
Lesson 1.3

OBSERVATION AND INFERENCE

Subjects: science, social studies, language arts.

Skills: knowledge, comprehension, application, analysis, evaluation.

Strategies: scientific inquiry, decision making, observation, problem solving, writing.

Duration: 45 to 60 minutes.

Class Size: any; groups of 2 to 4.



Stone gorget from Buncombe County,
North Carolina, ca. AD 200.

Objectives

In their study of observation and inference, students will use activity sheets and coins to:

- differentiate between observation and inference through a problem-solving approach;
- demonstrate their knowledge by analyzing an archaeological artifact and creating their own observation-inference statements.

Materials

“Algonkian Boat Building” activity sheet and master, and “A Colonial Coin” activity sheet for each student, and/or transparencies of each. A collection of foreign or U.S. coins (one for each student or team).

Vocabulary

Artifact: any object made, modified, or used by humans; usually this term refers to a portable item.

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.

Observation: the act of recognizing or noting a fact or occurrence; or the record obtained by such an act.

Site: a place where human activities occurred and material evidence of those activities was left.

Background

Science is based on *observation* and *inference*. Any phenomenon being studied must first be observed, whether it be from a satellite or through a microscope. An inference is a reason proposed to explain an observation. The *hypothesis* is a chosen inference that the scientist will attempt to confirm or disprove through testing.

Archaeologists use observation and inference to learn the story of past people. By making observations about objects (*artifacts* and *sites*) they infer the behavior of the people who used the objects. When archaeologists find the remains of a coastal Algonkian village (observation), they could infer that the people were farmers. To test that inference (hypothesis), they would look for evidence of farming, such as farming implements (like stone hoes) and food remains from crops

(like corn cobs and squash seeds). If they find these things, their hypothesis is verified. Archaeologists construct careful hypotheses when making inferences from archaeological *data*.

Setting the Stage

1. Present students with a possible observation-inference scenario from their lives. Example: All the students in the classroom came to school on Tuesday, but did not come on Monday (observation).

2. What many and varied reasons (proposed inferences) might there be for their absence on Monday? Examples: holiday, sleet storm, teacher workday, fire at school Sunday night.

3. In what ways might one or more of these inferences (hypotheses) be tested in order to come to a conclusion about the absence? Examples: Look at the calendar to see if there was a holiday on Monday; check the weather report; ask the teacher if Monday was a teacher workday; ask the local fire department if they responded to a fire at the school Sunday.

Procedure

1. For “Algonkian Boat Building”:

- a. Project or distribute the master of the “Algonkian Boat Building.” Project or distribute the “Algonkian Boat Building” activity sheet.
- b. Read each statement and ask students to decide if it is a statement of observation or of inference. Ask them to give reasons for their answers.
- c. How might one or more of the inferences (hypotheses) be tested?
- d. Assist students to create a definition for observation, inference, and hypothesis.

2. For “A Colonial Coin”:

- a. Project or distribute the activity sheet “A Colonial Coin” and explain that the coin was found by an archaeologist at the North Carolina site of Brunswick Town, which was occupied during the 1700s.
- b. Which statements are observations and which are inferences? Which observation is each inference based on?
- c. Many different inferences are possible from one observation. What other inferences might be made from observing this coin?
- d. Choose one inference (hypothesis) and think of ways archaeologists might test it by looking at other evidence at the site (e.g., if people are peace loving, archaeologists would not expect to find a lot of weapons or protective gear).

Closure

Ask students to summarize what they learned about the importance of observation, inference, and hypothesis testing in archaeology.

Evaluation

Ask each student to be an archaeologist.

1. Give each student or team a foreign or U.S. coin and ask them to imagine they have found the coin at an archaeological site.
2. Ask them to create a list of observation statements and inference statements about the coin.
3. Have them choose one inference as their hypothesis and describe how they might test it.
4. Collect and correct their statements.

Links

Lesson 2.3: “Artifact Classification.”

Sources

Hulton, Paul. 1984. *America 1585: The Complete Drawings of John White*. Chapel Hill: University of North Carolina Press.

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 “Observation and Inference” on pp. 14–18, 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 5.7.]

“Algonkian Boat Building” Activity Sheet Answers:

1, observation; 2, observation; 3, inference; 4, observation; 5, inference; 6, inference; 7, observation; 8, inference; 9, observation; 10, inference; 11, inference; 12, observation; 13, inference; 14, observation; 15, inference; 16, inference; 17, inference; 18, observation; 19, inference; 20, inference.

“A Colonial Coin” Activity Sheet Answers:

1, observation; 2, observation; 3, observation; 4, inference; 5, observation; 6, inference; 7, inference.

Algonkian Boat Building



Engraving originally published by Theodor De Bry in 1590, based on a painting by John White made in 1585.

Algonkian Boat Building

Name:

Place an “I” before the statements that are inferences and an “O” before the statements that are observations.

1. There are four men in the picture.
2. The two men near the fires are fanning the fires.
3. It is summer.
4. The tree on the ground has no leaves on it.
5. The tree on the ground is a hundred years old.
6. Squirrels lived in the tree on the ground.
7. There is a low fire at the base of a standing tree.
8. One of the men started the fire at the bottom of the tree.
9. That tree, like the one on the ground, is a tall, thick tree.
10. The men want tall, thick trees so they can build boats.
11. Two men are making a long cavity in a tree trunk by letting fire burn the wood away.
12. The hollowed tree is raised off the ground by forked tree posts.
13. The two men at the hollow tree trunk are friends.
14. The men’s hair is short except for the longer strip in the middle.
15. The fires will burn the whole forest down.
16. Deer live nearby in the woods.
17. The men are tired.
18. The tree with the fire in the cavity has no bark.
19. Smoke is getting into the men’s eyes.
20. The men are close to their village.

A Colonial Coin

Name:



Place an "I" before the statements that are inferences and an "O" before the statements that are observations.

1. There is a representation of a face on one side of the coin.
2. The words printed on both sides of the coin are Latin.
3. The Latin word "Dei" means "God."
4. The coin was made by deeply religious people.
5. The date 1722 is printed on one side of the coin.
6. The coin was made in 1722.
7. The face on the coin is a representation of the nation's president.