



California Assessment of Student
Performance and Progress

California Science Test Practice Test Scoring Guide



Grade Five

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About the Practice Test Scoring Guide

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 fully representative of all possible item types included in CAST. The practice test covers a selection of items from performance expectations (PEs) assessed in grade five.

This scoring guide should be used alongside the online practice tests, which can be accessed on the [Practice and Training Tests web page](#). Annotated responses are also available to help explain the rationale for each score point on selected constructed response items from the practice test on the [Practice and Training Test Resources web page](#).

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.

Item: This is the question number that corresponds to the question as it appears in the practice test.

Key: This 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.

PE Code: This references the standards that describe what students should know and be able to do.

Science and Engineering Practices (SEPs): These are descriptions of behaviors that students engage in as they investigate the natural world and design solutions.

Disciplinary Core Ideas (DCIs): These are essential ideas in the science disciplines that all students should understand.

Crosscutting Concepts (CCCs): These are interdisciplinary skills students should exhibit that unify the study of science and engineering through common application across fields.

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



Grade Five Practice Test Items

Items 1–9

Item	Key	PE	SEP	DCI	CCC	ILCS
1	A (1 point)	4-ESS2-1	3. Planning and Carrying Out Investigations	ESS2.A Earth Materials and Systems	2. Cause and Effect	Describe and identify observations that are relevant to investigating the effects of weathering or the rate of erosion.
2	B (1 point)	5-LS1-1	7. Engaging in Argument from Evidence	LS1.C Organization for Matter and Energy Flow in Organisms	5. Energy and Matter	Use data to identify which group of seedlings grown with air and/or water in the absence of soil gained the most mass.
3	First, third, and fourth options (1 point)	5-PS1-4	3. Planning and Carrying Out Investigations	PS1.B Chemical Reactions	2. Cause and Effect	Identify the properties to observe or measure that provide evidence of chemical change that would be useful to the investigation.
4	Two-point item: Part A: D (1 point) Part B: the more energy can be transferred to the stopper (1 point)	4-PS3-1	6. Constructing Explanations and Designing Solutions	PS3.A Definitions of Energy	5. Energy and Matter	Use a model to construct an explanation of how the speed of an object is related to its energy.
5	D (1 point)	4-ESS3-2	6. Constructing Explanations and Designing Solutions	ETS1.B Designing Solutions to Engineering Problems	2. Cause and Effect	Select the most appropriate design solution for a volcanic warning system.



Item	Key	PE	SEP	DCI	CCC	ILCS
6	Row 1: Needs to stay the same Row 2: Needs to be changed Row 3: Needs to stay the same (1 point)	3-5-ETS1-3	3. Planning and Carrying Out Investigations	ETS1.B Developing Possible Solutions	N/A	Identify factors that would need to be controlled to get a satisfactory measure of the functioning of the prototype.
7	C (1 point)	5-LS2-1	2. Developing and Using Models	LS2.B Cycles of Matter and Energy Transfer in Ecosystems	4. Systems and System Models	Complete an incomplete model of a food web.
8	C (1 point)	5-ESS1-2	4. Analyzing and Interpreting Data	ESS1.B Earth and the Solar System	1. Patterns	Use the data to correctly identify patterns and make a prediction about shadow movements caused by the changing daily position of the sun.
9	Exemplars and rubric provided on the next page.	3-LS4-2	6. Constructing Explanations and Designing Solutions	LS4.B Natural Selection	2. Cause and Effect	Describe an advantage that character variation may confer on an individual hare in an arctic ecosystem throughout the year.



Item 9 Exemplars and Rubric

Score	Exemplar(s)	Rubric
2	<p>White fur is good camouflage in the snow, so the arctic hare can hide more easily from predators.</p> <p>OR</p> <p>When the summer ends and winter comes the color changes from brown to white so the hare can hide from predators because it blends into the white snow.</p> <p>OR</p> <p>The brown fur would be easily seen by a mountain lion or fox, it is good that the fur changes color from brown to white so they can hide in the snow.</p>	<p>The response indicates that changing from a brown fur color to white fur coat color helps arctic hares hide (or be camouflaged) in the snow.</p> <p>AND</p> <p>The response indicates that white fur coat color protects arctic hares from predators.</p>
1	<p>The white fur helps arctic hares hide in the snow.</p> <p>OR</p> <p>The white fur helps prevent the arctic hare from being eaten.</p> <p>OR</p> <p>If the fur stayed brown in the winter, the hare couldn't hide from any predator that would be after it.</p>	<p>The response indicates that white fur coat color helps arctic hares hide (or be camouflaged) in the snow.</p> <p>OR</p> <p>The response indicates that white fur coat color protects the hare from predators.</p>
0	<p>The white fur is lighter so the hare can run away faster.</p> <p>OR</p> <p>The white fur helps the arctic hares survive in the winter.</p> <p>OR</p> <p>*&YTT%\$#\$D</p> <p>OR</p> <p>I don't know; I was never taught this.</p>	<p>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.</p> <p>A score of 0 should also be given to responses that consist only of:</p> <ul style="list-style-type: none">• No relevant content provided<ul style="list-style-type: none">• 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) <p>Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.</p>



Items 10–16

Item	Key	PE	SEP	DCI	CCC	ILCS
10	Row 1: Advantage Row 2: Disadvantage Row 3: Disadvantage Row 4: Advantage (1 point)	4-PS4-3	6. Constructing Explanations and Designing Solutions	ETS1.C Optimizing the Design Solution	1. Patterns	Compare two solutions that use patterns to transfer information across a loud cafeteria.
11	B (1 point)	5-ESS2-1	2. Developing and Using Models	ESS2.A Earth Materials and Systems	4. Systems and System Models	Identify the factor that is needed to accurately model melting glaciers.
12	battery (1 point)	4-PS3-4	6. Constructing Explanations and Designing Solutions	PS3.B Conservation of Energy and Energy Transfer	5. Energy and Matter	Select the design solution that best tests a simple electrical circuit.
13	First drop-down list: frozen Second drop-down list: lakes (1 point)	5-ESS2-2	5. Using Mathematics and Computational Thinking	ESS2.C The Roles of Water in Earth's Surface Processes	3. Scale, Proportion, and Quantity	Identify patterns or relationships revealed in the diagrams or graphs about the hydrosphere.
14	Row 1: Fossil fuel energy Row 2: Fossil fuel energy Row 3: Solar energy Row 4: Fossil fuel energy (1 point)	4-ESS3-1	8. Obtaining, Evaluating, and Communicating Information	ESS3.A Natural Resources	2. Cause and Effect	Identify the advantages or disadvantages of the use of fossil fuels and solar energy in a growing city.



Item	Key	PE	SEP	DCI	CCC	ILCS
15	Fourth and fifth options (1 point)	3-PS2-2	3. Planning and Carrying Out Investigations	PS2.A Forces and Motion	1. Patterns	Identify the plan that will provide the best evidence of a pattern that can be used to make a prediction about future motion of a swing.
16	Exemplars and rubric provided on the next page.	3-LS3-2	6. Constructing Explanations and Designing Solutions	LS3.A Inheritance of Traits	2. Cause and Effect	Use data to support an explanatory account of the effects watering has on plant growth.



Item 16 Exemplars and Rubric

Score	Exemplar(s)	Rubric
2	<p>The plant that got watered every day grew taller and had more flowers than the plant that only got watered once a week. That plant was short and had only a few flowers. So, water was the factor that made the plants different.</p> <p>OR</p> <p>Watering the plants daily compared to once a week made the plants grow taller and have more flowers than only watering them once a week. That plant didn't grow and didn't produce a lot of flowers.</p>	<p>The response includes that the traits for plant 1 are tall with lots of flowers and the traits for plant 2 are short with few flowers.</p> <p>AND</p> <p>The response includes that water is the factor that influences the traits.</p>
1	<p>Plant 1 was watered daily and grew tall and had a lot of flowers.</p> <p>OR</p> <p>Watering plant 1 every day gave the plant what it needed to grow tall.</p> <p>OR</p> <p>Plant 2 was only watered once a week, so it didn't grow tall and didn't have a lot of flowers.</p> <p>OR</p> <p>The environment can affect the plants traits by having a lot of flowers or only a few flowers or by growing tall or staying short.</p>	<p>The response includes that the traits for plant 1 are tall with lots of flowers and the traits for plant 2 are short with few flowers.</p> <p>OR</p> <p>The response includes that water is the factor that influences the traits.</p> <p>NOTE: 1 score point can be given to responses that state the traits of one plant (with no comparison to the other plant) and include water being that factor.</p>



Score	Exemplar(s)	Rubric
0	<p>Water supplies the plants with energy so they can grow and produce flowers.</p> <p>OR</p> <p>Plant 2 only got food once a week, that's not enough for it to grow.</p> <p>OR</p> <p>Less water is better, so the plants don't drown.</p> <p>OR</p> <p>*&YTT%\$#\$D</p> <p>OR</p> <p>I don't know; I was never taught this.</p>	<p>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.</p> <p>A score of 0 should also be given to responses that consist only of:</p> <ul style="list-style-type: none">• No relevant content provided<ul style="list-style-type: none">• 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) <p>Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.</p> <p>Additional annotated samples for this prompt can be found on the Practice and Training Test Resources web page.</p>



Items 17–29

Item	Key	PE	SEP	DCI	CCC	ILCS
17	Two-point item: Part A: First drop-down list: June Second drop-down list: January (1 point) Part B: C (1 point)	3-ESS2-1	4. Analyzing and Interpreting Data	ESS2.D Weather and Climate	1. Patterns	Use data represented in tables and graphical displays to describe typical weather conditions expected during a particular season.
18	C (1 point)	3-LS4-4	7. Engaging in Argument from Evidence	LS2.C Ecosystem Dynamics, Functioning, and Resilience	4. Systems and System Models	Evaluate the competing solutions and select the most appropriate one given certain criteria and constraints for reversing the decrease of the frog population.
19	First drop-down list: different from Second drop-down list: exists (1 point)	3-LS3-1	4. Analyzing and Interpreting Data	LS3.B Variation of Traits	1. Patterns	Analyze and interpret patterns in data about body length in hedgehogs to identify the inheritance of this trait.
20	B (1 point)	5-PS1-1	2. Developing and Using Models	PS1.A Structure and Properties of Matter	3. Scale, Proportion, and Quantity	Develop a model that correctly portrays evaporation or condensation as the movement of particles in the air from or to a surface, respectively.



Item	Key	PE	SEP	DCI	CCC	ILCS
21	Need to Know Now: Amount of money in the budget and Types of plants that attract butterflies in the region Might Need to Know Later: How to expand the layout of the butterfly garden (1 point)	3-5-ETS1-1	1. Asking Questions (for science) and Defining Problems (for engineering)	ETS1.A Defining and Delimiting Engineering Problems	N/A	Select relevant constraints on potential solutions.
22	A (1 point)	5-ESS3-1	8. Obtaining, Evaluating, and Communicating Information	ESS3.C Human Impacts on Earth Systems	4. Systems and System Models	Identify the effects of a given human activity on the environment.
23	A (1 point)	5-ESS1-1	7. Engaging in Argument from Evidence	ESS1.A The Universe and its Stars	3. Scale, Proportion, and Quantity	Evaluate data about stars to provide a conclusion about the appearance of the stars compared to the Sun.
24	First drop-down list: above the shoulder Second drop-down list: below the waist (1 point)	4-PS4-1	2. Developing and Using Models	PS4.A Wave Properties	1. Patterns	Select the components to develop a wave model that illustrates/explains the volume level of sound waves.
25	A (1 point)	5-PS2-1	7. Engaging in Argument from Evidence	PS2.B Types of Interactions	2. Cause and Effect	Describe the force that causes falling objects to move toward the Earth's center.



Item	Key	PE	SEP	DCI	CCC	ILCS
26	C (1 point)	4-LS1-1	7. Engaging in Argument from Evidence	LS1.A Structure and Function	4. Systems and System Models	Identify the correct claim that was missing from the argument about the structural function of cacti.
27	A (1 point)	3-LS3-1	4. Analyzing and Interpreting Data	LS3.B Variation of Traits	1. Patterns	Identify the patterns in the variation between the parents and the offspring.
28	First, third, and fifth options (1 point)	3-LS3-2	6. Constructing Explanations and Designing Solutions	LS3.B Variation of Traits	2. Cause and Effect	Use data to refute an explanatory account of a different dairy production between cattle ranches.
29	Exemplars and rubric provided on the next page.	3-LS3-1	4. Analyzing and Interpreting Data	LS3.B Variation of Traits	1. Patterns	Identify patterns in the data about production rates in different cattle ranches.



Item 29 Exemplars and Rubric

Score	Exemplar(s)	Rubric
2	<p>Cows A, B, and C at the McCoy farm made less milk in April than in March while at the Origin farm, while cows at the Kim farm made more milk in April than at the Origin farm.</p> <p>OR</p> <p>Cows A, B, and C made more milk in March, while cows D, E, and F made less milk in March. The Kim farm cows made more milk in April, while the McCoy cows made less milk in April.</p> <p>OR</p> <p>Cows A, B, and C made less milk at the McCoy farm than at the Origin farm and Cows D, E, and F produced more milk at the Kim farm than at the Origin farm.</p>	<p>The response includes that the amount of milk produced by Cows A, B, and C went down from March to April.</p> <p>AND</p> <p>The response includes that the milk produced by Cows D, E, and F went up from March to April.</p> <p>NOTE: Responses that reference the name of the farms, without a reference to the months, should receive score points as shown in the third exemplar.</p>
1	<p>The amount of milk that cows A, B, and C made went down in April when compared to March.</p> <p>OR</p> <p>Cows D, E, and F made more milk in April than they did in March.</p> <p>OR</p> <p>Cows at the McCoy farm produced less milk than at the Origin farm.</p> <p>OR</p> <p>Cows at the Kim farm made more milk in April than they did when they were at the Origin farm.</p>	<p>The response includes that the amount of milk produced by Cows A, B, and C went down from March to April.</p> <p>OR</p> <p>The response includes that the milk produced by Cows D, E, and F went up from March to April.</p>



Score	Exemplar(s)	Rubric
0	<p>The cows at the McCoy farm didn't produce any milk in April.</p> <p>OR</p> <p>Cows A, B, and C made more milk when they were with Cows D, E, and F.</p> <p>OR</p> <p>They should not have moved the cows to a different farm.</p> <p>OR</p> <p>*&YTT%\$#\$D</p> <p>OR</p> <p>I don't know; I was never taught this.</p>	<p>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.</p> <p>A score of 0 should also be given to responses that consist only of:</p> <ul style="list-style-type: none"> • No relevant content provided <ul style="list-style-type: none"> • 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) <p>Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.</p>



Items 30–36

Item	Key	PE	SEP	DCI	CCC	ILCS
30	D (1 point)	3-LS3-2	6. Constructing Explanations and Designing Solutions	LS3.A Inheritance of Traits	2. Cause and Effect	Make a qualitative conclusion regarding the relationships between dependent and independent variables based on data from dairy production ranches.
31	First drop-down list: McCoy Second drop-down list: April (1 point)	3-LS3-2	6. Constructing Explanations and Designing Solutions	LS3.A Inheritance of Traits	2. Cause and Effect	Make a qualitative conclusion regarding the relationships between dependent and independent variables in a dairy ranch.
32	First drop-down list: move toward Kristen Second drop-down list: unbalanced (1 point)	3-PS2-2	3. Planning and Carrying Out Investigations	PS2.A Forces and Motion	1. Patterns	Use the data or observations to make a prediction about future motion.
33	A (1 point)	3-PS2-2	3. Planning and Carrying Out Investigations	PS2.A Forces and Motion	1. Patterns	Identify the data that explains an observation of the rope.
34	C (1 point)	3-PS2-1	3. Planning and Carrying Out Investigations	PS2.B Types of Interactions	2. Cause and Effect	Identify the data that explains an observation of the rope.
35	First drop-down list: increase Second drop-down list: moves toward Maria (1 point)	3-PS2-1	3. Planning and Carrying Out Investigations	PS2.A Forces and Motion	2. Cause and Effect	Use the data or observations to make a prediction about future motion.



Item	Key	PE	SEP	DCI	CCC	ILCS
36	Exemplars and rubric provided on the next page.	3-PS2-2	3. Planning and Carrying Out Investigations	PS2.A Forces and Motion	1. Patterns	Identify and describe observations that support a given prediction of future motion.



Item 36 Exemplars and Rubric

Score	Exemplar(s)	Rubric
2	<p>Since John and Pablo are providing a balanced force and Kristen and Maria are providing an unbalanced force where the force is bigger in Kristen's direction, the total force will be unbalanced towards Kristen's team.</p> <p>OR</p> <p>The practice results show that Kristen's force combined with Pablo's is going to be greater than Maria's force combined with John's. So the unbalanced forces result in Kristen and Pablo winning.</p>	<p>The response includes all four of the forces each student contributes to the combined overall force of the team:</p> <ul style="list-style-type: none">• Kristen pulls with the most force / is strongest / beats everyone.• Maria pulls with more force than Pablo or John but less than Kristen.• Pablo and John pull with the same force / are weaker than Kristen or Maria.
1	<p>Kristen beat Maria, so Kristen applies a larger force to the rope than Maria does.</p> <p>OR</p> <p>Pablo and John apply equal forces and don't make a difference.</p>	<p>The response includes two to three of the forces each student contributes to the combined overall force of the team:</p> <ul style="list-style-type: none">• Kristen pulls with the most force / is strongest / beats everyone.• Maria pulls with more force than Pablo or John but less than Kristen.• Pablo and John pull with the same force / are weaker than Kristen or Maria.
0	<p>Kristen's team wins because they pull harder.</p> <p>OR</p> <p>The boys are stronger than the girls.</p> <p>OR</p> <p>Kristen's team wins if you add up the results.</p> <p>OR</p> <p>*&YTT%\$#\$D</p> <p>OR</p> <p>I don't know; I was never taught this.</p>	<p>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.</p> <p>A score of 0 should also be given to responses that consist only of:</p> <ul style="list-style-type: none">• No relevant content provided<ul style="list-style-type: none">• 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) <p>Responses that go on to provide an answer to the prompt should be scored based on the relevant part of the response.</p>



Items 37–41

Item	Key	PE	SEP	DCI	CCC	ILCS
37	First drop-down list: hydrosphere Second drop-down list: geosphere (1 point)	5-ESS2-1	2. Developing and Using Models	ESS2.A Earth Materials and Systems	4. Systems and System Models	Identify the two ecosystems contributing most to the excavation of a fossil.
38	changed over time (1 point)	4-ESS1-1	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	1. Patterns	Describe the reasoning for how the data support an explanation of marine fossils found in a terrestrial location.
39	C (1 point)	4-ESS1-1	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	1. Patterns	Describe the reasoning to support an explanation of fossil deposition and stratigraphy.
40	D (1 point)	4-ESS1-1	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	1. Patterns	Identify data that support the explanation of fossil deposition.
41	Exemplars and rubric provided on the next page.	4-ESS1-1	6. Constructing Explanations and Designing Solutions	ESS1.C The History of Planet Earth	1. Patterns	Describe the reasoning for how the data support an explanation of the law of superposition and stratigraphy.



Item 41 Exemplars and Rubric

Score	Exemplar(s)	Rubric
2	<p>The marine fossil layer of rock is older than the land fossil layer because the marine fossils are in the lower layer of rock. The landscape where the rock was formed changed from water to land.</p> <p>OR</p> <p>The rock layer with the marine fossils is older because it's at the bottom. When the lower layer of rock was forming the area was an ocean, but it changed to land over time.</p>	<p>The response includes that the rock layer with marine fossils is older than the layers with land fossils.</p> <p>AND</p> <p>The response includes that the landscape where the rock formed changed from being an ocean to a land environment.</p>
1	<p>The bottom layer of rock is the oldest.</p> <p>OR</p> <p>The rock layer with the marine fossils is older because it was formed first.</p> <p>OR</p> <p>The earth was once an ocean when the fossils formed and it is now land, so that's why we find ocean fossils on the land.</p>	<p>The response includes that the rock layer with the marine fossils is older than the layers with the land fossils.</p> <p>OR</p> <p>The response includes that where the rock formed was an ocean and it changed to land.</p>
0	<p>The rocks were moved by plate tectonics.</p> <p>OR</p> <p>The rock layers have all kinds of fossils in them.</p> <p>OR</p> <p>The land fossils are older because they are found in the higher layers.</p> <p>OR</p> <p>*&YTT%\$#\$D</p> <p>OR</p> <p>I don't know; I was never taught this.</p>	<p>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.</p> <p>A score of 0 should also be given to responses that consist only of:</p> <ul style="list-style-type: none">• No relevant content provided<ul style="list-style-type: none">• 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) <p>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 on the Practice and Training Test Resources web page.</p>