

Inferences and Scientific Investigation

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Objective: to better understand

1. the process of scientific investigation
2. how scientists can use indirect evidence to develop theories
3. how scientists can use inferences based on known phenomena to explain similar structures found only as fossils.

Materials:

Box with unknown object or objects. Sample specimens

Procedure:

- A. Use the box with an unknown object to do the following:
 1. Gently tilt, shake and move the box provided.
 2. Describe the sounds made, and relative weight.
 3. Record your observations.
 4. Attempt to guess what object is inside the box.
 5. Open the box to see the actual specimen.
- B. Examine the sample specimens.
 1. Attempt to categorize each specimen using the labeled specimens on the front table.
 2. List the criteria used to categorize the specimens.
 3. Construct a table to show your results for #3.

Questions:

- A.
 1. What sorts of sounds did the object make inside the box?
 2. Based on the sound, what did you guess the object to be?
 3. When you opened the box, how close were you to guessing the correct identity of the object?
 4. What kinds of information did you have no way of knowing? Explain.
 5. Scientists cannot "open the box" to see what really happened, or where something came from. How accurate are they?
- B.
 1. List what you think each object is.
 2. How were you able to determine what each was?
 3. If the person who was trying to decide what use each object was, had been an expert in that specimen, would that person have provided a more reliable description, function, title for the specimens?

Conclusion:

- 1) When scientists study subjects that are too far away, too many years old, or..., they formulate an hypothesis and investigate the subject with indirect evidence or inferences.
Explain how this is an effective way to obtain information about specimens that are too old, too far away, or...
- 2) What are some of the sources of error that can become significant involving studying ancient life forms?