

Life & Environmental Science 11
Science Processes

Name:
Block:
Date:

Key

To answer questions 1-4, closely observe the garden pictured below.

1. What observations can you make about the flowers on the east end of the garden?

taller

2. What observations can you make about the flowers on the northwest side of the garden?

dead

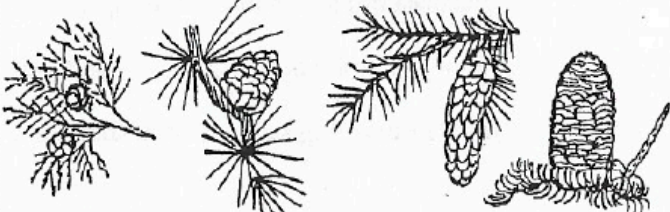

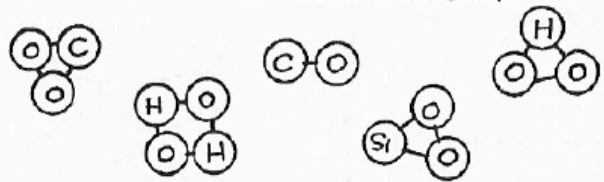
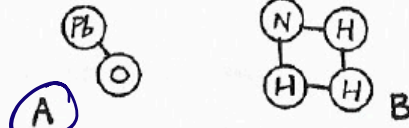

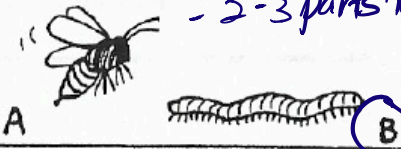
3. What observations can you make about the flowers on the southwest side of the garden?

Shorter, alive

4. State a hypothesis that could explain the differences you observe.

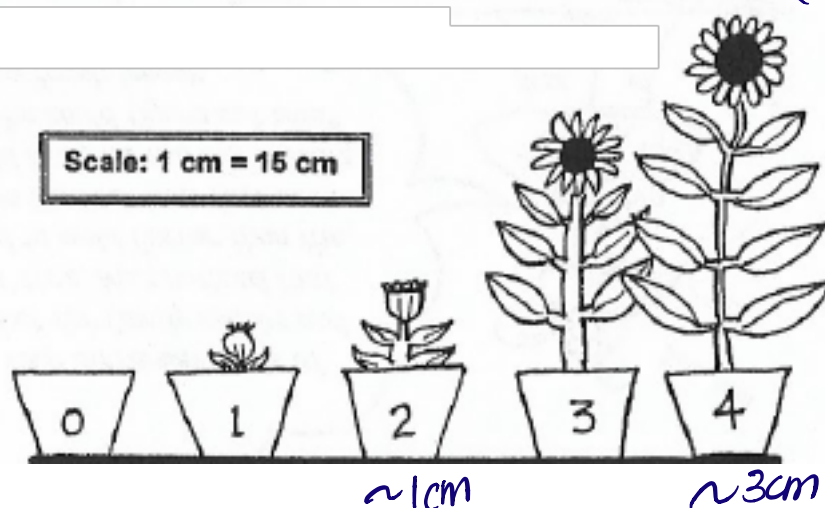
If plants are planted away from the shade of the fence then they will grow taller because they get more sunlight for photosynthesis.



<p>5. Look at the organisms in this group.</p> 	<p>Circle the organism that belongs in the group to the left.</p> 
<p>6. Look at the molecules in this group.</p> 	<p>Circle the one that belongs in the group to the left.</p> 
<p>7. Look at the organisms in this group.</p> 	<p>Circle the organism that does <u>NOT</u> belong in the group to the left.</p>  <p><i>- 2-3 parts to body</i></p>

Use the plant diagram below to answer questions 8-10. Use a centimeter ruler for your measurements.

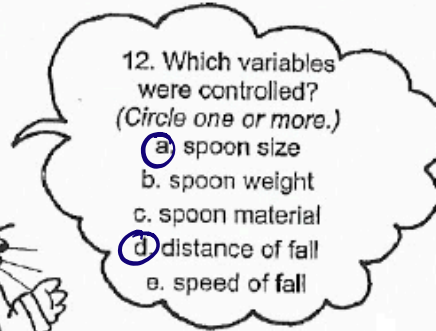
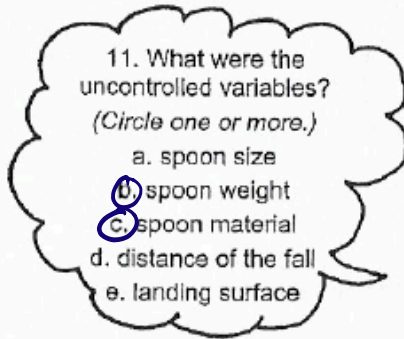
8. The plant grew about 30 centimeters between week 0 and week 3.
9. What was the total growth shown over the 4 weeks? 45cm (3cm x 15)
10. How much growth occurred between weeks 2 and 4? ~30cm (45-15)



In Miss Parsnip's science class one day, a rowdy student grabbed a paperweight and a marker off a desk and dropped them out the second story window. He laughed as he watched the objects fall. Much to his surprise, both the objects seemed to hit the ground at the same time.

His friends didn't believe him. They thought the paperweight would certainly fall much faster than the marker, so they decided to do an experiment.

They found two large spoons of exactly the same size and shape. One was made of wood, and weighed 75 grams. The other was made of metal, and weighed 350 grams. They dropped each spoon 5 times, using a stopwatch to time its fall. They calculated an average time for each spoon. In the end, the two spoons had an average fall time that was just hundredths of a second apart.



13. How would you interpret the results of the experiment?

Spoons fell at the same time due to gravity

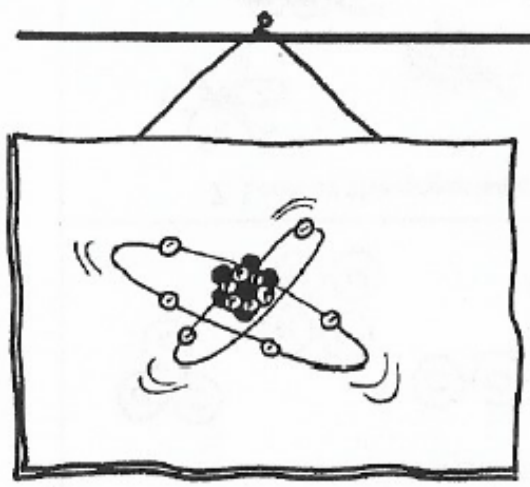
14. If the students also timed the fall of a heavy plastic spoon (of exactly the same size and shape) weighing 200 grams, what results do you predict that they would find?

results would be similar

At Max's house, four different kinds of bread were kept in a basket for family snacks and meals. Over a few weeks' time, Max noticed that one kind of bread seemed to mold faster than the other kinds. He wanted to find out how fast each kind got moldy, so he could examine the ingredients in the breads and see if he could figure out what kept some bread fresh longer.



15. When Max designs his experiment, which factors are important for him to include in his plan? (Circle one or more)
- a. Start with four kinds of fresh bread, all baked the same day.
 - b. Store all kinds of bread in the same kind of container.
 - c. Look at the bread everyday and record observations.
 - d. Keep all kinds of bread stored at the same temperature.
 - e. Make sure each piece of bread is exactly the same size.
 - f. Keep notes about the taste of each kind of bread.



This is a model of one molecule of an element. Use the model for questions 16-20. (Note: all neutrons, protons, and electrons are showing in the drawing. None are hidden from the eye.)

16. How many electrons does this element have? 6
17. How many protons does this element have? 6

(# protons = # electrons)

18. How many neutrons does this element have?
19. How many electrons are in the second level?
20. What is the atomic number of this element?

6

4 (outer shell)

6

Match the science terms with their descriptions. Write a letter for each answer.

A. **OBSERVATION**

B. **LAW**

C. **theory**

D. *scientific record*

E. **model**

F. *problem*

G. **DATA**

H. **hypothesis**

I. **control**

J. *inference*

K. *conclusion*

L. **MASS**

M. **variable**

N. *procedure*

O. *experiment*

21. L the amount of matter in an object

22. O a series of steps used to test a hypothesis under carefully controlled conditions

23. H a suggested solution to a problem

24. K a logical answer to a problem based on observations

25. M something that can bring about changes in an experiment

26. C an explanation of things or events (based on many observations)

27. E an example of what might be seen if something could be observed

28. N the way an experiment is carried out

29. I a standard for comparison in an experiment

30. J the meaning drawn from a conclusion

31. G recorded facts or measurements gathered from an experiment

32. A the things noticed by your senses

33. B a statement that describes the way nature works (based on many observations)



34. Which is an example of a scientific law?

- a. Energy is neither created nor destroyed.
- b. Dinosaurs disappeared from Earth because of a drastic climate change.
- c. The universe began 15 billion years ago in a huge explosion called "The Bing Bang."

35. Which is an example of a scientific theory?

- a. Ice melts when it is heated.
- b. On Earth, an object that is dropped falls to the ground.
- c. The surface of Earth is made of rigid plates that move.

36. What would cause a scientific law or theory to be dropped?

evidence disproves it

37. Why is it important for scientists to repeat experiments?

to ensure the same results and conclusion is drawn

38. Why is it important to have a control in an experiment?

make sure no other thing impacts results

39. Why should a scientist test only one variable at a time?

so we know what actually caused the results

SCIENCE SAFETY

- A. Get permission before doing an experiment.
- B. Keep safety goggles nearby in case you need them. *on.*
- C. Never eat or drink in a science lab.
- D. Wash off any spilled chemicals immediately.
- E. *Don't* Always slant test tubes towards you so you can see what's going on in them.
- F. Do not touch chemicals with your bare hands.
- G. *Don't* Taste substances that you think are safe.
- H. Keep a fire extinguisher and first aid kit nearby.
- I. If your clothing catches on fire, run out of the room. *stop, drop, roll*

40. A science student wrote up some rules for his science lab. Read them over. Cross out any that he has written totally or partially wrong.



Observations, Inference, Hypothesis Worksheet

1. Three goldfish are raised individually and grow to be a larger size than when raised in a group.

a. What can you observe about the above situation?

size, growth of the goldfish

b. What can you infer about the above situation?

When they are kept individually, they eat more food therefore they will grow larger. (no competition)

c. What hypothesis can you state above the above situation?

If the goldfish are raised individually then they will get larger because they will eat more food.

2. You observe that when a small amount of baking soda is added to a glass of water, gas bubbles form in the mixture and move to the surface.

a. What can you observe about the above situation?

There are bubbles formed and move to the surface.

b. What can you infer about the above situation?

Chemical reaction forms, producing CO_2

c. What hypothesis can you state above the above situation?

If baking soda is added to water, then bubbles will form because CO_2 gets trapped as it moves up.

3. A survey reveals that people who live within a 5 km radius of a chemical plant have a higher incidence of lung disease than people who live outside that area.

a. What can you observe about the above situation?

How many people get sick in a 5km radius and outside of the radius.

b. What can you infer about the above situation?

people who are within 5km of powerplant will get lung disease.

c. What hypothesis can you state above the above situation?

If you live within 5km of powerplant, then you will have lung disease because of the chemicals given off from the powerplant.