

Cube It: Introducing Inquiry and the Nature of Science

Purpose: Students should

- identify questions that can be answered through scientific investigations,
- design and conduct a scientific investigation,
- use appropriate tools and techniques to gather, analyze, and interpret data,
- develop descriptions, explanations, predictions, and models using evidence,
- think critically and logically to make relationships between evidence and explanations,
- recognize and analyze alternative explanations and predictions, and
- communicate scientific procedures and explanations.

You will be guided through the first part of the activity by your teacher. A cube will be placed on the table in front of you (DO NOT PICK IT UP!!!!!!) and you will formulate questions etc, about the cube and make observations and collect data to answer one of the questions. This procedure then will be refined using a second cube, using “technology” to collect more data.

Evaluate The final cube is an evaluation. There are two parts to the evaluation. First, in groups of two or three, you must create a cube that will be used as the evaluation exercise for other groups. Groups exchange cubes. The groups address the same question: *What is on the bottom of the cube?* Follow the same rules—for example, you cannot pick up the cube. Your group should prepare a written report on the cube developed by your peers that includes the following.

• **Purpose & Hypothesis:** (30 points)

- State the question you pursued.
- Record initial observations
- Make a hypothesis that answers your purpose question.
- Give an explanation for your hypothesis based on initial observations.

• **Procedure & Data:** (30 points)

- Describe your new experiment step by step.
- Record the data obtained from your new experiment.

• **Data Analysis and Conclusion:** (40 points)

- Make a diagram of the bottom of the cube.
- Explain your reasoning based upon your data.
- Discuss the accuracy of your hypothesis (was it correct or not?) and how accurate you think your results are.
- Suggest additional experiments to improve the accuracy of your results.