MUSEUM OF THE ROCKIES

touch history

What's the Picture

Adapted from *What's the Picture* Activity

www.ucmp.berkeley.edu/education/dynamic/session2/sess2_act1.html

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Grade Level: Grades K-8
Preparation Time: 5 minutes or less
Activity Duration: 30 minutes

Concepts Addressed

- Science is a process by which we learn about the natural world using our senses and extensions of our senses.
- Science follows a process guided by certain parameters.
- Science relies on the observation of physical evidence from the natural world.
- Physical evidence is examined and interpreted through logic.
- An observation is a description of physical evidence based on what we see, feel, hear, smell, or taste.
- An inference is a logical conclusion based on observation of physical evidence.
- A hypothesis is a scientific idea supported by physical evidence.
- Science advances as scientific theories are supported, modified, or replaced as new evidence is found.

Objectives

The student will:

- Make a hypothesis about the picture that a puzzle portrays based on limited data.
- Obtain more data and revise their hypotheses about the finished puzzle.

Materials Included

- 100 piece puzzle
- Envelope

Background

Scientists gather information and hypothesize about possible explanations of what they have found. Paleontologists collect specimens from a particular locality and work to assemble the story of what occurred in the past. As more information is gathered, hypotheses change. The literature is searched, collections are examined, information is shared with other scientists, and hypotheses are modified again and again. In this activity, students gather information (puzzle pieces) and work toward a closer approximation of the picture that the puzzle portrays. Despite

the artificiality of this activity, some aspects of the experience closely resemble real-life science. Students gather data (puzzle pieces) and make observations and inferences about what the data shows. They then make a hypothesis about the finished puzzle based on their observations of the data they have. Given new data, they may revise their hypotheses. This activity also fosters collaborative work which models scientists working collaboratively and introduces the idea that different investigators may have differing opinions about the data.

Explore this link for additional information on the topics covered in this lesson:
Nature of Science—http://evolution.berkeley.edu/evosite/nature/index.shtml

Procedure

1. Place the one hundred puzzle pieces into the envelope provided.
2. Place the box with the puzzle picture somewhere where the students will not be able to see it.
3. Divide the students into groups of 3-4 (up to 9 groups).
4. Each group draws 5 pieces randomly from the envelope.
5. Based upon the evidence at hand, each team proposes a hypothesis about what the puzzle picture portrays.
6. Write the groups' hypotheses on the board (for example, the puzzle shows yellow flowers in a field) and discuss why the evidence suggests this hypothesis (for example, one piece shows yellow flower petals). Then, differentiate between observations and inferences made about the data (for example, it is an observation that the puzzle piece shows yellow flowers, but an inference that these flowers are in field—we don't have enough information to know that yet).
7. Have each group select 5 more puzzle pieces from the envelope. Ask them to refine their original hypothesis based upon the additional evidence. (The new evidence may support their original hypothesis.)
8. Have teams select 1 more piece and repeat the process of hypothesis revision.
9. Have teams share their findings with the rest of the class. Ask students to walk around the classroom to see the evidence uncovered by the other teams.
10. Allow each team to adjust their hypothesis according to the total evidence revealed by the class.
11. Lead a discussion to consider how this activity models the process of science.
12. You may or may not want to show the class the puzzle box at the end of the activity. Paleontologists do not usually get to see the live animal (the puzzle) that they are studying from fossils (their puzzle pieces).