

Elementary Science MCAS Question of the Day

1

Grade 4 Standards
Physical Science

2

Which of the following examples **best** describes one type of energy changing into another?

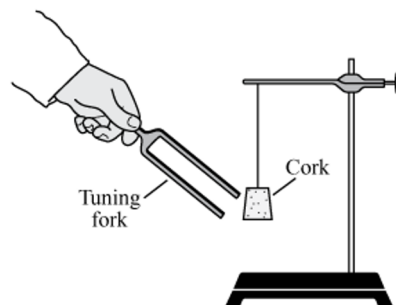
- A. a magnet sticking to a refrigerator
- B. sound traveling through a solid wall
- C. an electric heater warming up a cold room
- D. light rays bending as they pass through glass

3

In a science investigation, a student holds a vibrating tuning fork near a piece of cork, as shown below.

The student observes that the cork moves. Which of the following conclusions can be made from this investigation?

- A. Sound is a form of energy.
- B. Sound does not travel in air.
- C. Sound cannot travel through the cork.
- D. Sound is transformed into magnetic energy.



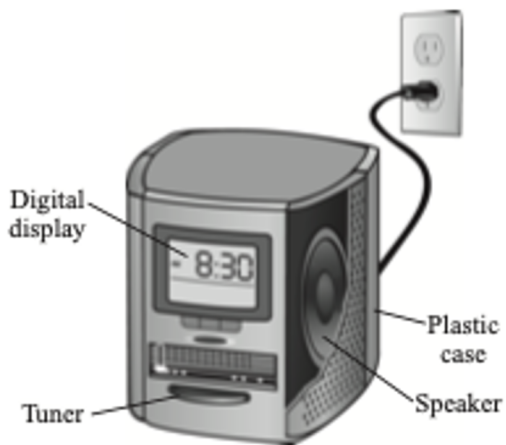
4

What form of energy makes a compass needle point north?

- A. electrical
- B. heat
- C. light
- D. magnetic

5

The diagram below shows a clock radio with four labeled parts.



Which part of the radio is designed to transform electrical energy into sound energy?

- A. digital display
- B. plastic case
- C. speaker
- D. tuner

6

Which of the following is an example of a form of energy?

- A. the air in a sealed jar
- B. the wire in a metal hanger
- C. the water in a small puddle
- D. the sound in a loud classroom

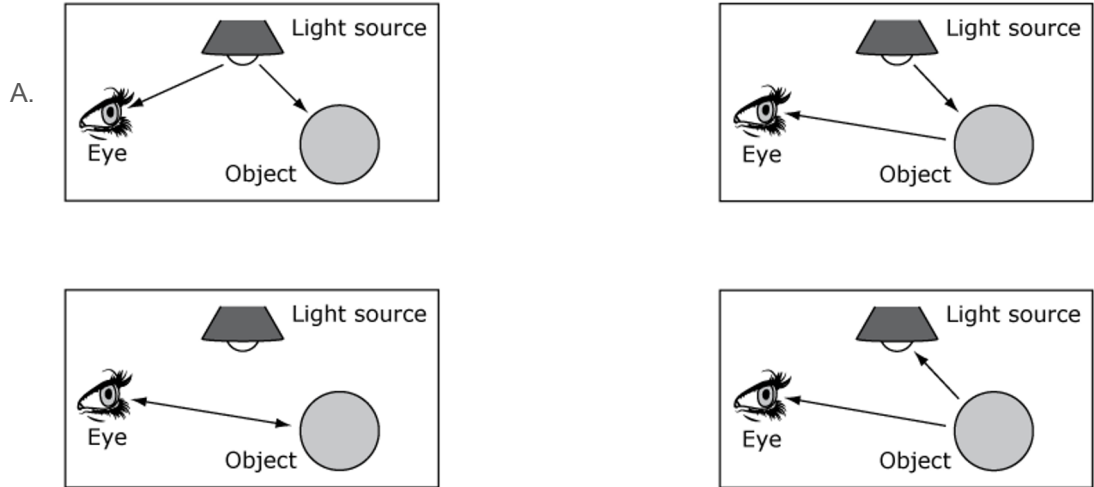
7

Which of the following statements describes an important difference between mushrooms and plants?

- A. Mushrooms can grow in wet areas, but plants grow only in dry soil.
- B. Mushrooms can grow in cold areas, but plants grow only in hot areas.
- C. Mushrooms reproduce by spreading roots, but plants need insects to reproduce.
- D. Mushrooms get energy from decomposing matter, but plants produce their own food.

8

Which of the following diagrams best shows how a person sees an object?



9

A student looks into a mirror and sees the wall behind him. Which of the following **best** describes why the student sees the wall in the mirror?

- A. Light reflects off the mirror.
- B. Light curves around the mirror.
- C. Light passes through the mirror.
- D. Light scatters when it hits the mirror.

10

Jamal wants to make an electrical circuit, but he only has the objects shown below.



Wires



Light bulb

Which of the following **must** Jamal also have to make an electrical circuit?

- A. a motor
- B. a switch
- C. a bar magnet
- D. a power source

11

A student uses the two containers shown below to investigate the properties of a liquid.



Container 1



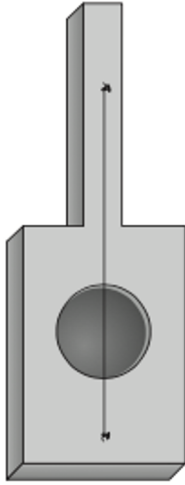
Container 2

The student fills container 1 with a liquid and then pours all the liquid from container 1 into container 2. Based on the student's investigation, which of the following statements **best** describes a property of a liquid?

- A. It takes the shape of its container.
- B. It expands to completely fill its container.
- C. It stays the same shape in different containers.
- D. It has different weights in different containers.

12

The picture below shows a simple musical instrument a student made in science class.



After playing the instrument, the student wanted it to have a higher pitch. Which of the following changes will give the instrument a higher pitch?

- A. lengthening the string
- B. plucking the string harder
- C. tightening the string
- D. using a thicker string

13

The drawing below shows a student blowing across the open top of a bottle that is half full of water.

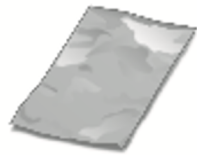


When the student blows across the bottle of water, a sound is made. Which of the following directly causes this sound?

- A. Air vibrates inside of the bottle.
- B. Warm air heats the inside of the bottle.
- C. Air moves away from the outside of the bottle.
- D. Warm air touches cold water inside of the bottle.

14

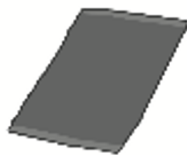
The pictures below show four objects that a student placed outside in the sunlight.



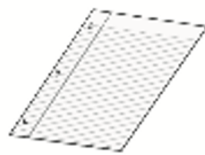
Aluminum foil



Clear glass



Black towel



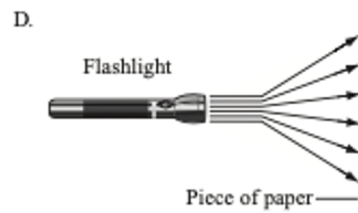
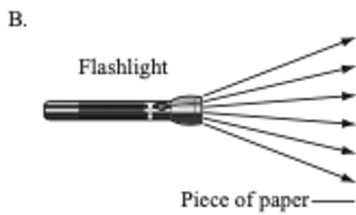
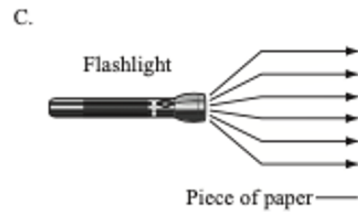
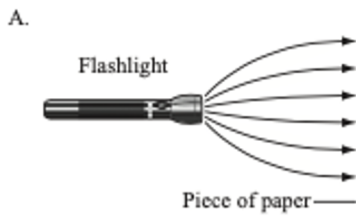
White paper

Which object should absorb the **greatest** amount of light?

- A. aluminum foil
- B. black towel
- C. clear glass
- D. white paper

15

Which of the following diagrams **best** represents how light travels from a flashlight to a piece of paper that is 40 cm away?



16

Which of the following objects would reflect the **greatest** amount of light from a flashlight?

- A. a brick wall
- B. a glass window
- C. a bathroom mirror
- D. a sheet of black paper

17

Grade 4 Standards Earth Science

18

The picture below shows trees with bent trunks growing on a hillside.

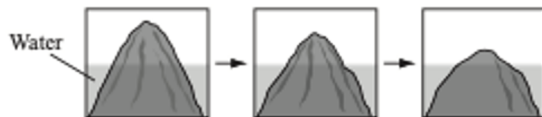
Soil moving downhill caused these trees to tilt slightly each year when they were young. Which of the following **most likely** caused the soil to move when these trees were young?

- A. an earthquake
- B. a thunderstorm
- C. weathering and erosion
- D. volcanic eruptions and lava flows



19

The pictures below show how an island changed over time.

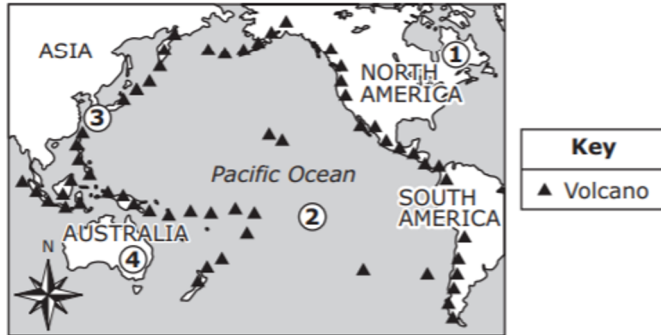


Which of the following processes **most likely** caused the island to change?

- A. earthquakes over many days
- B. hurricanes over several months
- C. rain and flooding over several years
- D. weathering and erosion over millions of years

20

Four locations on the map are labeled 1, 2, 3, and 4.

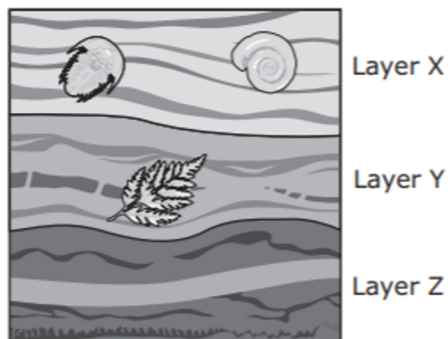


Which location is most likely on a plate boundary?

- A Location 1
- B Location 2
- C Location 3
- D Location 4

21

A cross section of three sedimentary rock layers is shown.



Which of the following represents the rock layers in order from the youngest to the oldest?

- A Layer X → Layer Y → Layer Z
- B Layer X → Layer Z → Layer Y
- C Layer Y → Layer Z → Layer X
- D Layer Z → Layer Y → Layer X

22

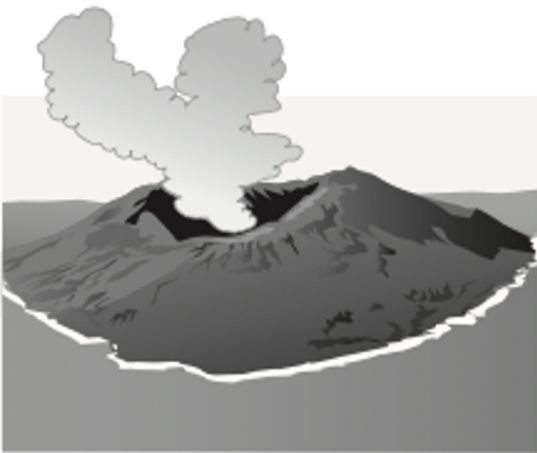
While hiking last year, Mike saw a large boulder next to a mountain trail. The boulder had no cracks.

While hiking on the trail this year, he saw two large cracks in the boulder. Which of the following **most likely** caused these cracks to form?

- A. shaking from high winds
- B. pressure from flowing water
- C. erosion due to falling rain and snow
- D. weathering due to freezing and thawing

23

A volcano erupted in the Atlantic Ocean and formed a new island over time. The picture below shows the new island as it was forming.



The new island is mainly made of which type of rock?

- A. igneous
- B. limestone
- C. metamorphic
- D. sedimentary

24

Which of the following **best** describes how most soil forms?

- A. through the growth of trees in a forest
- B. through the buildup of snow on an iceberg
- C. through the weathering of rock by wind and water
- D. through the cooling of lava from a volcanic eruption

25

The picture below shows a farmer plowing a field.



The farmer is plowing dead plants into the farmland soil. How does this improve the soil?

- A. The dead plants add nutrients to the soil.
- B. The dead plants bring oxygen to the soil.
- C. The dead plants absorb toxins from the soil.
- D. The dead plants reduce the carbon dioxide in the soil.

26

Sandstone is a sedimentary rock. Which of the following statements **best** describes how sandstone is formed?

- A. Minerals left behind by dripping water harden and form rock over time.
- B. Weathered rock particles form layers and are cemented over time.
- C. Volcanic eruptions force molten rock to the surface, where it cools and solidifies.
- D. Underground heat and pressure cause existing rock to change and form new rock.

27

Which of the following statements **best** explains how the decomposition of plant and animal matter helps to form rich soils?

- A. Decomposition adds silt to soil.
- B. Decomposition adds water to soil.
- C. Decomposition adds oxygen to soil.
- D. Decomposition adds nutrients to soil.

28

Grade 4 Standards Life Science

29

The pictures below show six animals.



Wolf



Penguin



Turtle



Frog



Squirrel



Bear

Which chart shows these animals correctly sorted into two groups based on how they reproduce?

A.

Lay Eggs	Live Birth
penguin squirrel	wolf turtle frog bear

C.

Lay Eggs	Live Birth
turtle frog	wolf penguin squirrel bear

B.

Lay Eggs	Live Birth
penguin frog turtle	wolf squirrel bear

D.

Lay Eggs	Live Birth
penguin turtle squirrel	wolf frog bear

30

A student has two plants of the same type, plant X and plant Y. Each plant is in its own pot outside in a sunny location. The student gives both plants the same amount of water and nutrients. The table below shows the student's notes about both plants.

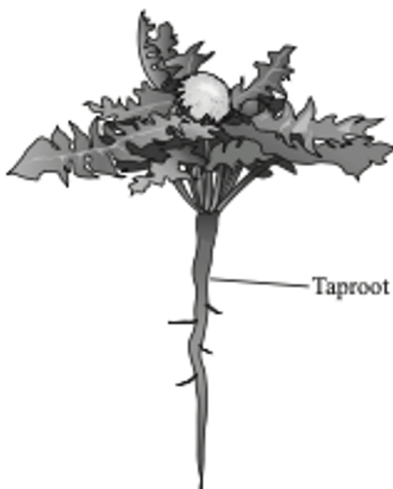
	Plant X	Plant Y
Soil	moist	moist
Number of Roots	many	many
Number of Leaves	12	4
Appearance of Leaves	green	yellow and wilted
Number of Flowers	4	1
Amount of Fruit	1	0
Stem	thick and green	brown spots, small holes, bent
Other Notes	growing quickly	small insects near plant, some dry leaves fell off

Based on the student's notes, what is the **most likely** reason for the differences between the two plants?

- A. Plant Y's roots were damaged by insects, so it cannot make as much food as plant X can.
- B. Plant Y's flowers were damaged by insects, so it cannot store as many minerals as plant X can.
- C. Plant Y's fruit was damaged by insects, so it cannot attract pollinating insects as well as plant X can.
- D. Plant Y's stem was damaged by insects, so it cannot move as much water to its leaves as plant X can.

31

The picture below shows a dandelion plant.

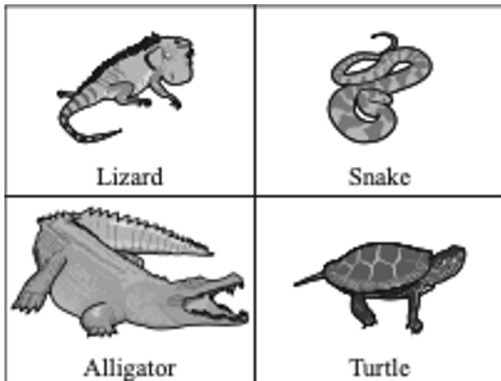


Which of the following is an important function of the taproot of a dandelion plant?

- A. to hold the plant in place
- B. to take in air for the plant
- C. to produce seeds for the plant
- D. to protect the plant against insects

32

Four reptiles are shown below.



Which of the following questions about an animal's physical characteristics is best to use when deciding whether an animal is a reptile?

- A. How big is it?
- B. Does it have scales?
- C. Does it have a shell?
- D. How many legs does it have?

33

One type of animal hatches from an egg, breathes through gills when it is young, and mainly lives on land as an adult. Into which group is this animal classified?

- A. amphibians
- B. birds
- C. mammals
- D. reptiles

34

Which of the following is the **main** role of flowers found on most flowering plants?

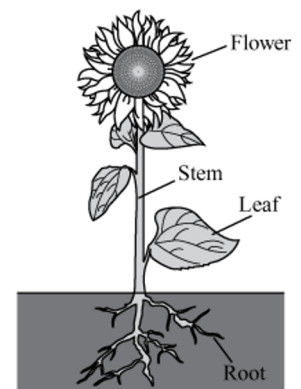
- A. to take in air
- B. to produce seeds
- C. to absorb nutrients
- D. to protect the stem

35

Some parts of a sunflower are shown in the diagram below.

A student claims sunflowers reproduce by producing seeds. What part of the sunflower would the student use to support this claim?

- A. flower
- B. leaf
- C. root
- D. stem



36

Grade 4 Standards Tech and Engineering

37

An engineer is testing different types of pervious concrete to use in a new parking area. Pervious concrete is a special kind of concrete that can help reduce flooding by allowing rainwater to pass through and soak into the ground.

Which of the following should the engineer measure to see how well a type of pervious concrete will reduce flooding?

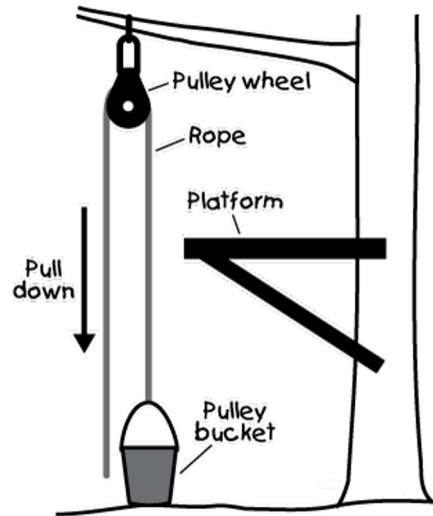
- A. the weight of 10 cubic meters of the concrete
- B. the strength of a 15-centimeter layer of the concrete
- C. the amount of water needed to mix a cubic meter of the concrete
- D. the number of liters of water per minute that can move through the concrete

38

The diagram below shows a student's design for a pulley system used to lift objects up to a platform.

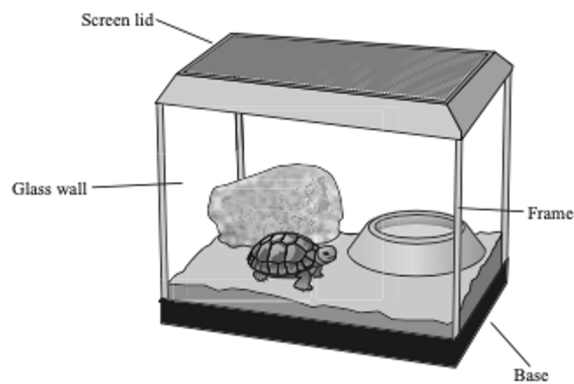
Which of the following is **most** important to consider when choosing the type of rope for the pulley system?

- A. the shape of the pulley bucket handle
- B. the speed at which the pulley wheel moves
- C. the amount of weight the pulley bucket will hold
- D. the distance of the pulley wheel from the platform



39

The picture below shows a turtle living in a container. This turtle is kept in a classroom.

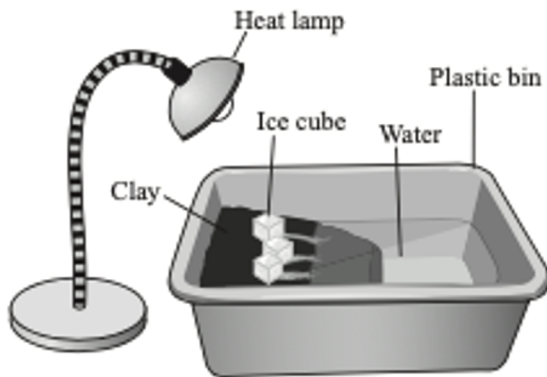


The students in the class want to build a new container to hold five more turtles. Which of the following changes is **most important** to make when they build a new container for all six turtles to live in?

- A. use a larger base
- B. use a taller frame
- C. use thicker glass walls
- D. use a stronger screen lid

40

Manuel is building a model to show how water from melting glaciers moves through the ocean. He puts clay, water, and ice cubes into a plastic bin. He places a heat lamp next to the bin. His model is shown in the diagram below.

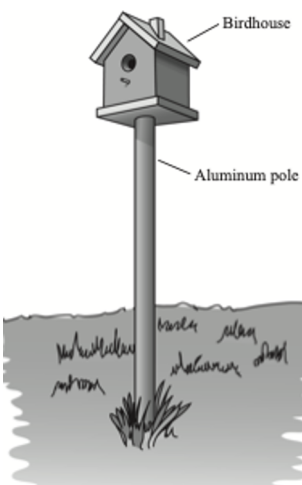


Which of the following would **most likely** help Manuel show how water from melting glaciers moves in his model?

- A. using colored water to represent the water in the ocean
- B. using colored water to make the ice cubes that represent the glaciers
- C. using different colors of clay to represent dry land and the bottom of the ocean
- D. using different colors of light to represent sunlight shining on the glaciers and dry land

41

The diagram below shows a birdhouse attached to an aluminum pole.



To be able to support the birdhouse, which of the following features of the pole is **most** important?

- A. its color
- B. its length
- C. its thickness
- D. its temperature

42