

The Nature of Science

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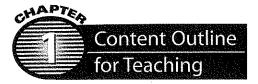
Underlined words and phrases are to be filled in by students on the Note-taking Worksheet

Section 1 How Science Works

- A. Science—process of trying to understand the world
- **B.** Archaeology—branch of science that studies the tools and other cultural remains of humans
 - 1. Tools—could be stone or bone
 - 2. Weapons—for hunting or defense
 - 3. Rock drawings—clues to everyday life
 - 4. Remains of buildings
 - 5. Pottery—whole or shards; can more accurately date culture
- C. <u>Technology</u>—knowledge gained from science used to conduct scientific studies; radar surveys can help study archaeological sites.
- D. Archaeological excavations or digs are important ways of studying a site.
 - 1. As artifacts are found, they are mapped, photographed, registered, and cataloged.
 - 2. In a lab, chemical analysis can help determine the age of artifacts.

Discussion Question.

How are archaeological sites found? Many are accidentally found; some are found through research.



Content Outline The Nature of Science

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Section 2 Scientific Problem Solving

- A. Scientific methods—solving problems using step-by-step procedures
- B. Scientific problem—question without an answer
 - 1. Scientists make observations using their senses.
 - a. What do you see? Did it change?
 - **b.** Is there and odor?
 - c. Did the texture change?
 - 2. Observations lead to <u>inferences</u>—conclusions about observations
- **C.** After identifying a problem, a **hypothesis** is developed based on observation, research, or prior knowledge.
- D. An experiment, a series of carefully planned steps, tests the hypothesis.
 - 1. Independent variable—the factor that is changed in the experiment
 - 2. <u>Dependent variable</u>—the factor or outcome to be measured in the experiment
 - 3. **Constants** are factors that stay the same during the experiment.
 - 4. A standard used for comparison is a control.
- **E.** <u>Data</u> are collected during the experiment through numeric measurements and observations.
- **F.** After analyzing data, a scientist makes a <u>conclusion</u>, which is valid only after multiple experiments support it.

Discussion Question.

What is a hypothesis based on? observation, research, prior knowledge