



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

Section 1 The Methods of Science

A. Science studies natural patterns.

1. Science is classified into three main categories: life science, Earth science, and physical science: sometimes a scientific study will overlap the categories.
2. Science explains the natural world; explanations can change over time.
3. Scientists investigate nature by observation, experimentation, or modeling.

B. Scientific method—organized set of investigation procedures

1. State a problem.
2. Gather information.
3. Form a hypothesis or educated guess based on knowledge and observation.
4. An experiment with variables is a common way to test a hypothesis.
 - a. A dependent variable changes value as other variables change.
 - b. An independent variable is changed to determine how it will affect the dependent variable.
 - c. A variable that does not change when other variables change is a constant.
 - d. A control is the standard to which test results can be compared.
5. Analyze data from an experiment or investigation.
6. Form a conclusion based on the data.
7. Reduce bias by keeping accurate records, using measurable data, and repeating the experiment.

C. Models represent ideas, events, or objects and can be physical or computerized.

D. A theory is an explanation based on many observations and investigations; a scientific law is a statement about something that always seems to be true.

E. Science deals with the natural world; questions of value or emotion cannot be answered.

F. Technology—applied science helping people

Discussion Question

What area of questioning is science restricted to? The natural world

END

**Section 2 Standards of Measurement**

- A. Standard—exact quantity that people agree to use for comparison
- B. Measurements must have a number and a unit.
1. SI—an improved version of the metric system used and understood by scientists worldwide
 2. SI system is based on multiples of 10 and uses prefixes to indicate a specific multiple.
- C. Length is measured using a unit appropriate for the distance between two points.
- D. Volume—the amount of space an object occupies
- E. Mass—measure of matter in an object
1. Density—mass per unit volume of a material
 2. A unit obtained by combining different SI units is called a derived unit.
- F. Time is the interval between two events; temperature is measured using a thermometer.

Discussion Question

What is the SI measurement system? An improved version of the metric system used by scientists worldwide



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Section 3 Communicating with Graphs

- A. Graph—visual display of information or data that is used to detect patterns
- B. A line graph shows a relationship where the dependent variable changes due to a change in the independent variable.
 1. The scale should make the graph readable.
 2. The x-axis should always be used for the independent variable.
 3. Units of measurement must be consistent.
- C. Bar graphs compare information collected by counting.
- D. Circle graphs show how a whole is broken into parts.

Discussion Question

What axis should always be used for the independent variable? The x-axis

