

Questions 1 through 30 are science questions. Read each question carefully. Choose the best answer and then go on to the next question. Do not skip any questions.

1. Electrical energy is transformed in many ways. Which of the following transforms chemical energy into electrical energy? □□

- A. battery □□ B. microphone □□ C. radio □□ D. wind

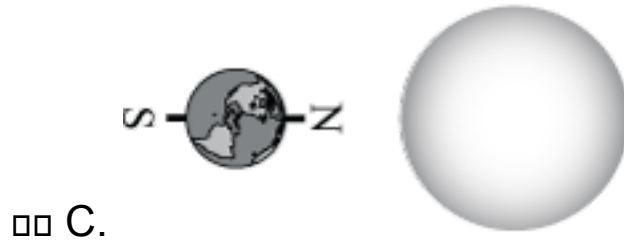
2. Which revolution takes about 1 year to complete?

- A. one revolution of the Sun around the Milky Way
B. one revolution of the Moon around Earth
C. one revolution of Earth around the Sun
D. one revolution of Earth around the Moon

3. The picture below shows a relationship between Earth and the Sun.

Which picture shows the position of Earth and the Sun when it is summer in the Northern Hemisphere? □□





4. Michael and Molly are putting together an electric motor for a science fair project. They will need a material that conducts electricity for the circuits and a material that does not conduct electricity for the insulators.□□

4. Which of the following materials would be the best conductor for their circuits?□□

- A. wooden sticks□□ B. cotton strings□□
C. glass rods□□ D. copper wires□

5. Which material would make a good insulator for their circuits because it does not conduct electricity?

- A. plastic□□ B. gold□□ C. aluminum□□ D. quartz□

6. Justin checked the weather report below from the National Weather Service:

Cloudy; air temperature is 54 °F. Winds SW at 10 mph. Air pressure is 30.3 and falling. Humidity is 56%. Dew point is 40 °F.

6. Based on the weather report, what should Justin expect when he steps outside?

- A. a warm, rainy day
- B. a cold, snowy day
- C. a cool, cloudy day
- D. a warm, sunny day

7. Justin checked the weather report below from the National Weather Service:

Cloudy; air temperature is 54 °F. Winds SW at 10 mph. Air pressure is 30.3 and falling. Humidity is 56%. Dew point is 40 °F.

7. The weather report indicated that the air pressure is falling. Next to the report, Justin saw a weather map that showed an area of low pressure behind a large mass of thick clouds, off to his west.

What type of weather should Justin expect this evening?

- A. a hot, dry evening
- B. a stormy, rainy evening
- C. a cool, dry evening
- D. a calm, snowy evening

8. Solar radiation heats Earth's atmosphere. This sets up

convection currents as the heat is transferred through the layers.

Which of the following is produced by the convection currents in the atmosphere?□□

- A. meteor shower□□
- B. cumulus cloud□□
- C. ozone layer□□
- D. jet stream□

9. During the _____ moon, high tides are higher than normal and low tides are lower than normal.

- A. waning
- B. full
- C. waxing
- D. quarter

10. The development of chemical fertilizers has increased the yield of many types of crops. Yet, the application of chemical fertilizer can produce unintended consequences because it washes out of the soil and ends up in lakes and rivers.

What is an unintended consequence that comes from using chemical fertilizers?□□

- A. an increase in algae blooms in lakes and rivers□□
- B. an increase in fish populations in lakes and rivers□□
- C. an increase in the overall quality of the water in lakes and rivers□□
- D. an increase in water insects and crustaceans in lakes and rivers

11. The planet Saturn can be seen at night with the eye alone. The planet Uranus can only be seen with a telescope.

Why can we see Saturn but not Uranus? □□

- A. Saturn is much hotter than Uranus. □□
- B. Saturn is much closer than Uranus. □□
- C. Saturn is much lighter than Uranus.
- D. Saturn is much denser than Uranus.

12. Jonas rode his skateboard from the top of a high ramp to the bottom.

What is the relationship between potential and kinetic energy in this example? □□

- A. Jonas and his skateboard rolled down the ramp, potential energy was transformed into kinetic energy. □□
- B. As Jonas and his skateboard rolled down the ramp, kinetic energy was transformed into potential energy. □□
- C. As Jonas and his skateboard rolled down the ramp, potential and kinetic energy remained unchanged. □□
- D. As Jonas and his skateboard rolled down the ramp, potential and kinetic energy were destroyed. □

13. The Gulf Stream is an ocean current that moves water north along the eastern coast of the United States. One reason oceans have currents is that _____. □□

- A. the Sun's gravity attracts ocean water and produces currents similar to the shape of Earth's orbit □□
- B. rivers dump huge amounts of fresh water into oceans

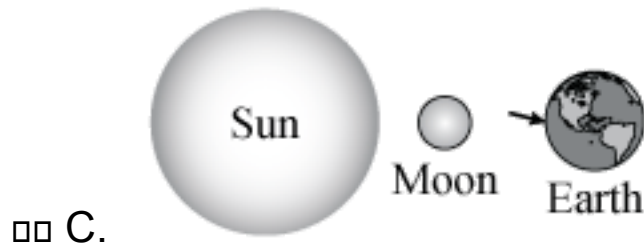
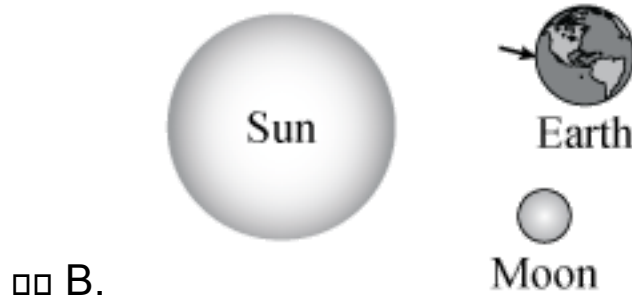
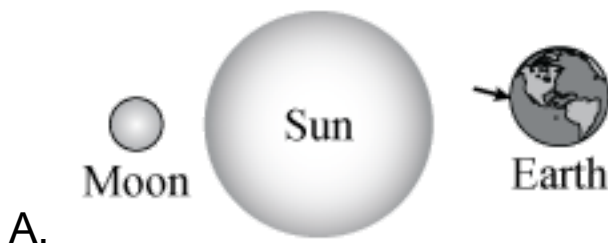
around the world every minute□□

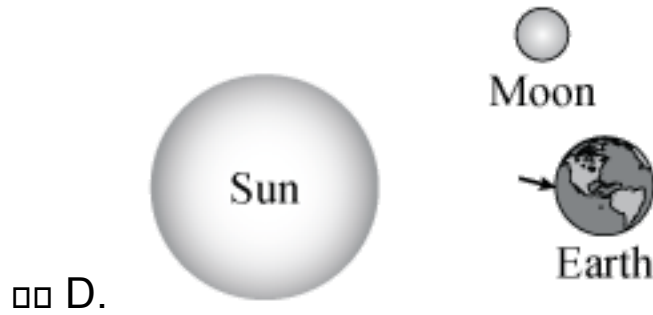
C. warm water rises and cold water sinks causing motion in places where water of different temperatures meet□□

D. ships move huge amounts of water through their propellers as they travel through the oceans□

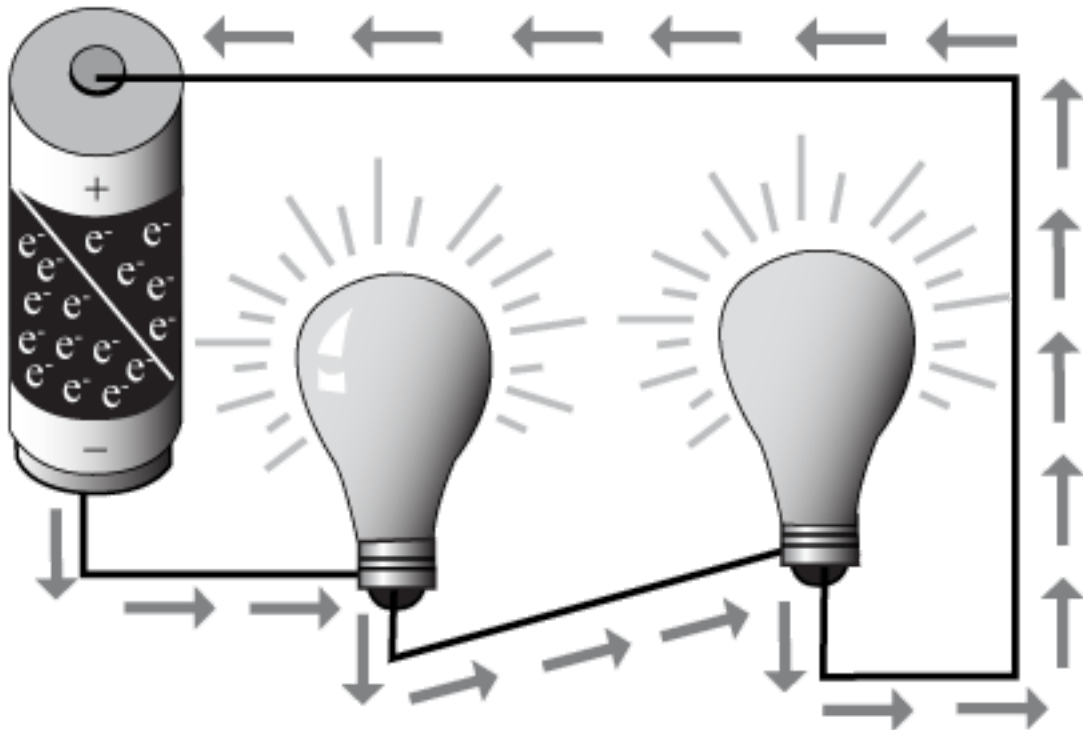
14. In the pictures below, an arrow points to the Pacific Ocean.

Which picture shows the correct position of Earth, Moon, and Sun that would create high-tide conditions in the Pacific Ocean?□□





15. The diagram below shows a simple series circuit that connects a battery and 2 light bulbs.



Which statement is true about this circuit?☐☐

A. Electricity stored in the battery flows out of the positive end of the battery, through the wires and light bulbs, and back to the negative end of the battery.☐☐

- B. Electricity stored in the battery flows out of the negative end of the battery, through the wire and light bulbs, and back to the positive end of the battery.□□
- C. Electricity stored in each of the light bulbs flows from the light bulbs through the wire to the positive and negative ends of the battery.□□
- D. Electricity stored in the battery flows through the wire to the light bulbs and stays in the light bulbs until they burn out.

16. Comets are composed of a mixture of ice, frozen gases, and dust. Comets travel through interplanetary space while they orbit the Sun.

What conclusion about interplanetary space can be drawn from the composition of comets?□□

- A. Temperatures in interplanetary space are very warm.□□
- B. Temperatures in interplanetary space are very cold.□□
- C. Interplanetary space contains abundant water.□
- D. Interplanetary space contains very little dust.

Use the information below to answer questions 17 and 18.

Keisha and Deon built a car for the soap box derby. In building their soap box derby car, they followed the steps in the order below:

First, they decided which car design they wanted to build and found the plans.

Next, they gathered their tools and materials in a safe workspace.

The next step was to cut the material for the base of the car in the correct shape.

After the base was cut, the next step was installing the front and back wheels and attaching a rope to the front wheels that would be used to steer the car.

Next, the upper body of the car was built and carefully attached to the base.

Finally, the soap box car was tested to make sure it worked properly.□□

17. After Keisha and Deon built their soap box derby car, they tested it to see how well it worked on a hill near their home. They had trouble steering the car.

Which should they work on first to improve their car's steering?

- A. They should work on the attachment of the rope to the front wheels.□□
- B. They should work on the arrangement of their workspace and materials.□□
- C. They should work on the shape of the car's upper body.□□
- D. They should work on the shape of the car's base.

18. After making several adjustments to their soap box car, Keisha and Deon decided to test the car again to find out if it is fast enough to win the soap box derby.

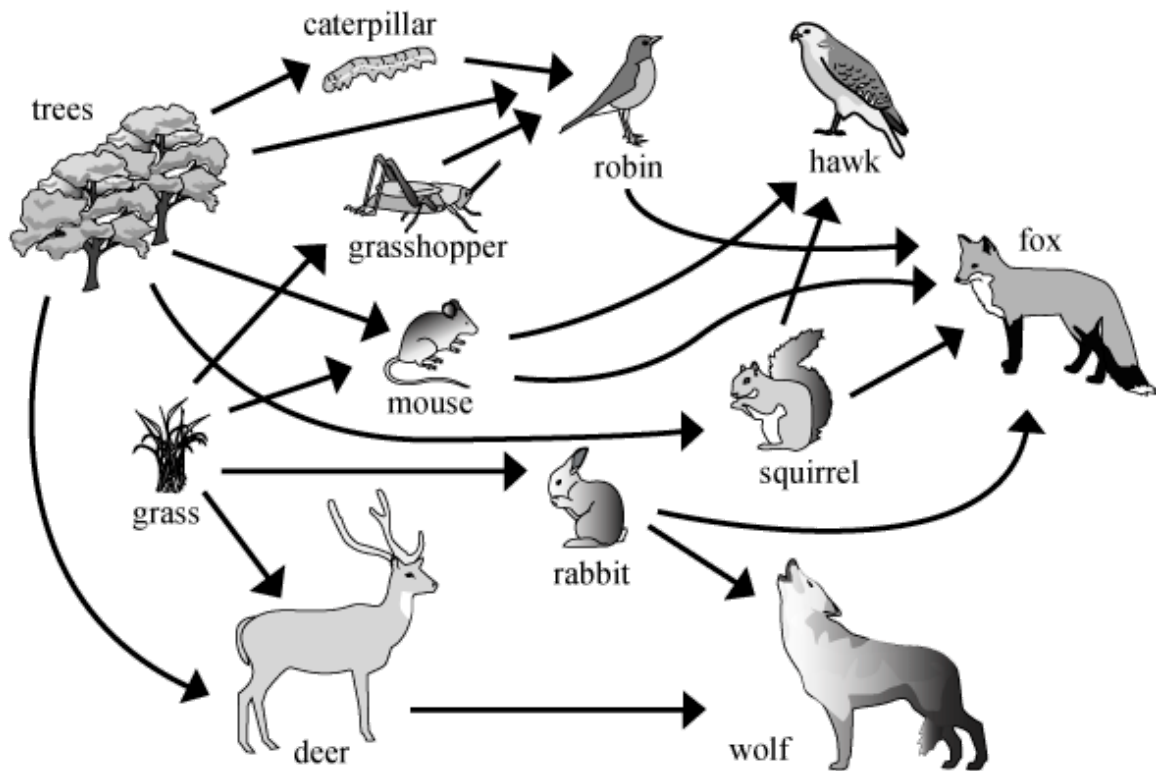
What would be the best way to find out if they could win?□□

- A. Time how long it takes their car to roll down the hill by their home, and compare it to the winning time of the last derby.□□

- B. Time how long it takes their car to complete the racecourse, and compare it to the winning time of the last derby.□□
- C. Ask the last soap box derby winner if their car is a good design.□□
- D. Ask the last soap box derby winner what color they should paint their car.□

Use the information below to answer questions 19 and 20.

The food web shows relationships in a temperate forest ecosystem.



19. In this food web, which producer is eaten by the greatest number of animals?

- A. trees B. grass C. mouse D. caterpillar

20. The extinction of the _____ would reduce the amount of food for some consumers in the ecosystem.

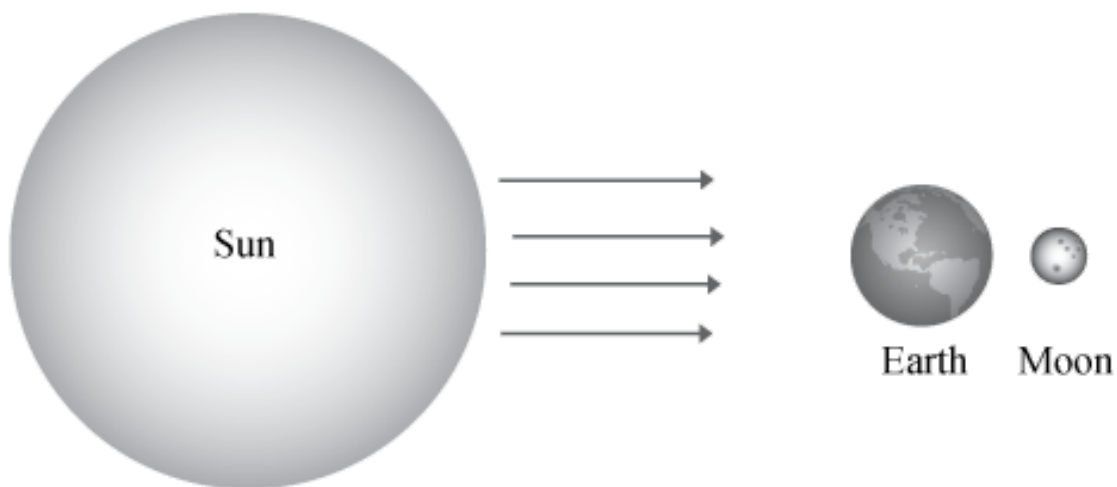
- A. hawk B. fox C. mouse D. wolf

21. The Sun and Moon appear to be disks of the same size when viewed from Earth, but the Sun is many times larger than the Moon.

Why do the Sun and Moon appear to be the same size?

- A. The Moon is much cooler than the Sun.
B. The Sun is much brighter than the Moon.
C. The Sun is much closer to Earth than the Moon.
D. The Moon is much closer to Earth than the Sun.

22. Look at the picture.

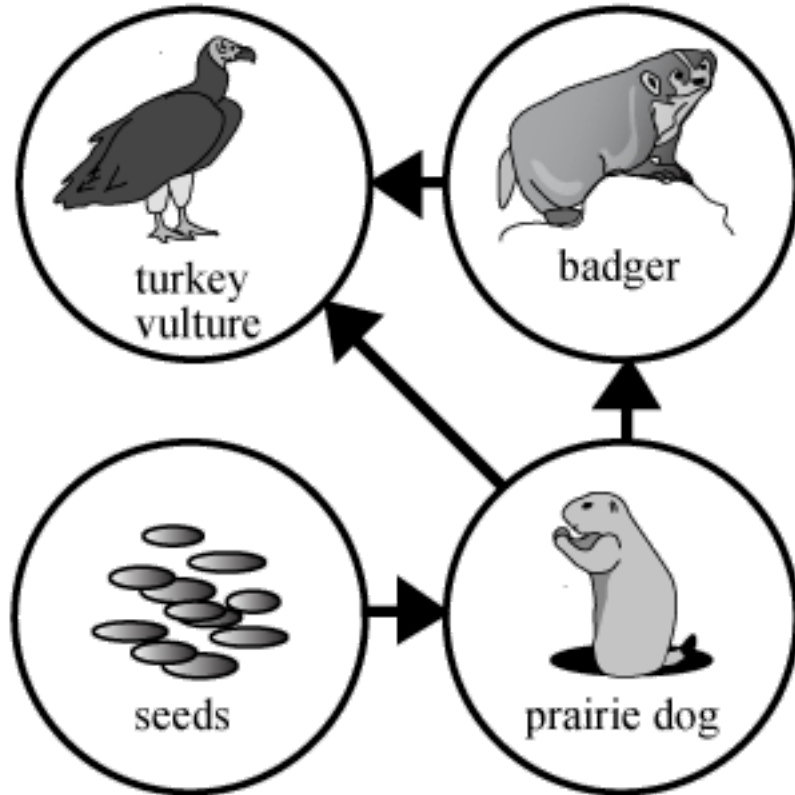


What occurs when Earth is in a direct line between the Sun and the Moon?

- A. crescent moon B. new moon

C. lunar eclipse □ □ D. solar eclipse □

Use the food web below to answer questions 23 and 24.



23. Which set of organisms lists only consumers? □ □

- A. turkey vultures, badgers, seeds □ □
- B. turkey vultures, badgers, prairie dogs □ □
- C. seeds, prairie dogs, turkey vultures □ □
- D. seeds, prairie dogs, badgers □

24. Which statement describes the flow of energy through this food web? □ □

- A. Badgers and turkey vultures provide energy for prairie dogs who provide energy for seeds. □ □
- B. Prairie dogs provide energy for badgers and turkey vultures who provide energy for seeds. □ □

- C. Seeds provide energy for badgers and turkey vultures who provide energy for prairie dogs.□□
- D. Seeds provide energy for prairie dogs who provide energy for badgers and turkey vultures.

25. A desert is very hot during the day and receives very little rain.

Which plants will most likely survive in this kind of environment?□□

- A. plants with few roots□□
- B. plants with soft stems□□
- C. plants with large leaves□□
- D. plants with waxy coatings

26. How does electricity change when a television is switched on?

- A. Electrical energy changes into stored energy.
- B. Electrical energy changes into moving energy.
- C. Electrical energy changes into sound and light.
- D. Electrical energy changes into light and water.

27. How is the energy in sunlight changed through the process of photosynthesis?

- A. Electrical energy is changed into light energy.
- B. Chemical energy is changed into light energy.
- C. Light energy is changed into electrical energy.

D. Light energy is changed into chemical energy.

28. Why does hurricane season happen from May to November in the Northern Hemisphere?

A. Increased solar radiation in the Northern Hemisphere during these months produces extra carbon dioxide that cools the atmosphere and promotes the formation of hurricanes.

B. Increased solar radiation in the Northern Hemisphere during these months produces convection currents in the atmosphere that promote the formation of hurricanes.

C. Increased solar radiation in the Northern Hemisphere during these months produces extra water that enters the atmosphere and promotes the formation of hurricanes.

D. Increased solar radiation in the Northern Hemisphere during these months produces precipitation in the atmosphere that promotes the formation of hurricanes.

Use the information below to answer questions 29 and 30.

Elena and Robert wanted to find out the best way to produce an electric current from a lemon.

They attached each diode of a 1 amp LED light to wires with alligator clips. They inserted a copper penny into one end of a lemon and a zinc nail into the other end of the lemon. They attached the penny and the nail to the wires and the LED light with alligator clips. After a few

minutes, they checked to make sure that the light was glowing.

After making sure the circuit and bulb worked properly, Elena and Robert tried nails made of different metals instead of the zinc nail. They tried a steel nail, an aluminum nail, and an iron nail.

29. Elena and Robert began their investigation by checking their circuit to make sure that it worked. This was a type of control for the experiment.

What kind of nail was used as the control in the experiment?

A. zinc nail B. steel nail C. aluminum nail D. iron

30. Which tool would be most helpful to Robert and Elena when they repeat their experiment with other materials?

- A. claw hammer
- B. digital thermometer
- C. voltage meter
- D. gram scale