WASHINGTON STATE BOARD OF EDUCATION

OLD CAPITOL BUILDING.•ROOM 253.•P.O. Box 47206.•600 S.E. WASHINGTON.•OLYMPIA, WA 98504-7206

May 7, 2008

Dear Boardies:

Utah Rocks, or at least that's what the tourist t-shirts say as Dave and I hiked through some magnificent canyon country a week ago. There is something very inspiring about those gorgeous deep red and white canyons with the rushing streams and cottonwoods just greening out. And of course the State Board of Education rocks too!

We will have a new student from the eastside, Austianna Quick, (also from Zac's high school in Oroville) join us at our Board meeting and will be saying good bye to Zac Kinman as he heads to the California State Maritime Academy this fall.

I want to say a special thanks to Kathe for all her hard work on the graduation requirements and science standards over the last month. Her brain circuits are smoking! Also a special thanks to Brad for his revamping of our Web site. You can actually find things now. We will continue to work on it. Ashley survived a week of Loy being on a well deserved vacation. Thanks Ashley! We have happy and sad news as Evelyn has announced her departure for the Higher Education Coordinating Board and a very cool job doing research for them. She starts there May 16.

Thanks for participating in the several special Board meetings as we launched the K-8 math standards. Steve Floyd has continued to steer our ship around many icebergs on this.

Warren Smith has been appointed to serve on the Interstate Compact for Military Children, which will study how to address the educational requirements across states for our mobile military student population.

Jeff Vincent and Kathe Taylor have shepherded our science standards review with Heil and Associates through panel meetings and focus groups so calmly - we need their secret!

We voted on the art show and look forward to honoring the student who will receive the Board award on May 16 and thanks to Linda Lamb for your help with this. Sheila Fox and Bunker Frank joined our Executive Committee for a productive Strategic Planning session on May 2. We are eager to hear your thoughts.

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We are starting to gear up for public outreach, in many ways, over the next several months as our work gels around graduation requirements and accountability. (I know Steve Dal Porto, Kris Mayer, Linda Lamb and others have already spent a lot of time out in the field talking to folks.) I met with 100 superintendents at Lake Chelan last Monday. They are reeling from major budget cuts and riffs, which made them not very receptive to our Core 24 proposal. I sent you a list of their concerns and feedback earlier this week. Mary Jean did a great job presenting to the Joint Basic Education Finance Task Force on Tuesday. We are preparing a list of key groups for you to contact in addition to some of your regulars. We want to do three public outreach sessions very soon—June 2 will be Spokane, June 3 will be Yakima and June 4 will be Seattle from 4:00-6:00 p.m.

Let's do a quick hop through the Board agenda. We will be in Sheila's neighborhood in Bellingham! The League of Education Voters is inviting you all to a reception in Bellingham on May 13, which I sent out to all of you yesterday. They have been strong supporters of our work.

Wednesday May 14

MHSD Graduation Requirement: the session will provide options on the Culminating Project, High School and Beyond Plan, and credit frameworks for you to discuss. Kathe has had two work sessions on these which many of you attended. This is the culmination (no pun intended) of that work.

Bellingham School District staff will share some of the ways they are changing high school graduation requirements, which include every student taking two years of a world language.

Colleen Warren will fill you in on the Dan Dempsey injunction over the K-8 math standards in an executive session during lunch.

APCO will present the student voices video they have been working on. We will use it with our outreach sessions this summer. We will also have a discussion about public outreach.

Brad has been working hard on a background briefing memo for you about online learning in Washington, as well as around the nation. He will be joined by a Bellingham School District staff to explain how they use on line learning in their district.

Math Standards for Algebra I and Geometry are in draft form now. Linda met with our Math Panel on May 1 (many of you were there!) and has asked for their feedback on her preliminary Edited Expectations. She will have a final report completed by May 13 (so we hope to email it out to you and have hard copies at the meeting). You will take public comment and determine if you want to make modifications before accepting her report at the May meeting. We hope things are all okay, but if not we can hold a special meeting to approve the report if needed, I realize the timing is tight. Please note, we will

need to have a special phone meeting in late May to determine whether you approve that the Superintendent may adopt these standards (we need to go through a two step process).

The Third Math Credit Rule has been revised to include designee for students whose parents or guardians cannot participate. We also reordered the rule to make it flow better. We plan to send out the math (and science) implementation survey through WSSDA very soon. We were slowed down a month by agreeing to have the PESB add their survey questions too, but we wanted to present a united front to districts. We also added back the High School and Beyond Plan language, which was dropped when SBE staff revised these rules in 2006.

Dinner will be Guiseppe's, which Sheila says is very good.

Thursday May 15th

Mary Campbell will be back to facilitate a Board discussion on draft direction for our new Strategic Plan. As I mentioned, the Executive Committee has worked with the information from your March meeting to develop a draft framework for your discussion.

We are in weekly contact with Mass Insight and NWREL on the accountability work. We will give you an update on that work as well as our thoughts on next steps for the accountability index.

OSPI will have selected its new vendors to develop assessments and we want to hear from Joe Willhoft about whom they have selected and what they plan to do.

Zac – don't' read this! We will honor Zac at lunch with some fun surprises.

David Heil and Associates will share their final report on the Science standards recommendations. As you recall from the draft report, they said our current standards are good, but could use some tweaks. They recommend going beyond the current grade 10 and including standards for grades 11-12. They have been very focused on how to implement the standards so teachers can be successful in teaching them. Jeff wants to work with OSPI and the PESB to ensure we have a strong science implementation plan, similar to the one with have for math.

In terms of business items, we will be seeking your direction on a number of items plus your approval of the delegation of authority to allow me to enter into things like hiring staff for you. We need to have you approve several contracts. Last month we did not go ahead with approving the Strategic Teaching contract because at the last minute, I received word that we needed to talk to the Office of Financial Management about how much of an extension we could do. We will advertise for the instructional materials review as a new contract.

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Mary Jean will share with you how her presentation went with the Joint Basic Education Finance Task Force.

Sorry to be a bit late with this, but staff need vacations to rest up for all this work and it is tough to do meetings six weeks apart. See you soon!

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State Board of Education Meeting
Whatcom Community College
235 W. Kellogg
Bellingham, WA. 98226
May 14 9:00 a.m. — 4:30 p.m.
May 15 9:00 a.m. — 3:30 p.m.

AGENDA

Wednesday, May 14, 2008

9:00 a.m. **Call to Order**
Welcome
Dr. Kathi Hiyane-Brown, President, Whatcom Community College
Pledge of Allegiance
Welcome New Student Representative
Agenda Overview
Approval of Minutes from the March 26-27 Meeting **(*Action Item*)**
Approval of Minutes from April 18 and April 28 Special Meetings ***(Action Items)***

9:10 a.m. **Meaningful High School Diploma: High School Graduation Requirement Options: Culminating Project, High School and Beyond Plan, and Credit Framework**
Mr. Eric Liu, Board Lead, SBE
Dr. Kathe Taylor, Policy Director, SBE

Board discussion

10:15 a.m. **Break**

10:30 a.m. Board discussion continued

11:00 a.m. **Public Comment**

11:30 a.m. **Bellingham School District High School Graduation Requirements**
Dr. Kenneth D. Vedra, Superintendent, Bellingham School District
Ms. Sherrie Brown, Interim Deputy Superintendent, Bellingham School District

12:10 p.m. **Lunch and Executive Session**

12:45 p.m. **Student Voices Video and Public Outreach Strategies**
Ms. Sara Jones, Consultant, APCO Worldwide
Ms. Kristi England, Consultant, APCO Worldwide

1:30 p.m. **Trends in On-Line Learning Brief and Local District Perspective**
Mr. Brad Burnham, Policy & Legislative Specialist, SBE
Ms. Ann Reed, Director, Instructional Technology and Libraries, Bellingham Public Schools

2:15 p.m. **Break**

2:30 p.m. **Math Standards Recommendations for Algebra I and Geometry: Strategic Teaching Report**
Mr. Steve Floyd, Board Lead, SBE
Ms. Edie Harding, Executive Director, SBE
Ms. Linda Plattner, Strategic Teaching

3:00 p.m. **Public Comment**

3:30 p.m. **Update on 3rd Mathematics Credit Rule and High School and Beyond Plan**
Ms. Edie Harding, Executive Director, SBE

4:00 p.m. **Public Comment**

4:30 p.m. **Adjourn**

Thursday, May 15, 2008

9:00 a.m. **Strategic Planning for 2009-11 Biennium**
Ms. Edie Harding, Executive Director, SBE
Ms. Mary Campbell, Principal, Mary Campbell &Associates

Board discussion

10:45 a.m. **Break**

11:00 a.m. **Update on System Performance Accountability with Focus on Accountability Index and Consultants' Work for Policy Barriers Study and State/Local Partnerships**
Dr. Kris Mayer, Board Lead, SBE
Ms. Edie Harding, Executive Director, SBE
Dr. Evelyn Hawkins, Research Associate, SBE

11:30 a.m. **Public Comment**

11:40 p.m. **Office of the Superintendent of Public Instruction Assessment Vendor Update**
Dr. Joe Willhoft, Assistant Superintendent
Assessment and Student Information, OSPI

12:10 p.m. **Lunch and Recognition of Board Member Zac Kinman's Service**

1:00 p.m. **Independent Review of Washington K-10 Science Standards Final Report**
Dr. Kathe Taylor, Policy Director, SBE
Mr. Jeff Vincent, Board Lead, SBE
Mr. David Heil, CEO, David Heil & Associates
Dr. Rodger Bybee, Co-Director of Science Standards Review Project, David Heil & Associates
Mr. Harold Pratt, Co-Director of Science Standards Review Project, David Heil & Associates

1:50 p.m. **Public Comment**

2:10 p.m. **Business Items**

- Approval of Strategic Teaching Report on Algebra I and Geometry Standards ***(Action Item)***
- Direction on 3rd Mathematics Credit Rule and High School and Beyond Plan ***(Action Item)***
- Approval of Heil K-10 Science Standards Review Report ***(Action Item)***
- Direction for High School Graduation Requirements ***(Action Item)***
- Direction of Strategic Plan ***(Action Item)***
- 180 Day Waivers ***(Action Item)***
- Delegation of Authority to Executive Director ***(Action Item)***
- Approval of Contracts for Studies ***(Action Item)***

3:00 p.m. **Update on Basic Education Task Force**
Chair Mary Jean Ryan, SBE

3:20 p.m. **Reflections and Next Steps from the Board Meeting**

3:30 p.m. **Adjourn**

PLEASE NOTE: Times above are estimates only. The Board reserves the right to alter the order of the agenda. For information regarding testimony, handouts, other questions, or for people needing special accommodation, please contact Loy McColm at the Board office (360-725-6027). This meeting site is barrier free. Emergency contact number during the meeting is 360-676-2170 x3408 OR 3225.

STATE BOARD OF EDUCATION

HEARING TYPE: _X_ ACTION

DATE: May 14, 2008

SUBJECT: **DIRECTION FOR HIGH SCHOOL GRADUATION REQUIREMENTS**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Mr. Eric Liu, Board Lead, SBE
Dr. Kathe Taylor, Policy Director, SBE

BACKGROUND:

CORE 24: Several versions of a CORE 24 graduation credit framework were considered at the March 2008 Board meeting, and the Board asked for further review of a version introduced by Board member Jeff Vincent. At the April 22 work session, Board members discussed refinements to the proposal, including suggestions for how to graphically represent key concepts associated with the framework, including:

- CORE 24 as the set of requirements in which all students would be enrolled automatically unless they selected the technical/career or four-year college options.
- Differences between the CORE 24 "default" focus of study and the other two emphases.

Culminating Project and High School and Beyond Plan: Board members began formal discussion about the culminating project and high school and beyond plan graduation requirements at the April 22 work session. Representatives from three districts—Highline, Kent, and North Thurston—described their approaches to the requirements and provided feedback about the benefits and challenges to implementation. Responses and recommendations from 145 of the 246 districts with high schools were presented, and are included in this packet.

In order to clarify any changes the Board might want to consider with respect to these two requirements, discussion of these and other questions will be taken up at the meeting:

1. What changes, if any, are needed to the Culminating Project requirements/guidelines to assure that students in all districts have rich and meaningful opportunities to demonstrate their learning?

2. What changes, if any, are needed to the High School and Beyond Plan requirement/guidelines to assure that students in all districts have an opportunity to establish a working plan?

Middle School and High School Connections: Almost since the Board began discussions about the Meaningful High School Diploma, the importance of middle school preparation to successful attainment of graduation requirements has been a recurring theme. Whether—and how—formally to connect the two levels through graduation requirement policy will be addressed at the meeting through discussion of two questions:

1. What is the purpose for encouraging middle school students to complete high school graduation requirements in middle school?

2. Do middle school courses that satisfy graduation requirements have to be taught at high school level standards?

EXPECTED ACTION:

The Board will give direction for next steps with the Meaningful High School Diploma work and agree to conduct a work session (tentatively scheduled for June 5) to move the work forward.

Washington State Board of Education

Working to Raise Student Achievement Dramatically

Meaningful High School Diploma

BACKGROUND

In 2006, the Legislature[1] directed the Board to develop and propose a revised definition of the purpose and expectations for high school diplomas issued by public schools. The Board expanded this task to a review of all graduation requirements, including the credit requirements that had not changed since 1985. Building upon 2003 rule language that affirmed the Board's commitment to "high, meaningful, and fair requirements every student can meet,"[2] the Board established a Meaningful High School Diploma committee of Board members and an advisory committee of stakeholders to assist with the work, which began in early 2007.

An initial discussion of credit requirements came before the Board in July 2007. The draft became a catalyst for conversation about the principles that the Board would use to drive its reconsideration of graduation requirements. The Board extended its internal timetable to complete its work on proposed new graduation requirements to the summer of 2008, and gathered feedback on the guiding principles during public outreach in fall 2007. Those guiding principles included the concept of one diploma for all, and the consideration of essential skills; competency-based learning and equivalency credits; alignment with postsecondary education requirements; and an integrated package of requirements.

Three themes emerged from the public outreach, including support for: 1) one diploma for all; 2) flexibility within the curriculum for students to choose different pathways; and 3) funding for new requirements.

All of these factors informed the Board's thinking about the purpose of a diploma and directions for the meaningful high school diploma work.

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[1] E2SHB 3098 of the 2006 Legislative session
[2] WAC 180-51-003 -- see appendix A for entire rule

PURPOSE OF A DIPLOMA

In January 2008, the Board approved a statement of purpose for a diploma, which will guide its review of the current high school graduation requirements.

The purpose of the diploma is to declare that a student is ready for success in postsecondary education, gainful employment, and citizenship, and is equipped with the skills to be a lifelong learner. The diploma represents a balance between the personalized education needs of each student and society's needs, and reflects at its core the state's basic education goals. The diploma is a compact among students, parents, local school districts, the state and whatever institution or employer the graduate moves on to—a compact that says the graduate has acquired a particular set of knowledge and skills. How the student demonstrates those skills may differ. Whether a student earns credit by participating in formal instruction or by demonstrating competency through established district policies is immaterial; they are equally acceptable.

TIMETABLE

The Board established July 2008 as its target for action on proposed graduation requirements for two reasons. First, the Board needs to have sufficient time to prepare its recommended budget request for local district implementation of graduation requirements by September 2008. This budget request will be submitted to the Governor for the 2009 legislative session. Second, the Board would like to provide budget information to the Joint Task Force on Basic Education Finance, as well.

In order to meet the July target and allow time to gather critical feedback from stakeholders, the Board has been following since March the timetable outlined on the following page. The timetable has been revised since the last meeting to reflect the addition of public outreach sessions and another work session.

UPDATE: WORK SESSION APRIL 22, 2008

The Board met for a work session with advisory committee members on April 22, 2008, and addressed the following topics: CORE 24, culminating project, and high school and beyond plan. The Board had intended to address essential skills, as well, but there was not sufficient time for that discussion, and it was postponed until a (tentatively scheduled pending Board approval) June 5 work session. Notes from the meeting are included in Appendix A.

<u>CORE 24</u>: Several versions of a CORE 24 graduation credit framework were considered at the March 2008 Board meeting, and the Board asked for further review of a version introduced by Board member Jeff Vincent. At the April 22 work session, Board members discussed refinements to the proposal, including suggestions for how to represent graphically, key concepts associated with the framework, including:

- CORE 24 as the set of requirements in which all students would be enrolled automatically unless they selected the technical/career or four-year college options.
- Differences between the CORE 24 “default” focus of study and the other two emphases.

Proposed Timetable: March – July 2008 (Revised)

Dates	Task	Board Action	Policy Questions
			These policy questions pervade all discussions of graduation requirements. Staff will provide background on these issues in the coming months.
March 26-27, 2008	Consider recommendations for credit frameworks	Approve one or more credit frameworks to vet with stakeholders	What package of credits will maximize opportunities for students, post high school?
April- June 2008	Feedback from key stakeholders through group meetings, web-based surveys, and public outreach		What implementation factors should the Board consider?
April 22, 2008	Work session on High School and Beyond Plan and Culminating Project; middle school connections; credit framework	No action	How does the Culminating Project and High School and Beyond Plan help students meet the purpose of a diploma? How do they help students personalize their educational experience?
May 15-16, 2008	Consideration of revised credit frameworks, High School and Beyond Plan and Culminating Project		What policy levers would help middle school students prepare for high school more intentionally?
June 5, 2008	Work session on essential skills and refinements to middle school connections, Culminating Project and High School and Beyond Plan, competency-based learning		How do we connect graduation requirements into an integrated, comprehensive package? How are essential skills reflected in an integrated package? What would encourage more competency-based learning?
June 2-4, 2008	Public Outreach in Spokane, Yakima, Seattle		
June, 2008	Meet with Tribal Leader Congress on Education representatives		How do we respond to the Tribal Leader Congress on Education resolution requesting the Board to add .5 credit of local tribal history as a graduation requirement?
July 23-24, 2008	Make any final revisions	Approve graduation requirements	

APCO has produced a flyer that conveys these concepts and the CORE 24 principles that underlie them. The first page of this flyer (the second page is still in process) is included in Appendix B, along with a series of draft scheduling scenarios created by staff. Discussion about the CORE 24 framework and underlying principles will continue at the meeting. Those principles include:

1. Equip Everyone. Commits the state to assist all students to prepare for a living-wage job or successful entry into postsecondary education.
2. Expect More. Recognizes that students need better preparation to meet the changing requirements of the labor market and the increasing wage premium paid for higher levels of educational attainment. Supports raising the overall level of educational attainment among Washington's younger citizens—one of the key goals of Washington Learns.
3. Create Intentional Pathways. Insists that students choose a pathway that will prepare them for work, postsecondary education, or both.
4. Provide Options. Provides the flexibility for students to choose a pathway that works for them, with electives to give students the freedom to explore new areas and to delve into areas of interest. Supports a variety of mechanisms for students to meet requirements by demonstrating competency, taking CTE-equivalent classes, earning credit online, or meeting requirements beginning in middle school.
5. Start Early. Recognizes the importance of preparation in middle school for high school and the value of helping students realize that they can begin to meet high school graduation requirements in middle school.
6. Plan Ahead. Elevates the significance of the High School and Beyond Plan by calling for schools to offer personalized guidance beginning in middle school and helps guide student course taking so students are positioned for success after high school.

Culminating Project and High School and Beyond Plan: Board members began formal discussion about the Culminating Project and High School and Beyond Plan graduation requirements at the April 22 work session. Representatives from three districts—Highline, Kent, and North Thurston—described their approaches to the requirements and provided feedback about the benefits and challenges to implementation. Responses and recommendations from 145 of the 246 districts with high schools were presented, and are included in Appendix C of this packet, along with the current guidelines.

In order to clarify any changes the Board might want to consider with respect to these two requirements, discussion of these and other questions will be taken up at the meeting:

1. What changes, if any, are needed to the Culminating Project requirements/guidelines to assure that students in all districts have rich and meaningful opportunities to demonstrate their learning?
    a. Would it be useful to specify the inclusion of one or more required elements? (e.g., proposal, research paper, community service, portfolio, oral presentation, reflection paper, etc.)

b. Would it be useful to specify that the Culminating Project must address skills beyond basic education goals 3 and 4?
c. Would it make a difference to change "should" language in the guidelines to "shall" language? (e.g., "School districts shall (vs. should) clearly identify Culminating Project student outcomes and develop and publish assessment criteria to support those outcomes"; "shall have a clearly identified culminating management system…;" shall include community involvement…
d. What are the pros and cons of assigning credit to the culminating project?

2. What changes, if any, are needed to the High School and Beyond Plan requirement/guidelines to assure that students in all districts have an opportunity to establish a working plan?
    a. When should the High School and Beyond Plan process begin, and how often should the plan be revisited?
    b. In what way (if any) should the High School and Beyond Plan be connected to the Culminating Project?
    c. Current guidelines specify that "students should be encouraged" to include the following elements in their Plan: personal story, learning style, goals for high school, and goals for immediately after high school. Is this language sufficient?

Middle School and High School Connections: Since the Board began discussions about the Meaningful High School Diploma, the importance of middle school preparation to successful attainment of graduation requirements has been a recurring theme, raising the question: What policy levers does the Board have to connect high school graduation requirements with middle school preparation?

Two primary ideas have emerged:

- Courses in middle school that satisfy graduation requirements.
- High School and Beyond Plan.

Courses in Middle School that Satisfy Graduation Requirements: Credit-Earning Courses. Middle school credit has, for all practical purposes, really meant credit earned in 8th grade (occasionally, 7th), and it has applied almost solely to math and world language classes. This practice reflects three realities:

1. Most middle schools aren't set up to teach high school level courses.
2. Not all middle school students are prepared to meet high school level standards.
3. There are limitations on credit earned in middle school when it comes to college admissions requirements.

Washington statute currently permits students to earn high school credit for middle school courses (defined as courses completed prior to ninth grade) if:

(a) The course was taken with high school students, if the academic level of the course exceeds the requirements for seventh and eighth grade classes, and the student has successfully passed, by completing the same course requirements and examinations as the high school students enrolled in the class; or

(b) The academic level of the course exceeds the requirements for seventh and eighth grade classes and the course would qualify for high school credit, because the course is similar or equivalent to a course offered at a high school in the district as determined by the school district board of directors.[3]

HECB Minimum Entry Requirements. The Higher Education Coordinating Board (HECB) will accept some math courses and world language courses taken in middle school if they were taught to high school standards. For example:

- The HECB will accept credit for a world language course taken in 8th grade as one of the credits satisfying its two-credit world language requirement ***if*** the second credit is earned in grades 9-12.
- The HECB will accept a high school-level algebra and/or geometry course completed prior to 9th grade ***if*** one credit of Algebra II (or Integrated Math III) is subsequently completed in the 9th grade or higher.
- The HECB will not accept credits earned prior to 9th grade in English, science, social studies, and the arts to satisfy minimum admissions requirements.

Courses in Middle School that Satisfy Graduation Requirements: Non-credit Earning Courses (Completion Requirements). The Board could also consider identifying non-credit graduation requirements to be completed in middle school. This practice would help students realize that middle school "counts" and would provide a way to emphasize more goal-directed education—the goal, in this case, being high school graduation. Two suggestions for "completion requirements" were made at the February 2008 work session.

- Washington State History. Require that Washington State History, which is usually taught in middle school, as early as 7th grade, be completed, but not for credit. This action would require the Board to amend the rule[4] that stipulates .5 credit of Washington State History.[5]
- Arts. Require a course in the arts for all middle school students. (If completed at middle school level standards, the course would better prepare students for the grade-level standards expected of them in high school.)

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[3] RCW 28A.230.090

[4] WAC 180-51-061

[5] Statute (RCW 28A.230.170) requires study of the Constitution of the state of Washington as a prerequisite to graduation from public and private high schools in the state. OSPI rule (WAC 392-410-120) stipulates that a one semester course in Washington State History must be taken in grades 7-12 combined (not at each grade level). Many districts offer Washington State History at the middle school level without offering it for a .5 credit. High schools then note that the requirement has been met (per Caleb Perkins, OSPI Social Studies/International Education Program Supervisor, in an e-mail April 14, 2008).

High School and Beyond Plan

The High School and Beyond Plan could present another opportunity for connecting middle and high school. Some districts introduce the High School and Beyond Plan in 8th grade as a way of encouraging students and parents to begin thinking about the demands of high school, and for setting appropriate educational goals.

Policy Questions

1. What is the purpose for encouraging middle school students to complete high school graduation requirements in middle school?
2. Do middle school courses that satisfy graduation requirements have to be taught at high school level standards?

Appendix A

Meaningful High School Diploma Work Session
Puget Sound ESD, Renton
April 22, 2008

MINUTES (Revised May 2, 2008)

Board Members Attending: Eric Liu (Board Lead), Amy Bragdon, Phyllis (Bunker) Frank, Linda Lamb, Mary Jean Ryan, Warren Smith

Staff Attending: Kathe Taylor, Loy McColm

Advisors: Sue Dixon (for Shep Siegel), Mark Mansell, Bob McMullen, Toni Pace, Scott Poirier, Wes Pruitt, Maureen Trantham

Culminating Project and High School and Beyond Plan—Origins and Overview

A background document was included in the packet to explain the Culminating Project and High School and Beyond Plan. It included feedback from 145 school districts that responded to a staff query about what districts are currently doing with the Culminating Project and High School and Beyond Plan—and what they would like the Board to do about the current requirements.

Warren shared information about the origins of the Culminating Project from a summary prepared by Larry Davis in 2006. He drew attention to the following points:

- Implementation of both the High School and Beyond Plan (HSBP) and the Culminating Project (CP) was intended to allow as much local flexibility as possible.
- The CP was intended to be an authentic demonstration of competencies, show progress over time, and focused on a topic of particular interest to the student. It was also connected to Basic Education Goals 3 and 4.
- The HSBP was about the skill of setting and meeting goals to achieve a diploma and to move beyond high school. In addition to outlining the steps needed to achieve a diploma, students were expected to identify at least one goal they expected to pursue the year following graduation, and to identify the steps needed to meet that goal.

Representatives from three school districts joined the meeting to give an overview of the process currently being used within their district for the Culminating Project and High School and Beyond Plan.

School District Approaches to Culminating Project and High School and Beyond Plan

Highline School District

Ms. Marianna Goheen, Director, Office of College and Career
Ms. Barbara Wilson, College and Career Specialist

Highline defines the purpose of the CP as providing "students an opportunity to test themselves—to see for themselves *as well as to demonstrate and communicate* to others that they can apply their knowledge and skills in important and practical situations to solve problems and achieve goals."

The CP is defined as "an independently conceived and managed piece of work, most often done outside the school, which shows the student's ability to: 1) design his/her own learning experiences; 2) use knowledge and skills to solve problems, and 3) independently manage a complex, multi-stage project."

The components of the CP include:

1. Project
    a. Proposal.
    b. Product, performance, exhibit.
    c. Documentation of what the student did.
2. Community-based connection.
3. Presentation to review panel comprised of community members.

Students do not earn credit for the CP; the district does not believe the credit adds value to the transcript, and colleges do not expect it. Student-led conferences are an important piece of the whole project. Some schools work on written components of the project in language arts classes; others do not. Some work is done in advisories. Students are pretty much on their own to do their projects. Discussion about high school expectations begins in the middle schools.

In the Q and A that ensued, the following topics were raised:

- Accountability—how does the district ensure quality control? (Answer: district-wide rubrics and visits by district staff).
- Worth of the project—is it a valuable tool to build the skills of project-based learning? (Answer: project-based learning adds relevance; the CP enables the schools to encourage more project-based learning. However, teachers need professional development—can't assume teachers know how to do it. Bottom line: It takes a lot of work).
- Worth of the project—what do students learn? (Answer: interviews of seniors showed the #1 learning was "Don't procrastinate." One challenge is to convince some teachers that students can do it.)
- Recommended Board action—what would Highline like the Board to do about the requirements? (Answer: Leave them alone—Highline followed the guidelines,

and has spent a lot of time developing the project. However, guidance from the state that brings together information about working with volunteers, student safety, and other considerations would be helpful because districts don't always have the time or resources to research that.)

- High School and Beyond Plan? (Answer: At Evergreen High School, the plans were successfully implemented in the 9th grade, but each year after that, they became less important. By senior year, students were just copying down the courses they had taken. It's a great project for 9th graders, but loses importance. Guidelines on what the plan should look like would be helpful).

North Thurston School District

Ms. Karen Eitreim, Director of Diversity, Policy, Languages and Arts
Ms. Kelly Boyer, CTE Teacher, Graduation Project Teacher and Coordinator, Timberline High School
Ms. Pat Slosson, English Teacher and House Facilitator, River Ridge High School; Graduation Project Teacher and Coordinator
Ms. Leslie Prather, Chinook Middle School Counselor

North Thurston directs students "to stretch your knowledge and abilities beyond your present level" by choosing a topic that they are personally interested in learning more about and in applying that learning in a practical setting.

The components of the Culminating Project include:

- Proposal.
- Review of Literature (minimum 13-page, research-based document).
- Product (documented 20 hours on an activity related to the topic).
- Oral presentation to community members.
- Journal (reflection on process.)

Students earn .5 credit in a semester-long course that guides students through the components of the CP.

Each high school puts a different "twist" on the basic framework. For instance, the alternative high school rolls the CP into a CTE course called Career Choices, and focuses the project much more on a career pathway. By contrast, Timberline asks students to submit a proposal, complete a project, and write two papers. One paper answers the essential question about their project. The second is a persuasive paper that addresses a controversial aspect of their project. Two staff members in the building score the papers.

In the Q & A, the following issues were addressed:

- Value of the requirement? (Answer: Kids feel a real sense of accomplishment—it's real work, and real accomplishment; community members are actively involved, particularly parents of younger students and retirees.)

- Implementation issues? (Answer: figuring out how to involve Running Start students; developing a district-wide and school-wide culture of involvement; huge impact on staffing.)
- Pros and cons of .5 credit? (Answer: There are different configurations. For example, a school might partner the senior project and a one-semester Advanced Placement (AP) government class. Students get .5 credit for the project and .5 AP credit—much of the CP work is done outside the classroom. There is also a combined computer applications and Culminating Project. One challenge is to figure out ways to broaden the opportunities to blend it into a CTE class. But the CP requirements need to be clearly defined or the credit issue gets blurred. Since students are required to do the .5 credit, they may not get to take other electives.)
- Community involvement in presentations? What advice would you give us to help all of our school districts develop that community piece? (Answer: We had to grow it, and our Board expected it. Maybe that's the answer—there's an expectation that community involvement is included. As we talk about revision, our superintendent made clear that that piece was not up for negotiation. We recruit parents (particularly of our younger students), and plug into service organizations and retirees. We now have some presentations during the afternoon for those who don't want to drive at night. We've talked about going to some of the retirement communities and doing the presentations on site.)
- High School and Beyond Plan? (Answer: It occurs through Advisory. They are beginning to see ways the HSBP and CP could overlap.)
- Recommended Board action? (Answer: Continue the requirement, with guidelines that allow local flexibility. As more schools engage in Navigation 101, they expect to see more of a meshing with the Culminating Project and the High School and Beyond Plan.)

<u>Kent School District</u>

Ms. Merri Rieger, Executive Director, Learning and School Improvement, 9-12
Ms. Molly King, Assistant Principal, Kentridge High School

This is the first year students have been required to do a Culminating Project in the Kent School District; however, seniors have been working on their CPs since they entered ninth grade. Kent has designed the CP to be completed over four years in high school. The CP includes both academic and career components, and is worked on during Advisory. Students do not earn credit for the CP.

The components of the CP include:

- Best works that reflect critical and/or creative thinking.
- Job shadow/interview.
- Research paper (four-six pages; graded by junior year English teacher.)
- Oral presentation before a panel of three, with one teacher as the head judge.
- Community experience (five hours.)
- Thirteenth year plan.

Documents are assembled in an e-Folio, an electronic portfolio that students have access to year-round, even for several years after their graduation from high school.

In the Q & A, the following issues were addressed:

- Challenges? (Answer: Our folks don't know how to provide academic personalization—yet. It's taking some time. It's also a workload issue, so we're dealing with this at the bargaining table. Any new additions you make take resources at the local level. I love the idea of taking every kid to a college campus. But if you mandate that—it becomes a different issue, and I don't know that our campuses are ready for us all to show up.)
- More guidance for the HSBP? (Answer: Not sure. Kids change their plans over the four years.)
- High School and Beyond template designed by Scott Poirier when he was at OSPI that is now maintained by an ESD—would be nice to hear more about that.
- Recommended Board action? (Answer: The District recommends not adding anything more to the Culminating Project for a few more years – they would like time to listen to their students and community and work with the current plan for a while. They also do not recommend attaching credit to the requirement.)
- Finding ways to showcase exemplary practices, perhaps at January OSPI conference.
- Challenge for the Board is to use the levers of the Board's authority effectively to encourage more districts to build exemplary CP and HSBP programs, while at the same time not limiting the flexibility that have enabled some districts to thrive and excel.

<u>One Diploma, Many Pathways: Opening Doors with Core 24</u>

(A draft graphic was distributed to illustrate the different pathways and core principles of Core 24.)

Core 24 is a new <u>draft</u> credit framework that the State Board of Education is considering. The framework requires students to choose one of three defined pathways—a coherent personal plan of study that prepares them for the next step after high school. The Core 24 principles include:

1. Equip everyone
2. Expect more
3. Create intentional pathways
4. Provide options
5. Start early
6. Plan ahead

Eric reviewed the draft CORE 24 framework and asked for discussion about whether the College and Work Ready requirements would be the default option that all students would be enrolled in unless they chose the College Ready or Work Ready requirements.

Rationale for making the “College and Work Ready” requirements the default option:

- Guidance and navigation is sometimes lacking, and students need a “safe harbor”—a set of requirements that is guaranteed to put them on a pathway that will keep all options open.

Discussion touched on:

- Importance of communicating that all three options are of equal value; although by placing students automatically in the college and work ready “box,” it makes it first among equals.
- Importance of assuring that students aren’t tracked.
- Importance of supporting students’ educational and career interests.
- Rigor of the college pathway—minimum requirements are insufficient to prepare students for more selective colleges (difference between state policy that “raises the floor” and district policy that augments the requirements.)
- Challenges of implementation and scheduling.
- Importance of middle school preparation so students arrive at high school prepared for the level of work expected; building more connections with middle school.
- Need for a comprehensive guidance system that helps students set educational and career goals.
- Clarity of terminology—“dual credit” usually means high school/college credits earned simultaneously; “cross-crediting or equivalency” usually means CTE courses that have established equivalency with academic courses and are transcripted as academic courses.
- Clarity of presentation—the differences among the three options boil down to differences in CTE, world language, and elective credit.
- Consideration of flexibility in requirements for students pursuing an IB diploma
- CTE vs. Occupational Education—Occupational Education allows greater flexibility because it doesn’t require that teachers be CTE certified; perhaps use both terms for the college-ready path.
- Implications for private schools.
- Culminating Project credit tied to CTE—good idea or not?
- Trade-off of prescribed and elective credit (some elective programs like AVID might be less accessible to students in a 24-credit framework.)

The meeting adjourned before a discussion of essential skills could begin. That discussion was postponed until a later date.

Opening Doors with Core 24

What is Core 24? Core 24 is the new set of draft credit requirements for high school graduation being considered by the Washington State Board of Education. Core 24 will require students to develop a plan for their future and choose classes to help them achieve their goals. Core 24 requirements will provide students with a strong academic foundation, with flexibility that will prepare them for whatever path they choose—whether that's the workforce, an apprenticeship in the trades, or a community or four-year college.

EQUIP EVERYONE Prepare ALL students for life after high school—in gainful employment, an apprenticeship or postsecondary education.

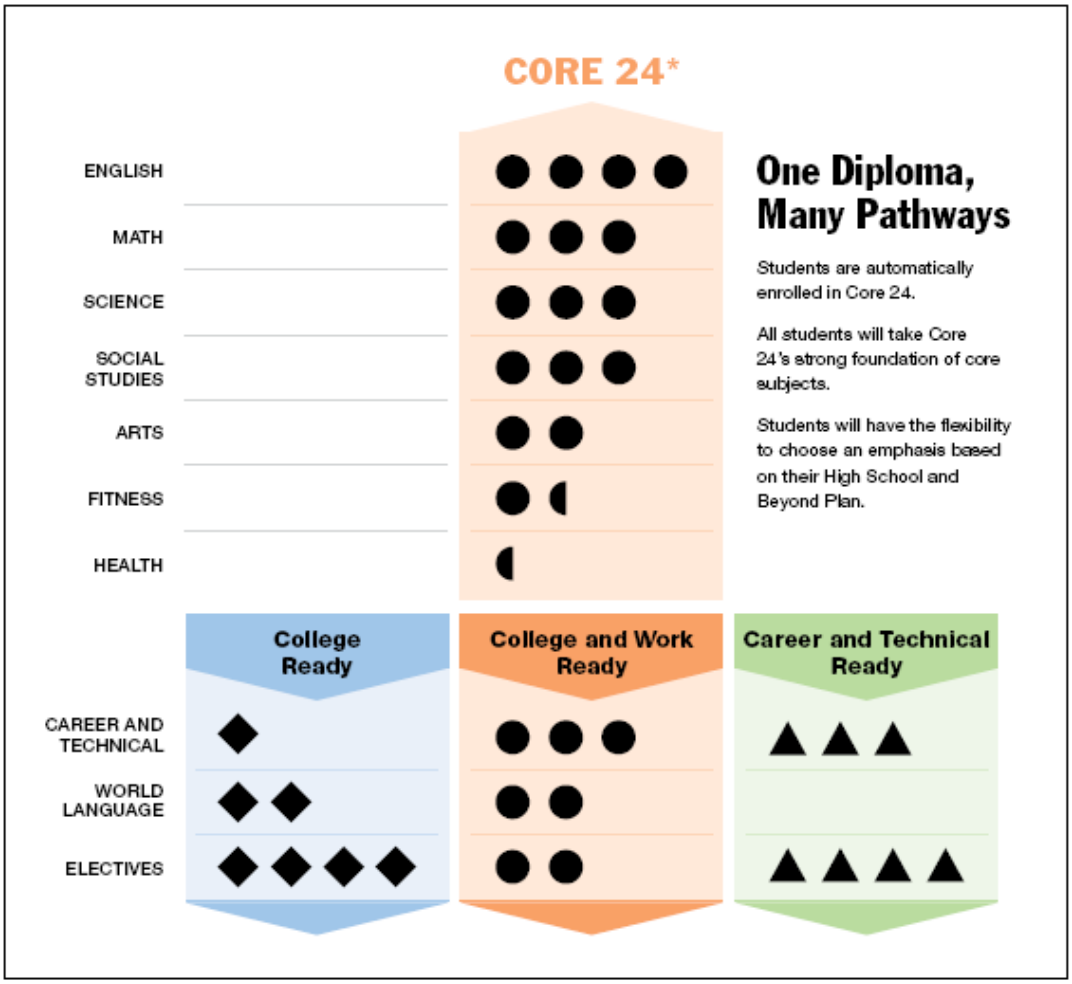
EXPECT MORE Align requirements to meet the increased expectations of the 21st century workforce.

PROVIDE FLEXIBILITY Allow student to customize their education, creating relevance to their interests.

GIVE FOCUS Encourage students to align course work to achieve their future career goals.

PLAN AHEAD Emphasize the High School and Beyond Plan to offer students personalized guidance to prepare them for work, postsecondary education, or both.

START EARLY Prepare students to enter high school and create opportunities to meet high school graduation requirements in middle school.



*** NOTES:**

1. Each symbol (◆,●,▲) represents one credit. 2. Where appropriate, CTE equivalent courses may be substituted. 3. One math credit must be taken in the senior year. 4. Some requirements (example: math, arts, world language) may begin to be satisfied in middle school. 5. One science lab credit must be an algebra-based lab. 6. Fitness credits can be waived and an equivalent experience substituted.

Core 24: College and Work Ready [DRAFT]
Student Pursuing the Environmental Exploration Advanced Placement Program at a Skills Center

This student can earn up to 8 college credits in high school in this tech/prep program.

College and Work Ready Subject Area Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Integrated Math I	Integrated Math II	Integrated Math III	Discrete Math
Science (2 lab)	3	Biology (lab)	Chemistry (lab)	Environmental Science (CTE equivalent)	
Social Studies	3	World History		US History	Sociology
Arts	2		Ceramics/ Pottery		
Fitness	1.5	Fitness (.5)	Fitness (1)		
Health	.5	Health (.5)			
CTE	3			Skills Center Environmental Exploration AP Program (2)	Skills Center Environ-mental Exploration AP Program (3)
World Language	2	Spanish I	Spanish II		
Electives	2	See notes			
Total	24	6	6	6	6

Notes:

- Assumes one arts requirement and Washington State History requirement completed in middle school.
- Assumes one Environmental Exploration course taken at skills center is a course equivalency for the third science credit, and is recorded on the transcript as a science course instead of a CTE course.
- Because the student satisfied the arts requirement in middle school, she actually had three electives and used them to take: one more credit of math and two more credits of CTE.

Core 24: Four-Year College Emphasis

This student plans to apply to the University of Washington and major in pre-med.

Four-Year College Subject Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Geometry	Algebra II	Pre-Calculus	Calculus
Science (2 lab)	3	Biology (lab)	Chemistry (lab)	Advanced Chemistry	Physics (lab)
Social Studies	3	World History		two courses: US History and Political Science (2)	Contemporary World Problems
Arts	2				Dance
Fitness	1.5	Fitness (.5)	Fitness (1)		
Health	.5	Health (.5)			
CTE/ Occupational Education	1		Computer Applications Technology		
World Language	2	Japanese I	Japanese II	Japanese III	Japanese IV
Electives	4	See notes			
Total	24	6	6	6	6

Notes:

- Assumes one arts requirement and Washington State History requirement completed in middle school.
- Assumes student took Algebra I in 8th grade.
- Because the student satisfied the arts requirement in middle school, he actually had five electives, and used them to take: two more credits in world language, one more credit in mathematics, one more credit in social studies, and one more credit in science.

Core 24: Technical/Career Emphasis
Student Pursuing a Business and Marketing CTE Pathway

Technical/ Career Subject Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Algebra I	Geometry	Algebra II	Statistics
Science (2 lab)	3	Earth Science	Biology (lab)	Chemistry (lab)	
Social Studies	3	World History		US History	Contemporary World Problems (1) and Economics (1)
Arts	2		Photography	Advanced Photography	
Fitness	1.5	Fitness (.5)	Fitness (1)		
Health	.5	Health (.5)			
CTE	3	Computer Applications (.5) and Digital Communica-tions Tools (.5)		Beginning Marketing (1)	Advanced Marketing (1)
World Language	0		Spanish I		Spanish II
Electives	4	See notes			
Total	24	6	6	6	6

Notes:

- Assumes Washington State History requirement completed in middle school
- The student is using four electives to take one more credit of social studies and math; two credits of world language

Core 24: Technical/Career Emphasis
Student Pursuing Health Services Pathway

Technical/ Career Subject Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Algebra I	Geometry	Algebra II	Pre-Calculus
Science (2 lab)	3	Physical Science (lab)	Biology (lab)	Chemistry (lab)	Anatomy and Physiology (CTE course equivalency)
Social Studies	3	World History	Sociology	US History	
Arts	2	Band	Band	Band	
Fitness	1.5	Fitness (.5)	Fitness (1)		
Health	.5	Health (.5)			
CTE	3			Introduction to Profes-sional and Medical Careers (1)	Professional and Medical Careers (3)
World Language	0				
Electives	4				
Total	24	6	6	6	6

Notes:

- Assumes Washington State History requirement completed in middle school
- The student is using four electives to take one more credit of arts, two more credits in CTEs, and one more credit in math.
- Assumes that one Health Care Professions CTE credit is equivalent to a science credit.

Core 24: Technical/Career Emphasis
Student Pursuing the Pre-Veterinary Technician Program
at a Skills Center (Struggling Student)

This student can earn up to ten college credits while in high school in this tech/ prep program and plans to enter a two-year Veterinary Technician Program at her local community and technical college.

Technical/ Career Subject Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Algebra I (fail)	Algebra I	Geometry	Algebra Inquiry
Science (2 lab)	3	Physical Science	Biology (lab)		Physiology and Anatomy (CTE equivalent) (lab)
Social Studies	3	World History		US History	Contemporary World Problems
Arts	2	Choir	Choir		
Fitness	1.5		Fitness (.5)	Fitness (1)	
Health	.5		Health (.5)		
CTE	3		Independent Living/Consumer Life Skills (1)		Skills Center Pre-Veterinary Technician Program (2)
World Language	0			American Sign Language	
Electives	4	Algebra I support class	See notes	Segmented Math (failed WASL)	See notes
Total	24	6	6	6	6

Notes:

- Assumes Washington State History requirement completed in middle school.
- The student is using four electives to take one credit of world language, and three credits of math (two remedial).
- Assumes a CTE equivalent course satisfies the third science credit.

Core 24: Technical/Career Emphasis
Student Pursuing a Construction Trades Program
at a Skills Center

This student is enrolled in a pre-apprenticeship program that is intended to prepare students for entry into a construction trades apprenticeship.

Technical/ Career Subject Requirements	Credits Required	9th Grade	10th Grade	11th Grade	12th Grade
English	4	English I	English II	English III	English IV
Math (1 in senior year)	3	Applied Math--Algebra I	Geometry		Math in Construction
Science (2 lab)	3	Physical Science	Biology (lab)	Chemistry in Context	
Social Studies	3	World History		US History	Contemporary World Problems
Arts	2		Guitar	Jewelry making	
Fitness	1.5	Fitness (.5)	Fitness (1)		
Health	.5	Health (.5)			
CTE	3	Computer-aided Drafting (CAD) I	CAD II	Architec-tural Design (1); Digitools (.5) and Financial Literacy (.5)	Skills Center Construction Trades Pre-Apprenticeship (3)
World Language	0				
Electives	4	See notes			
Total	24	6	6	6	6

Notes:

- Assumes Washington State History requirement completed in middle school.
- The student is using four electives to take more CTE courses.
- The student is electing to take the third credit in a math course that is applied to the construction trades.

Washington State Board of Education

Working to Raise Student Achievement Dramatically

What is the Core 24? The Core 24 is the new draft credit framework that the State Board of Education is considering. The framework requires students to choose a defined pathway. In order to receive a diploma, every student will develop and follow a coherent personal plan of study that prepares them for the next step after high school—whether that's a trade, an apprenticeship program, or college. Core 24 creates concrete options: under this plan, every graduate should be prepared for work, postsecondary education, or both.

Why is the State Board of Education putting forth this new proposal? Since 1985, when the credit requirements were last reviewed and revised, our society and economy have changed dramatically. Current credit requirements simply don't prepare students adequately for success. Our state can no longer afford to have students drift through high school without a plan, or to drop out of high school without motivation. Core 24 is designed to increase the rigor of high school learning while also increasing its relevance.

Core 24 Principles

1. Equip Everyone. Commits the State to assist all students to prepare for a living-wage job or successful entry into postsecondary education.
2. Expect More. Recognizes that students need better preparation to meet the changing requirements of the labor market and the increasing wage premium paid for higher levels of educational attainment. Supports raising the overall level of educational attainment among Washington's younger citizens—one of the key goals of Washington Learns.
3. Create Intentional Pathways. Insists that students choose a pathway that will prepare them for work, postsecondary education, or both.
4. Provide Options. Provides the flexibility for students to choose a pathway that works for them, with electives to give students the freedom to explore new areas and to delve into areas of interest. Supports a variety of mechanisms for students to meet requirements by demonstrating competency, taking CTE-equivalent classes, earning credit online, or meeting requirements beginning in middle school.
5. Start Early. Recognizes the importance of preparation in middle school for high school and the value of helping students realize that they can begin to meet high school graduation requirements in middle school.
6. Plan Ahead. Elevates the significance of the High School and Beyond Plan by calling for schools to offer personalized guidance beginning in middle school and helps guide student course taking so students are positioned for success after high school.

Appendix C

Culminating Project and High School and Beyond Plan

BACKGROUND

The State Board of Education established the Culminating Project and High School and Beyond Plan as graduation requirements for all students, beginning with the class of 2008.

CULMINATING PROJECT

Direction for the culminating project is provided in several places. First, the Board's graduation requirement WAC 180-51-061 states:

(i) Each student shall complete a culminating project for graduation. The project shall consist of the student demonstrating both their learning competencies and preparations related to learning goals three and four. Each district shall define the process to implement this graduation requirement, including assessment criteria, in written district policy.

Second, the Basic Education Act[6] goals three and four also inform the project. Goals 3 and 4 read:

> GOAL 3: Think analytically, logically, and creatively, and to integrate different experiences and knowledge to form reasoned judgments and solve problems.
>
> GOAL 4**:** Understand the importance of work and finance and how performance, effort, and decisions directly affect future career and educational opportunities.

Finally, guidelines are posted on the State Board of Education Web site. These guidelines state:

> Each student shall complete a Culminating Project. There is no state-level prohibition against doing joint projects of two or more students.
>
> School districts should clearly identify Culminating Project student outcomes and develop and publish assessment criteria to support those outcomes.
>
> Each district should have a clearly identified Culminating Management system, which supports student success through staff development and parent/community involvement.

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[6] RCW 28A.150.210

Project planning, supporting, and providing feedback should include community involvement. As part of the Culminating Project, each student will demonstrate essential skills through reading, writing, speaking, production, and/or performance (Essential Academic Learning Requirements). Each student will have the flexibility to construct his/her own Culminating Project.

School districts shall ensure the safety of each student by complying with legal and risk management guidelines.

HIGH SCHOOL AND BEYOND PLAN

Direction for the High School and Beyond Plan is established in the Board's graduation requirement WAC 180-51-061, which states:

> Each student shall have an education plan for their high school experience, including what they expect to do the year following graduation.

In addition, RCW 28A.230.090 stipulates:

> (c) Any decision on whether a student has met the State Board of Education's high school graduation requirements for a High School and Beyond Plan shall remain at the local level.

Guidelines regarding the High School and Beyond Plan are posted on the State Board of Education Web site.

The High School and Beyond Plan gets all students thinking about their future and how to get the most out of high school, so that they're ready to pursue their adult lives, no matter what direction they plan to take.

Ideally, students write their plan in 8th or 9th grade and then continue to revise it throughout high school to accommodate changing interests or goals. Students should be encouraged to include the following elements in their plan:

- Their personal story – what experiences, interests and goals are shaping who they are now and who they want to become.Their learning style.Their goals for high school – What will their four years of high school look like, including classes, extracurricular activities, sports, a job, etc.? Their goals for immediately after high school – Do their goals for high school get them ready for what they want to do after graduation? A student's plan should include the classes needed in preparation for a two- to four-year college, vocational or technical school, certificate program or the workforce.

Each school district determines the guidelines for the High School and Beyond Plan. Please contact your local school district to obtain a copy of the guidelines that have been established for your district.

POLICY QUESTIONS

- What is the relationship between the High School and Beyond Plan and the Culminating Project?
- How can the High School and Beyond Plan and Culminating Project be made more meaningful, and used to make the high school experience more intentional?
- When should the High School and Beyond Planning process begin?
- What key elements of a Culminating Project meet the intent of the Board's requirement?
- What key elements of a High School and Beyond Plan meet the intent of the Board's requirement?
- What are the pros and cons of assigning credit to the requirements?

CURRENT DISTRICT PRACTICE

In response to an e-mail query, 145 (59%) of the 246 districts, with high schools, provided information to the State Board of Education about the approaches they have taken to the culminating project and high school and beyond plan graduation requirements. This summary encapsulates the range of approaches the districts are taking.

Components of the Culminating Project

The most common components of the Culminating Project, listed in order of frequency were:

- Presentation (99)
- Portfolio (84)
- Project/Product (58)
- Research Paper (51)
- Reflection Paper (46)
- Community Service (44)
- Job Shadow (18)

In addition, many districts required project proposals or letters of intent, and a very few required students to complete a college application (2), participate in a senior exit interview (3), or attend a college/career fair (1).

It may appear odd to have a separate category for "project/product" for a requirement called the "Culminating Project." In some cases, the *project* was a portfolio/presentation, portfolio/presentation/reflection paper, or community service/reflection paper. In other cases, the district clearly stipulated that a tangible product or planned project was required in addition to other components. In one case, the culminating project consisted of attending a college/career fair and completing a college application essay.

In those districts where students completed a portfolio, the High School and Beyond Plan was usually part of the portfolio.

As expected with a requirement that can be locally determined, considerable variation in approaches exists across districts.

HIGH SCHOOL AND BEYOND PLAN

In response to the e-mail query, districts tended to elaborate more on the Culminating Project and only tangentially on the High School and Beyond Plan. That said, the information provided indicated considerable variation across districts. To capture the two extremes: In some districts, the High School and Beyond Plan was a brief, check-off type activity taking place in the senior year. In other districts, it was a process that began in 8th grade, revisited annually, and integrated into a portfolio that was part of the Culminating Project.

Following is a synopsis of district perspectives that will provide a glimpse into the issues posed by the Culminating Project and High School and Beyond Plan.

DISTRICTS' RESPONSES: CULMINATING PROJECT

In response to a question posed by SBE staff in an e-mail[7] to the superintendent of every district with a high school, the following responses were received. The question was, "From your perspective on the ground level, what, if anything, would you want the Board to do about these requirements (e.g., leave as is, provide more specific guidance, attach credit to them, etc.)"

Responses are categorized in the following ways:

- Leave as is (with responses organized according to the reasons people suggested to leave as is: working well, have already invested years of development, too much change going on at this time, local control allows flexibility.)
- Attach credit.
- Don't attach credit.
- Eliminate the requirements.
- Fund the requirements.

In addition, concerns, benefits, and general recommendations that surfaced in the comments are categorized and presented. Comments from some districts appear in more than one category as they provided lengthy responses that addressed more than one issue.

NARRATIVE DISTRICT RESPONSES

1. <u>Leave as is</u> (54 of the 145 responses—37%--recommended leaving as is)

a. Requirements are working well

"I've reviewed the state's Culminating Project language, and don't see any reason to change it. I'm glad that a project is now required, and as far as I'm concerned, the fewer restrictions the better. I just hope that more people will realize how meaningful and educational these projects can be." Pamela Snow, Senior Project Coordinator, Adna School District

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[7] Original e-mail sent in January, 2008; follow-up e-mail to non-respondents sent in March, 2008. A total of 145 (59%) of the 246 districts with high schools responded.

“We are pleased. Leave as is.” Greg Godwin, Superintendent, Asotin-Anatone School District

“We are fine with leaving it as it is because we would not adjust what we are doing with or without the requirement.” Vicky Murray, Assistant Superintendent, Student Services and Alternative Programs. Bellevue School District

"I think they are working fine the way we have it. We are adjusting it each year to make it work best for our students. At this time I am satisfied with the results." Tori Tinker, Personnel Office, Cashmere School District

"Leave as is and work to get fewer restrictions on PASS monies so funds can be used to assist students in this arena." Pete Lewis, Superintendent, Clarkston School District

"This school year we have begun Navigation 101 and students are working on their high school plan. We also have the seniors write a two-page essay explaining their five year and beyond plan that they put in their Culminating Project portfolio. My superintendent may have a different view than I, but I feel what we are doing is working well. We make minor changes each year as needed, but we have felt good about what our students are achieving." Julie A. Dashiell, Family and Consumer Science Education Instructor, Columbia School District (Stevens County)

"I think the requirements need to be left alone. They have been in place for years, with plenty of time for schools to ramp up for the requirements." Garth Steedman, Principal, Eatonville HS, Eatonville School District

"I'm not sure what further help is needed other than support to continue. Proactive planning and instruction on post high school training/careers is a very important function of our schools." Matt Charlton, Superintendent, Manson School District

“I would not want to have our requirement changed by further directions. I think we are on the right track for what the SBE wanted when they initiated the graduation requirement." Linda Metzger, CTE Supervisor, Tumwater School District

"The requirements are useful and relevant, and they benefit all students in the long run. While they require a great deal of work, we are navigating just fine. I don't think I'd change anything, at least not for another couple of years when we see how this all settles out." Gene Sementi, Assistant Superintendent, Instruction, West Valley School District

"I like the project requirement the way it is currently structured. Our kids get a great deal out of the project and we get a great deal of positive input from the community on the project." John Stemkoski, Principal, Winlock HS, Winlock School District

"Having the CP requirement in place from the state has absolutely been helpful to us. As we get pushback as to its value from certain constituencies, it has been useful to fall

back on the state requirement." Chip Kimball, Superintendent, Lake Washington School District

b. Leave as is: Have already invested years in development

“We have worked for many years on our Culminating Project process and are feeling very good about the work that our students are doing. Although it was difficult to get it started, we are excited about the structure we now have and would NOT want more/different guidance from the State Board. We currently offer credit for the course, which is an elective and only taken by a portion of our seniors. We do not offer credit for the project.” Susan Zoller, Deputy Superintendent, Bellingham School District

"Mike (superintendent) feels that we have worked with the project for a long time and that we would like to leave as is. Thru the last five years we have fine tuned it and feel we have a good thing going for our students. He does not feel we should attach credit or change any of the guidelines." Mary Weishaar, Senior Project Coordinator, Camas High School, Camas School District

"In Deer Park, we have had senior projects for over a decade, before it was a state requirement. We added the High School and Beyond Plan to the mix with last year's seniors as part of a four-year advisory program (begun with a Navigation 101 grant). It is difficult to determine cost. The grant paid for most of our expenses in putting the "Stags Lead" program together and we are using existing staff to monitor the program and senior presentations. We have added a credit to the four-year program already. I think this is an area where the State Board should leave it as is." Mick Miller, Superintendent, Deer Park School District

"Leave it as it is with local school districts developing their own project requirements to meet the WAC.” Steve Chestnut, Superintendent, Moses Lake School District

c. Leave as is: Too much change already

"Leave things alone. As a high school principal, we already have a hard enough time trying to figure out what is required these days for a diploma, now with the new legislation on maybe stalling reading. YIKES. Let's keep things consistent. Most schools around the state have known since 1993/94 that we were supposed to have a Culminating Project in place, so most have had something for some time now." Beth Vanderveen, Principal, Burlington Edison School District

"Do not change the requirements of these programs so we have time to further develop and stabilize our implementation plan." Terry Parker, Director of Curriculum, Instruction and Assessment, Enumclaw School District

"At this time, leave it alone. It takes considerable time for anything to become established. To offer changes at this time may be counterproductive." Dan Martell, Principal, Ephrata HS, Ephrata School District

"Speaking for myself, these requirements were not something I was in favor of to begin with. I believe they have limited value to the educational process. I don't believe the system or the students are better for them. Please don't make changes. With all of the changes constantly coming out of SBE, OSPI, and the Legislature, it is making everybody crazy." Joel Thaut, Superintendent, Granite Falls School District

"Please leave as is--leave the decision for this up to the local district. Please do not add any more requirements that would have our school and staff modify any programs, add elements to the Culminating Project or add any additional paperwork or tracking of data--we cannot keep up adjustments to all the new legislation that already comes out of the Legislature each session. In our case, our Culminating Project class earns graduation credit as an elective credit. The Culminating Project our students do is specifically related to their future career goals. In a previous district I was in, the Culminating Project could be on any topic i.e., fly fishing, snow skiing and such things not necessarily related to post secondary education or a career of interest. At the very least in my view, the Culminating Project is best related to future learning or work." Gary Wargo, Superintendent, LaCrosse School District

"At this point, we are working hard to implement what we have carefully planned over the past several years, I would not ask for or recommend any changes at this point. I believe we would lose credibility with students, parents, community and staff if we were to change the requirements after just getting them all in place this year." Larry Francois, Superintendent, Lakewood School District

"At this point I would be concerned with significant changes to what is currently required. What we are doing now is working pretty well, the students and staff understand it and I get nervous whenever any government agencies begin tampering with requirements as it usually means everyone needs to do more with less." Scott Grabenhorst, Superintendent, Toutle Lake School District

"From my perspective, we have worked very hard as a faculty developing a program that works for our students, our community, and our teachers. I would not want the Board to change anything regarding this year's requirements--certainly whether or not it is required for graduation--as was done with the math WASL. If the Board chooses to change things out, I would like the changes to begin with the class of 2010, as we have not held students to any project requirements yet." Joan Zook, Superintendent, Shelton School District

"Leave it as it is with local school districts developing their own project requirements to meet the WAC." Steve Chestnut, Superintendent, Moses Lake School District

d. Leave as is: Local control allows flexibility

"Leave it as it is with local school districts developing their own project requirements to meet the WAC." Steve Chestnut, Superintendent, Moses Lake School District

"Completion of the plan is part of three different courses students complete in the senior year, along with a portfolio they maintain via the career center. Thus, while certainly this has impacted teacher and career center counselors (as well as grade level counselors) time, the only true cost we might tie to this is that we did, a year ago, move from three counselors at Cheney High School to four--to assure we could have a designated counselor for each class because of changing/shifting graduation requirements for each class. We are candidly okay with this part of the graduation requirements...and the flexibility that has allowed for us to implement in a way that works for us." Mike Dunn, Superintendent, Cheney School District

"We think the two requirements are very valuable for our students and the Culminating Project is a great public relations tool for our community to see that students today are not all lost souls without morals, ethics, or skills but very good kids with a sense of direction and abilities. It is already a graduation requirement so allow local districts to govern how they are accomplished within the school. Local control allows districts to determine what it will look like for their district and what will work well for their students and community." Michael Morgan, Superintendent, Colfax School District

"Leave the requirements as they are. This gives local control for the Culminating Project and local control to the initial creation of the 13th year and beyond plan and the updating or revising of the plan. As the superintendent, I appreciate standards and goals. However, a one-size-fits-all program does not work. There are many school districts doing innovative and creative things to get their students to the next level. What I wish is that the State Board would establish goals and then provide support for local districts when they are struggling and need ideas or help from with other resources. At Dayton, we are increasing our graduation rate and increasing the number of students going beyond high school for education. If the State Board becomes too regulatory that may stifle many of the things that work with our district." Rich Stewart, Superintendent, Dayton School District

"It is working very well for us. I wouldn't want to see forced changes from above. I think it should remain a local decision to award credit or not. For example, we had not awarded credit previous to this year. We made the decision this year to tie it into a partial credit for Connections, as the projects our kids did were definitely worthy of some credit." Mark Hummel, Principal, East Valley High School, East Valley School District (Yakima)

“Students can complete their projects within courses or outside of courses through an alternative learning experience. Now that we have implemented a process for both the High School and Beyond Plan and the Culminating Project, it would be very difficult if the requirements were to change much. This would only cause confusion and more discontent if the changes were perceived as "more" or restrictive. We have the flexibility to attach credit if developed and aligned with such requirements. Leaving the development of specific requirements at the local level is helpful to meeting the needs of the students we serve and the goals of our district. I would be interested in knowing what is currently NOT working that would initiate a need to change these requirements." Debbie McClary, Kennewick School District

"Leave it to local control. Many districts and communities have developed projects that work for them. To step in and mandate certain specifications, etc. I think would be a bad deal." Doug Johnson, Superintendent, Odessa School District

"We do not want the SBE to do anything further about these two requirements, at least none of the things that you are suggesting. We like the openness of the current requirements that allows us to continue to create the High School and Beyond Plan in the 8th grade and gives the seniors, and us, a wide range of opportunities to create their culminating project." Barbara Kline, Principal, Orcas Island Middle and High School

"I like the requirement as it is. I also like the fact that we were able to develop our own project and not be told exactly what it will look like. I would say, "leave it as it is." At Toledo High School, we don't want more direction from the state. We feel as if we have developed a pretty good product that fits our kids and community." Shawn Corrigan, Principal, Toledo High School, Toledo School District

“I appreciate the ability to design our project with required state components and working as a district to improve, "tweak," and discuss our project. Since this is our first year, I do not want the state to do anything different other than provide some funding designated for this line item." Janet McCutcheon, Assistant Principal, Columbia High School, White Salmon School District

"Leave as is for local district-level decision-making." Lauri Landerholm, Assistant Principal, La Center High School, La Center School District

"Let the districts continue to implement the guidelines as presented." Mike Perry, Principal, Davenport School District

“Please maintain the requirement. There is value in the process and products the students produce as part of their CP.” Mike Johnson, Director of Teaching and Learning, South Whidbey School District

"My take, then, is for the SBE to leave it as it is, but if they see these specific requirements headed in the "wrong" direction, to give some further, general directions to get back on track as to what the SBE intended these programs to be." Rick De Graw, Counselor, Taholah School District

2. <u>Attach Credit</u> (15 of the 145 responses—10%--recommended attaching credit.)

"Attach credit to advisors and senior project--show on transcript." Dan Newell, Principal, Blaine HS, Blaine School District

"Currently, we have students complete these plans as part of their regularly scheduled classes (currently the career research report is done in Jr/Sr English classes). Additional time is set aside (approximately 10-20 hours) during the school year for teachers/counselors to assist students with their plans and projects. We should look (as a state) at attaching credit to the projects and a stipend for teachers that are responsible for assisting students in completion of their plan and project…this is an additional work load and responsibility…much like what is happening with the Collection of Evidence process." Kandy Ritter, Director of Teaching & Learning, Cape Flattery School District

"I would probably attach at least .5 credit to it because of the amount of work that goes in. Other than that I like the local control of how a culminating project looks." Rob Clark, Superintendent, Cascade School District

"Attach credit." Rich DuBois, Superintendent, Lake Quinault School District

"Attach credit and funding." Marti Harruff, Superintendent, Montesano School District

"From our perspective, the requirements could be left as is, or add a credit requirement. We already have a credit requirement at Quincy High School." Tracy Higgins, Advisory Coordinator, Quincy School District

"I would support giving credit for the completion of the Culminating Project. I don't think it would be appropriate for the 13 year plans. These expectations have finally become institutionalized. Students are being successful with the CP. A request from the Board to the Legislature for funding support for districts would be helpful." Mary Alice Henschel, Superintendent, Renton School District

"We would like to see the CP work tied to graduation requirements so that students receive credit for the required careers classes. Our biggest concern is still the awareness level that this is a state graduation requirement." Pam Ansingh, Executive Director for Teaching and Learning, Selah School District

"I think having each of the requirements bear credit would be beneficial for the Community School in knowing what students who come as fifth year seniors need to complete and also because kids seem to get the idea of "credits" as required." Patra Boots, Principal, Community School, Sequim School District

“This is the first year we require a Culminating Project with many guidelines and are giving a two-day a week class to help seniors complete their senior project. It is like pulling teeth. I do think a credit for this would be a good idea. I believe that students need to be accountable and this is a good process for our students, even if many of them will not go on to college (we have 25 students in our High School.) For the

Culminating Project, we used Bellingham's form which we got off the web. It is detailed and we modified some portions that did not apply. Our students live in the mountains and our community is 200 people. They do not have many opportunities for community involvement as, say, Edmonds. I believe it is more difficult for us; however, they are succeeding and completing their projects in order to graduate. We have put the senior project class with the speech class." Kathy McCowan, Skykomish School District

"I hope the SBE continues to give districts the flexibility to develop their own guidelines for the Culminating Project and High School and Beyond Plan. However, I believe it would be helpful to attach a credit to the project and plan." Dan Whitford, Director of Instructional Services, South Kitsap School District

"Our preference would be to: 1) allow students credit for their projects and have them evaluated for a letter grade, 2) receive an allocation to support the additional staff involvement required to advise students about their projects, monitor, and track their work, and 3) allocate funding to pay staff volunteers to be trained and be advisors to specific groups of students in order to ensure a quality project." Ethelda Burke, Interim Superintendent, Tukwila School District

“Fund it and give credit for it." Tim Ames, Superintendent, Wellpinit School District

"Many students struggle with beginning and completing the projects independently. Most need support throughout the entire process. A credit course may assist most students. More specific requirements might also level the playing field between schools." Pete Diklich, Principal, Yelm High School

3. **Don’t Attach Credit** (11 of the 145 responses—8%--recommended not attaching credit.)

"I wouldn't attach credit in our case as we have a class established for kids to work on a majority of the aspects of the Culminating Project. As long as the state is flexible, I think we are doing a good job. I like the open nature of the Culminating Project.” Justin Laine, Counselor, Naselle School District

"We can attach credit to them if we made the Culminating Project an elective course so we don't need the State Board to attach credit to this requirement. We don't want to take away from our electives. We don't need this to be a credit-bearing requirement. We do need financial support because no school can do it without having at least a part-time Culminating Project coordinator. We have a .4-8 FTE Culminating Project coordinators, depending on the size of our comprehensive high schools." Carolyn O'Keefe, Director of Secondary Education, Northshore School District

"Adequately fund basic education, or at least the mandates that the Board adopts. Currently, the discussion of math increases in requirements will most likely not come with funding, although it would be a significant strain on us because we are rural, we would need more math instructors, and that would be at the expense of electives. The

State Board can have guidelines, but should not have influence on local graduation "credit" requirements." John Belcher, Principal, Omak Middle and High School

"We would like to see NO changes at this point. The current arrangement allows for district flexibility to tailor projects and plans to individual building schedules and systems. We currently are not in favor of attaching credit due to this affecting graduation requirements." Kathy Ehman, Assistant Superintendent, Sedro-Woolley School District

“Attaching credit is not appropriate in our current system, since the plan is part of a graduation requirement as well as the current guidance delivery model." Tom Lockyer, Superintendent, White River School District

“If you add the Culminating Project as a credit then it involves union issues which we faced when we were using advisories to implement the Culminating Project and High School and Beyond Plan. Teachers would then need to be paid for the time, grading and interaction with students when credit is involved. Teachers would also require training, which was a complaint the teachers had about advisories and that also requires money for training time.” Cindy Wardlow, Culminating Project Coordinator and CTE Coordinator, Kelso School District

“At this time, we do not recommend that the State Board of Education attach a credit to the Culminating Project requirement or that they lower the current requirements. We do recommend that the State Board work to provide funding for this graduation requirement." Merri Rieger, Kent School District

"I would not recommend attaching credit to these requirements. These are designed to be proficiency-based, and work well as such. When you attach credit to them there is a whole host of problems that will be created including seat time requirements, labor contract issues, tracking issues, etc." Chip Kimball, Superintendent, Lake Washington School District

“We would not recommend the attachment of credit to the requirement for the senior project or fifth year and beyond plan. In Moses Lake we have come up with a very manageable program to meet the requirement." Steve Chestnut, Superintendent, Moses Lake School District

"As for credit--I know that some districts do assign credit for CP; however, since it is a state requirement, we felt that it should be a part of the English and CWP curriculum (i.e., you must do adequately on the Senior Culminating Project or you would not pass those two required classes) and this seems to work well." Kimm Minkler, Counselor, Kiona-Benton High School, Kiona Benton School District

“This is one of the most relevant, meaningful, inspirational requirements associated with graduation. I have numerous copies of students' reflection papers, and they are phenomenal. Please do not make such a project "credit bearing;" we need the flexibility to do that locally. Some students need to take a class (for credit) to have the support.

Others are fully independent and have full academic schedules." Whitney Meissner, Principal, Chimacum High School

4. <u>Eliminate the Requirements</u> (three of the 145 responses—2%--recommended eliminating the requirements.)

"Drop the requirements and put them back at the district level because they are unfunded mandates and have no true validity and are not required for any future employment or admittance into trade schools or any college and or university." Clay Henry, Principal, Goldendale High School, Goldendale School District

"Some of the project can be eliminated because it is an additional burden for students and staff. The five-year plan, job shadowing, career explorations, and college and technical school visitations would be far more effective than a Culminating Project." David Thomas, Superintendent, Lind School District

"To be honest, we are doing the minimum to comply with state law. Our High School program is rigorous and demanding. We see the project as an unnecessary add-on to an already full academic schedule. We have been doing a student five-year plan for at least ten years that I know of. We recommend that the CP be dropped as a state graduation requirement. We have a rigorous curriculum; we require 25 hours of community service annually; seniors prepare a scholarship notebook; we require substantially more English, math, science, history, and civics, than the state requirements. Our recommendation would be to drop everything but the WASL reading, writing and math assessments for graduation (plus the credit requirements, of course). Those skills are the building blocks for all academic disciplines." Susan Hanson, Principal, Vashon Island High School, Vashon Island School District

5. <u>Fund the Requirements</u> (15 of the 145 responses—10%--recommended funding the requirements.)

“Fund a longer school day; fund six periods; actually, we could use seven periods); fund clerical and counseling support; fund supplies needed to complete projects.” Ann Varkados, Asst. Superintendent Curriculum and Instruction, Pierce School District

"Fund CP or eliminate it." Judith Murdock, Executive Director of Education, Mukilteo School District

"If the state wants to mandate additional graduation requirements, it should find a way to pay for the time, energy, and financial costs associated with the changes. Put in the context of school reform and the mandates of NCLB and state standards, the amount of work and pressure to simply manage and organize all of this is very taxing on school employees. Remember that these are people with huge hearts for kids. I would hate for the additional burdens to diminish the great work we are already doing with our students." Mark St. Clair, Principal, Lakeside High School, Nine Mile Falls School District

"We have already attached a competency-based credit to this requirement as a local diploma requirement. This target needs to remain constant for a few more years until we get this done. A moving target will not be helpful. Some funding would be helpful." Ted Jansen, Principal, North Mason HS, North Mason School District

“These unfunded mandates are starting to divert a lot of energy in our school toward activities that are not helping us increase student learning but instead check boxes for completion. I know this is not the intent of the activities but it is the result. Schools are struggling to meet all the legislated requirements and meet the needs of our students. Our students have higher personal and academic needs on an annual basis. However, we find ourselves following data and procedure more than working with students to meet academic standards.” Dwight Lundstrom, Principal, Oak Harbor High School, Oak Harbor School District

"Assist in funding." Carrie Lutz, Port Angeles School District

"We offer two classes at the 9th and 11th grade to work on the CP portfolio and CP. We already attach credit to them, I think they need to fund teacher salary to provide class time for students to work on the CPs and portfolios; grants should be available for community and schools to work together to create and offer opportunities for students to do internships, service projects and other projects that benefit students exploring career interests.” Gordy Waite, Director of Guidance and Counseling, Friday Harbor High School, San Juan Island School District

"I would like the Board to provide funding for extra counseling help to deal with all the new graduation requirements." Loanna Torey, Sequim School District

"The SBE could recommend or require the legislature to provide additional funding to support the additional requirement. Any new requirements should also be followed by adequate funding. In our school district, we have been forced to divert other funding to support this program requirement." Mike Johnson, Director of Teaching and Learning, South Whidbey School District

"If the Board is interested in this as a continued graduation requirement, it would be appropriate for the Board to work with the legislature to direct resources to support a successful implementation of this mandate (as well as any others like it). While Navigation 101 as a grant resource is helpful to begin the implementation, it is only enough to begin the first steps of a successful implementation.” Michael Olson, Stanwood Camano School District

"The only change we would recommend is for the state to fund these mandates. We have liked being able to develop the program for our students with their unique needs and would not recommend any specific changes." Kim Grady-Andrews, Counselor, Warden School District

"The only thing I would add is that this is a great program and should continue. One must realize that it is an unfunded mandate that we have had to come up with creative ways to fund. Unfortunately, this always comes with a financial impact to other programs that we need to take money away from." John Schieche, Superintendent, East Valley School District (Yakima)

"I think that they are important requirements for our graduates. As I have said, we have had them in place for a number of years and would continue even if it was not a state requirement. The challenge we face is the cost of maintaining the level of quality." Brian Howe, Principal, Stevenson High School, Stevenson-Carson School District

“We would like the SBE to fund each career counselor to assist districts with completion of the graduation requirements. The mobility of our students (out of state students enrolling at our high schools) creates an increased workload for our academic counselors." Shirley Kenmochi, Executive Director, Secondary Teaching and Learning, Central Kitsap School District

"If we are going to keep the Culminating Project as a requirement, there must be some funding attached to it or it will be cut along with everything else or streamlined so much that it will not benefit students. Our project is a good one but requires a tremendous amount of administrative and teacher time, which is very expensive.” Kevin McKay, Superintendent, Zillah School District

CONCERNS ABOUT CULMINATING PROJECT

1. <u>Broad Guidelines Allow Flexibility but Create Inconsistency of Rigor Across Districts.</u>

"The requirements are broad enough that it gives each district some flex, but also keeps a common standard from occurring. Overall, we would want the requirement to remain, possibly with more definition as to acceptable standards." Rainer Houser, Superintendent, Ocean Beach School District

“Provide a better framework for what the state would like to see in regard to the High School and Beyond Plans as well as the Culminating Project. The Culminating Project has never really identified the parts and pieces that a school should include to show what a student knows. (Do you want a math element to it? How about reading?) A great number of districts use portfolios to show a student's best work, but does this really do what we are asking for? Stating that we have to do a project and then leaving all the details up to the schools raises the stress level for everyone involved, and then it is never measured. We are checking off a box...Are we doing the culminating project? Yes/No." Karl Ostheller, Principal, Oakesdale School District

"I feel that the CP is a great way to hold students accountable for their learning. The only concern I have is the variation of requirements as to the project and presentation." Sally Nelson, CP Coordinator, Thorp School District

“The state may play a role in assisting in the identification of a set of Culminating Project standards for all high schools. As we have a very mobile population, this is critical." Mike Stromme, Chief of Secondary Education, Vancouver School District

"My suggestion is to be sure there is a project component. Some local schools just make them do a paper and then do a presentation on it. Perhaps specific guidelines would be helpful to make it uniform. I know a student who transferred to another school and she said ours is much harder than that school. I know it is a great experience for our kids, but is it fair that others get by on much less?” Roseann Groom, Waitsburg HS, Waitsburg School District

“Help with quality control so that there is more consistency to avoid having students move from one high school to another to finish this.” Rebecca Miner, Assistant Superintendent, Washougal School District

“We realize that some districts do not require nearly the depth that we do but we are proud of our accomplishments even though it takes us more time. We don't want to diminish what we have started. So leave it as is with some minor monitoring of districts to assure that the state guideline is being followed." Michael Morgan, Superintendent, Colfax School District

"Schools have had too much added to their plate and it is difficult to find time to teach with all the added bureaucracy. What do I mean by that? It is that we should have had more guidance in the "Culminating Project" as it is not close to consistency across the state. Some districts have very difficult project requirements and others have very easy requirements. I think we fall in the middle of the spectrum. Students transferring from different districts run into conflicts with the next district as the requirements are so variable. If you add guidelines now, then all the work the districts have done to get in compliance with the state requirements will be wasted.” Cindy Wardlow, Culminating Project Coordinator and CTE Coordinator, Kelso School District

"Either local control as it was originally intended, and followed for many years in the past so that districts can truly individualize programs as they see fit, or, if consistency is what is truly desired, a more consistent statewide plan that is not as open for interpretation district to district." Kyle Miller, Principal, Columbia High School, Columbia School District (Walla Walla)

"Please do not create any more changes in the graduation requirements. If you must do so, please allow time for us to adjust and create the excellent communication and system structures so that our students, their families, and staff can prepare for these changes. Also, provide a consistent message about the requirements to the media and through your office." Kimberly Mueller, Coordinator of Graduation Requirements, Tacoma School District

"It would be nice if the requirements were more laid out and state wide. It is tough in smaller districts when you have two or three individuals trying to get all graduation requirements done for each student." Brian Parisotto, Asst. Principal, Freeman High School, Freeman School District

“Some districts are using the High School and Beyond Plan to meet the requirement of the Culminating Project, yet students do not do an independent study project (research paper, physical project, and public presentation). Some districts equate the presentation of their portfolio with an in-depth project where a student researches, completes, and then presents on a topic of interest. The SBE should more clearly define this standard. We have committed staffing to provide a class as required credit toward graduation. We clearly are meeting the law in terms of EALR Goal 3 and 4. Our visits to other districts show a dramatic difference in the requirement at the local levels.” John Polm, Jenkins High School Principal, Chewelah School District

"It would be nice to have more guidance from the state so the new requirements are implemented consistently. We are all over the map!" John Harrison, Principal, Mercer Island High School, Mercer Island School District

2. <u>The Culminating Project Assumes a Skill Level Some Students Don’t Have.</u>

"I believe the culminating project requirement is flawed. Ellensburg School District rewrote our project requirements based on the recommendations made by a self-study team. I very much like the new direction we have taken. Conceptually, the project design is sound and the work can be meaningful but, in my opinion, the premise of the Culminating Project is flawed. In theory, the Culminating Project should show applied application of mastery of academic goals. We (the state) measure the mastery of those goals, in large part, through a demonstration of mastery on the WASL. If the Culminating Project is to be truly meaningful a student must have basic skills to complete the project. That is not the case. Students who lack basic skills are allowed (forced) to proceed towards the completion of a senior project--this is happening not only in Ellensburg but in other districts as well. This effort distracts students from working on the basics and instead engages them in a watered-down activity to meet graduation requirements." John Glenewinkel, Superintendent, Ellensburg School District

"We believe the CP should be a local graduation requirement, not a state requirement. Right now our energies are on getting our seniors to standard in reading and writing, making sure they are successful in math if they didn't meet the math standard, and helping them to meet the credit requirements...no easy task and then we layer on the CP for the same students who are already at risk of not graduating. It's too much and in many cases it is not very meaningful. The SBE should make the Culminating Project a local option, not a state requirement." Nancy Stowell, Superintendent, Spokane School District

3. <u>The Culminating Project Adds to Workload.</u>

"Hoquiam has incorporated this requirement into its senior level Global Issues class. Students complete a project within the class and they must document community service hours as a requirement. Each senior also participates in a formal interview process with local citizens. Each student must present a formal cover letter and resume' during the interview. Since we have used this in the class and added the requirement to the teacher, it has created greater responsibility and paper work to his load. It is also another thing that the counselor must consider when determining who will or will not graduate. Hoquiam High School has also begun a Navigation 101 program this year as well. The High School and Beyond Plan is part of this curriculum." Mike Parker, Superintendent, Hoquiam School District

"I support these standards but it will take many staff members' time to make sure the quality and rigor is there for each student." Jim Busey, Superintendent, Lake Chelan School District

"We attach a credit for completion of the project. We use our computer class to introduce students to this four-year project. I then visit 10, 11, and 12th grade English classes to assist the students in keeping their projects on track. We offer an elective class senior year, in which students can also get additional assistance. I am in the computer lab one afternoon a month so students can get help. I know the students are the ones that are supposed to be responsible for this project; however, I see the adults in our school doing a lot of the work in order to make sure students graduate." Julie Riegel, Counselor, Newport High School, Newport School District

"We are discussing how to redesign the Grad Project. We all want to retain the elements that have been extremely valuable to students (research, writing a long paper, presenting to a panel of community adults, managing and completing a large and complex project) while reducing elements that are problematic (not all students need 90 days, the FTE required is difficult to provide with increasing demands for WASL/COE classes, etc.) We may look at changing the .5 credit requirement in 2009-10, but would like to know the new State Board graduation requirements first." Karen Eltreim, Director Diversity, Languages, Arts, North Thurston School District

“We are also concerned about the plans and how to manage them electronically so that we are not buried in paper and are able to sort and monitor student progress.” Susan Zoller, Deputy Superintendent, Bellingham School District

"When we take class time to address the Culminating Project, we are taking instruction time away from something else." Tom Anderson, Superintendent, Crescent School District

4. <u>The Purpose is Unclear.</u>

"I judged the Hearst Senatorial Scholarships in November for AWSP. Twelve top seniors from across the state compete for two $5,000 scholarships and a week in Washington, DC. When one interview question asked their understanding of the graduation requirements for the Class of 2008, the Culminating Project was clearly the most confusing element. Some even stated they knew they had to complete something but didn't know what or when or how. I was quite disturbed by this response because these were seniors and it was November. I share that just to encourage increased clarity for students in whatever revision is made." Karen Eitreim, Director, Diversity, Languages, Arts, North Thurston School District

"Since we engaged in the senior project/paper in 1995, our program has been reviewed annually and revised to meet the needs of our students. The past school year was no exception. We reviewed the program needs and are continuing to wrestle with the following program concerns: 1) Lost instructional time due to the time spent working with students on the state High School and Beyond Plan; 2) adequate resources to support the senior project/paper and the High School and Beyond Plan; 3) layering of the additional High School and Beyond Plan state standard on top of the existing program we operated. A significant component of our review last year was the time we spent with high school seniors in a focus group review of the senior project/paper and High School and Beyond Plan. We provided students a voice and they shared with us their frustrations. The students who participated shared their frustration with the lack of connection between the requirement and their future work. Of course, we are obligated to help students build this bridge to the work by developing a Culminating Project that is more focused on post high school readiness for work, school and life. The student learning must be more authentic and aligned with student interests. We could not argue with a Culminating Project. As previously stated, we have a model that we can build from and improve...making it more relevant to the lives of students. However, it may not be a research paper." Mike Stromme, Chief of Secondary Education, Vancouver School District

5. <u>The Logistics of Getting Full-time Running Start Students to Complete the Culminating Project is Challenging.</u>

"It would be nice if the colleges needed to take more responsibility for making sure that the Running Start students get their requirements completed successfully. It is hard for the teachers to try and keep on top of the kids when they aren't on campus. Our local community college doesn't seem to know anything about the CP requirements, and so that makes it "our problem" instead of them working in partnership with us on it. I know from talking to other administrative colleagues at the high school level that this is not a problem unique to our school." Carrie Ehrhardt, Principal, Port Townsend High School

"Determine whether community colleges will handle Running Start students' projects or whether students have to work with a high school on that issue; help with quality control so that there is more consistency to help avoid having students move from one high

school to another to finish this; consider a pass/fail credit for the 5-year plan if districts have a rigorous enough program" Rebecca Miner, Assistant Superintendent, Washougal School District

“We are very concerned about the students who are full-time Running Start and still have to complete this project.” Susan Zoller, Deputy Superintendent, Bellingham School District

BENEFITS

"Everything is done in a single class…we do have an advisory and are beginning to blend it into our advisory using Navigation 101. It gets the students to think about their plan throughout high school and then reflect on their education. It also makes them think about what they are going to do with their lives." Don Beazizo, Principal, Concrete High School

"I believe the project is a time for all students to show what the application of their learning is. Some students struggle but with the guidance of an adult mentor they do complete the project." Marianna Goheen, Highline School District

“This is the fourth school that I have had a major role in starting and implementing the CP requirement. I have found that the project and presentation can be a very profound and meaningful experience. I have had a number of students tell me it was one of the best things they ever did in high school.” John Lombardi, Principal, Monroe High School, Monroe School District

"We are proud of our district's implementation of the senior project and have had this requirement in place prior to the state requirements. We believe that the senior project is a powerful way for our students to demonstrate our six district outcomes and to synthesize their learning around a topic of their choosing. We will continue with the senior project even if it were no longer a state requirement.” Nancy Skerritt, Asst. Superintendent/Director, Teaching and Learning, Tahoma School District

“We have been requiring these classes for a long time (since 1993). We will continue to offer them no matter what the state does, because we believe they have great value and they are both so much a part of the culture in our building." Doug Dearden, Superintendent, Trout Lake School District

"Because we have all of our teachers and counselors involved via an Advisory Program designed to assist student with CP graduation requirements, all teachers need to know the requirements needed to graduate as well as those that will prepare students for college and the world of work; thus pushing students to think beyond the current year of school. Students are required to reflect on what is a "best work," which helps them to self-evaluate and defend what is quality work. Our community service requirement gets students out in our community which provides advantages to the community and an opportunity for the community to see how great our students are." Merri Rieger, Kent School District

"I see no problems with the requirements and believe they have enriched the education of our students. The senior project more than the High School and Beyond Plan. The portfolio that the students begin in 7th grade is valuable and the students use it each year to lead the student-led conference with their parents but I am not sure it has the meaning that the senior project does in the eyes of the students and their parents." Suellen White, Superintendent, Easton School District

"In the last few years, we have had good response from parents and community members who come in and listen to the oral presentations. I can't really think of any negatives or big changes that staff or other adults are asking for. Some even act as "mentors" to the students year after year and enjoy seeing the young people as they explore their topic/project." Kimm Minkler, Counselor, Kiona-Benton High School, Kiona-Benton School District

GENERAL RECOMMENDATIONS

"You should look at the 2007 schools of distinction research and see what elements have been implemented successfully, then go to the legislature to fund some grants to help schools get the requirements fully implemented. The requirements are easy to meet. School districts just need to get them going." Kim Spacek, Superintendent, Pomeroy School District

"Question from one of our principals: Could the completion of these projects substitute for passing a portion of the WASL?" Sue Porter, Director of Teaching and Learning, Shoreline School District

"I would also suggest that we use the Culminating Project as an option for those students who don't or can't pass the WASL. Scrap OSPI's COE model and let local school districts decide if the student's Culminating Project is worthy of them being able to graduate from high school." Kevin McKay, Superintendent, Zillah School District

"We have three comprehensive and one alternative high school within our district. Our alternative school has required a Culminating Project for the past eight years. I would want us to be very thoughtful and careful about what we do, particularly as an unfunded mandate. At this time, we are exploring the possibility of tweaking our model to more closely reflect the work being done by the HECB in identifying attributes that are deemed as college ready necessities, as well as the work required for the National Work Readiness credential." Mike Gallagher, Executive Director of High Schools, Issaquah School District

Recommendations about Navigation 101

“Also, promote the concept of Navigation 101. It gives predesigned lesson templates with an overall program that is similar to what we developed on our own. People shouldn't have to reinvent this program and it is too good to not provide it to all students in our state. We received a grant this year to perfect our high school program and start the comprehensive career counseling in the 6-8th grade. This year we will do the

planning and next year implementation." Michael Morgan, Superintendent, Colfax School District

"I would like to see both remain as graduation requirements as they contribute to significant parts of the educational experience. Personally, I would like to see the Board require Navigation 101 as the vehicle for the High School and Beyond Plan. This ensures that all students receive an equitable experience. The data behind this program to support its effectiveness is significant. Unfortunately, it can be a challenge in some schools and districts to implement something this comprehensive without it being a requirement." Dawn Fairchild, Principal, Ferndale HS, Whatcom School District

"We would like to see the state continue funding Navigation 101 grants--or fund coordinators directly as an additional administrator or counselor-type position specific to tracking graduation requirements. We are afraid that with the added duties involved with student learning plans, WASL preparation and organization, and the coordination involved with advisories and Culminating Projects, building budgets will have a difficult time supporting the need without increasing class-size." Carl Bruner, Superintendent, Mount Vernon School District

"My desire would be to require it be attached to a portfolio of work through a program such as Navigation 101 so it makes sense to everyone and is consistent across districts. It's quite difficult to have a senior transfer who has been working on a totally different sort of project." Kristine Hatfield, Counselor, Sultan High school, Sultan School District

High School and Beyond Plan

“A little more specific guidance on the High School and Beyond Plan might be nice. We have kids fill out a single page plan each year at registration with their parent. They identify post high school interests, present classes, possible careers, and they set a goal. We also write a reflection paper each year that requires them to reflect on their past and present personal and educational experiences as they relate to the future. I assume that this would meet the state's guidelines." Justin Laine, Counselor, Naselle School District

“For the High School and Beyond Plan...I don't know, maybe a general form for all districts to use (but I am speaking from a small school perspective...don't know how it would impact the larger districts.)" Karl Ostheller, Principal, Oakesdale School District

“Leave High School and Beyond Plan as is." Judith Murdock, Executive Director of Education, Mukilteo School District

"We need to look at how to better implement our High School and Beyond Plan. They seem tedious and time consuming and are not related to credit or any specific course work." Jodi Thew, Prescott School District

“Many middle schools perceive the High School and Beyond Plan as a graduation requirement "not their responsibility." Planning for high school and beyond, as an

exploratory process, is appropriate for the middle level. The plan should have a two-step requirement--the high school plan at the end of grade 8 and the "beyond plan" required at either end of junior or senior year; however, training and implementation supported resources must be directed from the state to middle-level schools. The bottom line is that as a continued requirement, these additional plans should be more coordinated to provide a more common experience for students across the state with additional state resources to support the implementation." Michael Olson, Stanwood Camano School District

"Layering the High School and Beyond Plan on top of the Culminating Project is redundant. It needs to be one or the other. One state graduation Culminating Project that has deep personal meaning and relevance to each student." Mike Stromme, Chief of Secondary Education, Vancouver School District

"Consider a pass/fail credit for the five-year plan if districts have a rigorous enough program." Rebecca Miner, Assistant Superintendent, Washougal School District

"As for the High School and Beyond Plan, it is the first year we have required it; although, our seniors last year completed one in their Advisory class. We did not monitor completion last year as it was not a graduation requirement. This plan takes about 15 minutes to fill out. The real work is the opportunities we provide for students to learn about future options. This would be the sophomore career fair, time on the Washington Occupation Information System (WOIS) which provides career research information, our Beyond High School Fair and opportunities to meet with guest speakers and reps from businesses." Cindy Wardlow, Culminating Project Coordinator and CTE Coordinator, Kelso School District

"The CP is great as is; however, we would like to see more guidance for the High School and Beyond Plan in terms of what is the expected end product." Russell Hill, Principal, River View HS, Finley School District

"I would like more specific guidance as to the state requirements for the Culminating Project and specifically the High School and Beyond Plan. My administrator would love a High School and Beyond Plan checklist so everyone had a completion map to follow. We feel this is the missing piece for total compliance to state requirements, because without it, we may inadvertently miss a piece of the plan. We begin working with our students in the 8th grade. They explore careers, do interest assessments, and begin to think about their future. I believe the earlier you start with students, the more likely they are to have a high school plan, so I schedule a college fair at the middle school for the day before I do the community and high school college fair." Cathy Krohn, Career Pathways Coordinator, Lake Roosevelt High School, Grand Coulee Dam School District

"I'd like to see the plans begin earlier and be career research-based. This will allow the course of study in high school to change if necessary based on career choices. This can obviously occur currently with the Board of Education action. As is, the program seems to be working well." Bill Motsenbocker, Superintendent, Liberty School District

“The High School and Beyond Plan gets all students thinking about their future and how to get the most out of high school, so that they're ready to pursue their adult lives, no matter what direction they plan to take. Ideally, students write their plan in 8th or 9th grade and then continue to revise it throughout high school to accommodate changing interests or goals. Students should be encouraged to include the following elements in their plan: their personal story, learning style, goals for high school, and goals for immediately after high school.” Kandy Ritter, Director of Teaching & Learning, Cape Flattery School District

With thanks to the 145 school districts that responded to staff queries:

School Districts Less than 500 Students (25)
Cape Flattery
Columbia (Stevens County)
Crescent
Easton
Entiat
Inchelium
Kahlotus
Lacrosse
Lake Quinault
Lind
Naselle-Grays River Valley
Oakesdale
Odessa
Palouse
Pomeroy
Prescott
Selkirk
Skykomish
St. John
Taholah
Tekoa
Thorp
Trout Lake
Waitsburg
Wellpinit

School Districts with 500-999 Students (21)
Adna
Asotin-Anatone
Brewster
Colfax
Columbia (Walla Walla)
Concrete
Davenport
Dayton
Finley
Freeman
Grand Coulee
Liberty
Manson
Ocosta
Orcas Island
Raymond
San Juan Island
Stevenson-Carson
Toledo
Winlock

School Districts with 1000-2,499 Students (35)
Blaine
Cascade
Cashmere
Chewelah
Chimacum
Colville
Deer Park
Eatonville
Ephrata
Goldendale
Granite Falls
Highland
Hoquiam
Kalama
Kiona Benton
La Center
Lake Chelan
Lakewood
Medical Lake
Montesano
Newport
Nine Mile Falls
Ocean Beach
Omak
Orting
Port Townsend
Quillayute Valley
Quincy
Royal
South Whidbey
Sultan
Vashon Island
White Salmon
Woodland
Zillah

School Districts with 2,500-4,999 Students (24)
Arlington
Bremerton
Burlington-Edison
Centralia
Cheney
Clarkston
East Valley
Eastmont
Ellensburg
Enumclaw
Mercer Island
North Mason
Port Angeles
Sedro-Wooley
Selah
Sequim
Shelton
Toppenish
Tukwila
Wapato
Washougal
West Valley
White River
Yelm

School Districts with 5,000-9,999 Students (16)
Camas
Ferndale
Kelso
Monroe
Moses Lake
Mount Vernon

Oak Harbor
Olympia
Peninsula
Shoreline
Stanwood-Camano
Sunnyside
Tahoma
Tumwater
University Place
Wenatchee

School Districts with
10,000-14,999 Students (10)
Auburn
Bellingham
Central Kitsap
Clover Park
Kennewick
Marysville
North Thurston
Renton
South Kitsap
Yakima

School Districts with
15,000+ Students (14)

Bellevue
Bethel
Edmonds
Evergreen
Highline
Issaquah
Kent
Lake Washington
Mukilteo
Northshore
Puyallup
Spokane
Tacoma
Vancouver

STATE BOARD OF EDUCATION

HEARING TYPE: _X_ INFORMATION

DATE: May 14, 2008

SUBJECT: **BELLINGHAM SCHOOL DISTRICT**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Ms. Sherrie Brown, Interim Deputy Superintendent
Dr. Kenneth D. Vedra, Superintendent

BACKGROUND:

After two years of study, and substantial community and parent input, the Bellingham School Board voted in 2007 to phase in new graduation requirements in English, math, and world language over the next seven years. Although the total required credits (23) will not change, the number of credits will increase in English (from 3.5 to 4 in 2012) and math (from 2 to 3 in 2013). Two credits of world language will be added in 2014. Electives will decrease from 8.5 to 5 credits to accommodate the changes.

Ms. Brown led the task force that spearheaded the changes. Dr. Vedra assumed the position of superintendent after the changes had been approved, and is now leading the transition.

Bellingham's "2008 Ready Guide" for students describes the changes and is included behind this tab.

May 6, 2008

TO: Edie Harding, Executive Director
State Board of Education

FROM: Kristi England and Sara Jones

RE: **Update to the Board**

The State Board of Education (SBE) continues to move forward on creating policies to improve student achievement to ensure all students are prepared to succeed in postsecondary education, the 21st century workforce and citizenship. APCO continues to support this work by providing overall communications strategy and implementation support to SBE. This memo provides an update on our recent efforts, on behalf of SBE, and provides a brief overview of the communications strategy for the Meaningful High School Diploma work.

1. Update

- **E-newsletter:** In the next few days, SBE will send out its first-ever e-newsletter – one of the efforts to better communicate with all of SBE's partners in education, from parents, students and educators, to business and community leaders. We expect to distribute these newsletters monthly, with special notifications to partners for key events, such as community meetings. Our first e-newsletter will be distributed to over 2100 individuals around the state, including legislators, school board directors, superintendents, community leaders, and key stakeholders.

- **Media Outreach:** APCO continues to maintain relationships with key media contacts and provide updates on SBE's work, to include distributing press releases on the math and science standards, as well as updating key messages and media materials.

- **Website:** APCO worked closely with SBE staff to make content updates to the Web site, improve usability, and increase opportunities for feedback and communication with the public. APCO will continue to work with SBE to add and update content.

- **Logo:** APCO is continuing to work with SBE to develop a new logo that more accurately reflects the mission and work of the Board.

- **Video:** APCO and Michael Cuddy Productions have been working closely to develop a short compelling video that focuses on students and conveys the following three key concepts: 1) every child, regardless of race or income deserve a high quality education, 2) it is not okay to let any student fall through the cracks, and 3) we are all responsible for ensuring that students get the education they need to succeed. The video will be shown to the Board at the May 14, 2008 Board meeting, and will be used in upcoming community meetings.

- **Community Leader Interviews:** In March, APCO conducted telephone interviews on behalf of SBE with 17 community leaders from across the state representing a number of groups, including minority and low-income communities. The goal of the research was to gain a better understanding of the expectations for schools and the education system, as well as opinions on the work of SBE, among these communities. A full summary report is available for review. (An executive summary is contained in the Board packet.)

2. Communications Strategy for the Meaningful High School Diploma
SBE has released a proposed graduation credit framework, Core 24, to better prepare students for life after high school. The potential change in credit requirements will affect a broad array of stakeholders from students, parents and educators, to employers and institutions of higher education. Getting the word out about potential changes and receiving useful feedback will be important to build the consensus needed to successfully implement a new policy on graduation requirements.

Included below is a brief outline of the communication strategy and tactics to support the Meaningful High School Diploma work.

A. Media outreach
To support the Meaningful High School Diploma (MHSD) work, APCO will focus on the following four key efforts:

- **Opinion Editorials:** APCO will work to leverage existing and developing support for SBE's work on MHSD by reaching out to stakeholders to begin engaging them in media efforts by encouraging them to place op-eds and letters to the editor in key publications across the state.

  Timeline: May to July

- **Media briefings:** Before the finalization of the graduation requirements, APCO will set up media phone or desk side briefings with key reporters to inform them of the proposed graduation requirements and encourage them to cover the draft credit framework.

  Timeline: May to July

- **Press releases:** We will create and distribute press releases and conduct media outreach to print, radio and television outlets statewide highlighting the finalization of the graduation requirements.

  Timeline: July

- **Editorial Boards:** When the graduation credit framework is finalized, APCO will schedule editorial boards for SBE board members and staff to explain the graduation requirements to top-tier papers across the state.

  Timeline: July

B. Community Outreach

Awareness of SBE's role as a catalyst for education reform among stakeholders is growing. To foster support for SBE's work, the Board must be seen as reaching out to stakeholders in a way that is proactive, comprehensive and sincere.

- **Stakeholder Briefings:** APCO will work with SBE to provide one-on-one briefings to key stakeholders/organizations. These briefings will be a way for Board members and SBE staff to explain proposed recommendations and policy changes and encourage collaboration with key education, community, and business leaders. The briefings will provide genuine opportunities for feedback from stakeholders, while ensuring that the feedback is constructive and assists SBE in their work moving forward. APCO will provide lists, briefing and all logistical support for the briefings.

  Timeline: On-going

- **Community Meetings:** SBE plans to hold public meetings on the Meaningful High School Diploma (MHSD) and System Performance Accountability (SPA) draft recommendations in late spring 2008.

  These meetings are intended not only to share information on Core 24 and a proposed accountability system, but also to receive feedback from interested parties. These meetings will be designed to provide an opportunity for SBE to deliver its messages and proposed actions in a compelling way and gather feedback, while building a sense of urgency to implement the proposed solutions.

  Timeline: Meeting Dates - Spokane, June 9; Yakima, June 10; and Tacoma, June 11.

- **Online Survey:** In addition to community meetings, APCO will develop an online survey on the proposed graduation requirements to collect useful feedback for SBE and provide an opportunity for additional public input. A link to the survey will be posted on the Web site, as well as distributed to the e-newsletter list.

  Timeline: Late May – Early June

- **E-newsletter**: APCO will also send out an e-newsletter that highlights the draft graduation requirements proposal and publicizes the community meetings and survey.

  Timeline: Late May

Washington State Board of Education - Briefing List

Tier	Assigned to	ORGANIZATION	FIRST	LAST	TITLE	ADDRESS	EMAIL
1	Mary Jean Ryan	Alliance for Education	Patrick	D'Amelio	President/CEO	509 Olive Way, Suite 500; Seattle, WA 98101-2556	patrickd@alliance4ed.org
1	Jeff Vincent	Association of Washington Business	Donna	Steward	Governmental Affairs	PO Box 658, Olympia, WA 98507-0658	donnas@awb.org
1	Jack Schuster / Amy Bragdon	Association of Washington School Principals	Gary	Kipp	Executive Director	1021 8th Ave. S.E.; Olympia, WA 98501	gary@awsp.org
1	Mary Jean Ryan	City of Seattle Office for Education	Holly	Miller	Director	PO Box 94649; Seattle, WA 98124-4649	Holly.Miller@seattle.gov
1	Mary Jean Ryan	College Success Foundation	Susan	Pollack			spollack@waedfoundation.org
1	Mary Jean Ryan	College Success Foundation	Deborah	Wilds	President	1605 NW Sammamish Road; Suite 100; Issaquah, WA 98027	info@collegesuccessfoundation.org
1	Kris Mayer/Edie Harding	Education First Consulting	Mark	Frazer			marc.frazer@comcast.net
1	Amy Bragdon	Greater Spokane Valley Chamber of Commerce	Eldonna	Shaw	President & CEO	9507 E. Sprague; Spokane Valley, WA 99206	eldonna@spokanevalleychamber.org
1	Sheila Fox / Kathe Taylor	Higher Education Coordinating Board	Ann	Daley	Executive Director	917 Lakeridge Way; Olympia, WA 98504-3430	annd@hecb.wa.gov
1	MaryJean Ryan	League of Education Voters	Chris	Korsmo	Executive Director	P.O. Box 1721; Seattle, WA 98111	chris@educationvoters.org
1	Jeff Vincent	Partnership for Learning/College & Work Ready Agenda			Executive Director	500 Union Street, Suite 745 Seattle, WA 98101	info@partnership4learning.org
1	Warren Smith	Stand for Children	Shannon	Campion	State Director	4000 Aurora Avenue, North; Suite 203; Seattle, WA 98103	shannon@stand.org
1	Mary Jean Ryan/Warren Smith	Tabor 100	Kevin	Washington			washinkc@comcast.net
1	Mary Jean Ryan/Warren Smith	Tabor 100	Leon	Rowland	President	5703 S. Fletcher Street; Seattle, WA 98118	skip@bannercross.com
1	Mary Jean Ryan/Warren Smith	Urban League of Metropolitan Seattle	James	Kelly	President/CEO	105 14th Avenue Seattle WA, 98122	
1	Steve Floyd / Phyllis Bunker Frank	Washington Association for Career and Technical Education	Kathleen	Lopp	Executive Director	PO Box 47200, Olympia, WA 98504-7200	
1	Steve Floyd / Phyllis Bunker Frank	Washington Association of Occupational Educators	Darlene	Edwards	Board President		waoe@waoeinfo.org
1	Steve DalPorto/Edie Harding	Washington Association of School Administrators	Paul	Rosier	Executive Director	825 Fifth Avenue SE, Olympia WA 98501	prosier@wasa-oly.org
1	Lorilyn Roller/New Student	Washington Association of Student Councils	Susan	Fortin	Director of Student Leadership	Association of Washington School Principals; 1021 8th Ave. S.E., Olympia, WA 98501-1500	susanf@awsp.org
1	Mary Jean Ryan/Bernal Baca	Washington Education Association	Mary	Lindquist	President	PO Box 9100; Federal Way, WA 98063-9100	mlindquist@washingtonea.org
1	Jack Schuster	Washington Federation of Independent Schools	Judy	Jennings	Executive Director	435 Main Avenue South, Renton, WA 98057	jjennings@wfis.org
1	Jeff Vincent	Washington Roundtable	Stephen	Mullin	President	520 Pike St., Suite 1212; Seattle, WA 98101-4001	
1	Bernal Baca	Washington State Hispanic Chamber of Commerce	Cristobal	Guillen	Executive Director	P.O. Box 21925; Seattle, WA 98111-3925	crisg99@msn.com
1	Linda Lamb	Washington State PTA	Laura	Bay	President	2003 65th Avenue West; Tacoma WA 98466-6215	oatkins@wastatepta.org
1	Steve Floyd	Washington State School Director's Association	Martharose	Laffey	Executive Director	221 College Street NE, Olympia, WA 98516	M.Laffey@wssda.org
1	Steve Floyd / Phyllis Bunker Frank	Washington Workforce Association	Tim	Probst	CEO	601 Main Street ~ Suite 403; Vancouver, WA 98660	timprobst@washingtonworkforce.org
1	Steve Floyd / Phyllis Bunker Frank	Workforce Training Board	Eleni	Papadakis	Executive Direct	128 10th Avenue SW; Olympia, WA 98504-3105	epapadakis@wtb.wa.gov
2	Warren Smith	Communities and Parents for Public Schools	Charles	Rolland	Executive Director	Communities and Parents for Public Schools	charlesr@cppsofseattle.org
2	MaryJean Ryan	Hate Free Zone	Pramila	Jayapal	Executive Director	1227 S. Weller Street, Suite A; Seattle, Washington 98144	info@hatefreezone.org

2	Warren Smith	Northwest Minority Business Council	Kenneth	Jones	President	320 Andover Park East, Suite 205,Tukwila, WA 98188-7635	kjones@nmbc.biz
2	Edie Harding	Paul G. Allen Foundation	Peter	Berliner	Program Director	505 5th Avenue South, Suite 900; Seattle, WA 98104	info@pgafamilyfoundation.org
2	Mary Jean Ryan	Social Venture Partners	Susan	Fairchilde	Grants and Advocacy Manager		susanf@svpseattle.org
2	Mary Jean Ryan	Social Venture Partners	Paul	Shoemaker	Executive Director	1601 2nd Ave., Suite 615; Seattle WA 98101-1539	paulshoe@svpseattle.org
2	Eric Liu	Technology Access Foundation	Trish	Millines Dziko	Executive Director	3803 S. Edmunds St. Suite A, Seattle, WA 98118	trishmi@techaccess.org
2	Edie Harding/Maryjean Ryan	The Bill & Melinda Gates Foundation				PO Box 23350; Seattle, WA 98102	info@gatesfoundation.org
2	Jeff Vincent	Washington Biotechnology and Biomedical Association	Patti	McKinnell Davis	Director of Public Affairs	2324 Eastlake Avenue East, Suite 500; Seattle, WA 98102	patti@washbio.org
2	Kris Mayer	Washington Women's Employment & Education	Robin	Lester	CEO	515 West Harrison, Suite 208; Kent, WA 98032	RobinL@wwee.org
1	Jeff Vincent	Battelle Foundation					
2	Mary Jean Ryan	WSA (Washington Software Association) - now Washington Technology Industry Association	Ken	Myer	President & CEO	2200 Alaskan Way, Suite 390, Seattle, WA 98121	info@washingtontechnology.org

April 16, 2008

TO: Edie Harding, Executive Director
State Board of Education

FROM: Kristi England and Sara Jones

RE: **Stakeholder Briefings**

Awareness of the State Board of Education's (SBE) role as a catalyst for education reform among stakeholders is growing. To foster support for SBE's work, it must be seen as reaching out to stakeholders in a way that is proactive, comprehensive, and sincere.

To further this effort, APCO will work with SBE to provide one-on-one briefings to key stakeholders/organizations. These briefings will be a way for Board members and SBE staff to explain proposed recommendations and policy changes and encourage collaboration with these key education, community, and business leaders.

While it's not feasible to assume that reform can happen without opposition, reaching out to concerned stakeholders prevents SBE from being put on the defensive and will help lay the foundation for the successful implementation of SBE's recommendation.

Briefings

Goal: An open conversation with key stakeholders that allows the Board and SBE staff to provide key updates and solicit input for proposed initiatives.

1. What's expected of Board members?

Along with SBE staff, APCO has developed an initial, prioritized list of stakeholders to be targeted for these briefings. The list is included as an attachment to this document. Board members and SBE staff are being asked to meet with specific organizations based on existing relationships and areas of expertise. During the meetings, Board members will provide details on proposed policy recommendations and solicit input and reaction to SBE's key initiatives.

SBE representatives need to ensure stakeholders are engaged in the conversation and understand that their participation is valued. It is important that the briefings provide genuine opportunities for feedback from stakeholders, while ensuring that the feedback is constructive and assists SBE in their work moving forward.

In the briefings, SBE representatives can inform stakeholders' how their feedback will be considered in the decision making process. Further, these briefings will provide an important opportunity for SBE to deliver its messages and proposed actions in a compelling way and to build a sense of urgency to implement the proposed solutions.

2. What's provided to Board members?

Organization backgrounder: To assist SBE in preparing for these meetings, APCO will develop a brief background document outlining specific organizations' policy positions on key education issues germane to the Board's work. The background document will be provided to the appropriate SBE representative several days in advance of their briefing.

Talking points and fact sheets: Additionally, APCO will provide Board members and SBE staff with updated messages and talking points on key initiatives, as well as fact sheets/handouts for stakeholders at the briefings. APCO will also provide SBE representatives with draft questions that solicit input that can inform SBE's next steps.

Scheduling assistance (as needed): Board members may find it logistically easier to schedule meetings themselves or through their own staff. If requested, APCO will provide Board members and SBE staff with scheduling support as appropriate.

De-brief: After each briefing, APCO will follow up with Board members and SBE staff to discuss the feedback from each meeting and what additional outreach is needed with the organization. This is one of the most important steps, as it allows us to capture feedback and to tailor further communications with the organization.

3. Timeline:

APCO will begin working with Board members to schedule the briefing sessions following the May Board meeting. We anticipate that the first round of briefings will take place during the month of May and ideally conclude in advance of the July board meeting.

Report on Stakeholder Interviews

April 25, 2008

Prepared for the Washington State Board of Education

APCO worldwide®

EXECUTIVE SUMMARY

Introduction

The Washington State Board of Education (SBE) is developing major recommendations on several key initiatives, including a third math credit, high school graduation requirements, math standards, science standards and a system of performance accountability. Communicating with and gathering input from all stakeholders, including educators, community, minority and business leaders and parents on these policies is essential.

In fall 2007, SBE conducted community outreach meetings, which were well-attended by a large number of education stakeholders. While the meetings were productive and informative, further outreach was needed to capture the opinions and develop relationships with all the diverse populations served by SBE. To that end, SBE asked APCO to conduct interviews with community leaders from across Washington State to gain a better understanding of the needs and perspectives of their communities.

In March 2008, APCO Worldwide conducted telephone interviews on behalf of SBE with 17 community leaders from across the state representing a number of groups, including minority and low-income communities. The goal of the research was to gain a better understanding of the expectations for schools and the education system, as well as opinions on the work of SBE, among these communities.

The following report details major findings from this research. These findings will be used to inform SBE's communications strategy in order to engage the community and education stakeholders and effectively convey SBE's efforts to ensure a high quality education for all students.

Key Findings

Through targeted stakeholder interviews, APCO was able to solicit thoughtful and candid feedback from a broad base of constituencies served by SBE. A number of key themes emerged through the course of the interviews, several of which relate to the relationship between constrained funding for education and the breadth of challenges districts and schools face in providing a high quality education to a diverse student population. It will be important for SBE to consider these views as they move forward in developing education policy to improve student achievement.

Key themes included:

- Respondents articulated a clear expectation for the K-12 system to provide all students with a high quality education that equips each student to pursue a path of their choosing after high school, whether that's entering the workforce, going on to an apprenticeship or college.
- Slightly more than half of the respondents said that to meet this expectation SBE should move to align graduation requirements with admissions requirements for a four-year university. Asserting that by preparing all students for college admission, students would

graduate with the ability to attend college, or would graduate with increased skills and knowledge that would better prepare them for any endeavor following high school.

- Overwhelmingly, respondents stated that schools were not doing enough for students that fell behind, but were quick not to lay the blame on teachers and staff. Respondents commonly identified resource constraints as the main impediment for schools' capacity to do more for failing students.
- Several respondents highlighted the important role communities and community-based organizations can play in supporting struggling students. They discussed the need for the development of partnerships between the schools, the community, and the students to prevent students from falling through the cracks in the system.
- Most respondents felt that schools and districts were making honest and sincere attempts to address their students' needs in a culturally sensitive way. However, it was widely recognized that these attempts were falling short. Respondents acknowledged the lack of appropriate teacher training and other programs focused on teaching in a multicultural environment primarily due to funding constraints. Several respondents cited the lack of diversity within school staff as exacerbating the problem.
- In general respondents were aware of SBE, but not well versed in the role it plays in shaping education policy. Respondents were supportive of SBE's focus on student achievement for all students. Some respondents noted lingering concerns about SBE's ability to help eliminate the achievement gap and to develop policy that supports *all* students.
- There was wide spread support among respondents for the basic concepts for system performance accountability. However, several respondents expressed concerns about the practical implementation of such a system, particularly as it relates to funding and resources available for schools and districts to improve student achievement.
- A number of respondents touched on the issue of creating a sense of relevancy for students, expressing concern that many students did not see their education as relevant to real life in their future.
- Many respondents also discussed the need to set high standards and challenge students, saying that low expectations produce mediocre student achievement. However, a couple of respondents did express concern that setting high standards could discourage some students from completing their education.
- The majority of people interviewed expressed the need for the system to focus on closing the achievement gap and providing a high quality education for all students, not just some students.

Overall, respondents expressed the need for a K-12 system that ensures that all students – regardless of race or income – are prepared with the skills needed to succeed after high school. Across the board, respondents indicated that additional funding and resources were needed in order to assist districts and schools in improving student achievement.

STATE BOARD OF EDUCATION

HEARING TYPE: __X_ INFORMATION

DATE: May 14-15, 2008

SUBJECT: **Online Learning in Washington State**

SERVICE UNIT: Edie Harding, Executive Director
State Board of Education

PRESENTER: Brad Burnham, Policy and Legislative Specialist,
State Board of Education

Ann Reed, Director, Instructional Technology and Libraries
Bellingham School District

BACKGROUND:

This brief and the Board meeting presentation will provide Board members with information about the status of online learning in Washington State and related policy issues.

Washington State is one of 42 states that provide supplemental or full-time online learning programs or initiatives. Washington State does not have a state-run online school, as some states have created, but it does have a subsidized non-profit online resource organization that provides services across the state. There are several online schools run by school districts in Washington State, as well. In total, about 14,000 students have been enrolled in online courses for credit in the 2007-2008 school year.

Many states have recently begun trying to address online learning issues. States are analyzing programs more closely all across the country. In Washington State, some of the issues are related to a lack of clarification in law, of the characteristics of online learning and to a scarcity of information about its status in the state. The current focus in online learning's growth is on: assessment, accountability, and finding best practices. Although online learning is still in its infancy, states and private companies are positioning themselves to be ready for future opportunities.

Washington State Board of Education

Working to Raise Student Achievement Dramatically

Online Learning Policy Issues

Introduction

This brief provides Board members with background information about the status of online learning in Washington State and related policy issues. Currently, local school districts determine whether to provide online learning, how to deliver it, and monitor the quality of that learning to ensure the courses meet the districts' requirements. Online learning is provided on a course-by-course basis in some districts, while in other districts there are full-fledged online schools with extracurricular activities. The State Board of Education does not provide direct oversight of these programs.

Summary of Policy Issues

Washington State students in grades K through 12 have utilized online learning since the late 1990's. In the 2007-2008 school year, 14,000 students (1.4% of enrollment) took online courses for high school credit in Washington State. This figure does not include students taking non-credit courses or using online resources to supplement their classroom experiences. Although the percentage of students earning credit is small, online learning has the potential to grow in use. The state will need to determine what oversight role is necessary.

The lack of a comprehensive definition of online learning creates issues related to reporting, funding, and accountability. Part of the reason for this lack of a definition has to do with the variability of online learning. There are several kinds of online learning programs:

1. Away from the Classroom Programs- offer complete courses online to students who fit under the Alternative Learning Experience (ALE) program rules of the Office of Superintendent of Public Instruction (OSPI), which were established to allow districts to provide educational opportunities for students not allowed or unable to attend brick and mortar schools.
2. Contracts- Programs that exist through contracts with private organizations fits under the laws governing contracts. These programs may also fall under ALE rules.

3. Hybrid and Small Programs- Programs that use online resources to supplement in-classroom learning and programs that serve a small number of students do not really fit under any of these laws or rules.

Another issue is the lack of knowledge of the characteristics of online learning in the state. Since 2001, the Office of Superintendent of Public Instruction (OSPI) has administered a yearly technology inventory survey to districts but the survey has only had a few questions about online learning. Other data that OSPI receives from districts for basic education funding does not differentiate by type of learning, such as online learning.

Online learning policy issues are interrelated with a variety of broader topics, such as transfer of students between districts, state-wide schools, class-sizes, school accreditation, meeting the needs of special education students and students with 504 plans, and the district's responsibility to administer state-wide assessments.

A small school district's budget can quickly become unbalanced when students leave to participate in another district's online school. The students do not have to physically move their residence in order to transfer to a new district. The district can accept these students as non-resident students. Some of the private organizations contracted by school districts to provide online learning have been advertising statewide in the hopes of encouraging students to transfer into their online schools. Currently, there is no limit to the number of students a district can receive through the transfer process.

Background

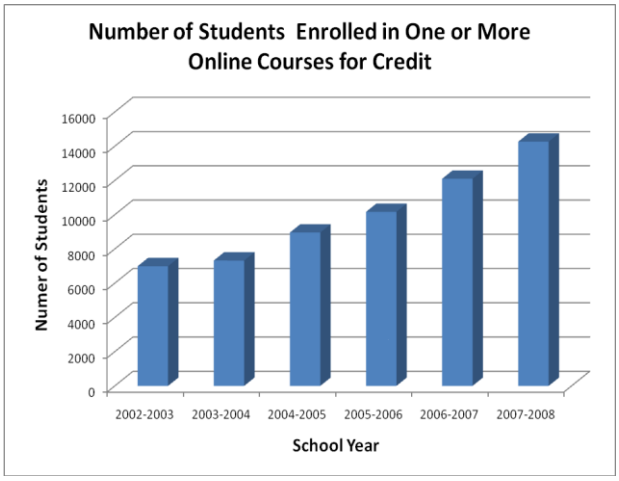
Across the United States

Washington State is one of 42 states that provide supplemental or full-time online learning programs or initiatives. The largest online K-12 school in the country is the Florida Virtual Academy. Last year, the Academy had more than 50,000 students completing more than 90,000 courses.

The largest operator of online schools in the country is K12, Inc., with 27,000 students in 2005, predominately through charter schools. K12's revenue in 2006 was $117 million and it recently went public.

A survey conducted for a report, entitled *Keeping Pace with K – 12 Online Learning*, found that a fifth of online learning programs reported growth of more than 50% between the 2005-2006 and 2006-2007 school years, and almost half of the programs reported growth of 25% or higher. The reported retention rates of students, however, were in the range of 60% to 95%, with many programs reporting in the 70-85% range.

Some states, like Washington State, offer online courses through state-led initiatives. The Digital Learning Commons (DLC) is a non-profit organization that is subsidized by Washington State to provide online learning resources to schools. Massachusetts provides a similar state-led initiative, the Massachusetts Online Network for Education. Some other states provide a state-wide online school, such as Florida, Illinois, Michigan, and Idaho. There are other means of delivery of online learning, as well, such as charter schools, parent partnerships, consortium programs, and district-level contracts. Charter schools are the only one of the mentioned delivery methods not present in Washington State.



Current Trends in Digital/Online Learning in Washington State. OSPI, 2008.

Recently, many states have begun trying to address online learning issues. A new law in Colorado created a small online division within the Colorado Department of Education that will oversee online programs. It also created quality standards for online programs, distinguished between multi-district online programs and single-district programs, and added a requirement that all online programs report annually to the state.

Other states are creating laws to embed online learning into the K-12 system. Michigan recently set a new graduation requirement that all students must have an "online learning experience."

In Washington State

In 2005, Governor Gregoire signed SB 5828, expanding the definition of a full-time student to allow districts to claim funding for students receiving instruction through digital programs, which includes online learning. Some school districts used this broader definition to expand or create their own online learning program, while other districts contracted out services.

Online schools and resources in Washington State

Program	Operating District	Number of WA Students	Operating Model
Digital Learning Commons	NA	67,000 (potential students)	Non-profit, state-subsidized online resource provider
Washington Learning Source	NA	NA	Broker of online courses and resources
Federal Way Internet Academy	Federal Way	299	District run program
Washington Virtual Academy	Steilacoom and Monroe Districts	2233	District contract with K12, Inc.
Everett Online High School	Everett	700	District run program;
Evergreen Internet Academy	Evergreen	75	District run program
Insight School of Washington	Quillayute Valley	1137	District contract with Insight Schools
Columbia Valley Virtual Academy	Valley	364	Consortium of district-level program in eleven districts
Spokane Virtual Learning	Spokane	300	District run program
Achieve Online	Kittitas and Marysville Districts	156	District contract with Advanced Academics

In 2001, OSPI began surveying districts about the number of students enrolled in online courses for credit (primarily high school students) as part of a technology inventory. In 2001, there were a total of 1,730 students enrolled in online courses for credit. Within seven years the number of K-12 students enrolled in online courses for credit grew to 14,266, a growth of 700%.

The Digital Learning Commons (DLC) started in 2003 with support from the Legislature and private organizations. The DLC does not award course credit or diplomas, nor does it have its own courses or teachers. It is a broker of courses and puts together resources, such as teachers and curricula, and provides some quality control. The DLC allows public schools to join for a subsidized rate of $6.00 per student. Private schools and private programs can join at $8.00 per student.

Through the DLD, students can access resources, such as college and career planning and tutoring. However, there is an additional charge, ranging from $120 to $350, for students to enroll in online courses. The fee can be paid by school districts with state funds if the students are enrolled in the district and the school or contractor providing the course is accredited through the regional accreditation program.

Washington State Laws & Rules

In Washington State, online programs must be accredited through a regional accreditation program and meet Basic Education Act (BEA) requirements. Some online programs, though, must also follow Alternative Learning Experience (ALE) program rules[1]. The Office of Superintendent of Public Instruction (OSPI) establishes rules for Alternative Learning Experience programs[2].

All ALE students must be supervised, monitored, assessed, and evaluated by Washington State certificated instructional staff. The academic progress of ALE students must be reviewed at least monthly and assessed annually and a Student Learning Plan must be developed. In addition, students must have direct personal contact with school staff at weekly, which can be achieved through face-to-face meetings, telephone calls, e-mail, instant messaging, interactive video communication, or other means of digital communication[3].

ALE rules provide a framework for school districts to establish a programs that are accessible to all students, supports the district's overall goals and objectives for

Digital Learning Commons
Online Course Offerings

Subject	Number of Courses
Arts	33
Business	28
CTE	7
ESL	6
Foreign Language	109
Interdisciplinary	3
Language Arts	128
Life Skills-Health	17
Mathematics	129
Occupational Credit Qualified	2
Science	124
Social Studies	113
Technology	32

[1] RCW 28A.150.305; WAC 392-121-182

[2] WAC 392-121-182

[3] WAC 392-121-182

student academic achievement, and meets the State Board of Education's requirements for courses of study and equivalencies, and high school graduation requirements.

All online learning programs that exist through contract between a school district and a third-party organization must follow the "instruction provided under contract" laws and rules[4]. If the contractor is not a state institution of higher education and more than 25 students (at least .0025 percent of the district's students) are enrolled, then the district must report the contractor's certificated instructional employees to the state as a part of its annual reporting[5]. High School diplomas are not issued by a contracted online school but by the district or one of its high schools.

Some school districts that do not offer online learning programs have experienced reductions in enrollment due to student transfers to online learning programs. According to the choice law, students may transfer to schools within a district or between districts at any time of the year[6]. Districts must develop transfer policies and assist with the process. A district may refuse to comply with a transfer request if the transfer would create substantive difficulties for the district and families may appeal a denial to OSPI. Some online learning programs rely heavily on transfer students and may end up with 30% or more of their students residing outside of the district.

The Future

Online learning programs are now being analyzed more closely all across the country. The focus is on assessment, accountability, and finding best practices. States and private companies are positioning themselves to be ready for future opportunities. It is unknown how big or influential online learning will become in the next few years.

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[4] RCW 28A.320.015; WAC 392-121-188

[5] WAC 392-121-188

[6] RCW 28A.225.220

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10. National Standards of Quality for Online Courses (NACOL): http://www.nacol.org/nationalstandards/
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12. Washington Learning Source: http://www.walearningsource.org/
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STATE BOARD OF EDUCATION

HEARING TYPE: _X_ ACTION

DATE: May 14, 2008

SUBJECT: **STRATEGIC TEACHING REPORT ON ALGEBRA I AND GEOMETRY**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Mr. Steve Floyd, Board Math Lead
Ms. Edie Harding, State Board of Education
Ms. Linda Plattner, Strategic Teaching

BACKGROUND:

Under SB 6543 passed by the 2008 Legislature, the State Board of Education is required to hire a national consultant to:

1. Conduct an exemplar review ("Benchmarking Report") of the OSPI March 5, 2008 draft of the revised K-12 mathematics standards.
2. Recommend specific language and content changes needed to finalize K-12 standards.

The process for this work includes the following tasks and deadlines:

- By May 15, 2008, the SBE will receive a review of the above work from the national consultant, consult with the Math Panel, and hold a public hearing. The SBE may direct the consultant to make modifications to the standards at that time. After modifications, the SBE will forward the standards to OSPI for implementation.
- By July 1, 2008, OSPI will revise the standards according to the recommendations outlined by the SBE report.
- By July 31, 2008, SBE will approve adoption of the revised standards by OSPI and/or develop a plan for ensuring recommendations are implemented and the standards are adopted by September 25, 2008.

In addition, later this year the SBE will provide feedback to OSPI on the proposed curricular menus within two months of OSPI's completion.

The Board held two special meetings in April. On April 18 the Board approved Strategic Teaching's April 14 "Edited Expectations for the K-8 math standards". In addition, Strategic Teaching briefed the Board on its Benchmarking Report. On April 28, the Board approved the Superintendent of Public Instruction's adoption of the April 25th K-8 math standards based on an affirmation by Strategic Teaching that the new OSPI standards met the Strategic Teaching Edited Expectations report.

On May 1, Strategic Teaching met with the Math Panel to receive feedback for its Algebra I and Geometry edited expectations. **A report that incorporates feedback from the Math Panel and others will be presented at the May 14 Board meeting (we will receive the report on May 13 and email a copy and provide a hard copy at the Board meeting)**. The Board will listen to public comment, make any necessary modifications, and may take action on the Strategic Teaching report on May 15. If the report is approved, OSPI will draft the new Algebra I and Geometry Standards, which the Board will review at a special meeting in early June.

On June 12, Strategic Teaching will meet with the Math Panel to receive feedback on its Algebra II edited expectations. A report that incorporates feedback from the Math Panel and others will be presented at the July 23 Board meeting. The Board will listen to public comment, make any necessary modifications, and take action on the Strategic Teaching report on July 24. If the report is approved, OSPI will draft the new Algebra II Standards, which the Board will review at a special meeting in early August.

EXPECTED ACTION:

The Board may approve the Strategic Teaching report on Algebra I and Geometry with any necessary modifications. We met with our Math Panel on May 1 to get their feedback as well as have a public comment time at our May Board meeting. Because we needed to allow more time for Strategic Teaching to review feedback, you will need to consider if the report is ready or should we hold another special meeting later to approve the report before giving it to OSPI to complete the standards.

STATE BOARD OF EDUCATION

HEARING TYPE: _X_ ACTION

DATE: May 15, 2008

SUBJECT: **FINAL DIRECTION FOR DRAFT THIRD CREDIT OF MATHEMATICS AND IMPLEMENTATION ISSUES AND HIGH SCHOOL AND BEYOND PLAN**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Mr. Steve Floyd, Board Math Lead
Ms. Edie Harding, Executive Director
State Board of Education

BACKGROUND:

In 2007, the Washington State Legislature directed the Board to increase the high school math graduation requirements from two to three credits (equivalent to three years of high school level math) and to determine the content of the three credits.

The Board directed staff to develop a draft rule for a third math credit, based on its definition of a meaningful high school diploma and January guidance. At the March meeting, the Board took public comment and directed staff to address the issue of when a student's parents or guardians could participate in the meeting and sign off for the election of a third math credit other than Algebra II or the Career and Technical Education credit. The Board will wait until July when it reviews the new Algebra II standards before adopting the third credit of math.

Board staff has worked with the Washington State School Directors Association and the Professional Educator Standards Board on a survey to address implementation and teacher supply issues at the district level. We expect to have the results back in late June.

The current version of the rules inadvertently excluded the high school and beyond plan graduation requirements, which need to be included in the revised rules. The language has been included in revised draft rule with the third math credit.

Attached you will find a copy of the revised draft rule for the third math credit, based on Board direction, and the high school and beyond plan.

EXPECTED ACTION:

The Board will be asked, at the business meeting, to give staff any further direction before the rule is filed with the Code Reviser.

Washington State Board of Education

Working to Raise Student Achievement Dramatically

RULE REVISION
3RD MATHEMATICS CREDIT and HIGH SCHOOL AND BEYOND PLAN
May, 2008
(New language is underlined)

CURRENT LANGUAGE for WAC 180-51-061 (**effective through June 30, 2009**)

Minimum requirements for high school graduation.

(1) The statewide minimum subject areas and credits required for high school graduation, beginning July 1, 2004, for students who enter the ninth grade or begin the equivalent of a four-year high school program, shall total 19 as listed below.

(b) Two mathematics credits that at minimum align with mathematics grade level expectations for ninth and tenth grade, plus content that is determined by the district. Assessment shall include the 10th grade Washington assessment of student learning beginning 2008.

AMENDATORY SECTION (Amending WSR 07-07-051, filed 3/14/07, effective 4/14/07)

WAC 180-51-061 Minimum requirements for high school graduation. (1) The statewide minimum subject areas and credits required for high school graduation, beginning July 1, ((~~2004~~)) 2009, for students who enter the ninth grade or begin the equivalent of a four-year high school program, shall total ((~~19~~)) 20 as listed below.

(a) Three **English** credits (reading, writing, and communications) that at minimum align with grade level expectations for ninth and tenth grade, plus content that is determined by the district. Assessment shall include the 10th grade Washington assessment of student learning beginning 2008.

(b) ((~~Two~~)) Three **mathematics** credits that ((~~at minimum~~)) align with ((~~mathematics grade level expectations for ninth and tenth grade, plus content that is determined by the district. Assessment shall include the 10th grade Washington assessment of student learning beginning 2008~~)) the high school mathematic standards as developed and revised by the office of superintendent of public instruction and satisfy the requirements set forth below.

(i) Unless otherwise provided for in (b)(iii) of this subsection, the three mathematics credits required under this section must include mathematics courses taken in the following progressive sequence:

(A) Algebra I, Geometry, and Algebra II;

(B) Integrated Mathematics I, Integrated Mathematics II, and Integrated Mathematics III; or

(C) Any combination of three mathematics courses set forth in (b)(i)(A) and (B) of this subsection but only if the courses are taken for credit in a progressive sequence (e.g., Algebra I, Integrated Mathematics II, Algebra II; Integrated Mathematics I, Geometry, Algebra II; Algebra I, Geometry, Integrated Mathematics III).

(ii) A student may elect to pursue a third credit of mathematics, other than Algebra II or Integrated Mathematics III if all of the following requirements are met:

(A) The student has completed for credit mathematics courses in:

(I) Algebra I and Geometry;

(II) Integrated Mathematics I and Integrated Mathematics II; or

(III) Any combination of two mathematics courses set forth in (b)(ii)(A)(I) and (II) of this subsection taken in a progressive sequence (i.e., Algebra I and Integrated Mathematics II; Integrated Mathematics I and Geometry);

(B) The student's election is based on a career oriented program of study identified in the student's high school and beyond plan that is currently being pursued by the student;

(C) The student's parent(s)/guardian(s) agree that the third credit of mathematics elected is a more appropriate course selection than Algebra II or Integrated Mathematics III because it will better serve the student's education and career goals;

(D) A meeting is held with the student, the parent(s)/guardian(s), or designee for the student, and a high school representative for the purpose of discussing the student's high school and beyond plan and advising the student of the requirements for credit bearing two and four year college level mathematics courses; and

(E) The school has the parent(s)/guardian(s) (or designee for the student if parent or guardian is unavailable) sign a form acknowledging that the meeting with a high school representative has occurred, the information as required was discussed; and the parent(s)/guardian(s) agree that the third credit of mathematics

elected is a more appropriate course selection given the student's education and career goals.

(iii) Equivalent career and technical education (CTE) mathematics courses meeting the requirements set forth in RCW 28A.230.097 can be taken for credit instead of any of the mathematics courses set forth in (b)(i)(A) or (B) or (ii)(A)(I) or (II) of this subsection if the CTE mathematics courses are recorded on the student's transcript using the equivalent academic high school department designation and course title.

(c) Two **science** credits (physical, life, and earth) that at minimum align with grade level expectations for ninth and tenth grade, plus content that is determined by the district. At least one credit in laboratory science is required which shall be defined locally. Assessment shall include the 10th grade Washington assessment of student learning beginning 2010.

(d) Two and one-half **social studies** credits that at minimum align with the state's essential academic learning requirements in civics, economics, geography, history, and social studies skills at grade ten and/or above plus content that is determined by the district. The assessment of achieved competence in this subject area is to be determined by the local district although state law requires districts to have "assessments or other strategies" in social studies at the high school level by 2008-09. In addition, districts shall require students to complete a classroom-based assessment in civics in the eleventh or twelfth grade also by 2008-09. The state superintendent's office has developed classroom-based assessment models for districts to use (RCW 28A.230.095). The

social studies requirement shall consist of the following mandatory courses or equivalencies:

(i) One credit shall be required in United States history and government which shall include study of the Constitution of the United States. No other course content may be substituted as an equivalency for this requirement.

(ii) Under the provisions of RCW 28A.230.170 and 28A.230.090, one-half credit shall be required in Washington state history and government which shall include study of the Constitution of the state of Washington and is encouraged to include information on the culture, history, and government of the American Indian people who were the first inhabitants of the state.

(A) For purposes of the Washington state history and government requirement only, the term "secondary student" shall mean a student who is in one of the grades seven through twelve. If a district offers this course in the seventh or eighth grade, it can still count towards the state history and government graduation requirement. However, the course should only count as a high school credit if the academic level of the course exceeds the requirements for seventh and eighth grade classes and the course would qualify for high school credit, because the course is similar or equivalent to a course offered at a high school in the district as determined by the school district board of directors. (RCW 28A.230.090(4).)

(B) The study of the United States and Washington state Constitutions shall not be waived, but may be fulfilled through an alternative learning experience approved by the local school principal under written district policy.

(C) Secondary school students who have completed and passed a state history and government course of study in another state may have the Washington state history and government requirement waived by their principal. The study of the United States and Washington state Constitutions required under RCW 28A.230.170 shall not be waived, but may be fulfilled through an alternative learning experience approved by the school principal under a written district policy.

(D) After completion of the tenth grade and prior to commencement of the eleventh grade, eleventh and twelfth grade students who transfer from another state, and who have or will have earned two credits in social studies at graduation, may have the Washington state history requirement waived by their principal if without such a waiver they will not be able to graduate with their class.

(iii) One credit shall be required in contemporary world history, geography, and problems. Courses in economics, sociology, civics, political science, international relations, or related courses with emphasis on current problems may be accepted as equivalencies.

(e) Two **health and fitness** credits that at minimum align with current essential academic learning requirements at grade ten and/or above plus content that is determined by the local school district. The assessment of achieved competence in this subject area is to be determined by the local district although state law requires districts to have "assessments or other strategies" in health and fitness at the high school level by 2008-09. The state

superintendent's office has developed classroom-based assessment models for districts to use (RCW 28A.230.095).

(i) The fitness portion of the requirement shall be met by course work in fitness education. The content of fitness courses shall be determined locally under WAC 180-51-025. Suggested fitness course outlines shall be developed by the office of the superintendent of public instruction. Students may be excused from the physical portion of the fitness requirement under RCW 28A.230.050. Such excused students shall be required to substitute equivalency credits in accordance with policies of boards of directors of districts, including demonstration of the knowledge portion of the fitness requirement.

(ii) "Directed athletics" shall be interpreted to include community-based organized athletics.

(f) One **arts** credit that at minimum is aligned with current essential academic learning requirements at grade ten and/or above plus content that is determined by the local school district. The assessment of achieved competence in this subject area is to be determined by the local district although state law requires districts to have "assessments or other strategies" in arts at the high school level by 2008-09. The state superintendent's office has developed classroom-based assessment models for districts to use (RCW 28A.230.095). The essential content in this subject area may be satisfied in the visual or performing arts.

(g) One credit in **occupational education.** "Occupational education" means credits resulting from a series of learning experiences designed to assist the student to acquire and demonstrate

competency of skills under student learning goal four and which skills are required for success in current and emerging occupations. At a minimum, these competencies shall align with the definition of an exploratory course as proposed or adopted in the career and technical education program standards of the office of the superintendent of public instruction. The assessment of achieved competence in this subject area is determined at the local district level.

(h) Five and one-half electives: Study in a world language other than English or study in a world culture may satisfy any or all of the required electives. The assessment of achieved competence in these subject areas is determined at the local district level.

(i) Each student shall complete a culminating project for graduation. The project shall consist of the student demonstrating both their learning competencies and preparations related to learning goals three and four. Each district shall define the process to implement this graduation requirement, including assessment criteria, in written district policy.

(j) Each student shall have an education plan for their high school experience, including what they expect to do the year following graduation.

(k) Each student shall attain a certificate of academic achievement or certificate of individual achievement. The 10th grade Washington assessment of student learning and Washington alternate assessment system shall determine attainment.

(2) State board of education approved private schools under RCW

28A.305.130(5) may, but are not required to, align their curriculums with the state learning goals under RCW 28A.150.210 or the essential academic learning requirements under RCW 28A.655.070.

[Statutory Authority: RCW 28A.230.090. 07-07-051, § 180-51-061, filed 3/14/07, effective 4/14/07; 04-23-004, § 180-51-061, filed 11/4/04, effective 12/5/04; 04-04-092, § 180-51-061, filed 2/3/04, effective 3/5/04; 01-13-114, § 180-51-061, filed 6/20/01, effective 7/21/01; 00-23-032, § 180-51-061, filed 11/8/00, effective 12/9/00.]

STATE BOARD OF EDUCATION

HEARING TYPE: ___X___ INFORMATION

DATE: May15, 2008

SUBJECT: **STRATEGIC PLANNING PROCESS**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Ms. Mary Campbell, Consultant
Mary Campbell & Associates

BACKGROUND:

The Office of Financial Management requires each state agency to submit a strategic plan by mid June, prior to their budget submittal to the Governor, for the following biennium. The Board has hired Mary Campbell, who worked on our last strategic plan, to assist us with a plan for the 2009-11 Biennium. The Executive Committee, with the assistance of Dr. Sheila Fox and Ms. Phyllis Bunker Frank, has taken the material generated from the March Board meeting to develop goals, objectives, strategies, and measurement indicators for the Board's new strategic plan.

Attached is a draft of their work for your Board discussion on May 15.

EXPECTED ACTION:

Board approval of direction for the strategic plan based upon any modifications members choose to make at the May meeting to this draft strategic plan framework.

DRAFT

VISION: A learner-focused state education system that is accountable for the individual growth of each student, so that students can thrive in a global economy and in life.

DRAFT

INDICATORS - Measures which, taken as a set, will help to determine if progress is being made toward the vision.

Indicator: Trends in assessment scores by subgroup

Indicator: Trends in graduation rates by subgroup

Indicators: Trends in post-secondary enrollment and industry certification rates by sub-group

GOAL - Desired Outcome with a 6yr horizon

GOAL: Improve achievement for all students

GOAL: Improve graduation rates

GOAL: Prepare all students to succeed in post-secondary education & the 21st century world of work and citizenship

STRATEGIES ("HOWS") Approaches SBE will use to achieve the goals - based on mandate, capacity, support from others, system readiness, etc.

STRATEGIES

1. Implement the math action plan
2. .Develop, implement a science action plan
3. Review achievement gap issues and advocate for effective interventions
4. Advocate for effective use of school time
5. Examine potential of on-line learning

STRATEGIES:

Study the reasons that students do not graduate, prioritize the barriers and develop the appropriate response for the board role in policy and intervention

STRATEGIES:

Adopt graduation requirements that result in high school diplomas that are meaningful certificates of graduates' readiness for success in post-secondary education, gainful employment and citizenship

FOUNDATIONAL STRATEGIES necessary to achieve all goals

1. Advocate for the creation of a strategic compact among SBE, OSPI, PESB and other key stakeholders to forge a system approach to achieve the goals: who will do what by when.
2. Implement a clear, workable statewide accountability system that fosters a learning culture, helps assess progress and informs policy-making.
3. Develop a comprehensive data system to inform management and instructional decisions
4. Advocate for results, and the policies and resources to achieve them.

STATE BOARD OF EDUCATION

HEARING TYPE: ___X___ INFORMATION

DATE: May 14-15, 2008

SUBJECT: **SYSTEM PERFORMANCE ACCOUNTABILITY, CONTRACTS AND ACCOUNTABILITY INDEX**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Dr. Kris Mayer, Board Lead
Ms. Edie Harding, Executive Director
Dr. Evelyn Hawkins, Research Associate
State Board of Education

BACKGROUND:

Our two contractors—Northwest Regional Educational Lab, conducting the policy barriers study and Mass Insight, working on options for state and local partnerships for priority schools—have been around the state and in a few of our districts conducting interviews and focus groups with administrators, teachers, and key policy stakeholders. Early feedback indicates that they are receiving useful and meaningful information. Both contractors have been flexible in using what they are learning to adjust their work plans to better meet the goals of these studies.

Staff has been investigating accountability measures related to the performance of low-income students and for a school awards program. We have continued to discuss these issues with OSPI staff and OSPI contractors. We plan to form two work groups of individuals who have the knowledge and experience needed to continue moving forward.

A power point presentation updating you on the progress of these efforts will be provided at the Board meeting

STATE BOARD OF EDUCATION

HEARING TYPE: __X__ INFORMATION

DATE: May 15, 2008

SUBJECT: **OSPI UPDATE ON PROGRESS OF CONTRACT FOR WASHINGTON STATE ASSESSMENT SYSTEM**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Dr. Joe Willhoft, Assistant Superintendent
Assessment and Student Information

BACKGROUND

The Office of Superintendent of Public Instruction currently has agreements with four contractors for the assessments used in Washington's public schools. Three of those contracts expire in 2008, covering the Washington Assessment of Student Learning (WASL), the Washington Alternate Assessment System (WAAS), the Collection of Evidence, and the Assessment of Segmented Math.

In July 2007, OSPI released a request for proposals (RFP) inviting vendors to bid on components of the Washington State Assessment System. Bids were due October 13, 2008.

OSPI has completed evaluating the bids and the Superintendent has identified "apparent successful bidders" for those components of the assessment system that received funding from the Legislature.

OSPI staff will provide an overview of the RFP and the subsequent selection process, including a summary of the involvement of stakeholders in the process, and will update the Board on the status of contract negotiations and anticipated time lines.

STATE BOARD OF EDUCATION

HEARING TYPE: _X_ ACTION

DATE: May 14, 2008

SUBJECT: **APPROVAL OF DAVID HEIL REPORT ON SCIENCE STANDARDS REVIEW**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Mr. Jeff Vincent, Board Lead, SBE
Dr. Kathe Taylor, Policy Director, SBE
Mr. David Heil, CEO, David Heil & Associates
Dr. Rodger Bybee, Co-Director of Science Standards Review Project, David Heil & Associates
Mr. Harold Pratt, Co-Director of Science Standards Review Project, David Heil & Associates

BACKGROUND:

The team of David Heil and Associates will review their final recommendations for changes to the K-10 science standards. The recommendations were developed after an analysis of the standards conducted by the Expert Review Panel assembled by David Heil and Associates, Inc. The Science Standards Advisory Panel reviewed and discussed the draft recommendations at panel meetings held on February 28, 2008 and April 16, 2008. OSPI curriculum and assessment staff members have been present at all panel meetings.

In addition, the recommendations were informed by feedback from participants in six focus groups conducted in Spokane, Wenatchee, and Seattle. An on-line survey posted on the Board's website elicited over 600 responses. These were analyzed, as well.

Once the recommendations are approved, the Superintendent of Public Instruction will revise the essential academic learning requirements and grade level expectations (standards) for science by December 1, 2008. The Heil Team and the Science Standards Advisory Panel will review the revisions in the fall.

EXPECTED ACTION:

Approval of the report.

Washington State Board of Education

Working to Raise Student Achievement Dramatically

Washington State Science Standards: An Independent Review

Final Report

Submitted May 7, 2008

PROJECT TEAM

David Heil
Rodger W. Bybee
Harold A. Pratt
Kasey McCracken

DAVID HEIL & ASSOCIATES, INC.

Innovations in Science Learning

Table of Contents

Executive Summary

Washington's State Board of Education (SBE) contracted with David Heil & Associates, Inc. (DHA), to conduct a comprehensive review of Washington's current K-10 science standards. The goal of the review was to provide recommendations to improve the science education standards so Washington students will be better prepared with the science knowledge and skills needed to successfully participate in post-secondary education, meet the workforce needs of tomorrow, and contribute to Washington's future economic growth. This final report summarizes findings from DHA's review of the Washington science standards, discusses important themes from public input on the recommendations that were presented in the *Interim Report of the Washington State Science Standards Review* (March 14, 2008), and presents a final set of recommendations for a new set of K-12 science standards for the state of Washington.

The DHA project team approached the review process for the Washington science standards in a series of five steps, with the outcomes from each step progressively informing the subsequent steps. The review process included 1) research and review of relevant state and national documents; 2) assessment of the standards' strengths and weaknesses in view of their current use statewide; 3) selection of benchmark states and nations to use in an Expert Panel's review of the standards; 4) the development and implementation of a rigorous review methodology to evaluate the Washington science standards against the benchmark states and nations and the 9 criteria requested by the Washington SBE; and 5) a public input process based on preliminary recommendations presented in the interim report.

Following the presentation of the interim report, the document was posted to the SBE website and public input was solicited through an online survey and a series of six focus groups in three locations across the state of Washington. Findings from the public input phase suggest that stakeholders largely endorse the recommendations presented in the interim report. However, a few important themes emerged that resulted in DHA making clarifications in the final recommendations presented in this report. In addition to the survey and focus groups, meetings with the Washington Science Advisory Panel also provided input to inform the development and clarification of the final recommendations.

The recommendations are based on a disciplined and scientific review of the current science standards, providing a vision for a new set of science standards for the state of Washington. Although the current Washington science standards rated relatively well when compared to the benchmark states and nations, the state of Washington faces the critical challenge of moving from a "good" set of science standards to an "excellent" set of science standards for the future.

The following recommendations are intended to guide the state of Washington in their efforts to develop and implement new science standards. The first section, *Recommendations to Inform Policy and Implementation Decisions* contains four broad recommendations focused on implementation. The second section, *Recommendations to Inform the Design and Writing of a New Science Standards Document*, contains seven more specific recommendations focused on the task of rewriting the Washington science standards.

Recommendations to Inform Policy and Implementation Decisions

1 **Based on our review and analysis of the current science standards for the state of Washington, we recommend the development of a new science standards document.**

- Washington should assemble a Science Standards Revision Team to incorporate the changes detailed in this report.
- The new science standards document should build on the strengths of the current science standards document.
- The Science Standards Revision Team should include teachers, a curriculum specialist, an assessment specialist, a university science educator, scientists from each of the three major disciplines, a professional with experience developing standards at the state or national level, a math educator who worked on the development of the math standards, and a professional editor.

2 **The new science standards should be a comprehensive K-12 document that sets high expectations for all students.**

- The document should be expanded to include grades 11 and 12.
- The document should describe the knowledge, skills, and abilities that all students need to be prepared for post-secondary education.

3 **The science standards should create a vision for the science content, methods of science, and applications appropriate for all K-12 students in the state of Washington.**

- The new science standards should be clear on their purpose, audience, and voice.
- The document's purpose should reflect the values of the stakeholders in the state of Washington.

4 **Implementation of the science standards should result in greater coherence across the full spectrum of the education system - including curriculum development, selection of instructional materials, professional development, and assessment.**

- The standards must not be presented as the curriculum.
- Supporting documents are necessary to ensure reliable alignment between the science standards, development and selection of instructional materials, professional development, classroom instruction, and assessment.
- Supporting documents should provide guidance on development and selection of standards-based instructional materials, professional development, instructional strategies, and assessment that support student achievement of the science standards and the measurement of that achievement.

Recommendations to Inform the Design and Writing of a New Washington Science Standards Document

5 Simplify the organization of the Washington science standards document.

- Reduce the number of organizing elements to improve user navigation of the document.
- Organize the discipline content, currently provided in EALR 1, by life sciences, earth and space sciences, and physical sciences.
- Include the same clear delineation of science content, methods of science, and applications that is provided in the current document.
- Continue to provide standards for grade spans rather than for grade levels, including expanding the high school span to integrate grades 11 and 12.

6 Increase the clarity and specificity of the Washington science standards document.

- The science standards should not depend on scientific vocabulary alone to convey the meaning of an outcome statement of what students should understand or be able to do. Scientific vocabulary within the content statements is acceptable if the term is explained as part of the standard.
- The science standards should provide a more complete, detailed, and specific description of the content to be learned, with special attention to the Life Science content. Minimize the use of external references for defining the science content that is to be learned.
- The verbs used in the standards should specifically delineate what students are to understand/know or be able to do.
- The science standards should use content statements to detail the science content that is to be learned. Model the format of these statements after statements provided in reference documents such as the *2009 National Assessment of Educational Progress* and the *National Science Education Standards*.

7 Increase the rigor of the Washington science standards document.

- Some concepts currently introduced in grades 3-5 should be introduced earlier.
- Increase the level of cognitive demand of the standards at all grade spans.
- With the addition of grades 11 and 12, the learning progression across grade spans for each standard should be revisited and content redistributed, with special attention to grade spans 6-8 and 9-12.
- Use the most current research on learning progressions within disciplines to establish what students should know and be able to do at each grade span.

8 Strengthen the standards for inquiry in the state of Washington.

- Devote more attention to the "abilities" of inquiry in addition to the "understandings" of inquiry. Students at all grade levels should be expected to demonstrate the abilities of inquiry.
- Incorporate linkages to the Washington State K-12 Mathematics Standards.
- Provide guidance to clarify the purpose of the inquiry standards as defining learning outcomes for students rather than outlining instructional strategies.

9 Improve the standards for Science and Technology.

- In addition to the "understandings" of technological design, increase focus on the "abilities" of technological design.
- Provide relevant "real world" examples to illustrate the concepts that are articulated in the standards.

10 Develop standards to address Science in Personal and Social Perspectives

- Include the Science in Personal and Social Perspectives content found in the *NSES*.

11 The Washington science standards should reflect the balance and depth of content found in the National Science Education Standards.

- Focus on fundamental concepts and abilities presented in the *NSES*.
- With the development of the new K-12 document, ensure that the Washington Standards contain all of the content from the *NSES*, with particular attention to Life Sciences.
- Eliminate areas of redundancy found in the current Washington science standards.

The recommendations presented in this report are based on the analysis and findings of an Expert Review Panel, public input from a preliminary set of recommendations, input from the Washington Science Advisory Panel, and the collective experience of the DHA project team developing and implementing national and state-level science standards. The recommendations provide a foundation for the development of a set of science standards that set high expectations for all students in Kindergarten through 12th grade in the state of Washington. They also provide guidance for the policies and practices that must be in place to ensure the science standards support a coherent science education system. The state of Washington will be well served by SBE and the Office of Superintendent of Public Instruction (OSPI) undertaking this effort to develop a new set of science standards and guidelines for implementation of those standards. This effort today will help provide Washington with the educated citizenry necessary to meet the workforce needs of tomorrow, positioning the state to realize its full potential as a global leader in science and technology, as well as the diverse economies dependent on science and technology to thrive.

Introduction

Washington's State Board of Education (SBE) contracted with David Heil & Associates, Inc. (DHA) to conduct a review of Washington's current K-10 science standards. The DHA project team conducted a comprehensive review of relevant state and national documents, assessed the strengths and weaknesses of the science standards in view of their current use in practice statewide, developed a methodology to review and benchmark Washington's science standards to exemplar states and nations selected for their strategic relevance to Washington, and convened an Expert Panel to complete a rigorous analysis of the current standards using nine criteria and the benchmark states and nations. Findings from the Expert Panel's review, along with public input and input from the Washington Science Advisory Panel, informed the development of the final 11 recommendations. The goal of the recommendations is to improve the science education standards so Washington students will be better prepared with the science knowledge and skills needed to successfully participate in post-secondary education, meet the workforce needs of tomorrow, and contribute to Washington's future economic growth.

This final report presents findings from the Expert Panel's review of the Washington science standards, summarizes important themes from public input on a preliminary set of recommendations, and provides final recommendations for a new set of K-12 science standards for the state of Washington. The recommendations are presented in two sections:

- **Recommendations to Inform Policy and Implementation Decisions** (four recommendations)
- **Recommendations to Inform the Design and Writing of a New Science Standards Document** (seven recommendations)

Review Methodology

The DHA project team approached the review process for the Washington science standards in a series of five steps, with the outcomes from each step progressively informing the subsequent steps. The review process included 1) research and review of relevant state and national documents; 2) assessment of the standards' strengths and weaknesses in view of their current use statewide; 3) selection of benchmark states and nations to use in an Expert Panel's review of the standards; 4) the development and implementation of a rigorous review methodology to evaluate the Washington science standards against the benchmark states and nations and the 9 criteria requested by the Washington SBE; and 5) a public input process based on preliminary recommendations presented in the interim report. In addition, the Washington Science Advisory Panel provided input at each phase of the project to inform the recommendations.

Research and Review of Relevant Documents

The DHA project team assembled and reviewed state and national reports, studies, and reviews relevant to a review of the Washington science standards. During this process, the team reviewed a number of established national and international reports including the *Science Framework for the 2009 National Assessment of Educational Progress (NAEP Framework), the Trends in International Mathematics and Science Study (TIMSS), the Programme for International Student Assessment (PISA), the National Science Education Standards (NSES)*, and the *American Association for the Advancement of Science (AAAS) Benchmarks for Science Literacy (Benchmarks)* with attention to their implications for the Washington science standards. The team also analyzed the *Science College Readiness Definitions* prepared by the Higher Education Coordinating Board in preparation for considering the development of Washington science standards for grades 11 and 12. These documents and reports were summarized in the *Preliminary Report of the Washington State Science Standards Review* (January 7, 2008). The summaries are included as Appendix A of this report.

Assessment of the Strengths and Weaknesses of the Science Standards

During the first Washington Science Advisory Panel meeting David Heil facilitated a discussion exploring the strengths and weaknesses of the current Washington science standards. After brainstorming a list of 25 strengths the panel members independently ranked the top ten most significant strengths of the current standards. This process was repeated for weaknesses with a list of 31 recorded and rank ordered. The *Preliminary Report of the Washington State Science Standards Review* (January 7, 2008) presents findings from this facilitated discussion.

Selection of Benchmark States and Nations

The project team used independent studies and published reviews of state and international standards to inform the selection of states and nations to serve as appropriate benchmarks for the review of the Washington science standards. This included comparison studies of state standards reviews (such as reports prepared by Education Week, the Thomas B. Fordham Institute, and the American Federation of Teachers) and findings from national and international assessments (such as *NAEP*, *TIMSS*, and *PISA*). In addition to these reports, states' performance on

the *2002 State New Economy Index* was used to provide additional context for selecting appropriate benchmarks. *Washington Learns* (2006) identified states that performed well on this index as important benchmarks for the state of Washington in the new economy. Findings from these documents were summarized in the *Preliminary Report of the Washington State Science Standards Review* (January 7, 2008), and are included in Appendix B of this report.

Expert Review Panel Methodology

The Expert Panel's review of the Washington science standards provided the quantitative and qualitative findings presented in this report. The findings were fundamental to the development of the recommendations also provided in this report. Recognizing the need for a broad based review of the science standards, DHA assembled eight experienced content and grade level experts in science education to form the Expert Review Panel. The panel included representation from each of the benchmark states, as well as individuals with broad experience evaluating and/or implementing standards-based science programs in Washington State and across the nation. Appendix D provides biographies for each of the Expert Review Panel members.

Based on the project team's review of national and international studies and reports, the following states and nations were selected as benchmarks for the review of the Washington Science Standards:

- *California*
- *Colorado*
- *Massachusetts*
- *Finland*
- *Singapore*

The Washington SBE requested that nine criteria be used to review the Washington science standards. The DHA project team developed the definitions of the criteria, shown in Figure 1, based on a review of similar criteria employed by Achieve, Inc. to review science standards in other states, and criteria used during the 2007 review of the Washington mathematics standards. In order to conduct the review with scientific precision and ensure inter-rater reliability, these definitions were presented to the Expert Panel Review and discussed prior to the review in order to clarify their meaning and effective use in the review process.

Figure 1 **Final Review Criteria Definitions**

Accessibility. The document contains enough detail for use by curriculum developers and assessment specialists, and the document can be easily navigated.

Balance. There is an appropriate allocation of Grade Level Expectations (GLEs) for each of the three disciplines and there is an appropriate distribution of GLEs representing subject matter content, skills and processes of inquiry, and applications.

Content. GLEs include the most fundamental concepts/outcomes in the science disciplines, matching well-respected benchmarks, **and** GLEs are scientifically accurate.

Specificity. The description of the content or skill is detailed enough to provide an adequate definition of the learning outcome.

Depth. Fundamental concepts/outcomes are fully developed in each content area.

Clarity. GLEs have a minimum of technical vocabulary and no jargon.

Measurability. The Evidence of Learning statements (ELs) provide guidance for the assessment of the GLEs.

Coherence. GLEs build on the knowledge and skill from the previous grade levels in a manner such that the learning progression of content from one grade level to the next level is recognizable.

Rigor. GLEs and ELs are written at an appropriate level for the student's age and the grade level to which they are assigned.

The definitions of the nine criteria are further operationalized in the scoring guides that were developed for the Expert Panel's review of the standards. The scoring guides include four-point rating scales for the criteria that provide anchors for each numerical rating. For cases in which the definition includes more than one dimension, the scoring guide includes two rating scales. The rating scales use national standards documents, primarily the *NSES*, but also the *NAEP Framework*, to establish reference points for the criteria that facilitate the comparison of Washington's science standards to the benchmark states and nations. The rating scales are displayed in the charts for the criteria that are provided in the *Findings* section of this report. In addition to providing guidance for the quantitative ratings, the scoring guides and protocols were designed to facilitate the capture of reviewers' qualitative feedback as well.

The Expert Panel's review was conducted over a two and a half day period, during which reviewers worked individually and as teams. The review was organized into four review blocks, each lasting approximately three hours; covering specific criteria for Essential Academic Learning Requirements (EALRs) 1, 2, and 3; and using two to three reviewer teams organized by content area or grade spans. For each review block, with the exception of the block for the review of *Accessibility* and *Balance*[1], reviewers first conducted an individual review and then met as a team to discuss their findings, clarify differences in their scores with examples, and develop consensus scores as a team. In addition to the four review blocks for the nine criteria, the Expert Panel's review included a facilitated discussion regarding the development of science standards for grades 11 and 12 (including a review of the *Science College Readiness Definitions* prepared by the Higher Education Coordinating Board) and a discussion of policy and implementation considerations.

Public Input

Following the presentation of the interim report to the Washington SBE, the document was posted to the SBE website and public input was solicited through an online survey and a series of six focus groups in three locations across the state of Washington. The online survey opened April 7, 2008 and closed April 21st, 2008. Stakeholders were made aware of the survey through announcement at the SBE meeting, professional networks, and through representatives of organizations such as the Washington Science Teachers Association (WSTA). During the two-week period, 616 respondents completed the survey.

In addition to the online survey, a total of six two-hour focus groups were hosted in Spokane, Wenatchee, and Seattle between April 9, 2008 and April 15, 2008. Two focus groups were hosted in each location. For the first group in each location DHA recruited a group of local educational professionals, such as district-level staff, Education Service District (ESD) staff, teachers, principals, and representatives from higher education and informal science education. A local recruitment firm was used to recruit a second group that included general public stakeholders, such as parents of students in the K-12 public education system, 11th and 12th grade students, local employers, individuals ages 18 to 22 attending college, and individuals ages 18 to 22 who have not attended college. Findings from the online survey and focus groups are summarized in the *Public Input* section of this report.

1 The review for *Accessibility* and *Balance* included individual reviews during which Expert Reviewers provided ratings and comments on the science standards for Washington, Massachusetts, Singapore, and Finland. Following the individual reviews, median ratings were calculated and the reviewers convened for a full panel discussion of their collective findings.

Washington Science Advisory Panel Input

The Washington Science Advisory Panel (see Appendix E for panel member biographies) provided early input into the review process and help with clarifying and refining the recommendations. The DHA project team facilitated three full-day meetings with the Panel during the period of work leading up to this final report. During the first meeting, the project team facilitated a discussion that resulted in assessment of the strengths and weaknesses of the current standards, summarized in the *Preliminary Report of the Washington State Science Standards Review* (January 7, 2008). The second meeting of the Washington Science Advisory Panel solicited input from panel members on the initial set of recommendations that were developed based on findings from the Expert Panel's review. During the third meeting DHA presented findings from public input on the preliminary set of recommendations from the *Interim Report of the Washington State Science Standards Review* (March 14, 2008) and facilitated a discussion to inform the development of the final recommendations.

Although the *Findings* section of this report is based on the analysis and interpretation of the data compiled from the Expert Panel's review, the *Recommendations* section specifically references comments and concerns by participants in the public input process and by members of the Washington Science Advisory Panel. In this manner, the recommendations are informed by the input that was provided through the public input process and by the Washington Science Advisory Panel.

Findings from the Expert Panel's Review

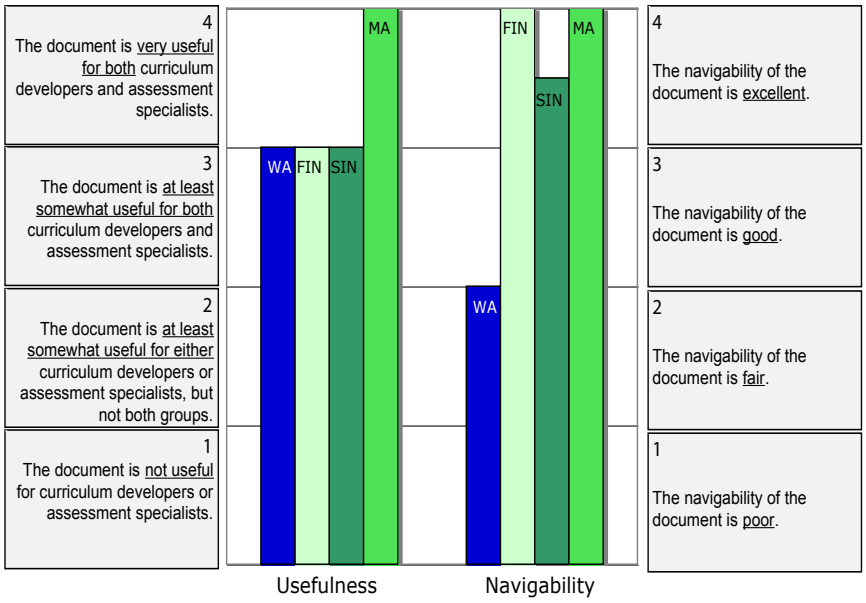
This section summarizes findings from the Expert Panel's review of the Washington science standards for each of the nine criteria employed in the review: accessibility, balance, content, depth, specificity, clarity, measurability, coherence, and rigor. In some cases, the review provided separate findings for EALRs 1, 2, and 3. When this occurs the findings for the criterion on the specific EALRs are presented individually. Each criterion summary includes the following:

- **A summary of quantitative findings** from the review based on the rating scales developed for each criterion;
- **Specific findings** from the review based on qualitative data collected during the review; and
- **An example** to illustrate key findings from the review.

Accessibility. The document contains enough detail for use by curriculum developers and assessment specialists, and the document can be easily navigated.

Reviewers found the Washington science standards to be somewhat useful for both curriculum developers and assessment specialists (a median rating of 3), but noted that the document is more useful for assessment specialists than for curriculum developers.

Reviewers found the navigability of the document to be fair (a median rating of 2). They found the Finland, Singapore, and Massachusetts documents to be more navigable than the Washington document, providing median ratings of 4, 3.5, and 4 respectively.



Example: Excerpt from the MA Science Standards Table of Contents

As shown in this section of the Table of Contents from the Massachusetts science standards the document is organized by discipline and includes front-matter that discusses the vision, purpose, and nature of the standards. Reviewers found the document easy to navigate.

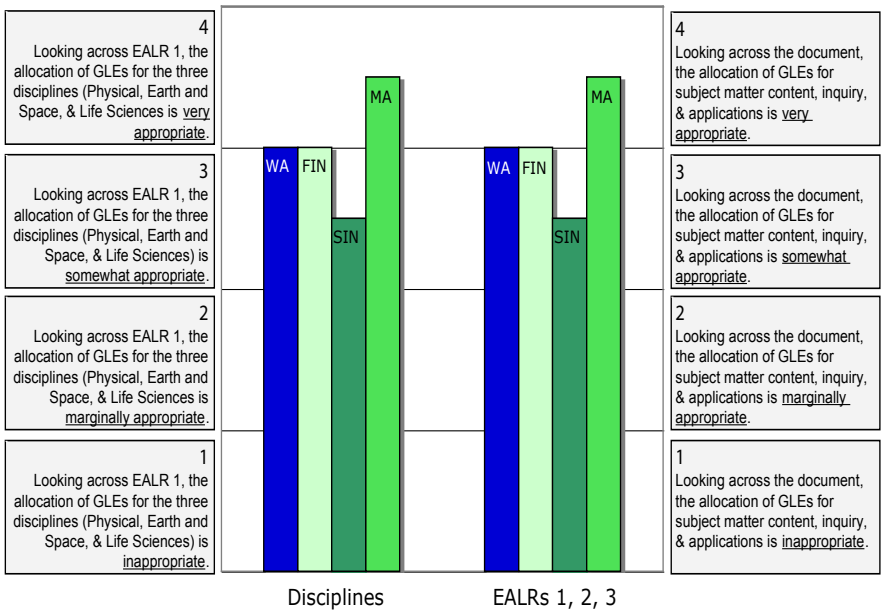
MA Science and Technology/Engineering Curriculum Framework Table of Contents

Specific Findings

- The organization of the GLEs by content strand and the utilization of the GLE tags are helpful and support the overall navigability of the document.
- The document is less useful for curriculum developers because the level of specificity of the science content is not sufficient to support curriculum development. The lack of detail in the science content also undermines the development of consistent assessments.
- The hierarchy of the systems framework makes it difficult to navigate the document.
- The Component feature in the standards forces the reader to read through too many layers to achieve an adequate depth of understanding and results in an organization of content that is of little value to most users.
- Unlike the Washington document, the Massachusetts and Finland documents are organized by discipline content.
- Although they were not reviewed by the Expert Review Panel, it is notable that in addition to the Science K-10 Grade Level Expectations document, OSPI provides a number of online resources at www.k12.wa.us/CurriculumInstruct/.

Balance. There is an appropriate allocation of GLEs for each of the three disciplines and there is an appropriate distribution of GLEs representing subject matter content, skills and processes of inquiry, and applications.

Reviewers found that looking across EALR 1 the allocation of GLEs for the three disciplines (Physical, Earth & Space, and Life Sciences) is somewhat appropriate (a median rating of 3). Similarly, they found that the allocation of GLEs for subject matter content, inquiry and applications is somewhat appropriate (a median rating of 3).Overall the reviewers found an appropriate balance of the content in the Washington science standards. Massachusetts was the only comparison state/nation to receive more favorable ratings.



Example: Singapore Inquiry Science Standards

Unlike the Washington inquiry standards, the Singapore inquiry standards (labeled skills and processes) are presented in conjunction with the disciplinary content. Although this approach mirrors best practices for teaching inquiry concepts in the classroom, it can also allows the inquiry standards to become lost within the content standards.

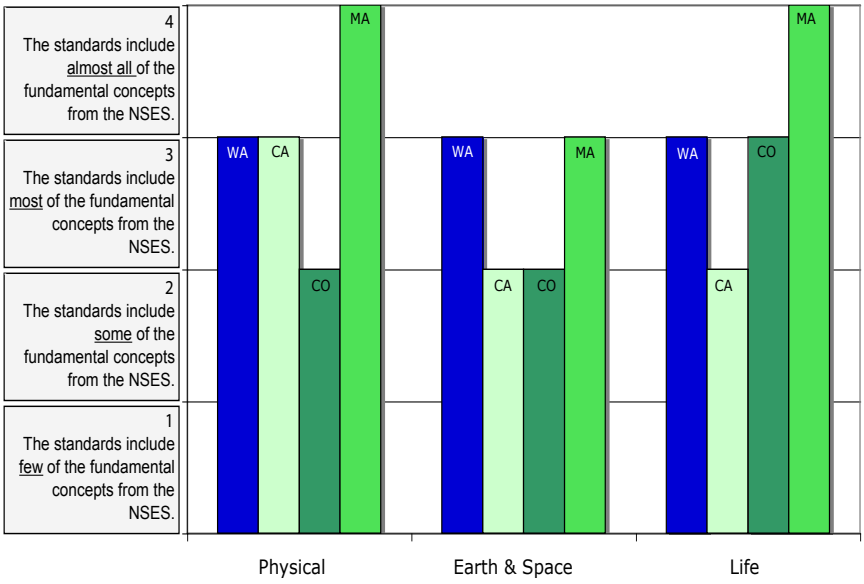
Singapore Primary Science Standards (P5 and P6): Cycles in Plants and Animals	
Knowledge, Understanding, and Application	**Skills and Processes**
State the processes in the sexual reproduction of flowering plants. • Pollination • Fertilization (seed production) • Seed dispersal • Germination State the process of fertilization in the sexual reproduction of humans.	Observe and compare the various ways in which plants reproduce and communicate findings. • Spores • Seeds

Specific Findings

- The standards provide appropriate weight to the importance of inquiry and applications.
- Panelists disagreed over whether it is most appropriate for inquiry standards to be integrated with content standards, as in the Singapore document or to be presented separately, as in the Washington document. Some expressed that integrating the standards makes it difficult to locate the inquiry standards, and others felt that integrating the standards models the manner in which these concepts should be handled in the classroom.
- Presenting the standards for the discipline, inquiry, and science & technology content separately ensures that the inquiry and science & technology standards stand alone as student learning outcomes. However, this presentation makes it is essential to provide guidance to support the use of instructional practices that integrate inquiry, science & technology, and discipline content in the classroom.

Content: EALR 1. GLEs include the most fundamental concepts in the science disciplines, matching well-respected benchmarks, and GLEs are scientificially accurate.

The Washington standards in EALR 1 compared favorably to the standards for California, Colorado, and Massachusetts for all three disciplines. Panelists concluded that overall, the Washington standards reflect most of the fundamental concepts from the *NSES* (a rating of a 3). Massachusetts is the only state that received higher ratings, with 4's for both the Physical and Life Sciences. Panelists found that a weakness of the Washington standards is that important *NSES* content has been omitted.



Example: NSES Content That is Not Included in the WA Science Standards

NSES Content Standard D (grade span 9-12). As a result of activities in grades 9-12, all students should develop an understanding of… geochemical cycles:

- The earth is a system containing essentially a fixed amount of each table chemical atom or element. Each element can exist in several different chemical reservoirs. Each element on earth moves among reservoirs in the solid earth, oceans, atmosphere, and organisms as part of geochemical cycles.
- Movement of matter between reservoirs is driven by the earth's internal and external sources of energy. These movements are often accompanied by a change in the physical and chemical properties of the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water as dissolved carbon dioxide, and in all organisms as complex molecules that control the chemistry of life.

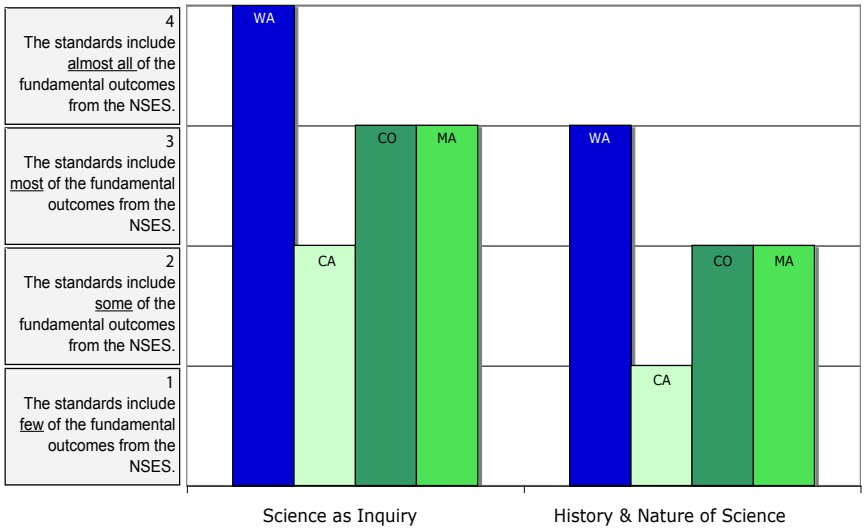
Specific Findings

- The GLEs include most of the *NSES* content for the physical sciences. Missing content in the GLEs includes heat, electrical forces, electrical circuits, relation between current and magnetism, electromagnetic waves, and light and spectrum.
- The GLEs are missing *NSES* content for the earth and space sciences in the areas of plate tectonics/earth history (with the exception of fossils), water, climate, energy from the sun, gravity, energy in earth systems, geochemical cycles, and the sun as a source of energy.
- The GLEs are missing *NSES* content for the life sciences in the areas of failure of structure and function and the development of disease. Some *NSES* content areas receive limited attention, such as the role of behavior, the organism in the environment, and interaction/human impact on the environment. In addition, there is an unusually heavy emphasis on human biology, and too much emphasis on classification.

Content: EALR 2. GLEs include the most fundamental concepts in the science disciplines, matching well-respected benchmarks, and GLEs are scientifically accurate.

Washington performed much more strongly with regard to the inclusion of *NSES* inquiry and history and nature of science standards than did California, Colorado, or Massachusetts. Reviewers found that the Washington standards in EALR 2 include almost all of the inquiry standards from the *NSES* (a rating of 4) and most of the fundamental history and nature of history science standards from the *NSES* (a rating of 3).

Compared to other states, Washington has made substantial progress towards the inclusion of inquiry in the science standards. Colorado provides a thorough treatment of inquiry that is similar to the *NSES*; in California, the treatment of inquiry is more focused on investigation and experimentation within the content than on actual inquiry; and the Massachusetts standards provide useful examples of inquiry, but do not explicitly provide standards for inquiry for grades K-8.



Example: Understanding Inquiry vs. the Abilities of Inquiry

Washington GLE 2.1.1, shown below, describes understanding inquiry rather than the abilities of inquiry as reflected in the corresponding *NSES* content statement. Note that although the ELs for this GLE describe the abilities of inquiry, the GLE itself is framed as an understanding of inquiry.

WA GLE 2.1.1: Grade Span 9-10	NSES Science as Inquiry Standard: Grade Span 9-12
Understand how to generate and evaluate questions that can be answered through scientific investigations. • Generate a new question that can be investigated with the same materials and/or data as a given investigation. • Generate questions, and critique whether questions can be answered through scientific investigation.	**As a result of activities in grades 9-12, all students should develop abilities necessary to do inquiry.** Identify questions and concepts that guide scientific investigations. Students should formulate a testable hypothesis and demonstrate the logical connections between the scientific concepts guiding a hypothesis and the design of an experiment.

Specific Findings

- The fundamental standards for inquiry are evident in the Washington standards. However, the GLEs focus primarily on "understanding" with little attention to "abilities." The *NSES* indicates that the standards on inquiry should include both "understanding" and "abilities" of inquiry:

  "The standards of inquiry highlight the ability to conduct inquiry and develop understanding about scientific inquiry. Students at all grade levels and in every domain of science should have the opportunity to use scientific inquiry and develop the ability to think and act in ways associated with inquiry." (*NSES*, pg. 105)

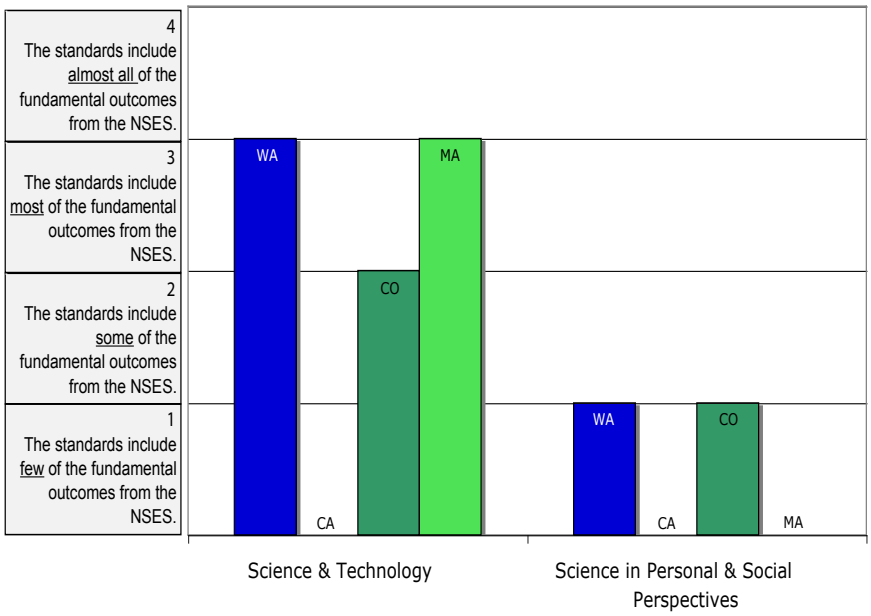
  Of the 5 inquiry GLEs, only 3 of them address the abilities of inquiry, and these do so only at the 6-8 and 9-10 grade spans. However, in some cases the ELs for GLEs that describe the "understanding" of inquiry reflect the "abilities" of inquiry.

- Inquiry concepts are less developed for the 9-10 grade span than for other grade spans.

- Although the inquiry standards are treated more broadly in the Washington standards than in the *NSES*, most of the fundamental outcomes are included in the Washington standards. In this regard the Washington standards perform better than any of the comparison states, which lack much of the *NSES* content for history and nature of sciences.

Content: EALR 3. GLEs include the most fundamental concepts in the science disciplines, matching well-respected benchmarks, and GLEs are scientificially accurate.

The Washington standards include most of the fundamental concepts from the *NSES* for science and technology (a rating of 3), but lack many concepts for science in personal and social perspectives (a rating of 1). Washington performs similarly to the comparison states in this regard. Reviewers noted that Washington is particularly strong with regard to the standards related to design.



Example: Science in Personal and Social Perspectives

As shown in this example, the Washington K-2 science standards include few GLEs that address *NSES* science in personal and social perspectives. The standards lack GLEs to address personal health, or characteristics and changes in populations.

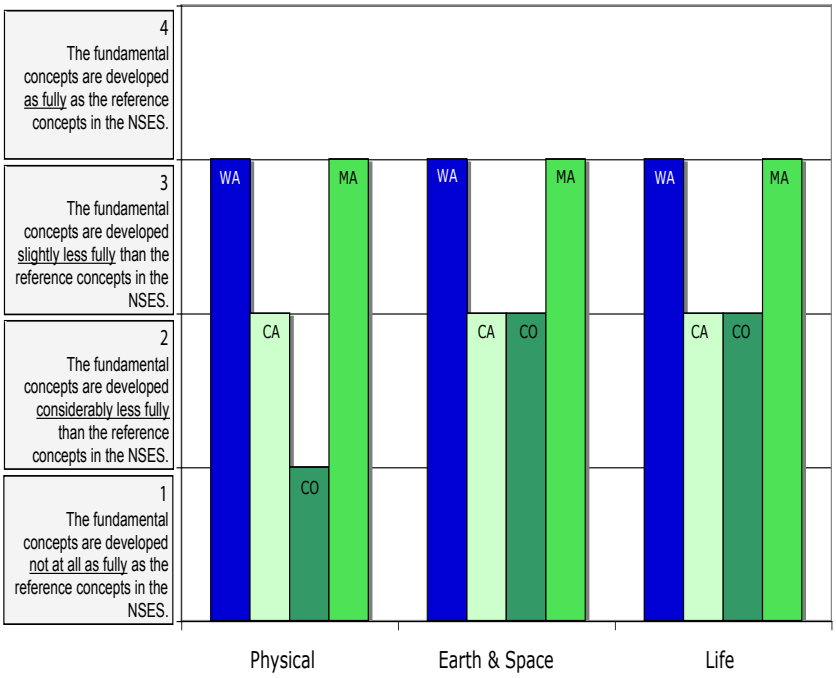
WA K-2 GLEs Related to Science in Personal and Social Perspectives	NSES Science in Personal and Social Perspectives: Grade Span K-4
GLE 3.2.2: Know that people have invented tools for everyday life. GLE 3.2.4: Understand how humans depend on the natural environment.	All students should develop an understanding of: • Personal health • Characteristics and changes in populations • Types of resources • Changes in environments • Science and technology in local challenges

Specific Findings

- Although most of the *NSES* science and technology content is addressed in the Washington standards, the document does lack content in some areas. Missing content includes:
  - for the K-4 grade span: constraints, teams or individual work, and the distinction between the natural and designed world;
  - for the 5-8 grade span: implementation, "imperfect design," constraints, and consequences; and
  - for the 9-10 grade span: implementation, alternative solutions, the scientist perspective, and creativity and imagination.
- Like the standards for other states, most of the *NSES* personal and social perspectives content is missing from the Washington standards, including: the impact of population growth, health, hazards, and local and global changes.
- GLE 3.2.3 addresses careers and occupations that use science, mathematics, and technology. This content is not found in the *NSES*.

Depth: EALR 1. Fundamental concepts/outcomes are fully developed in each content area.

Panelists concluded that overall, the fundamental concepts are developed slightly less fully than the reference concepts in the *NSES* (ratings of 3) for each of the three discipline groups in the Washington standards. These results are equivalent to those for Massachusetts and better than those for California and Colorado. The primary criticism of the Washington standards with regard to depth is that the organization of the document requires the reader to read through many layers to comprehend the required level of depth, which is provided by the ELs. In some cases reviewers found that the ELs provide the required depth, but that the completeness of the content is limited by the fact that these statements are written as a sample of "illustrations of learning" to support assessment rather than to detail the scientific content.



Example: WA GLE vs. Corresponding MA and NSES Standard

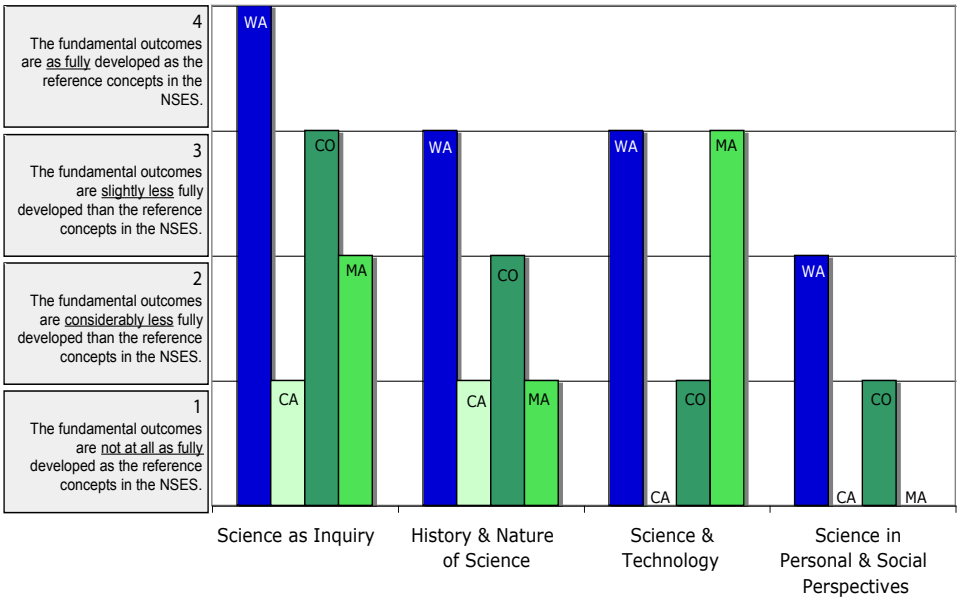
The Washington GLE statement alone does not provide sufficient depth to the science content. To obtain a fuller development of the concept it is necessary to read to the level of the EL statements, which by definition are not exhaustive. Notice that the Massachusetts standards provide more depth of content in the statement of the standard itself.

WA GLE 1.2.6: Grade Span 3-5	MA Life Science Standards 3-5: Grade Span 3-5	NSES Content Standard C: Grade Span K-4
Understand the life cycles of plants and animals and the differences between inherited and acquired characteristics. • Observe and describe the life cycle of a plant or animal. • Describe that the young of plants and animals grow to resemble their parents as they mature into adults. • Describe inherited characteristics (e.g. leaf shape, eye color) and learned characteristics (e.g., languages, social customs).	3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death. 4. Describe the major stages that characterize the life cycle of the frog and butterfly as they go through metamorphosis. 5. Differentiate between observed characteristics of plants and animals that are fully inherited (e.g., color of flower, shape of leaves, color of eyes, number of appendages) and characteristics that are affected by the climate or environment (e.g., browning of leaves due to too much sun, language spoken).	**All students should develop understanding of… life cycles of organisms.** • Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying. The details of this life cycle are different for different organisms. • Plants and animals closely resemble their parents. • Many characteristics of an organism are inherited from the parents of the organism, but other characteristics results from an individual's interactions with the environment. Inherited characteristics include the color of flowers and the number of limbs of an animal. Other features, such as the ability to ride a bicycle, are learned through interactions with the environment and cannot be passed on to the next generation.

Depth: EALRs 2 & 3. Fundamental concepts/outcomes are fully developed in each content area.

Reviewers found that for EALR 2 the inquiry outcomes are developed as fully as the reference outcomes in the *NSES* (a rating of 4) and the outcomes corresponding to the *NSES* history and nature of science standards are developed almost as fully as the reference outcomes (a rating of 3). Washington performs better than all of the comparison states for the depth of treatment of both inquiry and the history and nature of science.

Reviewers found that for EALR 3 (applications) the fundamental outcomes are developed almost as fully as the reference concepts in the *NSES*, and concluded that Washington should be commended for its treatment of this material. Like the comparison states, the Washington standards do not develop the science in personal and social perspectives outcomes at all as fully as the *NSES*.



Specific Findings

- Some History and Nature of Science GLEs could be improved with regard to depth. For example, GLE 2.2.2 for grade spans 6-8 and 9-10 should provide a more fully developed content description.
- The Washington science and technology standards are weak on the description of team-work and the development of the relationship between science and technology.

Example: WA Inquiry Standard vs. Comparison State Standards

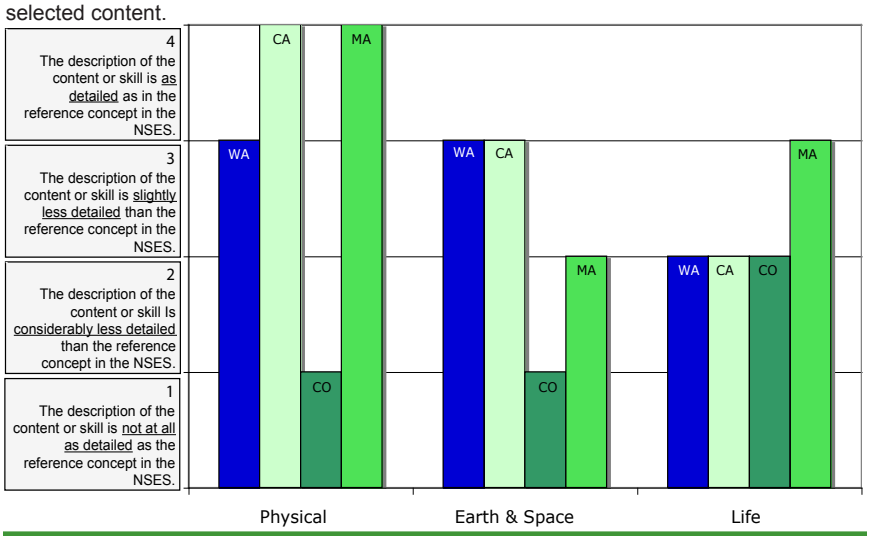
The following example displays the Washington GLE for inquiry, the corresponding Colorado standard, and notes regarding the treatment of inquiry in the California and Massachusetts documents. Notice that the Washington document provides a much fuller description of the inquiry content than do any of the comparison states.

WA GLE 2.1.3: Grade Span K-2	CO Standard 1: Grade Span K-4	Notes Regarding CA & MA Standards
Understand how to construct a reasonable explanation using evidence. • Categorize and order observational data from multiple trials. • Explain an event or phenomenon using observations as evidence (e.g., shape, texture, size weight, color, motion, and/or other physical properties).	In grades K-4, what students know and are able to do includes: • Using data based on observations to construct a reasonable explanation.	The California document includes standards for Investigation and Experimentation, but the standards do not include content that is comparable to that in GLE 2.1.3. The Massachusetts document includes a section outlining the skills of inquiry for the PreK-2 grade span, but does not include specific standards for this grade span.

Specificity: EALR 1. The description of the content or skill is detailed enough to provide an adequate definition of the learning outcome.

Panelists concluded that the Washington standards for the Physical and Earth & Space sciences provide a description of the content that is slightly less detailed than the reference concepts in the *NSES* (a rating of 3), and that the standards for the Life Sciences provide a description that is considerably less detailed than the *NSES* (a rating of 2). These results are better than those for Colorado across all three disciplines. The Massachusetts standards for the Physical and Life Sciences received higher ratings than did Washington. Interestingly, reviewers found the California standards to be very specific, in spite of the inclusion of inappropriate content.[1]

1 The ratings for California varied across disciplines from 4 for Physical Sciences to 2 for Life Sciences, but in the discussion reviewers attributed this variation to differences in the rating teams' approaches to scoring standards that are very specific about inappropriately selected content.



Example: WA Life Sciences GLE and Corresponding MA standard

The following example displays a Washington GLE and one of its ELs, along with the corresponding Massachusetts standard for the same content. Notice that the Massachusetts standard provides much more detail about the science content to be learned.

WA GLE 1.2.6: Grade Span 9-10	MA Biology, High School
Understand cellular structures, their functions, and how specific genes regulate these functions. • Describe how genes (DNA molecules) provide instructions for assembling protein molecules in cells.	**3. Genes allow for the storage and transmission of genetic information. They are a set of instructions encoded in the nucleotide sequence of each organism. Genes code for the specific sequences of amino acids that comprise the proteins characteristic to that organism.** • Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic code. Explain the basic processes of transcription and translation, and how they result in the expression of genes. Distinguish among the end products of replication, transcription, and translation.

Specific Findings

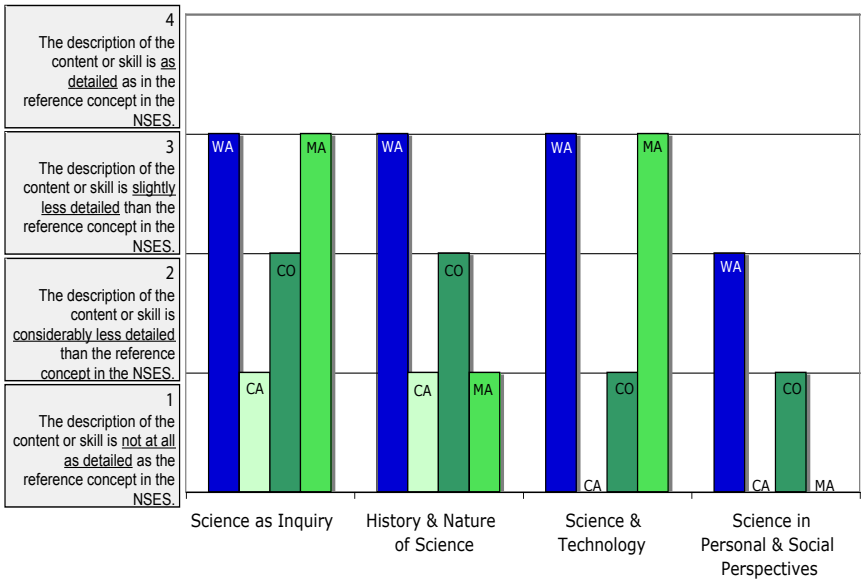
Reviewers based their ratings of specificity on a review of both the GLEs and their supporting ELs. A key finding with regard to specificity is that the GLEs themselves are of a very large grain size and are not at all specific. Although many of the ELs are specific, the use of the ELs to provide specificity to the standards is problematic because:

1. The level of specificity varies among the ELs.
2. The ELs are intended to provide a sample of "illustrations of learning" and are therefore not comprehensive.
3. The ELs are not always appropriately aligned to the GLEs.
4. The verbs used in the ELs, such as *describe*, *compare*, and *observe*, do not reference specific outcomes that describe what is to be learned. They tend to be terms used to suggest means of instruction.
5. The ELs are more specific with regard to what students should do than with regard to the details of the science to be learned.

Specificity: EALRs 2 & 3. The description of the content or skill is detailed enough to provide an adequate definition of the learning outcome.

Reviewers found outcomes in EALR 2 to be slightly less detailed than the reference outcomes in the *NSES* (ratings of 3), in this regard Washington performed better than all of the comparison states, except Massachusetts for inquiry (which received the same rating as Washington).

For EALR 3 reviewers determined that the descriptions of the skills are only slightly less detailed than the corresponding content in the *NSES* (a rating of 3). EALR 3 content received a rating of 2, indicating that the content is considerably less detailed than the corresponding personal and social perspectives standards in the *NSES*.



Specific Findings

- The design portion of EALR 3 is well detailed.
- EALRs 2 and 3 suffer from the same problems of specificity that are outlined in the specific findings for EALR 1.
- For some inquiry GLEs, such as GLEs 2.1.2 and 2.1.3, the ELs provide too much detail.
- For the Applications GLEs, the ELs would benefit from additional "real-world" examples.
- In some cases the Applications standards, such as GLE 3.1.3, provide redundant detail.

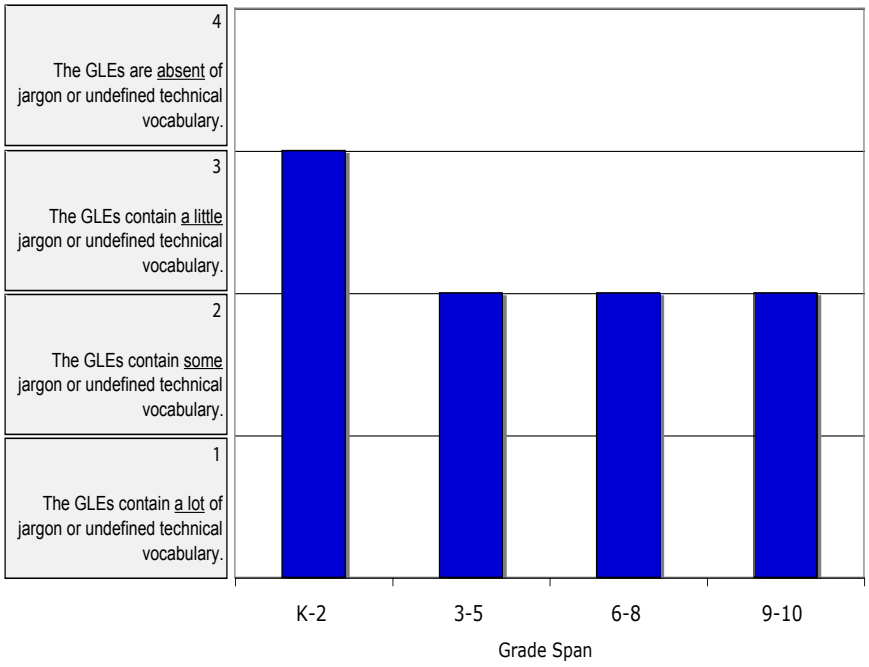
Example: WA Science and Technology Standard and Corresponding MA Standard

Although the Washington EL details the skills that students are to learn, notice how the examples that are provided in the Massachusetts standard provide further specificity.

WA GLE 3.1.2: Grade Span 3-5	MA Technology/Engineering: Grade Span 3-5
Understand how the scientific design process is used to develop and implement solutions to human problems. • Propose, implement, and document the scientific design process used to solve a problem or challenge: define the problem, scientifically gather information and collect measurable data, explore ideas, make a plan, list steps to do the plan, scientifically test solutions, and document the scientific design process.	**Engineering design requires creative thinking and strategies to solve practical problems generated by needs and wants.** • Identify a problem that reflects the need for shelter, storage, or convenience. • Describe different ways in which a problem can be represented, e.g., sketches, diagrams, graphic organizers, and lists. • Identify relevant design features (e.g., size, shape, weight) for building a prototype of a solution to a given problem. • Compare natural systems with mechanical systems that are designed to serve similar purposes, e.g., a bird's wings as compared to an airplane's wings.

Clarity. GLEs have a minimum of technical vocabulary and no jargon.

Reviewers found that the Washington standards for grade spans 3-5, 6-8, and 9-10 contain some jargon or undefined technical vocabulary and that the K-2 standards contain a little jargon or undefined technical vocabulary. Reviewers also noted that the standards often suffer from a vagueness that undermines the clarity of the standards.



Specific Findings

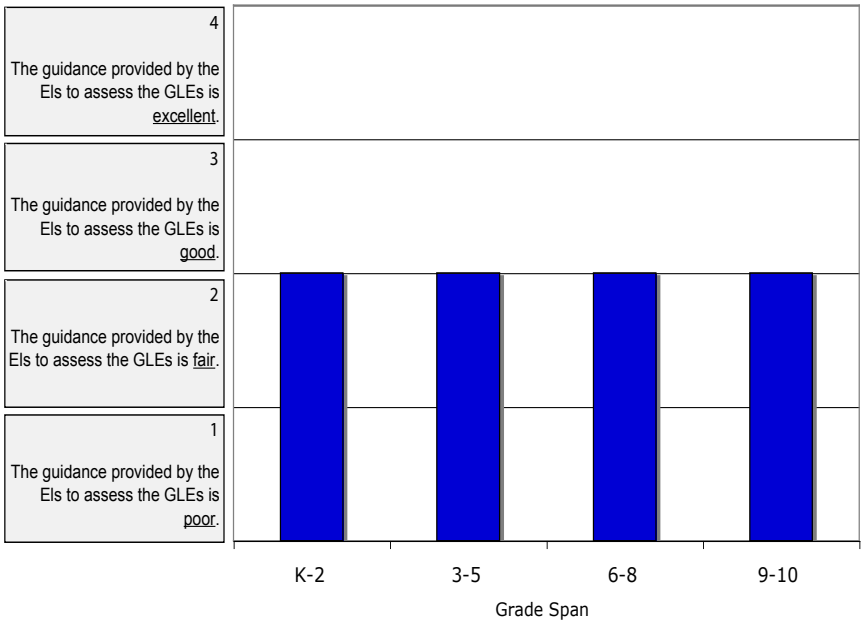
- Some of the GLEs for grade spans 6-8 and 9-10 contain excess wording.
- In some cases it is difficult to discern what students are being asked to demonstrate. For example, GLE 1.1.1 for grade span 6-8 states, "identify an unknown substance using the properties of a known substance."
- The following GLEs are especially problematic due to poor clarity that extends throughout the ELs and across grade spans: GLE 1.2.1, GLE 2.2.5, and GLE 3.1.2.
- Additional examples would help to clarify expectations, particularly in EALRs 2 and 3.

Example: WA GLEs That Demonstrate Poor Clarity

WA GLE Example	Concern About Clarity
1.3.6, 6-8 (GLE): Analyze the relationship between weather and climate and how ocean currents and global atmospheric circulation affect weather and climate.	The GLE and its supporting ELs do not define or describe "weather," "climate," or "global atmospheric circulation."
1.3.10, 3-5 (EL): Describe the role of an organism in a food chain of an ecosystem (i.e., predator, prey, consumer, producer, decomposer, scavenger).	The EL does not define "predator," "prey," "consumer," "producer," "decomposer," or "scavenger."
1.1.1, 6-8 (EL): Recognize that the mass of an object is the same when measured anywhere in the universe at any normal speed.	What is "normal" speed?
1.3.9, 9-10 (GLE): Analyze the scientific evidence used to develop the theory of biological evolution and the concepts of natural selection, speciation, adaptation, and biological diversity.	The GLE and its supporting ELs do not define or describe "natural selection," "speciation," "adaptation," or "biological diversity."

Measurability. The Evidence of Learning statements (ELs) provide guidance for the assessment of the GLEs.

Reviewers found that the guidance provided by the ELs to assess the GLEs is fair for all of the grade spans (a rating of 2), but they noted that measurability varies considerably across the GLEs. Reviewers primary attributed the low ratings for measurability to the lack of specificity and clarity with regard to the science content itself, making it difficult to ensure consistency in assessments between different assessment developers. In addition, they found that there is frequently poor alignment between the EL statements and the GLE statements.



Specific Findings

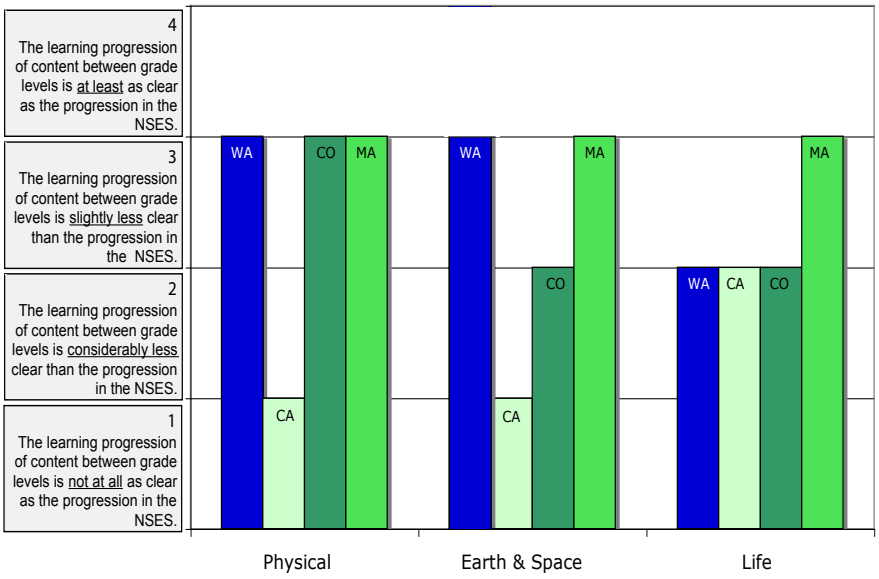
- In some cases the problem of vagueness, as discussed in the findings for clarity, impacts the ability to consistently develop appropriate assessments based on the ELs. For example, it would be challenging to develop assessments based on the information provided for GLE 3.2.4.
- As discussed for specificity, the use of verbs such as "wonder," "experience," "observe," and "investigate" in the ELs makes the assessment of the related GLE very difficult.

Example: WA ELs that Demonstrate Poor Measurability

WA GLE Example	Concern About Measurability
2.1.1, K-2 (EL): Wonder and ask questions about objects, organisms, and events based on observations of the natural world.	How does a student demonstrate "wonder?"
2.1.4, 3-5 (EL): Investigate phenomena using a simple physical or computer model or simulation.	How does an assessment specialist design an item to measure "investigate?"
3.2.4, 6-8 (EL): Explain the effects that the conservation of natural resources has on the quality of the life of ecosystems.	This EL does not provide sufficient detail about what students should know about the effects of conservation of natural resources to ensure consistency in the development of assessment items.
1.2.8, 9-10 (EL): Analyze the patterns and arrangements of Earth systems and subsystems including the core, the mantle, tectonic plates, the hydrosphere, and layers of the atmosphere. • Identify and describe sources of Earth's internal and external thermal energy.	The EL statement is not well aligned with the GLE statement.

Coherence: EALR 1. GLEs build on the knowledge and skill from the previous grade levels in a manner such that the learning progression of content from one grade level to the next level is recognizable.

Washington compares favorably to California and Colorado and is comparable to Massachusetts for coherence ratings, with reviewers finding that the learning progressions between grade levels for the Physical and Earth & Space Sciences content is only slightly less clear than in the *NSES* (a rating of 3) and that the learning progression for the Life Sciences is considerably less clear than in the *NSES* (a rating of 2). Reviewers found that the Washington document clearly demonstrates an effort to consider learning progressions in the development of content. However, they note that the progression appears to be based on the structure of knowledge in the discipline instead of what the students can understand at each grade span.



Specific Findings

- For the Physical Sciences, the conceptual development of the content is not always clear. For example, K-2 could include additional content about the structure of matter, and integrating the concepts of forces and motion would increase coherence
- For the Life Sciences, the handling of classification is redundant, without progressive development from grade-to-grade. In addition, there are gaps in the progression of content for the early grade levels (e.g. fossils are covered in the K-2 grade span without providing the context for time).

Example: WA Life Sciences Grade Span Progression for GLE 1.1.6

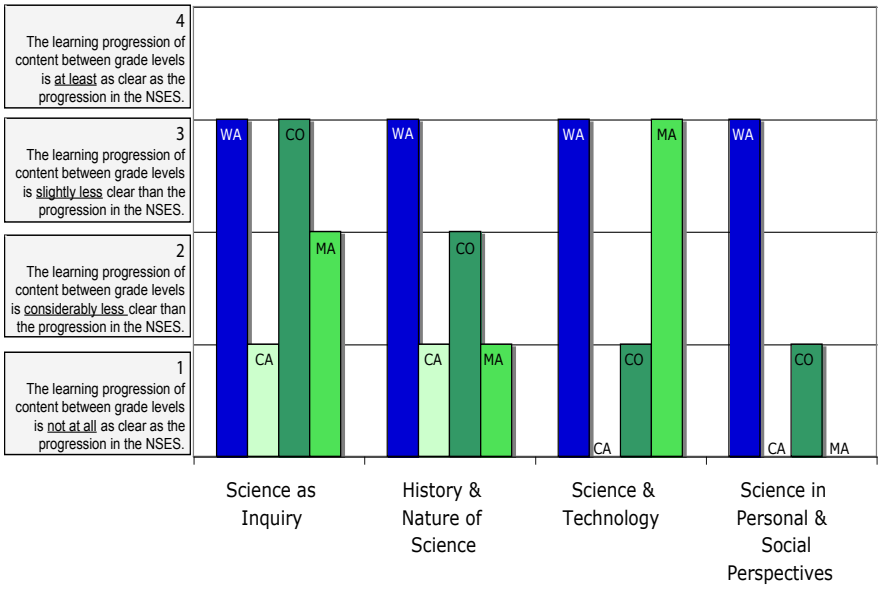
Reviewers found that although there is some progression between the K-2 and 3-5 grade spans for this GLE, the incremental gains in content knowledge are not sufficient, resulting in redundant information between grade spans.

WA GLE 1.1.6: Grade Span K-2	WA GLE 1.1.6: Grade Span 3-5
Understand characteristics of living organisms. • Identify observable characteristics of living organisms (e.g. spiders have eight legs; birds have feathers; plants have roots, stems, leaves, seeds, flowers). • Observe and describe characteristics of living organisms (e.g., spiders have eight legs; birds have feathers; plants have roots, stems, leaves, seeds, flowers).	**Understand how to distinguish living from nonliving and how to use characteristics to sort common organisms into plant and animal groups.** • Describe the characteristics of organisms. • Describe and sort organisms using multiple characteristics (e.g., anatomy such as fins for swimming or leaves for gathering light, behavior patterns such as burrowing or migration, how plants and animals get food differently). • Classify and sort common organisms into plant and animal groups.

Coherence: EALRs 2 & 3. GLEs build on the knowledge and skill from the previous grade levels in a manner such that the learning progression of content from one grade level to the next level is recognizable.

Reviewers found the learning progression for inquiry in EALR 2 to be only slightly less clear than the learning progression for the *NSES* standards (ratings of 3). With the exception of the treatment of inquiry in the Colorado standards, which also received a 3, the ratings for coherence for the Washington standards were higher than the ratings for the comparison states.

Reviewers found EALR 3 content in the Washington standards to have learning progressions that are only slightly less clear than the science and technology and science in personal and social perspectives content in *NSES* (ratings of 3).



Specific Findings

- There is redundancy in the inquiry content between grade spans, especially within the EL statements.
- In some cases there does not appear to be sufficient incremental gain between grade spans.
- Although the WA standards lack much of the *NSES* content for science in personal and social perspectives, the content that is evident is developed appropriately from grade span to grade span.
- Although a developmental sequence is implied through the use of Bloom's taxonomy, higher level thinking, should not be restricted to the highest grade levels.

Example: WA Inquiry Grade Span Progression for GLE 2.1.5

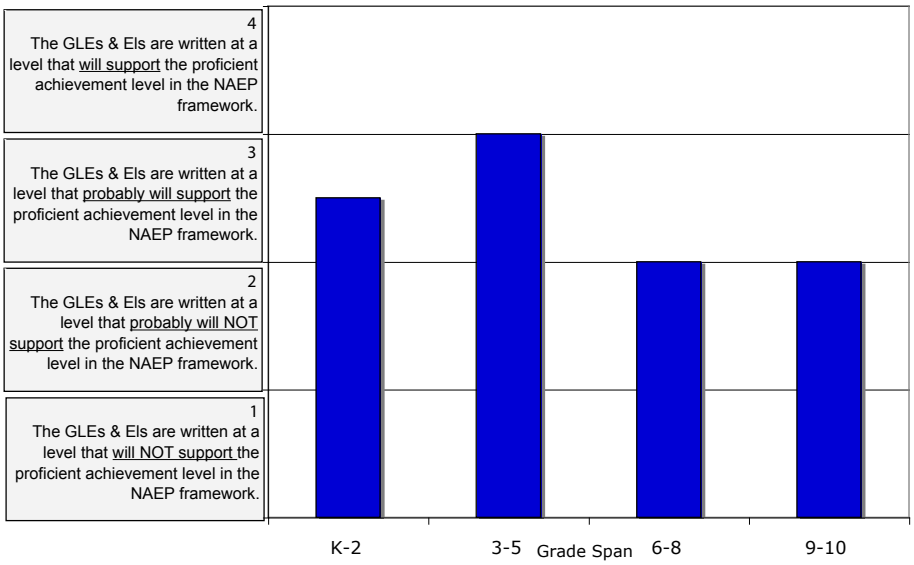
Notice that there is little incremental gain in expectations from the 3-5 grade span to the 6-8 grade span, and there is an over-reliance on Bloom's Taxonomy to imply a developmental sequence that is not supported by the detail included in the ELs. The 6-8 GLE differs from the 3-5 GLE based on the use of "Apply" in place of "Understand." However, most of the supporting ELs are the same for both grade levels.

WA GLE 2.1.5: Grade Span 3-5	WA GLE 2.1.5: Grade Span 6-8
Understand how to report investigations and explanations of objects, events, systems and processes. • Report observations or data of simple investigations without making inferences. • Summarize an investigation by describing: reasons for selecting the investigative plan; materials used in the investigation; observations, data, results; explanations and conclusions in written, mathematical, oral, and information technology presentation formats; safety procedures used.	**Apply understanding of how to report investigations and explanations of objects, events, systems and processes.** • Report observations or data of simple investigations without making inferences. • Summarize an investigation by describing: reasons for selecting the investigative plan; materials used in the investigation; observations, data, results; explanations and conclusions in written, mathematical, oral, and information technology presentation formats; ramifications of investigations; safety procedures used. • Describe the difference between an objective summary of data and an inference made from data.

Rigor. Grade Level Expectations (GLEs) and Evidences of Learning (ELs) are written at an appropriate level for the student's age and the grade level to which they are assigned.

Reviewers found that the GLEs for grand span 3-5 will probably support the proficient achievement level in the *NAEP Framework* (a rating of 3); they were unsure whether the GLEs for grade span K-2 would support the proficient achievement level (a rating of 2.5); and they found that the GLEs for grade spans 6-8 and 9-10 probably will not support the proficient achievement level. Consistent with findings related to depth and specificity, reviewers also noted that many ELs have language to support *NAEP* proficiency, but this is not reflected in the GLEs.

The *NAEP Framework* includes items categorized as *Identifying Scientific Principles* and *Using Scientific Principles*, and it requires that the majority of items be in the *Using Scientific Principles* category. Reviewers found that the level of cognitive demand required for the Washington GLEs does not support proficiency for the *Using Scientific Principles* category of items in the *NAEP Framework.*



Specific Findings

- Content that is currently included in grade span 9-10 could be more appropriately distributed across grades 9-12.
- The expectations tend to be low for the K-2 grade span. In some cases first grade appears to be absent from the progression of content. For example, the WA standards do not introduce the concepts of the strength and direction of a force until the 3-5 grade span (GLE 1.3.1), whereas the MA standards introduce these concepts in the K-2 grade span.
- In some cases the lack of specificity in the ELs leaves the degree of rigor open to the interpretation of the reader. For example, GLE 1.2.4 for grade span 3-5.
- The use of the verbs from Bloom's Taxonomy, in some cases results in lowered expectations for students.

Example: WA GLE 1.3.3 vs. NAEP Performance Expectations for States of Matter

The example displays the Washington grade span 6-8 GLE for Conservation of Matter and Energy and the corresponding *NAEP* Performance Expectations for the same content. Notice that the GLE and ELs provided in the example support a level of performance that is more consistent with *Identifying Science Principles* than with *Using Science Principles*.

WA GLE 1.3.3: 6-8	NAEP Performance Expectations for States of Matter: Grade 8*
Understand that matter is conserved during physical and chemical changes. • Observe and describe evidence of physical and chemical changes of matter (e.g., change of state, size, shape, temperature, color, gas production, solid formation, light). • Observe and describe that substances undergoing physical changes produce matter with the same chemical properties as the original substance and the same total mass (e.g., tearing paper, freezing water, breaking wood, sugar dissolving in water). • Observe and describe that substances may react chemically to form new substances with different chemical properties and the same total mass (e.g., baking soda and vinegar; light stick mass before, during, and after reaction).	**Identifying Science Principles:** Given an animation of molecules in motion, identify the substance that is being illustrated as a solid, liquid, or gas. **Using Science Principles:** Predict how the mass of a sample of iodine will change after sublimation. Justify the prediction based on what occurs during sublimation at a molecular level.

* Source. *Science Framework for the 2009 NAEP*, page 87.

Summary of Public Input on the Preliminary Recommendations

Based on the previous findings, an interim report with preliminary recommendations was posted to the SBE website and public input was solicited through an online survey and a series of six focus groups in three locations across the state of Washington. Details regarding the dates and locations of the survey and focus groups are provided in the Methodology section of this report. This section provides brief descriptions of the online survey and the focus groups, followed by summaries of the quantitative results from the online survey and major themes from the open-ended survey items and focus groups with regard to the *Recommendations to Inform Policy and Implementation Decisions* and the *Recommendations to Inform the Design and Writing of a New Washington Science Standards Document*.

Online Survey

The survey asked respondents to rate each of the 11 recommendations in the interim report on a 4-point scale from strongly disagree (1) to strongly agree (4). Respondents were also asked to provide comments on the set of *Recommendations to Inform Policy and Implementation Decisions* and on the set of *Recommendations to Inform the Design and Writing of a New Washington Science Standards Document*. Finally, respondents were asked to list their top priorities for undertaking a revision of the science standards.

The survey was completed by 616 respondents, the majority of whom identified themselves as K-12th grade teachers (64.1%), parents/guardians of K-12th grade students (23.2%), and district-level science specialists (5.7%). Other categories of respondents included K-12th grade students, school administrators, district and ESD staff, professors of science and science education, informal science educators, and school board members. Respondents identified their areas of residence as Puget Sound (37.2%), Northwest Washington (23.5%), Central Washington (16.2%), Southwest Washington (10.7%), Southeast Washington (5.8%), Northeast Washington (5.5%), and areas outside of Washington (1.0%).

Focus Groups

As described in the Methodology section, an educator and a general public focus group were held in three locations across Washington. Participants in the general public group were asked to comment on Recommendations 1 through 4 and 8 through 10 in the interim report. These recommendations are appropriate for comment from a general public audience because they address policy and implementation considerations along with priorities for what students in the state of Washington should know and be able to do by Grade 12. Participants in the educator focus group were asked to comment on all of the recommendations provided in the interim report. Because this group includes practitioners in the field of science education, their backgrounds and experiences working with science standards allowed them to provide more in-depth feedback on both sets of recommendations.

The general public focus groups included a diverse range of stakeholders with connections to the K-12 education system. Across the three groups, local employers (6), college students (7), recent high school graduates not attending college (4), high school students (5), and parents of students in grades Kindergarten through 12 (10) participated in the groups. The parents represented a mix of different levels of educational attainment. All focus group participants had completed high school; five had completed some college; two had competed a bachelors degree; and one had completed a masters degree. The local employer representatives were recruited based on their experiences hiring or managing staff and included an electrical engineer, a software development manager, an acupuncturist, a manager of an organization that provides services to students who have dropped out of school, and two human resources managers.

Across the educator focus groups representatives from nine different school districts participated, along with representatives of a number of organizations that are important stakeholders in science education in the state of Washington. For the 23 educator focus group participants with a background in K-12 formal education, their numbers of years in education ranged from 3 years to 36 years, with a median of 20 years of experience. The majority of the educator focus group participants reported that they were at least somewhat familiar with the Washington science standards and approximately two-thirds of them had reviewed the interim report before participating in the focus group.

Sample of Educator Focus Group Participant Affiliations:

- **WSTA**
- **Leadership Assistance for Science Education Reform (LASER)**
- **Seattle Pacific University, Physics**
- **University of Washington, Science Education**
- **Spokane City Lab**
- **Wenatchee Valley College, Nursing**
- **Mathematics, Engineering & Science Achievement Program (MESA)**

Quantitative Results and Major Themes from Public Input on Recommendations to Inform Policy and Implementation Decisions

As shown in Table 1, most survey respondents agreed with the recommendations to inform policy and implementation decisions. For Recommendations 2 through 4, at least 90% of respondents indicated that they "agree" or "strongly agree" with each recommendation. Recommendation 1, which proposes developing a new science standards document received the lowest levels of agreement, with 78% of respondents expressing agreement. Major themes from the open-ended survey comments and focus groups, discussed below, provide further insight into these findings.

Table 1 Recommendations to Inform Policy and Implementation Decisions

Recommendation	Strongly Disagree	Disagree	Agree	Strongly Agree	Rating Average	Valid n
1. Develop a new science standards document. (n = 510)	7.5%	14.1%	**44.9%**	33.5%	3.05	510
2. The new science standards should be a comprehensive K-12 document that sets high expectations for all students. (n = 550)	4.7%	4.4%	36.0%	**54.9%**	3.41	550
3. The science standards should create a vision for the science content, methods of science, and applications appropriate for all K-12 students in the state of Washington. (n = 553)	5.6%	3.1%	36.7%	**54.6%**	3.40	553
4. Implementation of the science standards should result in greater coherence across the full spectrum of the education system - including curriculum development, selection of instructional materials, professional development, and assessment. (n = 551)	6.2%	4.0%	33.6%	**56.3%**	3.40	551
				answered question		561
				skipped question		55

Note. 561 respondents answered this set of items. Respondents who selected "no opinion" for an item were excluded from the analysis for that item.

Although focus group participants and respondents to the online survey provided recommendations for improving the current science standards, stakeholders from both groups indicated that they believe that efforts to revise the standards should build on the existing standards and not discard the work the has already been completed. These stakeholders noted strengths of the current standards, such as their alignment with the *NSES*, their treatment of inquiry, and their comprehensiveness. Some participants in the educator focus groups also pointed out that many districts in the state of Washington have invested substantial resources in developing curricula and professional development to support the current standards, and they expressed concern that abandoning the current standards would undermine these efforts.

> ***We should not lose what is best about our current standards nor the work schools have been doing in the process of aligning coursework to state standards.*** **– Survey respondent**
>
> ***Teachers across the state are working hard to help their students to know and be able to do what is in the current set of standards. Changing just for the sake of change without a compelling reason will not serve any of us well.*** **– Survey respondent.**
>
> ***Obviously there are things that can be improved in the document but the thing that comes to mind is what about all of the work that's already been done and all of the school districts that have spent thousands of dollars for kits or for release time to actually put together their own power standards or core standards.*** **– Educator Focus Group participant**

As shown in Table 1 above, the concept of having K-12 science standards that set high expectations for all students (Recommendation 2) received strong support. Most survey respondents and focus group participants agree that the science standards should be expanded to cover grades 11 and 12. In general, most stakeholders also believe that the standards should apply to all students. Many stakeholders pointed out that it is important to remember that not all students will go to college and suggested that the standards should be written so that they are achievable by all students, whether they are college-bound or not. Some stakeholders did note that special provisions should be made for identifiable groups of students, such as English-Language Learners, students with at an economic disadvantage, students with a learning disability, and students who have been identified as gifted and talented.

> ***The standards should be realistically attainable for average, hardworking well-taught 10th grade students who may or may not be college bound.*** **– Survey respondent**
>
> ***Make them minimum standards… ones that will be beneficial in every-day adult living.*** **– Survey respondent**
>
> ***I think [we should expect students to learn the science that is going to get them into college] because a lot of my friends… they're freshmen this year at a four year university or community colleges and because the bar was set too low… they have to take… classes that don't count for college credit, but they still have to pay for it because it wasn't taught in high school.*** **– General Public Focus Group participant, recent high school graduate**

Stakeholders noted the importance of shifting the focus from revising the standards, to providing teachers with the support that they need to ensure that students are able to achieve the science standards, including appropriately aligned curricula, professional development, and effective instructional strategies. These comments and discussions highlighted the need to balance providing teachers with the tools that they need for effective instruction with the need to also provide teachers with flexibility in their classrooms. They also elicited regional differences in how the

current science standards are being used throughout the state, differences which must be attended to as the new science standards are implemented.

Make sure that all districts have access to solid curriculum, supplies, science kits… that will help teach these standards. **– Survey respondent**

The standards are not the problem. The problem is everyone is guessing at how to cover the standards. Why not spend time finding materials that accomplish the standards instead of moving the target? **– Survey respondent**

Teachers should have the flexibility and the creativity to teach in a manner that fits their unique students as long as the students are learning the content covered in the standards. **– Survey respondent**

Teachers aren't used to giving up their authority on their curriculum. **– Educator Focus Group participant**

I'm in a small district so I don't have the value of having people with specific content knowledge to help develop the curriculum. And when we're assessed on the standard, that then becomes the target and/or the curriculum. So I don't know how to delineate [the standards] from being the curriculum when it's tested. **– Educator Focus Group participant**

Quantitative Results and Major Themes from Pubic Input on Recommendations to Inform the Design and Writing of a New Washington Science Standards Document

Table 2 displays the results of the online survey for the Recommendations 5 through 11, which address the design and writing of a new Washington science standards document. The percentage of survey respondents expressing agreement with these recommendations varied from 60% for Recommendation 7 to 92% for Recommendation 5. Comments from the focus groups and open-ended survey items are consistent with this input and help to provide additional context for understanding the quantitative results.

Table 2	Recommendations to Inform the Design and Writing of a New Washington Science Standards Document					
Recommendation	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**	**Rating Average**	**Valid n**
5. Simplify the organization of the Washington science standards document. (n = 496)	2.2%	5.0%	39.3%	**53.4%**	3.44	496
6. Increase the clarity and specificity of the Washington science standards document. (n = 497)	3.4%	5.8%	35.6%	**55.1%**	3.42	497
7. Increase the rigor of the Washington science standards document. (n = 491)	6.9%	33.2%	**37.7%**	22.2%	2.75	491
8. Strengthen the standards for inquiry in the state of Washington. (n =492)	6.7%	21.5%	**43.1%**	28.7%	2.94	492
9. Improve the standards for Science and Technology. (n = 482)	4.8%	12.7%	**49.4%**	33.2%	3.11	482
10. Develop standards to address Science in Personal and Social Perspectives. (n = 468)	9.0%	20.7%	**43.2%**	27.1%	2.88	468
11. The Washington science standards should reflect the balance and depth of content found in the National Science Education Standards. (n = 503)	4.0%	4.4%	44.9%	**46.7%**	3.34	503
				answered question		**526**
				skipped question		**90**

Note. 526 respondents answered this set of items. Respondents who selected "no opinion" for an item were excluded from the analysis for that item.

As described earlier, many educators do not want to see a wholesale re-write of the document, but rather revisions that make the document more user-friendly and the standards more clearly defined. The focus group discussions and responses to the survey overwhelmingly endorsed the recommendations to reorganize and clarify the standards. This input suggests that the current standards require a considerable investment of time to develop educator competence in navigating the document. In addition, comments from the focus group members and survey respondents suggest that the standards are not written with enough clarity and specificity to ensure that educators interpret them consistently.

> ***The top priority should be making the standards clear so that teachers know what they should be teaching their students. They are so vague now and can be interpreted in so many different ways that each teacher may be teaching something different for the same standard.*** **– Survey Respondent**
>
> ***There needs to be some congruency among all of these documents – reading, writing, math, and science.*** **– Educator Focus Group Member**

Many stakeholder comments reflect concerns about creating standards that require such breadth of knowledge that depth of understanding is lost. The open-ended survey comments suggest that the higher levels of disagreement

observed with regard to Recommendation 7, which addresses increasing the rigor of the standards, is in large part due to respondents who associated increased rigor with an increase in the amount of content that is required. While a number of stakeholders noted the importance of aligning the Washington Standards to the *NSES* and of ensuring that students meet standards for Science in Personal and Social Perspectives, some respondents are concerned that these additions will add to the overall breadth of content required by the standards.

> ***Do not add to what we have. Rigor does not mean more.*** **– Survey Respondent**
>
> ***Depth of understanding should be emphasized as opposed to coverage.*** **– Survey Respondent**
>
> ***I am concerned that the Science in Personal and Social Perspectives standards will add standards to a document that we are trying to focus more sharply.*** **– Survey Respondent**
>
> ***I'm hoping that the result of the review is to reduce the total number of objectives and show teachers what to teach in depth.*** **– Educator Focus Group participant**

Although stakeholders sometimes differed in their opinions about priorities for revisions to the science standards and about which approaches to curricula and instructional strategies will best allow students to achieve the standards, fundamentally, most stakeholders highly value science education as a mechanism for ensuring that Washington has an informed citizenry and the workforce necessary to keep the state globally completive. Local employers who participated in the focus groups pointed to the important role that science education plays in developing the critical thinking skills that are needed in the workplace and educators, students, and recent graduates pointed to the importance of showing students the real-world relevance of science education to motivate them to achieve the standards.

> ***Effective citizens will realize the cause and effect relationships that exist in all parts of our world and understand that all the skills and knowledge they gain in school work together to prepare them to participate effectively as adults, parents, consumers, voters...*** **– Survey Respondent**
>
> ***We need to be competitive with the rest of the world in all areas of science education.*** **– Survey Respondent**
>
> ***I can't imagine not [teaching applications of science] when you look at the headlines and you read about Microsoft's need for engineers.*** **– Educator Focus Group participant**
>
> ***Having science skills is good if you want to do science, but science teaches you how to solve problems… how to learn better… It prepares you for courses beyond science.*** **– General Public Focus Group participant, recent high school graduate**

Final Recommendations

The following recommendations are intended to guide the state of Washington in their efforts to develop and implement new science standards. Although the recommendations are based on a disciplined review of the current science standards, they provide a vision for a new set of science standards for the state of Washington. While the current science standards for the state of Washington rated relatively well when compared to the benchmark states and nations in this review, Washington faces the critical challenge of moving from a "good" set of science standards to an "excellent" set of science standards for the future.

The following recommendations are intended to guide the state of Washington in their efforts to develop and implement new science standards. The first section, *Recommendations to Inform Policy and Implementation Decisions* contains four broad recommendations and the second section, *Recommendations to Inform the Design and Writing of a New Science Standards Document*, contains seven more specific recommendations.

Recommendations to Inform Policy and Implementation Decisions

Science standards are central to a coherent science education system. Ultimately, though, it is the curriculum and teaching that matter most when improving science learning across the system. Science standards must effectively inform curriculum development, selection of instructional materials, professional development, and assessment. To this end, the policy decisions governing the use of science standards are fundamental to ensuring that they best serve the education system as a whole. The following four recommendations inform policy decisions with regard to science standards for the state of Washington.

I **Based on our review and analysis of the current science standards for the state of Washington, we recommend the development of a new science standards document.**

- Washington should assemble a Science Standards Revision Team to incorporate the changes detailed in this report.
- The new science standards document should build on the strengths of the current science standards document.
- The Science Standards Revision Team should include teachers, content specialists, a curriculum specialist, an assessment specialist, a university science educator, scientists from each of the three major disciplines, a professional with experience developing standards at the state or national level, a math educator who worked on the development of the math standards, and a professional editor.

At the conclusion of the review process, we recommend that the state of Washington convene a Science Standards Revision Team to develop a new set of science standards that reflects the recommendations provided in this report. The new set of science standards should build on the strengths of the current science standards by reorganizing

existing content to make the document more user-friendly, by improving the specificity and clarity with which existing standards are described, by ensuring that existing and new content is assigned to appropriate grade levels based on current research on learning progressions, by strengthening existing standards for inquiry and science and technology, by eliminating areas of redundancy, and by focusing on the fundamental concepts and abilities presented in the *NSES*.

We recommend that this interdisciplinary team include at least two teachers at each grade span; a scientist who has extensive experience working with K-12 teachers in each of the three disciplines; at least one science curriculum specialist from a school district; at least one science assessment specialist; at least one university science educator; at least one person from any of the above categories who has developed standards at the state or national levels; a math educator who has worked on the development of the Washington math standards; and a professional editor. As they develop the new Washington science standards, this team should review the recently released Washington State K-12 Mathematics Standards to create important linkages between the two documents.

2 The new science standards should be a comprehensive K-12 document that sets high expectations for all students.

- The document should be expanded to include grades 11 and 12.
- The document should describe the knowledge, skills, and abilities that all students need to be prepared for post-secondary education.

Our recommendation to extend the Washington science standards to include grades 11 and 12 is firmly rooted in the vision that Washington is already, and will be in the future, a global leader in science and technology. *Washington Learns* was created by the 2005 Washington legislature and tasked with conducting a review of the state's entire education system. The *Washington Learns* committees reviewed the Washington education system with the goal of determining how to provide high-quality lifelong learning in the 21st century. The *2006 Washington Learns* report highlights the need for Washington to educate it's citizens to achieve higher levels of educational attainment if the state is to meet its workforce demands and remain competitive in a challenging global economy. To this end, the report provides ten 10-year goals for a world-class education in the state of Washington. Goal number 7 from this report states:

> *All students will complete a rigorous high school course of study and demonstrate the abilities needed to enter a post-secondary education program or career path.* – Washington Learns (2006)

The report further emphasizes the importance of ensuring that the education system support math and science education to maintain it's competitive advantage:

> *In specific industries where Washington has a competitive advantage – global health, aerospace, advanced manufacturing and technology, and other research-intensive industries – the demands on our education system are even greater… Washington has a constitutional duty to provide a basic education for all children from kindergarten through twelfth grade.* – Washington Learns (2006)

If Washington is to maintain its position as a global leader in science-based industries, the state must make a clear and strong commitment to science standards that reflect what all students must know and be able to do by the completion of 12th grade so they will be prepared for a post-secondary education.

Hereafter, this report will reference K-12 standards for the state of Washington. In particular, Recommendation 7, which addresses the rigor of the science standards, provides a detailed discussion of the implications of extending the science standards to grades 11 and 12.

3 The science standards should create a vision for the science content, methods of science, and applications appropriate for all K-12 students in the state of Washington.

- The new science standards should be clear on their purpose, audience, and voice.
- The document's purpose should reflect the values of the stakeholders in the state of Washington.

The front matter to the Washington GLEs provides an introduction to the standards as "a vision for all students" and notes guiding principles for teaching science in the state of Washington. Although this narrative is useful for setting expectations for what instruction should look like in the state of Washington, the document lacks a clear statement of expectations for how the science standards should be used in Washington.

If the science standards are to provide a vision of the content, methods, and applications for all students in the state of Washington, then the document itself must clearly articulate both its purpose and audience in order to achieve this vision. To this end, the front matter should include a discussion of how the new science standards are intended to be used in the state of Washington. We recommend that this statement clarify the role of science standards as:

1) defining the understanding and abilities of science that all students, without regard to background, future aspirations, or prior interest in science should develop;
2) providing a foundation for the development of materials, programs, and activities that support student achievement; and
3) guiding the development and use of assessments that are appropriately aligned with expectations for student achievement.

In describing this role of the standards in the state of Washington, pains must be taken to address prevalent misconceptions about the purpose of the standards. Discussions with the Washington Science Advisory Panel revealed that many teachers are provided with copies of the Washington Science GLEs and instructed to use the standards as their curriculum. Although the standards should inform curricular decisions and the selection of instructional materials, the standards themselves are not intended to provide a curriculum.

The *NSES* make the position on content standards and the school science curriculum clear. As shown in Figure 2, science content standards are not intended to serve as a science curriculum. Science standards specify what students should know and be able to do in science. The content described in science standards can be organized into many different curricula, which often integrate topics from different subject matter areas and content standards.

Figure 2	NSES Definitions
Science Content Standards	Includes specific capacities, understandings, and abilities in science. The content standards are not curriculum.
Science Curriculum The way content is delivered.	Includes the structure, organization, balance, and presentation of the content in the classroom.

Source. *National Science Education Standards* (1996), pg 22.

In describing how the standards are to be used in the state of Washington, the purpose should reflect the values of the state's educational stakeholders. Members of the Expert Review Panel, members of the Washington Science Advisory Panel, and participants in the pubic input process articulated a number of values that they believe should inform the vision for the Washington science standards:

The standards should:

- empower educators to work towards improving science education.
- support the use of well-designed curricula.
- set high expectations for students.
- allow teachers the flexibility to use a variety of instructional strategies.

The standards should <u>not</u>:

- preclude educators from making local decisions about the instructional strategies that will help their students to achieve the standards.
- be used to limit educational opportunities and course offerings for students who can achieve higher expectations in science.

Ultimately, the state of Washington must determine what values the document will reflect. What is essential is that these values be positive, challenging, and achievable. The values should be explicitly stated in the standards document itself and effectively communicated to all stakeholders in the education system. It is only through the development of this shared vision of education in the state of Washington that the science education system can begin to develop coherence among curriculum, instruction, assessments, teacher education, and professional development within the system.

The purpose of the science standards document must also address the intended audience for the science standards document. Although the science standards must serve educators working throughout the education system, a single document cannot meet all the needs of these diverse audiences. Instead, we recommend that the document be crafted for the primary audiences of curriculum and assessment specialists. We will elaborate on the appropriate use of the document by these and other audiences in Recommendation 4.

4 Implementation of the science standards should result in greater coherence across the full spectrum of the education system - including curriculum development, selection of instructional materials, professional development, and assessment.

- The standards must not be presented as the curriculum.
- Supporting documents are necessary to ensure reliable alignment between science standards, development and selection of instructional materials, professional development, classroom instruction, and assessment.
- Supporting documents should provide guidance on development and selection of standards-based instructional materials, professional development, instructional strategies, and assessment that support student achievement of the science standards and the measurement of that achievement.

This recommendation addresses what Washington State should do now to assure that the standards constructively influence the education system. Although no individual or organization can guarantee success, Washington State can establish a process that will increase the probability of fulfilling the promise of state standards.

We recommend that the state of Washington implement the *Strategic Framework for Standards-Based Reform* developed by the project on *National Science Education Standards* and described in *Improving Student Learning in Mathmatics and Science: The Role of National Standards in State Policy* (National Research Council, 1997). Such a framework helps leaders anticipate problems so they can realize the potential of standards to improve science education. Figure 3 summarizes that framework.

Figure 3	**A Strategic Framework for Standards-based Reform**	
Dissemination	Goal: Developing Awareness	"Getting the word out"
Interpretation	Goal: Increasing Understanding and Support	"Getting the idea"
Implementation	Goal: Changing Policies, Programs, and Practices	"Getting the job done"
Evaluation	Goal: Monitoring and Adjusting Policies, Programs, and Practice	"Getting it right"
Revision	Goal: Improving the Efficacy and Influence of Standards	"Doing it all again"

Actions by many individuals and organizations are needed if meaningful and lasting changes are to occur in science education. And, the larger the system the more coordinated the effort needs to be. The framework provided in this section is intended as an organizing tool for those responsible for standards-based reforms in education.

Similar to many models for change and improvement, the *Strategic Framework for Standards-Based Reform* (see Figure 3) has several different dimensions, each with particular goals. In the framework, the developer of the standards plays a role, as do other participants in the education system. State organizations, such as the Washington Science Teachers Association, play a major part in initial dissemination of the standards, but they do not implement the standards. The framework helps organize thinking about what strategies are needed and clarifies where responsibility and authority lie for making changes in the various components of the education system.

Although the framework is designed as a means of thinking about state standards, it is equally appropriate as a means of thinking about decisions at local levels.

Dissemination involves developing a general awareness of the existence of the standards document among those responsible for policy making, programs, and teaching, and providing support and encouragement for the changes that will be required.

Dissemination includes addressing the questions, "What are the science standards?" "Why are they needed?" and "How could they be used to shape policies, programs, and practice?" Although the current Washington science standards have been widely disseminated, what has been lacking during this process is clarity with regard to the message about what the standards can do (and cannot do), and why they are worth supporting. Being clear in the dissemination phase will help neutralize some criticisms and build support for the changes implied by the standards. As a final note on dissemination, leaders will need support from both the educational community and the general public.

Interpretation is about increasing understanding of and support for standards.

Interpretation involves careful analysis, dialogue, and the difficult educational task of challenging current conceptions and establishing a knowledge base that helps the community respond to critics. Deeper and richer understanding of standards is the goal.

Implementation involves changing policies, programs, and practices to be consistent with standards.

People modify the district and school science curriculum, revise criteria for the selection of instructional materials, change teacher credentialing and recertification, and develop new assessments. Enacting new policies, programs, and practices builds understandings that can feed back into interpretation.

In the evaluation dimension, information gathered about impact can contribute directly to improvement.

Monitoring of and feedback to various parts of the system results in modification and adjustment of policies, programs, and practices.

At some point, as a planned element of the process, revision of standards occurs, incorporating the new knowledge developed through implementation and evaluation and drawing heavily on input and discussion generated in the field by the original documents.

There exists some logical sequence to the dimensions. For example, people need to become aware of standards before they deepen their understanding through interpretation activities. Likewise, implementation without understanding can lead to change that is mechanical, superficial, and, in the extreme, can imperil reform with the dismissal that "it doesn't work." Effective implementation requires interpretation and understanding. Revision without adequate evaluation will not reflect what is learned from the original effort. Note, however, that while the framework may seem linear, its dimensions are intertwined. For example, because practice informs understanding, implementation can lead to a new or deeper interpretation of the standards or elements of them. Evaluation and reflection pervade all other dimensions.

The different dimensions of the framework are played out with different audiences, as shown in Figure 4. These audiences are organized into four categories that reflect each audience's primary role in the system: policy, program, practice, and political and public support.

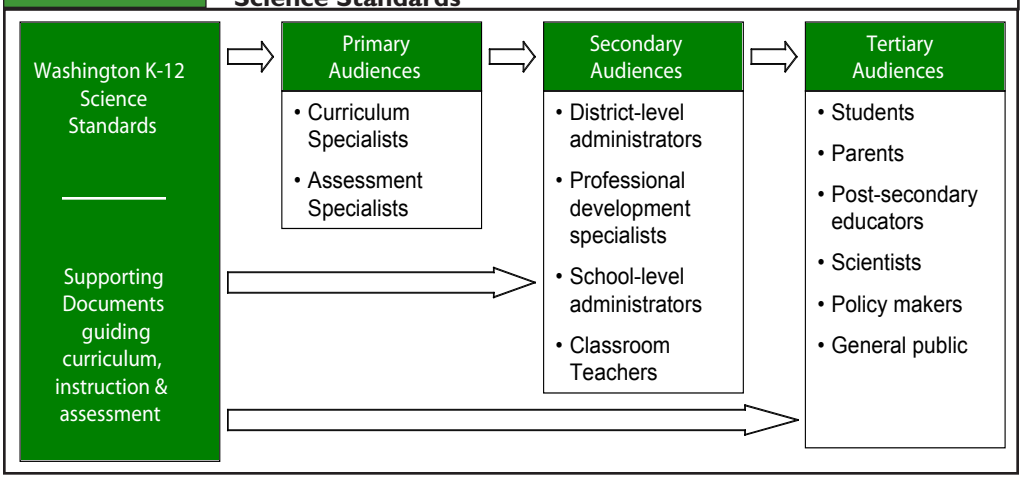
Figure 4	Participants in Standards-Based Education
Policy	Governors and State Legislators State Education Departments State and Local School Boards School Districts School Personnel
Programs	Colleges and Universities Publishers Curriculum and Assessment Developers School Districts Business and Industry Informal Educators Professional Organizations
Practices	Teachers Students
Political Support	Scientists and Engineers Business and Industry Federal, State, and Local Governments Parents General Public Teacher Unions

Although the developers of standards will likely have major responsibility for dissemination, they can be assisted by state agencies, special coalitions, or cadres of leaders. Responsibility and authority for implementation do not necessarily lie with the organizations that developed standards. The organizations or agencies can provide support and expertise, as well as help in networking various implementers, but they are not always positioned to change policies and practices directly. State supervisors, curriculum developers, teacher educators, and classroom teachers assume major responsibility for implementation.

As discussed in Recommendation 3, we recommend that the state of Washington recognize all of the diverse groups outlined above as important audiences of the sciences standards but also acknowledge that a single document cannot meet the varied needs of these groups. To ensure that implementation of the standards is coordinated across the components of the education system, Washington must establish the science standards as a central set of tenets that guide curriculum development, instructional practices, professional development, and assessment for science education; but the State must also provide appropriate avenues by which the professionals within these components of the education system can appropriately interface with the science standards. In some cases this may require the assistance of curriculum or assessment specialists who are the primary audiences of the science standards, and in other cases it may require supporting documents, developed by these primary audiences, that are supplements to the science standards.

To support this effort, we propose the implementation model shown in Figure 5.

Figure 5 **Implementation Model for the Washington K-12 Science Standards**



As shown in the model above, we envision the Washington science standards as central to guiding efforts across the education system, and we recognize primary, secondary, and tertiary audiences for the science standards. Although we refer to specific professionals in discussing these audiences (e.g. curriculum specialists), we acknowledge that other professionals may perform the functions typically associated with these specialists. For example, teachers often serve as curriculum developers. When acting in the role of a curriculum or assessment specialist, an individual is considered to be a member of the primary audience, regardless of his or her profession. Each audience interfaces with the Washington science standards in a unique manner:

1. The **primary audience** of the science standards includes curriculum and assessment specialists. The standards must serve the needs of both of these audiences equally well. Although the document itself does not serve as a curriculum or as test specifications, it should facilitate the development or selection of curricula by curriculum specialists and the development of test specifications by assessment specialists.

   Curriculum specialists should develop or select curricula that are based on the standards for use by classroom teachers. In addition, curriculum specialists should provide guidance on instructional strategies that integrate concepts and enable students to meet more than one standard in a unit or series of lessons. For example, inquiry standards and content standards can often be included in the same series of lessons. This is an instructional strategy that not only reduces the amount of instructional time necessary to cover the standards, but also reflects best practices within the field.

   Assessment specialists should develop assessment specifications or select assessment items that are also based on the standards. The Science WASL Specifications serve as a core supplemental document that assessment specialists use both in their work to develop test items and to communicate assessment strategies to teachers and educational administrators.

2. The **secondary audience** of the science standards includes other professionals working within the science education system such as educational administrators at the school and district levels, professional development specialists, and teachers. Although these audiences must be familiar with the science standards, they should rely on the work of curriculum and assessment specialists to facilitate interpretation of the standards for their needs.

3. The **tertiary audience** of the science standards includes the stakeholders in the education system and the general public, such as parents, scientists, and post-secondary educators. These audiences must be able to reference the science standards as documentation of what the students in the state of Washington are expected to know and be able to do, but they require guidance from the primary and secondary audiences to ensure that they understand the purpose of the document and how it informs curricular and assessment decisions.

Establishing a set of comprehensive science standards is central to ensuring coherence across the science education system in the state of Washington. However, the development of the science standards document alone cannot ensure this coherence. The education system must support the use of the science standards to ensure that educators across the system are applying the best practices within curriculum development, professional development, assessment, and classroom teaching so that students across the state of Washington achieve these standards.

Recommendations to Inform the Design and Writing of a New Washington Science Standards Document

OSPI is tasked with revising the science standards for the state of Washington, based on the recommendations of the SBE. The next set of seven recommendations are directed at the Science Standards Revision Team that OPSI will assemble. These recommendations are based on the findings from the Expert Panel's review and informed by the input of the Washington Science Advisory Panel. Where appropriate, we have provided examples to illustrate both strengths and weaknesses of the current set of standards and to provide examples from other states and nations that serve as useful references for the revision process.

5 Simplify the organization of the Washington science standards document.

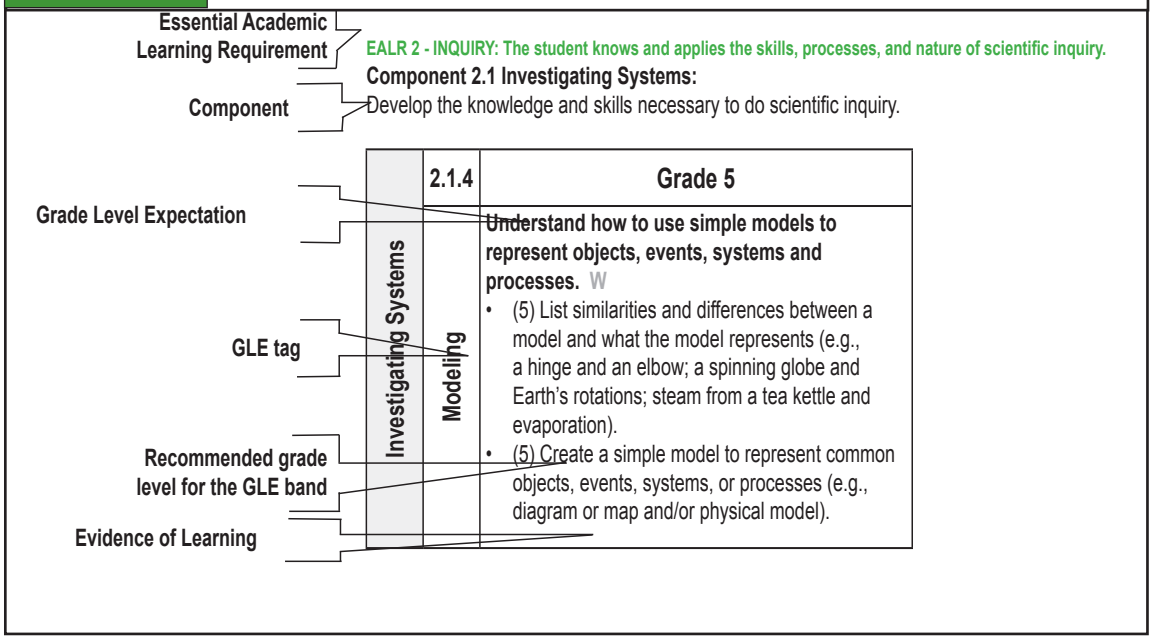
- Reduce the number of organizing elements to improve user navigation of the document.
- Organize the discipline content, currently provided in EALR 1, by life sciences, earth and space sciences, and physical sciences.
- Include the same clear delineation of science content, methods of science, and applications that is provided in the current document.
- Continue to provide standards for grade spans rather than for grade levels, including expanding the high school span to integrate grades 11 and 12.

When compared to Finland, Singapore, and Massachusetts, Washington received a low rating for Accessibility/ Navigability (2 out of a possible 4). Although reviewers found that the format of the document supports coherence across grades spans, they noted that the presentation is overly complex, making it difficult for the reader to understand and locate needed information.

Figure 6 below displays the current organizing structure of the Washington science standards. The standards are

organized into a complex hierarchy that includes an EALR, a Component, a GLE, a GLE tag, and a bulleted list of Evidence of Learning statements. For EALR 1, the Component statement organizes the EALR into GLEs that are related to properties and characteristics, structures, and changes. Standards for Physical Systems, Earth and Space Systems, and Living Systems are provided for each of these three components, thus producing a document in which the discipline content occurs in multiple places within the EALR. For example, life sciences content is included under Component 1.1: Properties, then separated by three pages of earth and space and physical sciences content before being presented again under Component 1.2: Structures.

Figure 6 **Structure of the Washington Grade Level Expectations**



Adapted from Science K-10 Grade Level Expectations: A New Level of Specificity, page 9.

Expert Panelists found that the Component feature in the current Washington document imposes an artificial structure that does not support the overall organization of the document. The component statements force the reader to read through too many layers to achieve an adequate depth of understanding of the standards, and result in an organization of content that is of little value to most users.

In contrast to the current Washington standards, both the Massachusetts and the Finland standards, which received the highest rating from reviewers, along with the *NSES*, are clearly organized by discipline content. Although the Singapore document rated higher than the Washington document, it was the lowest among the three. Like the ambitious approach that the Washington document takes by organizing the document by systems, the Singapore document uses a series of themes (diversity, cycles, systems, interactions, and energy) as the central organizer for the document. While these novel approaches are laudable because they provide a framework that encourages the integration of content across disciplines, the trade-off is a document that is challenging to navigate and contrary to the needs of most users.

In spite of the poor navigability of the current document, we find that there are helpful organizational and formatting elements in the current document that should be retained in the new Washington science standards document. For example, we favor the clear delineation of the science content, methods of science, and applications that is provided by the three EALRs over alternative presentations, by documents such as the Massachusetts standards,

which present standards for inquiry within the context of the science disciplinary content. The clear delineation of these standards ensures that the standards for inquiry do not become "buried" within the individual discipline content standards. We also find that the presentation of the standards by grade span and content area in the current document facilitates an understanding of the learning progression of the content.

As shown in the figure below, the current grade span groups reflect those used in the national *Benchmarks*. Although there continues to be debate in the field over whether science standards are most appropriately presented by grade level or by grade span, our reviewers found that the grade span configuration provided in the current document appropriately balances the need to allow for flexibility with the need to articulate the learning progression in the achievement benchmarks. We therefore recommend that the new science standards document continue to organize standards by the grade spans used in the current document.

Figure 7 **Grade Span Organization of State and National Science Standards Documents**

Standards	Grade Span Groups
Washington (2005)	K-2, 3-5, 6-8, 9-10
National Science Education Standards	K-4, 5-8, 9-12
Benchmarks for Science Literacy	K-2, 3-5, 6-8, 9-12
California	K,1,2,3,4,5,6,7,8, 9-12
Colorado	K-4, 5-8, 9-12
Massachusetts	PreK-2, 3-5, 6-8, High School

6 Increase the clarity and specificity of the Washington science standards document.

- The science standards should not depend on scientific vocabulary alone to convey the meaning of an outcome statement of what students should understand or be able to do. Scientific vocabulary within the content statements is acceptable if the term is explained as part of the standard.
- The science standards should provide a more complete, detailed, and specific description of the content to be learned, with special attention to the Life Science content. Minimize the use of external references for defining the science content that is to be learned.
- The verbs used in the standards should specifically delineate what students are to understand/know or be able to do.
- The science standards should use content statements to detail the science content that is to be learned. Model the format of these statements after statements provided in reference documents such as the 2009 National Assessment of Educational Progress and the National Science Education Standards.

The current Washington science standards for the physical sciences, the earth and space sciences, inquiry, the nature of science, and science and technology rated well for specificity, with reviewers finding that they provide a description that is only slightly less detailed than the reference concepts in the *NSES*. The life sciences were found

to be considerably less detailed and specific than the reference concepts. However, reviewers found it important to note that all of the content areas would have received significantly lower ratings had they not considered the ELs in their review. In addition, they found that a lack of specificity sometimes leads to a vagueness that compromises the clarity of the current Washington science standards.

In the current document, the GLE statements considered by themselves are generally of a very large grain size with little detail or specificity. It is necessary to read to the EL statements to obtain sufficient specificity to provide direction for assessment or to guide curriculum development. Unlike Washington, Massachusetts and the *NSES* provide a more detailed description of the content within the statement of the standard itself. The figure below provides examples of Washington GLEs and corresponding Massachusetts statements for similar content. Notice that the Massachusetts standards provide significantly more detail than the broad GLE statements. For example, in the last example (GLE 1.3.8) the reader is expected to fill in how organisms obtain matter and energy. The specific details are missing.

Figure 8 **Comparison of Washington and Massachusetts Statements of Science Content**

Washington	Massachusetts
GLE 1.3.3, K-2: Know that water can exist in different states: solid and liquid.	**Physical Sciences, Grades PreK-2, #2:** Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container.
GLE 1.2.5, 3-5: Know how the Sun, Moon, and stars appear from Earth.	**Earth & Space Science, Grade 3-5, #13:** Recognize that the earth is part of a system called the "solar system" that includes the sun (a star), planets, and many moons. The earth is the third planet from the sun in our solar system.
GLE 1.3.8, 6-8: Understand how individual organisms, including cells, obtain matter and energy for life processes.	**Life Science, Grades 6-8, #16**: Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.

Although the level of specificity was rated on par with the Massachusetts standards by using the ELs to add more details, once the Washington ELs were considered, reviewers noted several problems with using the EL statements as the primary source for providing needed detail.

1) ELs are not intended to be comprehensive. The *K-10 Grade Level Expectations: A New Level of Specificity* describe the ELs as:

> *A bulleted list of student demonstrations that provide educators with common illustrations of the learning. Because the bulleted list is not exhaustive, educators are encouraged to seek additional evidence of student learning from the* National Science Education Standards (NSES) *and the* American Association for the Advancement of Science (AAAS) Benchmarks*. These statements serve as the basis for the development of the WASL in science.*

   Members of the Washington Science Advisory Panel also noted that the new Washington science standards should be more complete and comprehensive so that the reader is not reliant on external sources, and, in cases where external sources are referenced, specific citations should be provided to facilitate locating applicable material.

2) The selection of verbs in the ELs diminishes the specificity of the content being articulated. Verbs such as "analyze" and "explain" present the reader with an unspecified and unmeasureable outcome, thus reducing the specificity. The verbs "describe" and "identify," which are frequently used in the ELs, usually are not followed by a specified outcome, rendering the statement vague and low in specificity.

   For example, in GLE 1.1.3 for grade span 9-10, shown below, it is clear that the student should be able to provide a comparison of different wave types. However, the EL does not specify what the properties are, or what specifically students should know about them.

Figure 9	Washington GLE 1.1.3 (9-10)
Analyze sound waves, water waves, and light waves using wave properties, including frequency and energy. Understand wave interference. ▪ **EL:** Compare the properties of light waves, sound waves, and water waves.	

3) The ELs are not always appropriately aligned with the GLEs. As shown in Figure 10, in some cases it is difficult to judge the level of alignment because the GLE is not written with sufficient specificity. In other cases, the EL simply does not represent a concept or level of cognitive demand that is consistent with the one articulated in the GLE.

Figure 10 Examples of Alignment Concerns for Washington GLEs and ELs

Washington GLE & EL	Alignment Concern
GLE 1.2.5 (6-8) Understand the structure of the Solar System. ▪ **EL:** Describe the Sun (i.e., a medium-size star, the largest body in our solar system, major source of energy for phenomena on Earth's surface).	The GLE implies that students' descriptions of the sun should be in relation to the structure of the solar system. However, the parenthetical example indicates that they must be able to describe the role of the sun as "the major source of energy for phenomena on Earth's surface."
GLE 1.2.4 (3-5) Understand that the Earth's system includes a mostly solid interior, landforms, bodies of water, and an atmosphere. ▪ **EL:** Describe how one part of the Earth's system depends on or connects to another part of Earth's system (e.g., Puget Sound water affects the air over Seattle).	While the GLE indicates that students should know what the components of the Earth's system are, the EL implies an understanding of how the parts of the system relate to one another.

Based on these findings, we recommend that the new Washington science standards include more comprehensive content statements that detail the science content that students are expected to learn. Content statements express scientific principles and concepts and, unlike the EL statements, they are inclusive of the science content that students are expected to learn. For example, a content statement from the *NAEP Framework* for the Grade 8 content related to GLE 1.2.5 shown in the table above is:

In contrast to earlier theory that Earth is the center of the universe, it is now known that the sun, an average star, is the central and largest body in the solar system. Earth is the third planet from the sun in a system that includes seven other planets and their moons, as well as smaller objects, such as asteroids and comets. – Science Framework for the 2009 NAEP, page 54.

Notice that this content statement provides detail about the science content that is to be learned that is lacking from both the GLE and the ELs in the current Washington document. Both the *NAEP Framework* and the *NSES* provide good examples of content statements.

The weakness in the current standards is that they lack sufficient specificity with regard to the science content to guide the development and selection of curricula. We believe that the inclusion of content statements will greatly enhance the usability of the Washington science standards by both curriculum and assessment specialists and ultimately support the development of a more coherent science education system in the state of Washington.

7 Increase the rigor of the Washington science standards document.

- Some concepts currently introduced in grades 3-5 should be introduced earlier.
- Increase the levels of cognitive demand of the standards at all grade spans.
- With the addition of grades 11 and 12, the learning progression across grade spans for each standard should be revisited and content redistributed, with special attention to grade spans 6-8 and 9-12.
- Use the most current research on learning progressions within disciplines to establish what students should know and be able to do at each grade span.

Reviewers found that the current standards for grade span 3-5 will probably support the proficient achievement level in the *NAEP Framework*; they were unsure whether the GLEs for grade span K-2 would support the proficient achievement level; and they found that the GLEs for grade spans 6-8 and 9-10 probably will not support the proficient achievement level.

In the current document, reviewers found that the application of the verbs in Bloom's Taxonomy, with a progression in the verbs from the taxonomy across grade spans, results in confusion and in some cases lowered expectations. Although Bloom's Taxonomy provides a useful framework for cognitive demand, the application of increasing levels of cognitive demand at increasing grade spans is inappropriate. Students at lower grade spans are are capable of some, if not many of the higher levels of cognitive demand in the Taxonomy. As a result of the application of Bloom's Taxonomy in the current standards, the levels of cognitive demand required for the Washington GLEs do not support proficiency for the Using Scientific Principles category of items in the *NAEP Framework*. We recommend that the new Washington science standards adopt a framework for cognitive demand that increases the levels of cognitive demand of the standards at all grade levels.

The question of rigor will be particularly important as the Science Standards Revision Team undertakes the development of a set of K-12 science standards. We recommend that the development the new K-12 document not be undertaken as merely an effort to add-on content for two additional grade levels. Instead, it should be used as an opportunity to set new expectations for what students should accomplish by grade 12 and to review what is currently understood about learning progressions within disciplinary areas to strengthen the rigor and the progression of

content in the Washington science standards so that it provides a foundation for expectations at grade 12.

Washington's Higher Education Coordinating Board has developed a *Preliminary set of Science College Readiness Definitions* that are intended to "articulate the relationship between Washington's K-10 learning standards and the knowledge and skills students need to develop throughout high school, particularly during the last two years of high school." The Expert Review Panel reviewed these definitions with an eye for how they might inform the development of science standards that extend through grade 12 in the state of Washington. The Panel concluded that the definitions cannot be easily adapted for use as science standards.

The Science Framework for the 2009 NAEP *divides science content expectations into Identifying Science Principles and Using Science Principles. The Identifying Science Principles category "focuses on students' ability to recognize, recall, define, relate, and represent basic science principles specified in the Physical Science, Life Science and Earth and Space Science content statements, while the Using Science Principles category "draws on 'schematic knowledge,' or 'knowing why' in addition to 'declarative knowledge.'" The* NAEP *is designed to include more Using Science Principles items than Identifying Science Principles items.*

However, the document does provide a broad reference for the Science Standards Revision Team, particularly with regard to developing rigorous standards for students in grades 9 through 12. For example, College Readiness Definition A indicates that "students will demonstrate facility in the core science concepts at cognitive demand levels beyond those described in the Washington State Science EALR 1. The emphasis will move from primarily knowing and understanding towards synthesizing, evaluating and transferring knowledge and skills across disciplines to solve problems and generate explanations." Clearly, the *College Readiness Definitions* document reinforces the assertion that the Washington science standards must set higher expectations for the levels of cognitive demand with which students approach science content if students are to be prepared for post-secondary education by the completion of grade 12.

Reviewers of the current science standards noted that although the document is clearly attentive to progression between grade spans, this progression often appears to be based on "what kids could do next," rather than based on current research about learning progressions within each discipline. We recommend that the Revision Team reference the most current research on learning progressions to ensure that the Washington K-12 science standards are consistent with best practices.

All three of the comparison states, the *NSES*, and the *Benchmarks* use a "high school" or single 9-12 grade span configuration of science standards. Members of the Washington Science Advisory Panel voiced a preference for standards that clearly identify what students are expected to know and be able to do by grade 10 because the WASL is administered at this grade level. They also raised questions about the implication of a set of 9-12 science standards that may appear inconsistent with Washington's current requirements for two years of high school science.

The recent National Research Council publication Taking Science To Schools *(2007), provides a useful starting place for incorporating the latest research on learning progressions. The publication clearly articulates the need for standards that are "deeply informed by research on children's learning such that the sequences are grounded also in what we know about the ideas children bring to the classroom that can form the foundation for developing understanding of scientific ideas."*

We recommend that the state of Washington develop standards that reflect what students are expected to know and be able to do by grade 12, and then establish graduation requirements and assessment strategies to align

with these standards. Fundamentally, the standards should provide direction to the education system rather than being constrained by the artifacts of the current system. With this in mind, we recommend a single grade span for grades 9-12 that clearly articulates what students should know and be able to by the time they complete their K-12 education. This approach provides flexibility to districts, schools, and teachers to determine what strategies and courses of study will help their students to achieve these standards.

8 Strengthen the standards for inquiry in the state of Washington.

- Devote more attention to the "abilities" of inquiry in addition to the "understandings" of inquiry. Students at all grade levels should be expected to demonstrate the abilities of inquiry.
- Incorporate linkages to the Washington State K-12 Mathematics Standards.
- Provide guidance to clarify the purpose of the inquiry standards as defining learning outcomes for students rather than outlining instructional strategies.

Reviewers found that compared to other states, Washington has a better than average inclusion of inquiry in the science standards. As a result, some members of the Washington Science Advisory Panel questioned the necessity of including a recommendation related to the inquiry standards. We elected to include this recommendation because, as other Advisory Panel members noted, if students in the state of Washington are to be appropriately prepared to be members of the 21st century workforce, then it is essential they graduate with critical thinking skills that allow them to conceptualize, apply, analyze, synthesize, and evaluate information based on their observations and experiences. We therefore recommend that Washington strengthen the standards for inquiry to create standards that serve as a model for those in other states.

The *NSES* emphasize that students at all grade levels should "develop the ability to think and act in ways associated with inquiry," rather than merely understanding the nature of scientific inquiry. As discussed in the Content findings for EALR 2, the current Washington inquiry standards overemphasize the "understandings" of inquiry and give too little attention to the "abilities" of inquiry. Few of the grade span 6-8 or 9-10 GLEs for inquiry address the abilities of inquiry, and none of the K-2 or 3-5 GLEs do so.

The inquiry standards provide an opportunity to develop linkages to the Washington math standards. The Science Standards Revision Team should review the recently released Washington State K-12 Mathematics Standards with particular attention to the core content area of *Summary and Analysis of Data Sets*. Where appropriate, the Revision Team should incorporate references to the mathematics standards into the inquiry standards to ensure coherence between the science and math standards. The *Massachusetts Technology/Engineering* standards provide a useful model for including these references.

As described in the *NSES*, it is reasonable to expect all students, even those at the early grade levels, to demonstrate the abilities of inquiry. Limiting the expectations for early grade levels to those of "understanding" undermines the development of appropriate expectations for students. This weakness in the inquiry standards relates to the problematic application of Bloom's Taxonomy described in Recommendation 7. We recommend that in developing the new science standards, the Revision Team be particularly attentive to including the abilities of inquiry.

In addition to re-crafting the inquiry standards themselves, we recommend that the Revision Team develop a clear orientation that the inquiry standards serve as learning outcomes for students and not as instructional strategies for teachers. The inquiry standards define expectations for what students should know and be able to do. They do not document best practices for how teachers help students to achieve these expectations. In fact, current best practices for instruction in inquiry promote the integration of inquiry techniques with conceptual content.

Participants in both the Washington Science Advisory Panel and the Expert Review Panel reported that many teachers approach the Washington standards as an outline of what they are to teach for the year. As a result, they cover the EALR 1 content for the Physical, Earth and Space, and Life Sciences first, and sometimes "run out of time" for the inquiry content that is presented in EALR 2. We recommend that the Washington science standards and supporting documents provide explicit guidance to 1) clarify the nature of the inquiry standards as learning outcomes and 2) promote instructional strategies that integrate disciplinary content and inquiry in the classroom to help students attain these learning outcomes.

The Washington science standards should provide guidance to ensure that the use of inquiry standards as learning outcomes for students does not perpetuate the problem of poor instructional practices related to the teaching of inquiry:

> *Many textbooks and curriculum documents still have separate sections on scientific inquiry, science processes, or "the scientific method." Many classroom teachers follow the lead of these resources, teaching skills and inquiry techniques separately from the conceptual content of their courses.* – Taking Science to Schools (2007, page 216).

9 Improve the standards for Science and Technology.

- In addition to the "understandings" of technological design, increase focus on the "abilities" of technological design.
- Provide relevant, "real-world" examples to illustrate the concepts that are articulated in the standards.

The current science and technology standards for the state of Washington reviewed well, receiving ratings of 3's for the criteria of content, specificity, coherence, and depth, and in all cases meeting or exceeding the ratings of the comparison states. Like the standards for inquiry, student achievement of the standards for science and technology is fundamental to efforts to develop a 21st century workforce for the state of Washington. We therefore recommend that the Science Standards Revision Team devote attention to improving these already strong standards.

Like the current inquiry standards, the current science and technology standards provide too little attention to the "abilities" of technological design. The current GLEs for science and technology focus almost exclusively on the understanding of science and technology in the K-2 and 3-5 grade spans.

Reviewers found that examples are essential for illustrating the concepts in the science and technology standards. Without the inclusion of "real-world" examples, the learning outcomes that are articulated in the standards are often unclear to the reader. For example, GLE 3.1.3, shown below with two ELs, provides very little context for understanding the types of problems that students are expected to explore. As a result, the reader does not have a clear understanding of the learning outcome. We recommend that the Science Standards Revision Team reference the examples provided in the *NSES* and the *Massachusetts Technology/Engineering Standards* to provide "real world" examples of the science and technology standards to facilitate an understanding of the intended learning outcome.

> *The science and technology standards establish connections between the natural and designed worlds and provide students with opportunities to develop decision-making abilities. They are not standards for technology education; rather, these standards emphasize abilities associated with the process of design and fundamental understandings about the enterprise of science and its various linkages with technology.* – NSES, page 106.

Figure 11 **Washington GLE 3.1.3 (6-8)**

Analyze multiple solutions to a problem or challenge.

- Describe the criteria to evaluate an acceptable solution to the problem or challenge.
- Describe the reason(s) for the effectiveness of a solution to a problem or challenge using scientific concepts and principles.

10 Develop standards to address Science in Personal and Social Perspectives.

- Include the Science in Personal and Social Perspectives content found in the NSES.

The *NSES* standards for science in personal and social perspectives outline learning outcomes for students with regard to personal and community health; population characteristics; natural hazards and resources; environmental change and quality; natural and human-induced hazards; and science and technology challenges. These standards set expectations that students understand science and its connection to contemporary social issues. A sample of the fundamental concepts underlying these standard for the 9-12 grade span are provided below.

Figure 12	**Sample of Concepts Underlying the *NSES* 9-12 Grade Span Standard for Science in Personal and Social Perspectives**
Population Growth	Populations grow or decline through the combined effects of births and deaths, and through emigration and immigration. Populations can increase through linear or exponential growth, with effects on resource use and environmental pollution.
Natural Resources	The earth does not have infinite resources; increasing human consumption places severe stress on the natural processes that renew some resources, and it depletes those resources that cannot be renewed.
Environmental Quality	Natural ecosystems provide an array of basic processes that affect humans. Those processes include maintenance of the quality of the atmosphere, generation of soils, control of the hydrologic cycle, disposal of wastes, and recycling of nutrients. Humans are changing many of these basic processes, and the changes may be detrimental to humans.

Like the comparison states, the current Washington science standards provide very little content related to science in personal and social perspectives. Some members of the Washington Science Advisory Panel questioned whether it is necessary to include this content in the Washington science standards because it is not present in the standards that were selected as benchmarks for the state of Washington. We contend that the science in personal and social perspectives content, like the inquiry and science and technology content, is fundamental to Washington's effort to prepare a 21st century workforce. We therefore recommend that the Science Standards Revision Team develop science standards for the science in personal and social perspectives content outlined in the *NSES*.

Although we recognize that the addition of the science in personal and social perspectives content adds to the volume of expectations required of students in the state of Washington, we believe that we would be remiss in not recommending the addition of this material. In consideration of the concerns expressed by the Washington Science Advisory Panel that the current standards already include too much information to be covered during the school year, in Recommendation 11 we provide suggestions for developing an overall set of science standards that can be reasonably accomplished during the course of a school year.

11 The Washington science standards should reflect the balance and depth of content found in the National Science Education Standards.

- Focus on fundamental concepts and abilities presented in the NSES.
- With the development of the new K-12 document, ensure that the Washington Standards contain all of the content from the NSES, with particular attention to Life Sciences.
- Eliminate areas of redundancy found in the current Washington science standards.

We recommend that the new Washington science standards focus on covering those concepts included in the *NSES*. The *NSES*, along with the *AAAS Benchmarks* informed the development of the current Washington science standards. The *NSES*, along with the *Benchmarks*, remain the primary science standards reference in the field because they were subjected to extensive internal and external reviews during development, and they are still considered to reflect the nation's best thinking on what students should know and be able to do in science. Indeed, the *NSES* are cited in the *NAEP Framework* as a primary reference for the development of the framework.

As the Science Standards Revision Team undertakes the development of the new K-12 science standards document, the team should ensure that the science standards reflect the content of the *NSES*. In some cases this development will entail redistributing existing content from grade levels prior to 11 and 12, particularly for the 9-10 grade span, and in other cases it will be necessary to add additional content from the *NSES*. In the current standards, the cell receives limited treatment (GLE 1.2.6) as compared to the description provided in the *NSES*. The *High School Biology Standards for Massachusetts* for example, provide a more comprehensive coverage of the cell that more closely follows the *NSES*.

The Expert Review Panel, the Washington Science Advisory Panel, and participants in the public input process expressed the concern that the science standards should not suffer from being "a mile wide and an inch deep." Panelists in both groups cautioned against sacrificing depth of content by adding to the breadth of the science standards to be covered. We recommend that the Science Standards Revision Team work to create a new science standards document that presents standards that can be reasonably accomplished during the K-12 progression by being attentive to the following during the revision process:

1) **Focus on the fundamental concepts and abilities presented in the *NSES*.** For example, the current science standards devote considerably more attention to Human Biology and fossil evidence than do the *NSES*, so these are areas that could receive less attention in the new science standards.

2) **Eliminate areas of redundancy.** For example, the life sciences content was found to contain redundancies between grade spans in the standards related to classification (GLE 1.1.6). Retention of fundamental content from one grade-level to the next should be assumed and therefore, it is not necessary to repeat content between grade-levels.

3) **Use introductory material and appendices of the science standards to point educators to supporting documents that highlight best practices in curriculum development and instructional strategies, specifically those that provide guidance for integrating multiple concepts into a unit or series of lessons.** As an example, inquiry standards and content standards can often be included in the same series of lessons. In a similar way, content and abilities of technological design can be met in the same unit. These strategies not only represent best practices in the field but also reduce the amount of instructional time necessary to cover the standards.

Conclusion

The recommendations presented in this report are based on the analysis and findings of an Expert Review Panel, public input from a preliminary set of recommendations, input from the Washington Science Advisory Panel, and the collective experience of the DHA project team developing and implementing national and state-level science standards. The recommendations provide a foundation for the development of a set of science standards that set high expectations for all students in Kindergarten through 12th grade in the state of Washington. They also provide guidance for the policies and practices that must be in place to ensure the science standards support a coherent science education system. The state of Washington will be well served by SBE and OSPI undertaking this effort to develop a new set of science standards and guidelines for implementation of those standards. This effort today will help provide Washington with the educated citizenry necessary to meet the workforce needs of tomorrow, positioning the state to realize its full potential as a global leader in science and technology, as well as the diverse economies dependent on science and technology to thrive.

Appendices

Appendix A: Reports for Reference

An important first step in the process of reviewing the Washington Science Standards is to review the established national and international reports that inform current thinking on the format, content, and appropriate use of science standards. This section provides a description of two landmark publications of science standards: *Benchmarks for Science Literacy* (American Association for the Advancement of Science, 1993) and the *National Science Education Standards* (National Research Council, 1996). It also describes the most recent frameworks available for three assessment systems that are currently used to measure student achievement in science: *National Assessment of Educational Progress (NAEP), Trends in International Mathematics and Science Study (TIMSS)*, and *Programme for International Student Assessment (PISA)*. Finally, descriptions of the two Washington state science documents that will serve as the basis of the review are provided: *K-10 Grade Level Expectations: A New Level of Specificity* (2005) and *Preliminary Science College Readiness Definitions* (2007).

National Science Education Standards and Benchmarks for Science Literacy

National Science Education Standards

The *National Science Education Standards* (*NSES)* were developed by the National Resource Council under the guidance and review of the National Academies of Science and published in 1996. As stated in the *NSES*:

> The National Science Education Standards present a vision of a scientifically literate populace. They outline what students need to know, understand, and be able to do to be scientifically literate at different grade levels… The standards apply to all students regardless of age, gender, cultural or ethnic background, disabilities, aspirations, or interest and motivation in science. They describe the science content that students should learn.

The content of *NSES* is unique among standards in that it contains more than content standards. The content standards are arranged by grade level spans (K-4, 5-8, 9-12). With the exception of Unifying Concepts and Processes, all eight content standards are included at each grade level span. The document contains the following standards:

- Standards for science teaching
- Standards for professional development
- Standards for assessment in science education
- Standards for science content
  - Unifying Concepts and Processes K-12
  - Science as Inquiry
  - Physical Science

    - Life Science
    - Earth and Space Science
    - Science and Technology
    - Science in Personal and Social Perspectives
    - History and Nature of Science
- Standards for science education programs
- Standards for science education systems

Each of the nine science content standards is organized into three to five "categories" or broad conceptual topics. As an example the Physical Science Standards for grade span 5-8 contain three categories, "properties and changes in properties of matter, motions and forces, and transfer of energy." The standards are followed by a few pages of narrative that discuss the progression of learning through the grade levels and what is known about research on how students learn the content. A variety of classroom vignettes illustrating what the learning of the standards looks like in schools are inserted at various places in the document.

Within these standards a number of "evidences of understanding" are listed. These evidences of understanding are what are often considered the standards by the casual reader. These statements of understanding or abilities represent fairly large "grain size" amount of content and are often three or four sentences long at the upper grade spans making it possible to indicate the substance of what is to be learned and how extensive or elaborate the learning is to be. The stem of each standard reads; "As a result of their activities in grades (K-4, 5-8, or 9-12), all students should develop an understanding of …" The evidences of understanding are written as statements of major scientific ideas or concepts. The abilities of inquiry standards and the abilities of technological design standards are preceded with the stem "As a result of their activities in grades (K-4, 5-8, or 9-12), all students should develop abilities necessary to do…"

The standards were drafted by a working group of 18 volunteers made up of approximately equal numbers of classroom teachers, scientists, and university and K-12 science educators. The drafts were reviewed and edited by a small staff before being reviewed by the National Committee on Science Education Standards and Assessment, a large oversight group consisting of members of the National Academy of Sciences, and experts from a number of educational disciplines. After a thorough review of initial drafts the final document was reviewed using the National Research Council's rigorous Report Review Process.

Insights from the *NSES* include the manner in which inquiry and technology are handled and the use of the verb "understand." Both the abilities of inquiry and the understanding of inquiry are included in the content standards. In a similar fashion, the Science and Technology Standards include both the abilities of technological design and the understanding of science and technology. The use of the verb "understand" in the *NSES* and "know" in the *Benchmarks for Science Literacy*, discussed below, are considered to have the same level of depth and rigor.

Benchmarks for Science Literacy

The *Benchmarks for Science Literacy (BMfSL)* were developed by Project 2061 at the American Association for the Advancement of Science and published in 1993. The content in the *Benchmarks* was derived from an early report, *Science for All Americans (SFAA)*. The Introduction to the *Benchmarks* states that:

> *SFAA* answers the question of what constitutes adult science literacy, recommending what all students should know and be able to do in science, mathematics, and technology by the time they graduate from high school. *Benchmarks* specifies how students should progress toward science literacy, recommending what they should know and be able to

> do by the time they reach certain grade levels. Together the two publications can help guide the reform in science, mathematics, and technology education.

Benchmarks is divided into 12 chapters. Each chapter contains the benchmarks for all four grade level spans (K-2, 3-5, 6-8, 9-12):

- The Nature of Science
- The Nature of Mathematics
- The Nature of Technology
- The Physical Setting
- The Living Environment
- The Human Organism
- Human Society
- The Designed World
- The Mathematical World
- Historical Perspectives
- Common Themes
- Habits of Mind

Each chapter opens with a short quote from *SFAA* and a few overall comments about the ideas to be learned and, in very general terms the kinds of student experiences that would foster learning. The chapters are divided into a small number (usually 4 to 6) of sections containing the benchmarks by grade level span. Each section has an introduction with comments on common difficulties in learning the ideas, on pacing over grade levels, and on clarification of the ideas in the benchmarks. Each grade span also has a few comments to clarify what "knowing" entails and suggestions of what students' experiences might include and what difficulties students might have. These comments are followed by the grade span benchmarks.

According to *Benchmark*s (page XII):

> In 1989, six school districts teams were formed in different parts of the nation to rethink the K-12 curriculum and outline alternative ways of achieving the literacy goals of *SFAA*. Each team, backed by consultants from and Project 2061 staff, was made up of 25 teachers and administrators and cut across grade levels and subjects. Working together over four summers and three academic years, the teams developed a common set of benchmarks. Drafts of *Benchmarks* were critiqued in detail by hundreds of elementary-, middle-, and high-school teachers, as well as by administrators, scientists, mathematicians, engineers, historians, and experts on learning curriculum design.

Important insights from this document include the manner in which learning is specified for each grade span. The "grain size" of *Benchmarks* is comparable to that in *NSES* each one containing enough information to indicate the substance of what is to be learned and how extensive or elaborate the learning is to be. The authors note that "*Benchmark* statements, whenever possible, are cast in language that approximates the intended level of sophistication." According to the authors of *Benchmarks,* "know" implies that students can explain ideas in their own words, relate ideas to other benchmarks, and apply the ideas in novel contexts.

Assessment Frameworks

Unlike the *Benchmarks* and the *NSES*, which provide standards that can be used to support the development of curricula and assessment tools, the following documents provide guidance on the science content to be assessed, the types of assessment questions, and the administration of the assessment for three systems for assessing student achievement in science: *NAEP*, *PISA*, and *TIMSS.*

National Assessment of Educational Progress (NAEP) Science—2009-2019

The National Assessment of Educational Progress measures student science achievement nationally, state-by-state, and most recently across selected urban school districts. Periodically, the framework underlying the science assessment is revised or updated. The *Science Framework for the 2009 NAEP* (hereafter referred to as *Framework*) contains recommendations for the *NAEP Science Assessment* to be administered in 2009 and beyond. The *Framework* provides guidance on the science content to be assessed, the types of assessment questions, and the administration of the assessment.

Any *NAEP* framework must be guided by *NAEP* purposes as well as the policies and procedures of the National Assessment Governing Board (NAGB), which oversees *NAEP*. For the *NAEP Science Assessment*, the main purpose of the *Framework* is to establish what students should know and be able to do in science for the 2009 and future assessments. Meeting this purpose requires a framework built on what communities involved in science and science education consider as a rigorous body of science knowledge and skills that are most important for *NAEP* to assess.

In prioritizing the content, the *Framework* developers used two national documents, *National Science Education Standards* (NRC, 1996) and *Benchmarks for Scientific Literacy* (AAAS, 1993), as representative of the leading science communities and their expectations for what students should know and be able to do in science. As curriculum frameworks, however, these documents cover a very wide range of science content and performance. The inclusive nature of both these documents demonstrates the difficulty of identifying a key body of knowledge for students to learn in science and, therefore, what should be assessed. Neither document limits or prioritizes content as is necessary for developing an assessment, posing a considerable challenge to the *Framework* developers and those using the *Standards* and *Benchmarks* for curriculum reform. The development of the *Framework* also was informed by research in science and science education, best practices, international assessment frameworks, and state standards.

Development of the *NAEP 2009* was directed by a number of criteria. We include summaries of several criteria as they should inform decisions about the development of Washington science education standards and subsequent use of those standards for curriculum, instruction, assessment, and teacher education and professional development.

- **The NAEP 2009 Framework is informed by the National Standards and Benchmarks.** The *Framework* reflects the nation's best thinking about the importance and age-appropriateness of science principles and thus is informed by two national documents that were subject to extensive internal and external reviews during their development.
- **The NAEP 2009 Framework reflects the nature and practice of science.** The *National Standards* and *Benchmarks* include standards addressing science as inquiry, nature of science, history of science, and the human-made world. The *Framework* emphasizes the importance of these aspects of science education and should include the expectation that students will understand the nature and practice of science.
- **The NAEP 2009 Framework uses assessment content, formats, and accommodations consistent with the objectives being assessed.** The best available research guides assessment item design and delivery. The *Framework* is inclusive of student diversity as reflected in gender, geographic location, language proficiency, race/ethnicity, socio-economic status, and disability.
- **The NAEP 2009 Framework uses a variety of assessment formats.** These include well-constructed selected response and open-ended responses as well as performance tasks. In addition, multiple methods of assessment delivery should be considered, including the appropriate uses of computer technology.

- **Each achievement level—Basic, Proficient, and Advanced—includes a range of items assessing various levels of cognitive knowledge that is broad enough to ensure each knowledge level is measured with the same degree of accuracy.** Descriptions of Basic, Proficient, and Advanced are clear.

The design of the *NAEP 2009 Science Assessment* is guided by the *Framework's* descriptions of the science content and practices to be assessed. Figure 2 illustrates how content and practices are combined ("crossed") to generate performance expectations. The columns contain the science content (defined by content statements in three broad areas), and the rows contain the four science practices. A double dashed line distinguishes Identifying Science Principles and Using Science Principles from Using Scientific Inquiry and Using Technological Design. The former two practices can be generally considered as "knowing science," and the latter two practices can be considered as the application of that knowledge to "doing science" and "using science to solve real-world problems."

Figure 2. Crossing Content and Practices to Generate Performance Expectations

		SCIENCE CONTENT		
		Physical Science content statements	**Life Science** content statements	**Earth and Space Science** content statements
SCIENCE PRACTICES	**Identifying Science Principles**	*Performance Expectations*	*Performance Expectations*	*Performance Expectations*
	Using Science Principles	*Performance Expectations*	*Performance Expectations*	*Performance Expectations*
	Using Scientific Inquiry	*Performance Expectations*	*Performance Expectations*	*Performance Expectations*
	Using Technological Design	*Performance Expectations*	*Performance Expectations*	*Performance Expectations*

The content statements are organized according to the three broad content areas that generally comprise the K-12 school science curriculum:

- Physical Science
- Life Science
- Earth and Space Science

The content statements are derived from *National Standards* and *Benchmarks*, as well as informed by international frameworks and state standards. The selection of science content statements to be assessed at each grade level focuses on principles central to each discipline, tracks related ideas across grade levels, and limits the breadth of science knowledge to be assessed.

The following science practices were found in the major sources used to develop the *Framework*. The practices to be assessed at grades 4, 8, and 12 are organized into four categories:

- Identifying Science Principles
- Using Science Principles
- Using Scientific Inquiry
- Using Technological Design

Selection and vetting of content was based on the thorough review of both the *National Standards* and *Benchmarks*. In addition, the document was reviewed by the committees responsible for development of the framework.

Insights gained from this review include:

- Basing science content and processes on the *National Standards, Benchmarks, TIMSS,* and *PISA;*
- Incorporating technological design;
- Structuring the document based on learning progressions; and
- Using clear and unambiguous statements of content (i.e., they are not behavioral statements).

The Program for International Student Assessment (PISA) Science 2006

PISA measures 15-year-olds' capabilities in reading literacy, mathematics literacy, and science literacy every three years. *PISA* was first implemented in 2000, and the most recent results are for the 2003 assessment.

Each three-year cycle assesses one subject in depth. The other two subjects also are assessed, but not in the same breadth and depth as the primary domain. In 2003, mathematics was the primary subject assessed, and in 2006 science was the primary domain. Results from *PISA Science 2006* were released in December 2007. *PISA* also measures cross-curricular competencies. In 2003, for example, *PISA* assessed problem solving. Finally, each assessment includes questionnaires for students, school personnel, and parents.

PISA is sponsored by the Paris-based Organisation for Economic Cooperation and Development (OECD), an intergovernmental organization of 30+ industrialized nations. In 2003, 41 countries participated in *PISA*, including 30 OECD countries and 11 non-OECD countries. Data from 39 countries—29 OECD countries and 10 non-OECD countries—were used for the final analysis.

PISA uses the term *literacy* within each subject area to indicate a focus on the application of knowledge and abilities. Literacy refers to a continuum of knowledge and abilities; it is not a typological classification of a condition that one individual has or does not have. For the 2003 assessment, *scientific literacy* was defined as having the "capacity to use scientific knowledge, to identify questions, and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity" (OECD 2003, p. 286). (Note: This definition was further clarified and elaborated for *PISA Science 2006* [OECD 2006].) "Domains or curricular areas that might be applicable are not isolated within the single domain of mathematics, science, or reading" (OECD 2003, p. 156).

Compared to the curricular orientation of *TIMSS* (discussed in the next section), *PISA* provides a unique and complementary perspective by focusing on the application of knowledge in reading, mathematics, and science for problems and issues in real-life contexts. *PISA's* goal is to answer the question: Considering schooling and other factors, what knowledge and skills do students have at age 15? The achievement scores from *PISA* represent a "yield" of learning at age 15, rather than a measure of the attained curriculum at grades 4 or 8, as is the case with *TIMSS*. The framework for assessment is based on content, processes, and life situations. For example, in 2003 the content for mathematical literacy consisted of major mathematical ideas such as space and shape, change and relationships, quantity, and uncertainty. The processes describe what strategies students use to solve problems, and the situations consist of personal contexts in which students might encounter mathematical problems.

In *PISA*, a situation may be presented and several questions asked about it. Although some items are answered by selected response, the majority of items require a constructed response. The typical *PISA* item makes more complex cognitive demands on the student than the typical item from *TIMSS* or the *National Assessment of Educational Progress* (NAEP) (Neidorf et al., 2004).

Trends in International Mathematics and Science Study (TIMSS) Science 2003

TIMSS 2003 is the third comparison of mathematics and science achievement completed since 1995. *TIMSS* combines science and mathematics in one assessment and assesses student learning at different grades; in 2003, *TIMSS* evaluated grades 4 and 8.

Since 1995, *TIMSS* has been coordinated by the International Association for the Evaluation of Educational Achievement (IEA), an international organization of national research institutions and governmental research agencies. *TIMSS* is funded by the U.S. Department of Education, the National Science Foundation, the World Bank, the United Nations Development Project, and participating countries. IEA is located in Boston, Massachusetts. In 2003, a total of 49 countries participated in *TIMSS* at the fourth-grade level, the eighth-grade level, or both levels.

While *PISA* uses a contextual applications orientation, *TIMSS* provides a complementary perspective by linking assessments to the curricula of cooperating countries. Thus, *TIMSS* provides an indication of the degree to which students have learned concepts in the mathematics and science they have had the opportunity to learn in school programs. *TIMSS* answers the question: Based on school curricula, what knowledge and skills have students attained by grade 4? By grade 8? The achievement scores from *TIMSS* represent the “learned” curriculum at different grade levels, specifically grades 4 and 8. The following figure summarizes essential information about *PISA* and *TIMSS*.

Table 1. Comparing the 2003 PISA and 2003 TIMSS.

	PISA: Programme for International Student Assessment	TIMSS: Trends in International Mathematics and Science Study
Organization sponsor	Organisation for Economic Co-operation and Development (OECD)	International Association for the Evaluation of Educational Achievement (IEA)
Location	Paris, France	Boston, Massachusettes, USA
Countries	41 participating countries in 2003	25 countries participated in grade 4 46 countries participated in grade 8
Content	Reading, mathematics, science	Mathematics and science
Emphasis	Knowledge and abilities as applied to real-world issues	Knowledge and abilities as attained based on countries' curriculum
Age or grade	15-year-olds (mostly grade 10)	Grade 4 (9-year-olds) and grade 8 (13-year-olds)
Assessment cycle	Every three years, with one content area emphasized in each assessment. 2003 emphasis: mathematics; 2006 emphasis: science	Every four years with variation of grades

Perhaps the most educationally significant insight to be gained from the two international assessments emerges from the difference between *TIMSS* and *PISA*. *TIMSS* is grounded in the curriculum and provides feedback for how students are attaining what is intended and enacted vis-à-vis a country's curriculum. While not ignoring school curriculum, *PISA* asks how students can apply their knowledge in real-world situations. Lower U.S. scores on *PISA* suggest that students do not do as well as the majority of economic competitors when they have to demonstrate basic skills in contextual situations.

The evidence from international assessments indicates that U.S. students achieve reasonably well on curriculum-based assessments. But U.S. students do not do very well on context-based assessments, especially on content and basic skills associated with economic productivity. *PISA* provides a beneficial perspective, one that complements that of *NAEP* and *TIMSS*.

Washington State Science Standards Documents

Although this review will reference a number of documents related to the Washington state science standards, the team will utilize the documents *Science K-10 Grade Level Expectations: A New Level of Specificity* (2005) and *Preliminary Science College Readiness Definitions* (2007) as the basis of their review. Descriptions of each of these documents are provided below:

Science K-10 Grade Level Expectations: A New Level of Specificity

The Washington Science Standards, also referred to as the Essential Academic Learning Requirements (*EALRs*), were developed in 1997 and a set of Grade Level Expectations (GLEs) added in 2005. The Science EALRs were developed as a result of Washington's Basic Education Act of 1993 which spelled out the goal: "Provide students with the opportunity to become responsible citizens, to contribute to their own economic well-being and to that of their families and communities, and to enjoy productive and satisfying lives."

The K-10 EALR statements are based on the three overriding themes of Inquiry, Systems, and Application. Under each of these three statements are a small number of K-10 components. The GLEs and their respective Evidences of Learning are placed under the components by grade level spans (K-2, 3-5, 6-8, 9-10). The three EALRs are:

EALR 1: SYSTEMS	EALR 2: INQUIRY	EALR 3: APPLICATION
The student knows and applies concepts and principles to understand properties, structures, and changes in physical, earth/ space, and living systems.	The student knows and applies the skills, processes, and nature of scientific inquiry.	The student knows and applies science concepts and skills.

The GLEs are written as short sentences beginning with a verb intended to identify Bloom's level of cognitive demand using the general progression of "know," "understand," and "analyze." A few of the K-3 GLE's are written with active verbs such as "observe" indicating the form of instruction involved. Many of the GLE's refer to a concept or idea but do not specify or elaborate on what is to be learned. The following is an example of a GLE of this nature. "Describe how a population of organisms responds to a change in its environment." (1.3.10)

The 2005 document, *K-10 Grade Level Expectations: A New Level of Specificity* indicates that "GLEs were developed from the 1997 EALRs through a process involving science educators, school administrators, university scientists, and representatives of prominent businesses from across Washington State. The Science Curriculum Instructional Framework (SCIF) team used material from the *Benchmarks for Science Literacy*, *Atlas of Science Literacy,* and the *National Science Education Standards* to clarify and give specificity to the EALRs by adding Grade Level Expectations and Evidences of Learning."

Preliminary Science College Readiness Definitions

College Readiness is a key educational strategy included in Section 8, Helping Students Make the Transition to College, of the state's *2004 Strategic Master Plan for Higher Education*. In 2006 under the auspices of the Higher Education Coordinating Board (HCEB) the science content development team began work on the *Science College Readiness Definitions*. A small team of six to seven high school and university personnel developed the definitions and attributes that were then reviewed by a group of 80 teachers and faculty.

The College Readiness Definitions and Attributes are designed to define what is needed for students to be able to successfully complete entry-level college coursework, without remediation, in two- and four-year colleges and universities. The college attributes reflect *how to learn*, while the college readiness definitions reflect *what to learn*. Student attributes include: demonstrate intellectual engagement; take responsibility for own learning; persevere through the learning process; pay attention to detail; demonstrate ethical behavior; communicate effectively; effectively read, parse and organize information presented questions/problems in order to formulate solutions.

The college readiness definitions include the follow six content areas and foundational skills: Big Ideas in Science (Physical Science, Life Science, and Earth and Space Science), Scientific Inquiry and the Nature of Science, Science and Society, Quantitative Analysis, Technology, and Communication.

The big ideas of science list the broad areas of science and do not define any specific ideas or concepts. The readiness document comments on this in the following way:

> The field of science is so broad that it does not allow for an exhaustive list of all that can or should be covered or considered important in the various science disciplines. Thus, Definition A emphasizes a student's proficiency with core science concepts—"big ideas" in science—at cognitive levels beyond those described in Washington State's grade 10 science EALR 1. Emphasis on learning moves from primarily knowing and understanding towards synthesizing and evaluating big ideas into a coherent and useful picture of the natural world, including physical, life and earth/space sciences.

The document consists largely of attributes and broad academic skills and does not attempt to assume the qualities of a standards document leading to an assessment. As the document states:

> Finally, in proposing English and science college readiness, the development teams emphasized that the intent is not to add another assessment layer or requirement to the K-12 system. While development of measures to determine whether individual students are "college ready" is viewed as valuable for both teacher and learner, additional statewide testing is considered unnecessary and, perhaps, counterproductive at this time.

Appendix B: Selected States and Nations for Benchmarking

The project team used independent comparison studies and published reviews of state and international standards to inform the selection of states and nations to serve as appropriate benchmarks for the review of the Washington science standards. This includes comparison studies of state standards reviews (such as reports prepared by Education Week, the Thomas B. Fordham Institute and the American Federation of Teachers) and findings from national and international assessments (such as *NAEP*, *TIMSS* and *PISA*). In addition to these reports, states' performance on the 2002 State New Economy Index was used to provide additional context for selecting appropriate benchmarks. *Washington Learns*, described in more detail below, identified states that performed well on this index as important benchmarks for the state of Washington in the new economy.

Based on the team's review of these documents, the following states and nations were selected as benchmarks for the review of the Washington Science Standards:

- California
- Colorado
- Massachusetts
- Finland
- Singapore

Below are summaries of the documents that were reviewed to inform the selection of these states and nations, followed by a presentation of key results from these documents for the top-ten performing states on the *2002 New Economy Index* and comparison results for nations that were considered as potential benchmarks.

Washington Learns (2006)

Washington Learns was created by the 2005 Washington legislature and tasked with conducting a review of the state's entire education system. The *Washington Learns* committees reviewed the Washington education system with the goal of determining how to provide high-quality lifelong learning in the 21st century. The reviewers proposed using the Global Challenge States as benchmarks against which to measure themselves. The Global Challenge States are the top eight performers on the 2002 New Economy Index (Progressive Policy Institute, 2002).

The New Economy Index ranks states on 21 indicators of their potential to compete in the new economy, grouped into the following 5 categories: knowledge jobs, globalization, economic dynamism and competition, transformation to a digital economy, and technological innovation capacity. Washington ranked second on the *2002 New Economy Index*, and the states that were selected as benchmarks ranked first (MA), third (CA), and fourth (CO).

Quality Counts 2007 and Quality Counts 2006

Education Week provides an annual publication tracking state policies for improving K-12 education. Each publication includes a State of the States report which tracks education information and grades states on their policy efforts in areas such as K-12 standards, assessments and accountability systems. Much of the data included in the State of the States report is gathered through an annual policy survey, results of which are verified with documentation from the state.

The *Quality Counts* report provides overall grades for state performance in the area of standards and accountability that is based on the following indicators: 1) the adoption of standards in four core subject areas (english, mathematics, science, and social studies/history) and ratings of the standard's clarity and specificity; 2) the usage of five types of assessment instruments; and 3) the implementation of an accountability system that includes report cards,

ratings (based on adequate yearly progress or state criteria), assistance, sanctions, and rewards. In the 2006 report Washington received a B for standards and accountability; Massachusetts received an A; California received a B+; and Colorado received a B.

The State of State Science Standards (2005)

The 2005 report is the latest in a series of three reports by that Thomas B. Fordham Institute that review state science standards (previous reports were in 1998 and 2000). The findings from this 2005 review are also reported in the *2006 The State of State Standards* (Thomas B. Fordham Institute, 2006).

The members of the Fordham evaluation team rated the science standards for each state on a 4-point scale based on 21 criteria in the areas of: Expectations, Purpose, and Audience; Organization; Science Content and Approach; Quality; and Seriousness. In addition to the 21 criteria within these categories, two additional criteria were given special attention by the reviewers: Inquiry and Evolution.The reviewers indicate that they include inquiry as an additional criterion because "these subjects are now treated in most standards documents as independent content or even as skills the students are expected to acquire." However, the reviewers caution against the overemphasis of inquiry in science standards, and state that in order to earn the highest rating "a state that gives the now-customary prominence to Inquiry had also to offer substantive, correct, and grade-appropriate material – subject matter – on the processes of scientific inquiry or on history or philosophy of science rather than empty encouragement toward good behavior." With regard to the treatment of evolution, the document states that in order to receive the highest rating the standards must introduce the main lines of evidence, including the fossil record, genetics, molecular biology, and development and connect these lines of evidence with Earth history.

Washington received a C for science standards based on the 2005 review. Massachusetts and California received A's, and Colorado received a B.

Smart Testing, Let's Get it Right (2007)

The American Federation of Teachers (AFT) conducted a review of state standards and reported on the strength of the content standards and the state's alignment of the science standards to the state's assessment system. To meet the AFT criteria for having state tests aligned to the standards, the state must: 1) have strong content standards; 2) provide evidence of alignment of the tests to the standards (e.g. item specifications, test blueprints, etc.); and 3) post the alignment evidence on the Web in a transparent manner. The majority of states met the AFT criteria for strong content standards in science. However, only 23 fully met the criteria for alignment between the science tests and the science standards. Washington, Massachusetts, and California met the AFT criteria for alignment at the elementary, middle school and high school levels. Colorado only met the criteria at the high school level.

Table 2 provides a summary of results of these reviews for the top-ten performing states on the *2002 New Economy Index*, which were considered as potential benchmark states. In addition to findings from the New Economy Index, the Quality Counts 2006 and 2007 reports, the State of the State Science Standards 2005 report, and the AFT 2007 review, the table displays *NAEP* grade 4 and grade 8 results for 2005 and indicates the change in these results from 2000 to 2005. These results are included because they were another important indicator used in the selection of the benchmark states.

Following Table 2, Table 3 displays comparison results for nations that were considered as potential benchmarks. In addition to results from *TIMSS* and *PISA*, this table includes comparison information on the percentage of the population enrolled in secondary education and expenditures on education. The assessment results and additional contextual information, such as Finland's innovative means of implementing science standards, informed the selection of Singapore and Finland as benchmark nations.

Table 2: State Comparisons for Top-10 Ranking States on the New Economy Index

State/Nation	2002 New Economy Rank	Most Recent Year Updated[1]	College Readiness Defined[1]	Regular Timeline for Revising[1]	Quality Counts 2006 Overall grade	Fordham Science	Levels Mtg AFT Criteria for Science Alignment[2]	2005 NAEP Grade 4 (Average Score)[3]	Direction of Change from 2000 to 2005[3]	2005 NAEP Grade 8 (Average Score)[3]	Direction of Change from 2000 to 2005[3]
Massachusetts	1	2006-07	NO	NO	A	A	e, ms, hs	160		161	+
Washington	2	2005-06	NO	YES	B	C	e, ms, hs	153	N/A	154	N/A
California	3	1998-99	YES	NO	B+	A	e, ms, hs	137	+	136	+
Colorado	4	2005-06	NO	YES	B	B	hs	155	N/A	155	N/A
Maryland	5	2000-01	NO	YES	A-	B	e, ms, hs	149	+	145	
New Jersey	6	2002-03	YES	NO	B+	B	e, ms, hs	154	N/A	153	N/A
Connecticut	7	2004-05	NO	NO	B-	C	NONE	155		152	
Virginia	8	2002-03	NO	YES	B	A	e, ms, hs	161	+	155	+
Delaware	9	1994-95	NO	NO	B+	C	NONE	152	N/A	152	N/A
New York	10	1995-96	YES	YES	A	A	e, ms, hs	N/A	N/A	N/A	N/A

[1] Source. *Quality Counts 2007*.
[2] Source. American Federation of Teachers. elementary = e; middle school = ms; high school = hs
[3] Source. *The Nation's Report Card*, Science 2005. Direction of change is shown only for those states for which the change was statistically significant.
N/A indicates that *NAEP* results for at least one time-point are unavailable

Table 3: National Comparisons for Nations Considered as Potential Benchmarks

State/Nation	TIMSS 2003 Grade 4 Avg. Science Scale Score	TIMSS 2003 Grade 8 Avg Science Scale Score	PISA 15 yr olds Average Science Scale Score	Education Expectancy 2004*	Percent of Population in Enrolled Secondary Education*	Expenditures on Education as a percent of GDP*
Singapore	565	578	no data	N/A	N/A	N/A
Chinese Taipei	551	571	no data	N/A	N/A	N/A
Hong Kong	542	556	539	N/A	N/A	N/A
Japan	543	552	548	N/A	n/a	n/a
Australia	521	527	525	20.7	85%	3.7%
United States	536	527	491	16.9	82%	5.7%
New Zealand	520	520	521	19.1	95%	6.8%
Finland	n/a	n/a	548	20	94%	6.5%
Intl Ave	489	473		17.4 (OECD)		5.5% (OECD)

*Source. *Quality Counts 2007*.

Recommendations to Inform Policy and Implementation Decisions

1 **Based on our review and analysis of the current science standards for the state of Washington we recommend the development of a new science standards document.**

- Washington should assemble a Science Standards Revision Team to incorporate the changes detailed in this report.
- The Science Standards Revision Team should include teachers, a curriculum specialist, an assessment specialist, a university science educator, scientists from each of the three major disciplines, a professional with experience developing standards at the state or national level, a math educator who worked on the development of the math standards, and a professional editor.

2 **The new science standards should be a comprehensive K-12 document that sets high expectations for all students.**

- The document should be expanded to include grades 11 and 12.
- The document should describe the knowledge, skills, and abilities that all students need to be prepared for post-secondary education.

3 **The science standards should create a vision for the science content, methods of science, and applications appropriate for all K-12 students in the state of Washington.**

- The new science standards should be clear on their purpose, audience, and vision.
- The document's purpose should reflect the values of the stakeholders in the state of Washington.

4 **Implementation of the science standards should result in greater coherence across the full spectrum of the education system - including curriculum development, selection of instructional materials, professional development, and assessment.**

- The standards must not be presented as the curriculum.
- Supporting documents are necessary to ensure reliable alignment between the science standards, development and selection of instructional materials, professional development, classroom instruction, and assessment.

Recommendations to Inform the Design and Writing of a New Washington Science Standards Document

5 Simplify the organization of the Washington science standards document.

- Reduce the number of organizing elements to improve user navigation of the document.
- Organize the discipline content, currently provided in EALR 1, by life sciences, earth and space sciences, and physical sciences.
- Include the same clear delineation of science content, methods of science, and applications that is provided in the current document.
- Continue to provide standards for grade spans rather than for grade levels, including expanding the high school span to integrate grades 11 and 12.

6 Increase the clarity and specificity of the Washington science standards document.

- The science standards should not depend on scientific vocabulary alone to convey the meaning of an outcome statement of what students should understand or be able to do. Scientific vocabulary within the content statements is acceptable if the term is explained as part of the standard.
- The science standards should provide a more complete, detailed, and specific description of the content to be learned, with special attention to the Life Science content. Minimize the use of external references for defining the science content that is to be learned.
- The verbs used in the standards should specifically delineate what students are to understand/know or be able to do.
- The science standards should use content statements to detail the science content that is to be learned. Model the format of these statements after statements provided in reference documents such as the *2009 National Assessment of Educational Progress* and the *National Science Education Standards*.

7 Increase the rigor of the Washington science standards document.

- Some concepts currently introduced in grades 3-5 could be introduced earlier.
- Increase the level of cognitive demand of the standards at all grade spans.
- With the addition of grades 11 and 12, the learning progression across grade spans for each standard should be revisited and content redistributed, with special attention to grade spans 6-8 and 9-12.
- Use the most current research on learning progressions within disciplines to establish what students should know and be able to do at each grade span.
- With the development of the new K-12 document, ensure that the Washington Standards contain all of the content from the *NSES*, with particular attention to Life Sciences.

8 Strengthen the standards for inquiry in the state of Washington.

- Devote more attention to the "abilities" of inquiry in addition to the "understandings" of inquiry. Students at all grade levels should be expected to demonstrate the abilities of inquiry.
- Incorporate linkages to the Washington State K-12 Mathematics Standards (March, 2008).
- Provide guidance to clarify the purpose of the inquiry standards as defining learning outcomes for students rather than outlining instructional strategies.
- Provide guidance to promote instructional strategies that integrate disciplinary content and inquiry in the classroom.

9 Improve the standards for Science and Technology.

- In addition to the "understandings" of technological design, increase focus on the "abilities" of technological design.
- Provide relevant "real world" examples to illustrate the concepts that are articulated in the standards.

10 Develop standards to address Science in Personal and Social Perspectives

- Include the Science in Personal and Social Perspectives content found in the *NSES*.

11 The Washington science standards should reflect the balance and depth of content found in the National Science Education Standards.

- Focus on fundamental concepts and abilities presented in the *NSES*.
- Eliminate areas of redundancy found in the current Washington science standards.
- Provide guidance for instructional strategies that integrate concepts and enable students to meet more than one standard in a unit or series of lessons.

This interim report presents the above recommendations based on the analysis and findings of the Expert Review Panel, input from the Washington Science Advisory Panel, as well as the collective experience of the DHA project team developing and implementing national- and state-level science standards. Following the presentation of this report to the Washington SBE, the document will be posted on the SBE website to facilitate public review and comment. The DHA project team will seek additional public comment through a series of focus groups in three locations across the state of Washington. A summary of the public comment will be prepared by the DHA project team, reviewed with the Washington Science Advisory Panel, and included in a separate section of the Final Report to the SBE.

Appendix D: Project Team and Expert Review Panel Biographies

David Heil, Co-Director and Expert Review Panel Facilitator

David Heil, President of DHA, is well known throughout the country as an innovative science educator, new enterprise developer, lecturer, author and host of the Emmy Award-winning PBS science series, Newton's Apple. He was the lead author of the award winning elementary science curriculum, *Discover The Wonder;* has produced innovative PreK -12 curricula for the National Science Foundation, PBS, and numerous corporate and government agency clients. He is the editor of the popular book *Family Science* and was the founding chair of the Foundation for Family Science supporting parent and child science learning worldwide. He has also been a leader in the informal science teaching and learning community providing expert consulting services to many of the nation's leading science and technology centers and organizations including the NSF, the National Academy of Sciences, the California Science Center, The National Science Center, the Smithsonian, the Denver Museum of Nature and Science, the Great Lakes Science Center, and currently, the Pacific Science Center in Washington State. Mr. Heil is frequently invited to speak at conferences and public events on science, technology, and the rewards of experiential learning.

Prior to establishing DHA, David was affiliated with the Oregon Museum of Science & Industry (OMSI) for 13 years, serving as associate director from 1988–1996. While at OMSI, David initiated and administered many of the museum's nationally recognized education and outreach programs, and also developed hands-on exhibits for national tour. David has also taught science and enrichment programs in grades 7-12, conducted research in plant biochemistry and radiochemistry, and worked for five years with the U.S. Fish and Wildlife Service. A native Oregonian, he is active in numerous scientific and educational organizations nationwide, is a past President of the Oregon Science Teachers Association, Director of Informal Science Education for the National Science Teachers Association (NSTA), served on the Board of Directors of the Biological Sciences Curriculum Study (BSCS), and currently serves on the Board of Directors for the Aspen Science Center and the Keystone Center.

Kasey McCracken, Project Manager

Kasey McCracken specializes in both internal and external evaluation at DHA. Using both qualitative and quantitative methodologies she plans and conducts baseline, formative, and summative evaluations as well as market research studies for a variety of non-profit entities, corporations, and government agencies, including the National Science Teachers Association, and NSF and NIH funded projects for a range of science and technology initiatives. Most recently, Ms. McCracken designed and conducted statewide surveys and focus groups on behalf of Washington's Pacific Science Center to provide public, member, school educator and administrator, and other key stakeholder input into the development of a comprehensive strategic business plan for Pacific Science Center. Prior to joining DHA, Kasey was an evaluation analyst for the Austin Independent School District (AISD) where she supported a variety of Department of Education-funded initiatives, including AISD's after-school program. As an independent evaluation consultant, she served a range of clients, including the Virginia Department of Mental Health, Mental Retardation, and Substance Abuse Services; the Partnership for People with Disabilities at Virginia Commonwealth University; and the Portsmouth (VA) Community Services Board. Kasey holds an MPH from the Johns Hopkins School of Public Health and a BA in Biology and Anthropology from the University of Pennsylvania.

Expert Review Panelists

Rodger W. Bybee, Co-Director and Expert Review Panel Chair

Rodger W. Bybee is one of the nation's leading science education scholars and has been an active leader in the development and implementation of national and state-level science standards. Most recently he served for 8 years as Executive Director of the Biological Sciences Curriculum Study (BSCS), a non-profit organization that develops curriculum materials, provides professional development, and conducts research and evaluation for the science education community. Prior to joining BSCS, he was executive director of the National Research Council's Center for Science, Mathematics, and Engineering Education (CSMEE), in Washington, D.C. Between 1985 and 1995 he was associate director of BSCS. From 1972 to 1985, Dr. Bybee was a professor of education at Carleton College in Northfield, Minnesota.

Dr. Bybee was a leader in the development of the National Science Education Standards. From 1993-1995, he chaired the content working group of that National Research Council project. At BSCS, he was principal investigator for five new National Science Foundation (NSF) programs; an elementary school program, *Science for Life and Living: Integrating Science, Technology, and Health*; a middle school program, *Middle School Science & Technology*; two high school programs, *BSCS Biology: A Human Approach* and *BSCS Science: An Inquiry Approach*; and a college program, *Biological Perspectives*. His work at BSCS also included serving as a principal investigator for programs to develop curriculum frameworks for teaching about the history and nature of science and technology for biology education at high schools, community colleges, and four-year colleges, and curriculum reform based on national standards. Dr. Bybee has served as chair of the Science Forum for PISA 2006 Science and chair of the Science Expert Group for that prestigious international entity.

Dr. Bybee has been active in education for forty years, having taught science at the elementary, junior and senior high school, and college levels. He has written widely, publishing in both education and psychology. He is co-author of a leading textbook titled *Teaching Secondary School Science: Strategies for Developing Scientific Literacy*. His recent books include *Achieving Scientific Literacy: From Purposes to Practices* and *Learning Science and the Science of Learning*. Over the years, he has received awards as a Leader of American Education and an Outstanding Educator in America and in 1979 was Outstanding Science Educator of the Year. He has received the National Science Teachers Association (NSTA) Distinguished Service to Science Education Award. The American Institute of Biological Science presented him the first annual AIBS Education Award, the Keystone Center presented him the Keystone Leadership in Education Award, and the University of Northern Colorado recognized him as the Outstanding Alumni for 2006. This year (2007) Dr. Bybee was the first recipient of the Public Understanding of Technology Award presented by the International Technology Education Association (ITEA). And most recently, Dr. Bybee was presented the National Science Teachers Association's (NSTA) most prestigious award, the Robert H. Carleton award presented to individuals who have made outstanding contributions to and provided leadership in science education at the national level and to NSTA in particular.

Harold Pratt, Co-Director and Panelist

Harold Pratt is a private consultant working in all areas of science education and has just completed a three-year term as is a Disciplinary Literacy Fellow in Science at the Learning Research and Development Center at the University of Pittsburgh. He also is the president of Science Curriculum Inc., the publishers of *Introductory Physical Science* and *Force Motion and Energy*. From May 1996 until July 1999, he was the Director of Science Projects in the Center for Science, Mathematics, and Engineering Education at the National Research Council (NRC). He has had extensive administrative and curriculum development experience at the local and national levels. Prior to

joining NRC, he directed the revision of *Science for Life and Living*, at the Biological Sciences Curriculum Study in Colorado Springs, Colorado. From October 1992 to December 1994, he served as a Senior Program Officer at the NRC for the National Science Education Standards Project. From 1986 to 1991 he was the Executive Director of Curriculum for the Jefferson County (CO) Public Schools, the largest district in Colorado with an enrollment of over 80,000 students. Prior to that, he served the district as the Science Coordinator for 23 years. He has co-authored or directed the development of three science textbooks, a book on educational leadership, and published numerous articles and book chapters. He is a Fellow of the American Association for the Advancement of Science and was selected by the National Science Education Leadership Association (formerly the National Science Supervisors Association) as the first recipient of the Nation's Outstanding Science Supervisor Award. He was president of the National Science Teachers Association (NSTA) from 2001-2002. NSTA honored him with the Distinguished Service to Science Education Award in 1999 and their highest recognition, The Carlton Award in 2005. In December, 2005 he received the Susan Loucks-Horsley Award from the National Staff Development Council.

Harold's contributions to the National Science Education Standards have resulted in his consulting and advising numerous states in the development and implementation of their own science education standards, including Ohio, Georgia, Utah, Colorado, Arkansas, South Carolina, and Minnesota.

Bonnie Brunkhorst, Panelist

Bonnie Brunkhorst is Past Chair of the National Council of Scientific Society Presidents (CSSP), Past President of the National Science Teachers Association (NSTA), and served as a member of the National Research Council's National Committee on Science Education Standards and Assessment, and the Standards Executive Editorial Committee for the National Academy of Sciences. She was a member of the NRC Committee on Undergraduate Science Education (CUSE).

Dr. Brunkhorst is a professor at California State University, San Bernardino, with a joint appointment in the College of Natural Sciences in Geological Sciences and the College of Education in Science, Mathematics and Technology Education. She serves on the Graduate Faculty for the Ed.D Program in Educational Leadership. She also taught secondary science for 15 years and supervised the science program, K-8, in the Lexington, Massachusetts Public Schools before receiving her Ph.D. She received her Bachelor's and Master's degrees in Geology from Boston University, and her Ph.D. from the University of Iowa in science education with geology.

Her areas of expertise, research, and publication include K-university Earth science teaching, undergraduate science (geology and science and technology), public understanding of science, science in public policy, science education reform, professional development of science teachers, and science standards development and implementation Dr. Brunkhorst has extensive experience in building coalitions and cooperation among various constituencies with stakes in science and science education, nationally, state-wide and regionally. She initiated and developed the coalition of science and science education national professional societies in support of the development of the national science education standards while president of NSTA and coordinated the transfer of the standards development to the National Academy of Sciences from NSTA. She served as the coordinator and was co-founder for the national Salish Consortium for the Improvement of Science Teacher Preparation Through Research. She continues to be a strong supporter for science teachers' professionalism and leadership.

She served as a science consultant to the state Commission for Developing Academic Content and Performance Standards, which prepared the California Science Education Standards, and on the state Commission on Teacher Credentialing (CCTC) Panel for the development of California's science teacher preparation standards.

Herb Brunkhorst, Panelist

Herb Brunkhorst is Professor of Science Education and Biology at California State University, San Bernardino, and is currently Chair of the Department of Science, Mathematics, and Technology Education in the College of Education. He carries a joint appointment in the Department of Biology in the College of Natural Sciences. Dr. Brunkhorst earned a Ph.D. with majors in science education and plant physiology at the University of Iowa. He has been a science educator for the past 40 years; 17 years at the pre-college level and the past 23 years at the university level. Dr. Brunkhorst was co-principle investigator of a university system-wide collaboration to improve science teacher preparation. He served as a senior faculty researcher on a national multidimensional collaborative research effort for improving science and mathematics teacher education. Dr. Brunkhorst was selected as a California State University Chancellor's Teacher Preparation Scholar. He is a past president of the Association for Science Teacher Education (formerly the Association for the Education of Teachers of Science), Director of Pre-service Teacher Preparation for the National Science Teachers Association, a Fellow of the American Association for the Advancement of Science, and a lifetime National Associate of the National Academies (Science, Engineering and Medicine).

Arthur Eisenkraft, Panelist

Arthur Eisenkraft is a Distinguished Professor of Science Education and Director of the Center of Science and Math in Context (COSMIC) at the University of Massachusetts, Boston.

Before arriving at University of Massachusetts Boston, Dr. Eisenkraft taught high school physics for over 25 years. He is a past president of the National Science Teachers Association. He is project director of the NSF-supported Active Physics Curriculum Project that is introducing physics instruction for the first time to all students; leading a similar effort with Active Chemistry; and chair and co-creator of the Toshiba/NSTA ExploraVision Awards, involving 15,000 students annually. In 1993, he was Executive Director for the XXIV International Physics Olympiad after initiating the U.S. involvement in the program and serving as the academic director of the United States team for six years. He is a consultant for the award-winning ESPN SportsFigures. Eisenkraft has received numerous teaching awards. He is a fellow of the AAAS.

Anne Kennedy, Panelist

Anne Kennedy is the founding Director of the Science and Mathematics Education Resource Center (SMERC), a partnership of Educational Service District 112, Washington State University Vancouver, Hewlett Packard, and 30 SW Washington School Districts. Since 1992, SMERC has supported strategic and long-term growth and development of K-20 science and mathematics education programs locally, regionally, and statewide. Activities have included: teacher and principal leader institutes; courses and workshops in K-12 science and/or mathematics; construction of regional science materials centers; development and statewide dissemination of classroom-based assessments for elementary science; technical assistance to schools and teachers adopting and implementing standards-based curriculum; and recruitment and training of scientists and engineers in the service of K-12 education.

Kennedy is currently working on a doctorate in Educational Leadership at Lewis and Clark College in Portland, Oregon. Prior to joining ESD 112, she spent 10 years as a science teacher in both the public and private sectors specializing in astronomy, design and technology, environmental education, and inquiry learning. Her current teaching and research interests include school change, leader development, sustainable program development in science and mathematics education, and K-12 / Higher Education Partnerships.

Mark St. John, Panelist

Dr. Mark St. John, founder and president of Inverness Research Associates, has a background in evaluation, policy analysis, and science and mathematics education at all levels. He was trained in aeronautical engineering at Princeton, served as a high school physics teacher at Phillips Academy and then was a graduate student in physics at the University of New Mexico. This led to a doctoral degree and subsequent faculty position at UC Berkeley in an interdisciplinary math and science education program. Dr. St. John has hybrid expertise that combines a knowledge of science, deep experience in the teaching and learning of the science disciplines, and a broad understanding of educational reform efforts. For over 15 years, he has been involved in the evaluation and study of public and private initiatives aimed at improving science and mathematics education. For nearly two decades Dr. St. John and his colleagues at Inverness Research Associates have been involved in studies and evaluations of reform initiatives in education, including a study of the impact of National Standards. Most recently, Dr. St. John and his group have assisted foundations and state agencies in planning and refining the design of their reform initiatives, as well as helping them to think about the overall evaluation designs most appropriate to their goals and needs.

Jo Anne Vasquez, Panelist

Jo Anne Vasquez is an experienced elementary science educator and supervisor who has taught primary through college level science education courses. She is presently the Director of Professional Development and Outreach at the Center for Research on Education in Science, Math, Engineering and Technology (CRESMET) on the campus of Arizona State University. She is the Past President of the National Science Teachers Association, and the National Science Education Leadership Association. She is a Presidential Appointee to the *National Science Board*, the governing board of the *National Science Foundation***,** the first K-12 Educator to become a sitting member of this prestigious board. Jo Anne's distinguished service and extraordinary contributions to the advancement of science education at the local, state, and national levels has won her numerous awards including National Science Teachers Association's most prestigious honor the 2006 "Robert H. Carlton Award" for Leadership in Science Education. She has also received the *"Distinguished Service to Science Education Award"* the "*Search for Excellence in Elementary Science Education and Supervision Award*" the 2007 New York Academy of Science's "Willard Jacobson Award" for major contribution to the field of science education and was the 2004 NALEO (National Association of Latino Elected and Appointed Officials) honoree for her contributions to improving education.

Appendix E: Washington Advisory Panel Biographies

The Washington Science Advisory Panel, chaired by Jeff Vincent, an SBE board member and chair of the Science Committee, provided input into the review process and the development of recommendations. The Washington SBE appointed the Science Advisory Panel after publicly soliciting applications. The SBE received 68 applications and selected 19 panelists based on an effort to ensure representation of key stakeholders such as educators, parents, and practicing scientists. The SBE also worked to provide broad geographic representation within the state of Washington. Brief biographies for the 19 members of the Washington Science Advisory Panel are provided below.

Jeff Vincent, Chair, a member of the Washington State Board of Education, is the Chief Executive Officer and President of the Laird Norton Company LLC. He leads the Laird Norton investment team in the oversight of current investments, the development of new investment opportunities, and in the day-to-day management of Company activities. Jeff joined the Laird Norton Company LLC in January of 2001. Jeff has more than 20 years of business experience in such roles as CEO, CFO, corporate development officer, and strategy consultant. During 15 years of this experience, he worked with privately held family companies where he developed a fundamental understanding of how to successfully manage these types of entities. Jeff received his BSBA from Drake University, *summa cum laude*, and received his MBA from the Harvard Business School where he was a Baker Scholar.

Len Adams is a Health Promotion Specialist for the Tacoma/Pierce County Health Department, where he has worked for two years. Len worked for 27 years at Pacific Science Center, where he held a variety of positions related to informal science education.

Jeffrey Bierman has been a physics professor at Gonzaga University for 12 years, and is a scientist with undergraduate degrees in mathematics and physics and a Ph.D. in experimental nuclear physics. He is the parent of three children in Washington public schools.

Georgia Boatman teaches at Amistad Elementary School in Kennewick and is a National Board Certified elementary teacher with 31 years of teaching experience in grades 1-6 and Special Education.

Theresa Britschgi is in her third year as BioQuest Director at the Seattle Biomedical Research Institute. Theresa Britschgi earned her MS in Microbiology at Oregon State University prior to her work experience as a twelve-year veteran of the biotechnology/pharmaceutical industry.

Chris Carlson is a genetic epidemiologist at the Fred Hutchinson Cancer Research Center, and holds a Ph.D. from Stanford University in Genetics. He is a parent of three children, legislative chair in his local PTA, and school board member.

Grant Fjermedal is the father of three children attending Seattle's North Beach Elementary School, where he serves as a member of the PTA Board and teaches science as a parent volunteer. A former science and medical writer for the Associated Press, Fjermedal is the author of four nonfiction books.

Jen Fox currently serves as a high school science coach in the Seattle School District. She taught biology, marine biology, and botany at Roosevelt High School in Seattle for six years, and has worked on science teams at the state level.

Mario Godoy-Gonzalez has been teaching Physical Science and Biology/Biotechnology to English Language Learners (ELL) at Royal High School in Royal City since 1994. He began his teaching career in Chile in 1984.

Judy Kjellman has taught biology at Yakima Valley Community College for 39 years. She worked with a team of K-12 and college instructors to draft the preliminary Science College Readiness Definitions.

Sheldon Levias is a Learning Sciences Ph.D. student in the University of Washington's College of Education. He taught math and science for three years at Meany Middle School in Seattle and served for three years as a middle school science resource teacher in the Seattle School District.

Michael McCaw is a Senior Scientific Specialist in the Cellulose Fibers Technology group of Weyerhaeuser where he works on developing new uses and markets for cellulose fibers. He has worked in applied science for the company for over 20 years.

Brian MacNevin is currently a Teacher on Special Assignment with the North Cascades and Olympic Science Partnership, where he supports reform efforts of teacher leaders. He teaches at Shuksan Middle School in Bellingham and has 13 years of experience in science reform.

Judy Morrison is an Assistant Professor of Science Education at Washington State University TriCities, working with both preservice and in-service teachers. She has also taught chemistry, biology, and physical science at both the middle and high school levels.

George (Pinky) Nelson is the Director of the Science, Mathematics, and Technology Education program at Western Washington University. He holds a Ph.D. in astronomy, and has served on or directed many state and national science initiatives, including the AAAS Project 2061.

Kimberly Olson taught 6th/7th grade science for four years at Giaudrone Middle School in Tacoma and is now currently an Instructional Facilitator at Baker Middle School in Tacoma. She has been teaching for five years.

Steve Olson has been teaching physical science, chemistry, physics, and mathematics for six years at Lakeside High School in the Nine Mile Falls School District. He also serves as chair of the science department.

Ethan Smith has taught at Tahoma High School in Covington for ten years and is currently serving as the Instructional Technology Coach for the Tahoma School District.

Barbara Taylor has taught in the Othello School District for 14 years: three years teaching 9th grade science and 10th grade biology, and 11 years teaching 8th grade science, math, and other subjects.

Kristen White has been teaching at Shahala Middle School in the Evergreen School District, Vancouver since 2001, and has over 15 years of teaching experience. She also served in the district office for two years as a Staff Development Specialist focusing on math, science, and technology.

Appendix F: References for Reports Used in Review and Other Resources

Reports and Documents Used to Support the Expert Panel Review

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Comparison State and Nation Science Standards Documents

California State Board of Education. (Adopted 1998.) Science: academic content standards for kindergarten through grade twelve. Retrieved January 18, 2008 from http://www.cde.ca.gov/be/st/ss/scmain.asp.

Colorado Department of Education. (1995.) *Colorado Model Content Standards: Science.* Denver, CO: Author. Available: http://www.cde.state.co.us/coloradoscience/Standards_and_Assessment.htm [accessed December 2007].

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STATE BOARD OF EDUCATION

HEARING TYPE: _X_ ACTION

DATE: May 15, 2008

SUBJECT: **REQUEST FOR WAIVER FROM THE 180-DAY SCHOOL YEAR REQUIREMENT**

SERVICE UNIT: Edie Harding, Executive Director
State Board of Education

RECOMMENDATION:

Staff recommends that the State Board of Education (SBE) approve the waiver requests from the minimum 180-day school year for the following school districts:

School District	#Days	#Years
Adna	4	3
Bremerton	4	3
Burlington-Edison:		3
Grades K-8	2	
Grades 9-12	3	
Federal Way	3	3
Highline	5	3
Inchelium	3	3
Lake Stevens	1	1
Marysville	5	1
Methow Valley	6	1
Morton	5	3
Mount Baker	4	3
North Kitsap	5	3
Northport	4	3
Sultan	4	1
Thorp	2	1

BACKGROUND:

Based on legislative authority (Chapter 208, Laws of 1995), the SBE adopted Chapter 180-18 WAC Waivers for Restructuring Purposes. Section 180-18-040 of this chapter allows school districts to apply for waivers from the minimum 180-day school year requirement with the assurance that they meet the annual minimum instructional hour offering requirements in such grades as are conducted by the school district, as prescribed in RCW 28A.150.220.

The decision to recommend approvals or non-approvals is based on the assessment of each request by a team of reviewers. While full applications will not be in the Board's agenda, Board members who want to have the full applications should contact Brad Burnham at 360-725-6029 or brad.burnham@k12.wa.us.

STATE BOARD OF EDUCATION

HEARING TYPE: __X_ ACTION

DATE: May 14-15, 2008

SUBJECT: **Delegation of Authority to Executive Director**

SERVICE UNIT: Ms. Edie Harding, Executive Director,
State Board of Education

PRESENTER: Ms. Edie Harding, Executive Director,
State Board of Education

BACKGROUND:

In January 2008, the Board requested a change in its statute to enable it to delegate certain administrative authorities to its Executive Director. HB 3097 was passed by the 2008 legislature. Our assistant attorney general, Colleen Warren, has drafted a resolution behind this tab to enumerate the authorities that the Board may delegate.

RECOMMENDED ACTION:

Staff recommends approval of this resolution.

RESOLUTION OF
THE STATE BOARD OF EDUCATION
DELEGATING AUTHORITY TO THE EXECUTIVE DIRECTOR

RCW 28A.305.130(7) provides the State Board of Education (Board) with the authority to "delegate to the Executive Director, by resolution, such duties as deemed necessary to efficiently carry on the business of the Board including, but not limited to, the authority to employ necessary personnel and the authority to enter into, amend and terminate contracts on behalf of the Board."

Pursuant to the authority set forth in RCW 28A.305.130(7), the Board hereby delegates to the Executive Director the following duties:

1. The authority to enter into, amend, and terminate contracts and agreements; to incur financial obligations; and to authorize the expenditure of grant money and funds appropriated by the State Legislature; as is necessary for the performance of the Board's duties, the fulfillment of its obligations, and the conduct of its business.

2. The authority to employ all personnel necessary to properly discharge the duties and functions of the Board, with the exception of the position of the Executive Director. This delegation of authority includes the appointment and termination of staff, development of job descriptions and classifications, the setting of salaries, the evaluation of staff, and the imposition of any discipline. The appointment of Board personnel under this delegation of authority shall be subject to the requirements set forth in RCW 28A.305.130(7).

3. The authority to prepare and submit all biennial and supplemental budget requests to the State Legislature.

The Board reserves all rights to revoke or revise this delegation of authority, in part or in whole, at any time. This delegation shall be effective as of June 12, 2008.

Done in open meeting by the Board this _____ day of May, 2008.

THE STATE BOARD OF EDUCATION

By: _____
Mary Jean Ryan, Chair

STATE BOARD OF EDUCATION

HEARING TYPE: ___X___ ACTION

DATE: May 15, 2008

SUBJECT: **CONTRACTS FOR APPROVAL**

SERVICE UNIT: Ms. Edie Harding, Executive Director
State Board of Education

PRESENTER: Ms. Edie Harding, Executive Director
State Board of Education

BACKGROUND:

The information on Strategic Teaching and the BERC Group contracts is provided behind this tab

RECOMMENDATION:

Approval of the following contracts:

1. Strategic Teaching contract extension to do exemplar comparison and specific changes recommended to the K-12 math standards ($180,300).
2. BERC Group contract to conduct a transcript study of students in 100 Schools ($161,000).

Washington State Board of Education

Working to Raise Student Achievement Dramatically

Strategic Teaching Contract Extension

Under SB 6534 passed by the 2008 Legislature, the State Board of Education is required to hire a national consultant to:

1. Conduct an exemplar review ("Benchmarking Report") of the OSPI March 5, 2008 draft of the revised K-12 mathematics standards.
2. Recommend specific language changes and content changes needed to finalize K-12 standards.

The Board will extend Strategic Teaching's contract to conduct this work for $180,300. Below are the dates for deliverables and presentations.

Date	Scope
April 1, 2008	Exemplar Benchmarking to Grades 2,4,8, and Algebra I to IN, CA, Singapore, National Math Panel, ADP, WA College Readiness Standards
April 5, 2008	Edits of K-8 standards
Mid-April 2008	Phone or attend SBE Meeting on K-8 standards
April 29, 2008	Standards edit and content specifications Algebra I and Geometry
May 1, 2008	Present at SBE Math Panel meeting
May 13, 2008	Finalize report on Algebra I and Geometry based on feedback to SBE

May 14-15, 2008	Present at SBE Board meeting
June 10, 2008	Standards edit and content specifications Algebra II
June 12 2008	Present at SBE Math Panel meeting
July 10, 2008	Provide content of math courses for three high school graduation credits that conforms with the standards
July 10, 2008	Finalize report on Algebra II based on feedback to SBE
July 23-24, 2008	Present at SBE Board Meeting
July 31, 2008	Finalize report

The Board will go out to bid nationally for additional work to assist the Math Panel and Board on the OSPI curricular review. The work for that review will start this fall.

THE BERC GROUP, INC. CONTRACT

The Board issued a Request for Proposals in March 2008 to conduct a transcript study of 100 school districts. Three vendors submitted proposals. A committee of four, including Board member Steve Dal Porto, selected The BERC Group, Inc. to do the work.

The intent is to use the results of the study to speak accurately and with confidence about course-taking patterns of students in the state. The BERC Group will gather transcripts of 2008 graduates from a representative sample of 100 districts throughout the state and analyze them to provide information about such topics as: What does a typical senior schedule look like? What percentage of students statewide are taking courses that meet minimum college entry requirements? What courses are students who meet WASL standards taking? How many math and science courses do students really take?

The BERC group has extensive experience with transcript studies, and has logged over 30,000 transcripts in the past six years. Completion of the project is targeted for October 1, 2008, with a final presentation/report delivered to the Board at its November 2008 meeting.