



CAST PRACTICE TEST

3-Dimensions of Science Learning Using NGSS

**5TH GRADE
Teacher**





5th Grade CAST Practice Test

SAMPLE

This sample only contains five questions with the answers

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A Science Teacher's Best Friend

We at Education4Equity recognized that throughout the state of California, science teachers are pondering how to best prepare their students for the CAST (California Science Test). The Next Generation Science Standards (NGSS) with the introduction of the 3-Dimensions of Science Learning (DCI – Disciplinary Core ideas; SEP – Science and Engineering Practices; and CCC – Crosscutting Concepts) have brought to the table a way of teaching science that is both inspiring, but at times overwhelming. A seven minute explanation of the new way of organizing the standards is given here: <https://www.youtube.com/watch?v=Q6eoRnrwL-A&t=9s> and links off of the NGSS website: <https://www.nextgenscience.org/standards/standards>.

Because science teachers all have their own way of introducing scientific concepts, we felt the best way to prepare a teacher and their students for the California Science Test (CAST), was to create a practice test that did the following:

1. It gave teachers, regardless of their background, a unified way to prepare students for the California specific test.
2. It allowed teachers to focus on helping students enter into the experience of dealing with various phenomenon.
3. It provided teachers the most flexibility in using various curriculum.
4. It has a proven record of raising student scores by as much as 30%.

In addition to using our practice test questions, we at Education4Equity highly encourage teachers to make use of these two resources for understanding the background of practice test questions and for creating your own test questions.

1. The CAASPP Online Practice and Training Tests Portal

<http://www.caaspp.org/practice-and-training/index.html>

2. Item Specifications

<https://www.cde.ca.gov/ta/tg/ca/castitemspecs.asp>

Don't hesitate to contact us if you need ideas for how to use the practice test questions to turn your classroom into a center of curiosity, innovation, and enlightenment. Simply email help@education4equity.com. We have tests for Elementary (which we mainly call the 5th grade test), for Middle school (which we call the 8th grade test) and for High School (which we call the High School test). The 3 books are listed on the next page, and each book comes in a student version and a teacher version with answers. We have not put all the answer in this book since this book is mainly a sample for teachers, principals and superintendents to get a "taste" of what we at Education4Equity are providing. See below for the front cover of our books.

We end on a note of comfort to all science teachers:

Be encouraged and please join us in the effort to make our students top critical thinkers in the world. We hope these practice questions will not be seen as a chore to burden you with added work, but as a "best friend" that lists "experiential opportunities" to stir up student curiosity.

In conclusion we'd like to give special thanks to the 40-member team who wrote the NGSS Standards, Jill Wertheim, Ph.D. (Stanford), Linda de Lucchi (Berkley), Ayele Doodoo, Ed.D. (WestEd), and the team that supports the CAASPP Web Portal. To all owner of our books, please take note that the way we deliver the answers to each practice question is highly instructive and helps teachers and students alike think like practitioners.

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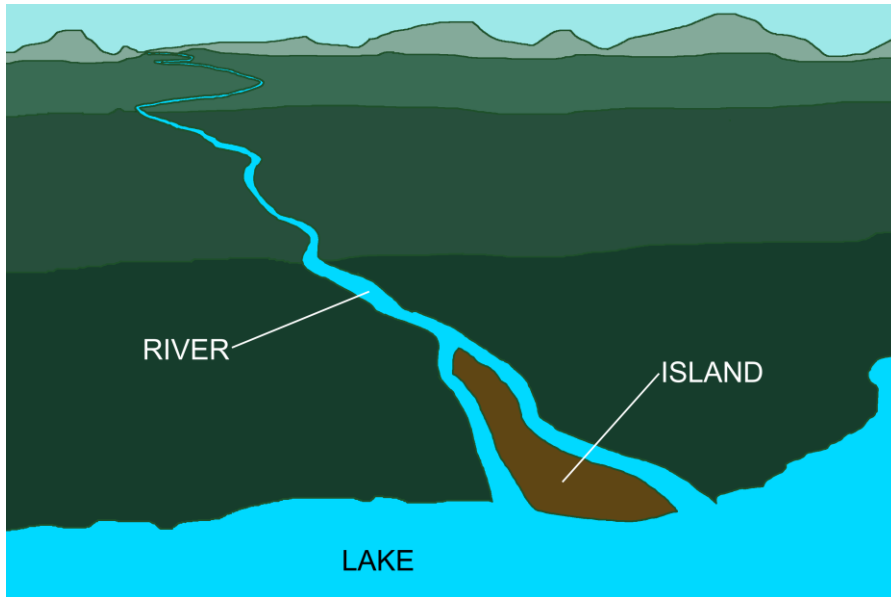
Discrete Items—Section 1

1. Write your name.

First

Last

2. Students visit a small river that flows into a lake. A short distance before the river reaches the lake, it splits into two branches with a low, flat island in between them.



Select the option that **best** completes the sentence describing how the island was **most likely** formed.

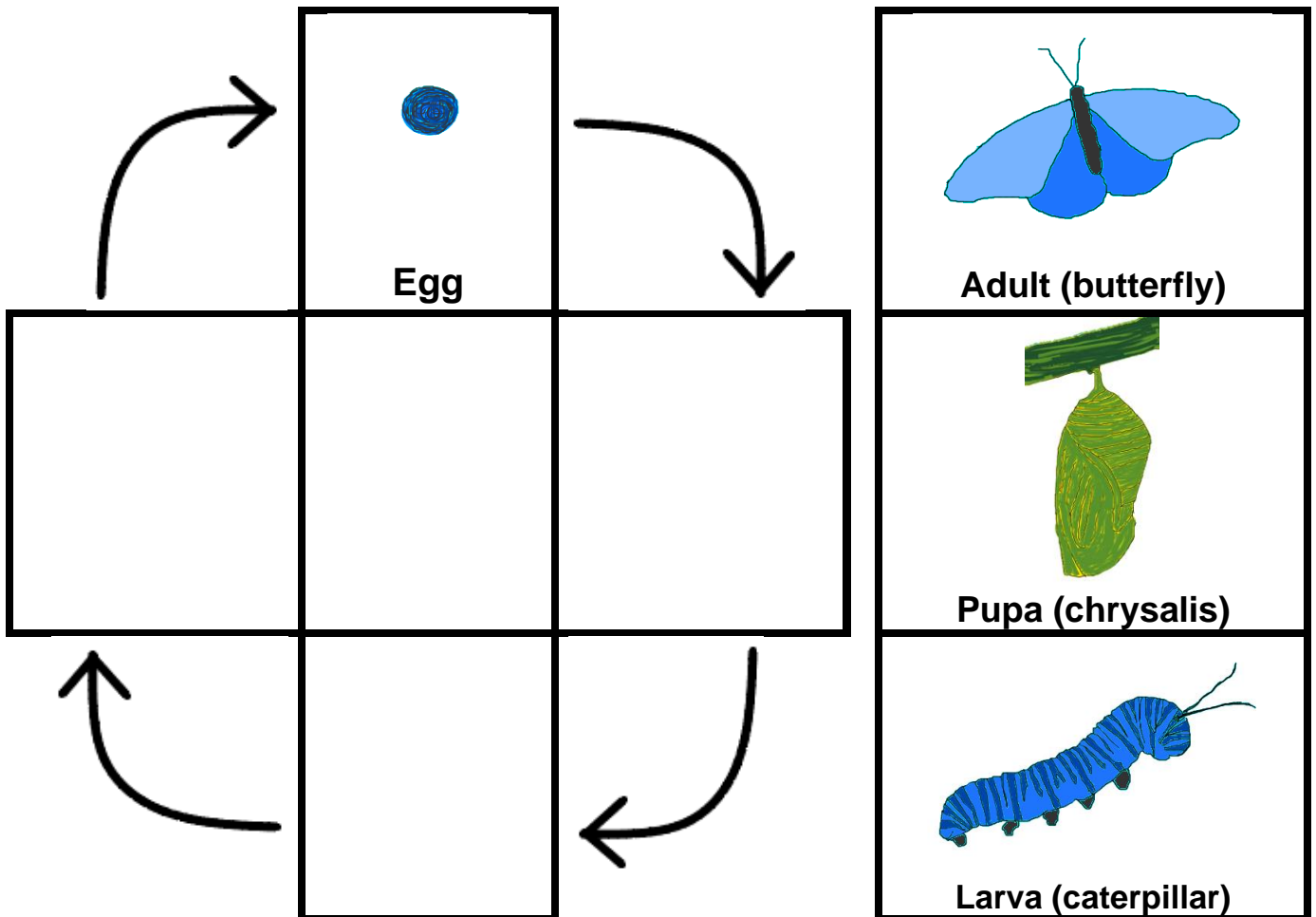
The island was formed by:

- A. the river gradually eroding the land around it over time.
- B. waves from the lake piling up sand and soil over time.
- C. the river gradually depositing sand and soil from upstream.
- D. humans using bulldozers and dump trucks to pile up soil.

3. A class is given a few butterfly eggs. After one of the eggs hatches, the students observe and record the stages of the butterfly's life cycle as it grows.

Part A

Complete the model of the butterfly's life cycle by writing in the words from the boxes on the left in the correct place in the diagram.



Part B

The students identify the adult butterfly as a female based on the coloring of her wings. They wonder why the female butterfly does not lay any eggs.

Which sentence gives the **best** reason why the butterfly does not lay any eggs?

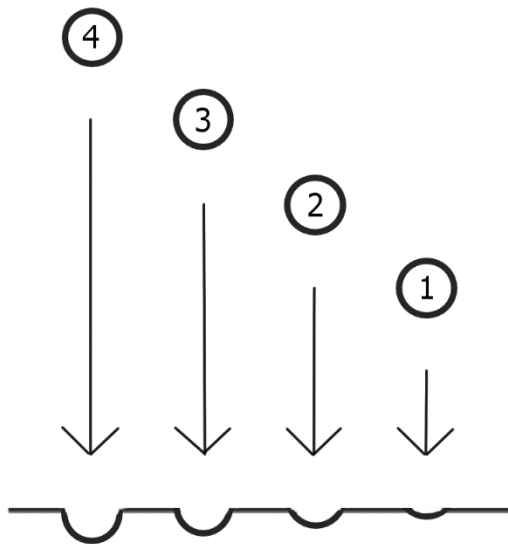
- A. The students are not feeding the butterfly the right food.
- B. The students are not giving the butterfly enough water.
- C. The butterfly needs to be outside in order to lay eggs.
- D. The butterfly needs to mate with a male in order to lay eggs.

4. A student mixes 100 grams of a purple powder with 100 grams of a clear liquid in a closed container. The student knows that a chemical reaction has taken place because the mixture bubbles, turns blue, and the container feels much colder.

How much does the new substance weigh?

- A. 100 grams
- B. 150 grams
- C. 200 grams
- D. 300 grams

5. A student drops the same bowling ball from 4 different heights onto an area of even, soft ground. The bowling ball makes an impression on the soil each time it falls. Another student measures the depth of each impression.



Drop Level	Depth of Impression
1	1 cm
2	3 cm
3	5 cm
4	7 cm

Part A

Which drop level resulted in the greatest speed of the bowling ball when it hit the ground?

- A. Level 1
- B. Level 2
- C. Level 3
- D. Level 4

Part B

Based on the evidence in the diagram and the table, circle the option in **BOLD** that **best** explains what happened in the experiment.

The faster the bowling ball is moving when it hits the ground, **the more energy / the less energy** it transfers to the ground.

Standards and Answers

Standard:	ESS2	Earth's Systems		
Performance Expectation:	4-ESS2-1	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.		
	Clarification Statement	Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.		
	Assessment Boundary	Assessment is limited to a single form of weathering or erosion.		
		SEP	DCI	CCC
		Planning and Carrying Out Investigations	ESS2.A—Earth Materials and Systems	Cause and Effect
		Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.	Cause and effect relationships are routinely identified, tested, and used to explain change.
			ESS2.E—Biogeology	
			Living things affect the physical characteristics of their regions.	

Item	Answer	Notes
2	C	

Standard:	LS1	From Molecules to Organisms: Structures and Processes		
Performance Expectation:	3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.		
	Clarification Statement	Changes organisms go through during their life form a pattern.		
	Assessment Boundary	Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.		
		SEP	DCI	CCC
		Developing and Using Models	LS1.B—Growth and Development of Organisms	Patterns
		Develop models to describe phenomena.	Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	Patterns of change can be used to make predictions.

Item	Answer	Notes
3a	Clockwise: “Larva” “Pupa” “Adult”	
3b	D	

Standard:	PS1	Matter and Its Interactions		
Performance Expectation:	5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.		
	Clarification Statement	Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances.		
	Assessment Boundary	Assessment does not include distinguishing mass and weight.		
		SEP	DCI	CCC
		Using Mathematics and Computational Thinking	PS1.B—Chemical Reactions	Scale, Proportion, and Quantity
		Measure and graph quantities such as weight to address scientific and engineering questions and problems.	When two or more different substances are mixed, a new substance with different properties may be formed.	Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
			No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)	

Item	Answer	Notes
4	C	

Standard:	PS3	Energy		
Performance Expectation:	4-PS3-1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.		
	Clarification Statement	Examples of evidence relating speed and energy could include change of shape on impact or other results of collisions.		
	Assessment Boundary	Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.		
		SEP	DCI	CCC
		Constructing Explanations and Designing Solutions	PS3.A—Definitions of Energy	Energy and Matter
		Use evidence (e.g., measurements, observations, patterns) to construct an explanation.	The faster a given object is moving, the more energy it possesses.	Energy can be transferred in various ways and between objects.
			PS3.B—Conservation of Energy and Energy Transfer	
			Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.	
			PS3.C—Relationship Between Energy and Forces	
			When objects collide, the contact forces transfer energy so as to change the objects' motions.	

Item	Answer	Notes
5a	D	
5b	"the more energy"	