



California Assessment of Student
Performance and Progress

California Science Test Practice Test Scoring Guide



High School

CAST Practice Test Scoring Guide—High School

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Introduction to Practice Test Scoring Guide

This California Science Test (CAST) practice test scoring guide offers details about the items, student response types, correct responses, and related scoring considerations for the practice test items. These items have been selected to show some of the new approaches to measuring the California Next Generation Science Standards (CA NGSS) that can be found in the assessment. The practice test items are not fully representative of all possible item types included in the CAST. The practice test covers a selection of items from performance expectations assessed in high school.

This scoring guide should be used alongside the online practice tests, which can be accessed at <http://www.caaspp.org/practice-and-training/index.html>. Annotated responses are also available to help explain the rationale for each score point on selected constructed response items from the practice test at <https://www.caaspp.org/ta-resources/practice-training.html>.

The following information is presented in a metadata table. Metadata contains specific information about each item including the alignment of the item with the CA NGSS standards.

Item: The question number that corresponds to the question as it appears in the practice test

Key: Represents the correct answer(s) to the item or question and includes the score point value for the item and its parts (Items are worth either one or two points. For some technology-enhanced items, a screen capture of the correct answers is included. Exemplars and rubrics are provided for constructed response items.)

Performance Expectations (PE) Code: References the standards that describe what students should know and be able to do

Science and Engineering Practices (SEP): Descriptions of behaviors that students engage in as they investigate the natural world and design solutions

Disciplinary Core Ideas (DCI): Essential ideas in the science disciplines that all students should understand

Crosscutting Concepts (CCC): Interdisciplinary skills students should exhibit that unify the study of science and engineering through common application across fields

Item-Level Claim Statement (ILCS): A brief statement that illustrates how an item aligns with the PE

Example of Metadata

Item	Key	PE	SEP	DCI	CCC	ILCS
1	A (1 point)	HS-LS4-4	6. Constructing Explanations and Designing Solutions	LS4.C Adaptation	2. Cause and Effect	Construct an explanation based on evidence for how natural selection leads to changes in traits in populations.

High School Practice Test Items

Item	Key	PE	SEP	DCI	CCC	ILCS
1	First drop-down menu: increase Second drop-down menu: natural selection (1 point)	HS-LS4-4	6. Constructing Explanations and Designing Solutions	LS4.C Adaptation	2. Cause and Effect	Construct an explanation based on evidence for how natural selection leads to changes in traits in populations.
2	B (1 point)	HS-PS1-2	6. Constructing Explanations and Designing Solutions	PS1.A Structure and Properties of Matter	1. Patterns	Select the ionic compound that can be formed in a reaction with Br ₂ , based on the number of valence electrons.
3	Two-point item: Part A: decrease by about 50% (1 point) Part B: B (1 point)	HS-ESS3-3	5. Using Mathematics and Computational Thinking	ESS3.C Human Impacts on Earth Systems	7. Stability and Change	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
4	B (1 point)	HS-PS1-8	2. Developing and Using Models	PS1.C Nuclear Processes	5. Energy and Matter	Select the relevant components to complete the model by applying the scientific principle of nucleon conservation.

High School Practice Test Items

Item metadata table continuation showing items 5–6

Item	Key	PE	SEP	DCI	CCC	ILCS
5	C (1 point)	HS- ESS2-5	3. Planning and Carrying Out Investigations	ESS2.C The Roles of Water in Earth's Surface Processes	6. Structure and Function	Identify the design that will provide the best evidence to determine the amount and type of sediment entering the stream.
6	Exemplars and rubric provided below.	HS- LS1-6	6. Constructing Explanations and Designing Solutions	LS1.C Organization for Matter and Energy Flow in Organisms	5. Energy and Matter	Construct an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules combine to form other large molecules.

Exemplars and rubric for item 6:

2 point
Exemplar(s):

Based on the table, it looks like the glucose molecules were stored in glycogen within 6 hours. And by the end of the 18-hour time period, the glucose was all used up by the cells for energy or stored in the glycogen.

OR

The glucose was stored in the glycogen at the beginning, to use for energy later, and by the end it was all used up or stored.

Rubric:

The response includes that glucose is incorporated into or stored in the glycogen.

Rubric continues on the next page.

Rubric continues from previous page.

AND

The response includes that within the first hours, glucose was stored or broken down into glycogen and by the end of the 18-hour period, the glucose was used up by the cells for energy or stored in the glycogen.

NOTE: If time is not mentioned (particular hours) credit should be given based on the response if the understanding is that over time the glucose was used up.

1 point

Exemplar(s):

The glucose was being used by the glycogen within the first 6 hours.

OR

By the time it was over after 18 hours, the glucose was turned into glycogen.

OR

Based on the data in the table, the glycogen was metabolizing the glucose between hour 6 and hour 12, then it was all gone.

OR

The glucose was used up by the cells for energy.

Rubric:

The response includes that glucose is incorporated into or stored in the glycogen.

Rubric continues on the next page.

High School Practice Test Items

Rubric continues from previous page.

OR

The response includes that within 6 hours the glucose was stored in or broken down into glycogen and by the end of the 18 hours, the glucose was used up or stored in the glycogen.

0 point

Exemplar(s):

Glucose combined with the glycogen.

OR

It looks like it stayed the same during the first 12 hours.

OR

The glucose dissolved in the petri dish.

OR

The glucose became radioactive.

OR

*&YTT%#\$D

OR

Rubric continues on the next page.

Rubric continues from previous page.

I don't know; I was never taught this.

Rubric:

0-point should be awarded if a student attempts to answer the prompt but the response is incorrect or too vague (insufficient information provided) to receive credit

A score of 0 should also be given to responses that consist only of:

No relevant content provided

- no response is provided (e.g., blank)
- random keystrokes or nonsense verbiage
- punctuation mark(s) (e.g., ".")

Student's opinion of the test

Direct copy of the stimulus without any attempt to answer

Opinions or comments about random topics

I don't know, IDK (without further elaboration)

Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.

High School Practice Test Items

Item metadata table continuation showing items 7–9

Item	Key	PE	SEP	DCI	CCC	ILCS
7	Row 1: High-mass stars Row 2: Low-mass stars Row 3: High-mass stars Row 4: Low-mass stars, High-mass stars Row 5: High-mass stars (1 point)	HS-ESS1-3	8. Obtaining, Evaluating and Communicating Information	ESS1.A The Universe and Its Stars	5. Energy and Matter	Describe how factors such as composition and temperature affect the rate of nuclear fusion and energy production.
8	C (1 point)	HS-PS4-1	5. Using Mathematics and Computational Thinking	PS4.A Wave Properties	2. Cause and Effect	Describe how wavelength is related to the change in the medium.
9	C (1 point)	HS-LS3-3	4. Analyzing and Interpreting Data	LS3.B Variation of Traits	3. Scale, Proportion, and Quantity	Calculate the predicted genotypic ratios of offspring.

Item metadata table continuation showing items 10–11

Item	Key	PE	SEP	DCI	CCC	ILCS
10	First drop-down menu: colliding with Second drop-down menu: weather and erosion (1 point)	HS-ESS2-1	2. Developing and Using Models	ESS2.A Earth Materials and Systems	7. Stability and Change	Describe how a model illustrates or explains the internal and surface processes that produced a geological feature.
11	C (1 point)	HS-PS2-1	4. Analyzing and Interpreting Data	PS2.A Forces and Motion	2. Cause and Effect	Identify the relationship between mass and acceleration.

High School Practice Test Items

Item metadata table continuation showing items 12–13

Item	Key	PE	SEP	DCI	CCC	ILCS
12	<p>Two-point item: Part A: Fourth and fifth options (1 point) Part B: Row 1: Addresses global problem of increasing CO₂ emissions Row 2: Addresses transportation concerns of farming community, Addresses global problem of increasing CO₂ emissions (1 point)</p>	HS-ETS1-1	1. Asking Questions and Defining Problems	ETS1.A Defining and Delimiting Engineering Problems	N/A	Select questions that could help determine criteria or constraints for design solutions that will help in reducing carbon dioxide emissions. Identify different variations on the problem definition that highlight the concerns of the community.
13	<p>First, third, and fourth options (1 point)</p>	HS-LS4-6	5. Using Mathematics and Computational Thinking	LS4.D Biodiversity and Humans	2. Cause and Effect	Identify components in a simulation that depict the effects of human activity on bird biodiversity.

Item metadata table continuation showing item 14

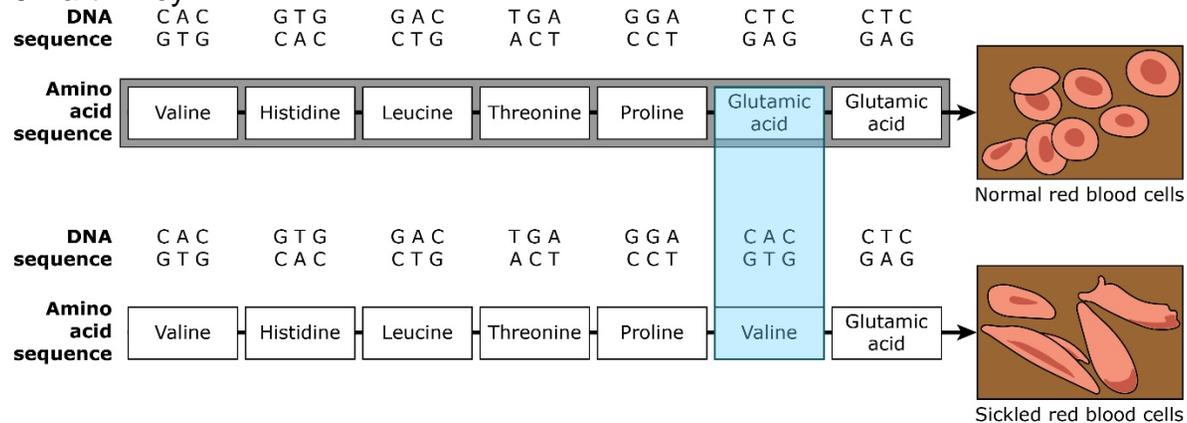
Item	Key	PE	SEP	DCI	CCC	ILCS
14	Two-point item: Part A: C (1 point) Part B: First drop-down menu: less Second drop-down menu: increases (1 point)	HS-ESS3-5	4. Analyzing and Interpreting Data	ESS3.D Global Climate Change	7. Stability and Change	Predict changes to the Arctic sea ice based on probability and describe the patterns shown in the data over time.

High School Practice Test Items

Item metadata table continuation showing item 15

Item	Key	PE	SEP	DCI	CCC	ILCS
15	<p>Two-point item:</p> <p>Part A: Sixth term of amino acid sequence changes from Glutamic acid to Valine. (1 point)</p> <p>Part B: First drop-down menu: three Second drop-down menu: a point mutation (1 point)</p>	HS-LS1-1	6. Constructing Explanations and Designing Solutions	LS1.A Structure and Function	6. Structure and Function	Explain how the differing nucleotide sequences can cause red blood cells to differ in phenotype due to the proteins encoded by these sequences.

Screen capture item 15 Part A key.



Item metadata table continuation showing items 16–18

Item	Key	PE	SEP	DCI	CCC	ILCS
16	First drop-down menu: 8 Second drop-down menu: the frequency of the building vibrations (1 point)	HS-ETS1-4	5. Using Mathematics and Computational Thinking	ETS1.B Developing Possible Solutions	4. Systems and System Models	Identify patterns of damage caused by earthquakes in buildings of different heights based on data from a simulation.
17	First drop-down menu: increases Second drop-down menu: speeds up (1 point)	HS-ESS1-4	5. Using Mathematics and Computational Thinking	ESS1.B Earth and the Solar System	3. Scale, Proportion, and Quantity	Evaluate how a comet's acceleration and/or force of attraction between the Sun and comet change with respect to the change in the comet's distance and/or mass.
18	D (1 point)	HS-LS4-5	7. Engaging in Argument from Evidence	LS4.C Adaptation	2. Cause and Effect	Describe the conditions under which a claim about temperature effect on sugar maple tree distribution can be supported.

High School Practice Test Items

Item metadata table continuation showing items 19–20

Item	Key	PE	SEP	DCI	CCC	ILCS
19	<p>First drop-down menu: wind turbines</p> <p>Second drop-down menu: released during manufacturing</p> <p>Third drop-down menu: solar panels</p> <p>(1 point)</p>	HS-ETS1-3	6. Constructing Explanations and Designing Solutions	ETS1.B Developing Possible Solutions	N/A	Select the best alternative solution from among multiple solutions of renewable resources, based on their strengths and weaknesses, in providing electricity.
20	Third and fourth options (1 point)	HS-LS1-3	3. Planning and Carrying Out Investigations	LS1.A Structure and Function	7. Stability and Change	Identify what is to be recorded as useful data for an investigation on the effect of exercise on heart rate.

Item metadata table continuation showing items 21–23

Item	Key	PE	SEP	DCI	CCC	ILCS
21	Two-point item: Part A: Row 1: Plan B, Plan C Row 2: Plan A, Plan B Row 3: Plan A, Plan C (1 point) Part B: Plan B (1 point)	HS- ESS3-4	6. Constructing Explanations and Designing Solutions	ETS1.B Developing Possible Solutions	7. Stability and Change	Identify the best design from among multiple designs based on a prioritized list of criteria (e.g., maximize pollutant in wastewater, cost, aesthetics, etc.) on wastewater treatment capacities.
22	First drop-down menu: ecological succession Second drop- down menu: car- rying capacity (1 point)	HS- LS2-2	5. Using Mathematics and Computational Thinking	LS2.A Interdependent Relationships in Ecosystems	3. Scale, Pro- portion, and Quantity	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
23	B (1 point)	HS- PS2-2	5. Using Mathematics and Computational Thinking	PS2.A Forces and Motion	4. Systems and System Models	Mathematically determine the properties of the system using the conservation of momentum of objects in the system.

High School Practice Test Items

Item metadata table continuation showing item 24

Item	Key	PE	SEP	DCI	CCC	ILCS
24	<p>Two-point item:</p> <p>Part A:</p> <p>Row 1: Long time to implement change</p> <p>Row 2: Requires change in people's behaviors, Provides benefits in a short time period</p> <p>Row 3: Requires change in people's behaviors, Provides benefits in a short time period (1 point)</p> <p>Part B: A (1 point)</p>	HS-ETS1-2	6. Constructing Explanations and Designing Solutions	ETS1.C Optimizing the Design Solution	N/A	Match the described solutions to a provided list of criteria/constraints in order to reduce air pollution within the community.

Item metadata table continuation showing items 25–26

Item	Key	PE	SEP	DCI	CCC	ILCS
25	Two-point item: Part A: B (1 point) Part B: Row 1: Due to stronger attractions between particles Row 2: Due to weaker attractions between particles (1 point)	HS-PS1-3	3. Planning and Carrying Out Investigations	PS1.A Structure and Properties of Matter	1. Patterns	Identify the procedure that will produce the most relevant and reliable data in carrying out an investigation on attractive forces between particles.
26	Exemplars and rubric provided below.	HS-PS3-1	5. Using Mathematics and Computational Thinking	PS3.A Definitions of Energy	4. Systems and System Models	Create a correct mathematical representation to determine the components of gravitational potential energy in the Earth-ball system and kinetic energy.

Exemplars and rubric for item 26:

2 point

Exemplar(s):

Rubric continues on the next page.

Rubric continues from previous page.

The kinetic energy of the ball at the bottom of the building is the same as the potential energy at the top of the building. The potential energy needs to be divided by the mass of the tennis ball and the acceleration due to gravity (g) to find the height of the building.

OR

In the system, kinetic energy at the bottom of the fall is equal to the gravitational potential energy so $\frac{1}{2}mv^2 = mgh$ where m is mass, v is velocity, g is acceleration due to gravity, and h is the height of the building, so just solve for h and you can find the height of the building.

Rubric:

The response includes that the kinetic energy of the tennis ball at the bottom of the building is equal to the gravitational potential energy of the tennis ball at the top of the building.

AND

The response includes that gravitational potential energy at the top of the building can be divided by the mass and acceleration due to gravity to find the height of the building.

1 point

Exemplar(s):

The kinetic energy of the ball at the bottom of the building is the same as the potential energy at the top of the building.

OR

The PE at the top is the same as the KE at the bottom when the ball hits.

Rubric continues on the next page.

Rubric continues from previous page.

OR

I can divide the potential energy by the mass of the ball and gravity if I want to find how tall the building is.

Rubric:

The response includes that the kinetic energy of the tennis ball at the bottom of the building is equal to the gravitational potential energy of the tennis ball at the top of the building.

OR

The response includes that gravitational potential energy at the top of the building can be divided by the mass and acceleration due to gravity to find the height of the building.

0 point

Exemplar(s):

The potential energy is 0 at the top of the building and it will be 0 when the ball hits the ground.

OR

I would just measure the building with a meter stick.

OR

I would time how long it takes for the ball to hit the ground.

OR

Rubric continues on the next page.

High School Practice Test Items

Rubric continues from previous page.

As the ball goes down the building, the potential energy increases.

OR

*&YTT%\$#\$D

OR

I don't know; I was never taught this.

Rubric:

0-point should be awarded if a student attempts to answer the prompt but the response is incorrect or too vague (insufficient information provided) to receive credit

A score of 0 should also be given to responses that consist only of:

No relevant content provided

- no response is provided (e.g., blank)
- random keystrokes or nonsense verbiage
- punctuation mark(s) (e.g., ".")

Student's opinion of the test

Direct copy of the stimulus without any attempt to answer

Rubric continues on the next page.

Rubric continues from previous page.

Opinions or comments about random topics

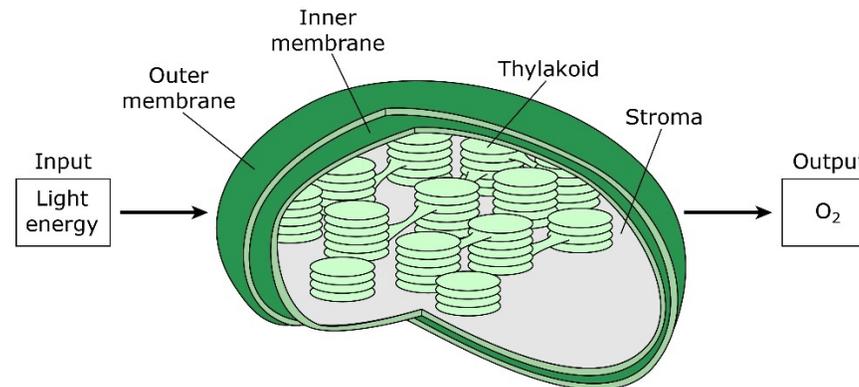
I don't know, IDK (without further elaboration)

Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.

Item metadata table continuation showing item 27

Item	Key	PE	SEP	DCI	CCC	ILCS
27	Input: Light energy Output: O ₂ (1 point)	HS-LS1-5	2. Developing and Using Models	LS1.C Organization for Matter and Energy Flow in Organisms	5. Energy and Matter	Identify the mechanisms and relationships among the inputs and outputs of photosynthesis.

Screen capture of item 27 key.



High School Practice Test Items

Item metadata table continuation showing items 28–31

Item	Key	PE	SEP	DCI	CCC	ILCS
28	Third and fourth options (1 point)	HS-ESS1-6	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	7. Stability and Change	Identify the roles of various earth processes (e.g., plate tectonics and erosion) in the preservation and destruction of evidence about Earth history.
29	B (1 point)	HS-PS3-5	2. Developing and Using Models	PS3.C Relationship Between Energy and Forces	2. Cause and Effect	Quantify the change in energy associated with the appropriate change in the relative orientation of the two objects.
30	Second, third, and fourth rows (1 point)	HS-LS2-7	6. Constructing Explanations and Designing Solutions	LS2.C Ecosystem Dynamics, Functioning, and Resilience	7. Stability and Change	Evaluate and refine solutions based on achieving a balance between overall environmental stability and human needs based on the accidental introduction of invasive species.
31	D (1 point)	HS-PS2-3	6. Constructing Explanations and Designing Solutions	PS2.A Forces and Motion	2. Cause and Effect	Select the design solution that best meets the provided criteria about momentum and force during a collision.

Item metadata table continuation showing item 32

Item	Key	PE	SEP	DCI	CCC	ILCS
32	Two-point item: Part A: From top to bottom: Redshift; Blueshift; No Shift (1 point) Part B: First and fifth options (1 point)	HS- ESS1-2	6. Constructing Explanations and Designing Solutions	ESS1.A The Universe and Its Stars	5. Energy and Matter	Explain the redshift pattern as indicating that more distant stars are moving away faster.

Screen capture of item 32 key.

	Laboratory reference
	Redshift
	Blueshift
	No shift

High School Practice Test Items

Item metadata table continuation showing items 33–37

Item	Key	PE	SEP	DCI	CCC	ILCS
33	Crossing over during meiosis (1 point)	HS-LS3-2	7. Engaging in Argument from Evidence	LS3.B Variation of Traits	2. Cause and Effect	Describe that crossing over is responsible for all of the variation in this rabbit species.
34	C (1 point)	HS-LS3-1	1. Asking Questions and Defining Problems	LS3.A Inheritance of Traits	2. Cause and Effect	Select the question that challenges the argument about phenotype and genotype connections in this rabbit species.
35	First, second, and fifth options (1 point)	HS-LS3-1	1. Asking Questions and Defining Problems	LS3.A Inheritance of Traits	2. Cause and Effect	Select questions that address the relationship between a chromosome and gene expression in this rabbit species.
36	First drop-down menu: color gene Second drop-down menu: gray-pointed (1 point)	HS-LS3-2	7. Engaging in Argument from Evidence	LS3.B Variation of Traits	2. Cause and Effect	Describe how the environmental conditions will impact the expression of the trait in this rabbit species.
37	C (1 point)	HS-LS3-1	1. Asking Questions and Defining Problems	LS3.A Inheritance of Traits	2. Cause and Effect	Select a scientifically correct question that challenges the conclusions about the offspring phenotypes in this rabbit species.

Item metadata table continuation showing item 38

Item	Key	PE	SEP	DCI	CCC	ILCS
38	Exemplars and rubric provided below.	HS-LS3-2	7. Engaging in Argument from Evidence	LS3.B Variation of Traits	2. Cause and Effect	Explain that genetic variation depends on both environmental and genetic factors in this rabbit species.

Exemplars and rubric for item 38:

2 point

Exemplar(s):

Genetic factors can affect point color variation because the color shown depends on the alleles that are inherited. Environmental factors can affect point color variation because it depends on the temperature that the rabbit is exposed to because temperature influences the expression of its inherited alleles, changing the point color.

Rubric:

The response includes that genetic factors affect point color variation because the specific phenotype expressed (black or gray) depends partly on the alleles that are inherited.

AND

The response includes that environmental factors can affect point color variation because the temperature that the rabbit is exposed to will influence the expression of its inherited alleles, thus altering its phenotype.

1 point

Exemplar(s):

Rubric continues on the next page.

Rubric continues from previous page.

Genes can affect the color that is expressed because it depends partly on what alleles are inherited.

OR

The environment affects the color of the rabbit because the temperature that the rabbit lives in can make the color change.

OR

The temperature change caused the rabbits points to change color.

OR

It's in the traits because of the alleles that are inherited from the parents.

Rubric:

The response includes that genetic factors affect point color variation because the specific phenotype expressed (black or gray) depends partly on the alleles that are inherited.

OR

The response includes that environmental factors can affect point color variation because the temperature that the rabbit is exposed to will influence the expression of its inherited alleles, altering its phenotype.

0 point

Exemplar(s):

The rabbit's genes affect point color variation more than the environment.

Rubric continues on the next page.

Rubric continues from previous page.

OR

The rabbit's genes and the environment both effect the point color in the rabbits.

OR

It has to be the genes because how can temperature make a rabbit change its color.

OR

*&YTT%#\$D

OR

I don't know; I was never taught this.

Rubric:

0-point should be awarded if a student attempts to answer the prompt but the response is incorrect or too vague (insufficient information provided) to receive credit

A score of 0 should also be given to responses that consist only of:

No relevant content provided

- no response is provided (e.g., blank)
- random keystrokes or nonsense verbiage
- punctuation mark(s) (e.g., ".")

Rubric continues on the next page.

High School Practice Test Items

Rubric continues from previous page.

Student's opinion of the test

Direct copy of the stimulus without any attempt to answer

Opinions or comments about random topics

I don't know, IDK (without further elaboration)

Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.

Additional annotated samples for this prompt can be found at <https://www.caaspp.org/ta-resources/practice-training.html>.

Item metadata table continuation showing items 39–44

Item	Key	PE	SEP	DCI	CCC	ILCS
39	A (1 point)	HS-ESS3-1	6. Constructing Explanations and Designing Solutions	ESS3.B Natural Hazards	2. Cause and Effect	Use the data as evidence to support an explanation about an environmental problem involving this fish species.
40	out-compete native fish species for food (1 point)	HS-ESS3-1	6. Constructing Explanations and Designing Solutions	ESS3.A Natural Resources	2. Cause and Effect	Use the data as evidence to support an explanation about an environmental problem concerning this fish species.
41	Second and third options (1 point)	HS-ESS3-4	6. Constructing Explanations and Designing Solutions	ESS3.C Human Impacts on Earth Systems	7. Stability and Change	Provide justification for a design solution to mitigate the effects of an environmental problem as a result of this fish species.
42	C (1 point)	HS-ESS3-4	6. Constructing Explanations and Designing Solutions	ESS3.C Human Impacts on Earth Systems	7. Stability and Change	Identify potential concerns from a proposed design solution for an environmental problem caused by restricting fish territory.
43	Third and fifth options (1 point)	HS-ESS3-1	6. Constructing Explanations and Designing Solutions	ESS3.B Natural Hazards	2. Cause and Effect	Identify aspects of the data that align to the claim about the effects of an environmental problem caused by the introduction of a new species.
44	Exemplars and rubric provided below.	HS-ESS3-4	6. Constructing Explanations and Designing Solutions	ESS3.C Human Impacts on Earth Systems	7. Stability and Change	Identify (with reasoning) whether the data is sufficient to support the claim about this invasive fish species.

Exemplars and rubric for item 44:

2 point

Exemplar(s):

The Great Lakes brings in \$7 billion per year so it would only take one year to get back the \$228 million investment and it would stop the carp from entering the lakes.

OR

If the silver carp enter the lakes, they would greatly reduce the income from fishing because the economy is dependent on the fishing industry, so it would be wise to invest the money.

OR

The silver carp would lower the number of jobs, which would affect the economy, so making an investment of 228 million is worth it in the long run because it would be recouped within a year and would save a lot of jobs.

OR

If the silver carp were to enter the lakes, they would replace the native fish species, negatively harming the ecosystem. And that would cause a lot of damage not only to the ecosystem but jobs, the economy.

Rubric:

The response includes that the fishing industry of the Great Lakes generates \$7 billion in revenue per year so it would only take one year to recoup the \$228 million investment.

AND

The response includes that the introduction of the silver carp would lower incoming revenue because the economy of the Great Lakes is heavily dependent on the fishing industry.

Rubric continues on the next page.

Rubric continues from previous page.

1 point

Exemplar(s):

Making an investment of 228 million is worth it in the long run because it would be recouped within a year and would save a lot of jobs.

Rubric:

The response includes that the fishing industry of the Great Lakes generates \$7 billion in revenue per year so it would only take one year to recoup the \$228 million investment.

OR

The response includes that the introduction of the silver carp would lower incoming revenue because the economy of the Great Lakes is heavily dependent on the fishing industry.

0 point

Exemplar(s):

The fishermen can just fish the carp and not lose any income.

OR

228 million is a lot of money to waste on a blockade, that the fish will cross anyway during a flood.

OR

No the government should not use 228 million dollars, find another solution.

Rubric continues on the next page.

High School Practice Test Items

Rubric continues from previous page.

OR

*&YTT%\$#\$D

OR

I don't know; I was never taught this.

Rubric:

0-point should be awarded if a student attempts to answer the prompt but the response is incorrect or too vague (insufficient information provided) to receive credit

A score of 0 should also be given to responses that consist only of:

No relevant content provided

- no response is provided (e.g., blank)
- random keystrokes or nonsense verbiage
- punctuation mark(s) (e.g., ".")

Student's opinion of the test

Direct copy of the stimulus without any attempt to answer

Opinions or comments about random topics

I don't know, IDK (without further elaboration)

Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.

Item metadata table continuation showing items 45–48

Item	Key	PE	SEP	DCI	CCC	ILCS
45	First and second options (1 point)	HS-PS1-6	6. Constructing Explanations and Designing Solutions	PS1.B Chemical Reactions	7. Stability and Change	Identify the scientific principles that support the effectiveness of the changes to meet the criteria required by the engineer in manufacturing fertilizer.
46	First drop-down menu: 84 Second drop-down menu: 18 (1 point)	HS-PS1-7	5. Using Mathematics and Computational Thinking	PS1.B Chemical Reactions	5. Energy and Matter	Select the mathematical representation that predicts the mass of the other component based on a chemical reaction.
47	B (1 point)	HS-PS1-7	5. Using Mathematics and Computational Thinking	PS1.B Chemical Reactions	5. Energy and Matter	Select the mathematical relationships that best demonstrate that atoms are conserved in the chemical reaction.
48	First drop-down menu: decrease Second drop-down menu: right Third drop-down menu: exothermic (1 point)	HS-PS1-6	6. Constructing Explanations and Designing Solutions	PS1.B Chemical Reactions	7. Stability and Change	Select the change that best meets the criteria and justifies the change in temperature necessary for increasing the amount of fertilizer manufactured.

High School Practice Test Items

Item metadata table continuation showing items 49–50

Item	Key	PE	SEP	DCI	CCC	ILCS
49	Row 1: Disadvantage Row 2: Disadvantage Row 3: Advantage Row 4: Advantage (1 point)	HS-PS1-6	6. Constructing Explanations and Designing Solutions	PS1.B Chemical Reactions	7. Stability and Change	Identify the advantages and disadvantages for each change in fertilizer production.
50	Exemplars and rubric provided below.	HS-PS1-6	6. Constructing Explanations and Designing Solutions	PS1.B Chemical Reactions	7. Stability and Change	Identify or describe the scientific principles that support the effectiveness of the change to meet the criteria to maintain equilibrium.

Exemplars and rubric for item 50:

2 point
Exemplar(s):

An increase in pressure would increase how often molecules collide. The reaction will reduce the effect of this by shifting the equilibrium to the right to make more NH_3 because there are fewer molecules on the right side of the equation.

Rubric continues on the next page.

Rubric continues from previous page.

Rubric:

The response includes that an increase in pressure would increase the frequency of collisions between the reactant molecules.

AND

The response indicates that a system at equilibrium will adjust to reduce the effects of any changes, so the equilibrium will shift right to produce more ammonia or NH_3 to reduce the overall pressure of the system.

1 point

Exemplar(s):

An increase in pressure would increase the number of collisions between molecules.

OR

The reaction will adjust to reduce the effects of the increase in pressure by shifting the equilibrium to the right and to produce more NH_3 . The equilibrium will shift to the right producing more ammonia.

Rubric:

The response indicates that an increase in pressure would increase the frequency of collisions between the reactant molecules.

OR

The response indicates that a system at equilibrium will adjust to reduce the effects of any changes, so the equilibrium will shift right to produce more ammonia or NH_3 to reduce the overall pressure of the system.

Rubric continues on the next page.

High School Practice Test Items

Rubric continues from previous page.

0 point

Exemplar(s):

The percent yield of ammonia at equilibrium would not be affected by an increase in pressure.

OR

There will be more ammonia.

OR

An increase in pressure would decrease the number of collisions between molecules.

OR

The equilibrium will shift to the left, producing less ammonia/ NH_3 .

OR

*&YTT%\$#\$D

OR

I don't know; I was never taught this.

Rubric continues on the next page.

Rubric continues from previous page.

Rubric:

0-point should be awarded if a student attempts to answer the prompt but the response is incorrect or too vague (insufficient information provided) to receive credit

A score of 0 should also be given to responses that consist only of:

No relevant content provided

- no response is provided (e.g., blank)
- random keystrokes or nonsense verbiage
- punctuation mark(s) (e.g., “.”)

Student’s opinion of the test

Direct copy of the stimulus without any attempt to answer

Opinions or comments about random topics

I don’t know, IDK (without further elaboration)

Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.

Additional annotated samples for this prompt can be found at <https://www.caaspp.org/ta-resources/practice-training.html>.