

Student Name: _____

MISSISSIPPI

Science Test



**Grade 8
Test Booklet**

Practice Test 1

Mississippi Code 37-16-4 prohibits prior disclosure of the materials contained in this booklet to a student who will be taking this test. Mississippi Code also prohibits any person from releasing, causing to be released, reproducing or causing to be reproduced any secure materials in any form or medium. Violations of the statute may result in invalidation of test scores, suspensions of certificates to teach, and/or prosecution.

**Mississippi Department of Education
Office of Student Assessment**

RIVERSIDE PUBLISHING



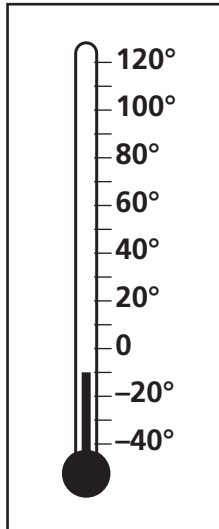
No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording or by any information storage or retrieval system without the prior written permission of The Riverside Publishing Company unless such copying is expressly permitted by federal copyright law. Address inquiries to Permissions, Riverside Publishing, 3800 Golf Rd., Suite 200, Rolling Meadows, IL 60008-4015.

Science

THIS PAGE WAS INTENTIONALLY
LEFT BLANK

Sample Items

1. Look at the following thermometer. The thermometer measures temperature in degrees Celsius ($^{\circ}\text{C}$).



What is the temperature shown on the thermometer?

- A. 10°C
- B. 0°C
- C. -5°C
- D. -10°C

2. What type of tissue is attached to the skeletal system and helps bones move?

- F. Muscle tissue
- G. Cardiac tissue
- H. Adipose tissue
- J. Epithelial tissue



Mark your answers for questions 1–60 on your answer document. Mark only one answer for each question. You may write in your test booklet, but you must mark your answers on your answer document.

1. Which of these describes two cell structures with similar functions?

- A. A chloroplast and a vacuole are alike because both store energy.
- B. A chloroplast and a mitochondrion are alike because both make energy from sugar.
- C. A cell wall and a cytoskeleton are alike because both provide rigidity and support for the cell.
- D. A cell wall and a cell membrane are alike because both surround the cell and provide the cell with protection.

2. Which of these describes a divergent boundary?

- F. Two continental plates moving away from each other, forming a rift valley
- G. Two oceanic plates rubbing against each other, forming a midocean ridge
- H. Two continental plates colliding, forming a mountain range
- J. Two oceanic plates colliding, forming a volcanic arc

3. Certain disorders, such as sickle cell anemia, are linked to specific genes. Some scientists would like to use gene therapy to cure such disorders. Gene therapy involves replacing the nonworking cells with cells that have been genetically altered.

Which of these is a logical argument against gene therapy?

- A. Changing one gene may negatively affect other genes.
- B. Changing one gene may lead to the formation of a new species.
- C. Scientists may not be able to distinguish one gene from another.
- D. Drugs may already exist to cure these diseases, so there is no need for risky therapy.

4. Which of these describes how Earth's orbit around the sun determines the seasons of Earth?

- F. Earth's distance from the sun changes as it orbits the sun.
- G. Earth's axis tilts in a different direction as Earth orbits the sun.
- H. Earth's axis tilts different parts of Earth toward or away from the sun at different points in Earth's orbit.
- J. Earth's orbit around the sun brings different parts of Earth around to face warmer or cooler parts of the sun.

5. Which of these would happen to the cell if cellular respiration stopped?

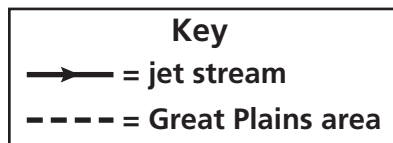
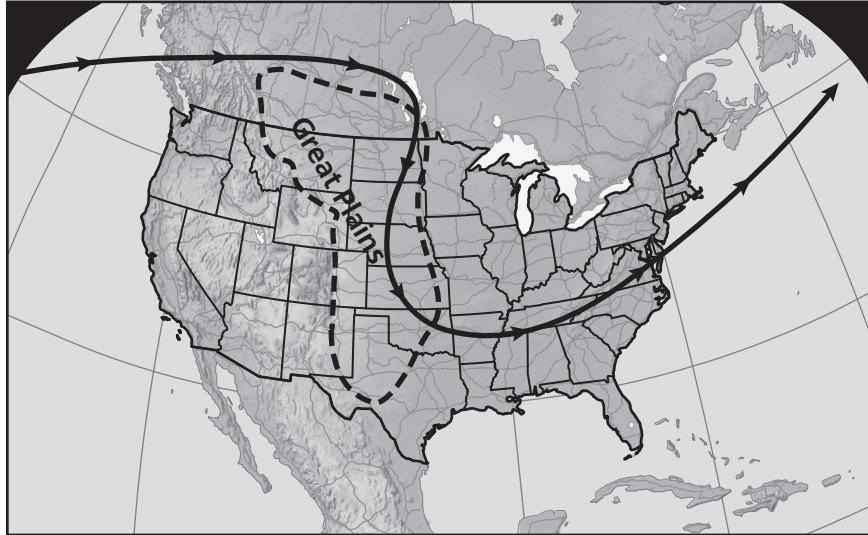
- A. It would not have the energy it needs to perform its functions.
- B. It would grow larger because it would not be able to dispose of wastes.
- C. It would have to access backup energy trapped in the chemical bonds of food.
- D. It would no longer be able to passively transport materials across its cell membrane.

6. Which of these describes the lithosphere and the asthenosphere?

- F. The lithosphere is rigid and immovable, and the asthenosphere is hot and flowing.
- G. The asthenosphere is rigid and immovable, and the lithosphere is hot and flowing.
- H. Both are hot inner layers of earth capable of bending and moving.
- J. Both are hard and rigid layers of earth close to the surface.

7. The following satellite map shows the path of a jet stream above North America.

Satellite Map of Jet Stream



Based only upon the data of this jet stream, which kind of weather is expected in the Great Plains area?

- A. Warm
- B. Cold
- C. Wet
- D. Dry

8. Earthquakes can cause great damage and injury. The solution to this problem is to warn people about possible earthquakes. Scientists place seismographs, which measure the movement of Earth, at many locations around the world. The data from the seismographs are analyzed by scientists, who then warn people of potential earthquake danger.

Which of these summarizes the quality of the design for the solution to this problem?

- F. The solution to the problem is well designed because scientists can now control earthquakes.
- G. The solution to the problem is well designed because earthquakes no longer cause injury or damage.
- H. The design is flawed because forces of Earth are unpredictable and the solution is therefore unreliable at times.
- J. The design is flawed because scientists should prevent earthquakes from occurring, not just warn people of potential danger.

9. When Alfred Wegener first proposed his theory of continental drift, most earth scientists did not immediately accept it. Many expressed skepticism because the theory did not explain what force was strong enough to move continents. Later, scientists investigating continental drift found evidence that explained how continents are able to move. Plate tectonics, which grew from the theory of continental drift, now explains how continents move over time.

How was the initial skepticism of earth scientists useful to the scientific process?

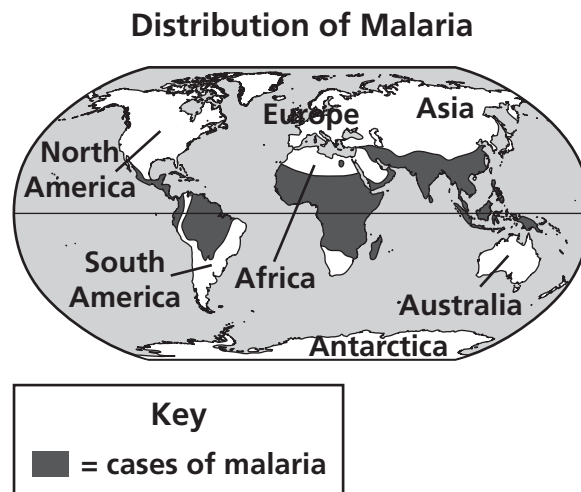
- A. Skeptical comments showed that continental drift was not a correct explanation of Wegener's observations.
- B. The skeptics kept people from forgetting about earlier observations that did not support continental drift.
- C. The scientists who were skeptical kept earth science from changing views too rapidly.
- D. The skeptics raised questions that became the starting point for new investigations.

Directions: Use the information below to answer questions 10 through 12.

The Sickle Cell Mutation and Malaria

Sickle cell anemia is a hereditary disorder caused by a mutation in the shape of red blood cells. Red blood cells are normally disk-shaped. Sickle red blood cells are shaped like a crescent moon, or sickle. The sickle-shaped cells cannot travel easily through the blood vessels of the circulatory system. Therefore, people with sickle cell anemia have problems with oxygen circulation.

Malaria is a disease caused by a parasite. The parasite is transmitted to humans through mosquito bites. Malaria is common in the warm, wet, tropical and subtropical regions shown in the following map.



Doctors found that patients with sickle cell anemia seemed to be immune to malaria. Research found that the sickle cell mutation disabled the effects of the parasite. People with one sickle cell gene did not develop sickle cell anemia and often survived exposure to malaria. People with two sickle cell genes had very high rates of surviving malaria, but these people developed sickle cell anemia.

10. In the early 1900s, scientists concluded that a mutated sickle cell gene was harmful and presented no benefits.

Which of these is a logical justification why this conclusion needs revision?

- F. People can survive having sickle cell anemia but cannot survive malaria.
- G. Having one sickle cell gene is harmless and provides some protection against malaria.
- H. People who have two sickle cell genes are healthy because they have immunity against malaria.
- J. Having sickle cell anemia is not a serious health concern and repels mosquitoes carrying malaria.

12. Some scientists concluded that the sickle cell mutation is beneficial to some people.

Which of these is logical evidence that supports this conclusion?

- F. Mosquitoes carrying the malaria virus cannot injure sickle-shaped cells.
- G. People with two mutated sickle cell genes have immunity against malaria.
- H. Mutated sickle-shaped cells destroy the malaria virus before it can spread to other cells in the body.
- J. People with one mutated sickle cell gene are not affected by sickle cell anemia and have some protection against malaria.

11. The following cross shows two people who are not affected by sickle cell anemia but who carry one mutated gene for the disorder. In this cross, *R* is the gene for a normal red blood cell, while *r* is the sickle cell mutated gene.

	<i>R</i>	<i>r</i>
<i>R</i>	<i>RR</i>	<i>Rr</i>
<i>r</i>	<i>Rr</i>	<i>rr</i>

What is the chance that an offspring from this cross will be affected with sickle cell anemia?

- A. 0%
- B. 25%
- C. 50%
- D. 75%

13. Yolanda learned the following about acids:

- They are made of elements from the periodic table.
- Most contain hydrogen.
- Very reactive elements tend to form stronger bonds.
- In general, the weaker the bond between hydrogen and another element in an acid, the stronger the acid will be.

Yolanda then studied the elements in group 17 of the following periodic table.

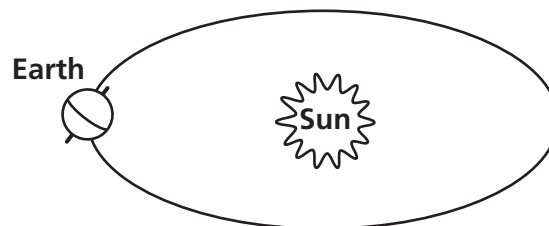
9	F Fluorine 19.00
17	Cl Chlorine 35.45
35	Br Bromine 79.90
53	I Iodine 126.91
85	At Astatine 210.00

Based on what Yolanda learned, which acid formed from an element in group 17 is weakest?

- HF
- HCl
- HBr
- HI

14. The following diagram shows the relative positions of Earth and the sun at a particular time of year.

Relative Positions of Earth and Sun



Which of these describes the length of day and night in the Northern and Southern Hemispheres at this time of year?

- Both hemispheres: Days are longer than nights.
- Both hemispheres: Days are shorter than nights.
- Northern Hemisphere: Days are shorter than nights.
Southern Hemisphere: Days are longer than nights.
- Northern Hemisphere: Days are longer than nights.
Southern Hemisphere: Days are shorter than nights.

15. Flooring material is usually made from hardwood trees or man-made materials. Scientists are researching the use of fast-growing plants to be used as floor covering.

Which of these is a logical justification for continuing research into this type of building material?

- A. Natural products are stronger than man-made products.
- B. Unlike hardwoods, fast-growing plants can be used for many products.
- C. Fibers from fast-growing plants are renewable and can be produced much faster than lumber from trees.
- D. Natural products decompose faster than man-made materials, making them ideal for buildings that will be used for only a few years.

16. Two plates composed of rock of similar density meet along a convergent boundary.

Which statement describes what will happen where the two plates meet?

- F. The plates will rub against each other, causing shearing and creating fault lines in the interior of the plates.
- G. The plates will collide with neither plate subducting, causing the crust to pile up and form a mountain range.
- H. The plates will collide, and the compression will heat the plates, causing some of the plates to melt and form volcanic mountains.
- J. The plates will rub against each other, causing one plate to subduct underneath the other plate and forming a deep trench along the boundary.

17. Which of these describes the outcome of the collision between oceanic and continental crust?

- A. The two portions of crust will stop moving.
- B. The continental crust will subduct beneath the oceanic crust.
- C. The two portions of crust will slide past one another, side by side.
- D. The oceanic crust will subduct beneath the continental crust.

18. Which of these is an example of selective breeding?

- F. Cutting a stem from a plant so that a new plant grows from the stem
- G. Taking a skin cell from a sheep and making an exact clone of the sheep
- H. Replacing DNA of a plant with DNA that allows the plant to grow in little water
- J. Selecting two horses and having them mate in order to produce stronger offspring

19. Which table shows adaptations that allow organisms to survive in a marshy wetland environment?

A.

Organism	Adaptation to Environment
Mammal	Broad tail
	Thick, waterproof coat
Plant	Broad leaves that float
	Roots that reduce salt absorption

C.

Organism	Adaptation to Environment
Mammal	Long ears to release heat from body
	Dig burrows into ground for shelter
Plant	Thick stems that store water
	Narrow leaves and needles

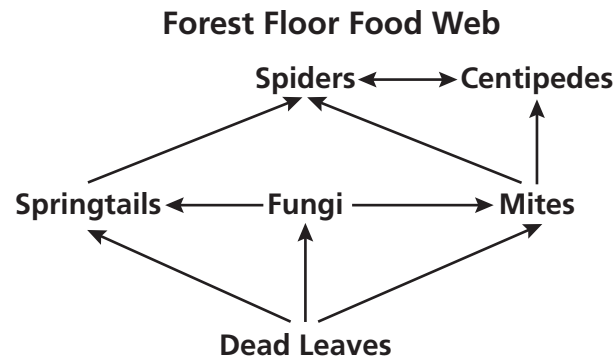
B.

Organism	Adaptation to Environment
Mammal	Broad, flat teeth
	Front paws structured for digging into ground
Plant	Tall, narrow leaves
	Fibrous roots that grow in clumps

D.

Organism	Adaptation to Environment
Mammal	White fur that provides camouflage and reduces amount of heat released back into air
	Insulated layer of fat
Plant	Furry, waxlike leaves
	Dead leaves that stay attached to provide insulation

20. The following diagram shows a food web for a Mississippi forest floor.



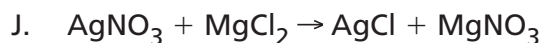
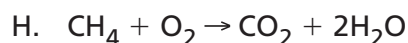
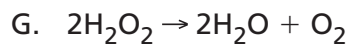
How would the disappearance of dead leaves from the forest floor affect spiders?

- F. Their population would decrease because they would have fewer dead leaves to eat.
- G. Their population would increase because they do not depend directly on dead leaves for energy.
- H. Their population would decrease because they eat animals that depend on dead leaves for energy.
- J. Their population would increase because they could eat more centipedes that do not eat dead leaves either.

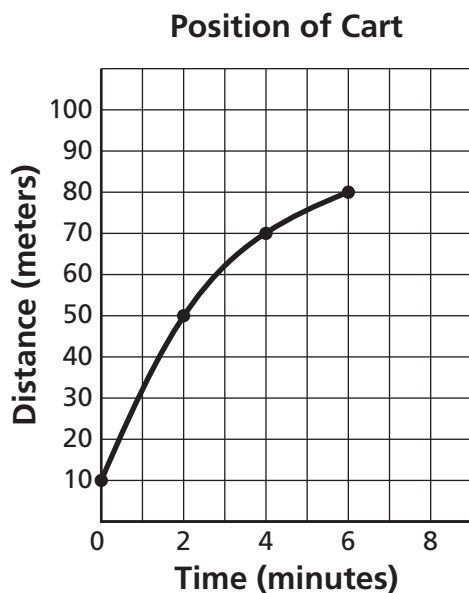
21. Which equation expresses Newton's second law of motion?

- A. $F = ma$
- B. $F = \frac{m}{a}$
- C. $F = m - a$
- D. $F = m + a$

22. Which chemical equation is balanced to show that mass is conserved during the reaction?



23. The following graph shows the position of a cart along a motorized rail.



If the cart continues to move at this rate, what will be its distance after 8 minutes?

- A. 80 meters
- B. 85 meters
- C. 95 meters
- D. 100 meters

24. Schistosomiasis is a disease that occurs when eggs of small flatworms hatch inside the body. The worms can grow in many different tissues.

How could schistosomiasis in the intestines interfere with normal body functions?

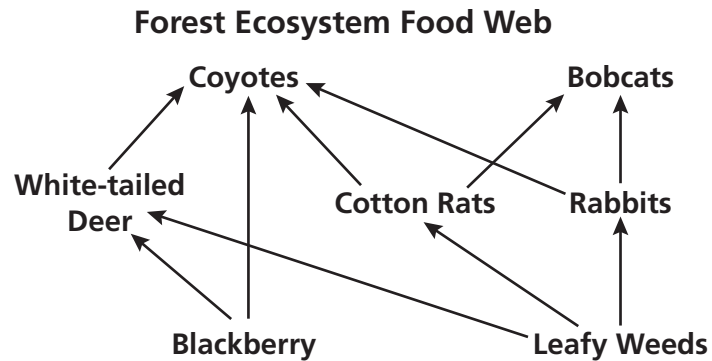
- F. By causing painful rashes and swelling on the skin
- G. By increasing the rate of cell metabolism in the body
- H. By reducing the oxygen movement to cells in the body
- J. By keeping the body from absorbing nutrients from food

25. Infrared light is often used in reptile habitats.

Which of these explains how a reptile benefits from infrared light?

- A. Infrared light destroys bacteria and other microorganisms.
- B. Infrared light increases the body temperature of the animals.
- C. Infrared light makes it possible for reptiles to see their surroundings.
- D. Infrared light makes it possible for humans to see the animals in their natural habitat.

26. The following diagram shows a food web for a Mississippi forest ecosystem.

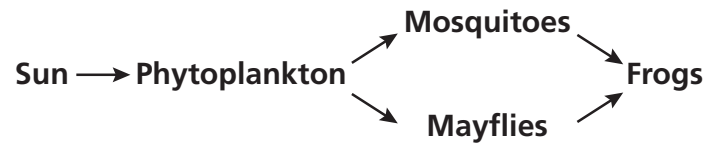


A virus reduces the number of rabbits in the ecosystem.

Which statement describes the impact of the reduction on other organisms in the ecosystem?

- F. The leafy weeds population will increase due to reduced feeding pressure from reduced numbers of rabbits.
- G. The bobcat population will increase due to the reduced number of animals that prey upon the bobcats.
- H. The loss of the rabbit population will cause the bobcat population to change its diet to include blackberry.
- J. The loss of the rabbit population will cause the white-tail deer population to decrease since its main source of energy is gone.

27. Some people created a water pond on their property. The following diagram shows the food web for this pond.



The owners of the property sprayed insecticide that destroyed the mosquito eggs.

How will this affect the flow of energy in the food web?

- A. Without mosquitoes available as a food source, less energy will be available to the frogs.
- B. Without mosquitoes available as a food source, less energy will be available to the phytoplankton.
- C. Without competition from mosquitoes, more energy will be available to the frogs.
- D. Without competition from mosquitoes, other insects will move into the pond area to prey upon the frogs.

28. Data about some stars in our galaxy are listed in the following table.

Star Data

Star	Distance from Our Sun (light years)	Approximate Age (Earth years)	Temperature (Kelvin)
Centauri A	4.37	4.85–6.8 billion	5,260
Sirius A	8.58	300 million	25,200
Barnard	5.96	10 billion	3,134
Proxima	4.24	5–6 billion	3,042
Wolf 359	7.78	350 million	2,800
61 Cygni	11.36	10 billion	4,440

Based on the data, what is the approximate age of our galaxy?

- F. 14 million years
- G. 400 million years
- H. 4 billion years
- J. 14 billion years

29. Scientists are studying the use of vegetable oil as an automotive fuel.

Which of these is a logical justification for continuing this research?

- A. The research may also help scientists develop new vegetables for use as food.
- B. Vegetable oil can be purchased at grocery stores, so there would be less need for fueling stations.
- C. Using vegetable oil will increase the number of cars that can be used by increasing the available fuel for cars.
- D. The fossil fuel used to make gasoline is becoming a limited resource, while vegetable oil is made of plants crops that are renewable.

30. Power grids use alternating current (AC) in transmission and distribution systems.

Which statement explains why AC is used instead of direct current (DC)?

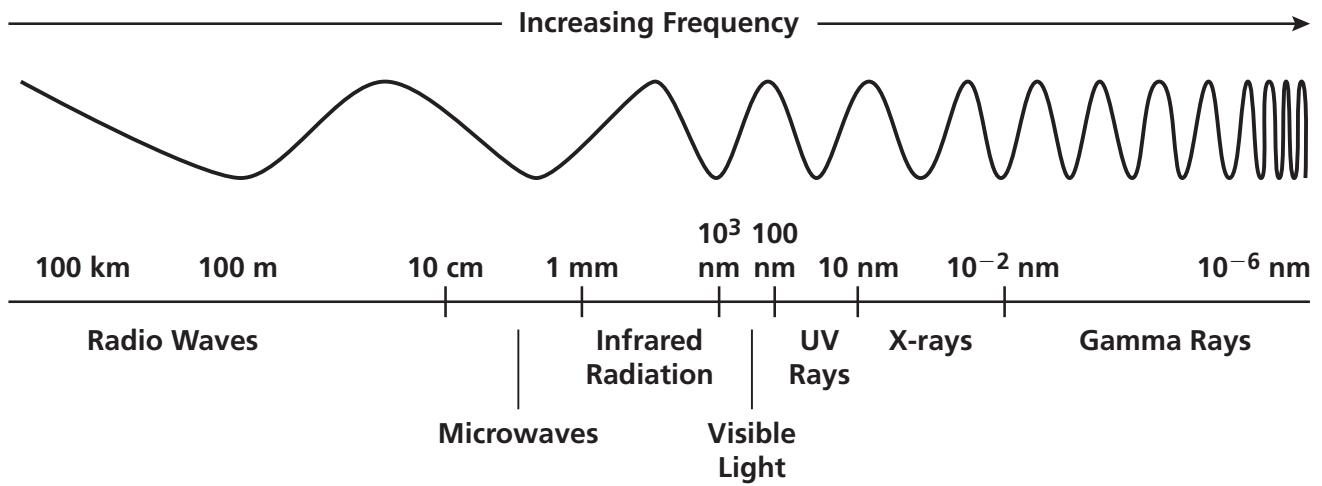
- F. Transmission wires cannot carry enough direct current to supply the needs of the power grid.
- G. The voltage can be changed in an alternating current system to transfer energy more efficiently.
- H. Electrical energy must be transmitted as alternating current because that is how it is produced at power plants.
- J. Direct current would not be useful to electric company customers because appliances operate on alternating current.

31. Before 1896, many scientists concluded that light could not pass through black paper. In 1896, Henri Becquerel observed that uranium salts could cause a plate covered by black paper to react as if light had reached it.

How did this observation affect conclusions about light passing through black paper?

- A. Scientists ignored Becquerel's evidence because uranium is dangerous to use, so his study was not valid.
- B. Scientists repeated Becquerel's experiment until it no longer worked and reported that his conclusions were not valid.
- C. Scientists had to revise their earlier conclusion because evidence from Becquerel did not support the original conclusion.
- D. Scientists stood behind the earlier conclusion that black paper blocks light because it was already an accepted conclusion.

32.

Electromagnetic Spectrum

Which type of electromagnetic wave has a wavelength longer than that of yellow light?

- F. Infrared Radiation
- G. UV Rays
- H. X-rays
- J. Gamma Rays

33. Lexa has the following symptoms of a cold:

- Coughing
- Sneezing
- Headache
- Sore throat

Which describes how Lexa contracted this cold?

- A. Lexa ate food with a fungus in it, which traveled to major organs in her body.
- B. Lexa inhaled a virus, which traveled to respiratory tissue and interfered with normal breathing function.
- C. Lexa walked barefoot in soil containing a parasitic worm. The worm imbedded itself in her skin and sent toxin throughout her body.
- D. Lexa touched an object covered with a bacterium. The bacterium penetrated her skin and traveled to her lungs through her blood system.

34. In pea plants, round peas (R) are dominant to wrinkled peas (*r*). The following table shows five possible crosses for round and wrinkled peas.

Combinations of Crosses for Round and Wrinkled Peas

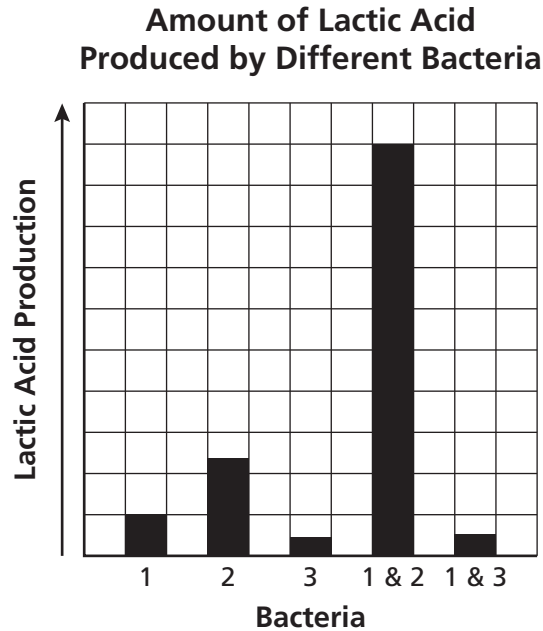
Number	Cross
1	$rr \times rr$
2	$Rr \times rr$
3	$Rr \times Rr$
4	$RR \times Rr$
5	$RR \times RR$

Two pea plants produce an offspring with a genotype of Rr .

Which three numbers from the table represent possible parents of pea plant Rr ?

- F. 1 or 2 or 3
- G. 2 or 3 or 4
- H. 3 or 4 or 5
- J. 4 or 5 or 1

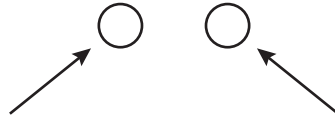
35. Some bacteria are mixed with milk to make yogurt. These bacteria change the lactose in the milk into glucose, which then ferments into lactic acid. The lactic acid causes the protein in the milk to stick together, creating the gelatinous yogurt. The following graph shows the relative lactic acid production of different bacteria.



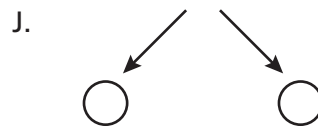
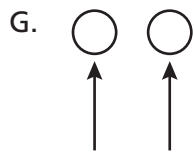
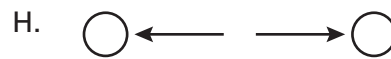
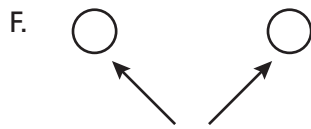
Which of these is a logical conclusion based on the data?

- A. Bacterium 2 makes glucose but not lactic acid and, therefore, should not be used in making yogurt.
- B. Bacterium 3 is least effective at changing lactic acid into glucose and, therefore, should not be used in making yogurt.
- C. Bacteria 1 & 2 combine to make the largest amount of lactic acid and, therefore, would be most effective at making yogurt.
- D. Bacteria 1 & 3 combine to be most effective at breaking down the glucose needed to make yogurt.

36. The following diagram shows the direction of motion of two objects of equal mass just before they collide.



Which diagram shows the direction of motion of the two objects after they have collided?



37. Dunia and Shane are studying the cold, snowy taiga biome for a science assignment. They learn that many of the trees in the taiga forests have long, thin needles that remain on the trees all year long. The following table shows Shane's beliefs about why needles allow trees to survive in the taiga.

Why Needles Allow Trees to Survive Taiga Biome

1	Needles grow faster than leaves, allowing the plant to increase its level of photosynthesis and crowd out other plants.
2	Needles have a smaller surface area than leaves, decreasing the loss of water during the winter when the ground is frozen.
3	The shape of needles allows snow to fall from them easily, minimizing the buildup of a large mass of snow that would break branches.
4	Needles do not have to be replaced every spring, increasing the amount of energy that can be used for growth and reproduction during short growing seasons.

Which explanations should Dunia include in their final paper?

- A. 1 and 2
- B. 1, 3, and 4
- C. 2, 3, and 4
- D. 3 and 4

38. Matt is allergic to mold.

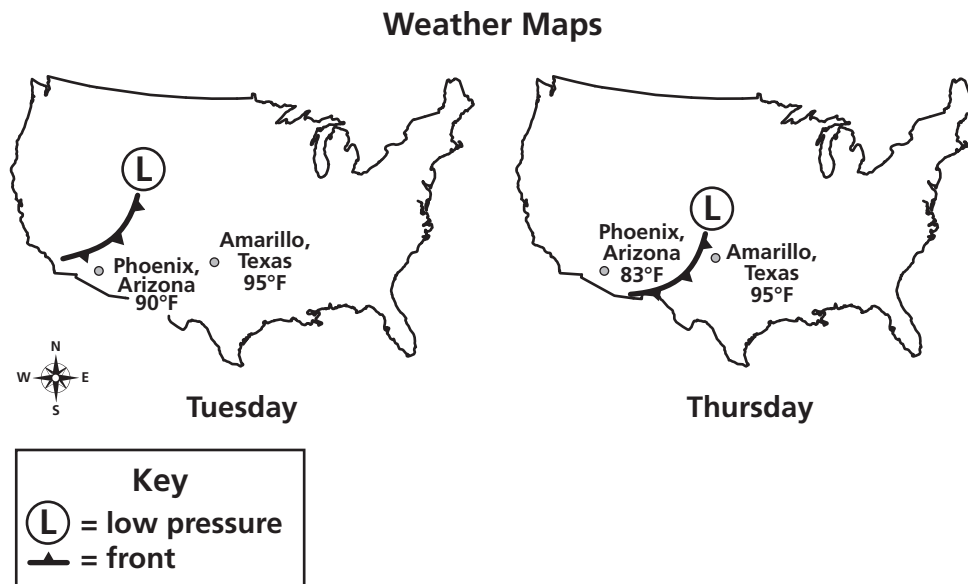
Which of these describes how mold affects Matt?

- F. Matt inhales mold spores that irritate respiratory tissue, causing him to sneeze.
- G. Matt eats food made from mold, causing an ulcer to develop in his stomach.
- H. Matt touches mold that burrows into his skin, causing swelling and a rash.
- J. Wind blows the mold in Matt's eyes, causing blurry vision.

39. Which of these kinds of tissue covers the outer surface of the human body?

- A. Epithelial
- B. Muscle
- C. Blood
- D. Bone

40. The following maps show a front as it moves east across the United States.



Which of these describes the weather change that can be expected for Amarillo, Texas?

- F. The cold front will bring cooler temperatures and snow.
- G. The cold front will bring cooler temperatures with thunderstorms and rain.
- H. The warm front will bring warmer temperatures with hot air for several days.
- J. The warm front will bring warmer temperatures with light rain for a few days.

41. Which list shows the path of electricity from a local power substation to a lamp in a home?

- A. Substation → transformer → junction box → outlet → electric circuit of lamp
- B. Substation → outlet → junction box → transformer → electric circuit of lamp
- C. Substation → junction box → transformer → outlet → transformer → electric circuit of lamp
- D. Substation → transformer → junction box → outlet → transformer → electric circuit of lamp

Directions: Use the information below to answer questions 42 through 44.

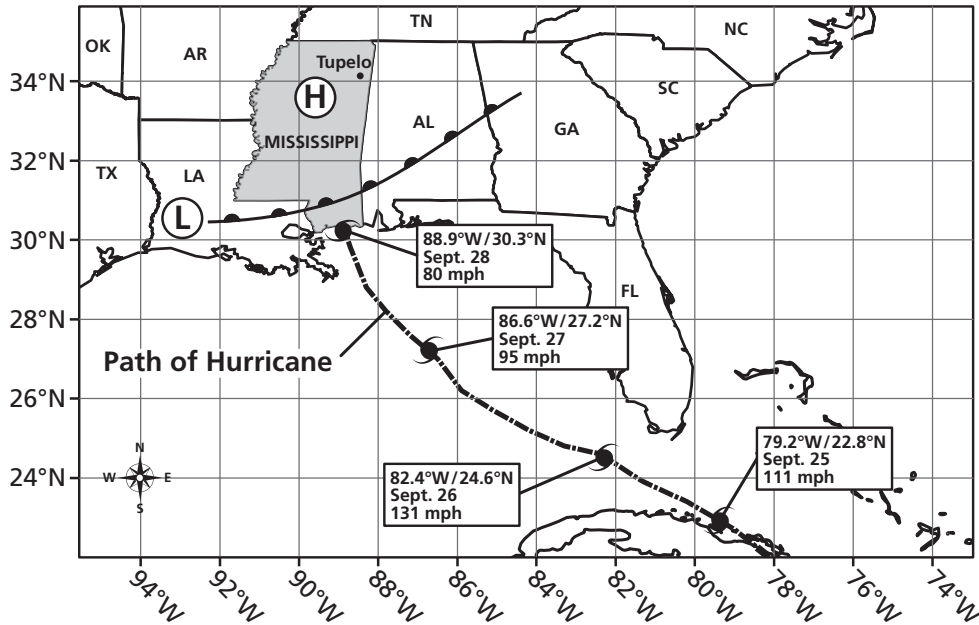
The Hurricane

The National Oceanic and Atmospheric Administration (NOAA) can find hurricanes using satellite imagery. Researchers dropped sensors in the wall of a hurricane each day to determine the wind speed within the hurricane. The following shows the hurricane data and a weather map of Mississippi on September 28.

Hurricane Data

Date	Position		Air Pressure (millibars)	Wind Speed (miles per hour)
	Longitude (°W)	Latitude (°N)		
Sept. 25	79.2	22.8	951	111
Sept. 26	82.4	24.6	939	131
Sept. 27	86.6	27.2	969	95
Sept. 28	88.9	30.3	984	80

Weather Map on September 28



Key

- (L) = low pressure system
- (H) = high pressure system
- = warm front
- ☯ = hurricane

42. The Saffir-Simpson Hurricane Scale describes the type of damage caused by the wind speed of a hurricane.

Saffir-Simpson Hurricane Scale

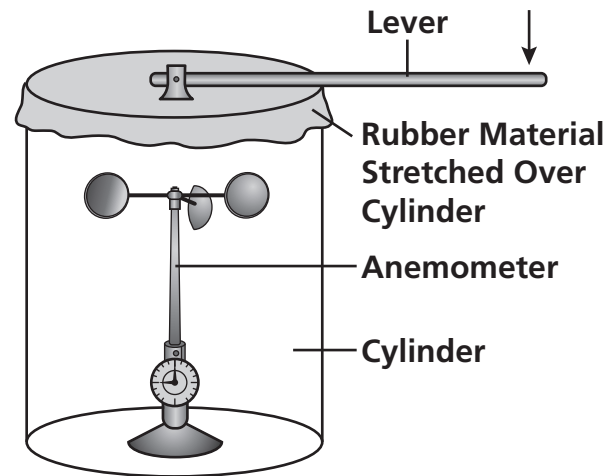
Category	Wind Speed (miles per hour)	Description of Damage
1	74–95	No real damage to buildings. Damage to unanchored mobile homes. Some damage to poorly constructed signs.
2	96–110	Some damage to building roofs, doors, and windows. Considerable damage to mobile homes.
3	111–130	Some structural damage to small residences and utility buildings. Large trees blown down. Mobile homes and poorly built signs destroyed.
4	131–155	Some structural damage to the roofs on small residences.
5	156 and up	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline.

Which of these describes the building damage that some areas of Mississippi will experience from this hurricane based on the hurricane data?

- F. No real damage to buildings.
- G. Some damage to building roofs, doors, and windows.
- H. Some structural damage to the roofs on small residences.
- J. Complete roof failure on many residences and industrial buildings.

43. Based on the hurricane data, which of these is a cause-and-effect relationship of hurricane factors?
- A. An increase in air pressure causes the hurricane's wind speed to decrease.
 - B. A decrease in wind speed causes a decrease in the hurricane's longitude.
 - C. An increase in air pressure causes an increase in the hurricane's wind speed.
 - D. A decrease in the hurricane's latitude causes the hurricane's longitude to decrease.

44. Dee reviewed the data for this hurricane. She replicated the pressure system of the hurricane and its effect on wind speed. The following diagram shows her setup.



Each time Dee pushed downward on the lever, the wind speed within the cylinder decreased. Dee concluded that the greater the air pressure within a hurricane, the lower the hurricane's wind speed.

Which of these is a logical defense for Dee's conclusion?

- F. Her investigation proves that both high and low pressure systems create hurricanes.
- G. Her investigation supports the relationship between air pressure and wind speed found in the hurricane data.
- H. Her investigation proves that reducing wind speed within a hurricane will increase the air pressure of the hurricane.
- J. Her investigation supports the relationship between hurricane position and air pressure found in the hurricane data.

45. A probe traveling through outer space is moving at a constant velocity.

Which statement applies to the motion of this probe?

- A. An unbalanced force is acting on the probe, causing it to accelerate.
- B. The probe will undergo constant acceleration until a force acts on it.
- C. The probe will continue on its current path until an unbalanced force acts on it.
- D. The force that makes the probe move through space is equal to its mass divided by its velocity.

46. Crassulacean acid metabolism (CAM) is a type of photosynthesis. A plant using CAM takes in carbon dioxide (CO_2) at nighttime, when it is cooler. The plant changes the CO_2 into an acid. During the daytime, the plant changes the acid into carbohydrates, without losing water to the warm air.

In which environment are such plants best adapted for survival?

- F. Low-altitude, because the air pressure is greater closer to sea level
- G. Desert, because plants living in the desert have little water available
- H. High-altitude, because the night air is cooler in alpine zones of mountains
- J. Aquatic, because plants living in water need more carbohydrates to avoid drowning

47. Lisa learned that there may be a link between global warming and stronger hurricanes. She decided to follow these guidelines in order to reduce levels of carbon dioxide (CO_2).

- Walk more.
- Use recycled paper.
- Use energy-efficient appliances.
- Use fluorescent bulbs instead of incandescent bulbs.

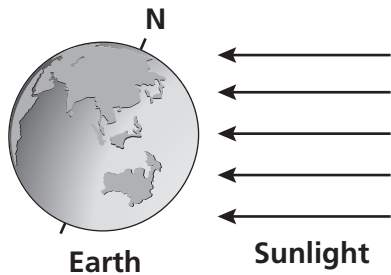
Which statement logically explains whether these methods are useful in decreasing global warming?

- A. These methods are not useful because they all release CO_2 into the atmosphere.
- B. These methods are not useful because they all release heat energy into the atmosphere.
- C. These methods are useful because they all reduce the amount of CO_2 released into the atmosphere.
- D. These methods are useful because they all reduce the use of renewable energy sources instead of fossil fuels.

48. How do the functions of the nucleus differ from those of the cell membrane?

- F. The nucleus converts food energy, while the cell membrane stores minerals and wastes.
- G. The nucleus controls the activities of the cell, while the cell membrane controls what enters and exits the cell.
- H. The nucleus provides support, while the cell membrane converts carbon dioxide and water into food.
- J. The nucleus stores food and water, while the cell membrane stores chemicals used by the cell for photosynthesis.

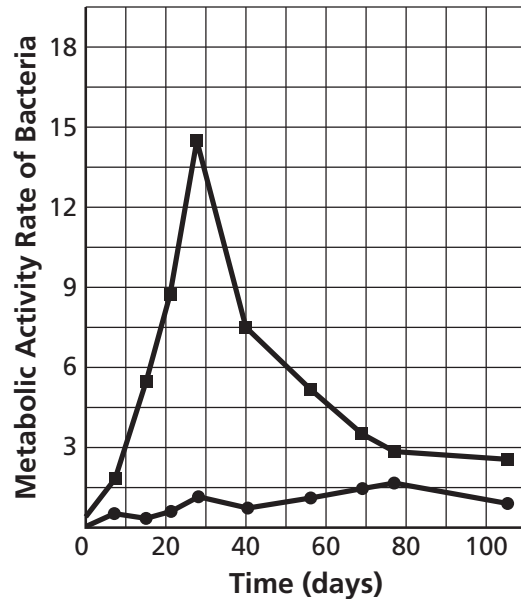
49. During which season does sunlight strike the Northern Hemisphere as shown?



- A. Spring
- B. Summer
- C. Fall
- D. Winter

50. Scientists discovered that some bacteria can be used to clean up oil spills. The following graph shows the results of a study where the oil-cleaning abilities of two groups of bacteria were compared.

Effects of Fertilizer on Metabolic Rate of Bacteria



Key

- = bacteria and fertilizer
- = bacteria

Which conclusion can be made from these data?

- F. Fertilizers eliminate the bacteria and increase the absorption of oil.
- G. Fertilizers do not affect the bacteria or the amount of oil that is cleaned up.
- H. Fertilizers increase both the metabolic activity of the bacteria and the amount of oil that is cleaned up.
- J. Fertilizers decrease both the metabolic activity of the bacteria and the amount of oil that is cleaned up.

51. Tasha is studying polar and tropical climates on Earth. She learned the following:

- **Tropical climates:** Summer and winter temperatures are similar.
- **Polar climates:** Summer temperature is much higher than winter temperature.

Tasha wonders why the tropical climate has the same temperature year round, but the polar climate temperature differs greatly.

Which of these explains the reason for this difference?

- More clouds block direct sunlight from reaching the polar surface during the winter months.
- Most regions with subtropical climates are located near large bodies of water that make the climate more even.
- The subtropical regions have longer days and shorter nights than polar regions, so they receive more solar energy.
- The axis of Earth causes the polar regions to be tilted either toward or away from direct sunlight, depending on the time of year.

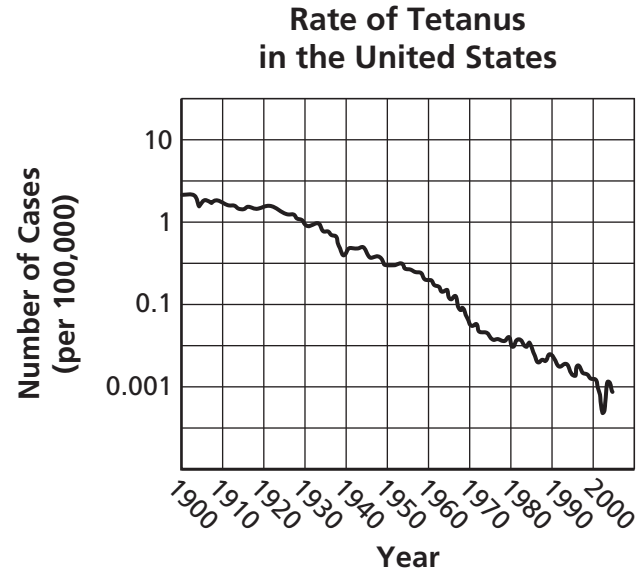
52. The following Punnett square, in which (Y) are yellow flowers and (y) are purple flowers, is incomplete.

	Y	y
Y	YY	?
y	Yy	yy

Which genotype should replace the question mark?

- Y
- YY
- Yy
- yy

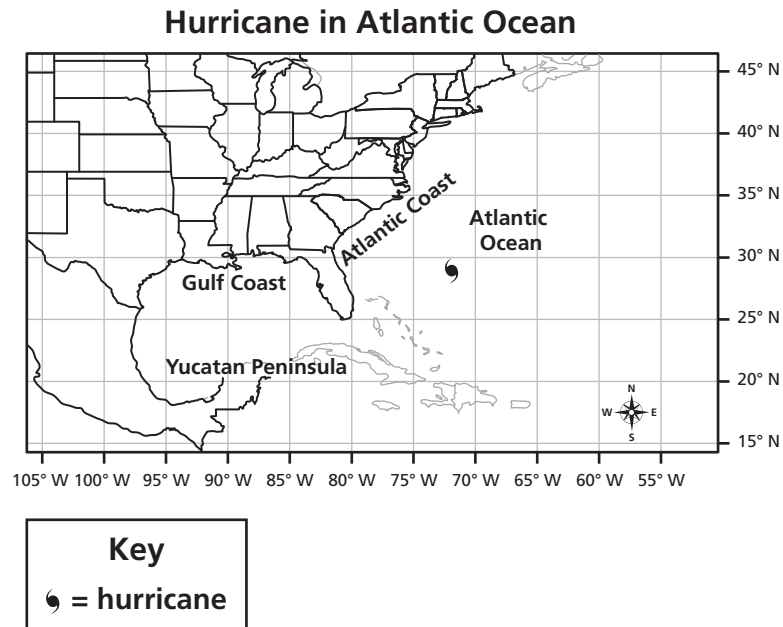
53. Tetanus is a disease caused by a certain type of bacteria. It can be prevented by a vaccine. The following graph shows changing rates of tetanus in the United States.



Which of these is a logical summary for the data in the graph?

- A. Quantitative data indicating that people will develop immunity to the bacteria
- B. Qualitative data indicating that the bacteria that caused tetanus are now extinct
- C. Qualitative data indicating that tetanus has become more deadly over the past 100 years
- D. Quantitative data indicating that routine vaccination resulted in a decline in the number of cases

54. The following map shows the location of a hurricane in the Atlantic Ocean at 72°W longitude and 29°N latitude.



The hurricane has been moving toward the northwest at a rate of 30 miles per hour.

Which statement describes the likelihood of landfall of the hurricane?

- F. The trade winds will blow the hurricane to the Atlantic Coast.
- G. The warm ocean currents will carry the hurricane to the Yucatan Peninsula.
- H. The rotation of Earth will cause the hurricane to hit the land along the Gulf Coast.
- J. The cold arctic air will force the hurricane to the southeast area of the Atlantic Ocean.

55. Research indicates that galaxies are moving away from Earth.

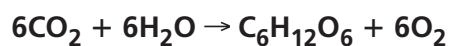
Which method allows astronomers to determine this movement?

- A. Observing these galaxies with a telescope
- B. Listening to the radio waves that these galaxies emit
- C. Detecting the kind of particles that these galaxies emit
- D. Measuring the wavelengths of radiation from these galaxies

56. According to Newton's second law of motion, in which of these situations is the object accelerating?

- F. A book on a shelf
- G. A rock sitting on the ground
- H. A helium balloon tied to a lamp post
- J. A ball that has been thrown upward

57. The following equation shows photosynthesis in plants.



Which of these products are made as a result of photosynthesis?

- A. Water and oxygen
- B. Glucose and oxygen
- C. Carbon dioxide and water
- D. Glucose and carbon dioxide

58. What happens during cellular respiration?

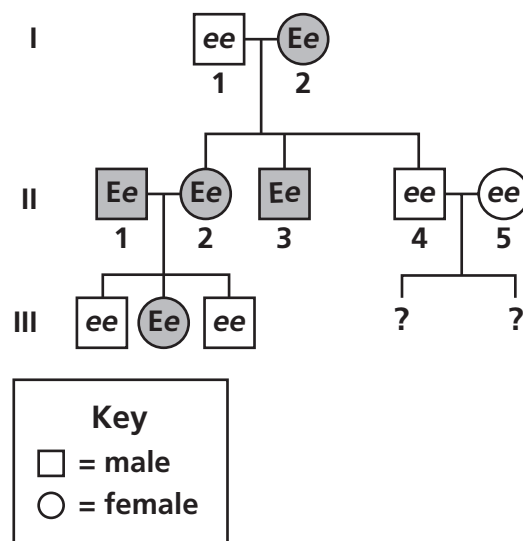
- F. Organisms change nitrogen into a form usable by living things.
- G. Organisms use carbon dioxide, water, and sunlight to make food.
- H. Organisms use oxygen to get energy from food, some of which is released as heat.
- J. Organisms use nitrogen to produce energy, which is transferred along a food chain.

59. In humans, earlobes can be considered attached or unattached. The following list describes earlobe type:

- Attached earlobe: bottom portion of earlobe is attached directly to head
- Unattached earlobe: bottom portion of earlobe slopes upward before attaching to head

Unattached earlobes (E) are dominant to attached earlobes (e). The following family pedigree shows which individuals have unattached or attached earlobes.

Family Pedigree Showing Earlobe Trait



Family members 4 and 5 in Generation II are expecting twins.

Which of these summarizes gender and earlobe appearance of these two offspring?

- The offspring both will be male with attached earlobes.
- The offspring both will be female with unattached earlobes.
- The gender of the offspring is unknown, and both will have attached earlobes.
- The gender of the offspring is unknown; one will have attached earlobes, and the other will have unattached earlobes.

60. Which source of energy is nonrenewable?

- F. Wind
- G. Nuclear
- H. Geothermal
- J. Hydroelectric

BE SURE YOU HAVE MARKED ALL YOUR ANSWERS
ON THE ANSWER DOCUMENT.

