



**UTAH MUSEUM OF
NATURAL HISTORY**

The University of Utah

Facts and Inferences

Alignment to Utah Core Curriculum

Grade Level: 4th Grade

Intended Learning Outcomes (ILO's):

1. Use science process and thinking skills.
2. Manifest scientific attitudes and interests.
3. Understand science concepts and principles.
4. Communicate effectively using science language and reasoning.

Enduring understanding:

Students will learn the differences between facts and inferences and apply that knowledge to everyday objects.

Background:

A fact is knowledge based on scientific evidence. The size, shape, location, color, are all features of an object that cannot be easily disputed.

An inference is a guess or idea based on the facts observed. There may be many different inferences based on the same observed fact. For instance, "I think it is blue because of genetics.", "Well, I think it is blue because of something it ate."

A hypothesis is a question that can be tested. It could be an inference that one wants to pursue to find out more.

Common Misconceptions:

An inference does not need to be "correct" to be valid. Often teachers dismiss a guess as just that if it does not match his or her expectations for what students should know. Learn to recognize when students are making inferences (guesses based on observations) and encourage them!

Length of Activity:

45 minutes

Materials Needed:

5 objects (things with obvious and not-so-obvious details; a matchbox car, a stuffed animal, a shoe, etc)

Fact or Inference graphic organizer and pencil for each student

Activity

Discuss

Talk about the differences between facts and inferences giving examples that students can relate to.

Ask students to write what they understand about facts and inferences.

Practice

Divide students into 5 groups.

Give each group an object.

Introduce students to the Fact or Inference graphic organizer. Explain that they will be making and recording their observations on this data collection sheet individually but that they may work together as a group.

Allow students 5 minutes to record their facts and inferences at the first station.

Rotate groups through until they have had a chance to observe and record about each object.

Discuss

Ask students what facts they recorded about each object and how they knew they were facts.

Ask students what inferences they recorded about each object. Ask them to explain why they inferred what they did.

Explain that these inferences could be turned into questions and used as hypotheses that could be tested to find out more.

Formative Assessment Strategies:

1. Assessments are built into this activity. Asking students to record what they know at the beginning and again at the end of the activity will give you an idea of their progress.
2. Circulate through the groups and listen to their conversations. Ask students to justify their inferences. This will give you unique insight into what previous experience students are drawing on to explain discrepant observations.

Learning Extensions:

You may choose to follow up on an inference that students are particularly excited about. Discuss how to turn the inference into a testable question. You may even take it a step further and design an experiment to test your hypothesis.

Research:

“Most science educators today agree that science can best be viewed as a continuous process of trying to discover order in nature and looking for consistent patterns of the universe through systematic study. It guides the inquirer to a variety of sources, revealing previously undetected patterns. These undiscovered openings can become sources of new questions that can deepen and enhance inquiry. Science is a way of thinking and asking questions.”

Adams, D., & Hamm, M. (1998). *Literacy in Science, Technology, and the Language Arts: An Interdisciplinary Inquiry*. Westport, Connecticut: Bergin & Garvey. p. 129.

“By constructing their own knowledge in a meaningful context, children can gain a conceptual understanding and develop the means for integrating language and science knowledge into their personal conceptions. To really learn the skills of language and science, students must follow a learning cycle: explore new phenomena, construct their own understandings, examine, represent, solve, transform, apply, prove, and communicate.”

Adams, D., & Hamm, M. (1998). *Literacy in Science, Technology and the Language Arts: An Interdisciplinary Inquiry*. Connecticut: Bergin and Garvey, p.10.



Fact or Inference?

Object 1 What is it?	
Facts	Inferences

Object 2 What is it?	
Facts	Inferences

Object 3 What is it?	
Facts	Inferences

Object 4 What is it?	
Facts	Inferences

Object 5 What is it?	
Facts	Inferences

