Questions: 1 | Grade 8 Science New Item Type Training Test (0 out of 4) | GUEST, GUEST (SSID: GUEST) | GUEST SESSION

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Fog appears and disappears over the course of a morning in the Willamette Valley in Oregon.

Morning Fog in Willamette Valley

Animation 1 shows the appearance and disappearance of fog in the valley during a 24-hour day. The sun rises at 6 a.m. and sets at 6 p.m. Click the small gray arrow to begin the animation.

Animation 1. Willamette Valley Fog

Your Task

In the questions that follow, you will develop an explanation for the appearance and disappearance of fog.

1

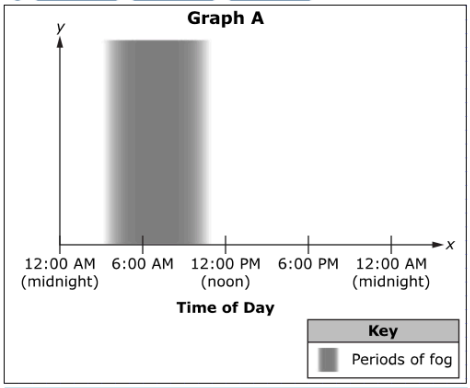
In the graphs below, illustrate three factors that change over the course of the day causing the fog to appear and disappear. The horizontal axis on each graph represents the 24-hour day shown in the animation.

For each graph's vertical axis, select the factor that you would like to graph. Then, use the Connect Line button to draw a graph that shows the pattern of change over time. To receive credit, your line segments must be connected and form a continuous graph.

Part A

Variable for vertical axis of Graph A: [ ]

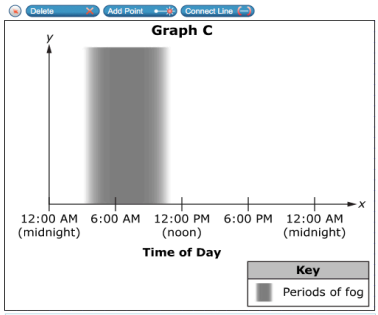
Delete | Add Point | Connect Line



Part C

Variable for vertical axis of Graph C: [ ]

Delete | Add Point | Connect Line



Part D

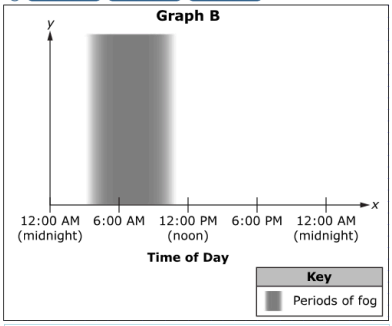
Click each box and select a word or phrase to complete the sentence describing why fog appears and disappears during the course of the day.

A change in [ ] causes a change in [ ], which in turn causes a change in [ ].

Part B

Variable for vertical axis of Graph B: [ ]

Delete | Add Point | Connect Line



Questions: 2 | Grade 8 Science New Item Type Training Test (1 out of 4) | GUEST, GUEST (SSID: GUEST) | GUEST SESSION

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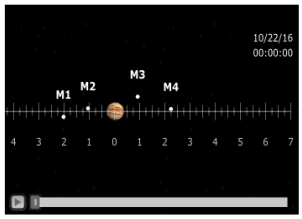
Using a low-powered telescope, you can see four of Jupiter's closest moons orbiting the planet.

A ruler on the lens of the telescope is used to take measurements in inches. The animation shows the movements of the moons and Jupiter over the course of several days. Only part of the telescope view is shown. Click on the small gray arrow at the bottom left of the picture to begin the animation.



The table shows data on each of the moons.

Table 1. Data on Galilean Moons

	Diameter (km)	Mean Distance from Jupiter (km)	Orbital Period (days)
Callisto	4,800	2,000,000	16.7
Europa	3,318	700,000	3.5
Ganymede	5,262	1,000,000	7.2
Io	3,630	400,000	1.8

Your Task

In the questions that follow, you will identify each of the four moons viewed through the telescope by utilizing data from your observations.

2

Part A

Use the measuring tool in the animation to determine each moon's maximum distance from Jupiter.

Complete the table by entering measurements to the closest 0.5 centimeter (cm) in the blank boxes.

	Maximum Distance from Jupiter in Animation (in cm)
M1	
M2	
M3	
M4	

Part B

Use your measurements and the Data on Galilean Moons table to identify each moon.

Select the boxes to identify each moon by name.

	Callisto	Europa	Ganymede	Io
M1	☐	☐	☐	☐
M2	☐	☐	☐	☐
M3	☐	☐	☐	☐
M4	☐	☐	☐	☐

Part C

M1 and M4 appear to intersect twice in the model.

Enter the approximate distance from Jupiter, in kilometers, where one of these apparent intersections occur.

1	2	3	+	-	×	÷
4	5	6	<	=	>	
7	8	9	□			
0	.	□				

Part D

Compare the measurements you took to the distances in the Data on Galilean Moons table.

Which statement is true about the two measurements?

Ⓐ The measurements you took are proportional to the data in the table.

Ⓑ The measurements you took are not proportional to the data in the table because the table is wrong.

Ⓒ There is not enough information to tell whether the measurements you took are proportional to the data in the table.

Ⓓ The data you measured is not proportional to the data in the table because the ruler on the lens is not accurate at that distance.

Part E

Which relationship between properties of the moons is supported by the data?

Ⓐ Diameter is related to orbit size.

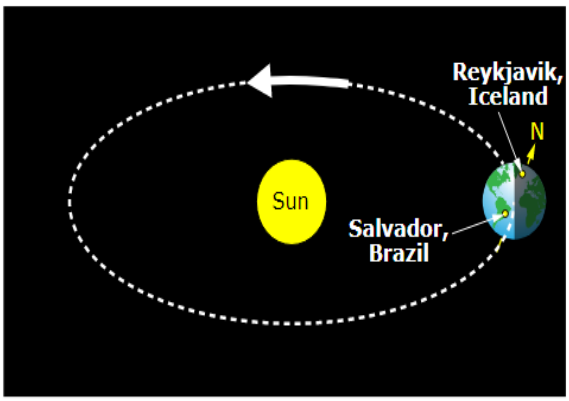
Ⓑ Orbital period is related to orbit size.

Ⓒ Diameter is related to the oribtal period.

Ⓓ Orbital period is related to diameter and orbit size.

around the sun in December.

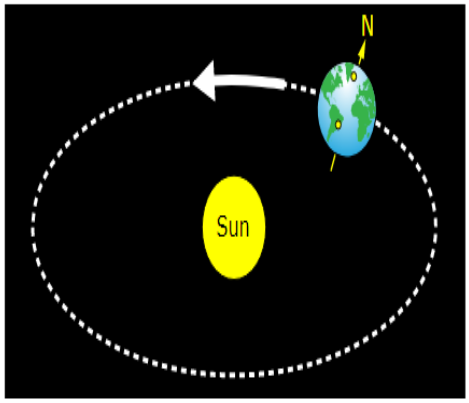
Figure 1. Winter in Reykjavik, Iceland and Summer in Salvador, Brazil



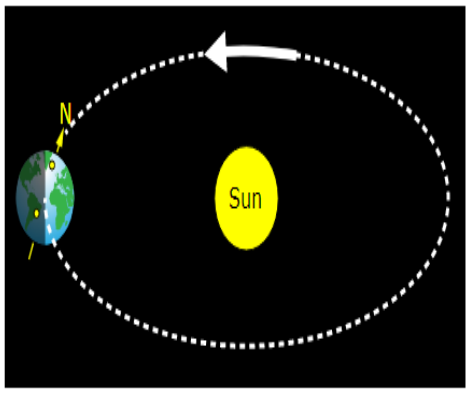
The four illustrations show Earth in different positions in its revolution around the sun. The frame of reference for all of the illustrations is the same.

Which illustration shows autumn in Reykjavik and spring in Salvador?

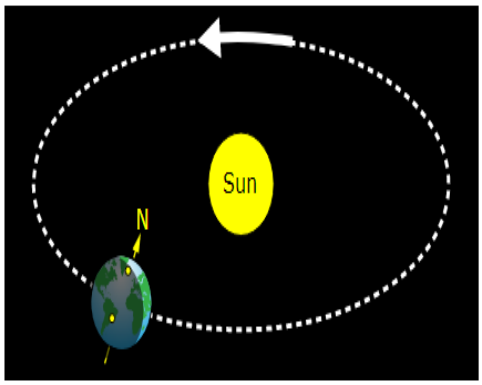
Ⓐ



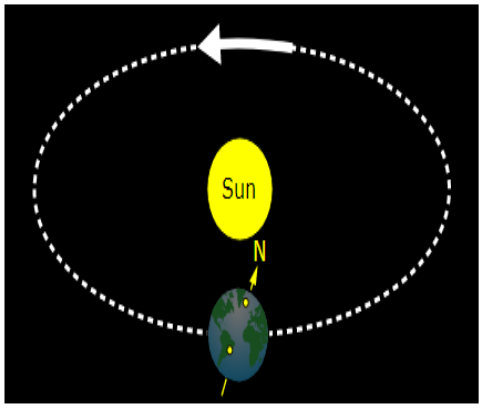
Ⓑ

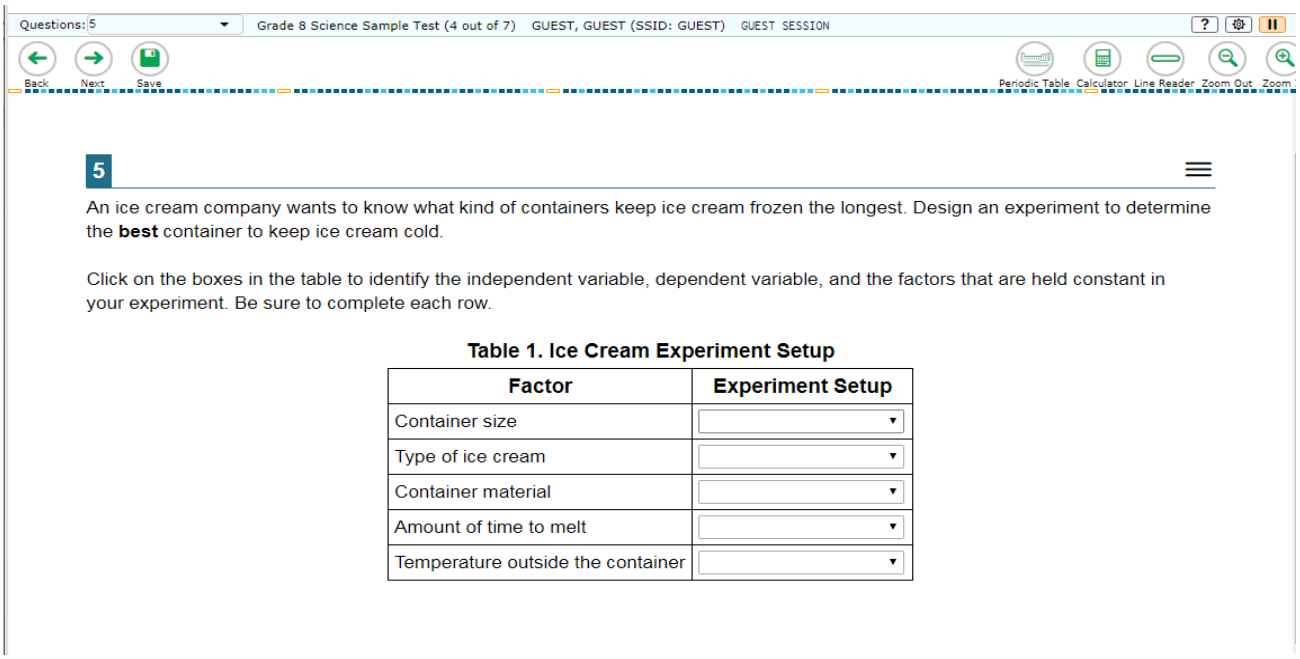


Ⓒ



Ⓓ





5

An ice cream company wants to know what kind of containers keep ice cream frozen the longest. Design an experiment to determine the **best** container to keep ice cream cold.

Click on the boxes in the table to identify the independent variable, dependent variable, and the factors that are held constant in your experiment. Be sure to complete each row.

Table 1. Ice Cream Experiment Setup

Factor	Experiment Setup
Container size	
Type of ice cream	
Container material	
Amount of time to melt	
Temperature outside the container	

Questions: 4 | Grade 8 Science Sample Test (3 out of 7) | GUEST, GUEST (SSID:

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Sparks fly off the wheels of a train when the brakes are applied.

Click the small gray arrow to see a demonstration of this happening in Animation 1.

Animation 1. Braking Train

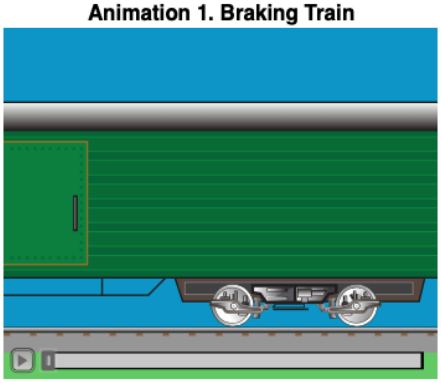


Table 1 explains some properties of the train and its surroundings as energy flows throughout the system.

Table 1. Properties of the Train System

Before Brakes Are Applied	After Brakes Applied
No sparks	Sparks fly off the wheels and brake pads
Brake pads make no sound	Brake pads make sound
Brake pads are cold	Brake pads are hot
Wheels are warm	Wheels are hot
Rails are warm	Rails are warmer
Train is moving fast	Train is moving slow

Your Task

In the questions that follow, you will analyze what happens to the train when the brakes are applied.

4

Part A

Click on each blank box to select the word or phrase that completes each sentence, constructing an argument about what happens when the train's brakes are applied.

Applying the brakes causes the [ ] to transfer kinetic energy to the [ ]. This causes the [ ] to slow down and have [ ] kinetic energy, which slows the train.

Part B

When the train applies its brakes, what happens to the energy of the surroundings?

Ⓐ The surroundings gain energy.

Ⓑ The surroundings lose energy.

Ⓒ The surroundings do not gain or lose energy.

Ⓓ There is not enough information to determine the energy of the surroundings.

Part C

Which **three** statements support your choice in part B?

- ☐ The train maintains its speed.
- ☐ Sound is produced.
- ☐ Sound is consumed.
- ☐ Light is produced.
- ☐ Light is consumed.
- ☐ Heat is produced.
- ☐ Heat is consumed.

Part D

Select **three** pieces of evidence that would support the claim that the kinetic energy of the wheels changed form.

- ☐ The brakes give off energy as heat.
- ☐ The brakes make a screeching sound.
- ☐ The brakes undergo a chemical reaction.
- ☐ The sparks that fly off the wheels give off light.
- ☐ The potential energy of the train increases as it slows.

Willow populations in Yellowstone National Park have increased wolves were reintroduced to the park in 1995.

Willows are small trees that grow best in marshlike environments. After studying the Yellowstone food web shown in Diagram 1 and the population data for the park shown in Table 1, students arrive at two different hypotheses.

Diagram 1. Yellowstone Food Web

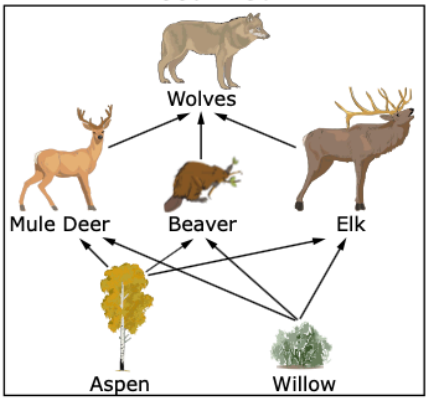


Table 1. Yellowstone Population Data

	Wolves	Elk	Beaver	Mule Deer
1995	31	16,791	10	2,014
2004	171	8,335	120	2,014

Note: These data are approximate.

Hypothesis 1:
When wolves were reintroduced to Yellowstone, the wolves preyed upon the elk, which allowed the beavers to eat more willow. This led to more beavers and beaver dams. Beaver dams create marsh environments that willows do well in, allowing the willow's population to increase.

Hypothesis 2:
When wolves were reintroduced to Yellowstone, they preyed upon all animal species that ate plants. With fewer plant-eating animals eating willows, fewer willow plants were eaten and the population of willow plants increased.

Your Task

In the questions that follow, you will analyze and evaluate these two competing hypotheses.

Part A

Click on each box and select a word/phrase that completes the table with the Yellowstone population data from 1995 and 2004 and the hypothesis those data support.

Table 2. Summary of Yellowstone Population Data and Supported Hypotheses

Data	Hypothesis Supported
Elk population	
Beaver population	
Mule deer population	

Part B

Which hypothesis is best supported by the evidence?

- (A) All of the evidence is consistent with Hypothesis 1.
- (B) All of the evidence is consistent with Hypothesis 2.
- (C) Most of the evidence is consistent with Hypothesis 1.
- (D) Most of the evidence is consistent with Hypothesis 2.
- (E) The evidence does not favor either hypothesis.

Part C

Aspen trees are shown in Diagram 1. Moose and bison are two plant-eating animal species that are not shown in Diagram 1 but are also part of the Yellowstone food web.

Based on Hypothesis 2, click on each box to select a word/phrase to make a prediction about what would happen to the moose, bison, and aspen tree populations after the reintroduction of wolves.

Table 3. Population Predictions

Species	Population after Wolf Reintroduction	Reason for Impact on Population
Moose		
Bison		
Aspen tree		

Part D

Based on Hypothesis 1, and the information in Diagram 1, Table 1, and Table 3 from part C, click on each box to select **two** different predictions.

Table 4. Population Predictions

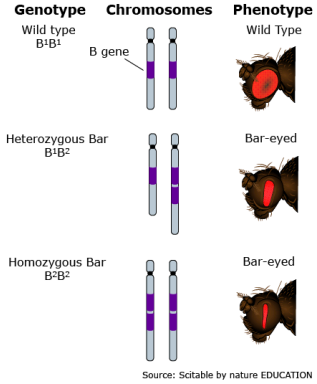
Prediction Number	Prediction Statement
1	
2	

7

Flies with bar-eyed phenotypes cannot see as well as those with wild type phenotypes.

The genotypes and phenotypes of three flies are shown in Figure 1.

Figure 1. Genotypes and Phenotypes of Three Flies



Source: Scitable by nature EDUCATION

Click on each blank box to select the statements that complete the chain of events explaining how the bar-eyed mutation reduces a fly's eyesight.

Chain of Events

Step	Event
1	
2	
3	
4	The eyesight of a fly is reduced.