

## **Cube Activity**

### Possible Scenario

1. Have students form groups of four.
2. Place the cubes on the center of the tables where the students are working. All cubes should have the same face on the bottom. Use the bottom square of the black-line masters to serve as the face on the bottom.
3. Students should not turn or lift the cubes.
4. Tell students they have to answer the question. "What is on the bottom of the cube?" Their answers should be supported by evidence. They should also include an explanation of how an answer was reached.
5. Ask students in each group to make observations and record the data each from his/her position (for e.g., what is the number or word that a student can see on the cube surface facing him/her). Then ask them to share their observations. Each student in the group can verbalize his/her observations to the 'recorder' who compiles all the data. This is intended to simulate scientists working together and sharing data.
6. Based on their observations, students in each group should be -able to -figure out the pattern on the cube, and consequently infer what is on the bottom. Each -group should then prepare a written report of the suggested answer and corresponding pattern and explanation.
7. Put the cubes away without showing the bottom. (You can make the experience more genuine by gluing the bottom of the cubes to a piece of cardboard). Scientists often have no way of 'seeing' the phenomena they are investigating.
8. Ask one or more groups to present their suggested answer to the class, including the pattern they discerned, and the way they reasoned to formulate that pattern. If different groups come up with different answers, then all differing views should be presented.

If all groups come up with the same answer, you can initiate a discussion of the role of evidence (or observation) in deciding the pattern, and how the answers were consistent with the available data. If different groups come up with different answers,

then two scenarios are possible. In some cases, some groups may have inferred patterns that are obviously inconsistent with the data. Here, you can emphasize the importance of evidence in supporting or weakening a certain conclusion by asking students to identify how a certain pattern is consistent or otherwise inconsistent with the data. In other instances, two or more patterns may be equally consistent with the data and consequently legitimate.

In this latter case, you can discuss with students whether it is possible to tell who is 'right' and who is 'wrong'. If differing explanations are consistent with all the evidence available, is it possible to decide which might correspond with the answer on the bottom of the cubes, which we cannot see?

The patterns in the different cubes are of varying difficulty levels. You might want to match those difficulty levels to your students' grade level(s).