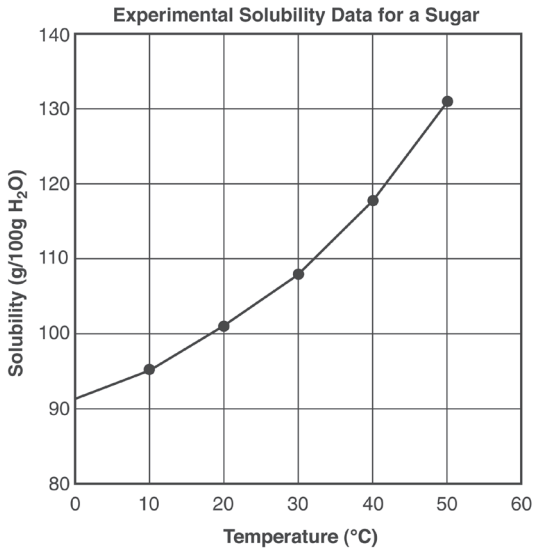
Name _____ Date_____ Class_____

SCREENING TEST 3

Directions: *Use the graph below to answer questions 1 and 2.*



1. A student conducted an experiment on the solubility of a sugar in water. The graph shows her results. Which inference can logically be made from the data?

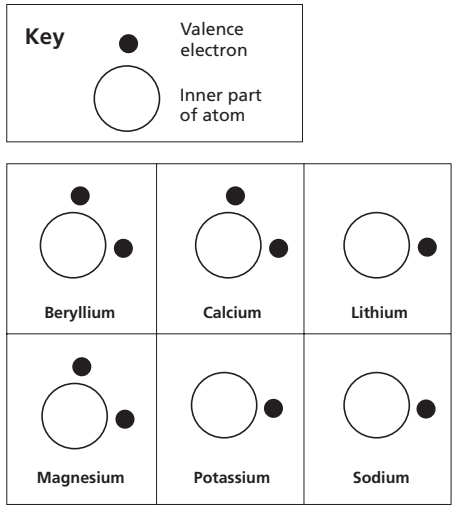
A The solubility of sugar increases with temperature.
B The solubility of sugar decreases with temperature.
C The temperature increases as sugar is added to the solution.
D The solution must be heated to 50°C before any sugar dissolves.

2. Using the graph, which of the following is the most logical prediction for the solubility of sugar at temperatures above 50°C?

A The solubility will be constant.
B The solubility will increase.
C The solubility will decrease.
D The solubility will be zero.

Directions: *Use the diagram below to answer question 3.*

3. More than 80 metals are found in nature. Metals can be classified by their atomic structure. The diagrams of six metals show their valence electrons, the electrons farther from the nucleus. Based on the structures shown, which way of classifying the metals would be the most useful?

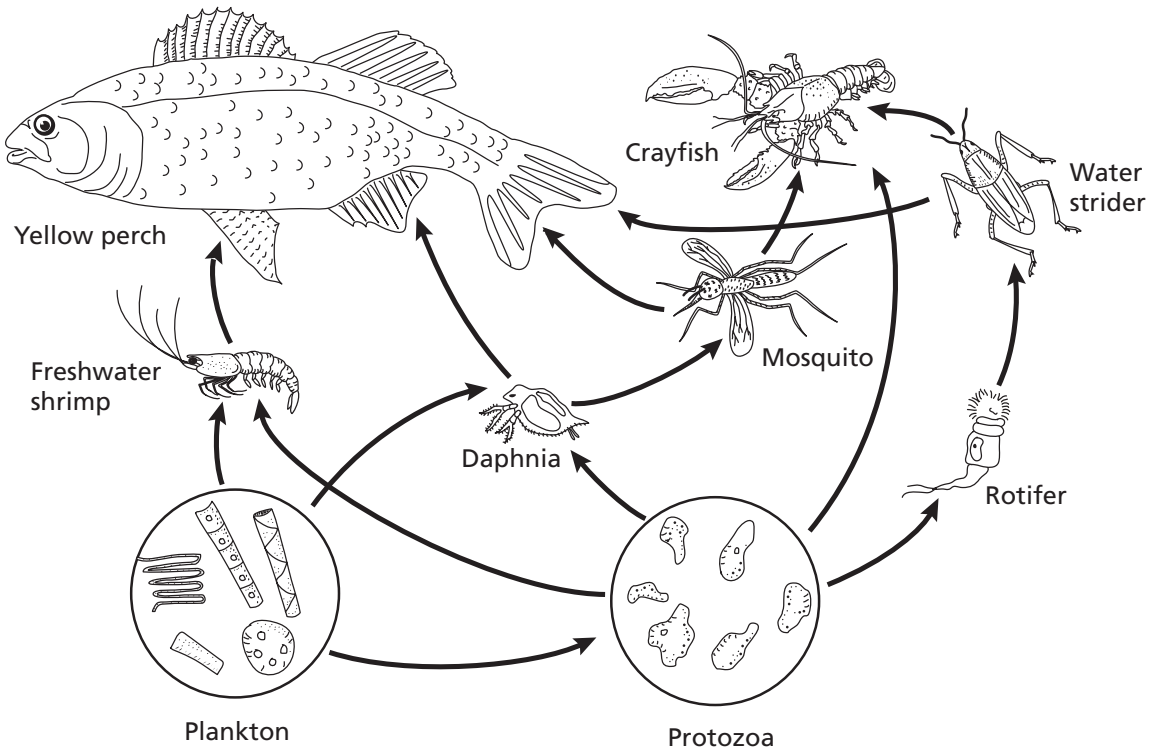


A Use 6 groups, one group per metal.
B Use 1 group containing six metals.
C Use 2 groups, one having a single valence electron, and the other having two valence electrons.
D Use 3 groups: metals, nonmetals, and metalloids.

GO ON

SCREENING TEST 3 *(continued)*

Directions: *Use the diagram below to answer questions 4 and 5.*



4. The diagram shows a model of a freshwater food web. Which statement correctly describes what the model shows?

A The food web shows all the things that live in or near a freshwater pond.

B Decomposers are not needed in this food web.

C The arrows flow from the living thing that is eaten to the living thing(s) that eat it.

D The model is a three-dimensional model because it shows producers, first-level consumers, and higher-level consumers.

5. Which of the following statements is a quantitative observation you can make about the organisms in the diagram?

A Freshwater food webs typically involve nine different types of organisms.

B Water striders prey on crayfish.

C The only fish living in freshwater is yellow perch.

D A mosquito has three pairs of legs and one pair of wings.

SCREENING TEST 3 *(continued)*

Directions: *Use the table below to answer questions 6 and 7.*

Household Water Usage	
Activity	**Water Used (L)**
Taking shower	50–77
Taking bath	96–116
Washing hands	4–8
Flushing toilet	19–27
Brushing teeth	19–39
Washing dishes by hand	20–77
Automatic dishwasher	27–58

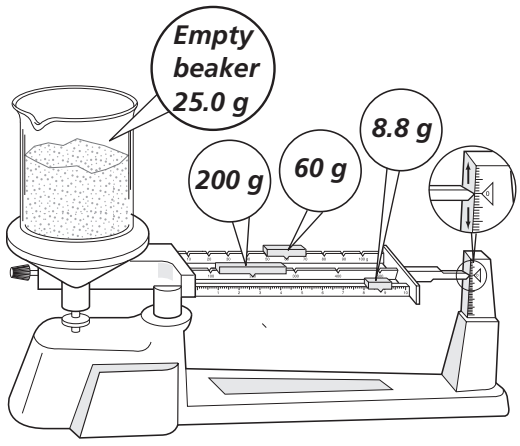
6. The table shows the results of a survey of home water usage. You are asked to reorganize the data so that they are easier to understand. Which would be the best way to change the table?

A There is no better way to arrange the information.
B Reorganize the activities in order of the amount of water usage, from highest to lowest.
C Retitle the table "What You Need to Know about Water Usage."
D Alphabetize the activities.

7. Which type of graph would best display the data in the table?

A a bar graph, because the data are made of separate but related categories
B a bar graph, because that graph will show percentages
C a line graph, because differences in the responding variable (water usage) depend on differences in the type of activity
D a line graph, because you can make inferences about values that lie between those that were measured

Directions: *Use the diagram below to answer question 8.*



8. Which statement below accurately describes the mass of the solid in the diagram?

A 268.8 g
B 200 g
C 243.8 g
D There is no way to find the mass of the solid using this information.

9. While hiking in a mountainous area, you find a fish fossil in exposed sedimentary rock. Which of the following is the most logical inference based on your find?

A The fish was dropped by a bird that flew by in ancient times.
B The rock layer was once the bottom of a lake.
C In ancient times, fish lived on dry land.
D There is no logical explanation.

GO ON

SCREENING TEST 3 *(continued)*

Directions: *Use the information below to answer question 10.*

Questions About the Sun

a. What materials are present in the sun?

b. How much money can we save by using solar energy?

c. What is the distance between the Earth and the sun?

d. Will the sun ever run out of energy?

10. Read the four questions about the sun. Which of those questions are scientific questions?

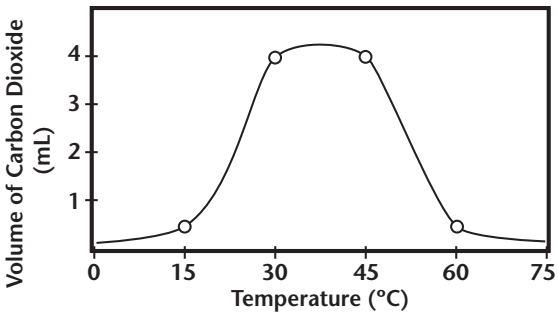
A all four questions
B only questions "a" and "c"
C only questions "b" and "d"
D only questions "a," "c," and "d"

11. Heat is the movement of thermal energy from a warmer substance to a cooler substance. Which of the following statements is a testable hypothesis for investigating whether heat has been transferred?

A If heat is transferred, one material will decrease in temperature, and another material will increase in temperature.
B Temperature measures the average kinetic energy of the particles in a material, so you need to record the temperature of all materials you study.
C Heat can be transferred by the movements of currents in a fluid, such as water boiling in a pot.
D If heat is transferred, good conductors such as metals or floor tiles must be involved, and they will show a change of temperature.

Directions: *Use the graph below to answer question 12.*

12. A scientist studying yeast, a single-celled fungus, produced the following graph:



From the graph, which is most likely the manipulated variable in the experiment?

A the number of yeast cells in the sample
B the volume of carbon dioxide produced by the yeast
C the temperature of the yeast
D the length of time each sample was studied

Directions: *Use the information below to answer question 13.*

Finding the Hardest Mineral

To determine which of a group of minerals is the hardest, use each mineral to make a scratch on the other minerals. The mineral that can make a scratch on all the other minerals without being scratched itself is the hardest.

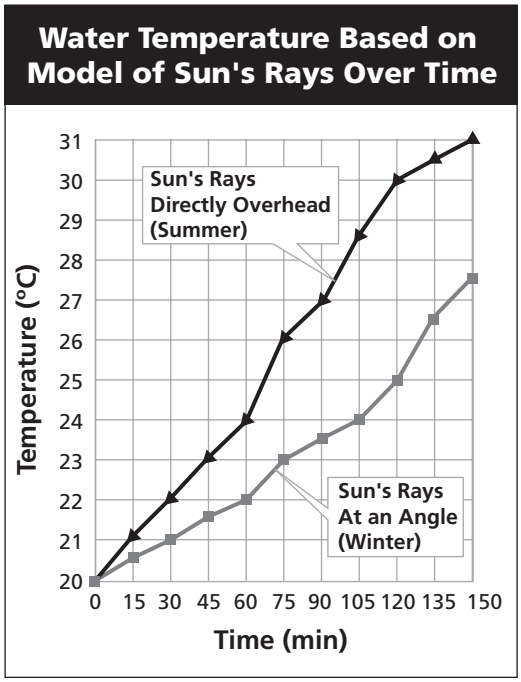
13. The procedure described is an example of a(n)

A controlled variable.
B manipulated variable.
C scientific prediction.
D operational definition.

GO ON

SCREENING TEST 3 *(continued)*

Directions: *Use the graph below to answer questions 14 and 15.*



14. A scientist modeled the position of the sun and its effect on water temperature in winter and summer. She set up two containers of water at 20°C to represent lakes and oceans. To represent the sun, she placed a light bulb 0.5 m above each container of water. To model winter, one light bulb was placed at an angle. To model summer, the other light bulb was placed directly above the water. Every 15 minutes, the scientist recorded the temperature in each container and plotted the results on the graph above. What kind of information does the graph provide?

A how the temperature of water changes over time

B the effects of time on the temperature of water

C how the presence or absence of sunlight affects water temperature

D how increases in water temperature are affected by the angle of the sun

15. Which of the following is the most logical conclusion you can draw from the graph?

A Temperatures in the summer are higher than temperatures in the winter because the water temperatures are different.

B When the amount of light is the same, sunlight that shines directly onto water increases the water temperature more than sunlight that shines at an angle.

C Water temperatures in the summer reach about 30°C, while water temperatures in the winter reach only about 27°C.

D Measurements of 120 minutes or more are necessary to determine how the angle of light affects the temperature of water at different seasons.

16. Suppose you are conducting an experiment to determine which metal(s) conducts electric current best. You decide the manipulated variable will be the type of metal wire used. The responding variable will be the current, measured in amperes. Which of the following variables should be controlled?

A length and width of the metal wires

B cost of the metal wires

C whether the metal wires react with acid

D how rapidly the metal wires react with oxygen

17. What is the first step of the scientific process?

A Gather equipment for an experiment.

B Plan an experiment.

C Make a chart.

D Formulate a testable hypothesis.

SCREENING TEST 3 *(continued)*

18. Of all of the shirts for sale, $\frac{7}{12}$ have white stripes. Which statement *best* represents this fact?

A None of the shirts for sale have white stripes.
B About $\frac{1}{4}$ of the shirts for sale have white stripes.
C About $\frac{1}{2}$ of the shirts for sale have white stripes.
D All of the shirts for sale have white stripes.

19. Rosa ran a 100-meter race in 14.74 seconds. Kylie ran the same race in 16.01 seconds. How much faster did Rosa run the race than Kylie?

A 1.17 seconds
B 1.27 seconds
C 2.17 seconds
D 2.27 seconds

20. Which number is a factor of 412?

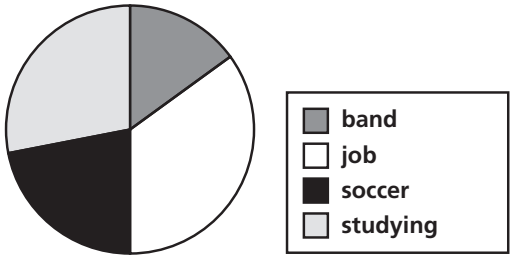
A 32
B 91
C 103
D 113

21. One side of a coin is heads and the other side is tails. When a coin is tossed 100 times, it will land on tails

A about 50 times.
B about 100 times.
C about 25 times.
D about 75 times.

22. On which activity did Carlos spend the most time?

Time Spent on After-School Activities



A band
B job
C soccer
D studying

23. An accountant drives 37 kilometers a day round-trip to and from work. Which expression represents the total number of kilometers she has driven after x days?

A $37x$
B $37 \div x$
C $x - 37$
D $x + 37x$

24. A poster lists the average masses of common objects. Which mass would most likely be given in kilograms?

A a paperclip
B a dragonfly
C a young child
D an orange