

Guided Reading Chapter 2 Sections 1 & 2

1. What is inquiry?
2. Draw figure 2.1 on page 58.
3. For a theory to be accepted as true, it must meet three important criteria. Name these criteria.
4. Scientific evidence includes numbers, tables, graphs, words, pictures, and _____
_____.
5. Scientific evidence must be objective and _____.
6. What does it mean to say that data is objective?
7. A _____ theory is an explanation supported by much evidence over a long period of time that attempts to describe a natural law.
 - a) scientific
 - b) ordinary
 - c) human
8. Scientists _____ by coming up with a possible explanation that can be **tested** by comparing scientific evidence. Usually, the first few attempts are rarely correct and need modification as time passes.
9. Generally speaking, what is the scientific method?
10. An _____ is a situation that is set up to analyze the relationships between variables.
11. When experimenting, it is important to change _____ variable(s) at a time.
 - a) two
 - b) one
 - c) all

12. Explain the difference between the experimental variable and the control variable in an experiment.
13. A _____ is the number of times an experiment is tried.
- a) control b) procedure c) trial
14. Your _____ is the manner in which you perform the experiment; the step by step collection of techniques you use to do an experiment.
- a) procedure b) experimental technique c) trial
15. "What happens to the speed of a car if I release it down a ramp at different angles?" pertains to what aspect of the scientific method process?
16. "The car seems to go faster when I change the angle of the ramp." is a statement based on experimentation, and pertains to what aspect of the scientific method process?
17. Creating a data table of information during an experiment is an important part of what part of the scientific process?
18. Who was Michael Faraday and what important experiment is he famous for conducting?
19. What did NASA scientists want to know about Earth in their 1996 mission STS-75?
20. How long was the cable that was used in the NASA experiment, and how fast was the cable dragged?

Teachers Guide

1. Inquiry is learning by asking questions, and solving problems through seeking answers to the questions.
- 2.



Figure 2.1: *The steps in learning through inquiry.*

3. The three criteria a theory must meet are; 1) there must be enough scientific evidence to support the theory, 2) not one piece of the evidence can contradict the theory, and 3) it must be a unique idea.
4. Sound recordings
5. Repeatable
6. When data is objective, it describes only what actually happened, exactly.
7. A, Scientific
8. Hypothesize
9. The scientific method is a logical, learning process that scientists use to solve problems by making hypotheses and revising them, as necessary, as ideas are compared with scientific evidence.
10. Experiment
11. B, one
12. The experimental variable is the variable that the experimenter varies during the experiment. The control variable is the variable that remains constant during experimenting.
13. C, trial
14. A, procedure
15. The part of the scientific process that pertains to the posed problem is an initial **question** that can be answered by experimenting with the car and ramp.

16. The part of the scientific process that pertains to the statement made by the experimenter is an initial **conclusion** based on the results of the experiment. Other trials should be made to confirm the results of the initial experiment.
17. Creating a data table is an important part of the formal lab report in communicating your results to other scientists.
18. Michael Faraday was a British scientist who experimented with electricity and magnetism. He wanted to know how the two were related and conducted an experiment where a magnet was moved through a wire and an electrical current was produced.
19. NASA scientists wanted to know if Faraday's electromagnetic experiment would also work in space.
20. The cable used in the NASA experiment was over 20 km and was dragged through Earth's magnetic field at a minimum speed of 15,000 mph.