



Teacher Guide

Sample Items

Science

Grade 5

Science

Grade 5

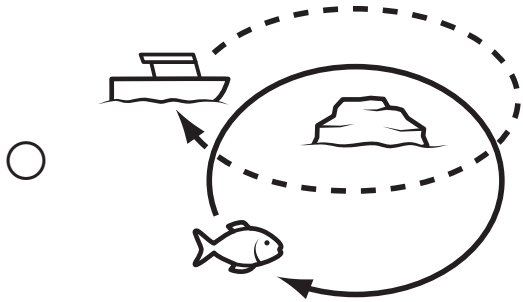
Sample Items

Item 1

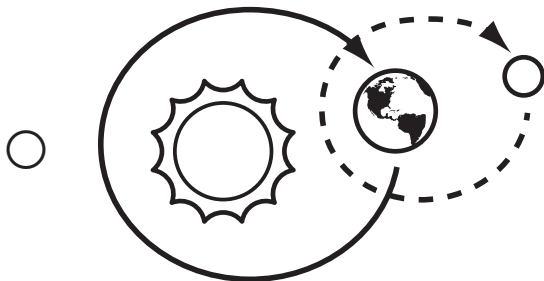
Yuki wants to show the Sun, the Moon, and Earth in the solar system.

Item 1

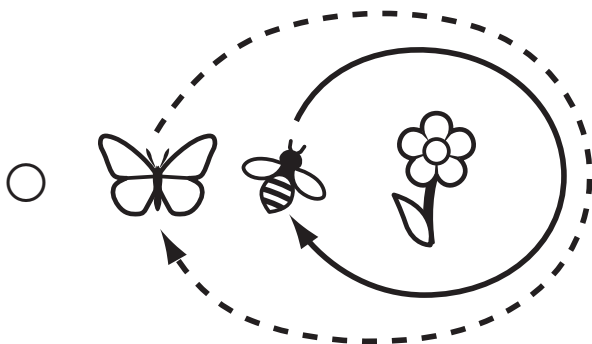
Which model should Yuki choose to show the positions of the Sun, the Moon, and Earth in the solar system?



A boat moves around a rock, and a fish moves around the rock.



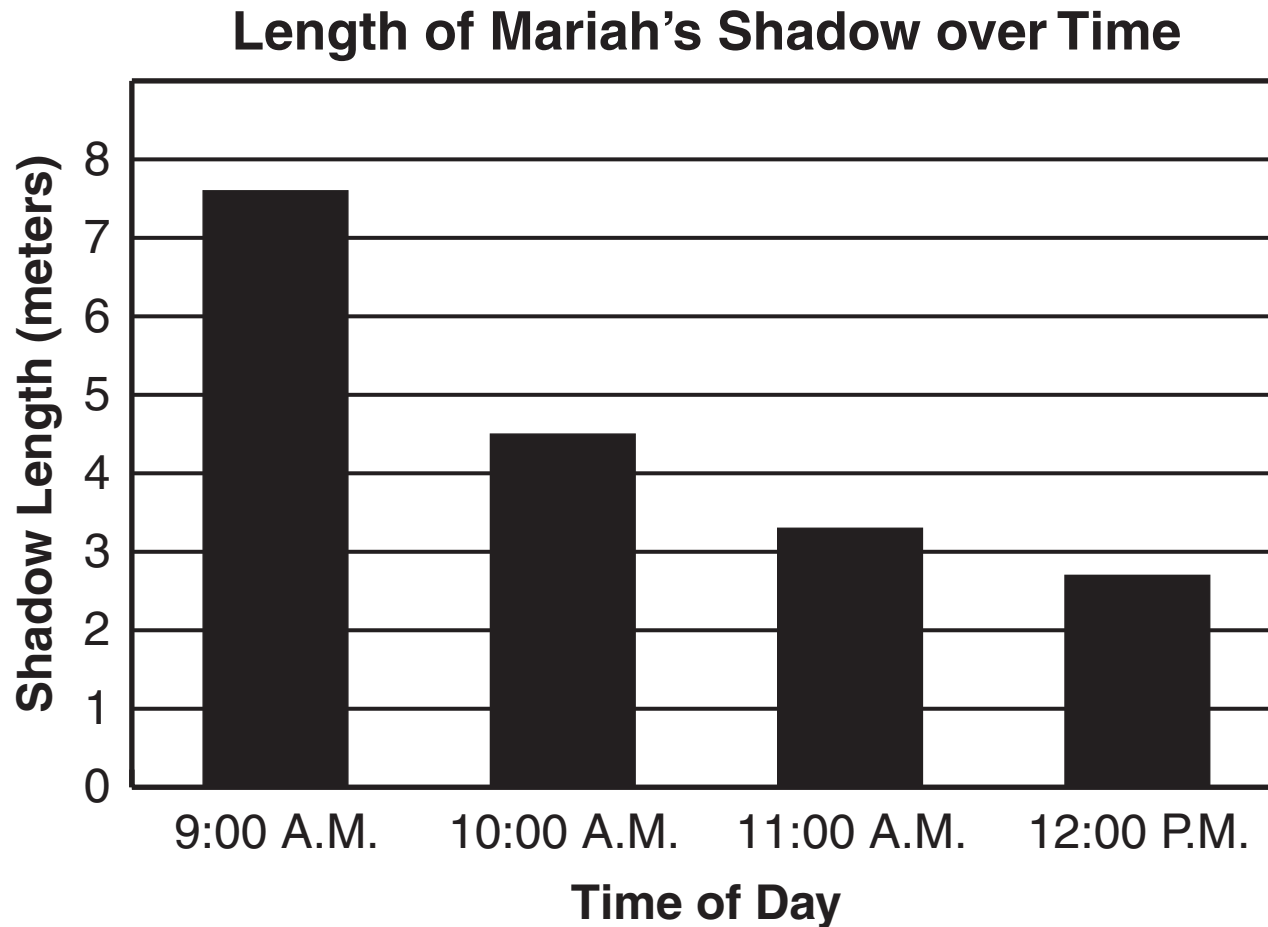
Earth moves around the Sun, and the Moon moves around Earth.



A butterfly moves around a bee and a flower, and the bee moves around the flower.

Item 2

At school, Mariah does an experiment. She stands outside and her teacher measures the length of her shadow. Every hour, Mariah goes back outside to the same place and her shadow length is measured. The bar graph shows Mariah's data.



Item 2

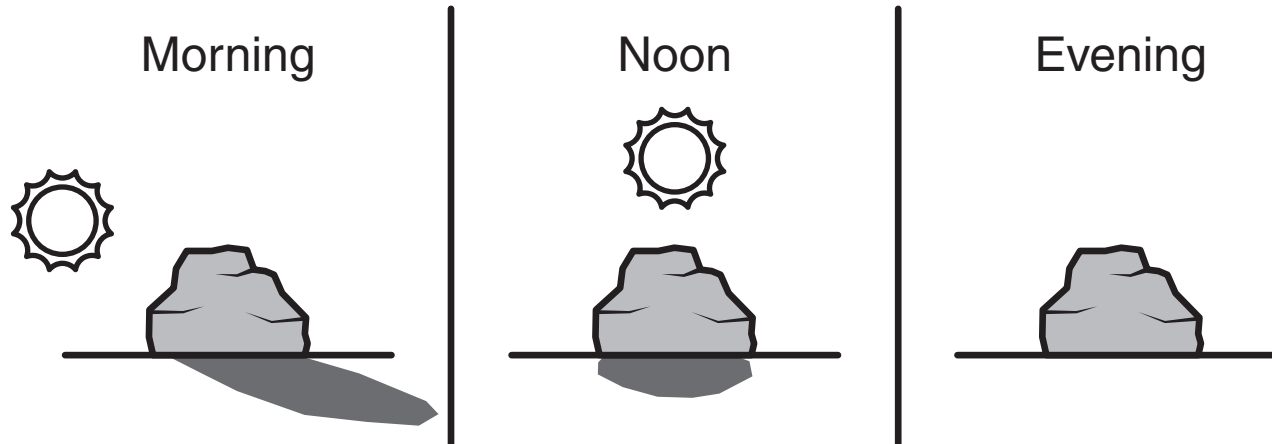
Based on the bar graph, which statement describes the pattern in shadow length?

- ☐ The shadows appear longer in length throughout the day.
- ☐ The shadows appear the same length throughout the day.
- ☐ The shadows appear shorter in length throughout the day.

Item 3

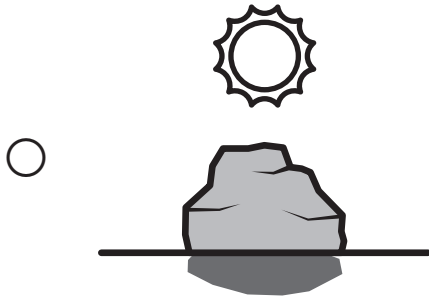
In the morning, Naya sees a large rock from her classroom window and notices that it casts a shadow. At noon, she sees the rock again from her classroom window and notices that the shadow has changed direction. Naya wonders what direction the shadow will be facing later in the evening after school.

She makes an incomplete model of the Sun shining on the rock and the direction of the rock's shadow throughout the day.

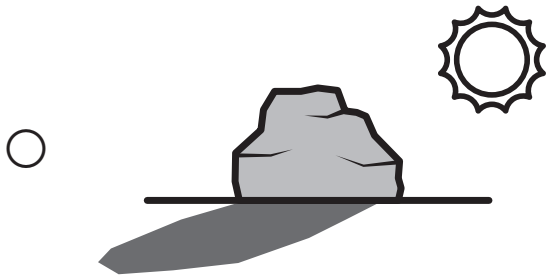


Item 3

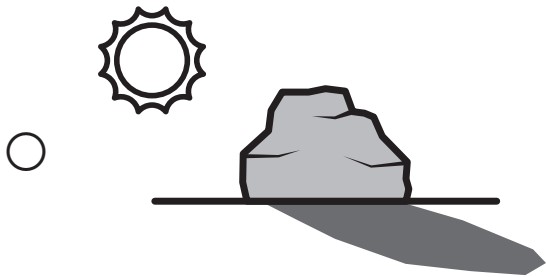
Which diagram shows the direction of the rock's shadow in the evening?



The Sun is above the rock and the shadow points in front of the rock.



The Sun is to the right of the rock and the shadow points to the left of the rock.



The Sun is to the left of the rock and the shadow points to the right of the rock.

Item 4

Sofia observes a tree bending as air blows on it outside.



Item 4

Which word can Sofia use to describe the weather?

- ☐ foggy
- ☐ windy
- ☐ sleepy

Item 5

This data table shows winter weather conditions in New York in 2015.

**Winter Weather Conditions
in New York**

Weather Condition	Data
Average snowfall	43 cm
Average temperature	31°F

Item 5

Based on the data table, which sentence **best** describes winter in New York?

- ☐ It has few windy days.
- ☐ It is warm with lots of rain.
- ☐ It is cold with lots of snow.

Item 6

This data table shows the high temperatures for a town in Alaska in the spring and fall. Data for June, July, and August are missing.

**High Temperatures for a Town
in Alaska**

Month	High Temperature (°F)
April	46
May	52
June	?
July	?
August	?
September	50
October	47
November	38
December	35

Item 6

Based on the data table, which range of high temperatures is expected for the summer?

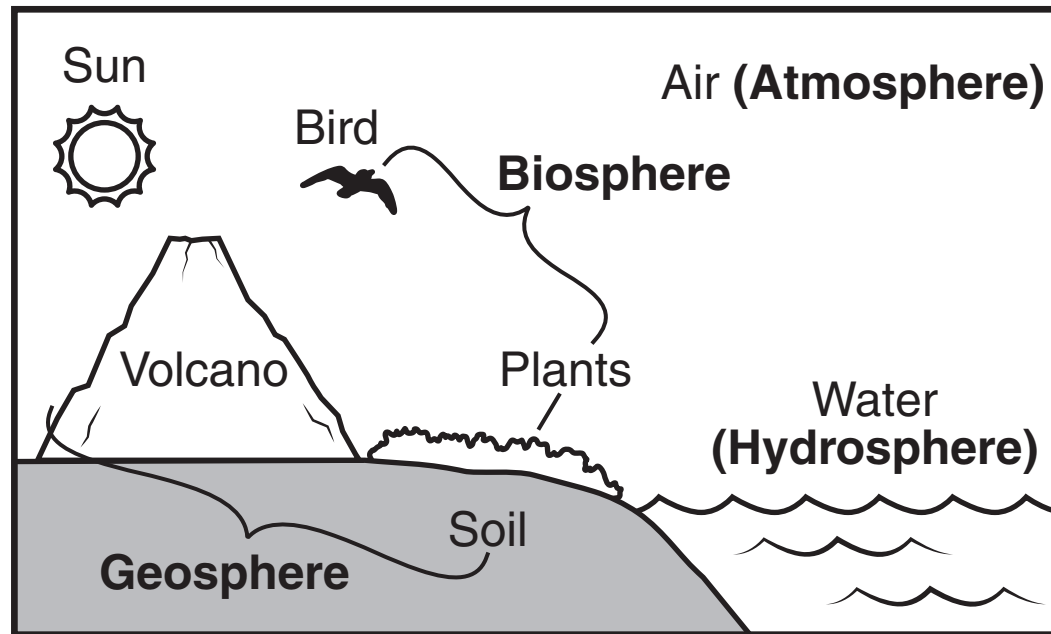
- ☐ between 20° and 29°F
- ☐ between 40° and 49°F
- ☐ between 60° and 69°F

Items 7–12 | Cluster Stimulus

Arjun is learning about islands in class. He is surprised to find out from his teacher that there are many things that live on a volcanic island.

Arjun wonders how a volcanic island supports life. His teacher shows him a model of the different systems on an island.

Volcanic Island Systems Model



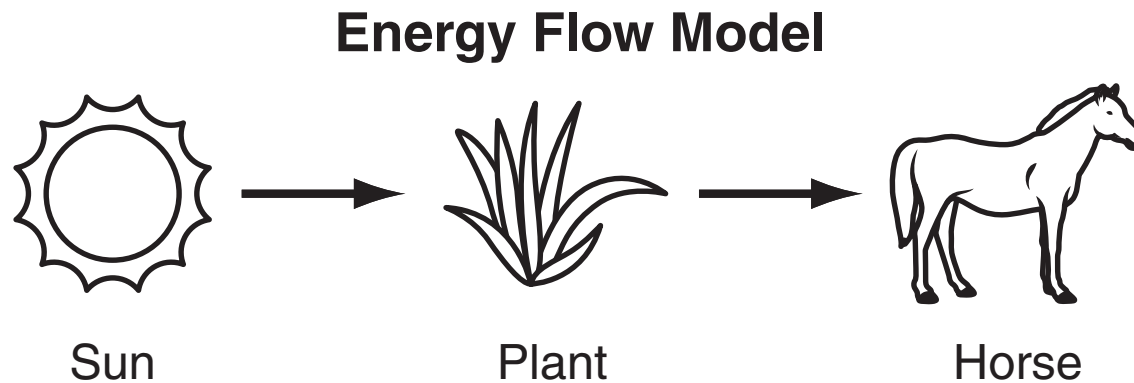
Arjun's teacher also shows him a list of some of the things that live on and around a volcanic island.

Items 7–12 | Cluster Stimulus

Things that live on and around a volcanic island:

- birds
- horses
- tiny living things in the water
- plants

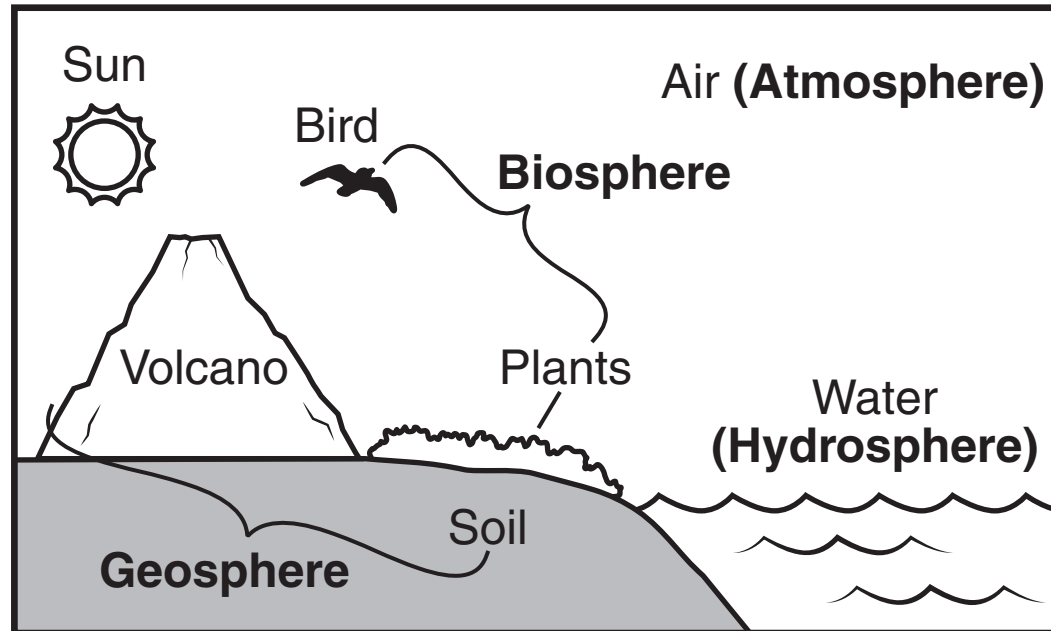
Arjun's teacher also shows him a model of how energy flows in a volcanic island ecosystem.



Item 7

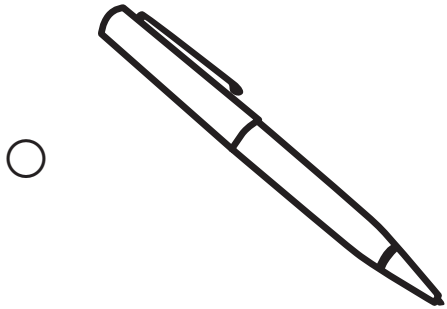
Arjun looks at the model of a volcanic island.

Volcanic Island Systems Model

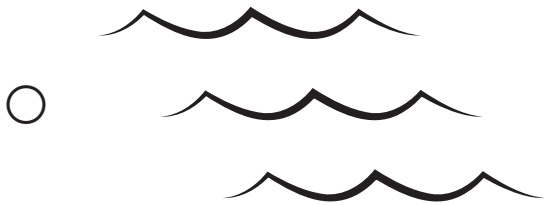


Item 7

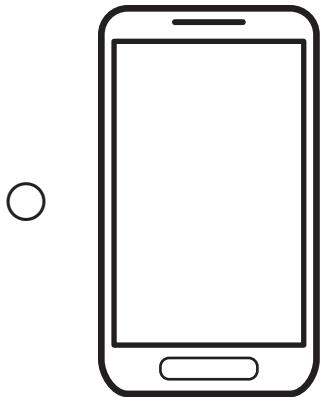
What part of the model is included in the hydrosphere?



pen



water

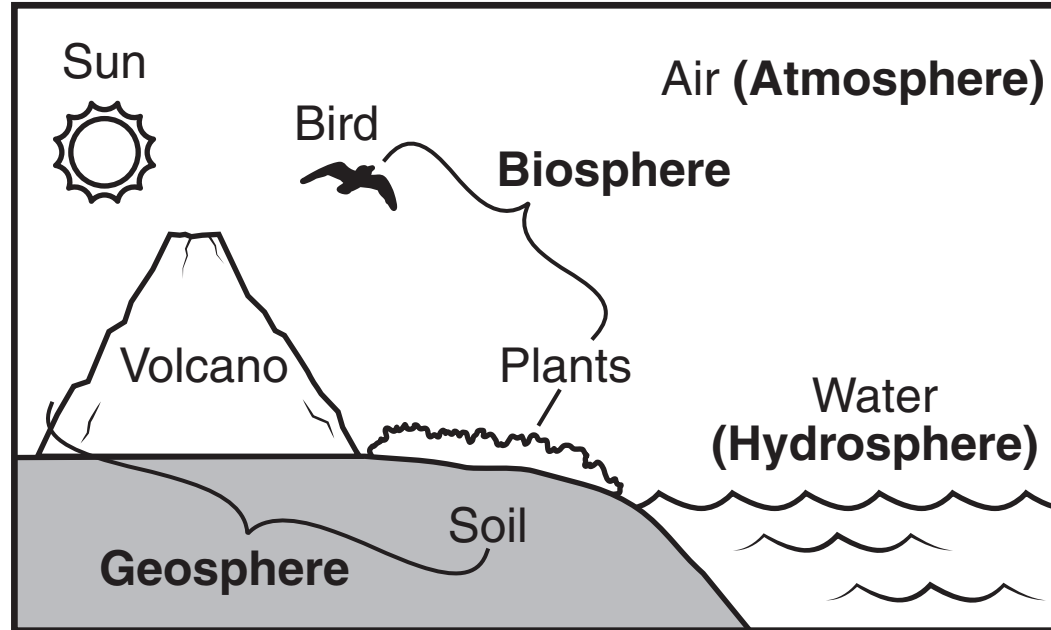


phone

Item 8

Arjun looks at the volcanic island model and wonders how the systems on an island interact.

Volcanic Island Systems Model



Item 8

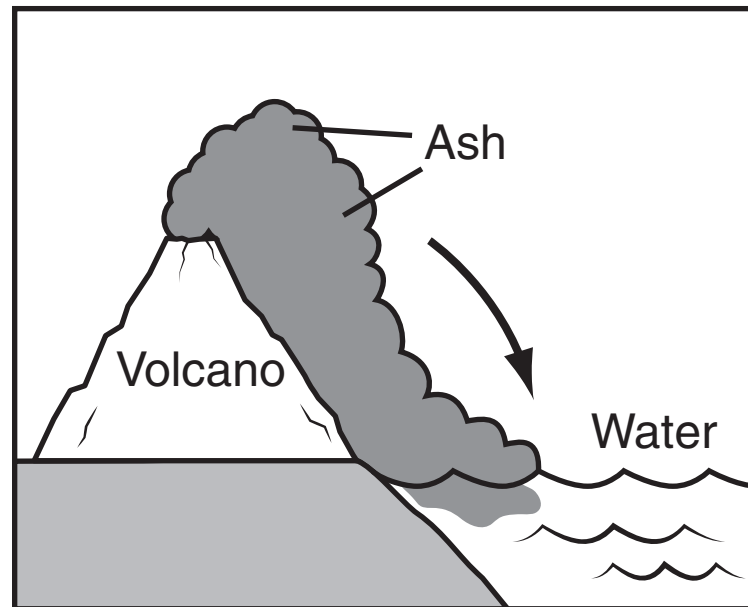
Which statement describes how the biosphere and the geosphere interact in the volcanic island model?

- ☐ The motor helps a car to move.
- ☐ The soil gives plants a place to grow.
- ☐ The air cools the water down with wind.

Item 9

Arjun wants to make a model to show how ash released from a volcano on an island affects the atmosphere.

**Effect of Volcanic Ash on
the Atmosphere Model**



Item 9

What should Arjun do to the model to show how the atmosphere and geosphere interact?

- ☐ Draw tiny living things in the water eating the ash.
- ☐ Draw lines in the air to show wind moving the ash.
- ☐ Draw clouds raining in the sky and mixing with the ash.

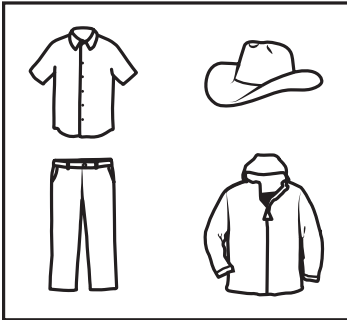
Item 10

Arjun learns that birds and plants, such as shrubs, live in a volcanic island ecosystem. He wonders where the energy for a volcanic island comes from to support these living things.

Item 10

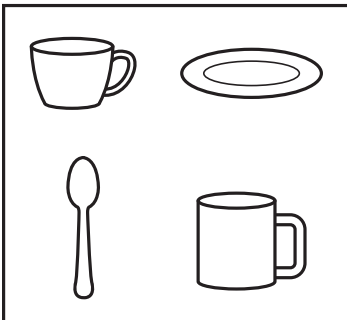
Which model shows the source of energy for a volcanic island ecosystem?

☐



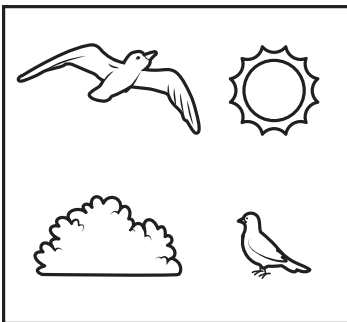
A hat is next to a shirt, a jacket, and pants.

☐



A plate is placed near a teacup, a mug, and a spoon.

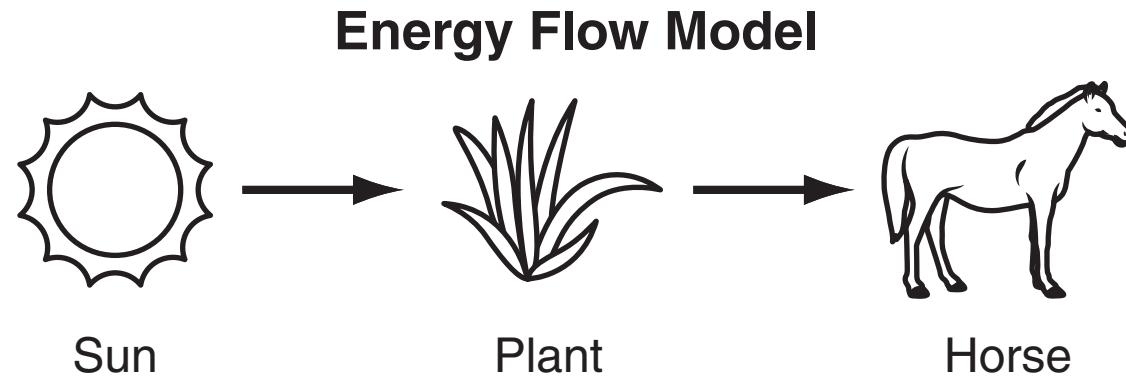
☐



The Sun is shining on a large bird, a small bird, and a shrub.

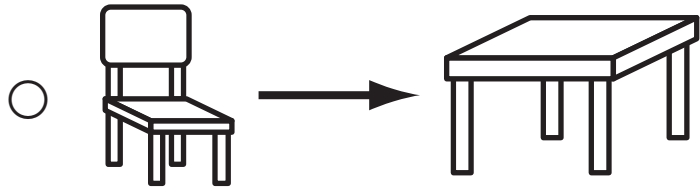
Item 11

Arjun looks at the model about energy flow in a volcanic island ecosystem.

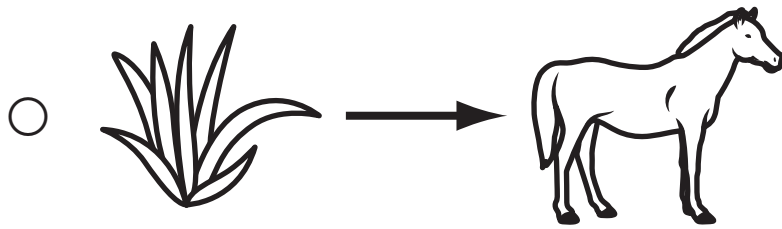


Item 11

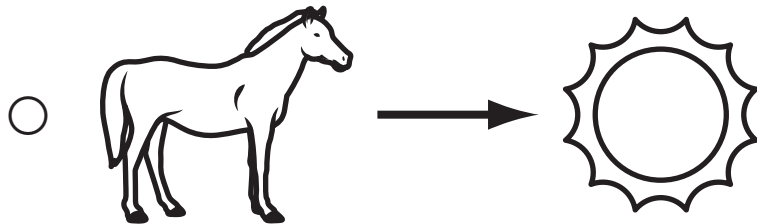
Which model shows an object or organism receives its energy from plants?



from a chair to a desk



from a plant to a horse

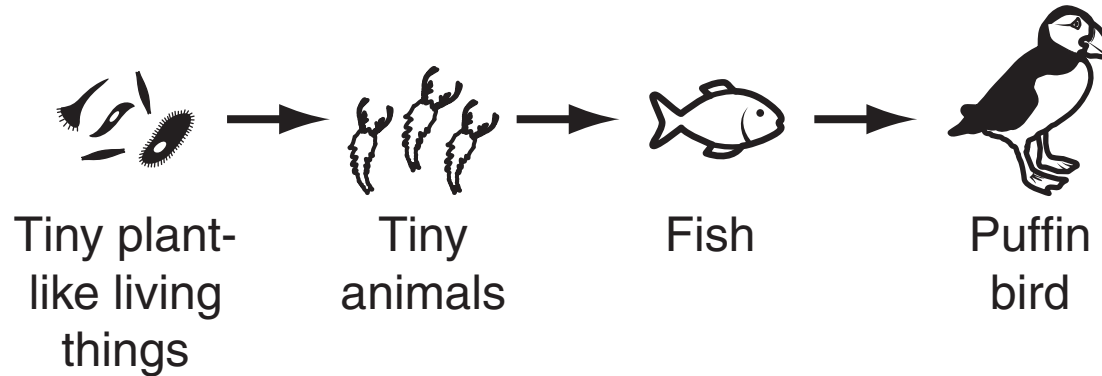


from a horse to the Sun

Item 12

Arjun makes a model to show how energy flows in a volcanic island ecosystem. His model shows energy flowing from tiny plant-like living things in the water, to tiny animals living in the water, to a fish, and then to a puffin bird.

Energy Flow in Volcanic Island Ecosystem Model



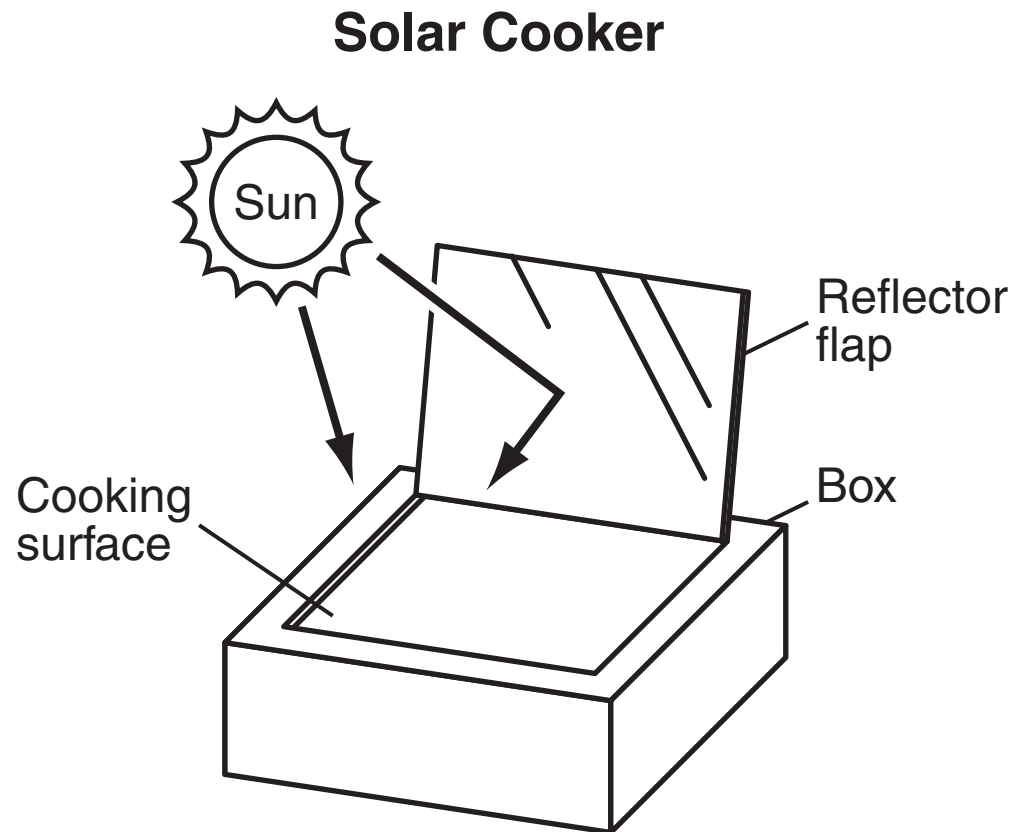
Item 12

What should Arjun add to his model to show the source of energy for all the organisms that live in or around the water?

- ☐ the Sun
- ☐ the Moon
- ☐ the Earth

Items 13–18 | Cluster Stimulus

Alma finds a diagram of a solar cooker made out of a box. A solar cooker uses energy from the Sun to cook food.



Food is cooked inside the box on the cooking surface.

Items 13–18 | Cluster Stimulus

Investigation 1

Alma sets up an investigation to find out the best color to make the cooking surface in her solar cooker. She places three pieces of paper that are different colors in the sun. One is red. One is green. One is blue. The papers are all the same size. Then, Alma places an ice cube on each piece of paper. The ice cubes are all the same size. Next, she measures how long it takes each ice cube to melt. Alma makes a data table to show her results.

**What Color Paper
Melts Ice Fastest?**

Paper Color	Time It Takes to Melt Ice Cube (minutes)
Red	35
Green	39
Blue	37

Items 13–18 | Cluster Stimulus

Investigation 2

Alma removes the paper from the solar cooker she used in Investigation 1 and does another investigation. She wants to know if cheese will change weight when it melts. She weighs some solid pieces of cheese. Then, she melts the cheese in her solar cooker and weighs the melted cheese. The data table shows the weights Alma measured.

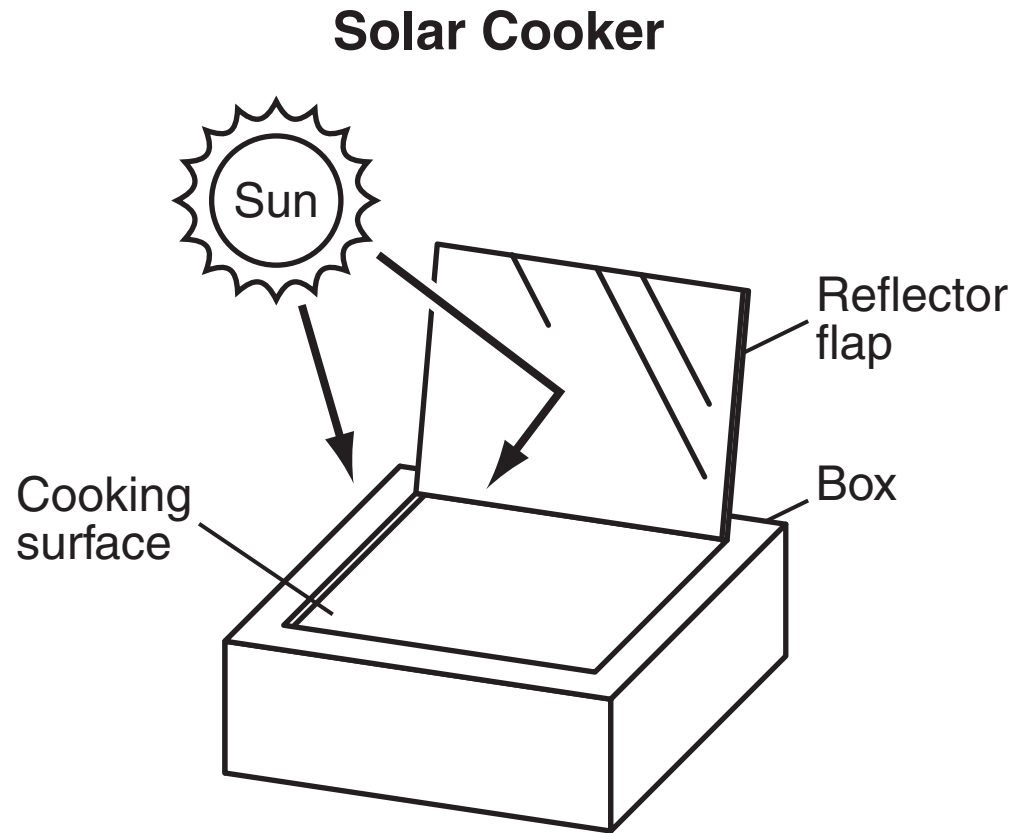
Weight of Cheese

Weight of Solid Pieces of Cheese	Weight of Melted Cheese
50 grams	50 grams

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Item 13

Alma's solar cooker uses energy from the Sun to heat food.



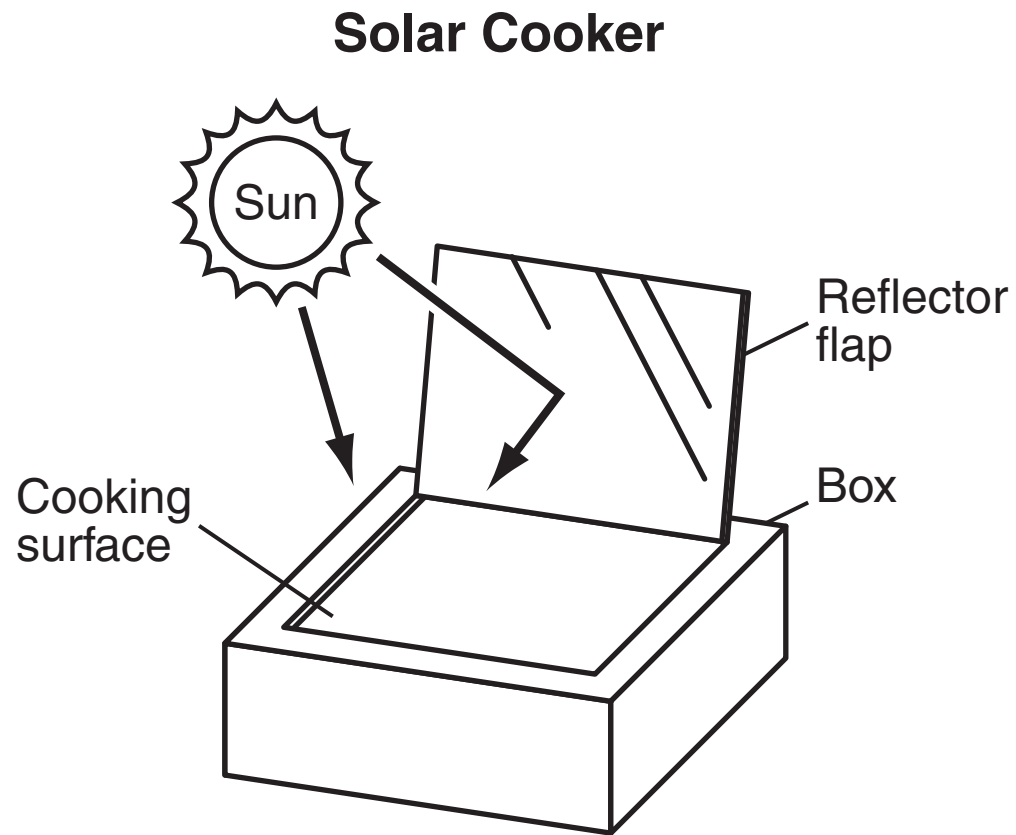
Item 13

What type of energy comes from the Sun?

- ☐ rain
- ☐ cold
- ☐ light

Item 14

When the solar cooker is placed in the sun, it warms up the food inside.



Item 14

How does the energy from the Sun change form when the solar cooker warms up food?

- ☐ from light to heat
- ☐ from heat to light
- ☐ from sound to cold

Item 15

Alma tests paper of different colors to see which one melts ice fastest. Alma's results are listed in the data table.

**What Color Paper
Melts Ice Fastest?**

Paper Color	Time It Takes to Melt Ice Cube (minutes)
Red	35
Green	39
Blue	37

Item 15

Based on Alma's results, which color material will make the solar cooker heat food fastest?

- ☐ red
- ☐ green
- ☐ blue

Item 16

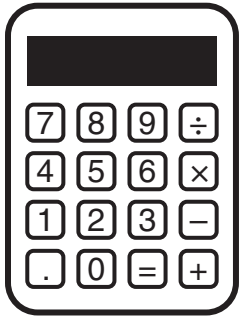
Alma places her solar cooker in the sun. She wants to know the temperature inside the cooker.

Item 16

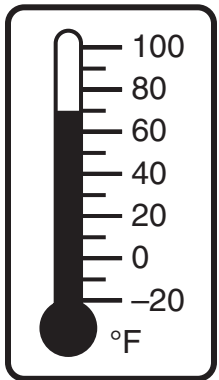
Which tool can Alma use to measure the temperature inside the solar cooker?



television



calculator



thermometer

Item 17

Alma weighs some solid pieces of cheese. Then, she melts the cheese in her solar cooker and weighs the melted cheese. The data table shows the weights Alma measured.

Weight of Cheese

Weight of Solid Pieces of Cheese	Weight of Melted Cheese
50 grams	50 grams

Item 17

How does the weight of the melted cheese compare to the weight of the solid cheese?

- ☐ The cooker is easy to put together.
- ☐ The solid and melted cheese weigh the same.
- ☐ The melted cheese weighs more than the solid cheese.

Item 18

Alma decides to try another food in her solar cooker. She weighs a marshmallow. Then, she melts the marshmallow in her solar cooker. The data table shows Alma's observations.

Weight of One Marshmallow

Marshmallow	Weight (grams)
Before Melting	7
After Melting	

Item 18

What is the weight of the marshmallow after it melts?

- ☐ 5 grams
- ☐ 7 grams
- ☐ 9 grams

