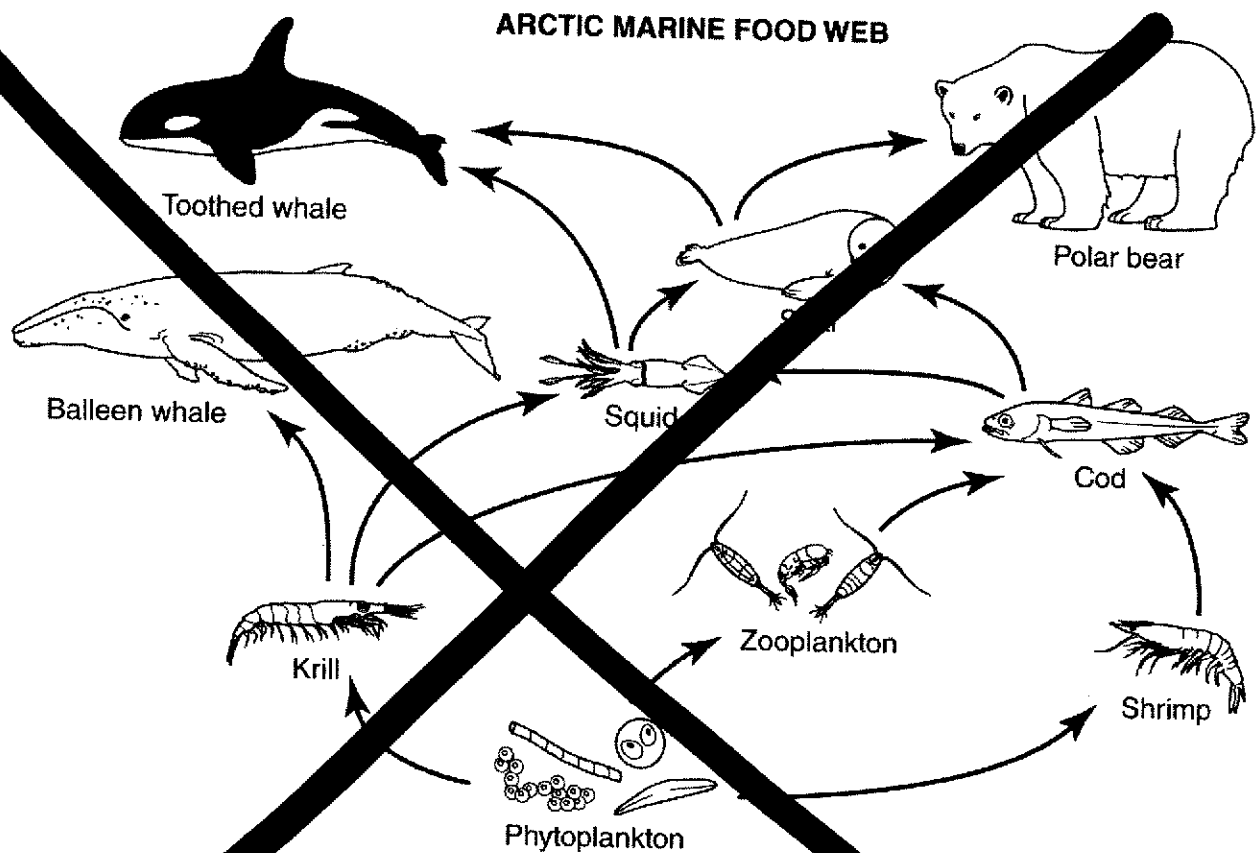


50. Below is a diagram of a food web in the Arctic Ocean.



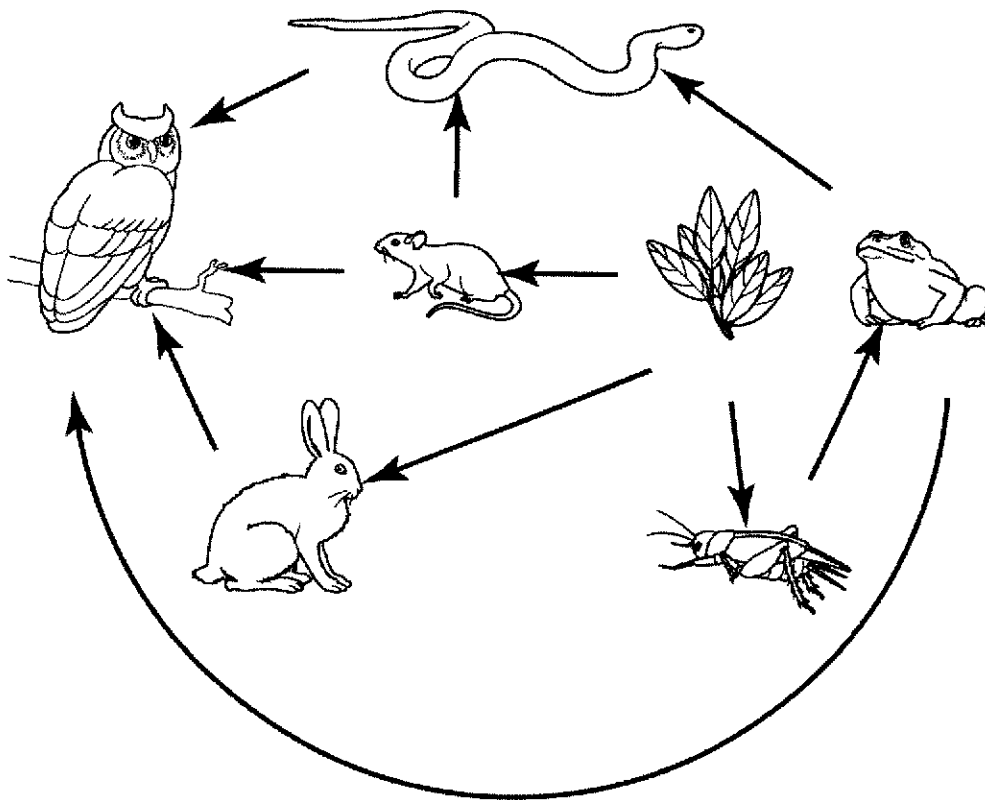
Which type of organism forms the base of this food web?

- A. krill
- B. shrimp
- C. polar bear
- D. phytoplankton

51. Manatees are herbivores, alligators are carnivores, and raccoons are omnivores. They all play roles as consumers of plants, animals, or both in a food web. Which statement correctly identifies examples of the foods these animals consume?

- A. Manatees eat small fish, alligators eat animals, and raccoons eat nuts and seeds.
- B. Manatees eat crabs, alligators eat animals, and raccoons eat plants.
- C. Manatees eat aquatic plants, alligators eat a variety of animals, and raccoons eat crabs, nuts, and seeds.
- D. Manatees eat aquatic plants and small fish, alligators eat a variety of animals, and raccoons eat crabs and small fish.

____ 52. Below is a diagram of a wetland food web.



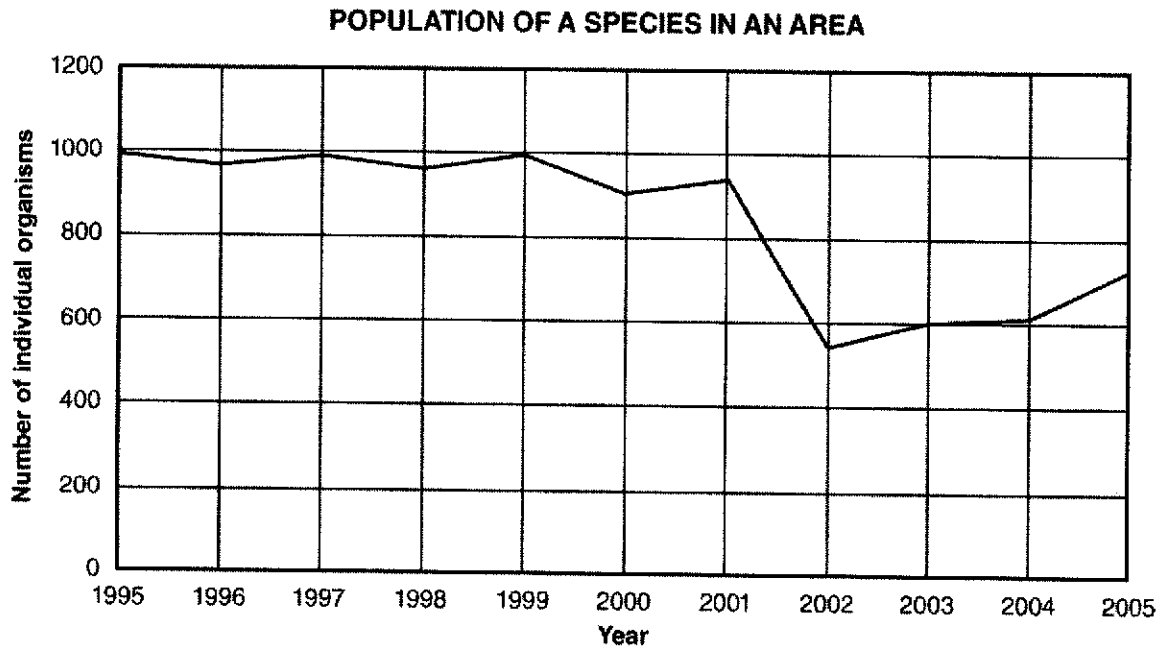
Which statement correctly describes one way that energy from the sun might flow through the food web from a producer to the owl?

- A. The snake eats the frog and the owl eats the snake.
- B. The snake eats the rodent and the rodent eats the owl.
- C. The rabbit eats the plant and the grasshopper eats the plant.
- D. The rabbit eats a leafy green plant and the owl eats the rabbit.

____ 53. The small clown fish lives among the poisonous tentacles of the anemone. The clown fish is immune to the poison and swims around the tentacles, cleaning the anemone. In turn, the anemone provides the fish with protection from predators. What kind of symbiosis do these two species show?

- A. parasitism
- B. mutualism
- C. commensalism
- D. predator-prey relationships

- _____ 54. An herbivorous insect called the walking stick looks like a twig when it is standing still. How does this camouflage benefit the walking stick?
- A. It hides the insect from predators.
 - B. It helps the insect fight off predators.
 - C. It helps the insect lure prey to its nest.
 - D. It hides the insect as it hunts for prey.
- _____ 55. Florida biologists noted that after 2001 the population of a small frog species declined along a section of the Kissimee River. Once a year, beginning in 1995, a group of volunteers had counted the frogs in the area by listening for individual frog calls. The biologists used the data to make a graph.



After studying the trend in the graph, what was **most likely** the next step in the biologists' research on the problem?

- A. They counted the frogs once a month instead of once a year.
- B. They increased the frogs' food supply by bringing insect larvae to the river.
- C. They formed a hypothesis that there was a limiting factor on the frog population and set out to determine what it could be.
- D. They formed a hypothesis that the count was not accurate and sent volunteers to get a more accurate count by looking for, rather than just listening for, frogs.

Name: _____

ID: A

56. Many species in the Everglades depend on "gator holes," holes dug by alligators in the rock and soil under the layer of water that covers the Everglades the wet season. During the dry season, the deep holes stay filled with water. Many species, in addition to alligators, depend on the holes for survival. How could a reduced number of alligators and gator holes be a limiting factor for many Everglades species?
- A. Fewer gator holes would allow alligators to find more prey.
 - B. Fewer gator holes would reduce the available food and water in the dry season.
 - C. Fewer gator holes would allow more water to stay in the Everglades and drown some species.
 - D. Fewer gator holes would reduce the population of alligators and reduce the food supply of species that prey on alligators.
57. Coral reefs off the Florida coast are made up of the stony skeletons of many tiny coral animals. Tiny algae that live inside the coral openings are food for some reef fish. The algae produce their own food from water, carbon dioxide, and the energy in sunlight. The table shows some of the environmental stresses that could affect reefs.

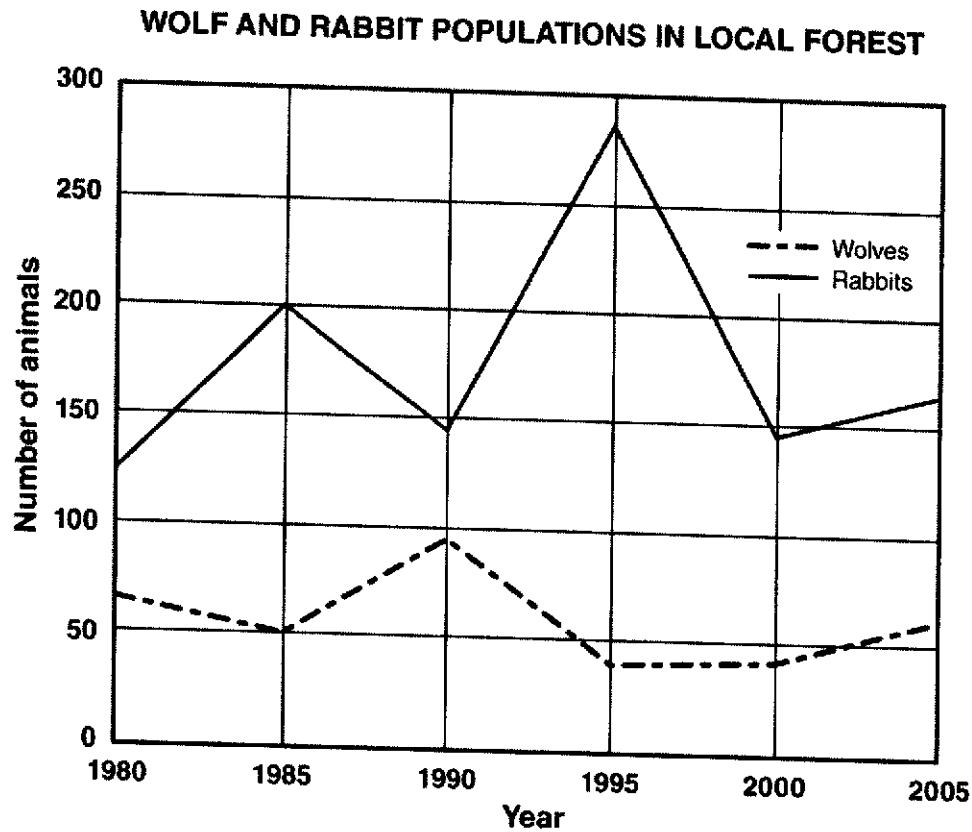
| ENVIRONMENTAL STRESS ON CORAL REEFS | | |
|-------------------------------------|-----------|--------------------------------|
| Environmental Factor | Change | Effect |
| Water Depth | Increased | Decreased Sunlight Penetration |
| Water Salinity | Increased | None |
| Carbon dioxide content | No change | None |
| Algae growth | Decreased | Decreased food supply for fish |

- Why might water depth be a limiting factor for algae-eating reef fish?
- A. sunlight can't penetrate deep water
 - B. ocean water becomes too salty in deep water
 - C. algae grow too big for the reef fish in deep water
 - D. carbon dioxide levels are too high in deep water

Name: _____

ID: A

58. Jenny's mom has tracked the wolf and rabbit populations in a local forest from 1980 to 2000.



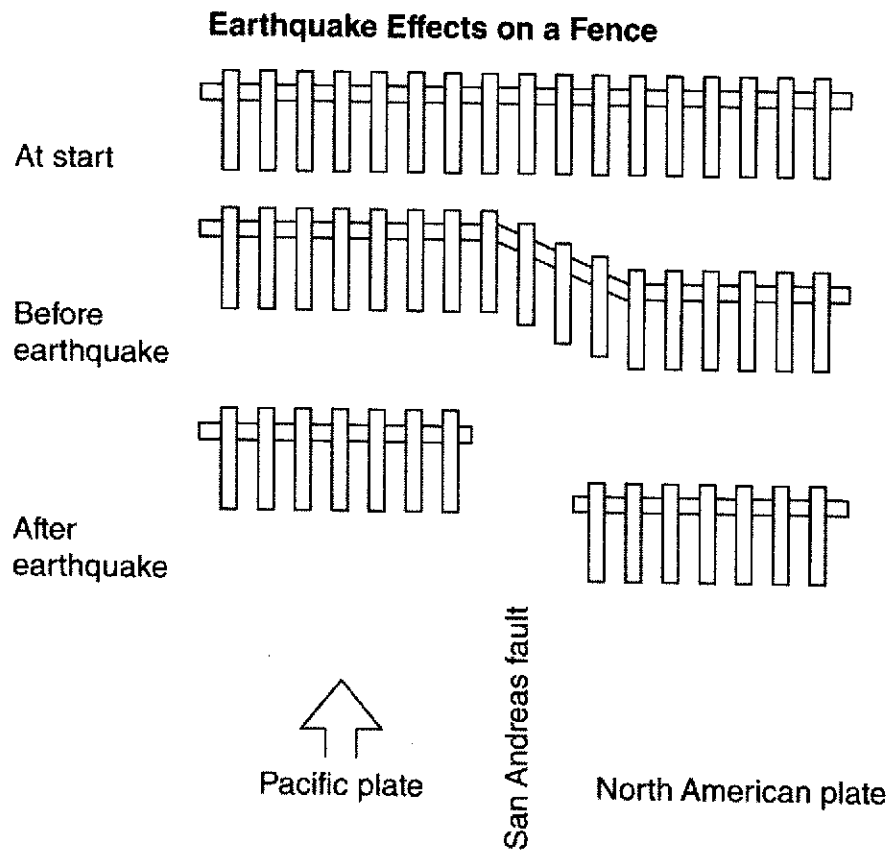
Based on this graph, what conclusion can she draw?

- A. In 1990, the rabbits were eating the wolves.
- B. The rabbit population will consistently decrease.
- C. The rabbit and wolf populations are not related.
- D. As one population increases, the other decreases.

Name: _____

ID: A

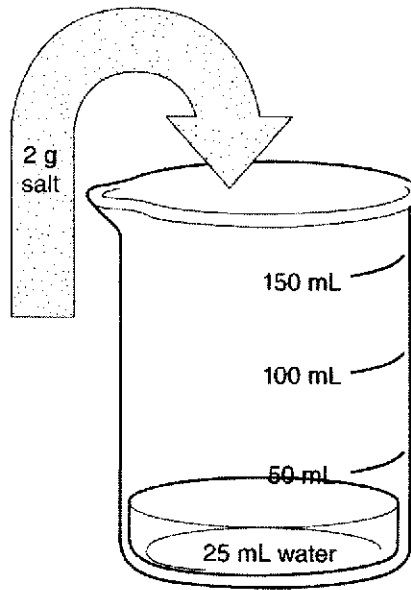
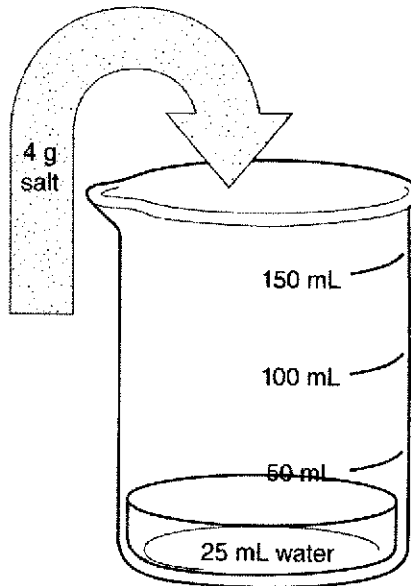
59. Letti shows what happened to her backyard fence before, during, and after an earthquake.



Based on the diagram, why is the fence in two pieces after the earthquake?

- A. The fence is broken at the start.
- B. Part of the fence falls into the fault.
- C. The Pacific plate pushes up and breaks the fence.
- D. The plates collide and force the fence onto itself.

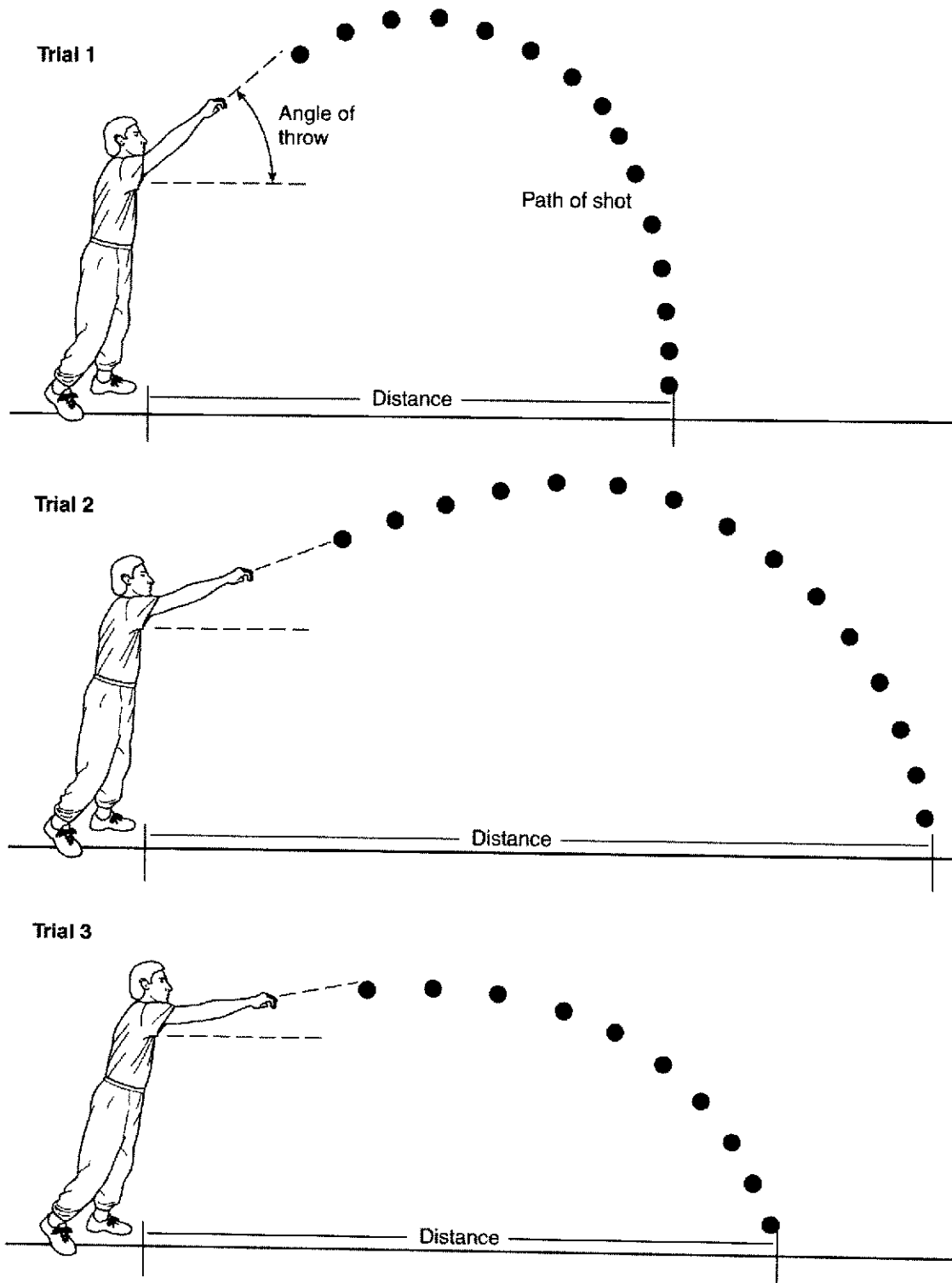
____ 60. Nate investigates how much table salt he can add to water before it becomes saturated.

STEP 1**STEP 2**

To complete this scientific investigation, what is Nate's next step?

- A. to heat the water
- B. to wait for the water to evaporate
- C. to add 25 mL of water to the beaker
- D. to add 2 more grams of salt to the water

61. Lance throws a ball three times and tracks its distance.



Why is this experiment NOT an example of repetition?

- A. The ball reaches the same distance each time.
- B. He needs to throw the ball more than three times.
- C. He does not throw the ball at the same angle each time.
- D. He changes from an overhand throw to an underhand throw.

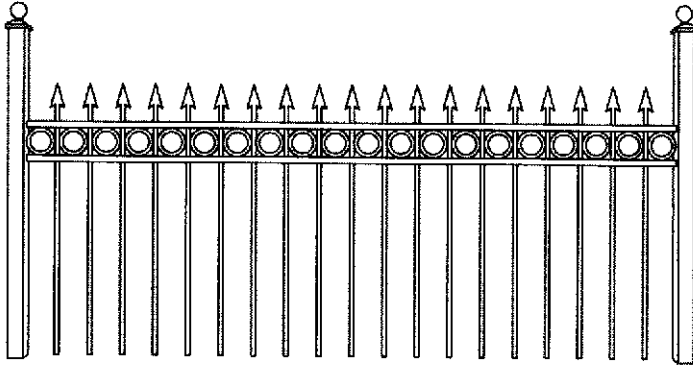
- _____ 62. Carly is studying dominant and recessive traits. She will observe those around her, and make notes about whether or not each person's earlobes are attached. Since attached earlobes are a recessive trait, she thinks the probability of having them is very low.



Which strategy will she use to find the probability of a person having attached earlobes?

- A. assumption
 - B. experimentation
 - C. invention
 - D. investigation
- _____ 63. Brandi wants to learn whether a particular type of bacteria grows faster in warm or cold water. She devises an experiment to measure the amount of bacteria in two similar bowls of water after the same amount of elapsed time. The temperature of the water in the two bowls varies. What is the outcome variable in this experiment?
- A. type of bacteria
 - B. size of the water bowls
 - C. temperature of the water in the bowls
 - D. amount of bacteria at the end of the experiment
- _____ 64. Casey wants to determine whether the rate at which melted glass cools affects the strength of the glass. He pours melted glass into a form and cools the glass at different rates. Then, he tests the breaking strength of each form. Which of the following is the test variable in this experiment?
- A. type of glass
 - B. strength of the glass
 - C. thickness of the glass
 - D. cooling rate of glass

- _____ 65. Jocelyn's uncle's fence company wants to test how resistant the metal they use is to corrosion or rust, which occurs when metal is exposed to water and oxygen.

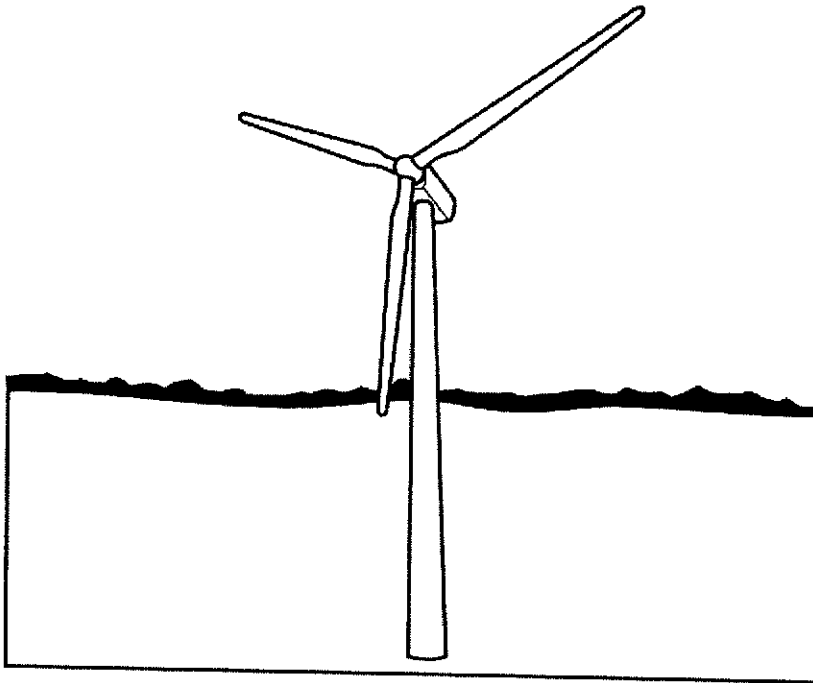


- Which of the following is an example of an outcome variable they might use?
- A. length of the fence
 - B. source of the water
 - C. surface coverage of the rust
 - D. time of exposure to water and oxygen
- _____ 66. Geneticists study genetics. What tool would be **most** necessary in their pursuit of scientific explanations?
- A. beaker
 - B. microscope
 - C. scale
 - D. thermometer
- _____ 67. Which of the following is empirical evidence that supports scientists' understanding of the orbit of the moon around the Earth and the Earth around the sun?
- A. solar eclipse
 - B. story of Apollo
 - C. temperatures on the sun
 - D. humans traveling to the moon
- _____ 68. What does NOT lead to scientific knowledge?
- A. A scientist repeats his experiment several times.
 - B. Scientists debate whether or not results are valid.
 - C. A scientist keeps the results of an experiment secret.
 - D. Others in the scientific community confirm the information..
- _____ 69. Which does NOT result in scientific knowledge?
- A. empirical evidence
 - B. more assumptions by scientists
 - C. communication and debates within the scientific community
 - D. confirmation through more experiments through repetition and replication

Name: _____

ID: A

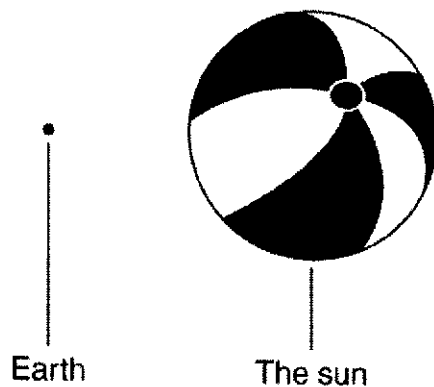
- ___ 70. Wind turbines are a way to use a natural resource, wind, as an energy source.



This scientific knowledge has been confirmed by the science community. What did NOT happen before the confirmation?

- A. Scientists built the first wind turbine.
 - B. Scientists denied a need for alternate energy sources.
 - C. Scientists determined that wind was a natural resource.
 - D. Scientists debated the possibility of different sources of energy.
- ___ 71. Gregor Mendel studied inheritance in pea plants by observing their traits, such as flower color. Which of the following did he add to the scientific knowledge of inheritance?
- A. an understanding of the structure of DNA
 - B. a new way to classify organisms into kingdoms
 - C. an understanding of dominant and recessive traits
 - D. a new theory about why species evolve over time
- ___ 72. Alfred Wegener came up with the idea of continental drift to explain why the coast lines of continents seemed to fit together like puzzle pieces. Later scientists found evidence that the sea floor was spreading. What did this new evidence lead to?
- A. the acceptance of continental drift as a theory
 - B. the understanding that continents cannot move
 - C. the development of the theory of plate tectonics
 - D. the identification of new species at the ocean bottom

73. Today scientists understand that radioactive elements decay to become more stable. Which discovery provided evidence that led to the current understanding of radioactive elements?
- A. the discovery that atoms contain a nucleus
 - B. the discovery that atoms contain electrons
 - C. the discovery of elements that gave off energy on their own
 - D. the discovery that certain elements give off light when they are exposed to light
74. On June 30, 1908 a tremendous explosion occurred in Siberia in Russia. The explosion was equivalent to the detonation of about 15 million tons of TNT. Many hypotheses have been proposed for what caused the explosion. One hypothesis is that the explosion was caused by the impact of an extraterrestrial ship. Why is this explanation considered a hypothesis and not developed into a theory?
- A. A hypothesis can never lead to the development of a theory.
 - B. A hypothesis must be verified by repeated tests using empirical evidence before it can become a theory.
 - C. Unlike a hypothesis, a theory is based on careful observations and experimental evidence.
 - D. Unlike a hypothesis, a theory can help scientists make predictions by forming if-then statements.
75. When scientists study the natural world, they may form scientific theories and scientific laws. How does a scientific theory differ from a scientific law?
- A. Unlike a theory, a law is not universal.
 - B. Unlike a theory, a law describes how the natural world operates.
 - C. Unlike a law, a theory is based on observations and experiments.
 - D. Unlike a law, a theory can be modified as new evidence is obtained.
76. Manuel learned how scientists use models to understand the natural world. He learned that even though some models are very simple, they still can be helpful. To demonstrate this point, Manuel built a model showing Earth and the Sun and showed it to the class. The diagram below shows what Manuel constructed.

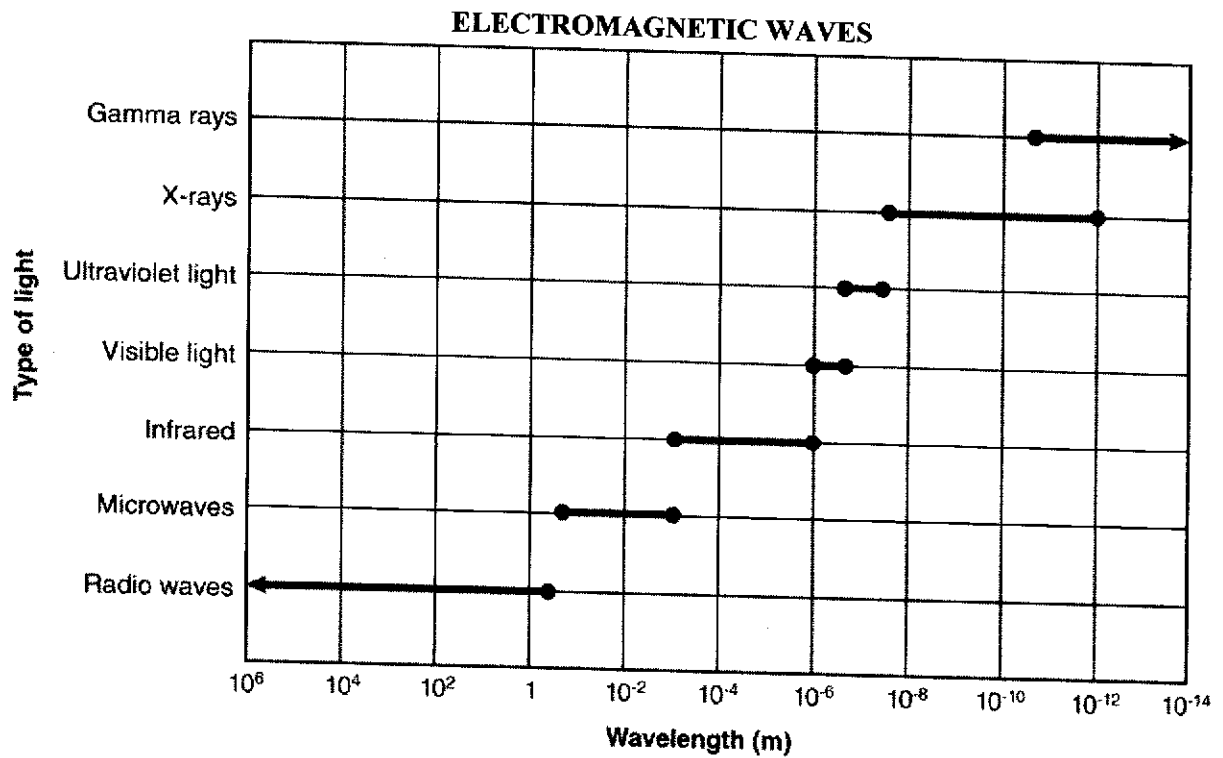


- What is a benefit of Manuel's model in helping others in the class understand the universe?
- A. The model describes how Earth receives solar energy.
 - B. The model indicates the relative size of Earth and the Sun.
 - C. The model indicates the distance between Earth and the Sun.
 - D. The model describes the orbit that Earth follows around the Sun.

Name: _____

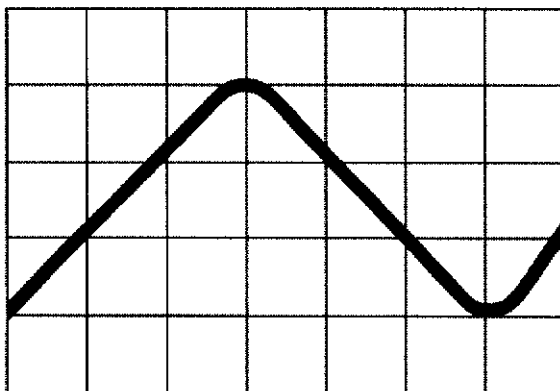
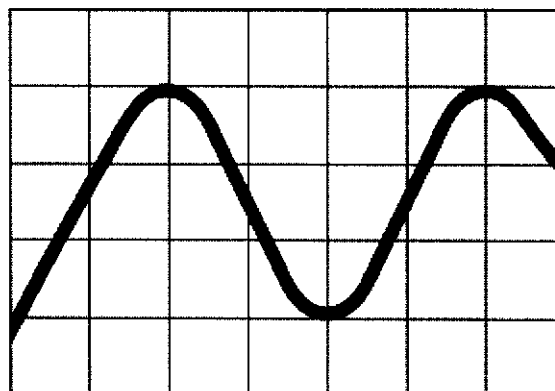
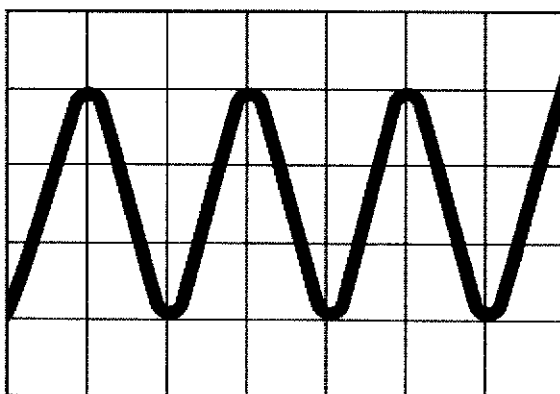
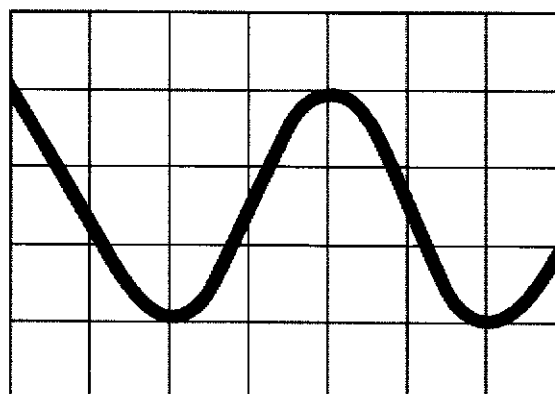
ID: A

77. The graph below compares the waves that are part of the electromagnetic spectrum.



- What can you conclude about gamma rays from the data shown in this graph?
- A. Gamma rays have the longest wavelength.
 - B. Gamma rays have the narrowest range of wavelengths.
 - C. Gamma rays and X-rays may have the same wavelength.
 - D. Gamma rays and radio waves have the same wavelength.

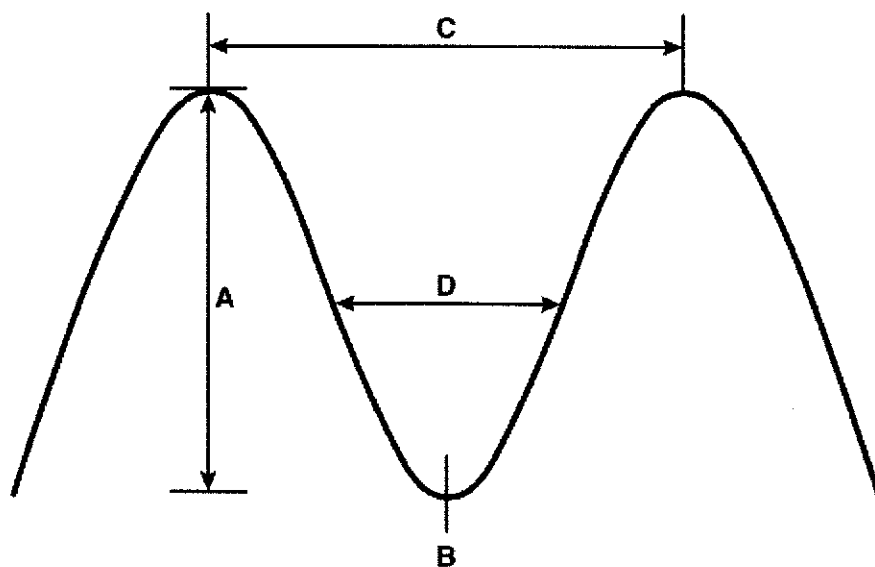
78. The graphs below show the wavelengths of four types of electromagnetic waves.

ELECTROMAGNETIC WAVES**A****B****C****D**

Which graph most likely illustrates radio waves?

- A. A
- B. B
- C. C
- D. D

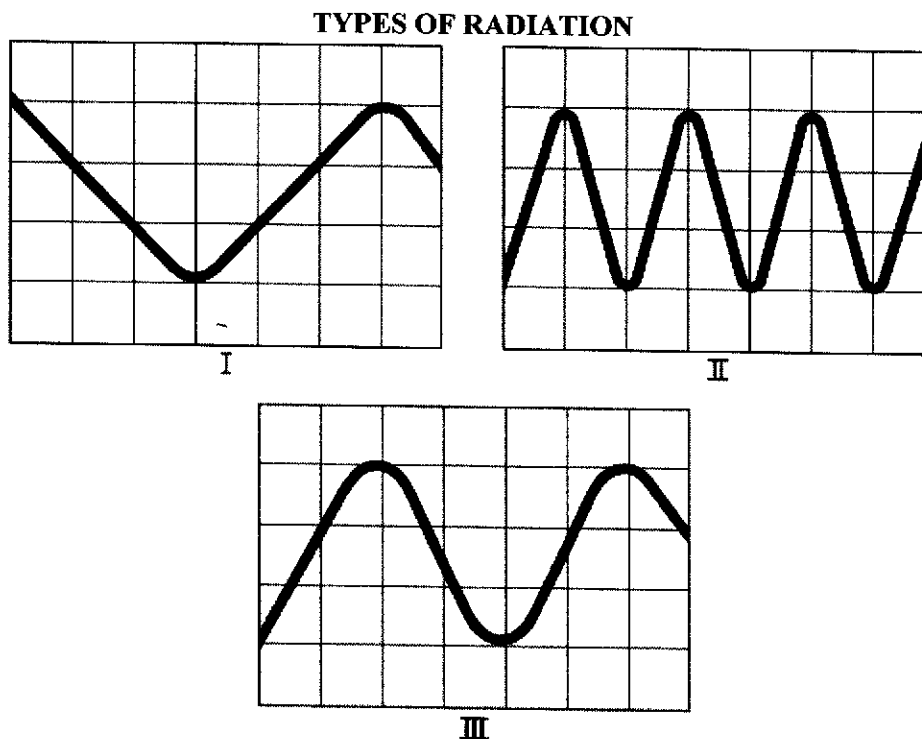
79. The diagram below represents waves from the electromagnetic spectrum.



Assume that the diagram above shows infrared radiation. How would a diagram showing X-rays be different?

- A. The distance indicated by D would be longer.
- B. The distance indicated by C would be shorter.
- C. The point represented by A would not be present.
- D. The point represented by B would be at the top of each wave.

____ 80. These graphs show three types of electromagnetic radiation.



If Graph III shows ultraviolet light, then which statement about the other two graphs would be correct?

- A. Graph I would show X-rays.
- B. Graph II would show visible light.
- C. Graph I would show infrared light.
- D. Graph II would show microwaves.

____ 81. Emma sets up an experiment to study light passing through different materials. What does Emma observe happen to light at the point when it passes into a material where the speed of light changes?

- A. The light is brighter.
- B. The light is reflected.
- C. The light is refracted.
- D. The light is absorbed.

____ 82. Tyler observed that light can be reflected, absorbed, and refracted. What causes the refraction of light?

- A. Light waves travel extremely fast.
- B. Light waves move at different speeds through different materials.
- C. Light waves can have different wavelengths and different frequencies.
- D. Light waves maintain the same speed as they travel through a different material.

- _____ 83. Light behaves in a very predictable manner. For example, it is possible to predict the angle at which light will bounce off a smooth, shiny surface. This behavior of light is known as a particular law in science. What is the name of this law?
- A. law of refraction
 - B. law of reflection
 - C. law of absorption
 - D. law of transmission
- _____ 84. Alejandro walked into the classroom before anyone else, including the teacher, had arrived. Because it was too dark to see anything, he turned on the lights. He was then able to see his desk. Why was Alejandro able to see the desk?
- A. The desk reflected the light.
 - B. The desk became a light source.
 - C. The desk absorbed the light when he turned it on.
 - D. The desk separated the light into all the wavelengths of visible light.
- _____ 85. The table below shows the speed of sound waves through various substances.

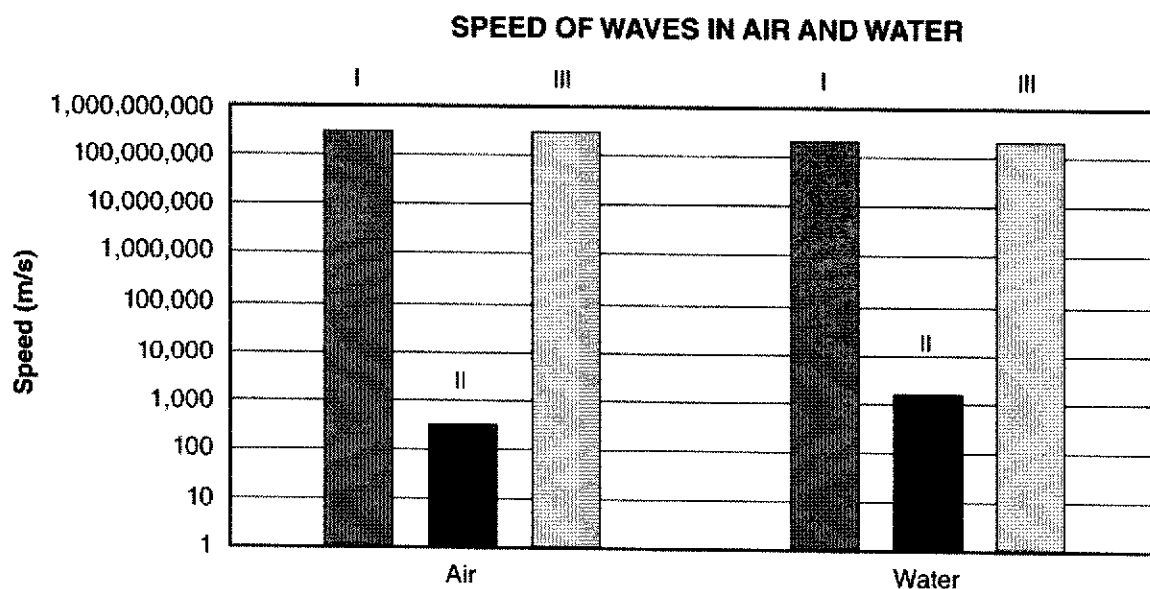
SPEED OF SOUND

| Substance | Speed of Sound (meters/second) |
|-------------|--------------------------------|
| Air at 20°C | 343 |
| Lead | 1210 |
| Glass | 4540 |
| Aluminum | 6320 |

What conclusion can you make from the data in this table?

- A. Metals conduct sound waves better than air.
 - B. Metals are the best conductors of sound waves.
 - C. Sound waves travel through all metals at the same speed.
 - D. Sound waves travel through aluminum twice as fast as they do through lead.
- _____ 86. In 1947, pilot Chuck Yeager became the first person in an airplane to fly faster than the speed of sound. He flew his plane about 12,000 meters above sea level. At that altitude, the speed of sound travels at 290 meters/second. At sea level, the speed of sound is about 340 meters/second. What conclusion can you make from this information?
- A. The speed of sound does not depend on altitude.
 - B. The speed of sound depends on the type of plane flown.
 - C. As the altitude increases, the speed of sound increases.
 - D. As the altitude increases, the speed of sound decreases.

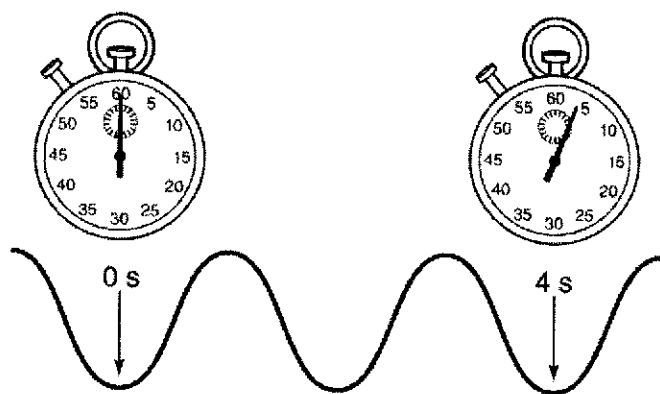
87. The graph below shows the speed of waves through various substances.



Notice the bars labeled I and III. What kinds of substances are these **most likely** to be?

- A. gases
- B. liquids
- C. solids
- D. vapors

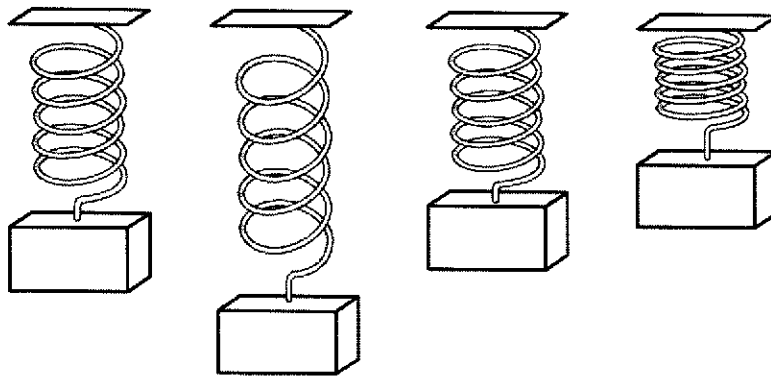
88. The diagram below shows the speed of a wave.



Assume that the waves in this diagram are traveling through a liquid. How would this diagram change if these waves were traveling through a solid?

- A. The diagram would show two waves between 0 s and 4 s.
- B. The diagram would show only one wave between 0 s and 4 s.
- C. The diagram would not show any waves between 0 s and 4 s.
- D. The diagram would show more than two waves between 0 s and 4 s.

89. The water in Mario's swimming pool absorbs energy as heat during the day. Which of the following would the water in the pool be **most likely** to do?
- A. condense
 - B. evaporate
 - C. freeze
 - D. melt
90. In her kitchen, Greta prepares breakfast and performs some chores to start her day. Which of the following examples of water gaining heat energy does she observe?
- A. water in a kettle boiling to produce steam
 - B. water in a glass decreasing in temperature
 - C. water in an ice cube tray freezing to form ice
 - D. water vapor condensing on the leaf of a window plant
91. During a science experiment, students compress four springs and then release them.



Position 1

Position 2

Position 3

Position 4

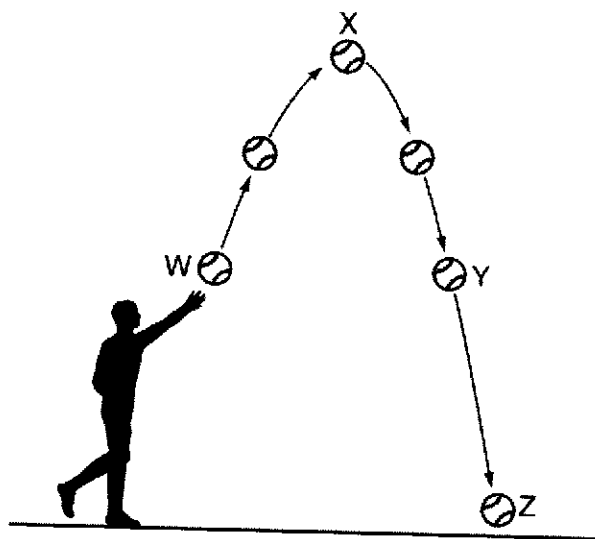
In which position would the greatest conversion of elastic energy to kinetic energy occur when the spring is released?

- A. Position 1
 - B. Position 2
 - C. Position 3
 - D. Position 4
92. Juan serves a tennis ball. He throws the tennis ball into the air and hits it with his racket when it reaches its highest point. Once he hits the ball, it moves forward and downward, eventually hitting the ground after it goes over the net. At which point is kinetic energy converted to gravitational potential energy?
- A. just before Juan throws the ball
 - B. just after Juan throws the ball into the air
 - C. just after Juan hits the tennis ball
 - D. just before the tennis ball hits the ground

Name: _____

ID: A

93. Peyton throws a baseball at practice. As the baseball travels in the path shown below, energy is converted from kinetic energy to potential energy and from potential energy to kinetic energy.

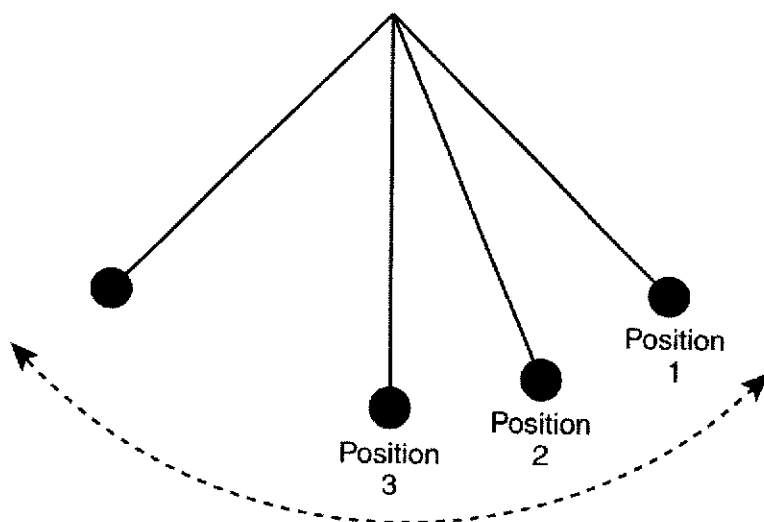


- At which point is the kinetic energy of the baseball at its minimum?
- A. point W
 - B. point X
 - C. point Y
 - D. point Z
94. Malik learns that in a chemical reaction, the chemical energy of the products is less than the chemical energy of the reactants. To which form is the chemical energy of the reactants most likely converted?
- A. heat
 - B. light
 - C. mass
 - D. sound
95. Tamara rides a roller coaster car downward from its highest point. What happens to the potential energy of the roller coaster car as it moves?
- A. It is destroyed and lost.
 - B. It remains at the same level.
 - C. It is converted to kinetic energy.
 - D. It increases as height decreases.

Name: _____

ID: A

- ____ 96. Xavier draws this diagram to show the path of a pendulum.



Which of the following describes the energy transformation that occurs as the pendulum swings from Position 1 to Position 3?

- A. kinetic energy to elastic potential energy
 - B. elastic potential energy to kinetic energy
 - C. kinetic energy to gravitational potential energy
 - D. gravitational potential energy to kinetic energy
- ____ 97. Myra places two objects in contact. One object is warmer than the other object. Which type of heat transfer is she **most likely** testing?
- A. conduction
 - B. convection
 - C. insulation
 - D. radiation
- ____ 98. Kirby leaves a beaker of water at 80°C to stand in a room with an air temperature of 20°C . He measures the temperature of the water in the beaker every five minutes. At what temperature will the water temperature stop decreasing?
- A. 0°C
 - B. 20°C
 - C. 50°C
 - D. 80°C

- _____ 99. Tran places a warm plate with a temperature of 60°C on a bench that is at a temperature of 25°C . After an hour, the plate and the bench are at the same temperature. Which of the following best describes what occurs during the hour?
- A. The temperature of the plate stays the same, while the temperature of the bench increases to 60°C .
 - B. The temperature of the bench stays the same, while the temperature of the plate decreases to 25°C .
 - C. The temperature of the plate and the bench both decrease until they reach a temperature of 0°C .
 - D. The temperature of the plate decreases to 30°C , while the temperature of the bench increases to 30°C .
- _____ 100. Anna places a pot of water on a stove to make some tea for her grandmother. Water at the bottom of the pot is heated. This water moves to the top of the pot, while cooler water moves downward. This process continues and causes the temperature of all the water in the pot to increase. Which method of heat transfer describes this process?
- A. conduction
 - B. convection
 - C. evaporation
 - D. radiation