

# California Science Test



## Grade Eight Practice Test Constructed Response Annotated Examples

This guide provides scored and annotated student examples for selected constructed response items and is intended to be used in conjunction with the California Science Test (CAST) Practice Test Scoring Guide.



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This packet provides the prompts, rubrics, and scored and annotated student examples for two constructed-response items on the grade eight practice test, and is intended to be used in conjunction with the grade eight [CAST: Practice Test Scoring Guides](#). The Scoring Guide includes a glossary of terms, student response types, correct responses, and related scoring considerations for the practice test items.

## CAST Practice Test Item 6 Metadata

This item is not part of a performance task. Refer to the online Practice Test and the Scoring Guide for additional context.

**Table 1. Metadata**

| Item | PE       | SEP                                | DCI   | CCC                 | ILCS   |
|------|----------|------------------------------------|---|---------------------|--|
| 6    | MS-LS2-1 | 4. Analyzing and Interpreting Data | LS2.A<br>Interdependent Relationships in Ecosystems | 2. Cause and Effect | Explain how resource availability affects population growth and carrying capacities. |

## CAST Practice Test Item 6 Prompt

*Explain why the paramecium population growth is rapid at the part labeled A and why the population growth rate is slower at the part labeled B, where the population is at carrying capacity.*

*Enter your answer in the box provided.*

## California Science Test Grade Eight Practice Test Constructed Response Annotated Examples

### Constructed Response Rubric and Student Samples

#### Score Point

**2**

#### Grade 8 Score Point 2 Rubric and Exemplars from Scoring Guide

| Rubric  | Exemplar(s)  |
|---|--|
| <p>The response includes that at point A, resources are plentiful (unlimited) and the population can grow rapidly.</p> <p>AND</p> <p>The response includes that at point B, carrying capacity, resources are limited and so the growth rate slows down.</p> | <p><i>At point A, the paramecium population is growing rapidly because there's plenty of food. At point B, the growth rate slows down because now there are more paramecium and the food supply is limited.</i></p> <p>OR</p> <p><i>At Point A the paramecium are growing quickly because there is plenty of food but at Point B the food supply has decreased so the growth rate has slowed down.</i></p> |

### Grade 8 Sample 1, Score Point 2

| Student Response   | Score Rationale and Evidence   |
|--|--|
| <p><i>At Label A the growth rate is rapid because there is enough resources and space to hold more paramecium so they can easily reproduce and live longer. At Label B the growth rate is slower because the paramecium don't have enough resources and space to keep reproducing. Therefore the environment cannot support a growing population anymore so it stays the same.</i></p> | <p>The response correctly states that at point A, resources are plentiful and the population can grow rapidly (<i>At Label A the growth rate is rapid because there is enough resources.</i>). The response also includes that at point B resources are limited and growth slows down. (<i>At Label B the growth rate is slower because the paramecium don't have enough resources ...</i>).</p> |

### Grade 8 Sample 2, Score Point 2

| Student Response  | Score Rationale and Evidence   |
|---|--|
| <p><i>It is growing rapidly at Part A because there was abundant resources. But once the population reached it's carrying capacity the growth slows down because there is only enough resources for a certain population now.</i></p> | <p>The response correctly states that at point A, resources are plentiful and the population can grow rapidly (<i>It is growing rapidly at Part A because there was abundant resources.</i>). The response also includes that at point B, resources are limited and growth slows down (<i>... growth slows down because there is only enough resources ...</i>).</p> |

### Grade 8 Sample 3, Score Point 2

| Student Response  | Score Rationale and Evidence  |
|---|---|
| <p><i>The growth is rapid at A because there were alot of resources so the population increased alot. At part B, the rate slowed down because it reached the carrying capacity and there were not enough resources.</i></p> | <p>The response correctly states that at point A, resources are plentiful and the population can grow rapidly (<i>The growth is rapid at A because there were alot of resources ...</i>). The response also includes that at point B, resources are limited and growth slows down. (<i>At part B, the rate slowed down ... there were not enough resources.</i>).</p> |

## Score Point

# 1

### Grade 8 Score Point 1 Rubric and Exemplars from Scoring Guide

| Rubric  | Exemplar(s)   |
|---|---|
| <p>The response includes that at point A resources are plentiful (unlimited) and the population can grow rapidly.</p> <p>OR</p> <p>The response includes that at point B, carrying capacity, resources are limited and so the growth rate slows down.</p> | <p><i>At Point A there is a lot resources for the paramecium so the population can grow rapidly.</i></p> <p>OR</p> <p><i>At point B there is not enough resources to support any more growth.</i></p> <p>OR</p> <p><i>Because after the paramecium has reached its carrying capacity and there is not enough resources, growth has slowed down.</i></p> |

### Grade 8 Sample 4, Score Point 1

| Student Response   | Score Rationale and Evidence   |
|--|--|
| <p><i>At point A this population experiences a period of logistic growth. A population will increase rapidly because there is nothing stopping them, they have abundant resources. Once the population starts to slow in growth and reaches its carrying capacity at point B, it will stay at a steady rate. This population experiences logistic growth just like most populations do at some point during their existence.</i></p> | <p>The response correctly states that at point A resources are plentiful and the population can grow rapidly (... population will increase rapidly because ... they have abundant resources.). The response does not include that at point B growth slows because resources are limited.</p> |

### Grade 8 Sample 5, Score Point 1

| Student Response  | Score Rationale and Evidence   |
|---|--|
| <i>In part A the population increases. In part B the population reached its carrying capacity, meaning that there are only enough resources in their environment to support a certain population and the resources can't sustain any more paramecium.</i> | The response does not state that at point A resources are plentiful. The response does include that at point B the environment can't support any more paramecium because resources are limited ( . . . <i>there are only enough resources to support a certain population . . . the resources can't sustain any more paramecium</i> ). |

### Grade 8 Sample 6, Score Point 1

| Student Response   | Score Rationale and Evidence  |
|--|---|
| <i>At A they have plenty of resources but at B they completely ran out of resources.</i> | The response receives credit for stating that at point A resources are plentiful ( <i>At A they have plenty of resources . . .</i> ). The response does not include that at point B resources are limited. Instead, it states that “they completely ran out of resources.” Had the paramecia completely run out of resources, the population would have declined after that point, not remained steady. |



## Score Point

# 0

### Grade 8 Score Point 0 Rubric and Exemplars from Scoring Guide

| Rubric   | Exemplar(s)  |
|--|--|
| 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><i>The population didn't change size, just that the resources were gone.</i></p> <p>OR</p> <p><i>The paramecium will find a new food source and continue to grow.</i></p> <p>OR</p> <p><i>*&amp;YTT%\$#\$D</i></p> <p>OR</p> <p><i>I don't know; I was never taught this.</i></p> |

### Grade 8 Sample 7, Score Point 0

| Student Response   | Score Rationale and Evidence  |
|--|---|
| <i>First the population is rapid because the parameciums are reproducing and growing. But then the population hits the carying capacity. This means for a couple of years the population will stay the same with nothing effecting them.</i> | <p>The response does not state that at point A resources are plentiful nor does the response include that at point B resources are limited. No credit is given for restating from the prompt that the population is at carrying capacity. The student's statement that there is "nothing effecting" the population once it reaches carrying capacity is also incorrect.</p> |

**Grade 8 Sample 8, Score Point 0**

| Student Response  | Score Rationale and Evidence   |
|---|--|
| <p><i>At the part labeled A, the population's growth is rapid because at the start it needs to grow in order to produce more and more paramecium. The growth rate is slower at B because it is almost reaching the carrying capacity and at some point it will decrease</i></p> | <p>Although the response does state that at part A the population's growth is rapid, this is simply a restatement of the prompt. A correct explanation for <i>why</i> the growth is rapid (resources are plentiful) is not given. In addition, although the response does state that at part B the growth rate is slower, it does not provide the correct reason <i>why</i> (resources are limited).</p> |

**Grade 8 Sample 9, Score Point 0**

| Student Response   | Score Rationale and Evidence  |
|--|---|
| <p><i>The population (A) is rapid cause they are parasites infecting an area. (B) they began to slow down cause they are at carrying capacity.</i></p> | <p>The student may have confused "parasites" with "paramecium"; however, credit would still have been provided if correct reasons had been given for why growth was initially rapid and then slowed down. The response does not state that at point A resources are plentiful nor does the response include that at point B resources are limited. No credit is given for repeating the phrase "carrying capacity" from the prompt.</p> |

## CAST Practice Test Item 13 Metadata

This item is not part of a performance task. Refer to the online Practice Test and the Scoring Guide for additional context.

**Table 1. Metadata**

| Item | PE       | SEP                                   | DCI   | CCC                     | ILCS  |
|------|----------|---------------------------------------|---|-------------------------|---|
| 13   | MS-LS2-4 | 7. Engaging in Argument from Evidence | LS2.C Ecosystem Dynamics, Functioning, and Resilience | 7. Stability and Change | Link the evidence/data to a claim about how the impact of La Niña caused a change in the rate of photosynthesis within a tropical rainforest ecosystem. |

## CAST Practice Test Item 13 Prompt

*Predict how a La Niña event affects the rate of photosynthesis by plants in the tropical forests of Central America. Provide evidence from the graph to support your prediction.*

*Enter your answer in the box provided.*

## Constructed Response Rubric and Student Samples

### Score Point

# 2

### Grade 8 Score Point 2 Rubric and Exemplars from Scoring Guide

| Rubric   | Exemplar(s)   |
|--|---|
| <p>The response includes that the rate of photosynthesis will decrease</p> <p>AND</p> <p>The response includes that the graph shows as light intensity decreases, the CO<sub>2</sub> uptake decreases.</p> | <p><i>The rate of photosynthesis will decrease. The graph shows that as light intensity decreases then CO<sub>2</sub> intake decreases too.</i></p> |

### Grade 8 Sample 1, Score Point 2

| Student Response   | Score Rationale and Evidence  |
|--|---|
| <p><i>A La Niña event would affect the rate of photosynthesis by plants because clouds will form in the cooler temperature, blocking the sun. In the graph, the CO<sub>2</sub> uptake is less with a lower light intensity, because sunlight and CO<sub>2</sub> are needed for photosynthesis. And, if you don't have enough sunlight, since there are clouds, then plants won't be doing as much photosynthesis. Therefore, the CO<sub>2</sub> uptake will be less.</i></p> | <p>The response includes that the rate of photosynthesis will decrease (... plants won't be doing as much photosynthesis.). The response also includes that as light intensity decreases, the CO<sub>2</sub> uptake decreases (In the graph, the CO<sub>2</sub> uptake is less with a lower light intensity ...).</p> |

### Grade 8 Sample 2, Score Point 2

| Student Response   | Score Rationale and Evidence   |
|--|--|
| <i>La Niña slows the plants ability to do photosynthesis. This is evident by the fact that the less light, the less CO<sub>2</sub> uptake.</i> | The response includes that the rate of photosynthesis will decrease ( <i>La Niña slows the plants ability to do photosynthesis.</i> ). The response also includes that as light intensity decreases, the CO <sub>2</sub> uptake decreases ( <i>This is evident by the fact that the less light, the less CO<sub>2</sub> uptake.</i> ). |

### Grade 8 Sample 3, Score Point 2

| Student Response  | Score Rationale and Evidence   |
|---|--|
| <i>A La Niña event could slow the rate of photosynthesis by a moderate amount. This is because sunlight can be blocked by the more frequent cloud formations, and the graph also shows that CO<sub>2</sub> intake goes down when there is a lack of light. The light difference would surely stifle the rate of photosynthesis, of which light is a necessary ingredient.</i> | The response includes that the rate of photosynthesis will decrease ( <i>A La Niña event could slow the rate of photosynthesis .... the light difference would surely stifle the rate of photosynthesis ...</i> ). The response also includes that as light intensity decreases, the CO <sub>2</sub> uptake decreases ( <i>The graph also shows that CO<sub>2</sub> intake goes down when there is a lack of light.</i> ). |

## Score Point

# 1

### Grade 8 Score Point 1 Rubric and Exemplars from Scoring Guide

| Rubric   | Exemplar(s)   |
|--|---|
| <p>The response includes that the rate of photosynthesis will decrease.</p> <p>OR</p> <p>The response includes that the graph shows as light intensity decreases, the CO<sub>2</sub> uptake decreases.</p> | <p><i>The rate of photosynthesis will decrease.</i></p> <p>OR</p> <p><i>With less sunlight, the plants take up less carbon dioxide.</i></p> |

### Grade 8 Sample 4, Score Point 1

| Student Response  | Score Rationale and Evidence  |
|---|---|
| <p><i>The La Niña event affects the rate of photosynthesis because when there is less light, the plants go through photosynthesis slower.</i></p> | <p>The response receives one point for including that the rate of photosynthesis will decrease (... <i>when there is less light, the plants go through photosynthesis slower.</i>). The response does not receive a second point, as it neither references the graph nor states that as light intensity decreases, the CO<sub>2</sub> uptake decreases.</p> |

### Grade 8 Sample 5, Score Point 1

| Student Response  | Score Rationale and Evidence   |
|---|--|
| <i>The La Niña event would affect the amount of CO<sub>2</sub> a plant intakes. The graph shows that the less light, the less CO<sub>2</sub> the plant uptakes.</i> | The response includes that as light intensity decreases, the CO <sub>2</sub> uptake decreases ( <i>The graph shows that the less light, the less CO<sub>2</sub> the plant uptakes.</i> ). The response does not include that the rate of photosynthesis will decrease. |

### Grade 8 Sample 6, Score Point 1

| Student Response   | Score Rationale and Evidence   |
|--|--|
| <i>A La Niña event would cause the rate of photosynthesis by plants to decrease. La Niña events cause clouds which block the sun from getting to plants. On the graph, the less sunlight a plant gets, the lower the rate of photosynthesis will be.</i> | The response includes that the rate of photosynthesis will decrease ( <i>A La Niña event would cause the rate of photosynthesis by plants to decrease.</i> ). The response does not include that as light intensity decreases, the CO <sub>2</sub> uptake decreases. |

## Score Point

# 0

### Grade 8 Score Point 0 Rubric and Exemplars from Scoring Guide

| Rubric   | Exemplar(s)  |
|--|--|
| 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><i>The rate of photosynthesis will increase.</i></p> <p>OR</p> <p><i>The rate of photosynthesis will increase because of the warmer climate.</i></p> <p>OR</p> <p><i>Carbon dioxide uptake will increase.</i></p> <p>OR</p> <p><i>*&amp;YTT%\$#\$D</i></p> <p>OR</p> <p><i>I don't know; I was never taught this.</i></p> |

### Grade 8 Sample 7, Score Point 0

| Student Response   | Score Rationale and Evidence  |
|--|---|
| <i>La Niña can block the sun's rays from the plants with clouds.</i> | <p>Although the response does correctly state that clouds can “<i>block the sun's rays from the plants</i>,” this is simply a repeat of information provided in the prompt and does not directly state that rate of photosynthesis will decrease. In addition, the response neither references the graph nor states that as light intensity decreases, the CO<sub>2</sub> uptake decreases.</p> |



### Grade 8 Sample 8, Score Point 0

| Student Response  | Score Rationale and Evidence  |
|---|---|
| <i>La Niña can affect plants photosynthesis because there isn't as much sunlight so plants can't make CO<sub>2</sub>. This also means that they can't grow.</i> | The response does not include that the rate of photosynthesis will decrease. The response does not reference the graph or include that as light intensity decreases, the CO <sub>2</sub> uptake decreases. The response earns no credit for describing the misconception “ <i>because there isn't as much sunlight so plants can't make CO<sub>2</sub>.</i> ” |

### Grade 8 Sample 9, Score Point 0

| Student Response  | Score Rationale and Evidence  |
|---|---|
| <i>From the increase of clouds forming it blocks out the sun from the process of photosynthesis. And the more light that is shown, the more CO<sub>2</sub> is produced to let the forests grow.</i> | The response does not receive credit for stating that clouds will “ <i>block out sun from the process of photosynthesis</i> ”; this is simply a repeat of the prompt and does not directly state that the rate of photosynthesis will decrease. The response does not receive credit for misinterpreting the graph as indicating that “ <i>the more light that is shown, the more CO<sub>2</sub> is produced.</i> ” |