
Lesson 1.7

SCIENTIFIC INQUIRY

Subjects: science, social studies, language arts.

Skills: application, analysis, synthesis, evaluation.

Strategies: scientific inquiry, classification, research skills, writing.

Duration: 45 to 60 minutes.

Class Size: any; groups of 3 to 4.



Chipped-stone drill from Stanly County,
North Carolina, 8000–6000 BC.

Objectives

In their study of scientific inquiry, students will use an activity sheet to:

- make inferences about what activities go on at different places in school (desk, locker, etc.) and form an hypothesis about how space is used;
- simulate how archaeologists learn about past people by designing and conducting a research project.

Materials

“Archaeological Inquiry” activity sheet for each student and group.

Vocabulary

Classification: a systematic arrangement in groups or categories according to established criteria.

Data: information, especially information organized for analysis.

Hypothesis: a proposed explanation or interpretation that can be tested by further investigation.

Inference: a conclusion derived from observations.

Background

The goal of archaeological research is to answer questions about people who lived in the past. *Hypothesis* formation and *classification* depend on the chosen question. For example, if we want to learn about a Colonial family’s income, we could hypothesize that more nonessential items than essential items means they had a significant disposable income. We would classify the relevant artifacts into two classes: essential items and nonessential items. Based on the outcome of the classification, we would accept or reject our hypothesis.

Archaeology is an intrusive science. When archaeologists use its techniques to study contemporary cultures, they can reveal facets of those cultures that can touch a number of different emotions among the people studied. These can be a mix of embarrassment, enlightenment, denial, anger, appreciation, or curiosity. Sometimes descendants of the people studied feel the same way.

Archaeology is also an incremental science. A hypothesis supported by data from one site can be turned on its head when another site’s evidence is analyzed. Archaeologists constantly subject the *inferences* they make about people to critical analysis. For example, after they use one set of *data* to accept the hypothesis about Colonial income, they ask themselves what else can they

include in the equation to support or refute it.

Setting the Stage

Have students classify the contents of their own desks, lockers, or backpacks in whatever manner they choose. Items could be categorized as follows:

- writing instruments (pencils, crayons, etc.);
- paper;
- books;
- miscellaneous (gum, money, toys, etc.).

Ask students how they would proceed if they wanted to know something specific about what the owner of a desk, locker, or backpack does at that particular site. This is how an archaeologist begins to study past cultures.

Procedure

1. Distribute a copy of the “Archaeological Inquiry” activity sheet, which the students will fill in as they are led through the following inquiry.

2. *Pose a question:* Archaeological inquiry always begins with a research question. Archaeologists want to answer questions about past human activities and behavior and must use material evidence to do so. Ask students to consider the following question: “Are the items in their desks or lockers used only for school work or do they reflect other activities the student engages in while at school?”

3. *Formulate an hypothesis:* If a student’s desk or locker has items not required for school work, then he or she engages in other kinds of activities while at school.

4. *Classify the data:* For each location’s artifacts, only two categories are essential: items required for school work and items not required for school work. Discuss with the students differing ideas about what constitutes “required items,” because this determines how objects are categorized.

5. *Analyze the data:* To answer the research question, ask which category contains the largest number of objects. If there is a greater number of items that are not required, then we *accept the hypothesis*: i.e., the school is a place where people do things besides school work. The students have made an *inference* about the place called school and have tested their inference (hypothesis) using classified objects.

Closure

Divide the class into groups of 3 to 5 students and give each group another “Archaeological Inquiry” activity sheet. Have them design and conduct an archaeological research project using objects found in different locations in the school. Each project must answer a question about the people who own or use the objects; e.g., what subjects are being studied at this point in time in the classroom? Do the things students keep in their desks or lockers suggest something about social activities? What? Each group presents their results to the class.

Evaluation

Students turn in their “Archaeological Inquiry” activity sheets for evaluation.

Links

Lesson 2.1: “Gridding a Site.”

Lesson 2.3: “Artifact Classification.”

Lesson 2.7: “Experimental Archaeology: Making Cordage.”

Sources

Smith, Shelley J., Jeanne M. Moe, Kelly A. Letts, and Danielle M. Paterson. 1993. *Intrigue of the Past: A Teacher’s Activity Guide for Fourth through Seventh Grades*. Washington, D.C.: Bureau of Land Management, U.S. Department of the Interior. [This lesson is adapted from “Scientific Inquiry” on pp. 30–33, courtesy of the Bureau of Land Management.]

Ward, H. Trawick, and R. P. Stephen Davis, Jr. 1999. *Time Before History: The Archaeology of North Carolina*. Chapel Hill: University of North Carolina Press. [The image in this lesson’s main heading is taken from Figure 3.4.]

Archaeological Inquiry

Name:

| | |
|--|--|
| Research Question | |
| Hypothesis | |
| Classification Categories | |
| Accept or Reject the Hypothesis | |
| Make a Behavioral Inference | |

Archaeological Inquiry (Sample)

Name: Jane Doe

| | |
|--|--|
| Research Question | Does the owner of the desk use more pencils or pens for school work? |
| Hypothesis | If there is a larger number of pens, then the owner uses more pens than pencils for school work. |
| Classification Categories | Items with graphite (lead) writing tips. Items with indelible ink writing tips. |
| Accept or Reject the Hypothesis | There is a greater quantity of items with indelible ink writing tips, so I accept the hypothesis the desk owner uses more pens than pencils for school work. |
| Make a Behavioral Inference | The owner of the desk prefers pens. |