

**Section 1 What is science?**

- A. **Science**—a way or a process used to investigate what is happening around you
1. Scientists observe, investigate, and experiment to find answers.
  2. Scientists also use prior experience to predict what will occur in investigations.
  3. Technology is the application of science to make products or tools that people can use.
- B. **Communication in science**
1. Thousands of scientific journals and magazines report the results and conclusions of experiments every year.
  2. You can also keep scientific data and results in a Science Journal.

**Discussion Question**

Why might it be important to keep a Science Journal? *Scientists usually need to repeat experiments and all the conditions must be the same. Describing the experiment in your Science Journal can help you repeat the experiment. Also, you can write down results, problems, and questions for future consideration.*

## Section 2 Doing Science

- A. **Scientific methods**—ways, or steps to follow, to solve problems
- B. **Descriptive research**—answering a scientific question by making observations about the question
1. State the research objective.
  2. Describe the research design, or how you will carry out your investigation.
  3. Eliminate bias, or expected results.
  4. Select the best materials for the investigation.
    - a. A **model** represents things that happen too slowly, too quickly, or are too big, small, dangerous or expensive to observe directly.
    - b. Scientists around the world use a system of measurements called the International System of Units to make observations.
  5. Design data tables, or ways to accurately record results and observations.
  6. Analyze your data and figure out what your results mean.
  7. Draw conclusions.
- C. **Experimental research design**—answering a scientific question by observation of a controlled situation
1. Form a **hypothesis**, which is a prediction that can be tested.
  2. Plan the experiment.
    - a. **Independent variable**—the factor in the experiment that is changed
    - b. **Dependent variable**—the factor in the experiment that is being measured
    - c. **Constants**—variables that stay the same
  3. Use a **control**—a sample that is treated like the other experimental groups except that the independent variable is not applied to it.
  4. Conduct several trials of the experiment.
  5. Analyze your results and draw conclusions.

**Discussion Question**

Why is it important to have a control sample when conducting experimental research?  
*In order to say that an independent variable caused a change, you must know that, in its absence, the change would not have occurred anyway.*

END



Underlined words and phrases are to be filled in by students on the Note-taking Worksheet.

## Section 3 Science and Technology

- A. Scientific discoveries lead to new products that influence your lifestyle.
1. Entertainment
  2. Convenience
  3. Health
- B. Science provides information that people use to make decisions.
- C. However, science cannot decide whether the new information is good or harmful, moral or immoral.

### Discussion Question

It is the task of science to answer questions and provide information, but not to decide whether the new information is good or harmful. Can you think of some examples where science has provided information or advancements that people have used in a harmful way? *Examples might include biological weapons, the negative effects of the Internet or television, or people living unnaturally and unhealthfully long lives because of technology.*

END