Lesson Plan

Wooden Blocks

Background

Scientific models are created to explain observations. Good models provide clear explanations for all known data and make predictions for new observations. New observations either support and strengthen the model or refute it. Models that fail to explain an observation are wrong and must be modified or replaced with better models. The old model might still be useful in a limited way, but ultimately it has failed and must be replaced or modified.

This lesson uses a set of wooden cubes with labels on five of the faces. Students are invited to observe the labels, make inferences about the patterns that emerge from the observations and predict how the unknow face could be labelled.

After the demonstration, with teacher-guided discussion, students are led to a deeper understanding of how observations and inferences lead to models that can be tested.

Purpose

- To create models based on observation

Materials

- Wooden Cubes (1” x 1” x 1”)
- Labels printed on sheet of 2”x4” labels (i.e., Avery 6468 or 8163)

Lesson (20 min)

Before the lesson:
Create a set of blocks so there is one block for each group of students.

- Edit the labels to include names that are familiar to your students, maintaining the existing patterns.
- Apply the labels so that similar names are on opposite sides, i.e., Keon/Keisha, Sam/Sameena.
- Apply the labels so the orientation of opposite sides match (or not) as part of the patterns present in the activity.

Option One: Observation, Collaboration, and Model Building

1. Arrange students in groups of four. Place the block in the middle, blank face is down, with one vertical face toward each student. Do not let students see that the bottom face is blank.
2. Students record observations about the vertical face closest to them. Students are not allowed to touch the block.
3. After one minute they share their observations with their opposite partner. Discuss any patterns.
4. Combine observations with the adjacent pair. Discuss the patterns that emerge.
5. Students build a detailed model that describes how the labels are assigned.
6. Using observations of the top face and their model students then predict the hidden face.
7. Have students write their prediction on a whiteboard.

Option Two: Observation and Inference

1. Distribute one block to each group of four. Students are free to handle and manipulate the block.
2. Tell the students that they have one minute to record as many observations as possible on a whiteboard.
3. After 30 seconds, stop the class and ask the students to reflect on whether they are making observations or inferences.
4. After one minute, have students discuss their observations and develop inferences based on the observations.
5. Have students write their prediction for the blank side, referring to the specific inferences that they have drawn.

Discussion:

1. Have students share their predictions and the patterns they used with the class. Discuss any differences
   - How are observations and inferences different?
   - Are all the predictions equally valid?
   - Is it acceptable for scientists to draw different inferences based on the same observed phenomenon?
   - How does it feel when someone disagrees with your prediction?
   - What role does experiment play in developing good models?

Credits

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Original Premise

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3 SAM 3	3 SAM 3	3 SAM 3	3 SAM 3
3 SAM 3	3 SAM 3	3 SAM 3	3 SAM 3

7 SAMEENA 3	7 SAMEENA 3	7 SAMEENA 3	7 SAMEENA 3
7 SAMEENA 3	7 SAMEENA 3	7 SAMEENA 3	7 SAMEENA 3

4 KEON 2	4 KEON 2	4 KEON 2	4 KEON 2
4 KEON 2	4 KEON 2	4 KEON 2	4 KEON 2

6 KEISHA 2	6 KEISHA 2	6 KEISHA 2	6 KEISHA 2
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5 FRANK 4	5 FRANK 4	5 FRANK 4	5 FRANK 4
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