

Student Name _____

Teacher Name _____

School _____

System _____



TENNESSEE

Tennessee Comprehensive Assessment Program Achievement Test ~ Grade 6 Item Sampler



Science



Reporting Category: INQUIRY AND TECHNOLOGY & ENGINEERING

Performance Indicator: 0607.INQ.4 Draw a conclusion that establishes a cause and effect relationship supported by evidence.

- 1** Thermometers were placed inside different-colored socks made of the same material and placed on a sunny sidewalk. After 30 minutes, the temperatures were collected and recorded in the table below.

Sock Temperature Data

Sock Color	Temperature (°C)
Black	39
Dark Green	37
Grey	33
White	32

Which conclusion best explains the difference in the temperatures?

- A** The thermometers absorbed energy from the sidewalk.
- B** The dark-colored socks absorbed more solar energy.
- C** The solar energy did not reach the white sock.
- D** The dark-colored socks refracted the sunlight.

Performance Indicator: **0607.INQ.5 Identify a faulty interpretation of data that is due to bias or experimental error.**

- 2** From the same type of aluminum, several pieces have been hand cut to the same size. The data collected for the samples are shown below.

Aluminum Sample Data

Sample	Mass (g)
1	11.25
2	10.85
3	12.75
4	11.00

The mass of which sample was most likely recorded incorrectly?

- F** Sample 1
- G** Sample 2
- H** Sample 3
- J** Sample 4

Reporting Category: INQUIRY AND TECHNOLOGY & ENGINEERING

Performance Indicator: 0607.TE.2 Evaluate a protocol to determine if the engineering design process was successfully applied.

3 A bridge that crosses a small river was damaged by a flood. After engineers repair the bridge, which engineering procedure should be performed next?

- A** test the strength of the bridge
- B** build a small-scale model of the bridge
- C** identify how fast the water in the river travels
- D** measure the width of the river

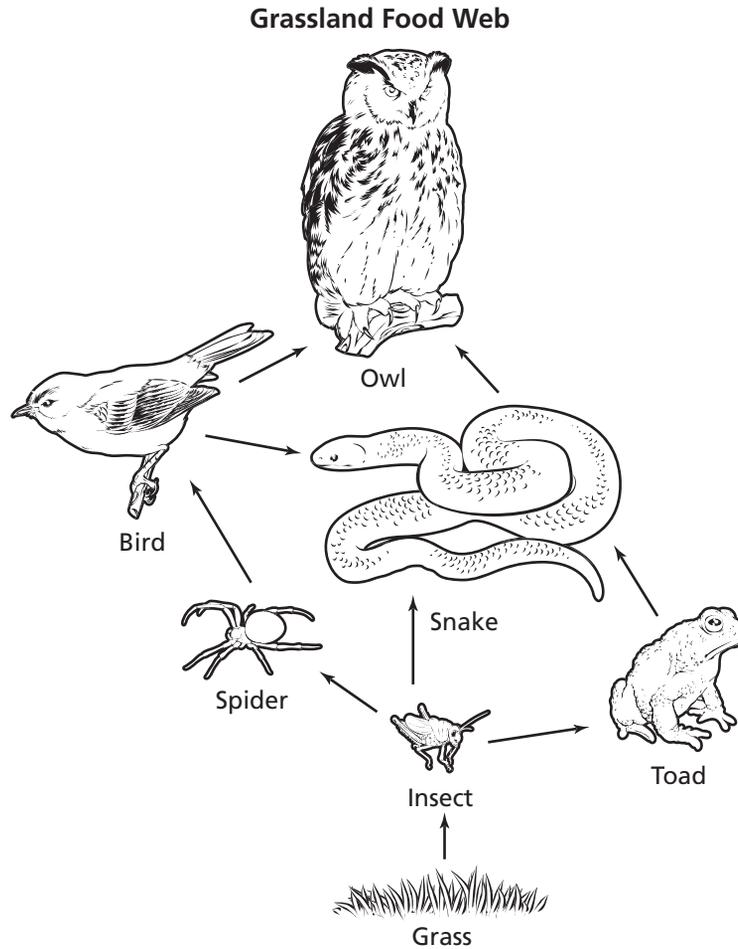
Reporting Category: INQUIRY AND TECHNOLOGY & ENGINEERING

Performance Indicator: 0607.TE.3 Distinguish between the intended benefits and the unintended consequences of a new technology.

4 New fluorescent bulbs use less electrical energy and last longer than traditional incandescent bulbs. What is a benefit of this technological advance?

- F** The bulbs will never need to be replaced.
- G** There will be more solar energy available.
- H** Fewer bulbs will be disposed of in landfills.
- J** Homes will need fewer light sources.

- 5 A grassland food web is shown below.



Which organism in this food web is a producer?

- A Snake
- B Toad
- C Grass
- D Spider

Reporting Category: LIFE SCIENCE: Interdependence

Performance Indicator: 0607.2.2 Interpret how materials and energy are transferred through an ecosystem.

6 Which process begins the transfer of materials and energy throughout a forest ecosystem?

- F** photosynthesis
- G** metamorphosis
- H** growth
- J** reproduction

Reporting Category: LIFE SCIENCE: Interdependence

Performance Indicator: 0607.2.3 Identify the biotic and abiotic elements of the major biomes.

7 A grassland biome contains many abiotic and biotic factors. What is an example of a biotic factor of this biome?

- A** water
- B** plants
- C** air
- D** clouds

Reporting Category: LIFE SCIENCE: Interdependence

Performance Indicator: 0607.2.4 Identify the environmental conditions and interdependencies among organisms found in the major biomes.

8 Plants in the tundra biome grow close to the ground and have shallow root systems. Which statement best explains why these plants have shallow root systems?

- F** The plants are eaten before they are mature.
- G** The plants can be easily transplanted.
- H** The ground is frozen much of the year.
- J** The seeds must be spread quickly.

Go On ►

9 The data table describes the movements of components in the universe.

Components of the Universe

Component	Movement
W	Orbits around planets
X	Revolves around the sun
Y	Rotates through space around their centers
Z	Revolves around the sun in the same direction as planets

Which component is best described by letter W?

- A asteroids
- B galaxies
- C moons
- D suns

Reporting Category: EARTH AND SPACE SCIENCE 1: The Universe

Performance Indicator: 0607.6.2 Explain how the relative distance of objects from the earth affects how they appear.

10 During a solar eclipse, the sun and the moon appear to have exactly the same diameter. Which best explains this phenomena?

- F** The sun has a greater gravitational attraction than the moon because it is larger.
- G** The moon is larger than the sun but appears to be the same size because it is slightly closer to Earth.
- H** The moon is smaller than the sun but appears to be the same size because it is much closer to Earth.
- J** The sun travels closer to Earth than the moon because of its elliptical orbit.

Reporting Category: EARTH AND SPACE SCIENCE 1: The Universe

Performance Indicator: 0607.6.3 Distinguish among a day, lunar cycle, and year based on the movements of the earth, sun, and moon.

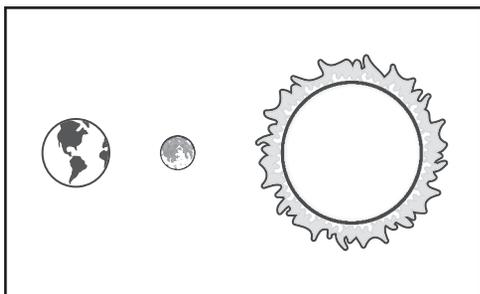
11 Which most likely occurs in a 24-hour period?

- A** The moon rotates once on its axis.
- B** Earth rotates once on its axis.
- C** The moon rotates once around Earth.
- D** Earth rotates once around the sun.

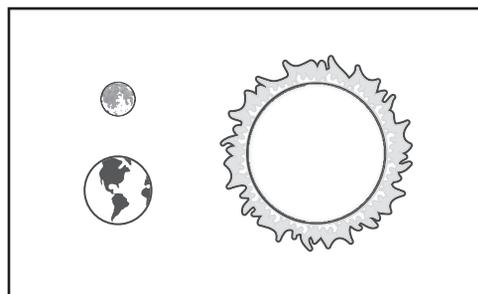
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12 Which diagram best shows the arrangement of the Earth, sun, and moon during a new moon?

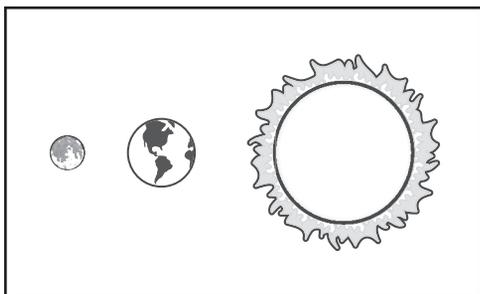
F



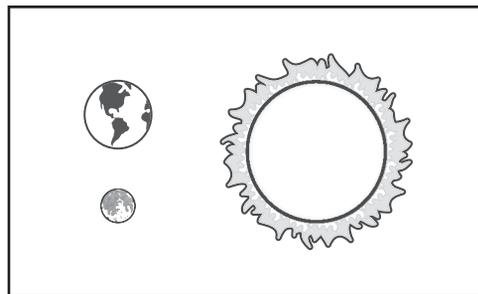
H



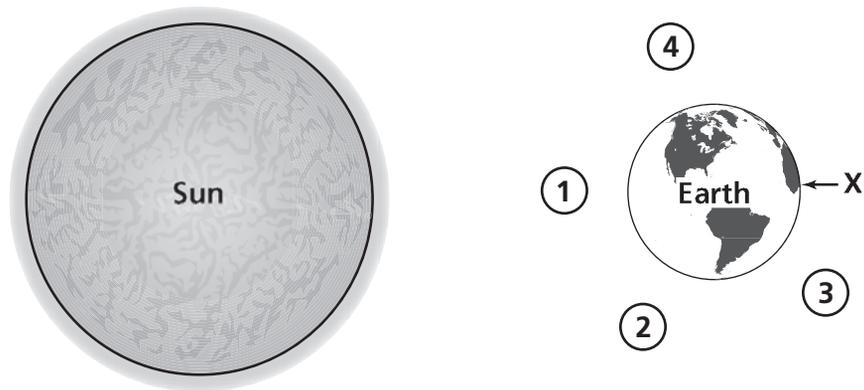
G



J



13 The diagram shows the sun, Earth, and four different locations of the moon.

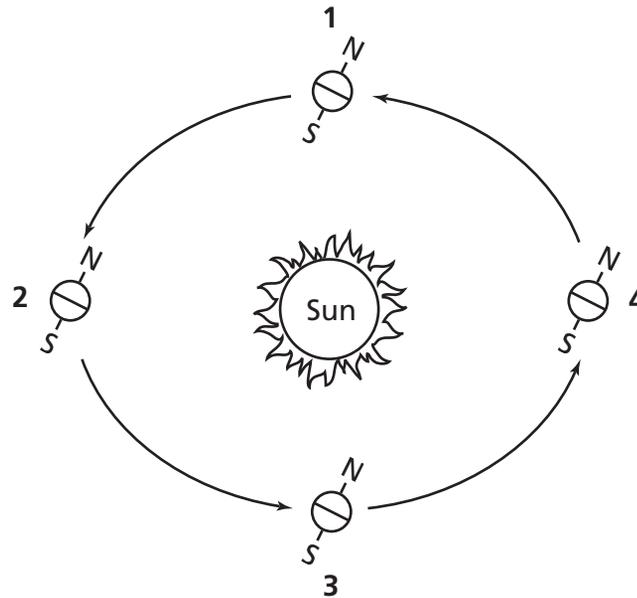


At which position would the moon be located for there to be the highest high tides at location X on Earth?

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

Performance Indicator: 0607.6.6 Use a diagram that shows the positions of the earth and sun to explain the four seasons.

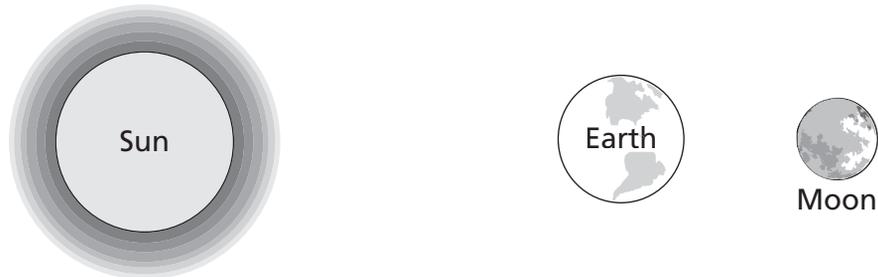
14 A diagram of Earth revolving around the sun is shown below.



Winter is occurring in the Northern Hemisphere when Earth is at which position?

- F** 1
- G** 2
- H** 3
- J** 4

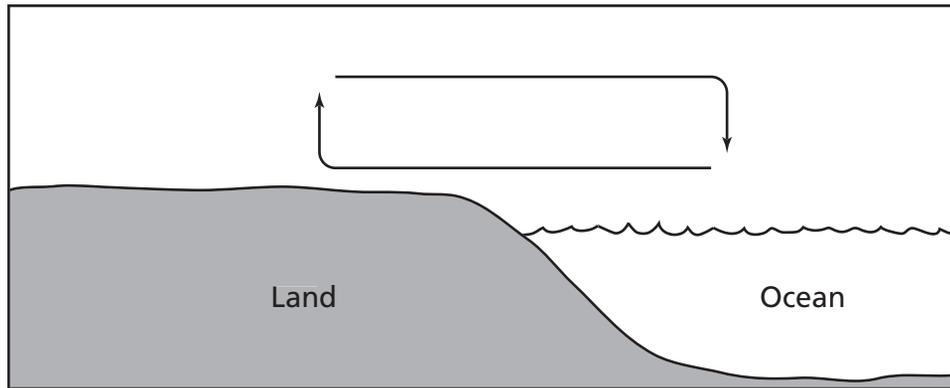
15 The diagram shows the locations of the sun, Earth, and the moon.



Which of these is possible only when the sun, Earth, and the moon are aligned as shown?

- A** a solar eclipse
- B** a third-quarter moon
- C** a lunar eclipse
- D** a first-quarter moon

16 The diagram represents air circulating over coastal land and the ocean.



What most likely causes the air rising from the land to be warm?

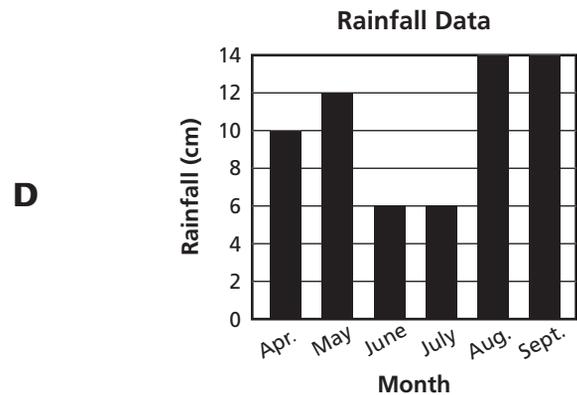
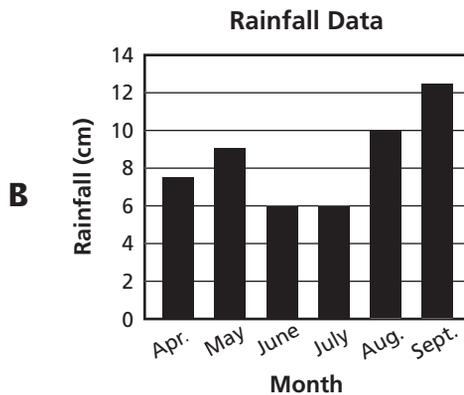
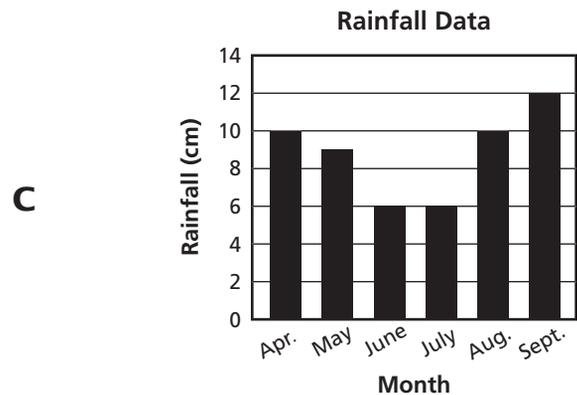
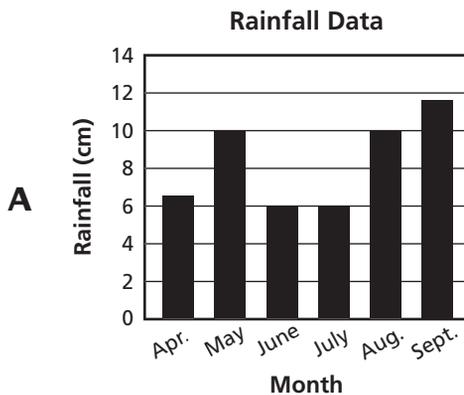
- F** heat from electricity
- G** heat from the sun
- H** heat from hot springs
- J** heat from decomposition

- 17** The data table below lists the amount of rainfall measured during a six-month period at a particular location.

Rainfall Data

Month	Rainfall (centimeters)
April	7.5
May	9.0
June	6.0
July	6.0
August	10.0
September	12.5

Which bar graph below correctly displays the data in the table?



Go On ►

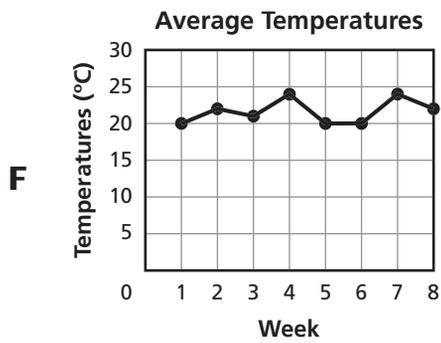
Performance Indicator: 0607.INQ.3 Interpret and translate data into a table, graph, or diagram.

18 Students recorded the temperature outside their classroom every day for 2 months. Then they calculated the average weekly temperature. Their data are recorded in the table below.

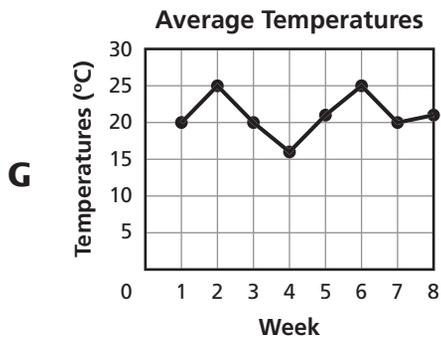
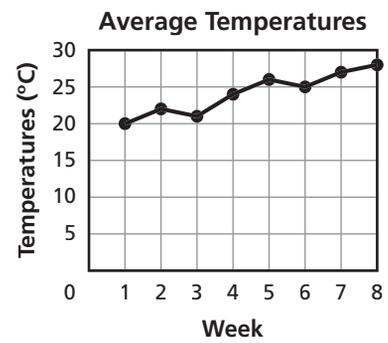
Weather Data Table

Week	Average Temperature °C
1	20
2	22
3	21
4	24
5	26
6	25
7	27
8	28

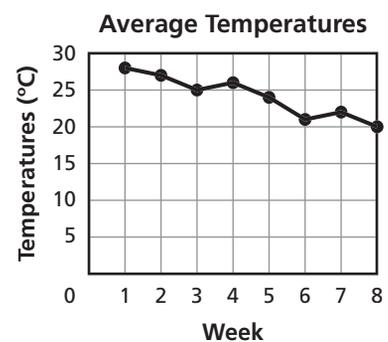
Which graph best shows their results?



H



J



Reporting Category: EARTH AND SPACE SCIENCE 2: The Atmosphere

Performance Indicator: 0607.8.2 Recognize the connection between the sun's energy and the wind.

19 When the atmosphere is warmed by the sun, a change in air pressure results in

- A** clouds.
- B** humidity.
- C** precipitation.
- D** wind.

Reporting Category: EARTH AND SPACE SCIENCE 2: The Atmosphere

Performance Indicator: 0607.8.3 Describe how temperature differences in the ocean account for currents.

20 Which best explains the cause of currents that move north from the equator?

- F** Cold water at the poles rises and moves toward the tropics.
- G** Warm water at the equator rises and moves toward the poles.
- H** Warm water near the coastline rises and moves toward the poles.
- J** Cold water deep in the ocean rises and moves toward the tropics.

Go On ►

Reporting Category: EARTH AND SPACE SCIENCE 2: The Atmosphere

Performance Indicator: 0607.8.4 Interpret meteorological data to make predictions about the weather.

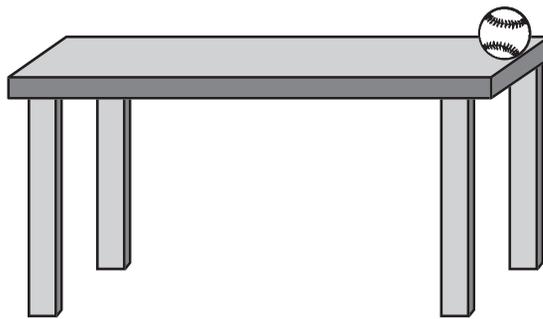
21 A student observes a clear sky and a temperature reading of 35° Celsius at 8:00 a.m. What is the most likely prediction about the day's weather?

- A** The day's weather will be cold.
- B** The day's weather will be rainy.
- C** The day's weather will be hot.
- D** The day's weather will be snowy.

Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.10.1 Distinguish among gravitational potential energy, elastic potential energy, and chemical potential energy.

22 A baseball rests on a tabletop as shown in the diagram below.



What type of potential energy is stored in the baseball based on its position on the table?

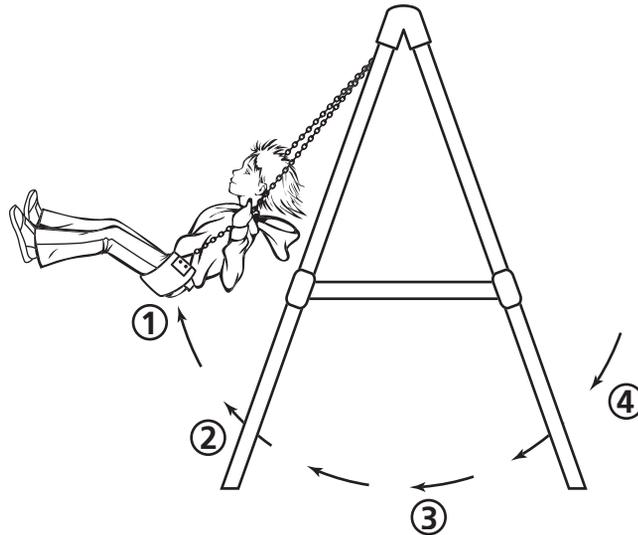
- F** heat
- G** chemical
- H** elastic
- J** gravitational

23 Designers of building materials need to test the strength and flexibility of a new material. They will stack cement blocks on top of the material to see how much force the material can withstand until it bends. Which tool will best test the strength of the material?

- A microscope
- B stopwatch
- C thermometer
- D spring scale

Reporting Category: **PHYSICAL SCIENCE: Energy, Forces in Nature**
Performance Indicator: **0607.10.2 Interpret the relationship between potential and kinetic energy.**

24 A diagram of a student on a playground swing is shown below.



At which point is the kinetic energy the greatest?

- F** 1
- G** 2
- H** 3
- J** 4

Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.10.3 Recognize that energy can be transformed from one type to another.

25 An automobile engine converts the chemical energy in gasoline mostly into heat and

- A** nuclear energy.
- B** light energy.
- C** electromagnetic energy.
- D** mechanical energy.

Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.INQ.2 Select tools and procedures needed to conduct a moderately complex experiment.

26 A student heats different volumes of water in glass beakers and times how long it takes for the water temperatures to return to room temperature. Which tool should be used to measure the volume of the water?

- F** graduated cylinder
- G** meter stick
- H** stopwatch
- J** thermometer

Go On ►

Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.10.4 Explain the Law of Conservation of Energy using data from a variety of energy transformations.

27 A gasoline engine only converts about 15% of the chemical energy of gasoline into mechanical energy. What other energy transformation is taking place in the gasoline?

- A** chemical to thermal
- B** nuclear to chemical
- C** electrical to thermal
- D** mechanical to nuclear

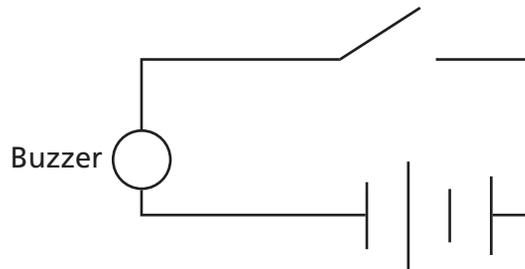
Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.INQ.1 Design a simple experimental procedure with an identified control and appropriate variables.

28 A student wants to determine if different colored boxes produce the same temperature as a white box. The student places white, blue, and red boxes of the same size in the sunlight. A thermometer is placed inside each box. The student observes and records the temperatures in the boxes throughout the day. Which is the dependent variable in this investigation?

- F** size of the boxes
- G** repeated trials
- H** color of the boxes
- J** recorded temperatures

29 A diagram of an electric circuit is shown below.

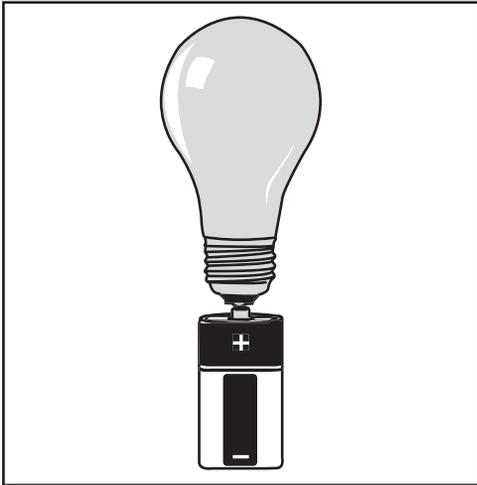


When the circuit above is complete, which energy transformation will occur?

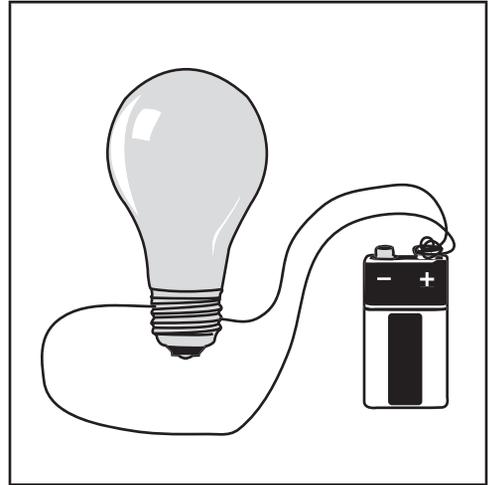
- A** light to heat
- B** electrical to sound
- C** light to sound
- D** electrical to light

30 Which diagram shows a simple circuit that will cause the light bulb to glow?

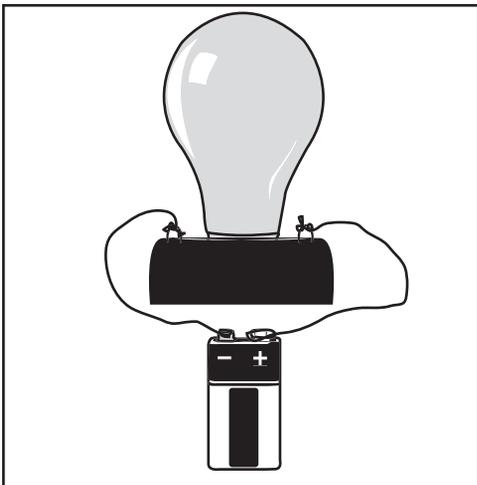
F



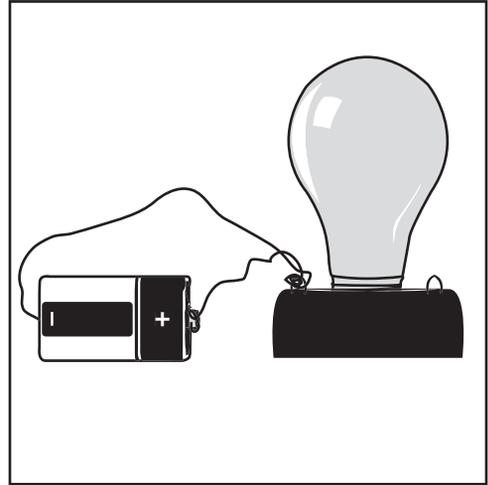
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G



J



Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.TE.4 Differentiate between adaptive and assistive engineered products.

31 Which is the best example of adaptive biotechnology?

- A** cookware made of cast iron
- B** treating a headache with aspirin
- C** measuring volume in a beaker
- D** doorbells that flash a light when activated

Reporting Category: PHYSICAL SCIENCE: Energy, Forces in Nature

Performance Indicator: 0607.12.2 Identify materials that can conduct electricity.

32 Which material would best conduct electricity?

- F** copper
- G** plastic
- H** diamond
- J** wood

STOP 

Science Answer Key

1	B
2	H
3	A
4	H
5	C
6	F
7	B
8	H

9	C
10	H
11	B
12	F
13	A
14	J
15	C
16	G

17	B
18	H
19	D
20	G
21	C
22	J
23	D
24	H

25	D
26	F
27	A
28	J
29	B
30	G
31	D
32	F



Tennessee Comprehensive Assessment Program

Achievement Test ~ Grade 6

Item Sampler