7th Grade Science Blizzard Bag

Complete the 3 take home tests. Fill in the bubble for the correct corresponding answer.

Student Name:_____

Science Teacher Name:_____

Day 1 Earth Science and Scientific Method

1. Winds generally flow away from the equator and towards the poles. What transfer does this flow of wind cause?

○ **A.** an energy transfer, with heat energy moving away from the equator

○ **B.** an energy transfer, with heat energy moving toward the equator

○ **C.** a water transfer, with water moving from the ocean to the atmosphere

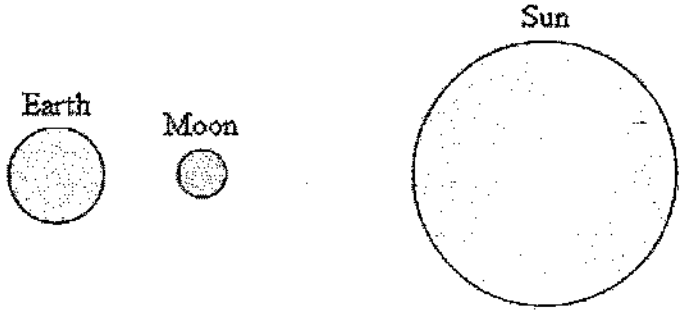
○ **D.** a water transfer, with water moving from the atmosphere to the ocean

2. Many events that occur on Earth and in the solar system are related to the fact that most objects in the solar system move in regular and predictable patterns.

What causes objects in the solar system to move in these regular and predictable patterns?

○ **A.** nuclear forces
○ **B.** frictional forces
○ **C.** gravitational forces
○ **D.** electrical forces

3. What type of eclipse occurs when the Earth, Moon, and Sun are lined up in the order shown below?



○ **A.** Planetary eclipse
○ **B.** Lunar eclipse
○ **C.** Martian eclipse
○ **D.** Solar eclipse

4. Which of the following describes all of the types of water found in the hydrosphere?

○ **A.** all frozen water on the Earth

○ **B.** all of the water found on the surface of the continents

○ **C.** all of the water on the Earth

○ **D.** all of the fresh water on the Earth

5. Jill has found evidence that suggests that individual volcanoes produce igneous rocks with a certain chemical signature. She predicts that scientists could use an igneous rock's chemical signature to determine where the rock came from. What type of investigation should Jill perform to test her prediction?

○ **A.** model the formation of an igneous rock

○ **B.** collect and test rock specimens

○ **C.** perform a controlled experiment on a volcano

○ **D.** observe and describe a volcanic eruption

6. The location of ozone in the atmosphere determines whether it is "good" or "bad." Which of the following statements about ozone is true?

○ **A.** Ozone in both the troposphere and the stratosphere is bad.

○ **B.** Ozone in both the troposphere and the stratosphere is good.

○ **C.** Ozone in the troposphere is harmful, and ozone in the stratosphere is beneficial.

○ **D.** Ozone in the stratosphere is harmful, and ozone in the troposphere is beneficial.

7. Which of the following is a necessary trait of a good hypothesis?

○ **A.** It is clear and testable.

○ **B.** It includes a reference to the theory from which the hypothesis was derived.

○ **C.** It includes a statement about the type of research to be used in testing the hypothesis.

○ **D.** It is written in the form of a question.

8. Sam lives in the city of Springdale and is interested in how the climate in his city compares to the climate in Ecuador. Which of the following is a testable question that could help him make this comparison?

○ **A.** Are thunderstorms in Ecuador as scary as thunderstorms in Springdale?

○ **B.** Do high pressure systems prefer forming in Ecuador compared to in Springdale?

○ **C.** Are average yearly temperatures in Ecuador greater than in Springdale?

○ **D.** Is the climate in Ecuador better than the climate in Springdale?

9. Currents caused by differences in water density are most often the result of

○ **A.** differences in temperature and salinity.
○ **B.** uniform temperature and salinity.
○ **C.** differences in salinity and wind.
○ **D.** uniform salinity and wind.

10. The soil around Jack's house is very sandy. Whenever it rains, the ground dries out quickly.

While spending the summer at his grandmother's house, Jack notices that the ground stays wet for a long time after it rains. Jack digs in his grandmother's yard in several places and finds that the soil has a lot of clay in it. He wonders if the observed differences in soil between his house and his grandmother's house cause the moisture differences.

To investigate this problem, which of the following questions should Jack ask?

○ **A.** Will a sample of sandy soil from Jack's house mix well with a sample of clay-rich soil from his grandmother's house?

○ **B.** Is there any organic matter in either of the two soils?

○ **C.** Will a sample of water flow through a volume of sandy soil faster than through an equal volume of clay-rich soil?

○ **D.** Why are the particles found in the two soils different?

11. Solar energy from the Sun's rays is absorbed by the Earth's land and water surfaces. This absorbed energy is then radiated back to the atmosphere as infrared radiation. Most of the radiation cannot be transmitted and is absorbed by the atmosphere. This absorption adds heat to the atmosphere and helps keep the Earth warm enough to support life.

The process described above is known as

- **A.** the heating blanket effect.
- **B.** the hot air effect.
- **C.** the greenhouse effect.
- **D.** the solar energy effect.

12. The atmosphere will likely contain more carbon dioxide and less oxygen in the future

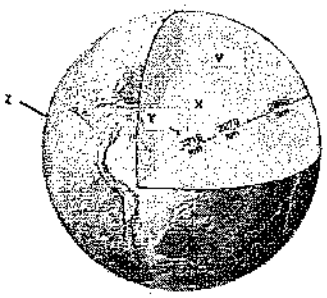
- **A.** if the rate of deforestation continues to increase.
- **B.** if more people ride bicycles instead of driving gasoline powered cars.
- **C.** if all coal burning power plants are replaced by wind turbines.
- **D.** if we set aside more land for forest preserves.

13. The atmosphere is heated both by the Sun and by the Earth's surface. Water radiates heat differently than land, so the air temperature over the ocean is usually different than the air temperature over land.

The difference in air temperature over land compared to over water causes convection currents in the atmosphere. How would a person at the beach experience these convection currents?

- **A.** They would feel the heat of the Sun.
- **B.** They would feel that the sand is hot.
- **C.** They would feel wind as the air moves.
- **D.** They would feel that the water is cold.

14. Which of the following letters on the diagram below indicates a portion of the hydrosphere?



- **A.** X
- **B.** Y
- **C.** Z
- **D.** V

15. Over the past 60 years, the level of carbon dioxide in the atmosphere has been continually increasing. Many scientists hypothesize that this increase has led to an imbalance in the carbon cycle and a climatic trend known as global warming.

In which of the following ways could humans help the carbon cycle return to normal?

- **A.** reduce the amount of fossil fuels they combust
- **B.** cut down trees and other large plants that depend on carbon dioxide
- **C.** pump nitrogen and oxygen into the air to help rebalance the atmosphere
- **D.** cap volcanoes so that they do not release more carbon dioxide

16. Water can move from the hydrosphere to the _____ through the process of evaporation.

- **A.** atmosphere
- **B.** lithosphere
- **C.** biosphere
- **D.** cryosphere

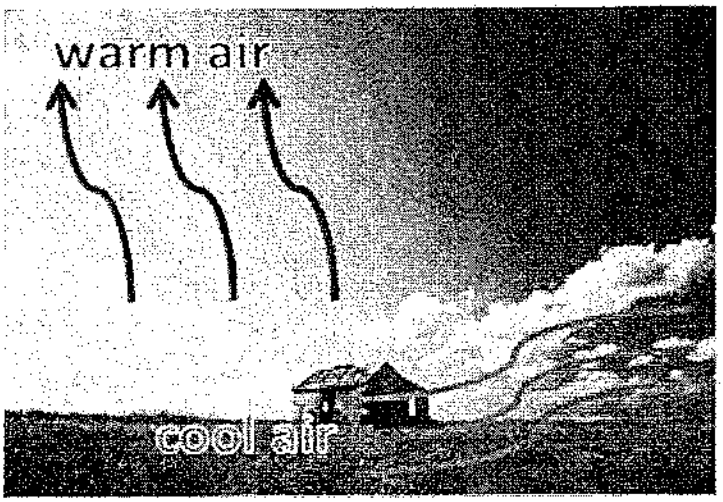
17. Which of the following cycles tracks the movement of water in the hydrosphere?

- **A.** the hydrologic cycle
- **B.** the nitrogen cycle
- **C.** the hydrogen cycle
- **D.** the rock cycle

18. What event happens about once every month?

- **A.** a rotation of the Earth
- **B.** a lunar eclipse
- **C.** a full Moon
- **D.** a revolution of the Earth around the Sun

19. Sunlight heats the ground, and the ground warms the nearby air. The warm air expands and rises, while cool air rushes in to take its place.



The example above describes the process that generates many surface winds. Surface winds are an example of _____ in the Earth's atmosphere.

- **A.** radiation
- **B.** condensation
- **C.** convection
- **D.** conduction

20. Which of the following statements about the Moon is true?

- **A.** The Moon is the Earth's largest natural satellite.
- **B.** The Moon is the Sun's largest natural satellite.
- **C.** The Moon orbits the Sun once every 29.5 days.
- **D.** The Sun and the Moon orbit the Earth at the same rate.

Day 2 Lab Tools and Safety and Life Science

1. How do the nutrients in soil become building materials for a plant to grow?

○ **A.** The plant absorbs the nutrients into its cells and connects them together.

○ **B.** The plant puts the nutrients on the leaf edges to make them bigger.

○ **C.** The plant only uses nutrients to grow flowers.

○ **D.** The plant only keeps nutrients in its roots system.

2.

Taiga Biome Features

Animals	bears, foxes, raccoons, birds, insects
Plants	pine trees, fir trees, spruce trees, mosses
Average Annual Rainfall	200 to 750 mm
Average Annual Temperature Range	-58°F to 86°F
Geographic Features	mountains, lakes

The table above lists many features of an ecosystem in the taiga biome. Based on this table, what are the abiotic features of the taiga?

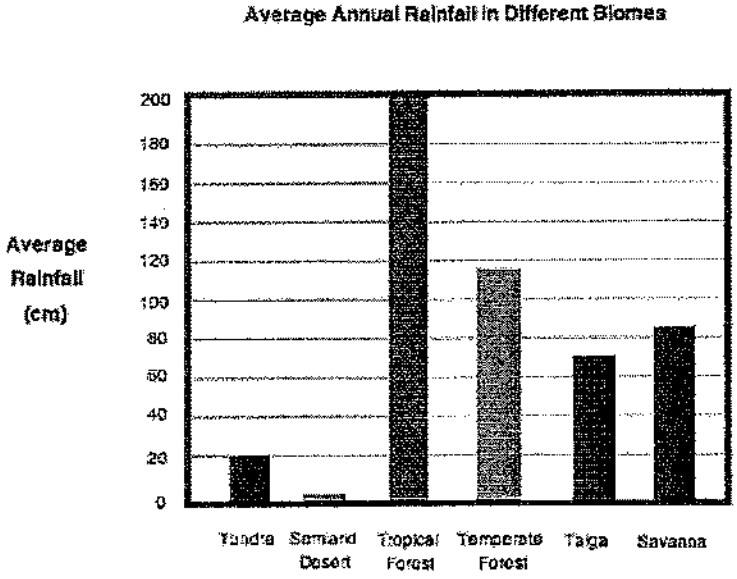
○ **A.** wide range of temperature, very little annual rainfall, foxes, bears, raccoons, birds, insects

○ **B.** mountains, lakes, spruce trees, fir trees, pine trees, mosses

○ **C.** bears, foxes, raccoons, birds, insects, pine trees, fir trees, spruce trees, mosses

○ **D.** mountains, lakes, wide range of temperature, very little annual rainfall

3. The graph below shows the average amount of rainfall of several types of biomes.

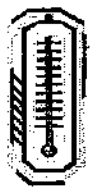


A certain type of plant cannot survive in very wet areas.

Which of the following biomes would best support this type of plant?

- **A.** semiarid desert
- **B.** taiga
- **C.** tropical forest
- **D.** temperate forest

4.



What type of instrument is pictured above?

- **A.** probe
- **B.** thermometer
- **C.** graduated cylinder
- **D.** stirring rod

5. Seals are successful in ecosystem X. Alligators are successful in ecosystem Y. Which of the following is probably a physical difference between ecosystem X and ecosystem Y?

○ **A.** Ecosystem X has better soil than ecosystem Y.

○ **B.** Ecosystem X is on land and ecosystem Y is in water.

○ **C.** Ecosystem X is cooler than ecosystem Y.

○ **D.** Ecosystem X has fish and ecosystem Y does not.

6. _____ should be worn to prevent spilling potentially harmful or staining chemicals on clothing and the skin beneath the clothing.

○ **A.** Gloves
○ **B.** A laboratory apron
○ **C.** Safety goggles
○ **D.** A fire blanket

7. Which of the following best describes an ecosystem?

○ **A.** several different species of organisms living together
○ **B.** a living community and all the nonliving factors that affect it
○ **C.** plants and animals living together at the same place and time
○ **D.** the nonliving factors that support various populations

8. Photosynthesis and cellular respiration are related processes in living things. What is true about these processes?

○ **A.** Animals perform only photosynthesis.
○ **B.** Plants perform only photosynthesis.
○ **C.** Animals perform both photosynthesis and cellular respiration.
○ **D.** Plants perform both photosynthesis and cellular respiration.

9. Which of the following statements is true?

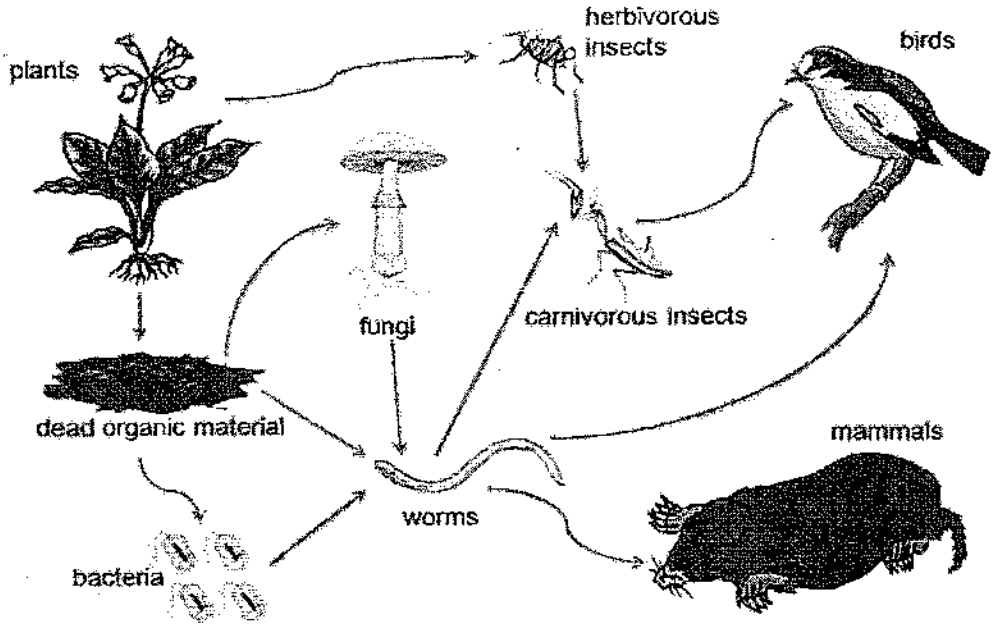
○ **A.** Species diversity tends to remain constant during ecological succession.

○ **B.** Species diversity tends to increase as a result of ecological succession.

○ **C.** Species diversity is not affected by ecological succession.

○ **D.** Species diversity tends to decrease as a result of ecological succession.

10. The diagram below shows the flow of organic matter through an ecosystem.



A special molecule known as beta-keratin makes up the feathers of birds. Where do the birds in the above food web get the matter needed to make beta-keratin?

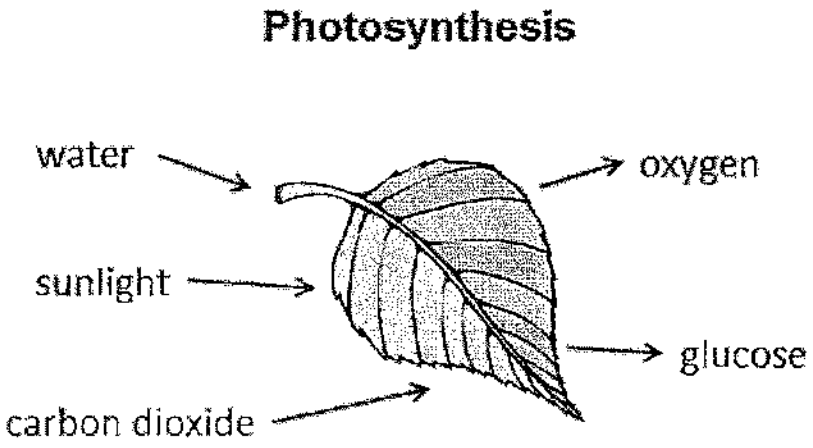
○ **A.** directly from bacteria

○ **B.** directly from the Sun's energy

○ **C.** from the insects and worms they eat

○ **D.** from their parents

11. The model below presents the relationship of the reactants and products involved in photosynthesis.



If all other factors stayed the same, which of the following would likely decrease the rate of photosynthesis?

- **A.** an increase in the amount of carbon dioxide
- **B.** a decrease in the amount of carbon dioxide
- **C.** an increase in the amount of oxygen
- **D.** a decrease in the amount of oxygen

12. The amount of matter in the Earth system remains constant over time. The forms and locations of the matter stored within the system, however, change continually as it cycles through the Earth.

Matter can be transferred between which of the following elements of the Earth system?

- **A.** from the physical environment to living organisms
- **B.** from one living organism to another living organism
- **C.** from living organisms to the physical environment
- **D.** all of these

13. Through the process of photosynthesis, plants make their own food using energy from the Sun, carbon dioxide from the air, and water from the ground. This food can then be stored for later use, or energy from the food can be released by the plant through the process of cellular respiration. This energy is then used to perform other life processes.

What is another common use of the food produced by plants?

- **A.** The food is vaporized to help fuel the Sun.
- **B.** The food is excreted as waste and is no longer useful.
- **C.** The food is converted entirely into heat energy.
- **D.** The food is used by an animal when it consumes the plant.

14. The main reason that cells carry out cellular respiration is to _____.

- **A.** eliminate wastes
- **B.** breathe
- **C.** release energy
- **D.** get glucose

15. Food molecules contain biochemical energy which is made available by

- **A.** cellular circulation.
- **B.** cellular respiration.
- **C.** cellular movement.
- **D.** cellular transpiration.

16. Within any ecosystem, there is a fixed amount of energy available for organisms to use. Since organisms usually produce more offspring than a given ecosystem can support, this causes _____.

- **A.** genetic drift
- **B.** competition
- **C.** parasites
- **D.** bottlenecking

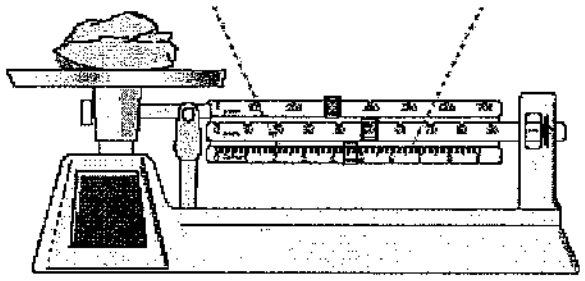
17. Jodie is studying the sleeping habits of various types of animals. She wants to know how long each type of animal sleeps during the day.

Jodie puts each of the animals in a cage with food, water, and light. However, she cannot stay to watch the animals all day.

Which of the following tools would be most helpful to Jodie's experiment?

- ○ **A.** a video camera
- ○ **B.** a metric ruler
- ○ **C.** a tape recorder
- ○ **D.** a triple beam balance

18. The picture below shows a laboratory tool being used to measure a physical property of a solid.



What property is the lab tool being used to measure?

- ○ **A.** length
- ○ **B.** mass
- ○ **C.** viscosity
- ○ **D.** temperature

19. How are changes in populations related to the availability of an ecosystem's resources?

- ○ **A.** Changes in population are independent of the availability of an ecosystem's resources.
- ○ **B.** Population sizes are limited by the amount of resources that are available.
- ○ **C.** As populations grow, ecosystems produce more resources in order to support the larger population.
- ○ **D.** Large populations need the same amount of resources as small populations.

20. Farmers sometimes use slash and burn farming techniques, which consist of cutting down and burning forests to make enough room to grow crops. There are several problems with this, including that the farmland created by this method is only good for a short time.

How does slash and burn farming affect the environment?

○ **A.** It ruins the area for future farming, removes oxygen-producing trees, and creates harmful gases from the fires needed to burn the area.

○ **B.** It creates areas that allow farmers to grow crops for a long time and does not affect the vegetation in the area.

○ **C.** It helps the environment by creating more oxygen and by increasing the amount of vegetation in the burned area.

○ **D.** It has no effect on the environment.

Day 3 Physical Science and Data Analysis

1. Which of the following is true about mixtures and compounds?

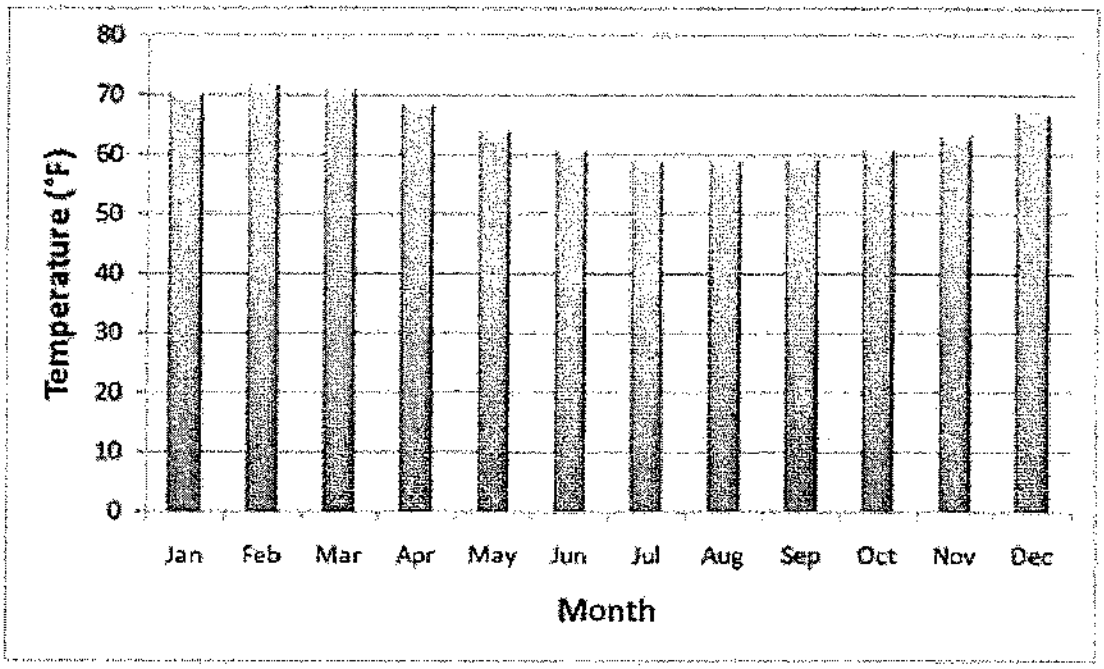
○ **A.** Mixtures and compounds are both made of two or more different substances.

○ **B.** A compound forms when different substances chemically combine to form a new substance.

○ **C.** A mixture contains different substances that are not chemically combined with one another.

○ **D.** all of these

2. The average monthly temperatures in Lima, Peru are graphed below.



Which of the following conclusions could be made from this data?

○ **A.** It tends to be warmer in February than in August.

○ **B.** It tends to be warmer in July than in December.

○ **C.** It tends to rain more in July than in December.

○ **D.** It tends to rain more in February than in August.

3. Which type of energy transformation takes place in a light bulb?

○ **A.** Electrical energy is transformed into light energy.

○ **B.** Heat energy is transformed into electrical energy.

○ **C.** Electrical energy is transformed into chemical energy.

○ **D.** Light energy is transformed into electrical energy.

4. How is most of the energy of an earthquake transported through the Earth's crust?

- **A.** by heat transfer
- **B.** by light waves
- **C.** by radiation
- **D.** by seismic waves

5. Where does the energy released by an earthquake come from?

- **A.** It comes from strain that builds up in the Earth's crust along fault lines.
- **B.** It comes from the pressure of buildings pushing on the ground.
- **C.** It comes from the transfer of kinetic energy from moving water to the ground.
- **D.** It comes from the energy of sunlight that is absorbed by rocks.

6. Distilled water is about the only completely neutral solution. What is its pH?

- **A.** 7
- **B.** 1
- **C.** 14
- **D.** 0

7. Kelly is sledding on a snowy hill in the winter. The energy the sled has as it slides down the hill is a form of

- **A.** potential energy.
- **B.** mechanical energy.
- **C.** chemical energy.
- **D.** electrical energy.

8. During an earthquake, _____ travels through the Earth's interior as _____ waves.

- **A.** energy; electromagnetic
- **B.** energy; seismic
- **C.** matter; seismic
- **D.** matter; electromagnetic

9. Acid rain has been falling in a forest in Europe for many years.

How can acid rain change the forest?

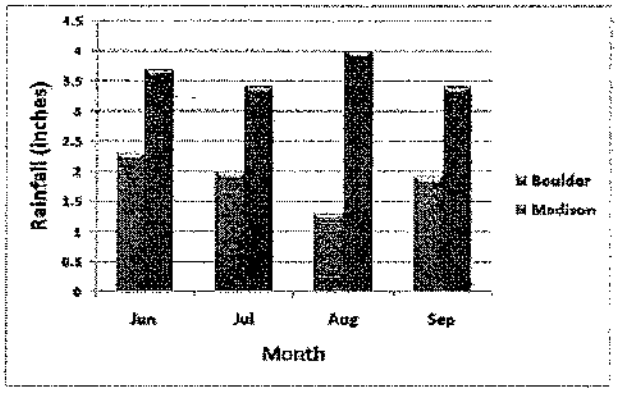
- **A.** The it will always rain.
- **B.** The trees can live longer.
- **C.** There is no sunlight in the forst.
- **D.** Many trees can die.

10. Heat energy is the transfer of _____ energy.

- **A.** electrical
- **B.** chemical
- **C.** mechanical
- **D.** thermal

11. 1. The average monthly rainfall during the summer months in Boulder, Colorado and in Madison, Wisconsin are shown in the graph below.

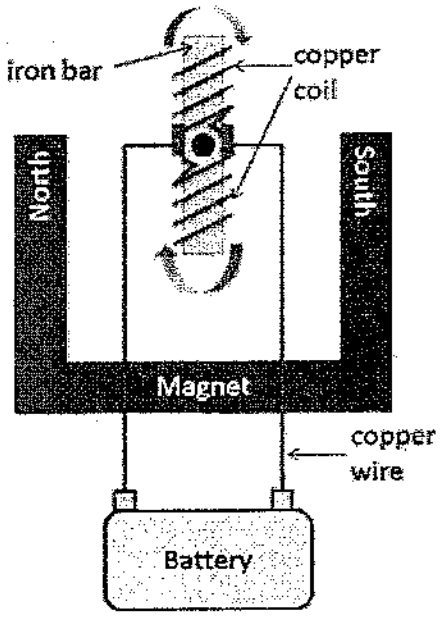
Average Monthly Rainfall



Which of the following conclusions could be made from this data?

- **A.** Madison's summer climate is drier than Boulder's.
- **B.** It is hotter in Madison than in Boulder during the winter.
- **C.** It is hotter in Madison than in Boulder during the summer.
- **D.** Madison's summer climate is wetter than Boulder's.

12. When the motor below is connected to the battery, the iron bar and copper coil spin in a circle.



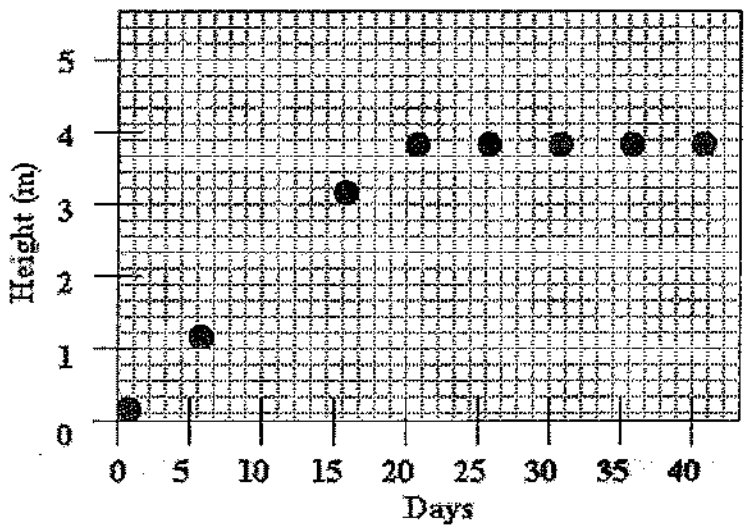
If no energy is lost as heat and no electrical energy remains after it runs through the coil, how much of the electrical energy flowing through the copper wire is transformed into mechanical energy?

- ○ **A.** half of it
- ○ **B.** all of it
- ○ **C.** none of it
- ○ **D.** a tiny fraction of it

13. Why is it important to use proper safety equipment when handling acids?

- ○ **A.** Acids taste sour.
- ○ **B.** Acids contain hydrogen.
- ○ **C.** Acids can burn skin.
- ○ **D.** Acids feel slippery.

14. The graph below shows the growth of a tree with time, but some data are missing. What was the most likely height of the tree in meters (m) at 10 days?



- A. 1 meter
- B. 2 meters
- C. 3 meters
- D. 4 meters

15. Which of the following is the correct definition of electrical energy?

- A. energy of an object due to the random motion of its atoms and molecules
- B. energy resulting from the flow of charged particles, such as electrons or ions
- C. energy stored in chemical bonds of molecules
- D. energy that is transmitted in the form of electromagnetic waves

16. Which of the following can be used to produce electrical energy?

- A. solar cells
- B. batteries
- C. generators
- D. all of these

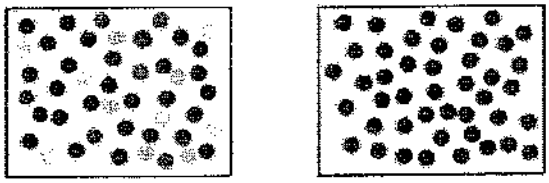
17. The flow of electric charges through a material describes an electric _____.

- A. resistance
- B. voltage
- C. inductance
- D. current

18. Which of the following statements is true?

- A. Solar power, wind power, and burning coal are all sources of electricity.
- B. Burning coal is the only source of electricity used today.
- C. Solar power is used to create only electricity for heating homes.
- D. Solar power and wind power have nothing to do with electricity.

19.



Look at the picture of two different substances above. Which substance is a mixture?

- A. Y and Z
- B. Z
- C. neither Y nor Z
- D. Y

20. The air we breathe contains different individual gases (mostly nitrogen and oxygen). Which of the following correctly describes the air we breathe?

- A. mixture
- B. element
- C. compound
- D. liquid