

NGSS Grade 5 Practice Test Answer Key

Item 1

Alignment: 3-ESS3-1: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

- **SEP:** Engaging in Argument from Evidence
- **DCI:** ESS3.B: Natural Hazards
- **CCC:** Cause and Effect

Part A

Which problem can be solved using the beach solutions shown in Tables 1 and 2, and Figure 1?

- Ⓐ larger rocks being deposited on the beach
- Ⓑ harmful new plants and animals arriving on the beach
- Ⓒ waves growing smaller over time, which increases erosion
- Ⓓ future storms causing erosion and decreasing the shoreline

Answer: D

Part B

The homeowner wants to select a solution that will help protect the house. The owner has four goals the solution must meet. Click on the boxes to select which solution(s) meet each goal.

- You may select more than one box per row.
- You do not have to select a box for every row.

| Goal | Plants | Sea Wall | Stone Wall |
|-----------------------------------|--------------------------|--------------------------|--------------------------|
| Cost is less than \$100 per meter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Least amount of work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Can last for more than 30 years | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Helps wildlife the most | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Answer:

| Goal | Plants | Sea Wall | Stone Wall |
|-----------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| Cost is less than \$100 per meter | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Least amount of work | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Can last for more than 30 years | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Helps wildlife the most | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Part C

Click on the blank box and select the solution that should be used for the house based on the goals met in part B.

| | |
|-----------------|----------------------|
| Solution | <input type="text"/> |
|-----------------|----------------------|

Options:

- Plants
- Sea wall
- Stone wall

Answer: Answer will vary based on the student's response to Part B.

Part D

Select **two** additional pieces of information that would help the homeowner decide which solution to use.

- the type of materials needed to build the solution
- the height of the waves that typically hit the beach
- the types of animals that use the beach for shelter
- the necessary length of beach between the house and the ocean
- whether the solution is damaged during heavy rain or strong waves

Answer:

- the type of materials needed to build the solution
- the height of the waves that typically hit the beach
- the types of animals that use the beach for shelter
- the necessary length of beach between the house and the ocean
- whether the solution is damaged during heavy rain or strong waves

Item 2

Alignment: 4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

- **SEP:** Constructing Explanations and Designing Solutions
- **DCI:** ESS3.B: Natural Hazards
- **CCC:** Cause and Effect

The tsunami warning system that should be used is the

- It has many parts.
- It has a low total cost.
- It has a low continued cost.
- It can be moved to different locations.
- The data can be shared with other systems.
- It keeps working if one part of the system breaks.

Options:

- DART system
- Cable system
- GPS system

Answer:

The tsunami warning system that should be used is the

- It has many parts.
- It has a low total cost.
- It has a low continued cost.
- It can be moved to different locations.
- The data can be shared with other systems.
- It keeps working if one part of the system breaks.

Item 3

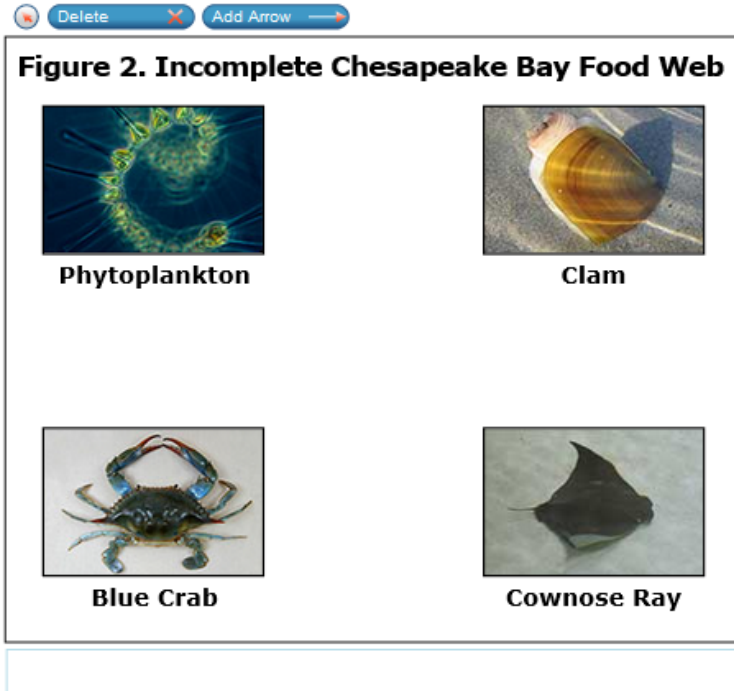
Alignment: 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers and the environment.

- **SEP:** Developing and Using Models
- **DCI:** LS2.A: Interdependent Relationships in Ecosystems
- **CCC:** Systems and System Models

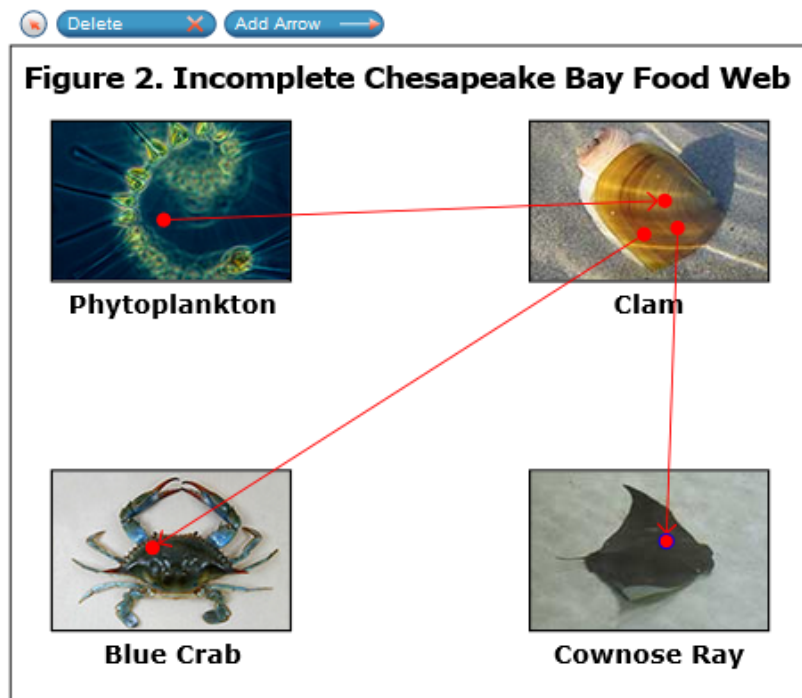
Part A

Use the Add Arrow tool to draw arrows showing the flow of matter in the Chesapeake Bay.

- Each arrow must begin and end on a picture of an organism.



Answer:



Part B

Select **two** statements that describe how matter flows among phytoplankton, blue crabs, and cownose rays.

- Matter flows from consumer to producer.
- Matter flows from producer to consumer.
- Matter flows from consumer to consumer.
- Matter flows from consumer to decomposer.
- Matter flows from decomposer to consumer.

Answer:

- Matter flows from consumer to producer.
- Matter flows from producer to consumer.
- Matter flows from consumer to consumer.
- Matter flows from consumer to decomposer.
- Matter flows from decomposer to consumer.

Part C

Using the information in Table 1, click on the blank boxes and first select the organism that completes the flow of matter in part A. Then, select the process by which this occurs.

| Organism |
|----------|
| |

| Process |
|---------|
| |

Options:

- Organism:
 - Oysters
 - Bacteria
 - Bull sharks
 - Laughing gulls
- Process:
 - They prey on cownose rays.
 - They compete with clams for food.
 - Their diet includes matter from land and sea.
 - They break down matter and return it to the environment.

Answer:

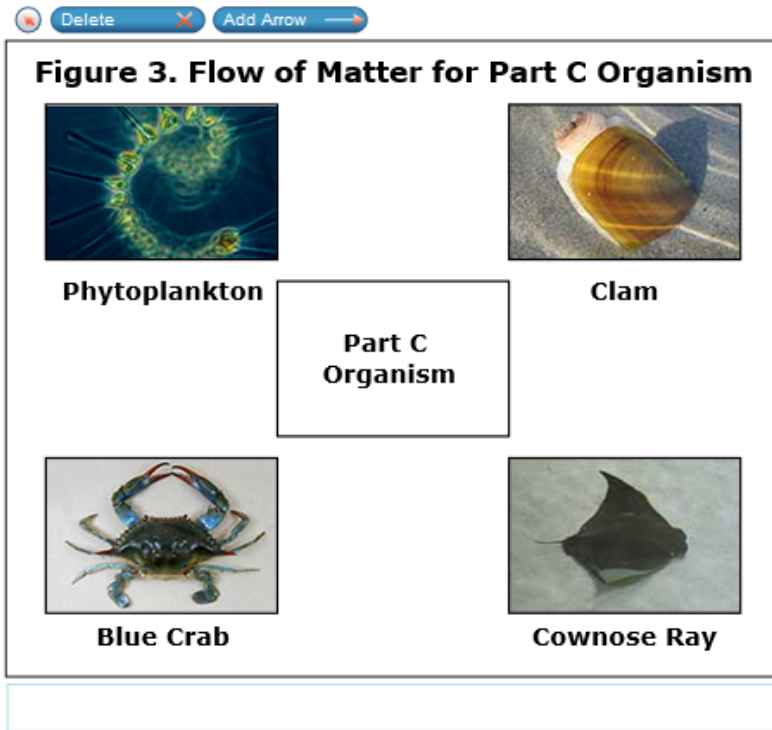
| Organism |
|----------|
| Bacteria |

| Process |
|--|
| They break down matter and return it to the environment. |

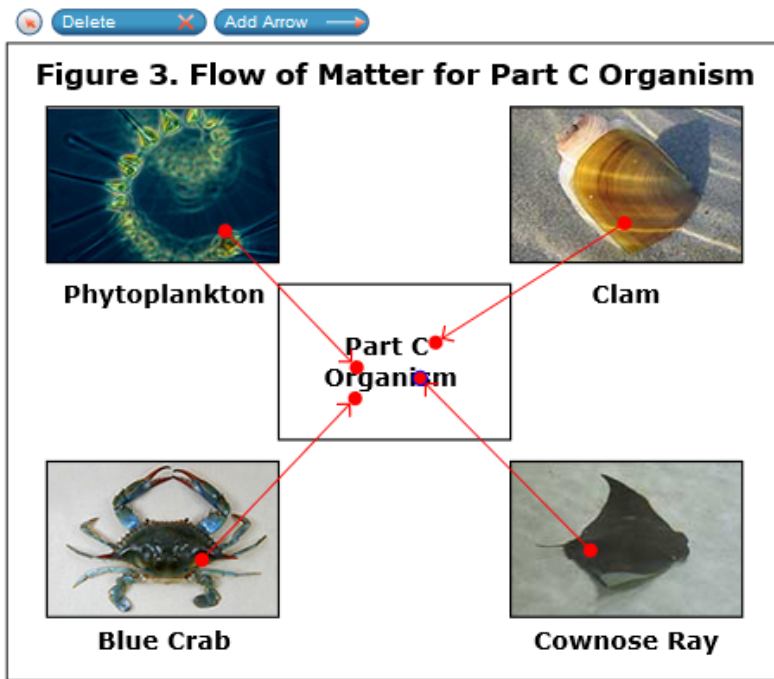
Part D

Use the Add Arrow tool to draw arrows showing the flow of matter only among the organism you chose in part C and the other organisms.

- Each arrow must begin and end on a picture of an organism or part C organism.



Answer:



Item 4

Alignment: 3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

- **SEP:** Engaging in Argument from Evidence
- **DCI:** LS4.D: Biodiversity and Humans
- **CCC:** Systems and System Models

Select **two** outcomes that could result if the dams were removed and the scientists' claim is valid.

- The habitat rating index would decrease.
- The water flow within the sites would increase.
- The number of smaller fish released would decrease.
- The amount of pollution in the river would decrease.
- The number of species found in the river would increase.

Answer:

- The habitat rating index would decrease.
- The water flow within the sites would increase.
- The number of smaller fish released would decrease.
- The amount of pollution in the river would decrease.
- The number of species found in the river would increase.

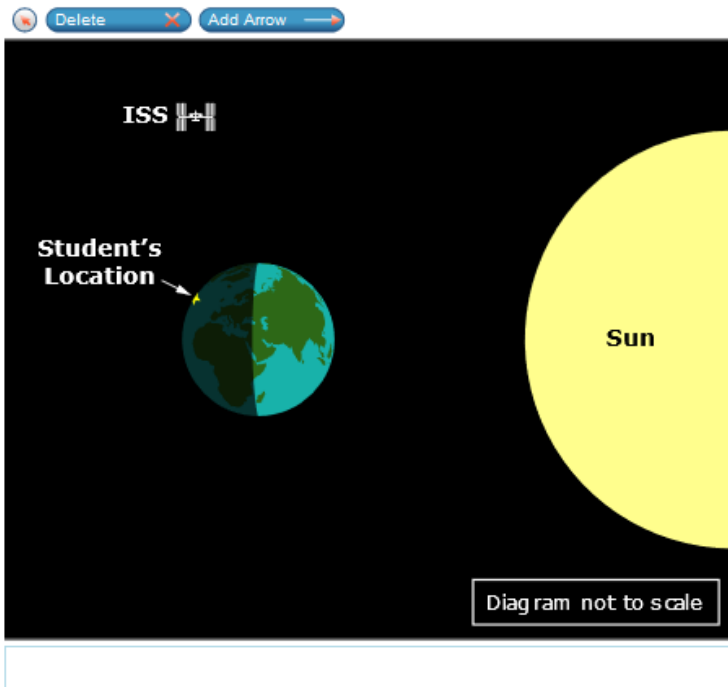
Item 5

Alignment: 4-PS4-2: Develop a model to describe that light reflecting from objects and entering the eyes allows objects to be seen.

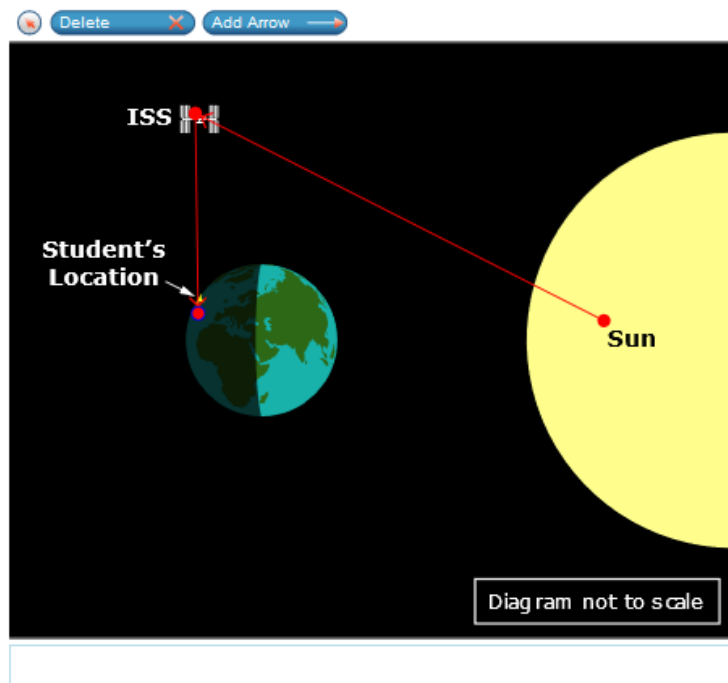
- **SEP:** Developing and Using Models
- **DCI:** PS4.B: Electromagnetic Radiation
- **CCC:** Cause and Effect

A student sees the International Space Station, or ISS, in the night sky.

Use the Add Arrow tool to draw **two** arrows showing the path of light that allows the student to see the ISS.



Answer:



Item 6

Alignment: 4-PS3-4: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

- **SEP:** Constructing Explanations and Designing Solutions
- **DCI:** PS3.D: Energy in Chemical Processes in Everyday Life
- **CCC:** Energy and Matter

Part A

Click on each blank box and select a phrase to describe what is happening to the energy at each part of the circuit when the doorbell is turned on.

| Parts | Energy Pathway when Doorbell Is on |
|--------------|---|
| Battery | <input type="text"/> |
| Wires | <input type="text"/> |
| Speaker | <input type="text"/> |

Options:

- Energy is stored.
- Energy is destroyed.
- Energy is transferred.
- Electrical energy is converted to sound energy.
- Sound energy is converted to electrical energy.

Answer:

| Parts | Energy Pathway when Doorbell Is on |
|--------------|---|
| Battery | Energy is stored. ⚡ |
| Wires | Energy is transferred. ⚡ |
| Speaker | Electrical energy is converted to sound energy. ⚡ |

Part B

Use the simulation to select the materials necessary to conduct fair experiments and create a doorbell that can be heard from upstairs and costs less than \$40. The student can only hear a doorbell from upstairs if it is loud or very loud.

- Select the speaker, battery, and switch to determine the overall cost and loudness of the doorbell.
- Then click Run Trial.
- The cost of wire has already been included in the total cost.
- You must complete **two** trials.
- You may run up to **five** trials.
- Click the trash can icon if you want to delete a trial and generate new data.

Speaker

Battery

Switch

| Trial | Speaker | Battery (V) | Switch | Loudness | Cost (\$) |
|-------|---------|-------------|--------|----------|-----------|
| | | | | | |

Answer: Answers will vary. The student earns the point for completing a trial that produced a 'loud' or 'very loud' sound and the components cost less than \$40. At least two trials need to be run to earn the point.

In this example table, Trial 2 would give the student the point.

| Trial | Speaker | Battery (V) | Switch | Loudness | Cost (\$) |
|-------|---------|-------------|-------------|-----------|-----------|
| 1 | Bell | 12.0 | Rectangular | Very Loud | 42 |
| 2 | Bell | 9.0 | Rectangular | Loud | 18 |

Part C

Select **all** of the trials that meet the criteria for being heard upstairs and cost less than \$40.

- Trial 1
- Trial 2
- Trial 3
- Trial 4
- Trial 5
- None

Answer: Answers for this interaction will vary based on the student's output table in Part B.

Part D

Click on the blank boxes and select words or phrases to predict what will happen to the loudness of the doorbell when the battery power increases.

The loudness of the doorbell will because

Options:

- The loudness of the doorbell will
 - Increase
 - Decrease
 - Stay the same
- Because
 - Less energy is stored in the battery.
 - More energy is stored in the battery.
 - Less energy is transferred to the battery.
 - More energy is transferred to the battery.
 - The same amount of energy is stored in the battery.
 - The same amount of energy is transferred to the battery.

Answer:

The loudness of the doorbell will because .

Part E

Select **two** trials that support the relationship between the loudness of the doorbell and the power of the battery.

- Trial 1
- Trial 2
- Trial 3
- Trial 4
- Trial 5
- Cannot be determined

Answer: Answers for this interaction will vary based on the student's output table in Part B.

Item 7

Alignment: 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

- **SEP:** Constructing Explanations and Designing Solutions
- **DCI:** PS3.A: Definitions of Energy
- **CCC:** Energy and Matter

Part A

Click on the blank box and select a phrase to determine the relationship between the speed of the object and the energy within the ball.

As the force of the throw increases, the speed of the ball and the energy of the ball .

Options:

- As the force of the throw increases, the speed of the ball
 - Increases
 - Decreases
 - Remains the same
- And the energy of the ball
 - Increases
 - Decreases
 - Remains the same

Answer:


As the force of the throw increases, the speed of the ball and the energy of the ball .

Part B

Select **two different** trials that support the relationship in part A.

- Click on the pencil icon.
- Then, select the trials that support the relationship.
- Click on the circular arrow to the right of any selection you would like to change.

Answer: Responses may vary. The student can select any combination of Trials 1, 2, and 3 for their support of the correct relationship. This is an example of a correct response:

Trial 2 

Trial 1 