



Grade 8
Science Item Samples

Student Booklet



Purpose of the Science Item Samples Booklet

This booklet is an opportunity for you to practice working with different types of questions that appear on the AMP Science Test for your grade.

In this booklet there are two types of questions: multiple choice and constructed response. For the multiple choice questions, you may be asked to fill in bubbles on an answer sheet. The second type of question, constructed response, asks you to write out an answer.

In the spring, you will take the AMP Science Test on KITE Client. There will be a variety of question types, including multiple choice and technology enhanced items. Technology enhanced items ask you to show what you know by doing things like matching, highlighting, put ideas in order, or dragging & dropping labels to a picture. There are not questions that require you to keyboard, or type, an answer. You will have access to all of the universal tools (highlighter, calculators, striker, etc.).

SCIENCE—SAMPLE QUESTIONS

Directions:

Read Sample Questions A and B. For Sample A, fill in the circle that goes with the answer you choose. Be sure to fill in the circle completely and make your mark heavy and dark. If you want to change your answer, completely erase the mark you made before making a new mark. For Sample B, write your answer on the lines provided.

SAMPLE A

The drawing below shows a bird called a puffin.



Which statement is a scientific conclusion based on this drawing of a puffin?

- (A) It can see far away.
- (B) It makes loud sounds.
- (C) It has two webbed feet.
- (D) It will survive the winter.



SAMPLE B

The pictures below show the growth of a plant.



June

July

Describe two ways this plant has changed.

- 1. _____

- 2. _____

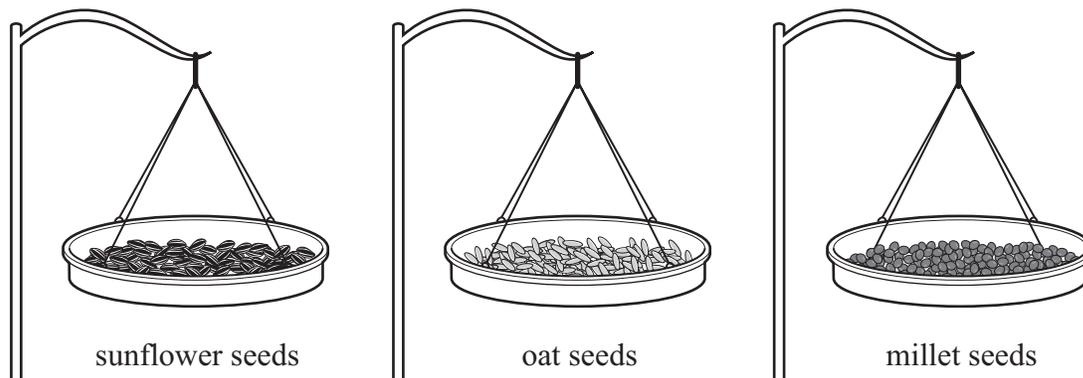


1. A student is asked to measure the distance from the floor to the ceiling in a classroom. Which unit of measurement should the student **most likely** use to accurately measure this distance?

- (A) liter
- (B) kiloliter
- (C) meter
- (D) kilometer

2. Students designed an experiment using bird feeders with different types of seeds.

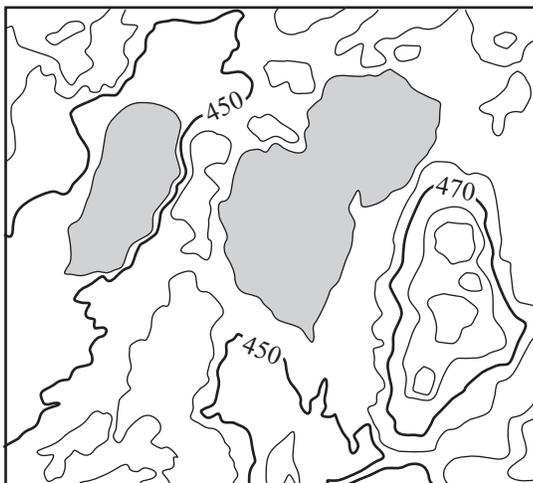
Bird Feeders



For one hour, the students counted the number of birds that ate from each bird feeder. Which question would this experiment **most likely** answer?

- (A) Which kinds of birds eat seeds?
- (B) How many seeds can a bird eat?
- (C) How does a bird find seeds to eat?
- (D) Which seeds do birds eat most often?

3. Use the topographic map to answer the question.



What are the shaded features shown on this topographic map?

- (A) lakes
 - (B) valleys
 - (C) islands
 - (D) mountains
-
4. A student wants to organize a group of animals into two categories based on observable external features. Which display will **most** appropriately show the two categories of animals?
- (A) a timeline
 - (B) a pie chart
 - (C) a data table
 - (D) a line graph

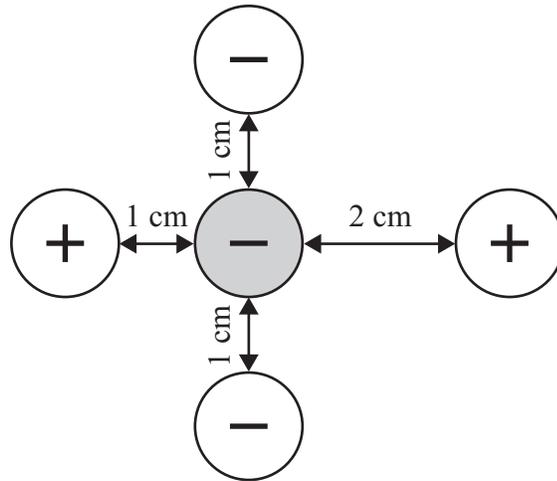
5. Which statement **correctly** describes a relationship between the distance from Earth and a characteristic of a star?
- (A) As the distance from Earth to the star decreases, its size increases.
 - (B) As the distance from Earth to the star increases, its size decreases.
 - (C) As the distance from Earth to the star decreases, its apparent brightness increases.
 - (D) As the distance from Earth to the star increases, its apparent brightness increases.
-

6. Which change in Earth’s surface is **most** directly related to the water cycle?
- (A) deposition of sediments
 - (B) uplifting of a mountain
 - (C) formation of ocean trenches
 - (D) movement of tectonic plates
-

7. Which statement **best** describes how the circulatory system and respiratory system can work together?
- (A) Toxins are removed from the bloodstream by the liver.
 - (B) The stomach signals for the production of gastric juices.
 - (C) Food molecules are transported to the organs of the body.
 - (D) Gases are exchanged between the lungs and blood vessels.



8. The diagram shows five charged objects.



Based on the diagram, in which direction will the shaded object in the middle **most likely** move?

- (A) up
- (B) left
- (C) right
- (D) down

9. Two pure substances combine to make a new substance. The new substance cannot be physically separated and has a different boiling point than each of the original substances. This new substance can **best** be classified as

- (A) an atom.
- (B) a mixture.
- (C) an element.
- (D) a compound.

This question is worth 2 points.

10. The data table shows information for some animals from a coastal ecosystem in Alaska. Included in the data table are some of the sources of food and some known predators of each animal.

Alaska Animal Information

| Animal | Food Source | Predators |
|---------------|-----------------------------------|--|
| herring | phytoplankton, zooplankton, krill | salmon, fur seals, harbor seals, bald eagles |
| salmon | herring, anchovies | harbor seals, brown bears, bald eagles |
| glaucous gull | small birds, salmon eggs, berries | bald eagles |
| fur seal | herring, squid | polar bears |

Use the information from the data table to draw a food web with at least five or more types of organisms. Be sure to include arrows between the organisms showing the correct direction of energy transfer.



SCIENCE

11. Students conducted an experiment to test how temperature changes can affect a rubber ball. They repeatedly dropped the rubber ball from the same location and recorded the height of each initial bounce.

Rubber Ball Experiment

| Trial 1 | | Trial 2 | | Trial 3 | |
|------------------|-----------------------|------------------|-----------------------|------------------|-----------------------|
| Temperature (°C) | Height of Bounce (cm) | Temperature (°C) | Height of Bounce (cm) | Temperature (°C) | Height of Bounce (cm) |
| 0 | 35 | 0 | 36 | 0 | 40 |
| 25 | 38 | 25 | 37 | 25 | 36 |
| 70 | 42 | 70 | 42 | 70 | 48 |

Which statement **best** explains why the students conducted three trials?

- (A) Three trials were used because the students studied three different temperatures.
- (B) The students repeated the experiment until the ball reached a height of 48 cm.
- (C) The students used the first trial to practice and the last two trials to collect experimental data.
- (D) Performing an experiment with multiple trials can increase the accuracy of the students' results.

-
12. Which statement **best** explains Earth's day and night cycle?

- (A) Earth rotates once each day on its axis.
- (B) Earth revolves around the Sun each year.
- (C) The Sun is closest to Earth during the day.
- (D) The tilt of Earth changes throughout the year.



13. Which behavior can help animals establish a territory?

- Ⓐ A caribou herd migrates seasonally.
 - Ⓑ A scent trail leads ants to a food source.
 - Ⓒ A wolf pack howls to warn other wolves to stay away.
 - Ⓓ A honeybee society divides the work between its members.
-

14. A person cuts down a living oak tree. The person burns the wood from the oak tree to boil water. Which sequence correctly orders the energy transformations that occurred from the living tree to the boiling of water?

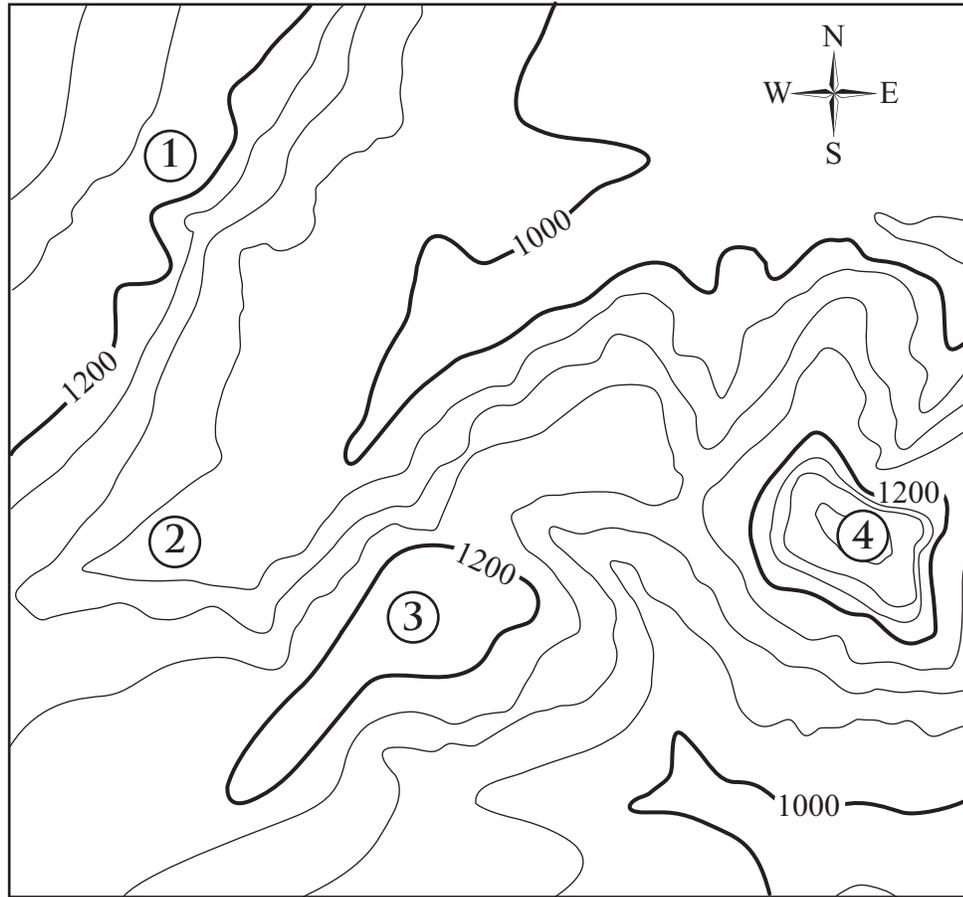
- Ⓐ light energy → chemical energy → thermal energy
 - Ⓑ thermal energy → chemical energy → light energy
 - Ⓒ chemical energy → mechanical energy → electrical energy
 - Ⓓ electrical energy → mechanical energy → chemical energy
-

15. Which property would **best** help a student determine if two substances are made of two different elements?

- Ⓐ mass
- Ⓑ shape
- Ⓒ density
- Ⓓ volume



16. A topographic map is shown below.



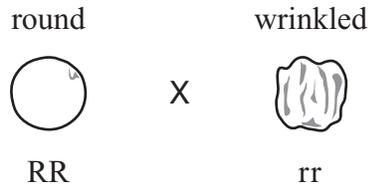
contour interval = 25 meters

Which description of a location is **best** supported by the topographic map?

- Ⓐ Location 1 is a valley.
- Ⓑ Location 2 is the southern edge of a lake.
- Ⓒ Location 3 is an island.
- Ⓓ Location 4 is the top of a small mountain.

17. A pea plant with genes that are homozygous for round seeds is crossed with a pea plant that is homozygous for wrinkled seeds.

Genetic Cross of Two Pea Plants



Which statement correctly predicts the results of this genetic cross?

- Ⓐ The offspring will have the genotype Rr.
 - Ⓑ The offspring will have the genotype RR.
 - Ⓒ Round seeds will be recessive to wrinkled seeds.
 - Ⓓ Wrinkled seeds will be observed in half of the offspring.
-
18. Which skill is a scientist using when sorting rocks into two groups based on physical appearance?
- Ⓐ inferring
 - Ⓑ classifying
 - Ⓒ generalizing
 - Ⓓ hypothesizing



19. Students investigated the effects of pollution on plant growth. They used different amounts of detergent mixed with the same amount of water and seeds from one type of plant.

Effect of Detergent on Plants

| Number of Plant Seeds | Substance | Number of Seeds that Sprouted |
|-----------------------|------------------------|-------------------------------|
| 30 | water only | 28 |
| 30 | 1% detergent in water | 24 |
| 30 | 5% detergent in water | 16 |
| 30 | 10% detergent in water | 5 |

Which statement is **best** supported by the information in the data table?

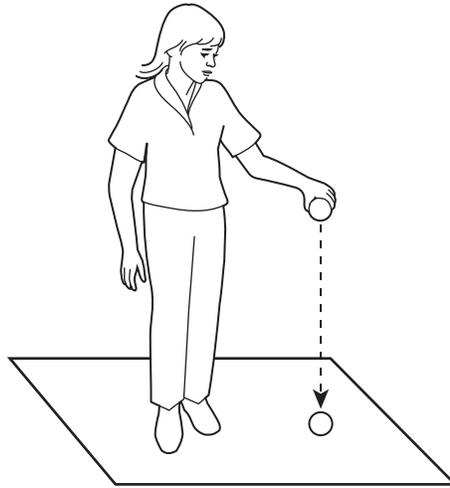
- (A) As the number of seeds decreased, the rate of seeds sprouting increased.
- (B) As the amount of detergent increased, the number of seeds that sprouted decreased.
- (C) The rate at which the seeds sprouted was not affected by the amount of detergent used.
- (D) Twice as many seeds sprouted in the 1% detergent mixture as in the 10% detergent mixture.

20. Which physical features are part of an animal that would **most likely** be classified as a reptile?

- (A) fur and claws
- (B) dry skin and scales
- (C) wings, feathers, and claws
- (D) scales, moist skin, and fins

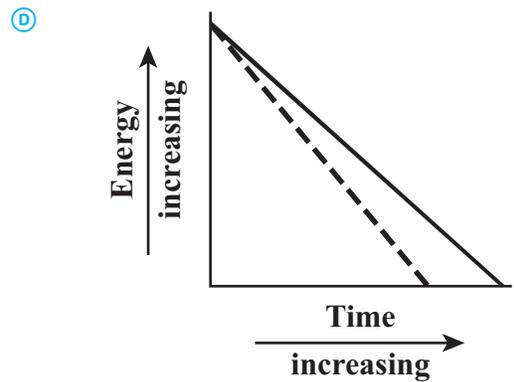
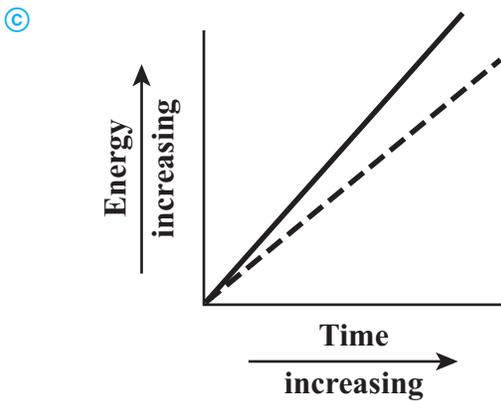
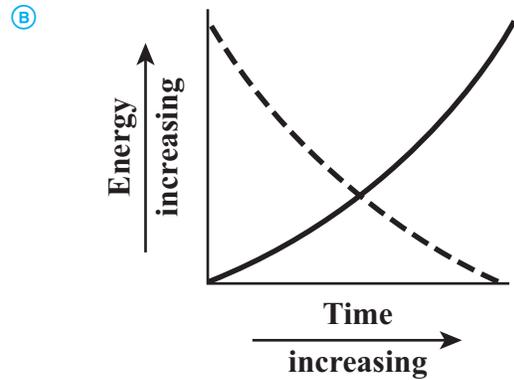
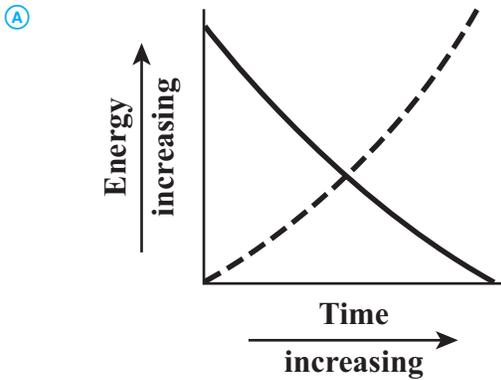
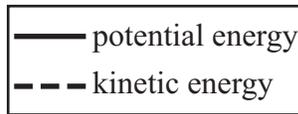


21. A student holding a ball releases it, and the ball falls to the floor.



Which graph **best** shows the changes in potential energy and kinetic energy of the ball as it falls to the floor?

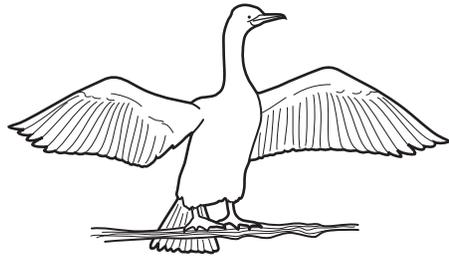
Key



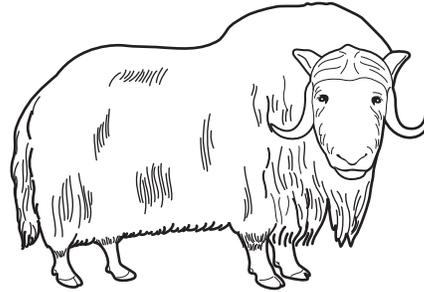
GO ON 

This question is worth 4 points.

22. Use the pictures and classification chart to answer the question.



cormorant



muskox

Classification Chart

| Animal | Group | Classifying Characteristic |
|-----------|---------|----------------------------|
| cormorant | ? | feathers |
| muskox | mammals | ? |

The classification chart is missing information for each animal.

A. Write the missing information for the classification chart below.

cormorant group: _____

muskox classifying characteristic: _____

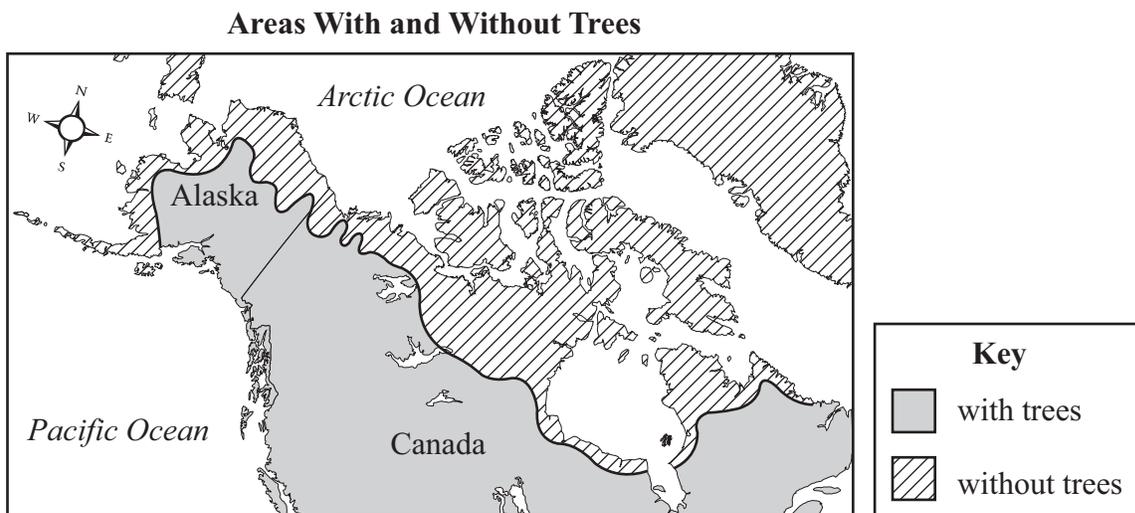
B. Identify two observable characteristics that do **not** help place the cormorant or the muskox into a specific group.

1. _____

2. _____



23. A map displaying areas with and without trees is shown below.



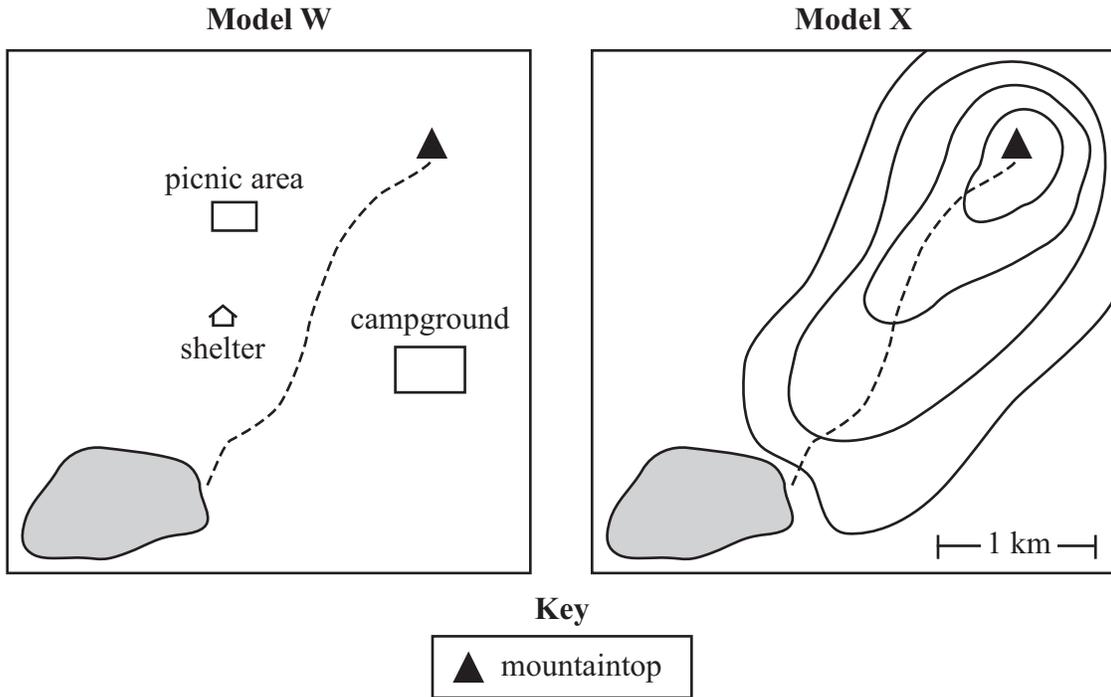
Which question could **most likely** be answered using this map?

- (A) What types of trees grow in Alaska?
- (B) How tall are most of the trees in Alaska?
- (C) Where are most forests in Alaska located?
- (D) What is the best temperature for tree growth in Alaska?

24. Which statement correctly describes a relationship between two human body systems?

- (A) The digestive system absorbs nutrients which are transported by the nervous system.
- (B) The digestive system absorbs nutrients which are transported by the circulatory system.
- (C) The circulatory system exchanges gases which are transported by the nervous system.
- (D) The circulatory system exchanges gases which are transported by the digestive system.

25. Students are given two models below to plan a hiking trip to the top of a small mountain.



Which model will give the **best** information for the students to prepare for their hike?

- (A) model W because it shows the top view
 - (B) model W because it shows changes in elevation
 - (C) model X because it shows the top view
 - (D) model X because it shows changes in elevation
-
26. Which situation would **most likely** cause an object to travel in a circular motion?

- (A) one force acting on the object in the opposite direction of the motion
- (B) two forces acting on the object in the same direction as the motion
- (C) one force acting on the object perpendicular to the direction of the motion
- (D) two forces acting on the object in different directions to the motion

27. Two balloons are hanging from a ceiling.



The balloons are attracted to each other because the balloons have

- Ⓐ neutral charges.
- Ⓑ opposite charges.
- Ⓒ a positive charge.
- Ⓓ a negative charge.

28. During a lab investigation a scientist heats a solid substance. The scientist observes that the solid has two different melting points. The scientist is able to separate the two resulting liquids. Which statement **best** classifies the original solid substance?

- Ⓐ It was an atom.
- Ⓑ It was a mixture.
- Ⓒ It was an element.
- Ⓓ It was a compound.



29. A research scientist repeatedly observes a bird avoiding a specific butterfly species even though it eats other types of butterflies. Which statement **most likely** explains the behavior of the bird?

- Ⓐ The behavior is a random act.
- Ⓑ The behavior is the result of a genetic mutation.
- Ⓒ The behavior is inherited from the bird’s parents.
- Ⓓ The behavior is learned over the lifetime of the bird.

30. Some recent changes in an area were recorded.

Changes in an Area

- decreasing runoff
- increasing temperature
- decreasing precipitation

Which of the following is **most likely** a result of the changes in the area?

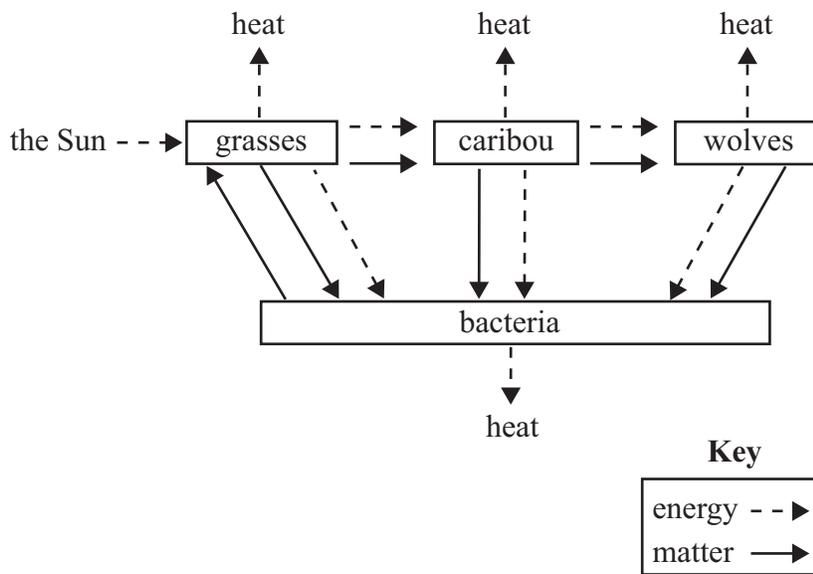
- Ⓐ rivers flooding
- Ⓑ sea ice forming
- Ⓒ permafrost thawing
- Ⓓ sea levels increasing



31. Which of the following **best** describes a scientific inference?

- Ⓐ the data collected during an experiment
- Ⓑ an explanation based on facts but is not the direct observation
- Ⓒ an opinion that is not based on logical thinking or material evidence
- Ⓓ the results from experiments that can be reproduced through more experimentation

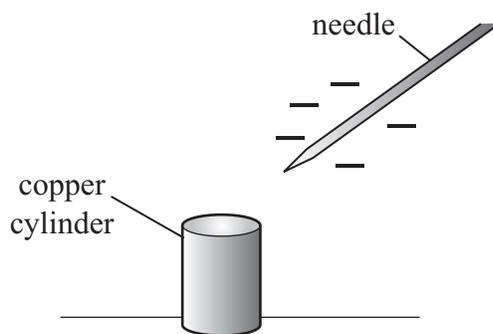
32. An ecosystem diagram is shown below.



Based on the diagram, which statement **best** describes this ecosystem?

- Ⓐ Energy is gained by the organisms in the ecosystem, while matter is lost.
- Ⓑ Energy flows through the ecosystem, while matter is cycled and conserved.
- Ⓒ Energy cycles in the ecosystem, while matter is transferred to the organisms.
- Ⓓ Energy is made by the organisms, while matter flows through the ecosystem.

33. A student moves a charged needle near an electrically neutral copper cylinder.



Which statement describes what will happen when the needle first touches the cylinder?

- (A) The needle will become positively charged.
- (B) Negative charge will flow from the needle to the cylinder.
- (C) The charge will be forced out of the needle and into the air.
- (D) Repulsion between the needle and the cylinder will increase.

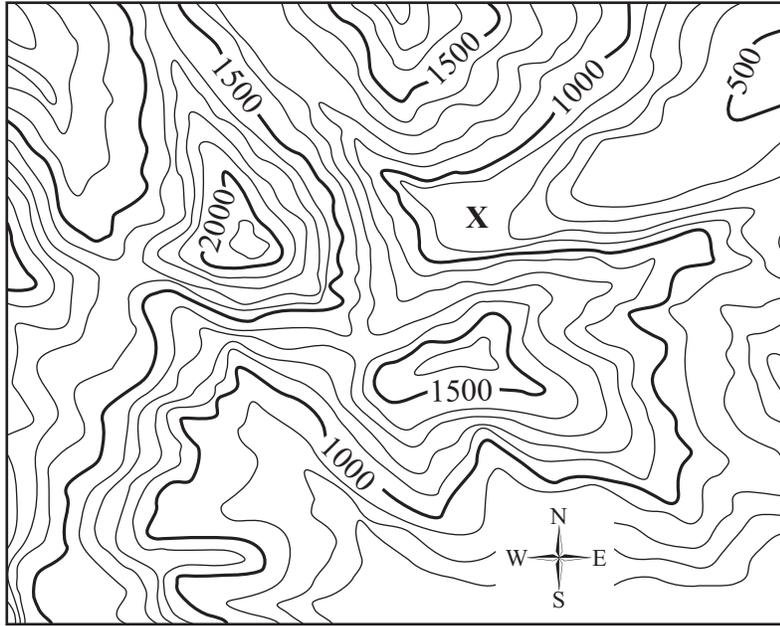
34. Which statement **best** describes the energy transformations that occur when a candle burns?

- (A) Heat energy from the wax is converted into chemical and light energy.
- (B) Heat energy from the air is converted into mechanical and light energy.
- (C) Chemical energy from the wax is converted into light and heat energy.
- (D) Chemical energy from the air is converted into mechanical and light energy.

This question is worth 2 points.

35. The topographic map below shows part of an island.

Topographic Map



A. In which general compass direction will water flow from point X?

B. Explain how topographic maps indicate the steepest locations in the mapped area.



36. Some of the characteristics of a vertebrate are shown below.

Vertebrate Characteristics

- is warm-blooded
- has hair
- has live birth

To which group does this vertebrate belong?

- (A) birds
- (B) reptiles
- (C) mammals
- (D) amphibians

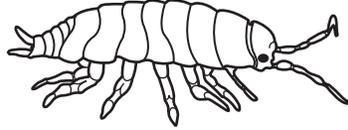
37. An astronomer is studying two stars that are the same distance from Earth. Star X appears brighter than star Y. Which statement **best** explains this observation?

- (A) Star X is larger than star Y.
- (B) Star Y is larger than star X.
- (C) Star X reflects the Sun's light better than star Y.
- (D) Star Y reflects the Sun's light better than star X.

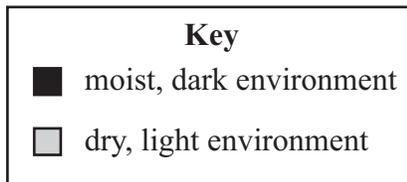
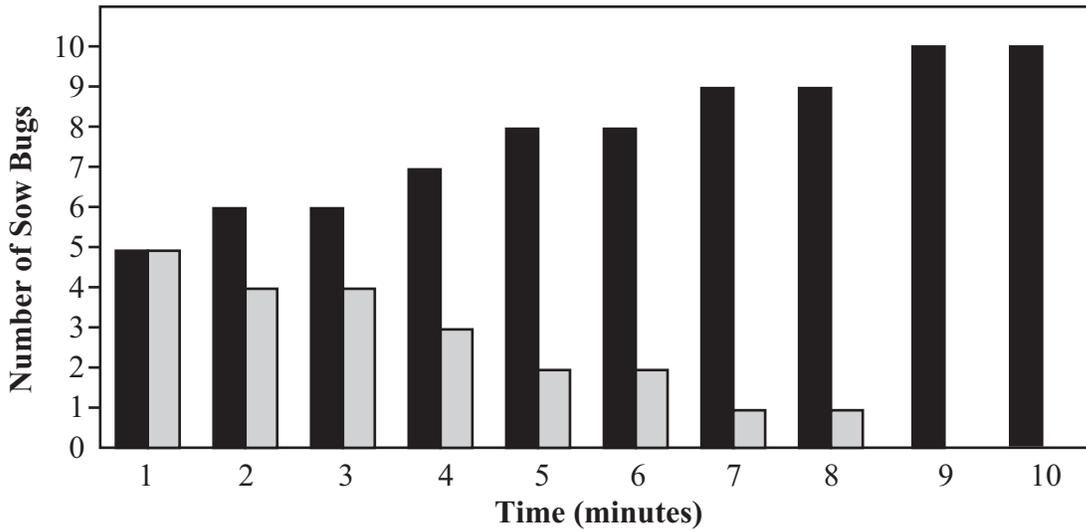


38. Ten sow bugs were placed in a closed container where they had a choice to move to a moist, dark environment or a dry, light environment. Five sow bugs were initially placed in each environment. Every minute, for 10 minutes, the number of sow bugs in each location was recorded.

Sow Bug



Sow Bug Data



Which explanation is **best** supported by the sow bug data?

- (A) Sow bugs prefer moist, dark environments because they need moisture to breathe.
- (B) Sow bugs prefer dry, light environments because they do not need water to survive.
- (C) Sow bugs prefer moist, dark environments because they use their eyes to locate food.
- (D) Sow bugs prefer dry, light environments because they use the Sun’s energy to produce food.



39. During a lab investigation, students were asked to determine the best way to clean up an oil spill using different materials.

Investigation Materials

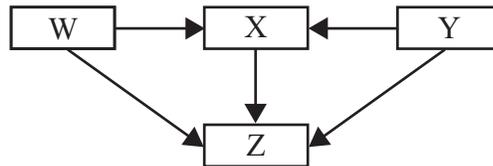
- filter paper
- foam sponge
- metal wire screen
- thin sock filled with hair

The students tested the materials by placing each material into separate buckets containing oil and water. They recorded their observations on which material absorbed the most oil. Why would the students' teacher ask them to repeat their tests?

- (A) to determine if water and oil can be separated
- (B) to learn more about how to protect wildlife during an oil spill
- (C) to improve the chances of obtaining accurate oil cleanup results
- (D) to increase the total amount of oil removed from each container

40. Each box represents a type of organism in a food web.

Food Web



Which box **most likely** represents an organism that is a decomposer?

- (A) box W
- (B) box X
- (C) box Y
- (D) box Z

41. Which two processes in the water cycle are **primarily** responsible for the creation of a lake?

- (A) evaporation and runoff
 - (B) evaporation and condensation
 - (C) precipitation and runoff
 - (D) precipitation and condensation
-

42. A change in the density of air can result in a breeze. Which diagram **best** shows a series of energy transfers that begins with the Sun and results in a breeze?

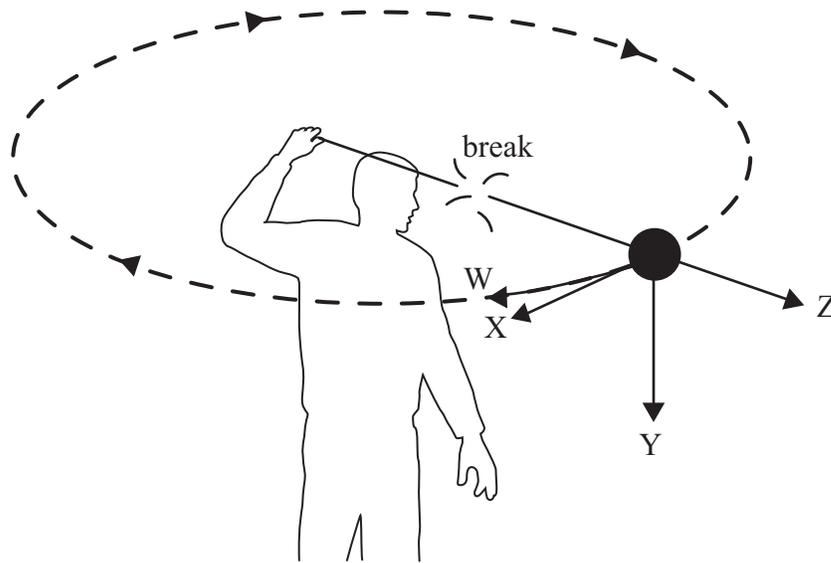
- (A) radiation → conduction → breeze
 - (B) radiation → conduction → convection → breeze
 - (C) convection → radiation → breeze
 - (D) convection → conduction → radiation → breeze
-

43. Which two traits would **best** distinguish a bird from other vertebrates?

- (A) fur and wings
- (B) gills and feet
- (C) feathers and wings
- (D) moist skin and feet



44. A student swings a ball attached to a string.



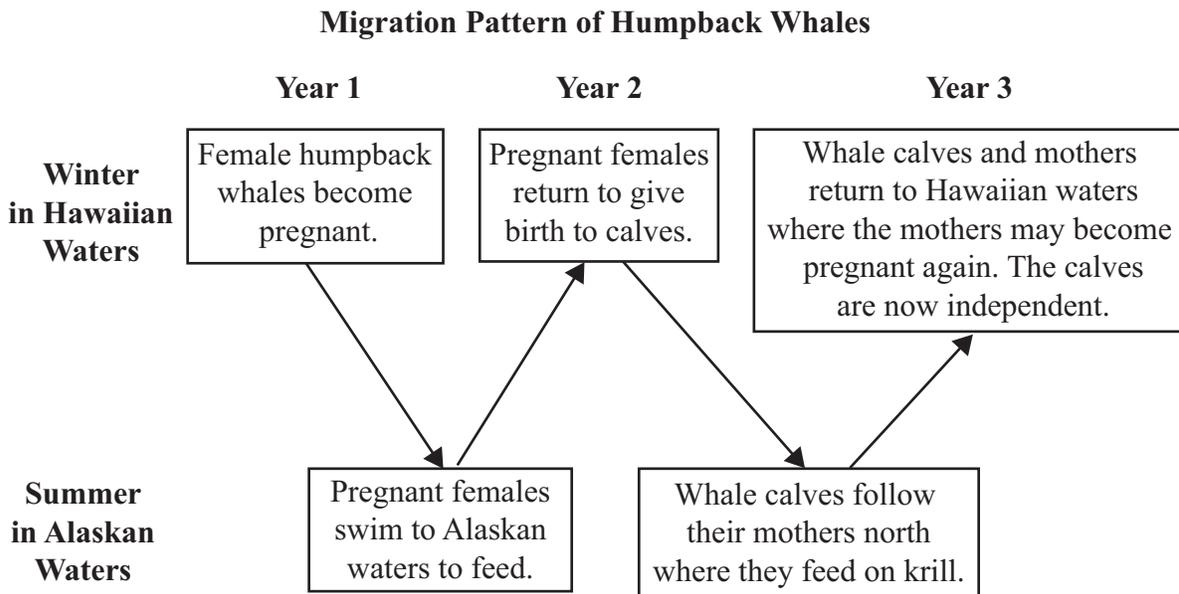
The string breaks when the ball is in the location shown. Which arrow **best** shows the direction of the ball's motion immediately after the string breaks?

- (A) arrow W
- (B) arrow X
- (C) arrow Y
- (D) arrow Z

45. Which action is **most likely** a learned behavior?

- (A) A bird builds a nest.
- (B) A spider spins a web.
- (C) A lion cub practices its hunting skills.
- (D) An earthworm moves away from bright light.

46. The diagram shows a three-year pattern of migration for many humpback whales in the Pacific Ocean.

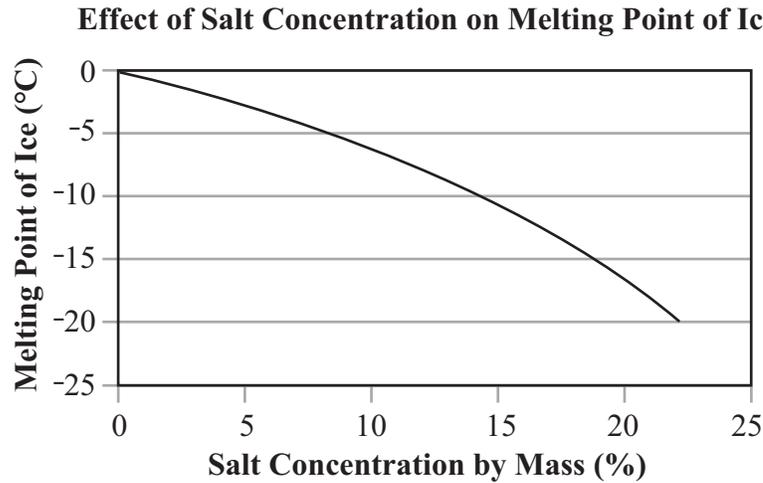


Which statement **best** communicates the purpose of humpback whale migration?

- Ⓐ They migrate to decrease the thickness of their insulating fat and increase their muscle mass.
- Ⓑ They migrate north in summer to avoid predators, and they return south in winter to avoid ice floes.
- Ⓒ They migrate to warm southern waters to mate and raise their young, and they migrate to Arctic waters to feed.
- Ⓓ They migrate to allow ocean ecosystems to restore their supplies of krill because whales consume so much food.



47. A science class is investigating the effect of salt on roadways during winter storms. The teacher gave the class the graph below.



Which statement **best** explains the effect of salt on roadways during a winter storm?

- (A) The salt increases the temperature of the ice on the road.
- (B) Salt allows the ice on the road to stay frozen as air temperatures increase.
- (C) The salt soaks up the liquid water on the road as the temperature of air increases.
- (D) Salt prevents the water on the road from freezing when the air temperature is below zero.

48. In 1931, Barbara McClintock discovered that genes could change position on a chromosome. In corn plants, if a certain gene was moved next to the gene that controls kernel color, the kernels in an ear of corn were various colors. Which statement **best** supports McClintock's discovery?

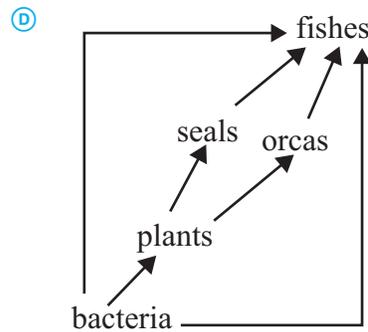
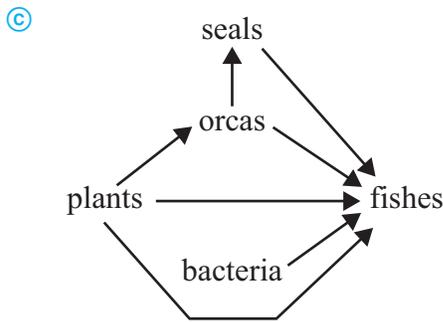
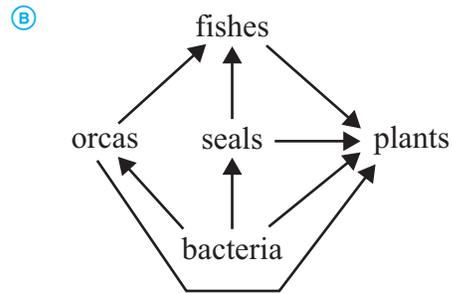
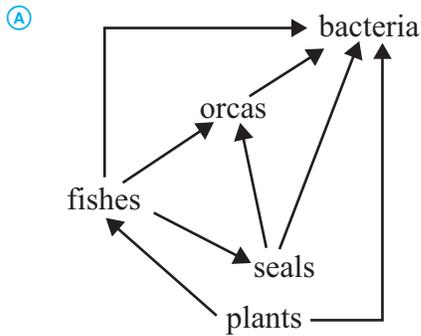
- (A) Genes control inherited traits in organisms.
- (B) Corn plants can reproduce in laboratory environments.
- (C) Chromosomes can move around in the nucleus of a cell.
- (D) Genes are able to disappear and reappear in later generations.

49. The organisms in this list are part of the same marine ecosystem.

Organisms in a Marine Ecosystem

- seals
- orcas
- fishes
- plants
- bacteria

Which food web **best** shows how matter can be cycled between these organisms in this marine ecosystem?



This question is worth 2 points.

50. The data table shows physical properties of three solid materials.

Physical Properties of Three Solid Materials

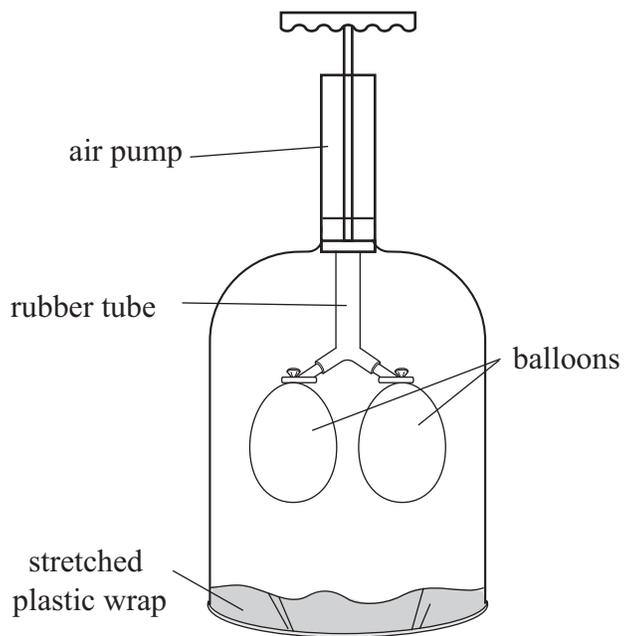
| Material | Made of Two or More Elements | Conducts Electricity | Is Flammable |
|----------|------------------------------|----------------------|--------------|
| X | no | no | yes |
| Y | yes | no | no |
| Z | yes | yes | no |

A. Identify a material in the data table that is **most likely** a metal.

B. Explain why material Y is **most likely** a compound and material X is not.



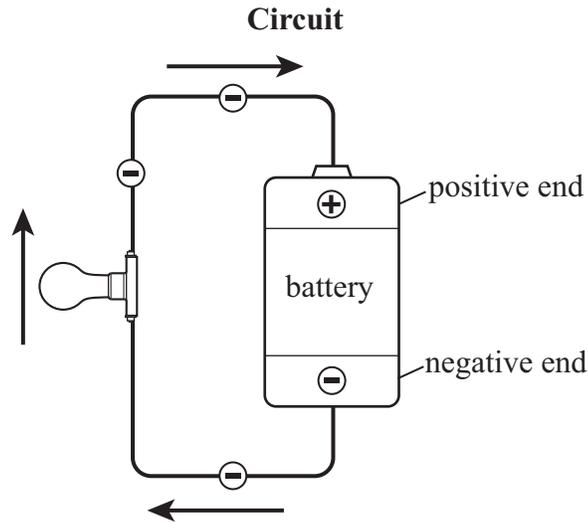
51. Study the model below.



Which system of the human body does this model **most likely** represent?

- (A) skeletal
- (B) digestive
- (C) respiratory
- (D) circulatory

52. The movement of negatively charged electrons in a complete circuit with a lamp and battery is shown below.

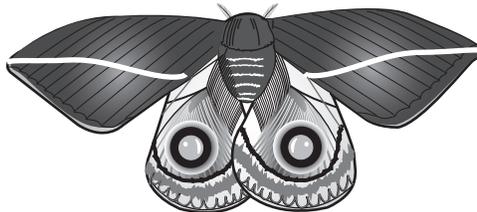


Which statement **best** explains the movement of these electrons?

- (A) Positive charges repel negative charges.
 - (B) Positive charges repel positive charges.
 - (C) Negative charges are attracted to positive charges.
 - (D) Negative charges are attracted to negative charges.
-
53. Some sinkholes and caves are created when water dissolves certain rocks and minerals below ground. Which two parts of the water cycle are **most** directly responsible for the formation of sinkholes and caves?
- (A) evaporation and infiltration
 - (B) evaporation and transpiration
 - (C) precipitation and infiltration
 - (D) precipitation and transpiration

54. The drawing shows a moth with markings on its wings that look like owl eyes.

Moth

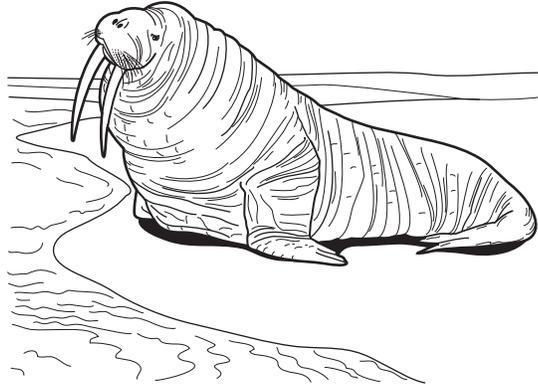


When the moth leaves its cocoon, it will often land on a tree and display these markings. Which statement **best** explains the moth's behavior?

- Ⓐ It is a learned behavior to capture prey.
- Ⓑ It is a learned behavior to scare away predators.
- Ⓒ It is an inherited behavior to capture prey.
- Ⓓ It is an inherited behavior to scare away predators.

55. Past models have helped scientists identify possible causes for declining walrus populations. Some scientists are now using a new model that includes the effect of changing sea ice on walrus populations.

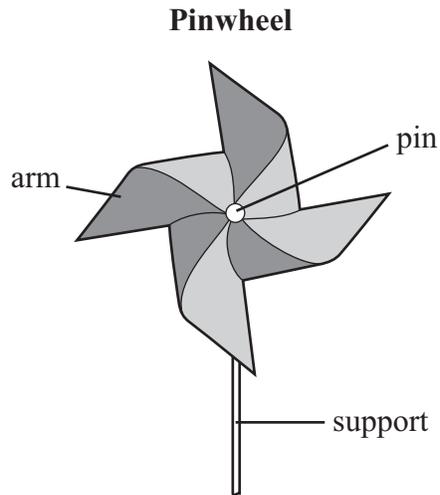
Walrus on Sea Ice



Which statement **best** compares the new scientific model with past models?

- (A) The new model is less useful because it causes disagreements among scientists.
- (B) The new model is less useful because it generates more data for scientists to analyze.
- (C) The new model is more useful because it includes the most recent scientific knowledge.
- (D) The new model is more useful because it is based more on opinions than on scientific facts.

56. When wind applies a force to a pinwheel, the arms of the pinwheel start to move in a circular motion.



Which additional force keeps the arms of the pinwheel moving in a circular motion?

- Ⓐ an inward pull along the arms
- Ⓑ an outward push along the arms
- Ⓒ the upward push of the support
- Ⓓ the downward pull of the support



**DO NOT
MARK
ON THIS
PAGE**



**Grade 8
Science Practice Test Book
Form 8PTSC**

Copyright © 2012 by Alaska Department of Education & Early Development. Only the State of Alaska educators and citizens may copy, download, and/or print the document, located online at www.eed.state.ak.us. Any other use or reproduction of this document, in whole or in part, requires written permission of the Alaska Department of Education & Early Development.

SERIAL#