

# Making Observations and Inferences

It takes many skills to design and carry out good scientific experiments. The scientific method involves asking a good question, making a hypothesis, conducting research, identifying and controlling variables, making observations during testing, collecting data, and drawing conclusions. Using data sheets, diagrams, and graphs helps you organize and present your results. These skills help make your experiments reliable, repeatable, and meaningful.

## Purpose

To make and observe model fossils and infer how they were made.

## Process Skills

Make a model, observe, compare, classify, collect data, interpret data, communicate, draw conclusions

## Background

When you make an **observation**, you gather information using your five senses. When you make an **inference**, you form an explanation for something you observe. Your inference is based on what you already know and your past experiences.

*Fossils*, which are the remains or traces of ancient living things, can be observed in rocks. Since fossils are often millions of years old, paleontologists make inferences about how the fossil formed and which organism made the fossil imprint. A fossil that shows the shape of an ancient living thing is called a *mold*. A fossil mold is a hollow imprint of a plant or animal. Fossils that show evidence of the activities or movements of animals are called *trace fossils*. Trace fossils include trails, footprints, and burrows. In this activity, you will make models of fossil molds and trace fossils in clay. Using the fossil models, you will practice making observations and inferences.

**Time** – Part 1: 20 minutes; Part 2: 15 minutes

**Grouping** – Pairs or small groups

### Materials

(per group)

- ☐ wax paper
- ☐ clay
- ☐ rolling pin
- ☐ assorted small objects with round edges (coins, marbles, lids, small wheels, small balls, buttons)
- ☐ petroleum jelly
- ☐ pencil
- ☐ paper towels
- ☐ data sheet

### Optional Materials


- ☐ apron
- ☐ ruler



## Procedure

### *Part 1: Making Fossil Models*

1. Place a piece of wax paper on a smooth, flat surface such as a desk or table. Place some clay on the wax paper, and place another piece of wax paper over the clay. Use a rolling pin to roll and flatten the clay into a smooth, thin layer. Then remove the top piece of wax paper.
2. Choose four different objects from the class pile of assorted objects.
3. Use your fingers to lightly coat each object with petroleum jelly. Then wipe the extra jelly off your fingers.

 **Safety:** Wash your hands after touching petroleum jelly or clay.

4. Lay one object on its “flat” side and press it into the clay. You are making a model of a fossil mold. Carefully remove the object. Keep track of the object used to make your fossil by assigning it a number. Use a pencil to carve the number in the clay next to the fossil. Record the fossil number and the object used to create it in the Part 1 table on the data sheet.
5. Repeat step 4 using a different object. Again record the fossil number and the object used to create it in the Part 1 table on the data sheet.

6. Repeat step 4 for the two remaining objects, but this time, lay each object on its rounded side and gently roll it across the clay. Now you are making models of trace fossils. As you roll the object, be sure to press hard enough to leave marks on the clay, but not so hard that the object gets stuck in the clay or cuts all the way through it. Again, number your fossil and record this information in the Part 1 table on the data sheet.



7. Use paper towels to clean off any clay or petroleum jelly remaining on the objects. Return the objects to the class pile.

*Part 2: Observing and Making Inferences  
About Fossil Models*

1. Exchange fossil models with another group in your class. Be sure not to reveal the objects you used to make your fossils. Observe the other group's fossils. For each fossil, record an observation in the Part 2 data table on the data sheet. At this point, be sure to record only observations and not inferences. Make observations by simply gathering information with your senses. Observations can also include measurements. An example of an observation would be, "this fossil mold is round."
2. Now make inferences about the fossils. Use what you already know and have observed to decide which object in the pile made each fossil. Study the objects in the pile as needed. Record an inference for each fossil in the Part 2 data table on the data sheet. An example of an inference would be, "this trace fossil was made by rolling a coin across the clay."
3. As a class, discuss how well the inferences made by each group matched the actual objects used to create the fossil models.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Part 1: Making Fossil Models****Collect Data**

	Fossil 1	Fossil 2	Fossil 3	Fossil 4
Object used to make fossil				

**Part 2: Observing and Making Inferences About Fossil Models****Collect Data**

Fossil	Observations about fossil	Inference about object used to make fossil
1		
2		
3		
4		

Name \_\_\_\_\_ Date \_\_\_\_\_

**Critical Thinking**

1. What is the difference between an observation and an inference?
  
  
  
  
  
  
  
  
  
  
2. Did you find it more difficult to make observations or inferences about the fossil models? Why?
  
  
  
  
  
  
  
  
  
  
3. Were the inferences you made about your classmates' fossil models correct? If not, why do you think this was so?
  
  
  
  
  
  
  
  
  
  
4. Do you think that scientists should rely more on observation or inferences? Why?
  
  
  
  
  
  
  
  
  
  
5. How do observations and inferences help a scientist draw a conclusion?