

Directions: Answer the following question(s).

- 1 Suppose you made a hypothesis that robins migrate sooner than swallows. What would be your next step to determine if this is true?
- A. form questions about robin and swallow migration behavior
  - B. make observations about robin and swallow migration behavior
  - C. analyze the results of robin and swallow migration behavior
  - D. make a conclusion determining which bird migrates sooner
- 2 Which step of the scientific method is the same as "making an educated guess?"
- A. forming a hypothesis
  - B. asking a question
  - C. analyzing results
  - D. drawing conclusions
- 3 During a scientific experiment, what step comes after formulating a question?
- A. making observations
  - B. drawing conclusions
  - C. analyzing results
  - D. forming a hypothesis
- 4 As they were studying photosynthesis in plants, a group of students wondered how much oxygen is produced by plants. To help them with their investigation, their teacher, Mrs. Ramirez, tells the students about an underwater plant called Elodea that produces oxygen through photosynthesis. Mrs. Ramirez also offers the students the school's dissolved oxygen meter that can be used to measure the amount of oxygen in the water.

The students developed the following procedure for the investigation:

1. Measure the amount of oxygen in a 5 gallon tank of water using the dissolved oxygen meter
2. Place a single Elodea plant in the 5 gallon tank of water
3. \_\_\_\_\_
4. Record oxygen measurements and observations every 10 minutes for 2 hours

Which of the following best completes the missing step #3 in the procedure?

- A. Measure the amount of oxygen in the tank after 10 minutes using the dissolved oxygen meter
- B. Seal the 5 gallon tank of water and make sure that it is placed in a cool, dark place
- C. Remove the single Elodea plant from the 5 gallon tank and measure the amount of oxygen left in the tank
- D. Slowly remove oxygen from the tank using the dissolved oxygen meter every 10 minutes

Directions: Answer the following question(s).

- 5 A power plant near the coastline in California uses seawater to cool itself, and pumps the warmed seawater into the ocean. Hiram wonders whether the warm seawater has an effect on the ocean life in the area.

Hiram thinks that the shellfish in the area might have thicker, heavier shells due to the warm seawater. Which of these sets of items would BEST be used to investigate this question?

- A. graduated cylinder, spring scales, microscope, scuba diving equipment, and sample boxes
- B. triple beam balance, sample boxes, microscope, nets, and scuba diving equipment
- C. topographical maps, star charts, calculator, nets, field guides, and spring scales
- D. triple beam balance, topographical maps, microscope, cover slips, and a rock hammer

- 6 A power plant near the coastline in California uses seawater to cool itself, and pumps the warmed seawater into the ocean. Hiram wonders whether the warm seawater has an effect on the ocean life in the area.

Hiram wants to analyze samples of the water to find out if a greater amount of algae is growing in the warmer water. Which of these groups of items would be the MOST useful for Hiram's investigation?

- A. sample jars, microscope, slides, cover slips, boat, and life vests
- B. telescope, slides, topographical maps, boat, sample jars, and life vests
- C. microscope, slides, cover slips, spring scale, flashlight, and an eyedropper
- D. slides, topographical maps, calculator, boat, and a triple beam balance

- 7 Dillon was testing the effects of temperature on elastic. Dillon wrote in his report "After conducting many tests, I found that the elasticity of elastic is not affected by cold temperatures".

What part of the lab report should this statement go under?

- A. hypothesis
- B. observations
- C. conclusion
- D. procedure

- 8 Paul is growing ferns for his science experiment. He is giving half of the ferns water and half of the ferns soda. What should his hypothesis be about?

- A. which of the ferns will grow better
- B. how much soda or water he will give the ferns
- C. why ferns grow better in the sunlight
- D. why soda tastes better than water

Directions: Answer the following question(s).

9 Which of the following is a good way to develop a hypothesis?

- A. Ask a question about a phenomenon and try to answer it.
- B. Observe a phenomenon and try to explain it.
- C. Both A and B
- D. None of the-above

10 Fossil bones and teeth of dinosaurs have been researched for the last century. Recent discoveries of fossilized dinosaurs have also revealed details of soft tissues, such as skin. Which is BEST for a scientist to do when reporting research on dinosaurs now?

- A. exclude research on teeth or bones
- B. predict what the next discovery will be
- C. analyze new data as it becomes available
- D. delete earlier reports that were missing the new findings

11 What safety equipment should be taken on all field trips?

- A. gloves
- B. fire extinguisher
- C. first-aid kit
- D. goggles

Directions: Answer the following question(s).

12 Which picture shows the safest way to detect an odor produced during an investigation?

A.



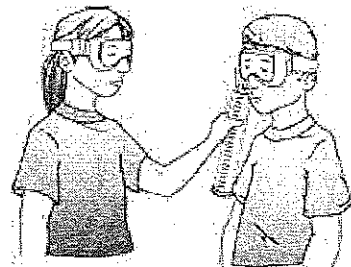
B.



C.



D.



13 Two inventors from different labs are each trying to develop a better stain remover. During their investigations, which of these is **MOST** important for the inventors to do?

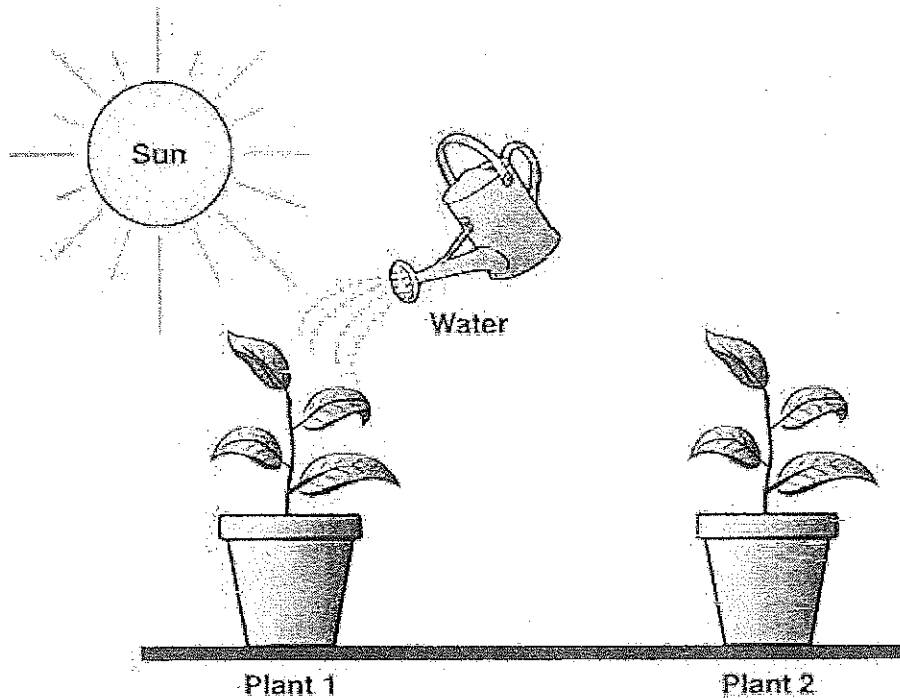
- A. One inventor should copy the design of the other.
- B. One inventor should perform half of the procedure for the other.
- C. Each inventor should write down the procedure so it can be repeated.
- D. Each inventor should follow the same process so they get the same results.

Directions: Answer the following question(s).

- 14 What must happen in order for scientific data to be verified through repetition?
- A. Accurate records must be kept.
  - B. Modern technology must be used.
  - C. Investigations must be conducted by trained scientists.
  - D. Observations must be made by more than one scientist.
- 15 Sarah wants to know what will happen when water is added to bean seeds. She puts five bean seeds and a wet paper towel in a clear, plastic bag. She tapes the bag to a window so the beans will get sunlight. To get accurate results, which should Sarah do each morning when she observes the bag of beans?
- A. plan what she will do in the investigation
  - B. guess how much the beans have grown
  - C. write down what she sees in the bag
  - D. add more beans to the bag
- 16 A class learns about weather. The students in the class measure the outside air temperature at the same time each day. Which way of measuring the temperature would provide the MOST accurate data?
- A. taking the measurement in the shade
  - B. taking measurements with one thermometer
  - C. taking a measurement using a different tool each day
  - D. recording the measurements from three thermometers
- 17 John is investigating if ants will eat crackers. He puts ants and sand in a clear plastic jar. John puts tiny pieces of crackers on top of the sand. He plans to observe the ants at the same time each day for a week. To perform the investigation correctly, which should John do each time he observes the ants in the jar?
- A. add more cracker pieces to the jar
  - B. write down what the ants are doing
  - C. guess how much the ants have eaten
  - D. plan what he will do next in the investigation
- 18 Which statement about scientific hypotheses is true?
- A. Hypotheses are guesses that are not based on knowledge.
  - B. Hypotheses should be made after the investigation is completed.
  - C. If hypotheses are not supported, the experimental results are still useful.
  - D. If hypotheses fail, the experiment should be repeated to get a different result.

Directions: Answer the following question(s).

- 19 Michelle performed an investigation but the results did not match her hypothesis. What should Michelle do next?
- A. perform the investigation in a different way
  - B. change the hypothesis to match the results
  - C. choose a different investigation
  - D. repeat the investigation
- 20 A student set up an investigation to study the growth of two plants. The plants are placed next to each other in the sunlight. Plant 1 is watered everyday while Plant 2 is never watered.



Which question is the student MOST likely trying to answer in this investigation?

- A. How does adding fertilizer affect plant growth?
- B. How do plants change the soil around them?
- C. How does not watering a plant affect its growth?
- D. How do plants follow the daily path of the Sun?

Directions: Answer the following question(s).

- 21 Students dropped marbles into the center of a pan of flour and measured how far from the center the flour spread. Their results are shown in the table.

**Class Investigation**

Distance Flour Spread			
Mass of Marble	Trial 1	Trial 2	Trial 3
2 g marble	25 cm		
4 g marble		35 cm	
6 g marble			44 cm

Based on the table, which statement is the MOST likely reason the students are getting different results for each drop?

- A. The students made a mistake in measuring.
- B. Different-sized marbles were used in each trial.
- C. Similar amounts of flour were used in each trial.
- D. The marbles were dropped from different heights.

- 22 Which step should be performed first in a scientific investigation?

- A. ask a question
- B. prepare a conclusion
- C. conduct the experiment
- D. choose the correct equipment

- 23 What safety procedure should a student follow when a thermometer is broken during a lab experiment?

- A. tell the teacher immediately
- B. stop the experiment immediately
- C. sweep the glass into a biohazard container
- D. use a paper towel to pick up the pieces

- 24 A container tips over and liquid spills on the work surface during a laboratory exercise. What should the student do first?

- A. notify the teacher
- B. wipe up the spill
- C. tell a classmate
- D. call the janitor

Directions: Answer the following question(s).

- 25 The table shows data for four energy bars.

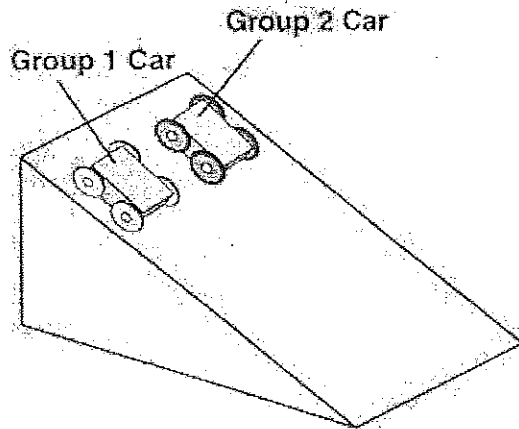
Energy Bar Data

Energy Bar	Number of Calories	Weight of Bar
1	250	140 grams
2	175	85 grams
3	325	115 grams
4	400	170 grams

Which energy bar has the greatest number of calories per gram?

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

- 26 Two groups of students made toy cars. Group 1 used cardboard wheels. Group 2 used cardboard wheels wrapped with rubber bands. They rolled their cars down a ramp to see which car would travel the farthest.



After one trial, the Group 2 Car traveled farther than the Group 1 Car. Which activity would MOST support their results?

- A. rolling the cars down the ramp three more times
- B. measuring the time it takes for the cars to stop
- C. racing more cars with different wheels
- D. making the ramp higher