# State Science Assessment Updates

WERA Conference

December, 2018


Office of Superintendent of Public Instruction

Chris Reykdal, State Superintendent

# Welcome!

- Who is with us today?

# Science Assessment Office Staff

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# Today's Topics

- Current Assessments
- What's new?
- WCAS Design and Features
- Assessment Resources
- WCAS Development

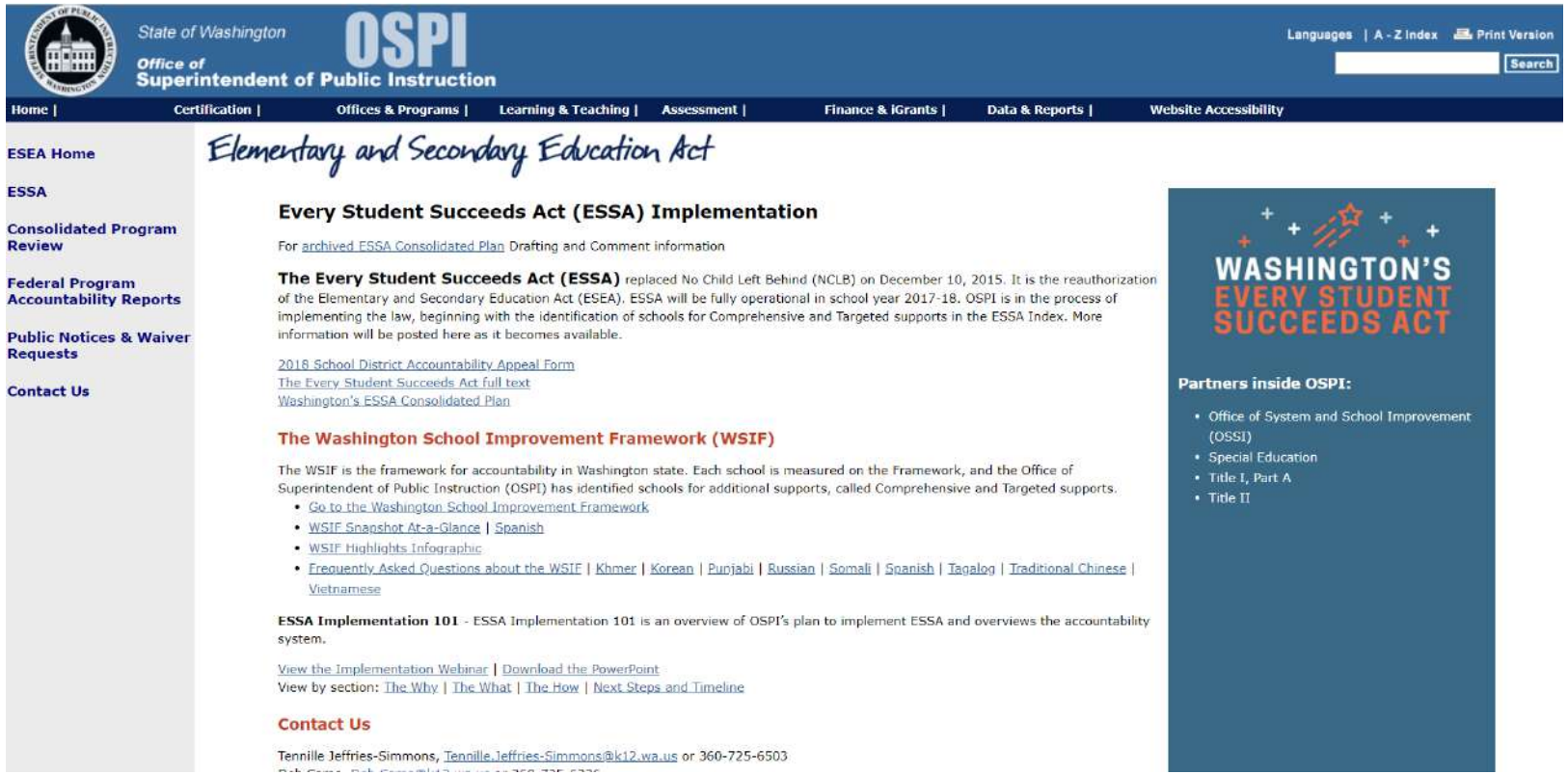
# Current Assessments

# Why do we have state assessments?

- The No Child Left Behind Act (NCLB) and state law require that we give a state science assessment once each in elementary, middle, and high school for the purpose of school and district accountability.

- The Every Student Succeeds Act (ESSA) continues those same requirements.

# Every Student Succeeds Act




http://www.k12.wa.us/ESEA/ESSA/default.aspx

# House Bill 2224

- Provides flexibility in high school graduation requirements and supports student success during the transition to a federal Every Student Succeeds Act-compliant accountability system
  - For science
    - Delayed the high school graduation requirement until the class of 2021
      - Biology EOC was discontinued
    - Graduation alternatives
      - Biology Collection of Evidence was discontinued
      - Other graduation alternatives are delayed until the class of 2021

# High School Science Assessment 2019+

| Grade in 2018-19 | Class of… | Science Assessment 2018-19 | Science Assessment 2019 -20 and beyond |
|---|---|---|---|
| 12 | 2019 | N/A | N/A |
| 11 | 2020 | 2019 WCAS for accountability | N/A |
| 10 | 2021 | N/A | 2020 WCAS for accountability and graduation in 11th grade |
| 9 | 2022 | N/A | 2021 WCAS for accountability and graduation in 11th grade |

# WCAS Graduation Alternatives

Alternatives for science should begin in 2020-2021 after the Class of 2021 have attempted the test in spring 2020.

More information available in 2020.

http://www.k12.wa.us/assessment/GraduationAlternatives/Options.aspx

## Assessment Pathways to Graduation by Cohort

| | | | Class of 2018 | Class of 2019 | Class of 2020 | Class of 2021 |
|---|---|---|---|---|---|---|
| Certificate of Academic Achievement (CAA) | Standard Assessment | Meeting high school graduation standard on the Smarter Blanced assessment (on-grade Level) | ✓ | ✓ | ✓ | ✓ |
| | | End of Course (EOC) Math* | ✓ | | | |
| | | Washington Comprehensive Assessment of Science (WCAS)** | | | | ✓ |
| | Assessment Graduation Alternatives | Dual Credit Course (must have potential to earn college-level credit in the course for the content area) | ✓ | ✓ | ✓ | ✓ |
| | | Locally Administered Assessment | ✓ | ✓ | ✓ | ✓ |
| | | Transitions Course (as a Locally Administered Assessment) | ✓ | ✓ | ✓ | ✓ |
| | | Collection of Evidence | ✓ | | | |
| | | SAT/ACT/AP/IB | ✓ | ✓ | ✓ | ✓ |
| | | Grades Comparison | ✓ | ✓ | ✓ | ✓ |
| Certificate of Individual Achievement (CIA) (for students receiving special education services) | Standard Assessment | Meeting high school graduation standard on the On-Grade WA AIM (alternate assessment) - for students with significant cognitive challenges | ✓ | ✓ | ✓ | ✓ |
| | Assessment Graduation Alternatives | Off-Grade Level WA-AIM (alternate assessment) - for students with significant cognitive challenges | ✓ | ✓ | ✓ | ✓ |
| | | CIA Cut score (formerly known as Basic/L2) on the ON-Grade Level Smarter Balanced assessment | ✓ | ✓ | ✓ | ✓ |
| | | Off-Grade Level Smarter Balanced/WCAS assessment | ✓ | ✓ | ✓ | ✓ |
| | | Locally Determined Assessment (LDA) | ✓ | ✓ | ✓ | ✓ |
| CAA/CIA Waivers | | Out of State Waiver | waives CAA/CIA | waives CAA/CIA | waives CAA/CIA | waives CAA/CIA |
| | | Expedited Assessment Appeal/Waiver | waives CAA/CIA | | | |
| | | WA-AIM Engagement Rubric (formerly known as the Awareness Waiver) | waives CAA/CIA | waives CAA/CIA | waives CAA/CIA | waives CAA/CIA |

*1 if enrolled during or after 2018-19*
*2 if submitted by 6/2017*
**Only applicable to meeting the math graduation assessment requirement*
***Only applicable to meeting the science graduation assessment requirement (class of 2021)*

# 2019 Science Test Windows

| Washington Comprehensive Assessment of Science | | | |
|---|---|---|---|
| | Grades | Requirement | Testing Window |
| Spring 2019 | 5 & 8 | Required for federal and state accountability | **Online:** April 15 – June 7<br>**Paper Pencil:** April 15 – May 24<br>*(Paper testing is available only to support large print, braille, and standard print forms for students whose IEP or 504 plan states paper)* |
| | 11 | Required for federal and state accountability | **Online:** May 6 – June 7<br>**Paper Pencil:** May 3 – May 24<br>*(Paper testing is available only to support large print, braille, and standard print forms for students whose IEP or 504 plan states paper)* |

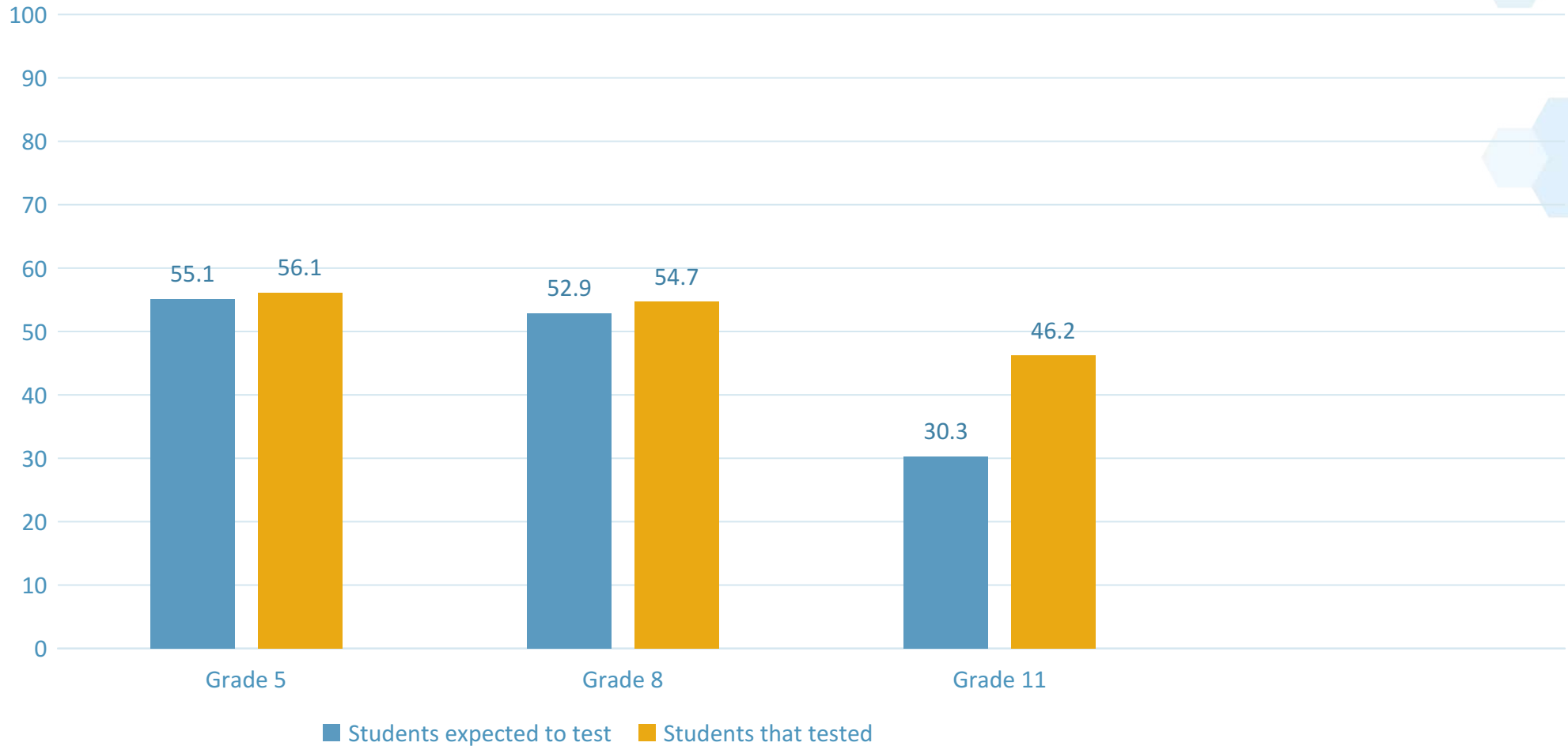
- http://www.k12.wa.us/assessment/StateTesting/timelines-calendars.aspx

# WCAS Paper Pencil Testing

- Accommodated standard print, large print, Spanish, and braille
- IEP or 504 designation needed
- 3 students per proctor
- Standard print, large print, and braille student responses are entered into the Data Entry Interface (DEI) by test proctor
- Spanish forms are shipped back to the vendor for processing and scoring
- Resources
  - DEI User Guide: https://wa.portal.airast.org/resources/user-guides-and-manuals-testc
  - Paper Test Administration Manual (TAM): https://wa.portal.airast.org/resources/user-guides-and-manuals-testc/
  - Training Module: https://wa.portal.airast.org/resources/modules-testc/
  - Secure TA Script—shipped with test booklets

# What's New?

# Statewide WCAS Results



# Approximate Participation by Grade

- Grade 5: 97%
- Grade 8: 96%
- Grade 11: 66%

# Questions to explore…

- How much time to kids spend on science?
- Is your science curriculum truly aligned to the NGSS?
- When did NGSS implementation occur?
- How much training has staff received on the NGSS?
- Did students practice with WCAS training tests?
- How do your results compare to the state average?
  (example: 2017 vs. 2018)
- How many 11th grade students in your school/district participated in the 2018 WCAS ?

# WCAS Achievement Level Setting

- August 6-8, Bellevue
- Purpose: Develop cut score recommendations corresponding to each performance level (e.g., Level 2, Level 3) for grades 5, 8, and 11
  - 30 Washington State educators per grade level panel
  - Chosen to carefully represent the state demographic
  - Classroom teachers, science coaches, curriculum specialists, etc.
- Process
  - Orientation to test development and achievement level setting process
  - Taking the online WCAS test
  - Examining the Achievement Level Descriptors (ALDs)
  - 3 rounds of ratings using an Ordered Item Booklet (OIB)
  - Articulation Panel
- Recommendations were accepted by the State Board of Education on August 9

# Scale Score Ranges

| Washington Comprehensive Assessment of Science | | | | |
|---|---|---|---|---|
| The cut (or threshold) scores for Levels 1, 2, 3, and 4 were developed by Washington educators. These cut scores were adopted by the State Board of Education in August 2018 | | | | |
| Grades | Level 1 | Level 2 | Level 3 | Level 4 |
| 5 | 375 – 649 | 650 – 699 | 700 – 784 | 785 – 1060 |
| 8 | 345 – 649 | 650 – 699 | 700 – 764 | 765 – 1060 |
| 11 | 390 – 649 | 650 – 699 | 700 – 790 | 791 – 1190 |

- http://www.k12.wa.us/assessment/StateTesting/ScaleScores.aspx

# Scores—Communication Timeline

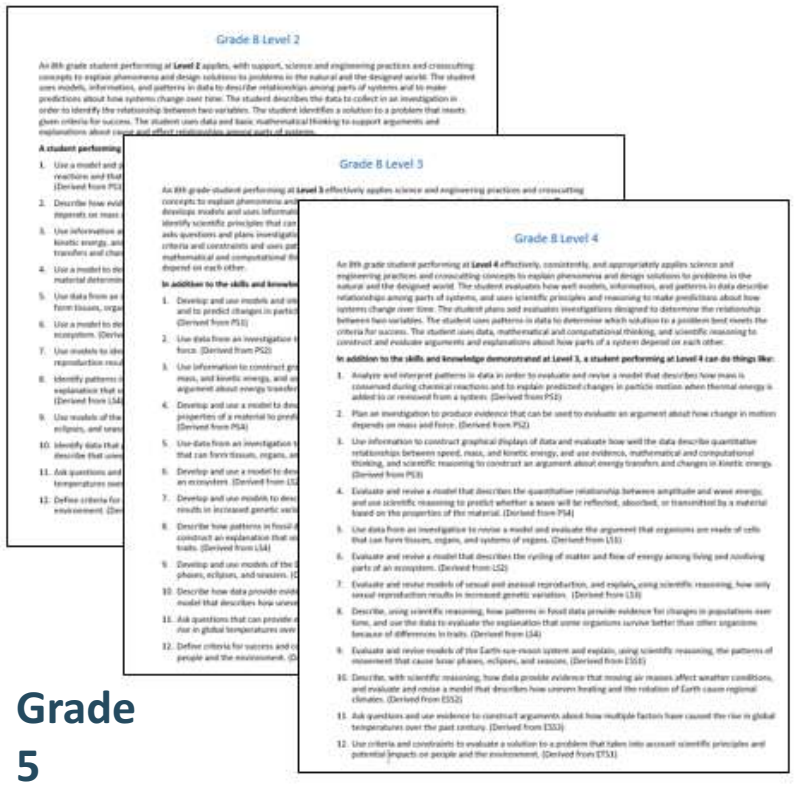
- Scores made available in the Online Reporting System (ORS) on the WCAP Portal on September 5th
- Statewide test scores were publically released on Report Card on September 10th
- Paper WCAS Individual Score Reports (ISRs) arrived in districts on October 9th and 10th

# Achievement Level Descriptors (ALDs)

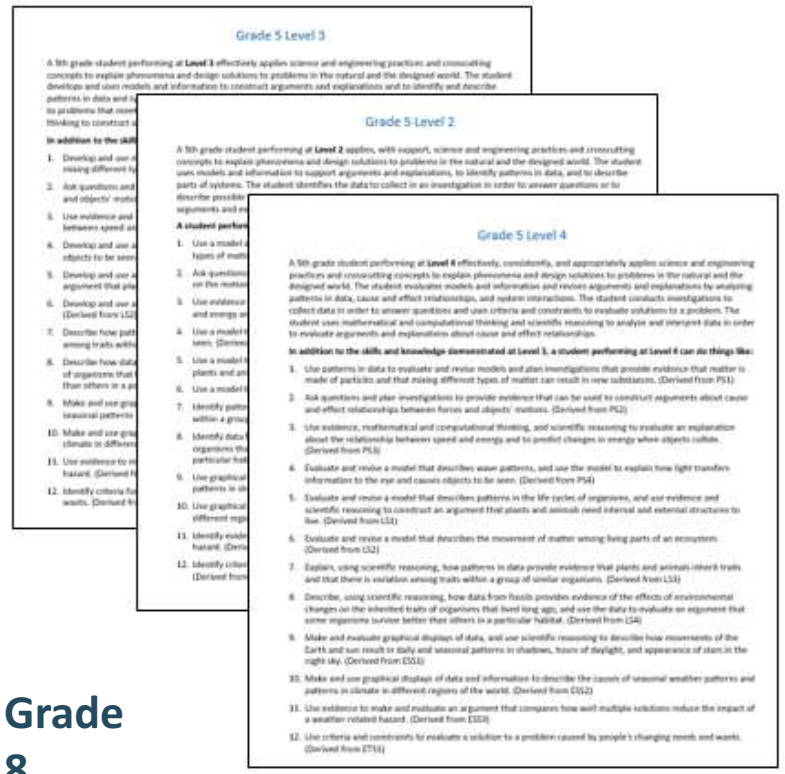
- Intended to describe the performance exhibited by students at Level 2, Level 3, and Level 4 on the WCAS for grades 5, 8, and 11.
- Can enhance understanding of a student's academic strengths and weaknesses and guide educators in planning.
- Derived from the *Washington State 2013 K–12 Science Learning Standards* which are the *Next Generation Science Standards*.
- Developed by Washington State science educators in November 2017
- Component of Achievement Level Setting
- Inform some individual score report language

- http://www.k12.wa.us/assessment/StateTesting/PLD/default.aspx

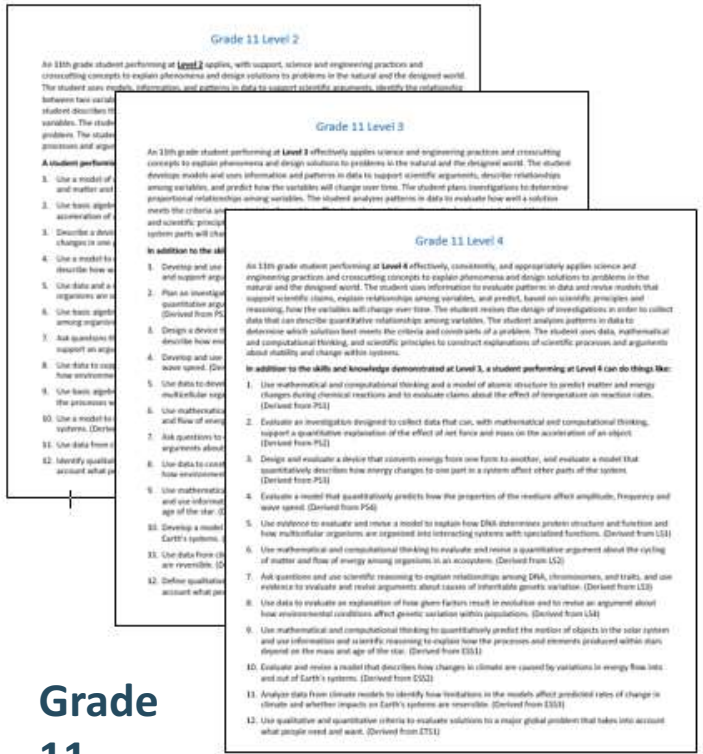
# Full Set of ALDs




**Grade 5**




**Grade 8**




**Grade 11**

# Grade 8 ALDs

## Grade 8 Level 2

An 8th grade student performing at **Level 2** applies, with support, science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student uses models, information, and patterns in data to describe relationships among parts of systems and to make predictions about how systems change over time. The student describes the data to collect in an investigation in order to identify the relationship between two variables. The student identifies a solution to a problem that meets given criteria for success. The student uses data and basic mathematical thinking to support arguments and explanations about cause and effect relationships among parts of systems.

**A student performing at Level 2 can do things like:**

1. Use a model and patterns in data to show that the number of particles does not change during chemical reactions and that particle motion changes when thermal energy is added to or removed from a system. (Derived from PS1)
2. Describe how evidence from a given investigation supports the argument that change in an object's motion depends on mass and force. (Derived from PS2)
3. Use information and graphical displays of data to describe qualitative relationships between speed, mass, and kinetic energy, and use evidence and basic mathematical thinking to support a given argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Use a model to describe the relationship between amplitude and wave energy and to identify that properties of a material determine whether a wave is reflected, absorbed, or transmitted. (Derived from PS4)
5. Use data from an investigation and a model to support the argument that organisms are made of cells that can form tissues, organs, and systems of organs. (Derived from LS1)
6. Use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Use models to identify differences between sexual or asexual reproduction and to identify which type of reproduction results in increased genetic variation. (Derived from LS3)
8. Identify patterns in fossil data that provide evidence for changes in populations over time and that support the explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Use models of the Earth-sun-moon system to identify the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Identify data that provide evidence that moving air masses affect weather conditions, and use a model to describe that unequal heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions and identify evidence to support arguments about one factor that has caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Define criteria for a successful solution to a problem that takes into account potential impacts on people and the environment. (Derived from ETS1)

## Grade 8 Level 3

An 8th grade student performing at **Level 3** effectively applies science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student develops models and uses information and patterns in data to describe relationships among parts of systems and to identify scientific principles that can be used to make predictions about how systems change over time. The student asks questions and plans investigations to determine the relationship between two variables. The student identifies criteria and constraints and uses patterns in data to evaluate solutions to problems. The student uses data and mathematical and computational thinking to construct arguments and explanations about how parts of a system depend on each other.

**In addition to the skills and knowledge demonstrated at Level 2, a student performing at Level 3 can do things like:**

1. Develop and use models and interpret patterns in data to show that mass is conserved during chemical reactions and to predict changes in particle motion when thermal energy is added to or removed from a system. (Derived from PS1)
2. Use data from an investigation to construct an argument about how change in motion depends on mass and force. (Derived from PS2)
3. Use information to construct graphical displays of data that describe quantitative relationships between speed, mass, and kinetic energy, and use evidence and mathematical and computational thinking to construct an argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Develop and use a model to describe the quantitative relationship between amplitude and wave energy and use properties of a material to predict whether a wave will be reflected, absorbed, or transmitted by a material. (Derived from PS4)
5. Use data from an investigation to develop a model and support the argument that organisms are made of cells that can form tissues, organs, and systems of organs. (Derived from LS1)
6. Develop and use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Develop and use models to describe sexual or asexual reproduction and to describe that only sexual reproduction results in increased genetic variation. (Derived from LS3)
8. Describe how patterns in fossil data provide evidence for changes in populations over time, and use the data to construct an explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Develop and use models of the Earth-sun-moon system to describe the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Describe how data provide evidence that moving air masses affect weather conditions, and develop and use a model that describes how uneven heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions that can provide evidence that supports arguments about multiple factors that have caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Define criteria for success and constraints on a solution to a problem that takes into account potential impacts on people and the environment. (Derived from ETS1)

## Grade 8 Level 4

An 8th grade student performing at **Level 4** effectively, consistently, and appropriately applies science and engineering practices and crosscutting concepts to explain phenomena and design solutions to problems in the natural and the designed world. The student evaluates how well models, information, and patterns in data describe relationships among parts of systems, and uses scientific principles and reasoning to make predictions about how systems change over time. The student plans and evaluates investigations designed to determine the relationship between two variables. The student uses patterns in data to determine which solution to a problem best meets the criteria for success. The student uses data, mathematical and computational thinking, and scientific reasoning to construct and evaluate arguments and explanations about how parts of a system depend on each other.

**In addition to the skills and knowledge demonstrated at Level 3, a student performing at Level 4 can do things like:**

1. Analyze and interpret patterns in data in order to evaluate and revise a model that describes how mass is conserved during chemical reactions and to explain predicted changes in particle motion when thermal energy is added to or removed from a system. (Derived from PS1)
2. Plan an investigation to produce evidence that can be used to evaluate an argument about how change in motion depends on mass and force. (Derived from PS2)
3. Use information to construct graphical displays of data and evaluate how well the data describe quantitative relationships between speed, mass, and kinetic energy, and use evidence, mathematical and computational thinking, and scientific reasoning to construct an argument about energy transfers and changes in kinetic energy. (Derived from PS3)
4. Evaluate and revise a model that describes the quantitative relationship between amplitude and wave energy, and use scientific reasoning to predict whether a wave will be reflected, absorbed, or transmitted by a material based on the properties of the material. (Derived from PS4)
5. Use data from an investigation to revise a model and evaluate the argument that organisms are made of cells that can form tissues, organs, and systems of organs. (Derived from LS1)
6. Evaluate and revise a model that describes the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (Derived from LS2)
7. Evaluate and revise models of sexual and asexual reproduction, and explain, using scientific reasoning, how only sexual reproduction results in increased genetic variation. (Derived from LS3)
8. Describe, using scientific reasoning, how patterns in fossil data provide evidence for changes in populations over time, and use the data to evaluate the explanation that some organisms survive better than other organisms because of differences in traits. (Derived from LS4)
9. Evaluate and revise models of the Earth-sun-moon system and explain, using scientific reasoning, the patterns of movement that cause lunar phases, eclipses, and seasons. (Derived from ESS1)
10. Describe, with scientific reasoning, how data provide evidence that moving air masses affect weather conditions, and evaluate and revise a model that describes how uneven heating and the rotation of Earth cause regional climates. (Derived from ESS2)
11. Ask questions and use evidence to construct arguments about how multiple factors have caused the rise in global temperatures over the past century. (Derived from ESS3)
12. Use criteria and constraints to evaluate a solution to a problem that takes into account scientific principles and potential impacts on people and the environment. (Derived from ETS1)

# Alignment Study

- July 31-August 1, Olympia
- 5 Washington State Educators per grade level panel (5, 8, 11)
  - New to state science assessment development
- Designed to answer two key questions:
  - How well does the test design/blueprint represent the NGSS?
  - How well do the set of items on each form match the design/blueprint?

*Both questions were answered with “Meets Expectations”

# WCAS Design and Features

# State Science Standards

- Washington State adopted the NGSS as science learning standards in October of 2013.
  - *Washington State 2013 K-12 Science Learning Standards*
- WCAS first administered in Spring 2018
  - 5, 8, 11

# NGSS Resources

- Next Generation Science Standards (NGSS)
- NGSS Appendices
- K–12 Framework for Science Education

# Washington Comprehensive Assessment of Science (WCAS)

| Washington State 2013 K-12 Science Learning Standards<br>Next Generation Science Standards (NGSS) | | |
|---|---|---|
| Grade 5 | Grade 8 | Grade 11 |
| 3-5 band | Middle School band | High School band |

http://www.k12.wa.us/Science/Standards.aspx

# Performance Expectations per Grade Band

| Grade Band | Number of Three-Dimensional Performance Expectations | | | | |
|---|---|---|---|---|---|
| | Physical Sciences Domain | Life Sciences Domain | Earth and Space Sciences Domain | Engineering Domain | Total |
| 3-5 | 17 | 12 | 13 | 3 | 45 |
| Middle school | 19 | 21 | 15 | 4 | 59 |
| High school | 24 | 24 | 19 | 4 | 71 |

**Each Performance Expectation (PE) includes a Science and Engineering Practice, a Disciplinary Core Idea, and a Cross-cutting Concept**

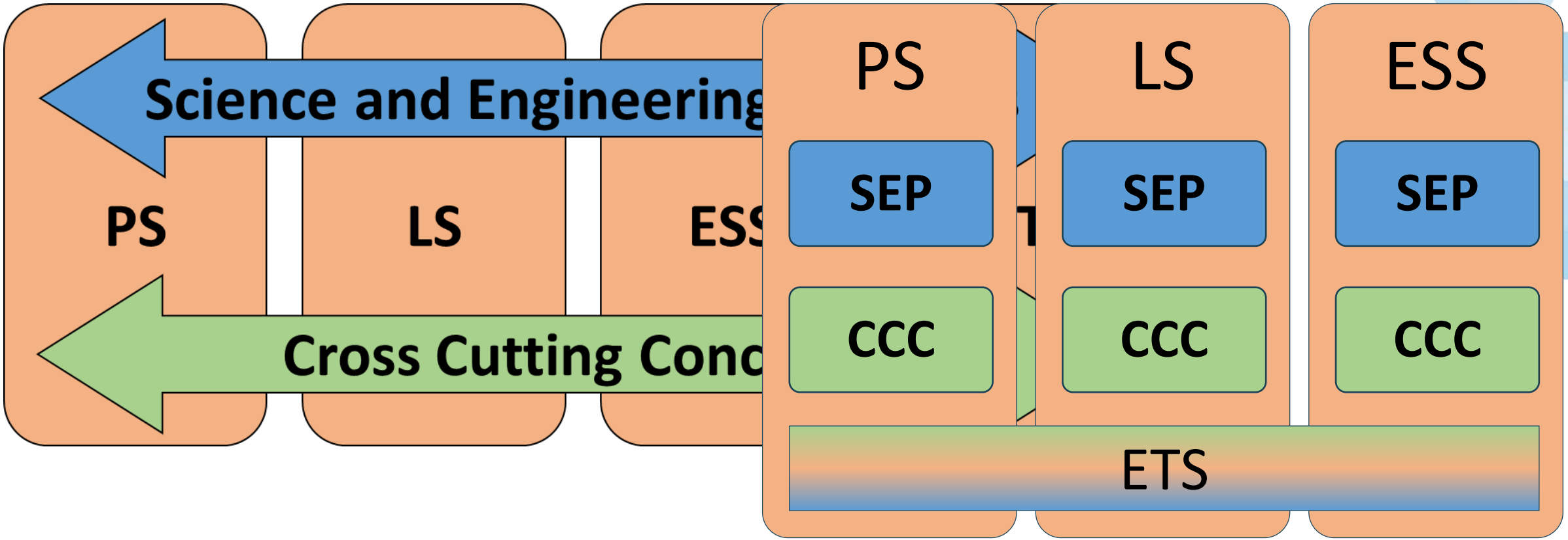
# WCAS Reporting Areas

| Reporting Area | Grade 5 | Grade 8 | Grade 11 |
|---|---|---|---|
| Science and Engineering Practice and Cross-Cutting Concepts in Physical Sciences | 17 Performance Expectations<br>40 %<br>~14 pts | 19 Performance Expectations<br>35 %<br>~14 pts | 24 Performance Expectations<br>36 %<br>~16 pts |
| Science and Engineering Practice and Cross-Cutting Concepts in Life Sciences | 12 Performance Expectations<br>29 %<br>~10 pts | 21 Performance Expectations<br>38 %<br>~15 pts | 24 Performance Expectations<br>36 %<br>~16 pts |
| Science and Engineering Practice and Cross-Cutting Concepts in Earth and Space Sciences | 13 Performance Expectations<br>31 %<br>~11 pts | 15 Performance Expectations<br>27 %<br>~11 pts | 19 Performance Expectations<br>28 %<br>~13 pts |
| **Total Points** | **35** | **40** | **45** |

**ETS PEs assessed but not included here.**

The 3-Dimensional nature of the *Next Generation Science Standards* (NGSS)…

…is measured by the WCAS and reported in three reporting areas:

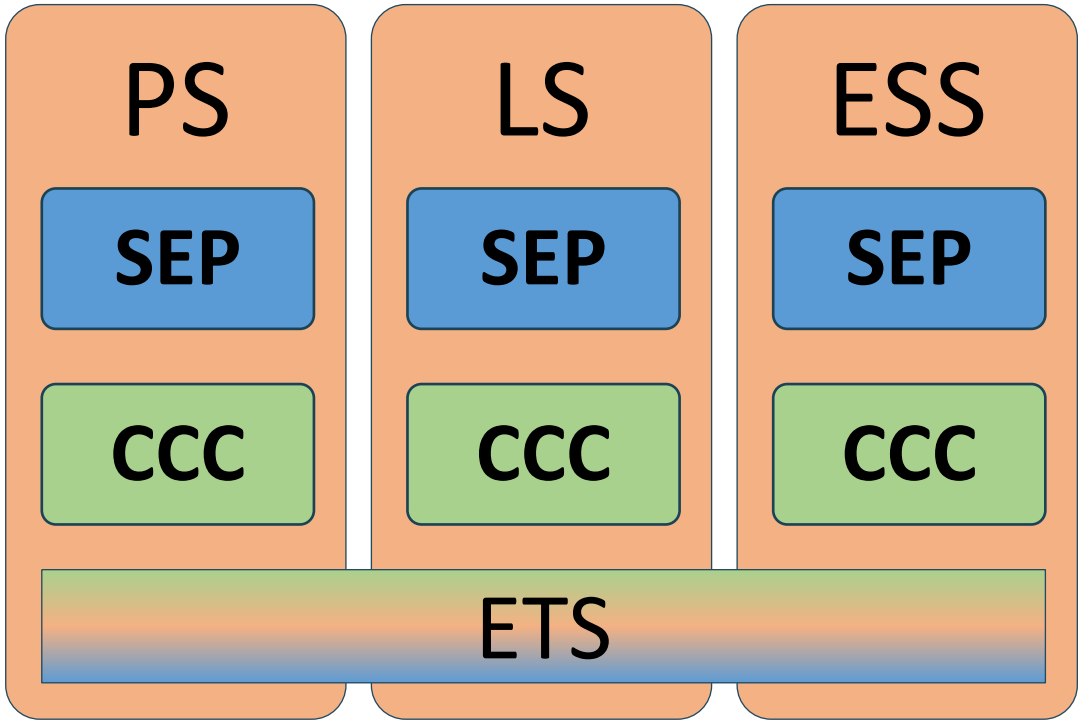


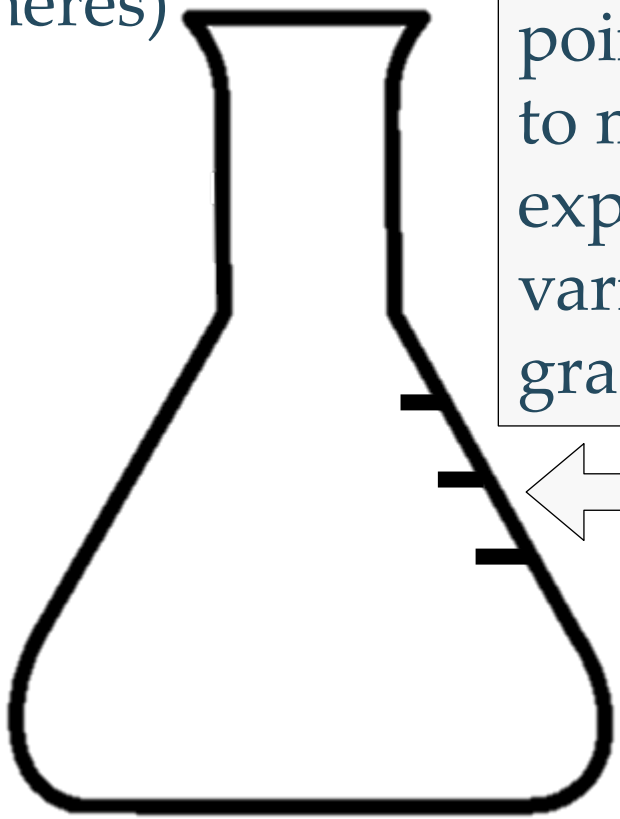
# Sample Cluster Alignment

| Sample Cluster | Item Type | Score Point | Performance Expectation Alignment | Science & Engineering Practice | Disciplinary Core Idea | Crosscutting Concept |
|---|---|---|---|---|---|---|
| Item 1 | Multiple Select | 1 | HS-LS2-3 | Constructing Explanations and Designing Solutions | LS2.B | Energy and Matter |
| Item 2 | Table Match | 1 | HS-LS2-3<br>HS-ETS1-3 | Constructing Explanations and Designing Solutions | LS2.B<br>ETS1.B | Influence of Science, Engineering, and Technology on Society and the Natural World |
| Item 3 | Graphic Gap Match | 2 | HS-LS2-3 | - | LS2.B | Energy and Matter |
| Item 4 | Edit Task Inline Choice | 1 | HS-LS2-3<br>HS-ETS1-3 | Constructing Explanations and Designing Solutions | LS2.B<br>ETS1.B | Influence of Science, Engineering, and Technology on Society and the Natural World |

A student who correctly answers all of the items from the sample cluster earns five points, all in the reporting area "Practices and Crosscutting Concepts in Life Sciences"

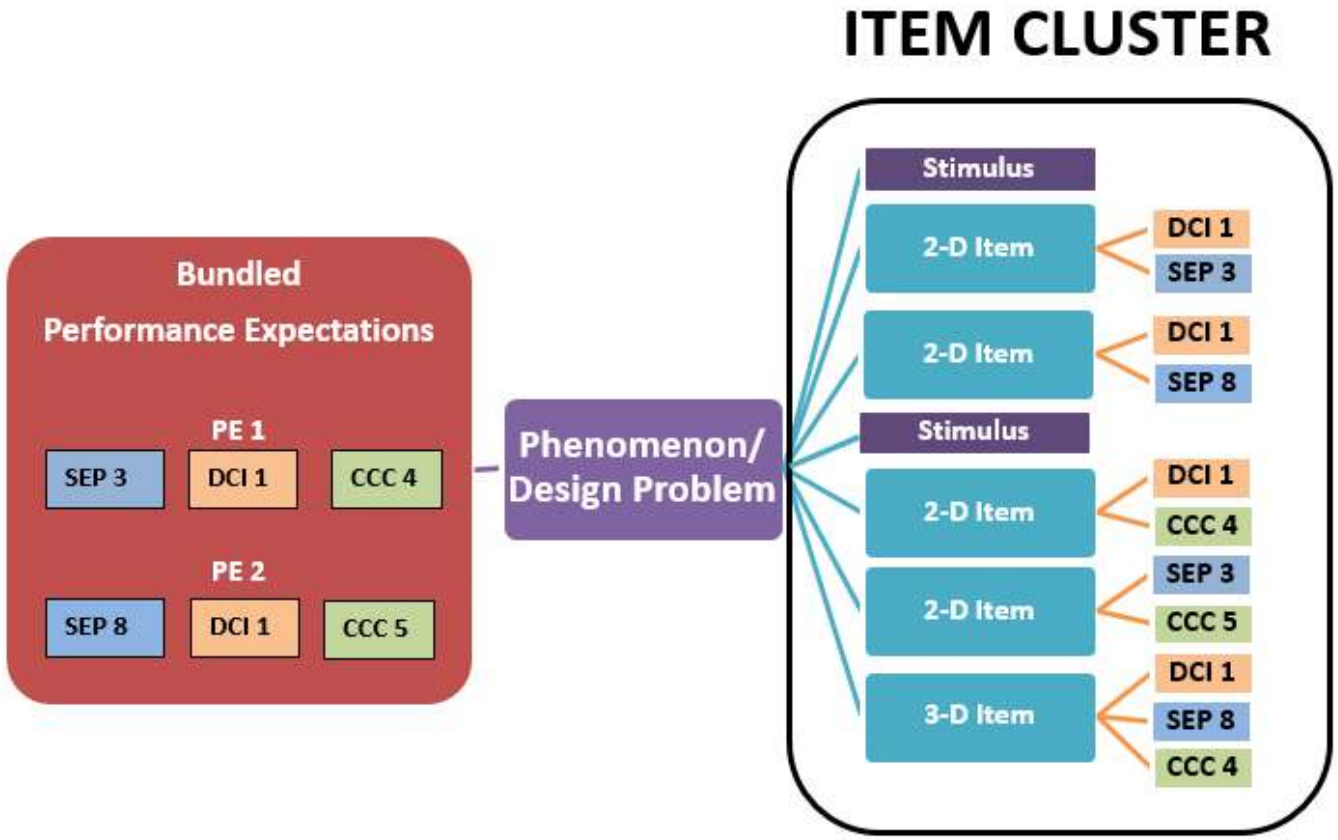
All points are weighted equally (same size spheres)



The number of points needed to meet expectations varies by grade level

# Item Cluster Map



# Standalone Items

- Allow more PEs to be assessed on a test
- Are 2 or 3 dimensional
- Can have multiple parts
- Computer scored item types only

# WCAS Features

- All online
- Item Clusters and Standalone Items
- Item Types:
  - Selected Response—multiple choice, multiple select
  - Constructed Response—short answer
  - Technology enhanced—ex: drag and drop, drop-down choices, simulations
- Multi-part items
  - Parts labeled with letters A, B, and C.
  - May have a mix of item types. Parts work together. May ask for evidence to support answer in previous part of the item.

# Structure and Test Length

- Structure
  - Operational
    - Grades 5 and 8: 5 Clusters and 6-12 Standalone items
    - High School: 6 Clusters and 6-12 Standalone items
    - Counts toward a student's score
  - Field test items
    - Embedded in the online administration
    - One cluster and/or standalone items
      - 2019 Field test—standalone items
    - Does not count toward a student score
  - All items are aligned to 2 or 3 dimensions of a PE

- Test Length
  - Grade 5: 90 minutes
  - Grade 8: 110 minutes
  - Grade 11: 120 minutes

- Administration
  - Can be administered in multiple sessions like the Smarter Balanced ELA and Math assessments
  - 1 to 3 sessions recommended

# Item Cluster Screenshot from the WCAS Grade 5 Training Test

**Section 1—Soggy Solutions**

**Section 2—Soggy Solutions**

The students used a stream table to model the ditch and the playfield. The stream table is shown in the Ditch and Playfield Model diagram.

**Ditch and Playfield Model**

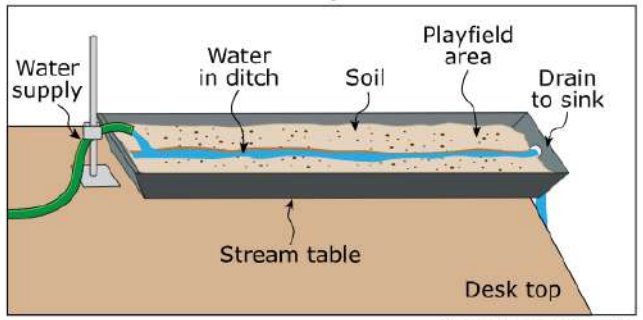



Diagram not to scale

The students used the stream table to test each solution. All three solutions kept water from flowing out of the ditch onto the playfield.

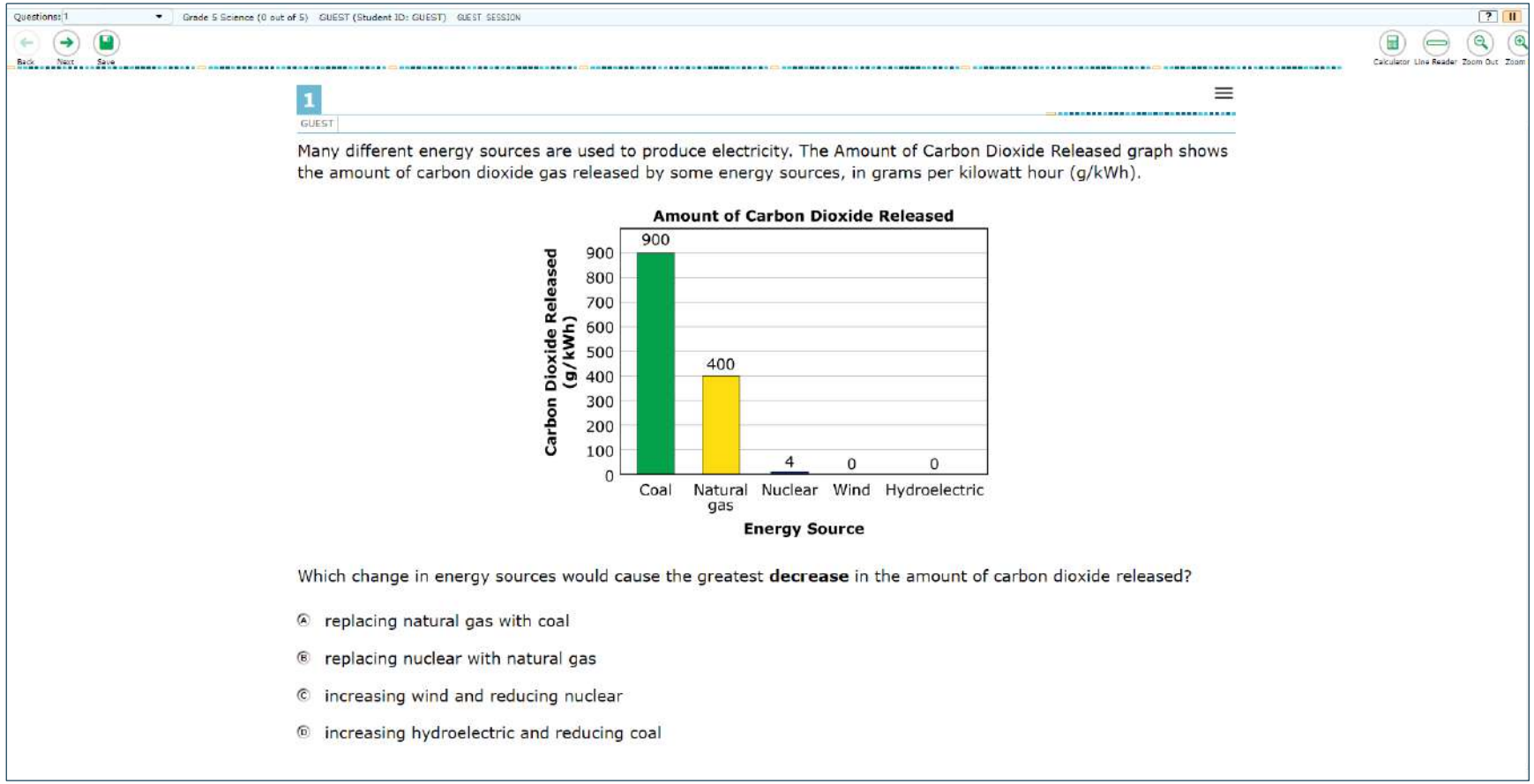
4

GUEST

Select **three** statements that describe reasons to use a stream table to test possible solutions during the design process.

- ☐ The stream table conditions are exactly the same as the conditions in the real ditch.
- ☐ The stream table shows the time needed for water to soak in to the playground soil.
- ☐ The stream table allows all three solutions to be tested without waiting for heavy rainfall.
- ☐ The stream table tests all three solutions without affecting the environment around the ditch.
- ☐ The stream table allows students to collect data more quickly than testing with the real ditch.

# Screenshot from the WCAS Grade 5 Training Test



# Special WCAS Features

- Collapsing stimuli
  - First stimulus is hidden when second stimulus is provided.
  - Both stimuli are available to the student.

- Locking Items
  - Student can answer the question only once.
  - Allows subsequent questions to update with correct information.
  - An “attention” box warns student that they won’t be able to change their answer.

# Example of Collapsible Stimuli

Questions: 4 | Grade 8 Science (3 out of 6) | GUEST (Student ID: GUEST) | GUEST SESSION

Back | Next | Save | Periodic Table | Calculator | Line Reader | Zoom Out | Zoom In

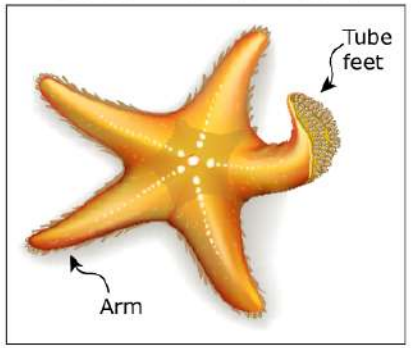
**Section 1—Sea Star Reproduction**

**Section 2—Sea Star Reproduction**

**Section 3—Sea Star Reproduction**

Sea stars have tube feet for walking, climbing, and grasping. The Sea Star External Anatomy diagram shows the appearance and location of tube feet on a sea star.

**Sea Star External Anatomy**



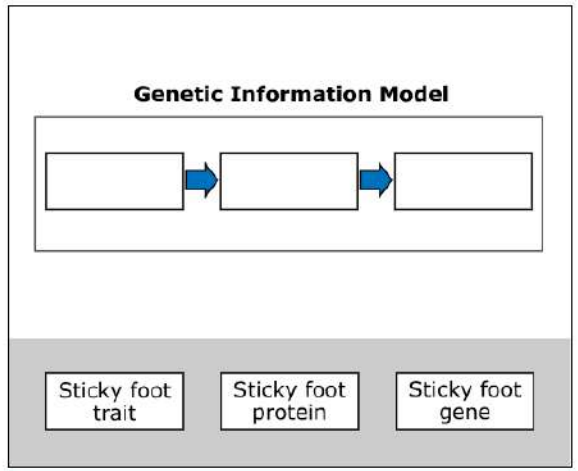

There are cells in the tube feet of sea stars that produce a protein that acts like glue. The protein makes the tube feet sticky.

4

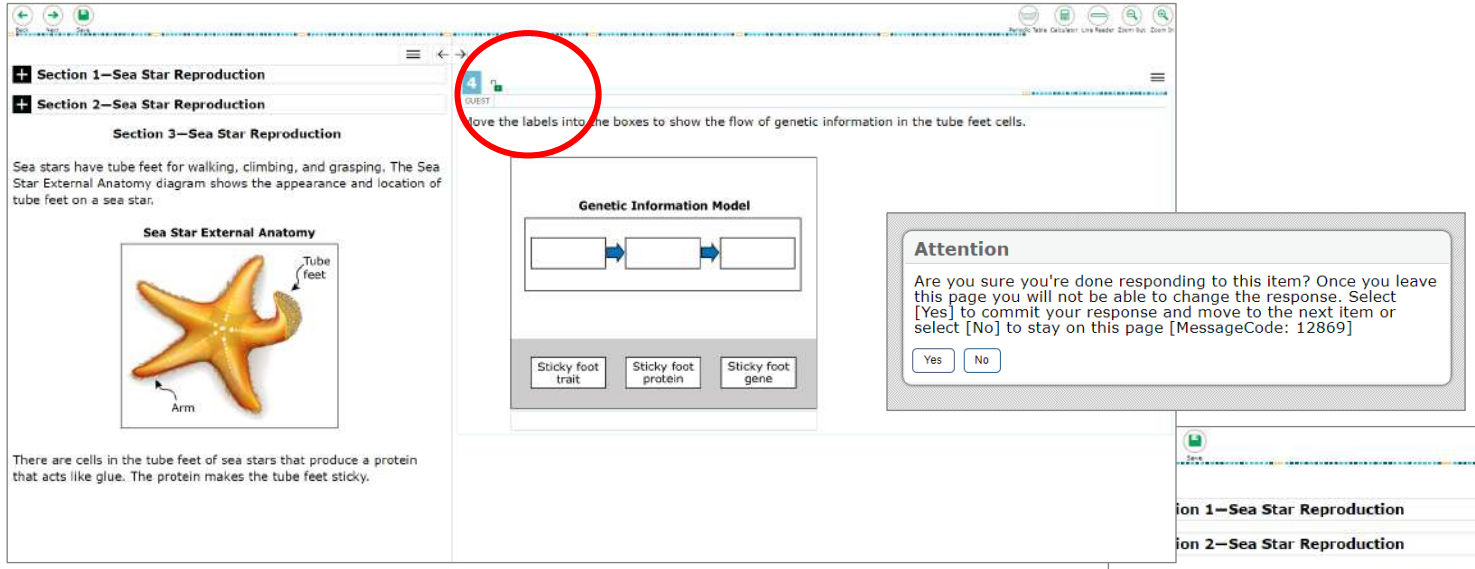
GUEST

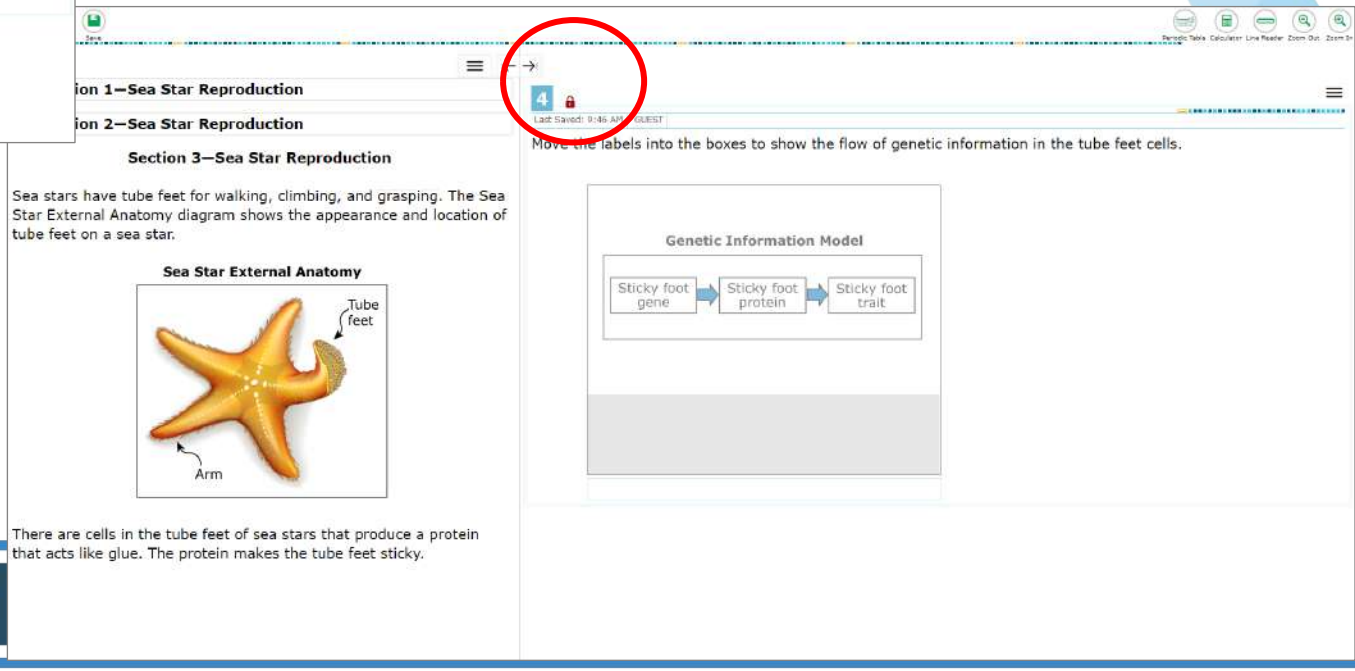
Move the labels into the boxes to show the flow of genetic information in the tube feet cells.

**Genetic Information Model**



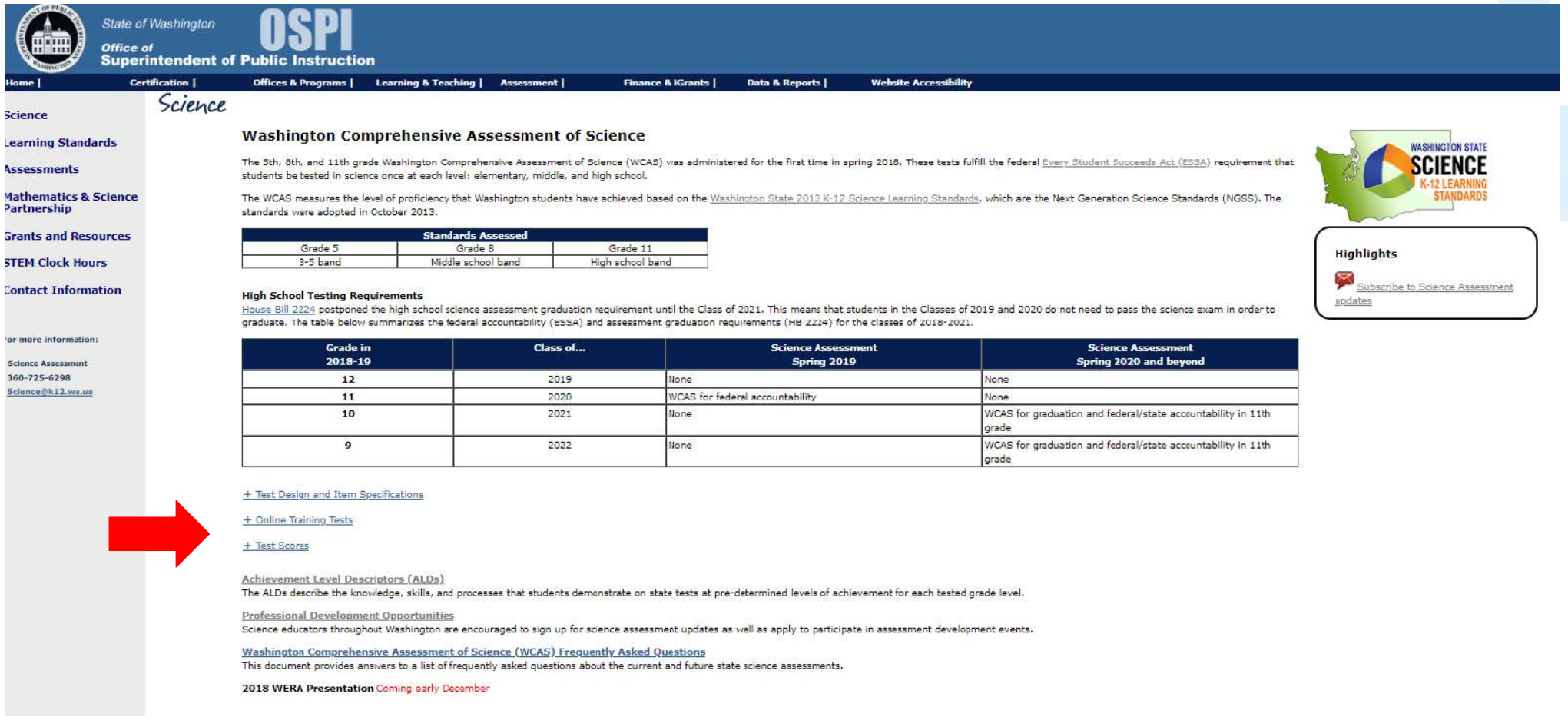
# Example of Locking Feature



# Assessment Resources

# Science Assessment Webpage



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## Washington Comprehensive Assessment of Science

The 5th, 8th, and 11th grade Washington Comprehensive Assessment of Science (WCAS) was administered for the first time in spring 2018. These tests fulfill the federal Every Student Succeeds Act (ESSA) requirement that students be tested in science once at each level: elementary, middle, and high school.

The WCAS measures the level of proficiency that Washington students have achieved based on the Washington State 2013 K-12 Science Learning Standards, which are the Next Generation Science Standards (NGSS). The standards were adopted in October 2013.

| Standards Assessed | | |
|---|---|---|
| Grade 5 | Grade 8 | Grade 11 |
| 3-5 band | Middle school band | High school band |

**High School Testing Requirements**

House Bill 2224 postponed the high school science assessment graduation requirement until the Class of 2021. This means that students in the Classes of 2019 and 2020 do not need to pass the science exam in order to graduate. The table below summarizes the federal accountability (ESSA) and assessment graduation requirements (HB 2224) for the classes of 2018-2021.

| Grade in 2018-19 | Class of... | Science Assessment Spring 2019 | Science Assessment Spring 2020 and beyond |
|---|---|---|---|
| 12 | 2019 | None | None |
| 11 | 2020 | WCAS for federal accountability | None |
| 10 | 2021 | None | WCAS for graduation and federal/state accountability in 11th grade |
| 9 | 2022 | None | WCAS for graduation and federal/state accountability in 11th grade |

+ Test Design and Item Specifications

+ Online Training Tests

+ Test Scores

Achievement Level Descriptors (ALDs)
The ALDs describe the knowledge, skills, and processes that students demonstrate on state tests at pre-determined levels of achievement for each tested grade level.

Professional Development Opportunities
Science educators throughout Washington are encouraged to sign up for science assessment updates as well as apply to participate in assessment development events.

Washington Comprehensive Assessment of Science (WCAS) Frequently Asked Questions
This document provides answers to a list of frequently asked questions about the current and future state science assessments.

**2018 WERA Presentation** Coming early December

WASHINGTON STATE SCIENCE K-12 LEARNING STANDARDS

**Highlights**

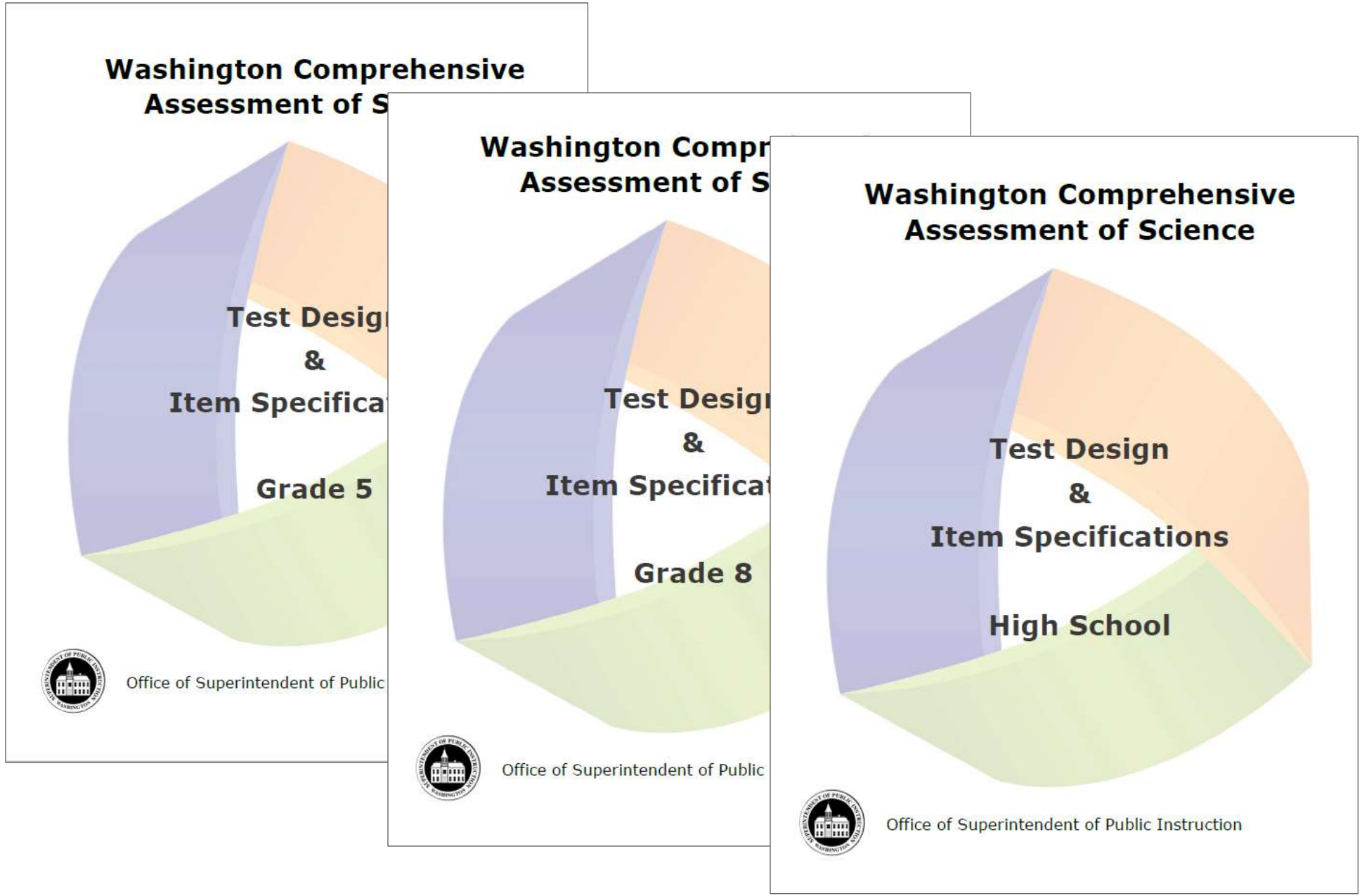
Subscribe to Science Assessment updates

- http://www.k12.wa.us/Science/Assessments.aspx

# Test and Item Specifications

- Describe how item clusters (stimuli and items) and standalone items for the WCAS are developed to assess the NGSS
- Contents
  - Structure of the test
  - Item Types
  - Test organization
  - Overview of NGSS
  - Item specifications that Describe how students can demonstrate understanding of the PEs on the state test.

- The second draft of the Test Design and Item Specifications documents will be released in December 2018:
  - Grade 5 Front matter + item specifications for approximately 22 G5 PEs
  - Grade 8 Front matter + item specifications for approximately 18 G8 PEs
  - Grade 11 Front matter + item specifications for approximately 22 G11 PEs
- The remainder of the individual PE item specifications are scheduled for release in by the end of the 2018-2019 school year.
- The Item Specifications will be updated annually based on WA educator feedback.
- A modification log will be posted at each subsequent publication.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Washington Comprehensive
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Item Specifications
High School
Office of Superintendent of Public Instruction

| Performance Expectation | **4-LS1-1** Construct an argument that plants and animals have int structures that function to support survival, growth, behavior, an | | |
|---|---|---|---|
| Dimensions | **Science & Engineering Practice** | **Disciplinary Core Idea** | **Crossc** |
| | **Engaging in Argument from Evidence**<br>Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).<br>• Construct an argument with evidence, data, and/or a model. | **LS1.A: Structure and Function**<br>• Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. | **Systen Models**<br>• A syst descri compo intera |
| These item specifications were developed using the following reference n | | | |
| K–12 Framework | pp. 71–74 | pp. 143–145 | pp. 91- |
| NGSS Appendices | Appendix F<br>pp. 13–14 | Appendix E<br>p. 4 | Append<br>pp. 7–8 |
| Clarification Statement | Examples of structures could include thorns, stems, roots, colored stomach, lung, brain, and skin. | | |
| Assessment Boundary | Assessment is limited to macroscopic structures within plant and | | |

Items may ask students to:

| Code | Alignment | Item Specification |
|---|---|---|
| 4-LS1-1.1 | SEP-DCI-CCC | **Construct** an **argument** using **system models** to describe plants and/or animals in terms of their **structures** and how the structures interact to serve various survival, growth, behavioral, and/or reproductive **functions**. |
| 4-LS1-1.2 | SEP-DCI | **Construct** an **argument** to show that plant and/or animal **structures** serve various survival, growth, behavioral, and/or reproductive **functions**. |
| 4-LS1-1.3 | DCI-CCC | Use **system models** to show how plant and/or animal **structures** serve various survival, growth, behavioral, or reproductive **functions.** |
| 4-LS1-1.4 | SEP-CCC | **Construct** an **argument** that connects system components and interactions in a **system model**. |

**Details and Clarifications**

- **Construct** an **argument** is expanded to include:
  - using evidence to support an argument and/or claim
  - developing an argument based on evidence, data, or a simple model
  - distinguishing between observations and inferences in an explanation or argument
  - comparing and/or refining arguments based on evidence
  - providing feedback on an explanation or argument
- **Structures** and **functions** may include, but are NOT limited to, structures that work together to support:
  - plants
    - obtaining water/sunlight/air
    - growing toward sunlight and/or water
    - defending against herbivores
    - attracting pollinators
  - animals
    - pumping blood/breathing/moving/digesting food
    - obtaining food
    - defending against predators
    - attracting mates
- **System models** may include, but are NOT limited to:
  - an entire organism (plant or animal)
  - a subsystem within a plant or animal
  - the interactions of structures working together within a plant or animal system or subsystem

# Science Training Tests

- Help students become familiar with the features and tools of online tests.
- Became available on the WCAP portal in December 2017.
- Grades 5, 8, and high school
  - One cluster (stimuli and items) and one standalone item at each grade
  - All three training tests should be used at each grade level to experience most online item types

- Classroom instruction should align to the *Washington State K–12 Science Learning Standards* (*NGSS*), not the WCAS.

# Formative Assessment Resources

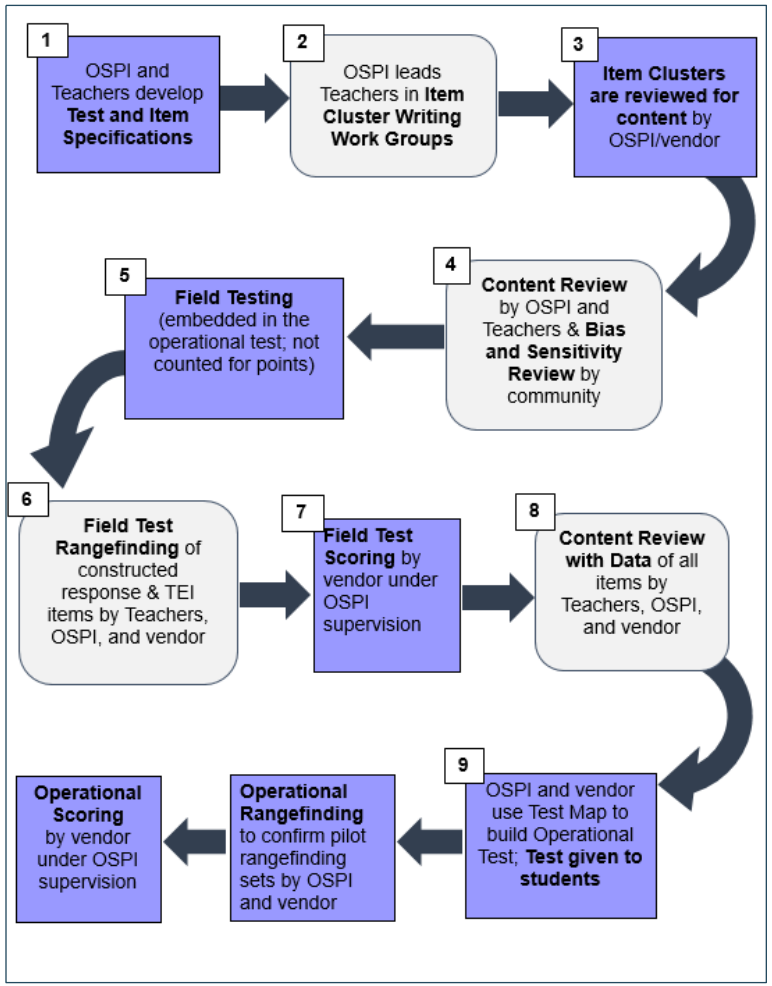
- Formative assessment resources are available that can help you and your students measure progress toward learning the Science K-12 Learning Standards as assessed on the WCAS
- STEM Teaching Tools website
  - Includes tools that can help teach science, technology, engineering and math (STEM) and is currently focused on supporting the teaching of the Next Generation Science Standards (NGSS). Each tool is focused on a specific issue and leverages the best knowledge from research and practice.
- Recommended tools:
  - Prompts for Integrating Crosscutting Concepts Into Assessment and Instruction
  - Integrating Science Practices Into Assessment Tasks
  - How can formative assessment support culturally responsive argumentation in a classroom community?
  - How can assessments be designed to engage students in the range of science and engineering practices?
  - Steps to Designing a Three Dimensional Assessment

# WCAS Development

# Goals for WCAS

- Design an assessment that reflects how science content is taught and tested in the classroom.
- Use WA educators in assessment development.
- Develop high quality item clusters and standalone items that achieve alignment to the SEPs, DCIs, CCCs represented in a PE or PE bundle.
- Design an assessment that allows for valid and reliable inferences to be drawn from the results.
- Design an assessment that ensures the fair and accurate assessment of students in special populations.

# Science Assessment Development Cycle



# Educator Work Group Descriptions

- **(2) Item Cluster Writing Workgroup:** Teams of 2-3 educators write stimuli, items, and rubrics designed to validly measure student understanding of the NGSS.

- **(4) Content Review Workgroup:** Educators review the products of the Item Cluster Writing Workgroup to ensure that every stimulus, item, and rubric is scientifically accurate and gathers appropriate evidence about student skill with the NGSS. At the same time, a separate committee of community members reviews the items and stimuli for any bias and sensitivity issues. Recommendations from the Bias/Sensitivity Review Workgroup are considered by the Content Review Workgroup.

- **(6) Field Test Rangefinding and Rubric Validation Workgroups:** Educators look at a range of student responses to each item and decide how to score each response. This educator workgroup refines scoring rubrics and produces the materials that will be used to score the field test items.

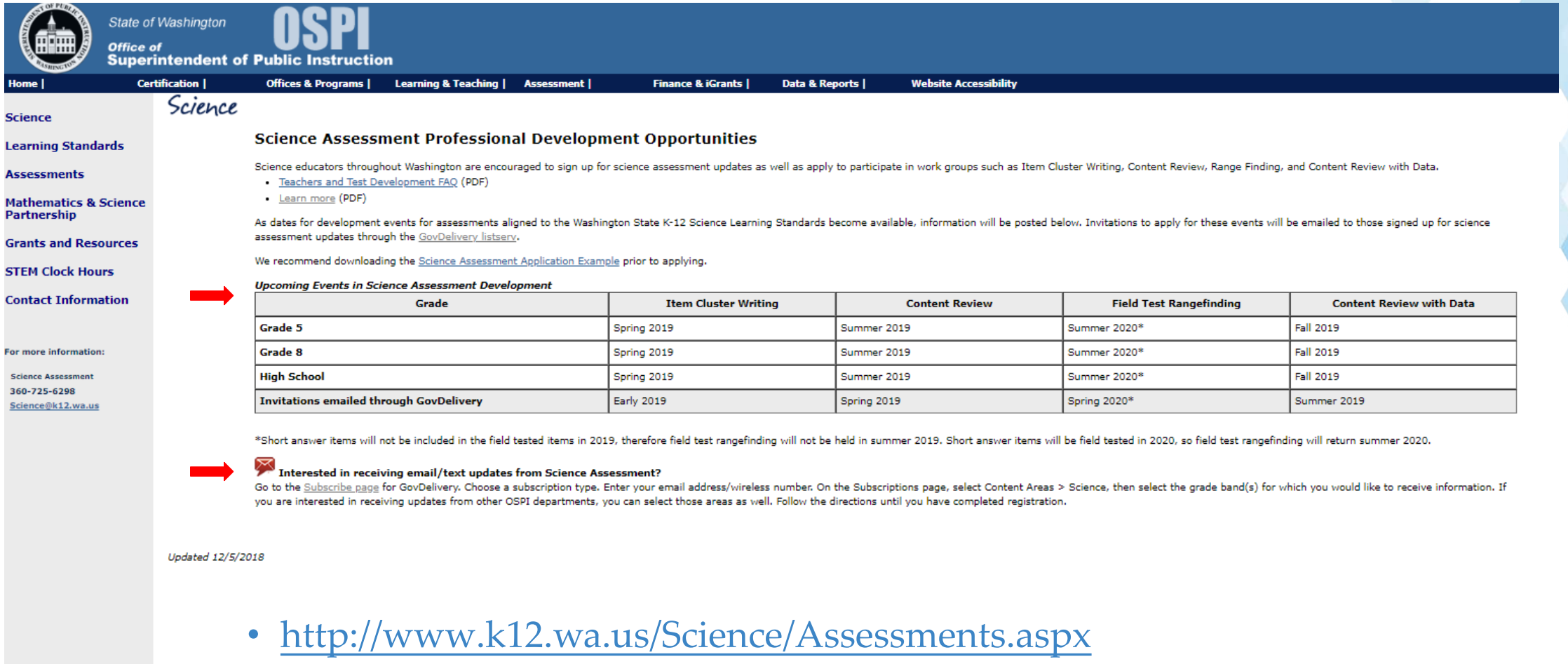
- **(8) Content Review with Data Workgroup:** Educators use item performance data, as well as members' science content knowledge, to decide whether each item should advance into the item bank.

# Upcoming Professional Development Opportunities

| Event | Timing |
|---|---|
| Item Cluster Writing | Spring 2019 |
| Content Review | Summer 2019 |
| Field Test Range Finding * | Summer 2020 |
| Content Review with Data* | Fall 2019 |

*Only standalone items will be field tested this year so Field Test Rangefinding will not occur this summer. Field Test Range Finding will return summer 2020 and thereafter.

# Science Assessment Webpage



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## Science Assessment Professional Development Opportunities

Science educators throughout Washington are encouraged to sign up for science assessment updates as well as apply to participate in work groups such as Item Cluster Writing, Content Review, Range Finding, and Content Review with Data.

- Teachers and Test Development FAQ (PDF)
- Learn more (PDF)

As dates for development events for assessments aligned to the Washington State K-12 Science Learning Standards become available, information will be posted below. Invitations to apply for these events will be emailed to those signed up for science assessment updates through the GovDelivery listserv.

We recommend downloading the Science Assessment Application Example prior to applying.

***Upcoming Events in Science Assessment Development***

| Grade | Item Cluster Writing | Content Review | Field Test Rangefinding | Content Review with Data |
|---|---|---|---|---|
| **Grade 5** | Spring 2019 | Summer 2019 | Summer 2020* | Fall 2019 |
| **Grade 8** | Spring 2019 | Summer 2019 | Summer 2020* | Fall 2019 |
| **High School** | Spring 2019 | Summer 2019 | Summer 2020* | Fall 2019 |
| **Invitations emailed through GovDelivery** | Early 2019 | Spring 2019 | Spring 2020* | Summer 2019 |

*Short answer items will not be included in the field tested items in 2019, therefore field test rangefinding will not be held in summer 2019. Short answer items will be field tested in 2020, so field test rangefinding will return summer 2020.

**Interested in receiving email/text updates from Science Assessment?**
Go to the Subscribe page for GovDelivery. Choose a subscription type. Enter your email address/wireless number. On the Subscriptions page, select Content Areas > Science, then select the grade band(s) for which you would like to receive information. If you are interested in receiving updates from other OSPI departments, you can select those areas as well. Follow the directions until you have completed registration.

*Updated 12/5/2018*

- http://www.k12.wa.us/Science/Assessments.aspx

# Stay informed and get involved

## Sign up for GovDelivery messages

- Go to the Subscribe page for GovDelivery. Enter your email address. On the Subscriptions page, select Content Areas > Science, then select the grade band(s) for which you would like to receive information.

# Thank you!