Washington **C**omprehensive **A**ssessment of **S**cience

Test Design & Item Specifications

High School

Science Assessment Development Team

February 6, 2020

Washington Office of Superintendent of
PUBLIC INSTRUCTION

Logistics

- Webinar Recording, PowerPoint slides and FAQ

  https://www.k12.wa.us/student-success/testing/state-testing-overview/washington-comprehensive-assessment-science/wcas-educator-resources
- Chat Box
- pdEnroller

  https://www.pdenroller.org

Objectives

- Share the design and development of the Grade 11 WCAS
- Share how Grade 11 WCAS items are aligned to and assess the *2013 Washington State K-12 Science Learning Standards* which are the *Next Generation Science Standards*, or *NGSS*.

Contact Information

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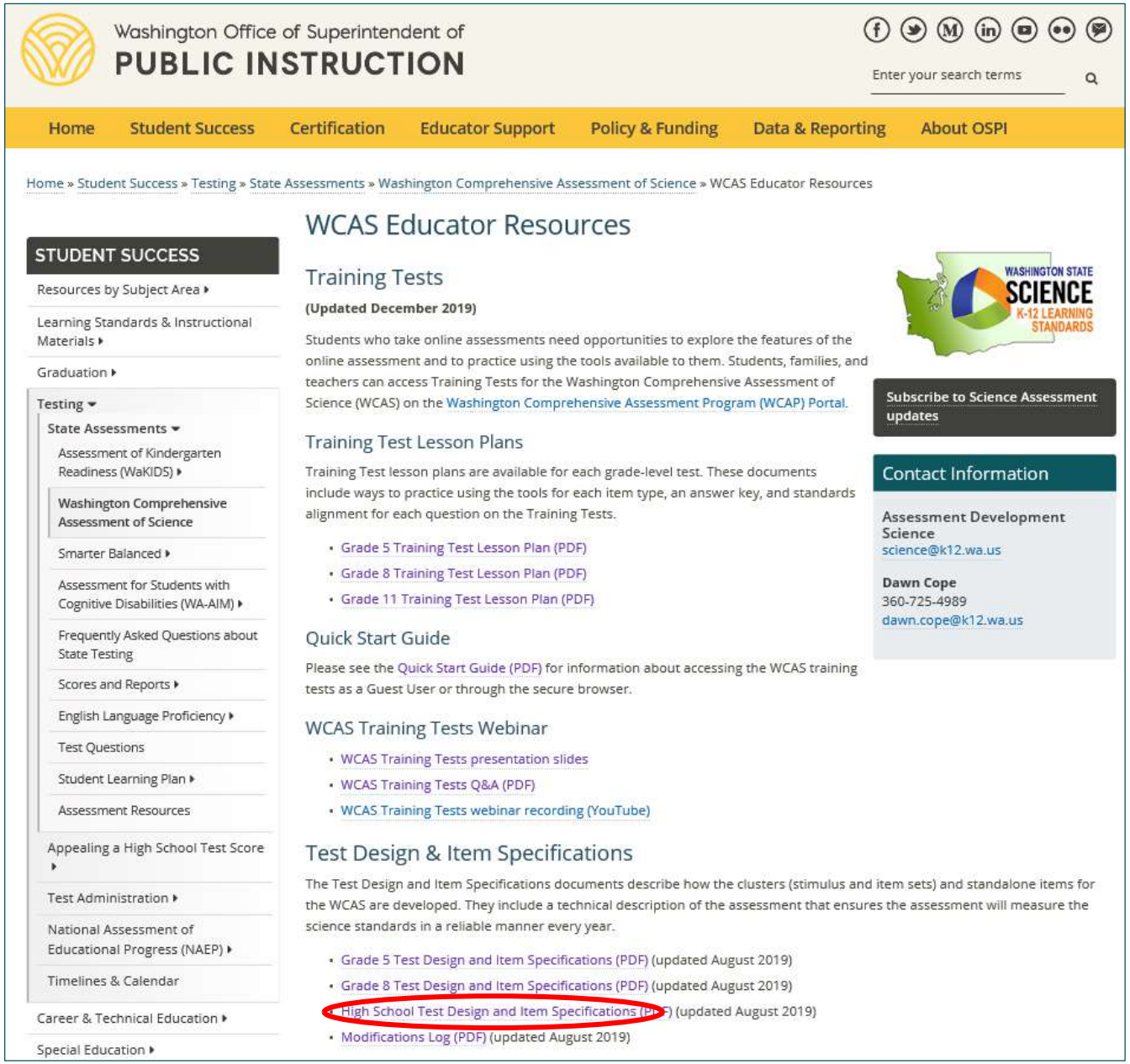
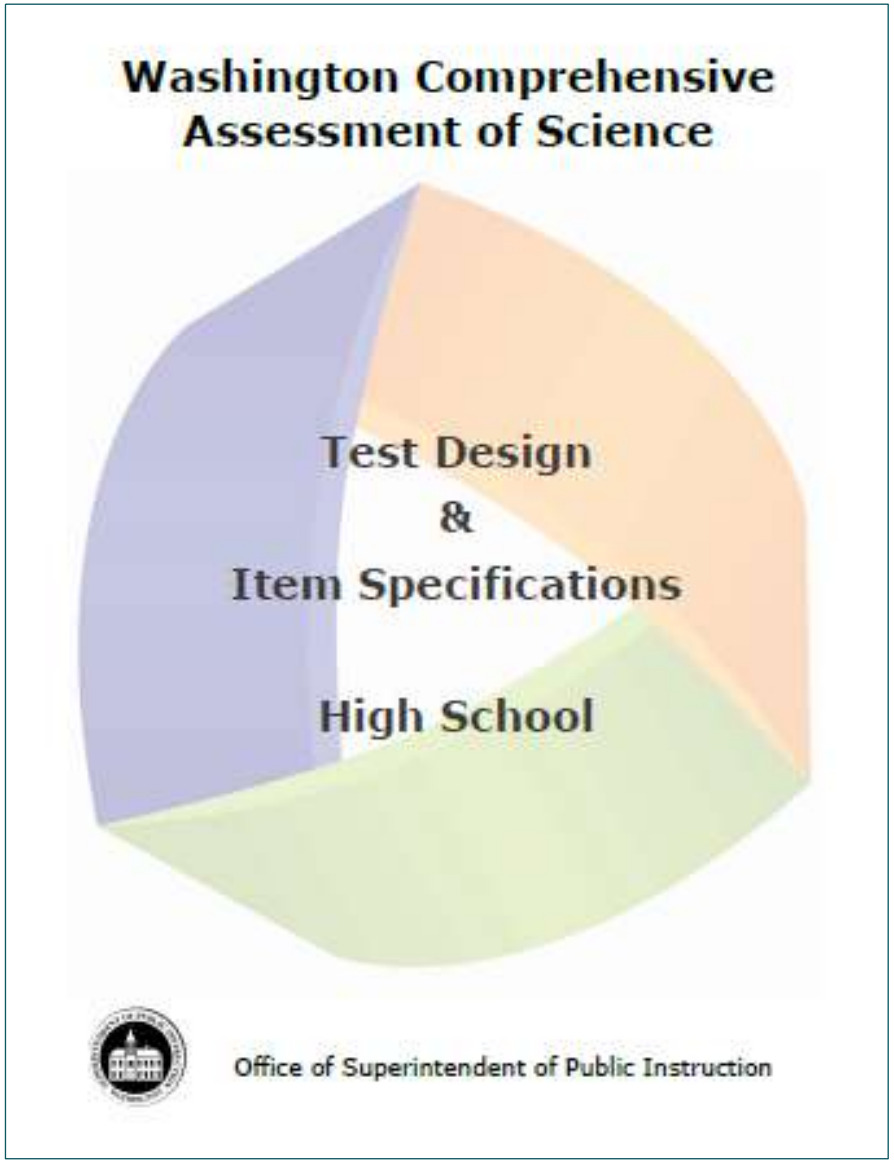
Test Design and Item Specifications – High School

https://www.k12.wa.us/student-success/testing/state-testing-overview/washington-comprehensive-assessment-science/wcas-educator-resources



Document Components

- Test Design (pages 1-14)
  - Development Cycle
  - Structure of the Test
  - Item Types
  - Test Structure
  - Standards Overview
  - Resources and References
- Item Specifications (pages 15-165)
- SEP, DCI, and CCC Vocabulary (pages 166-169)

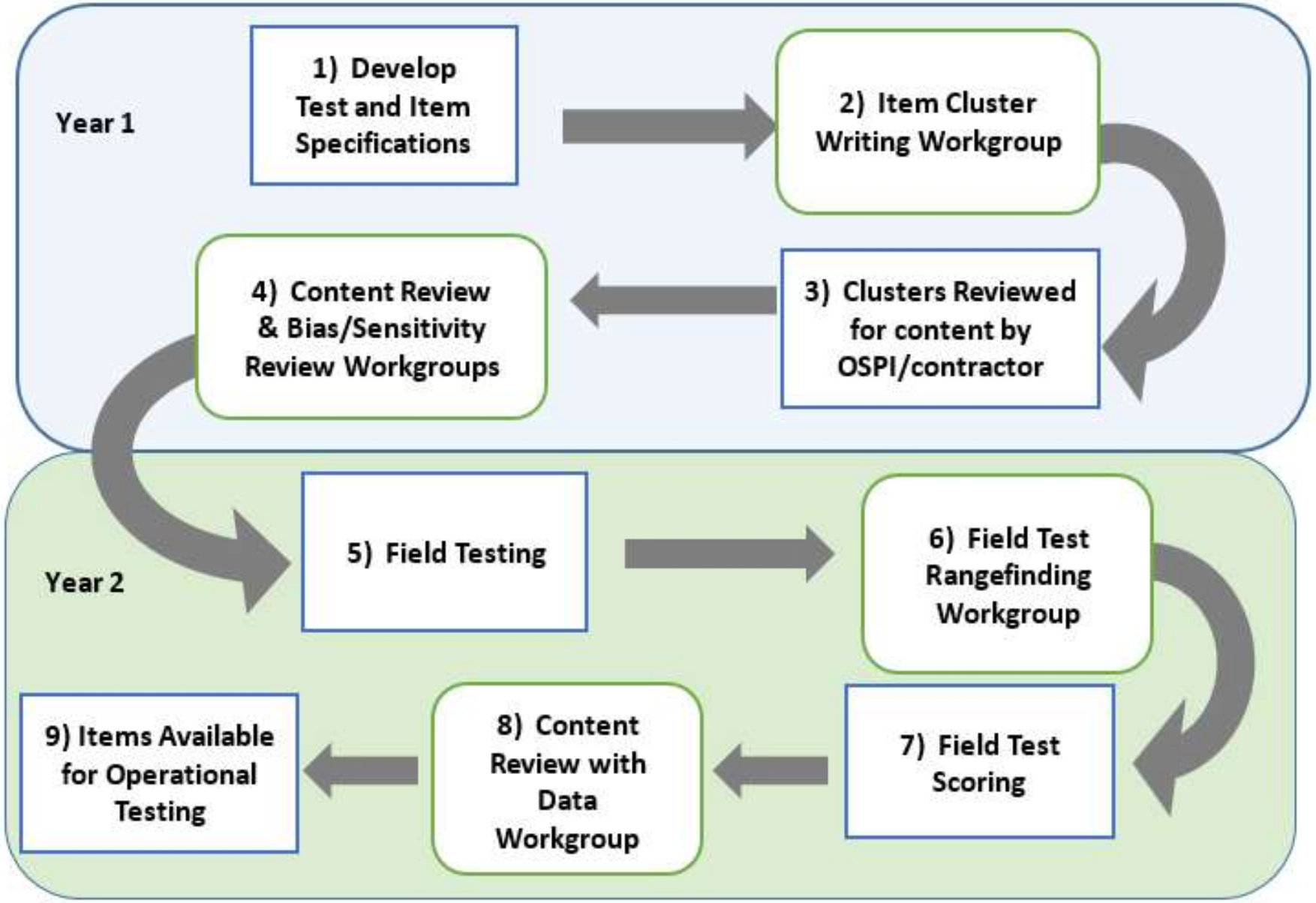


WCAS Development Process

Educator Involvement

Science Assessment Development Cycle

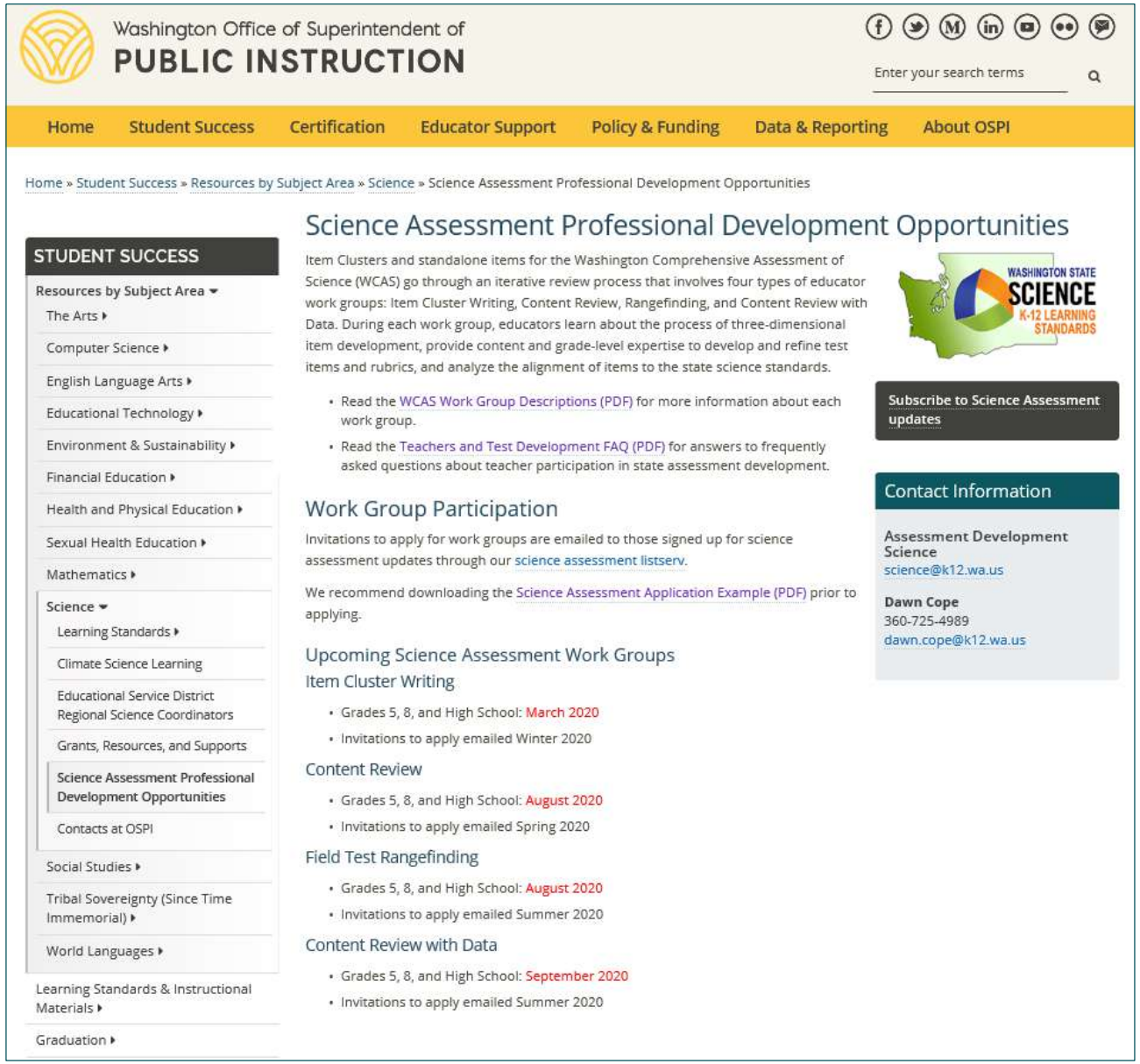
Pages 1-2



Join Us!

Science Assessment Professional Development Opportunities https://www.k12.wa.us/student-success/resources-subject-area/science/science-assessment-professional-development-opportunities

Invitations to apply for work groups are emailed to those signed up for science assessment updates through the science assessment listserv. https://public.govdelivery.com/accounts/WAOSPI/subscriber/new



Washington Standards Overview

NGSS 101

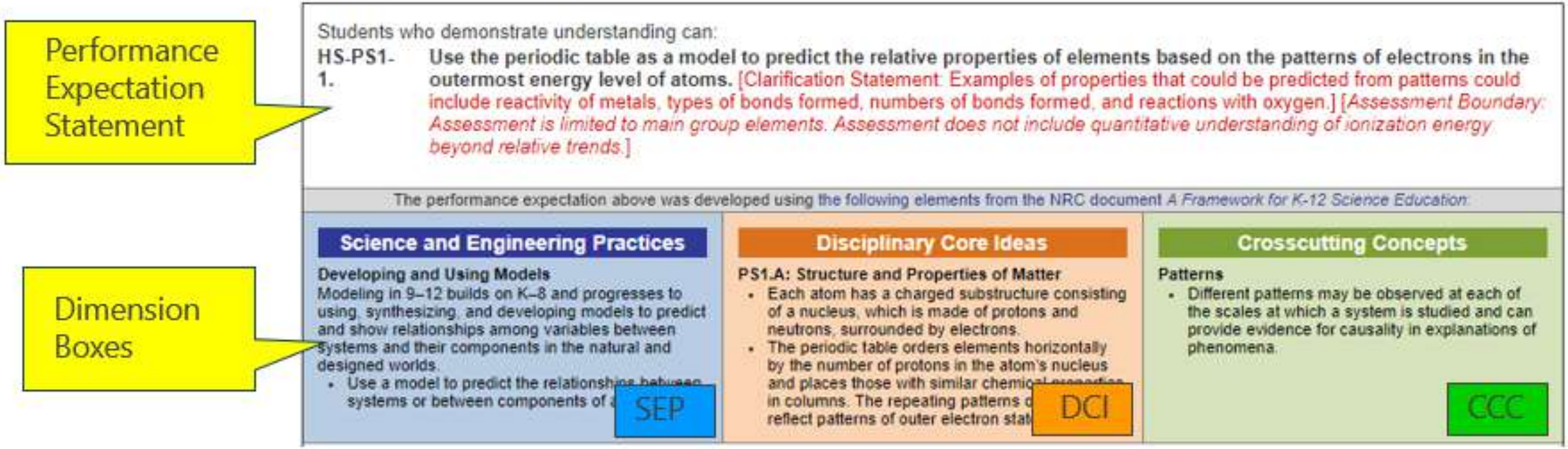
NGSS High School Band

Pages 10-12

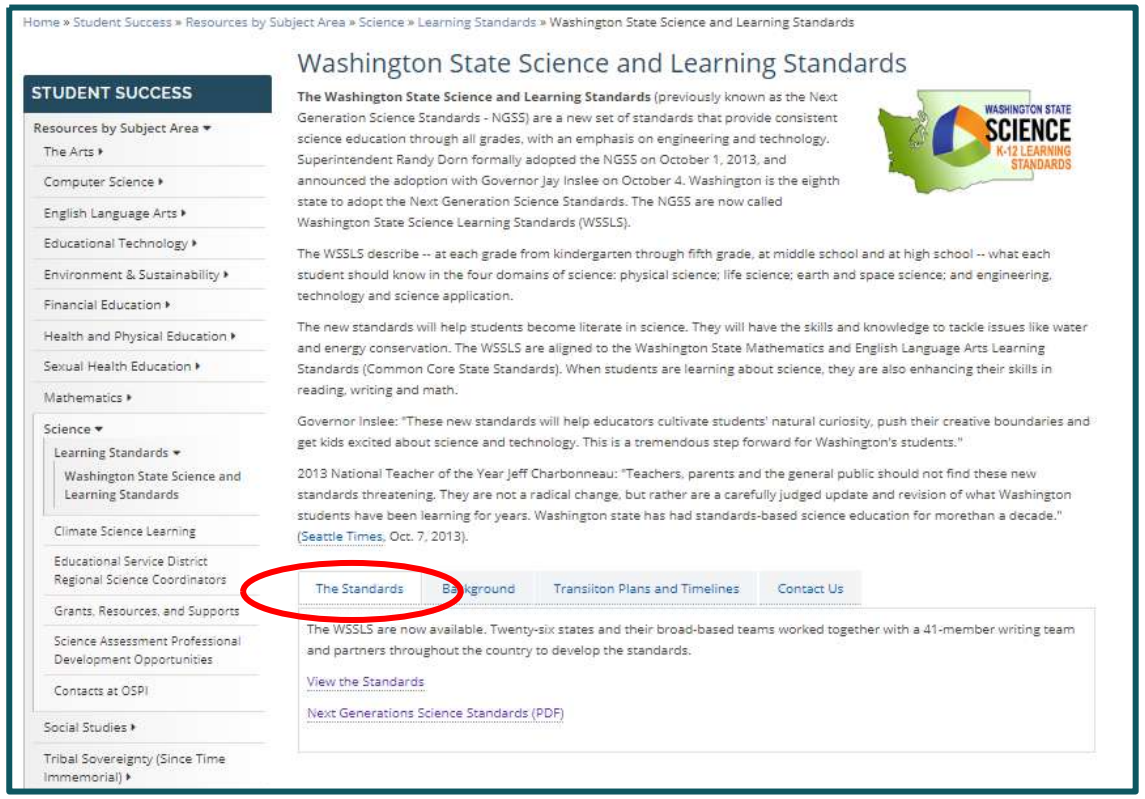
- Domains
  - Physical Sciences (PS)—24 Performance Expectations
  - Life Sciences (LS)—24 Performance Expectations
  - Earth and Space Sciences (ESS)—19 Performance Expectations
  - Engineering Design (ETS)—4 Performance Expectations

Each Performance Expectation includes a Science and Engineering Practice (SEP), a Disciplinary Core Idea (DCI), and a Crosscutting Concept (CCC)

NGSS Performance Expectation



The 2013 Washington State K-12 Science Learning Standards are the *Next Generation Science Standards* (*NGSS*)

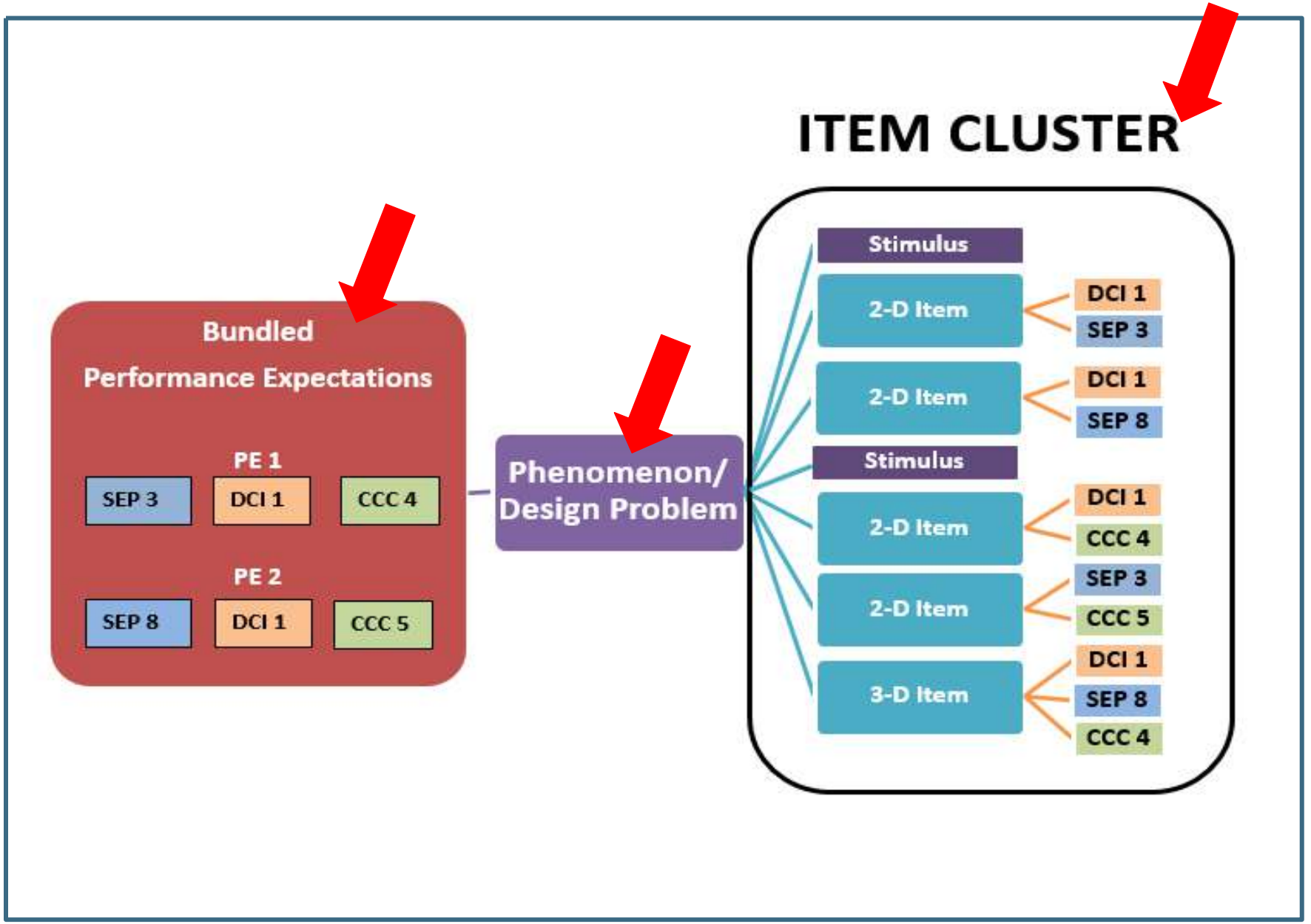


- OSPI Science Standards Webpage https://www.k12.wa.us/student-success/resources-subject-area/science/science-k%E2%80%9312-learning-standards/washington-state-science-and-learning-standards
- Next Generation Science Standards https://www.nextgenscience.org/search-standards
- Get to Know the Standards https://www.nextgenscience.org/get-to-know
- Understanding the Standards: https://www.nextgenscience.org/understanding-standards/understanding-standards

Test Structure

Cluster Map

Page 3



Standalone Items

- Use a single item to address two or three dimensions of one PE
- Stimulus and question/questions

Grade 11 Blueprint

Pages 8-9

Reporting Area	Percentage of PEs per Science Domain in the Standards	Percent Range for the WCAS per Science Domain	Score Point Range for WCAS per Science Domain
Practices and Crosscutting Concepts in Physical Sciences	36%	31-41%	14-18
Practices and Crosscutting Concepts in Life Sciences	36%	31-41%	14-18
Practices and Crosscutting Concepts in Earth and Space Sciences	28%	23-33%	11-15

- 45 Total points
- 6-12 standalone items
- 6 clusters
- Estimated testing time: 150 minutes

ETS PEs are assessed but not reported separately.

Performance Expectation Coverage

Pages 8-9

Item Clusters

- 3-6 items per cluster
- 6 clusters per operational form
- At least one PE from each domain (PS, LS, ESS, and ETS) represented
- A minimum of 3 different SEPs across the clusters
- A minimum of 3 different CCCs across the clusters

Stand Alone items

- 6-12 items per operational form
- Each item must assess 2 or 3 dimensions of a single PE
- Increases DCI, SEP, and CCC coverage for the whole test

Structure and Administration

Pages 8-9

Structure

- Operational Section
  - Counts toward a student's score
  - Fixed form
- Field Test Section
  - Embedded in the online administration
  - Does not count toward a student's score
  - A cluster or several standalone items

Administration

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

Features & Item Types

Pages 4-7

Features

- Collapsible Stimuli
- Locking items
- Multipart items
- Animation
- Periodic Table https://wa.portal.airast.org/
- Calculator https://www.desmos.com/testing/washington

Item Types

- Multiple Choice
- Multiple Select
- Short Answer
- Drag and Drop
- Hot Text
- Table Match
- Table Input
- Edit Task Inline Choice
- Simulation

WCAS Training Tests

- Grades 5, 8, 11
- Accessed through the WCAP Portal https://wa.portal.airast.org/training-tests.stml
- Grade 5 Lesson Plan https://www.k12.wa.us/sites/default/files/public/science/pubdocs/LessonPlans5-FINAL%20DRAFT.pdf
- Grade 8 Lesson Plan https://www.k12.wa.us/sites/default/files/public/science/pubdocs/LessonPlans8-FINAL%20DRAFT.pdf
- Grade 11 Lesson Plan https://www.k12.wa.us/sites/default/files/public/science/pubdocs/LessonPlans11-FINAL%20DRAFT.pdf
- Quick Start https://www.k12.wa.us/sites/default/files/public/science/pubdocs/OnlineTrainingTestQuickStart-FINAL_DRAFT.pdf

Q&A

Item Specifications

HS-LS2-6

Pages 92-93

Front Page

Performance Expectation	**HS-LS2-6** Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.		
Dimensions	**Science & Engineering Practices** **Engaging in Argument from Evidence** Engaging in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. • Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. **Connections to Nature of Science** **Scientific Knowledge is Open to Revision in Light of New Evidence** • Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation.	**Disciplinary Core Ideas** **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** • A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.	**Crosscutting Concepts** **Stability and Change** • Much of science deals with constructing explanations of how things change and how they remain stable.
These item specifications were developed using the following reference materials:			
K–12 Framework	pp. 71–74	pp. 154–156	pp. 98–101
NGSS Appendices	Appendix F pp. 13–14 Appendix H p. 5	Appendix E p. 5	Appendix G pp. 10–11
Clarification Statement	Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.		
Assessment Boundary	An assessment boundary is not provided for this PE.		

HS-LS2-6

Pages 92-93

Back Page

Items may ask students to:

Code	Alignment	Item Specification
HS-LS2-6.1	SEP-DCI-CCC	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** of how the **complex interactions** within an ecosystem help maintain **stability** and/or cause **change.**
HS-LS2-6.2	SEP-DCI	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** about **complex interactions** within an ecosystem.
HS-LS2-6.3	DCI-CCC	Connect **complex interactions** within an ecosystem to **stability** and/or **change.**
HS-LS2-6.4	SEP-CCC	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** of how things change and/or how things remain stable

Details and Clarifications

- **Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** is expanded to include:
  - describing criteria used to critique claims
  - using evidence to compare and/or evaluate competing arguments and/or solutions
  - using evidence to determine the merit of an argument and/or an explanation
  - using evidence to construct and/or support an argument and/or a claim
  - evaluating competing design solutions to real world problems using scientific ideas and/or evidence and/or relevant economic, societal, and/or environmental considerations.

- **Complex interactions** may include, but are NOT limited to:
  - relationships among different species
  - relationships between populations and their environment
  - biological disturbances and the effect on populations
  - physical disturbances and the effect on populations
  - resources affecting population size

- **Explanations** of **stability and change** may include, but are NOT limited to:
  - biological and/or physical disturbances can change the types and/or numbers of the ecosystem's species
  - ecosystems with modest disruptions maintain stable conditions or return to their original state after the disruption
  - extreme fluctuations in ecosystem conditions can change the resources and/or habitat availability to such a degree that the ecosystem cannot return to its original state and instead becomes a very different ecosystem
  - feedback can stabilize or destabilize an ecosystem

Item Specification Activity

Section 1—Coral Bleaching

Read the information and answer the questions.

A coral reef is made up of organisms called corals. Corals are marine animals whose skeletons form the structure of the reef. The bright colors of coral reefs are caused by algae that live inside the skeletons of the corals and provide the corals with energy.

Coral reefs provide homes for about 25% of all marine species. The Coral Reef Ecosystem diagram shows some of the organisms found in a coral reef ecosystem.

Coral Reef Ecosystem

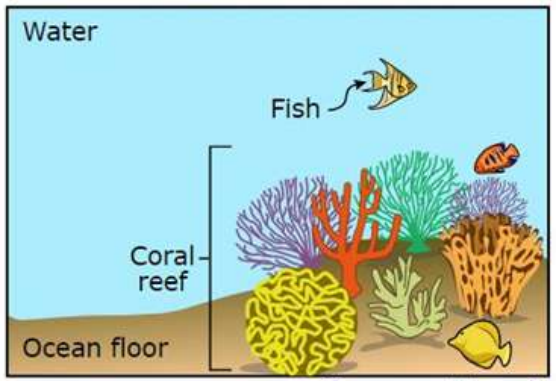


Diagram not to scale

When stressed, corals expel the algae, lose their bright colors, and become white. This is known as a coral bleaching event. If the stress lasts for only a short time, the corals can recover. But if the stress lasts for a long time, the corals can starve.

Item 1

A student claims that coral reef ecosystems are stable because they can recover after a bleaching event.

Which evidence should be collected to evaluate the student's claim?

Ⓐ the number of algae in a coral reef ecosystem during a bleaching event

Ⓑ the size of predators in a coral reef ecosystem that survive a bleaching event

Ⓒ the temperature of the ocean in a coral reef ecosystem before and after a bleaching event

Ⓓ the number and type of organisms in a coral reef ecosystem before and after a bleaching event

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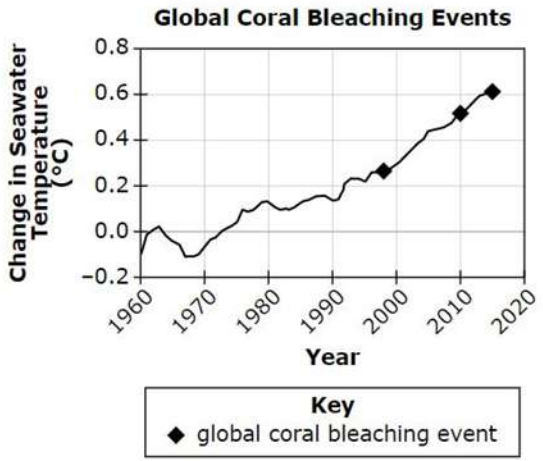
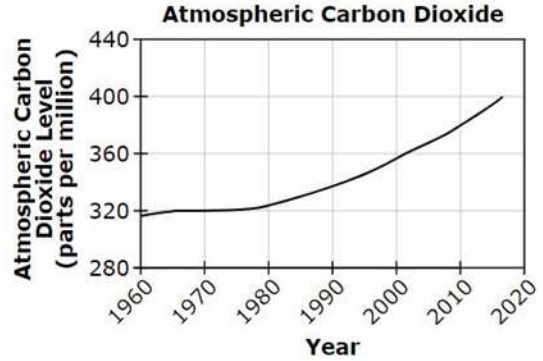
Section 2—Coral Bleaching

An increase in the temperature of seawater is one possible cause of coral bleaching. The Global Coral Bleaching Events graph shows the relationship between the change in seawater temperature and three global coral bleaching events.



The change in seawater temperature is correlated with the amount of carbon dioxide in the atmosphere. The Atmospheric Carbon Dioxide graph shows how the amount of carbon dioxide in the atmosphere has changed since 1960.



Item 2

Scientists claim that an increase in carbon dioxide in the atmosphere destabilizes coral reef ecosystems. Which evidence from the Global Coral Bleaching Events and Atmospheric Carbon Dioxide graphs supports the claim?

Ⓐ The increase in the frequency of coral bleaching events correlates with the increase in atmospheric carbon dioxide levels.

Ⓑ The increase in seawater temperature correlates with the decrease in atmospheric carbon dioxide levels.

Ⓒ The atmospheric carbon dioxide level and change in seawater temperature fluctuate at regular intervals.

Ⓓ The atmospheric carbon dioxide level was highest before the first coral bleaching event occurred.

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Ⓒ The atmospheric carbon dioxide level and change in seawater temperature fluctuate at regular intervals.

Ⓓ The atmospheric carbon dioxide level was highest before the first coral bleaching event occurred.

HS-ESS2-2

Pages 132-133

Front Page

Performance Expectation	**HS-ESS2-2** Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.		
Dimensions	**Science & Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
	Analyzing and Interpreting Data Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data. • Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.	**ESS2.A: Earth Materials and Systems** • Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. **ESS2.D: Weather and Climate** • The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space.	**Stability and Change** • Feedback (negative or positive) can stabilize or destabilize a system. **Connections to Engineering, Technology, and Applications of Science** **Influence of Engineering, Technology, and Science on Society and the Natural World** • New technologies can have deep impacts on society and the environment, including some that were not anticipated. Analysis of costs and benefits is a critical aspect of decisions about technology.
These item specifications were developed using the following reference materials:			
K–12 Framework	pp. 61–63	pp. 179–182 pp. 186–189	pp. 98–101
NGSS Appendices	Appendix F p. 9	Appendix E p. 2 Appendix E p. 3	Appendix G pp. 10–11 Appendix J pp. 3–4
Clarification Statement	Examples should include climate feedbacks, such as how an increase in greenhouse gases causes a rise in global temperatures that melts glacial ice, which reduces the amount of sunlight reflected from Earth's surface, increasing surface temperatures and further reducing the amount of ice. Examples could also be taken from other system interactions, such as how the loss of ground vegetation causes an increase in water runoff and soil erosion; how dammed rivers increase groundwater recharge, decrease sediment transport, and increase coastal erosion; or how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent.		
Assessment Boundary	An assessment boundary is not provided for this PE.		

HS-ESS2-2

Pages 132-133

Back Page

Items may ask students to:

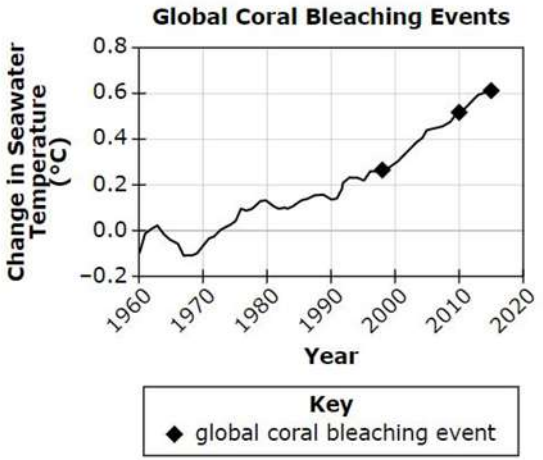
Code	Alignment	Item Specification
HS-ESS2-2.1	SEP-DCI-CCC	**Analyze** geoscience **data** to make the claim that one **change** to Earth's surface can create **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.2	SEP-DCI	**Analyze** geoscience **data** to make claims about relationships among Earth's surface and other **Earth systems**.
HS-ESS2-2.3	DCI-CCC	Connect **changes** to Earth's surface to **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.4	SEP-CCC	**Analyze data** to make claims that feedback can affect the stability of systems.

Details and Clarifications

- **Analyze** geoscience **data** is expanded to include:
  - organizing and/or interpreting data using tables, graphs, and/or statistical analysis
  - identifying relationships in data using tables and/or graphs
  - identifying limitations (e.g., measurement error, sample selection) in data
  - comparing the consistency in measurements and/or observations in sets of data
  - using analyzed data to support a claim and/or an explanation
- **Earth systems** may include:
  - atmosphere
  - biosphere
  - cryosphere
  - geosphere
  - hydrosphere
- Examples of **changes** that can create **feedbacks** that affect **stability** may include, but are NOT limited to:
  - atmospheric and/or oceanic processes influencing land, organisms, weather, and/or climate
  - energy inputs from the sun interacting with matter in the atmosphere and/or Earth's surface to influence climate, organisms, and/or Earth's surface features
  - energy released from Earth's interior driving changes in Earth's surface features that influence weather, climate, living things, and/or oceans
  - water, ice, wind, and/or organisms interacting with materials on Earth's surface to shape landforms (i.e., through erosion, weathering, deposition)

Section 2—Coral Bleaching

An increase in the temperature of seawater is one possible cause of coral bleaching. The Global Coral Bleaching Events graph shows the relationship between the change in seawater temperature and three global coral bleaching events.



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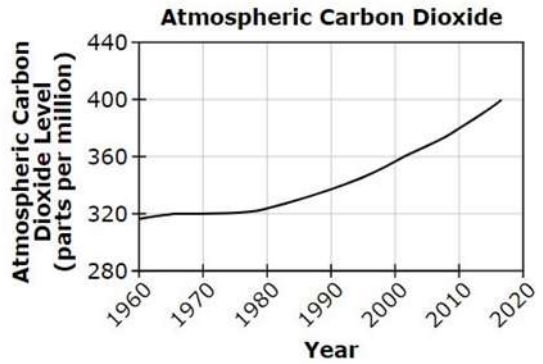


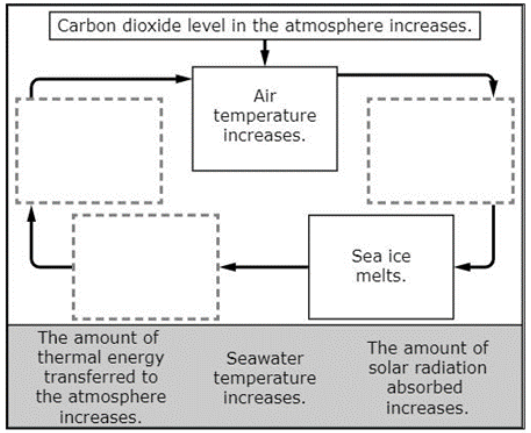
Item 3

The following question has two parts. First, answer part A. Then, answer part B.

Part A

Atmospheric carbon dioxide is a greenhouse gas that absorbs thermal energy, resulting in an increase in air temperature. An increase in the amount of carbon dioxide in the atmosphere causes a feedback loop that stresses coral reef ecosystems by causing seawater temperature to increase.

Move the statements into the boxes to complete a model of a feedback loop that could stress coral reef ecosystems.



Part B

Click each box and select a word or phrase to describe the answer to part A.

The model represents [ ] feedback, because as the air temperature increases over time, the amount of sea ice melting will [ ] over time, causing the ecosystem to [ ].

Item 3

The following question has two parts. First, answer part A. Then, answer part B.

Part A

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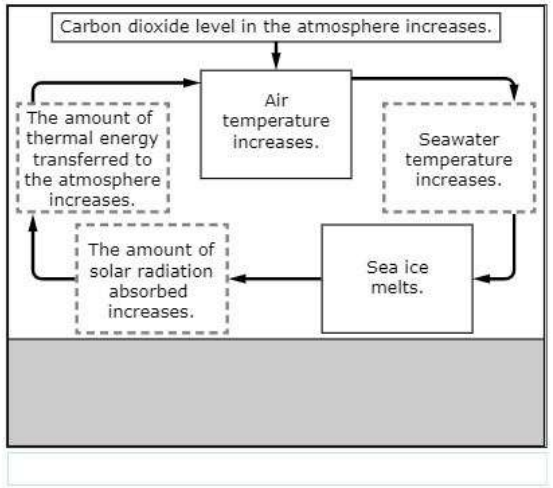


Part B

Click each box and select a word or phrase to describe the answer to part A.

The model represents [positive] feedback, because as the air temperature increases over time, the amount of sea ice melting will [increase] over time, causing the ecosystem to [destabilize].

Items may ask students to:

Code	Alignment	Item Specification
HS-ESS2-2.1	SEP-DCI-CCC	**Analyze** geoscience **data** to make the claim that one **change** to Earth's surface can create **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.2	SEP-DCI	**Analyze** geoscience **data** to make claims about relationships among Earth's surface and other **Earth systems**.
HS-ESS2-2.3	DCI-CCC	Connect **changes** to Earth's surface to **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.4	SEP-CCC	**Analyze data** to make claims that feedback can affect the stability of systems.

Details and Clarifications

- **Analyze** geoscience **data** is expanded to include:
  - organizing and/or interpreting data using tables, graphs, and/or statistical analysis
  - identifying relationships in data using tables and/or graphs
  - identifying limitations (e.g., measurement error, sample selection) in data
  - comparing the consistency in measurements and/or observations in sets of data
  - using analyzed data to support a claim and/or an explanation
- **Earth systems** may include:
  - atmosphere
  - biosphere
  - cryosphere
  - geosphere
  - hydrosphere
- Examples of **changes** that can create **feedbacks** that affect **stability** may include, but are NOT limited to:
  - atmospheric and/or oceanic processes influencing land, organisms, weather, and/or climate
  - energy inputs from the sun interacting with matter in the atmosphere and/or Earth's surface to influence climate, organisms, and/or Earth's surface features
  - energy released from Earth's interior driving changes in Earth's surface features that influence weather, climate, living things, and/or oceans
  - water, ice, wind, and/or organisms interacting with materials on Earth's surface to shape landforms (i.e., through erosion, weathering, deposition)

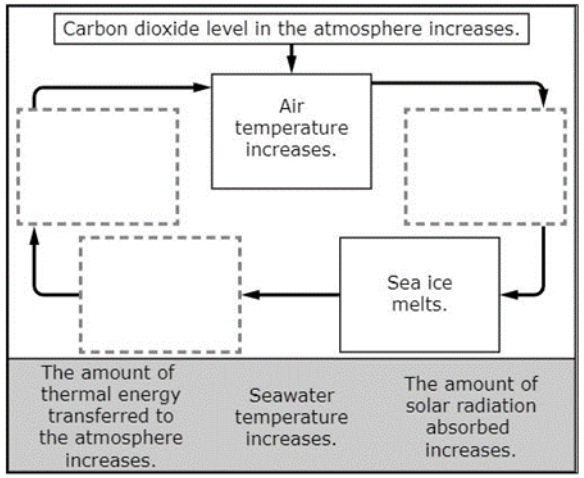
Item 3

The following question has two parts. First, answer part A. Then, answer part B.

Part A

Atmospheric carbon dioxide is a greenhouse gas that absorbs thermal energy, resulting in an increase in air temperature. An increase in the amount of carbon dioxide in the atmosphere causes a feedback loop that stresses coral reef ecosystems by causing seawater temperature to increase.

Move the statements into the boxes to complete a model of a feedback loop that could stress coral reef ecosystems.



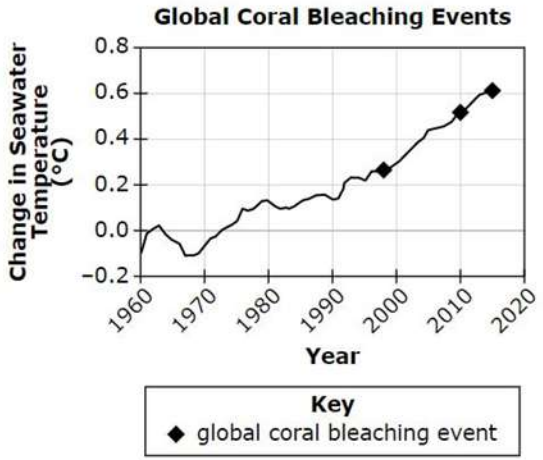
Part B

Click each box and select a word or phrase to describe the answer to part A.

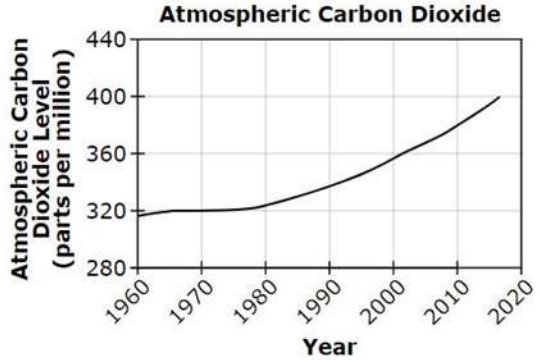
The model represents [ ] feedback, because as the air temperature increases over time, the amount of sea ice melting will [ ] over time, causing the ecosystem to [ ].

Section 2—Coral Bleaching

An increase in the temperature of seawater is one possible cause of coral bleaching. The Global Coral Bleaching Events graph shows the relationship between the change in seawater temperature and three global coral bleaching events.



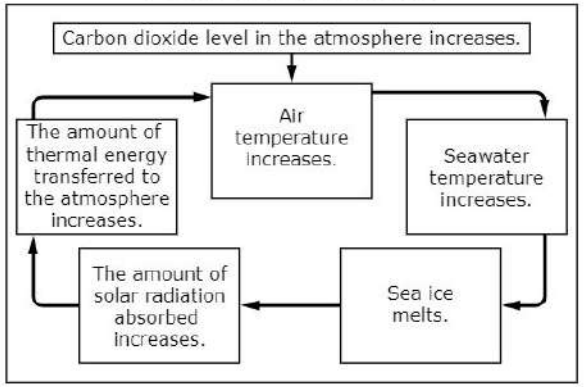
The change in seawater temperature is correlated with the amount of carbon dioxide in the atmosphere. The Atmospheric Carbon Dioxide graph shows how the amount of carbon dioxide in the atmosphere has changed since 1960.



Item 4

One student made the Positive Feedback Model to describe a feedback loop that could destabilize coral reef ecosystems.

Positive Feedback Model



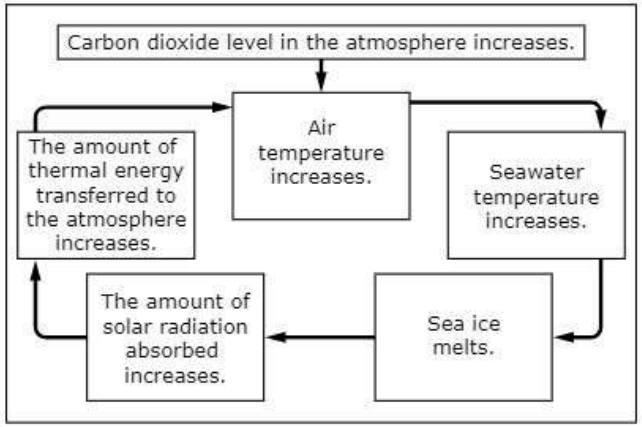
Select a box to identify whether each human activity would speed up or slow down the rate of change in the feedback loop.

Human Activity	Speed Up	Slow Down
Planting a new forest	☐	☐
Walking to school instead of driving to school	☐	☐
Increasing the number of trucks driving on roads	☐	☐
Replacing a coal power plant with a solar power plant	☐	☐

Item 4

One student made the Positive Feedback Model to describe a feedback loop that could destabilize coral reef ecosystems.

Positive Feedback Model



Select a box to identify whether each human activity would speed up or slow down the rate of change in the feedback loop.

Human Activity	Speed Up	Slow Down
Planting a new forest	☐	☑
Walking to school instead of driving to school	☐	☑
Increasing the number of trucks driving on roads	☑	☐
Replacing a coal power plant with a solar power plant	☐	☑

Item 4

Items may ask students to:

Code	Alignment	Item Specification
HS-ESS2-2.1	SEP-DCI-CCC	**Analyze** geoscience **data** to make the claim that one **change** to Earth's surface can create **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.2	SEP-DCI	**Analyze** geoscience **data** to make claims about relationships among Earth's surface and other **Earth systems**.
HS-ESS2-2.3	DCI-CCC	Connect **changes** to Earth's surface to **feedbacks** that affect the **stability** of other **Earth systems**.
HS-ESS2-2.4	SEP-CCC	**Analyze data** to make claims that feedback can affect the stability of systems.

Details and Clarifications

- **Analyze** geoscience **data** is expanded to include:
  - organizing and/or interpreting data using tables, graphs, and/or statistical analysis
  - identifying relationships in data using tables and/or graphs
  - identifying limitations (e.g., measurement error, sample selection) in data
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  - geosphere
  - hydrosphere
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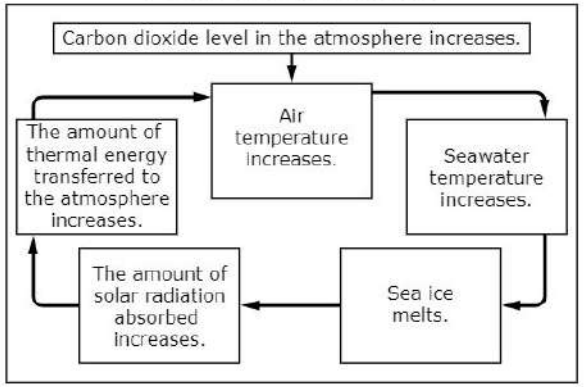
  - water, ice, wind, and/or organisms interacting with materials on Earth's surface to shape landforms (i.e., through erosion, weathering, deposition)

One student made the Positive Feedback Model to describe a feedback loop that could destabilize coral reef ecosystems.

Positive Feedback Model

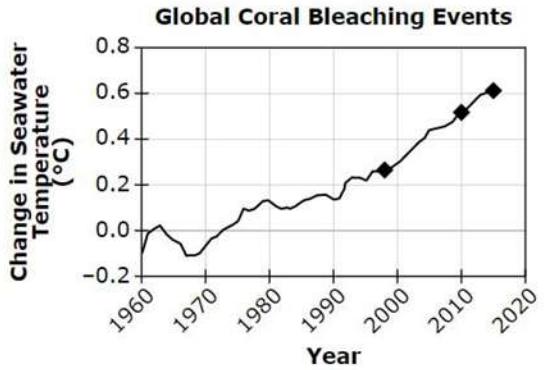


Select a box to identify whether each human activity would speed up or slow down the rate of change in the feedback loop.

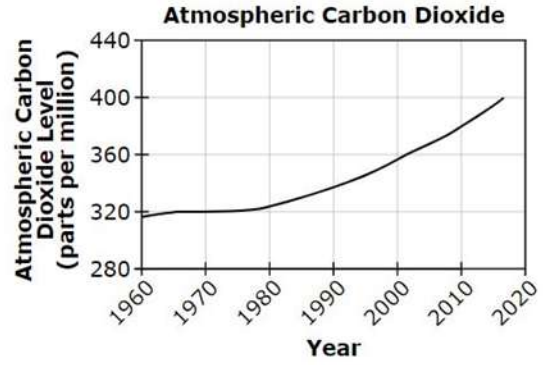
Human Activity	Speed Up	Slow Down
Planting a new forest	☐	☐
Walking to school instead of driving to school	☐	☐
Increasing the number of trucks driving on roads	☐	☐
Replacing a coal power plant with a solar power plant	☐	☐

Section 2—Coral Bleaching

An increase in the temperature of seawater is one possible cause of coral bleaching. The Global Coral Bleaching Events graph shows the relationship between the change in seawater temperature and three global coral bleaching events.



The change in seawater temperature is correlated with the amount of carbon dioxide in the atmosphere. The Atmospheric Carbon Dioxide graph shows how the amount of carbon dioxide in the atmosphere has changed since 1960.



Item 5

Describe what could happen to a healthy coral reef ecosystem if atmospheric carbon dioxide levels continue to increase.

In your description, be sure to:

- Describe **one** way a healthy coral reef ecosystem could change if atmospheric carbon dioxide levels continue to increase.
- Describe how **that** change to a coral reef ecosystem could affect other organisms in the coral reef ecosystem.

Item 5

Describe what could happen to a healthy coral reef ecosystem if atmospheric carbon dioxide levels continue to increase.

In your description, be sure to:

- Describe **one** way a healthy coral reef ecosystem could change if atmospheric carbon dioxide levels continue to increase.
- Describe how **that** change to a coral reef ecosystem could affect other organisms in the coral reef ecosystem.

Sample Answers

The coral reef ecosystem corals will lose all their algae and starve. This will cause other organisms that live on the reef not to have a habitat.
OR
The reef will not be able to recover from repeated bleaching events. There will be nothing for the fish to eat.
OR
There will be only white corals on the reef, and many organisms won't be able to camouflage themselves.

Items may ask students to:

Code	Alignment	Item Specification
HS-LS2-6.1	SEP-DCI-CCC	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** of how the **complex interactions** within an ecosystem help maintain **stability** and/or cause **change.**
HS-LS2-6.2	SEP-DCI	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** about **complex interactions** within an ecosystem.
HS-LS2-6.3	DCI-CCC	Connect **complex interactions** within an ecosystem to **stability** and/or **change.**
HS-LS2-6.4	SEP-CCC	**Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** of how things change and/or how things remain stable.

Details and Clarifications

- **Evaluate** the claims, evidence, and/or reasoning behind currently accepted **explanations** is expanded to include:
  - describing criteria used to critique claims
  - using evidence to compare and/or evaluate competing arguments and/or solutions
  - using evidence to determine the merit of an argument and/or an explanation
  - using evidence to construct and/or support an argument and/or a claim
  - evaluating competing design solutions to real world problems using scientific ideas and/or evidence and/or relevant economic, societal, and/or environmental considerations.

- **Complex interactions** may include, but are NOT limited to:
  - relationships among different species
  - relationships between populations and their environment
  - biological disturbances and the effect on populations
  - physical disturbances and the effect on populations
  - resources affecting population size

- **Explanations** of **stability and change** may include, but are NOT limited to:
  - biological and/or physical disturbances can change the types and/or numbers of the ecosystem's species
  - ecosystems with modest disruptions maintain stable conditions or return to their original state after the disruption
  - extreme fluctuations in ecosystem conditions can change the resources and/or habitat availability to such a degree that the ecosystem cannot return to its original state and instead becomes a very different ecosystem
  - feedback can stabilize or destabilize an ecosystem

Item 5

Describe what could happen to a healthy coral reef ecosystem if atmospheric carbon dioxide levels continue to increase.

In your description, be sure to:

- Describe **one** way a healthy coral reef ecosystem could change if atmospheric carbon dioxide levels continue to increase.
- Describe how **that** change to a coral reef ecosystem could affect other organisms in the coral reef ecosystem.

Vocabulary Terms

Expected SEP, DCI, and CCC Vocabulary

Pages 166-169

SEP, DCI, and CCC Vocabulary Used in Assessment Items at Grade 11

Items on the grade 11 exam use language targeted to an eighth grade or lower reading level with the exception of the required science terms in the following list. Appropriate science vocabulary allowed for the grades 5 and 8 WCAS may also be used on the grade 11 WCAS. Vocabulary words from the earlier grade levels are included in the list.

a

Used in grade 5:
advantage
amplitude
angle
attract
axis

Used in grade 8:
absorb
acceleration
adaptation
algae
allele
altitude
analog signal
artificial selection
asexual reproduction
atom

Used in grade 11:
aerobic
alpha decay
amino acid
anaerobic

b

Used in grade 5:
balanced force
behavior
biosphere

Used in grade 8:
biodiversity
boundary

Used in grade 11:
beta decay
biomass
boiling point
bond
bond energy

c

Used in grade 5:
camouflage
cause
characteristic
charge
claim
classify
climate
collide
collision
compare
conclusion
conductivity
conserve
constraint
continent
criteria

Used in grade 8:
cell
cell membrane
cell wall
cellular respiration
chemical change
chemical property
chemical reaction
chloroplasts
chromosome
condensation
conservation
consumer
continental crust
correlation
crystallization

Used in grade 11:
carrying capacity
chemical energy
coevolution
combustion
compound
concentration (of a solution)
conduction
convection
core (of Earth)
cosmic microwave background radiation
cryosphere

d

Used in grade 5:
data
decomposer
decrease
deep ocean trench
defend
demonstration
describe
design
development
device
diagram
digital signal
direction
disadvantage
disease
distance

Used in grade 8:
density

Used in grade 11:
differentiate
diffraction
DNA
DNA replication

e

Used in grade 5:
earthquake

Q&A

Reminders & Wrap up

Where to find the materials

- WCAS Educator Resources Webpage
  https://www.k12.wa.us/student-success/testing/state-testing-overview/washington-comprehensive-assessment-science/wcas-educator-resources

  - Presentation slides with script 1 week out
  - FAQ document with answers to Chat questions 1 week out
  - Webinar recording 2 weeks out

- pdEnroller
  https://www.pdenroller.org/

Thank You!

Washington Office of Superintendent of

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