



## Investigating Investigations: Building a Parachute



### Content Standards:

#### CA- California K-12 Academic Content Standards

- **Subject** : Science
- **Grade** : Grade Six
- **Area** : Investigation and Experimentation
  - **Sub-Strand 7**: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
    - **Standard a**: Develop a hypothesis.
    - **Standard b**: Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
    - **Standard c**: Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
    - **Standard d**: Communicate the steps and results from an investigation in written reports and oral presentations.
    - **Standard e**: Recognize whether evidence is consistent with a proposed explanation.

## Learning Objectives:



### *Conceptual Understanding:*

- The students will be able to identify, isolate, and measure variables in an experiment. The students will learn how to pose a question that can be answered by a scientific investigation. The students will be able to identify independent and dependent variables. The students will be able to record data in charts and graphs from their observations. The students will be able to come to a conclusion about their findings in an experiment.

### *Science Process Skills:*

- Students will be discovering the world of scientific investigation through a inquiry into the creation and performance of a parachute. The overall goal is to have students discover how the scientific process works through asking questions, playing with ideas, creating a prototype, creating dependent and independent variables, creating a hypothesis, collecting data, organizing data, and concluding the experiment with organization of findings.

### **Informal Assessments:**

- What is the definition of science?
- What is an investigation?
- What is a scientific investigation?
- Name the key elements of a scientific experiment.
- What is the difference between a dependent and independent variable?
- What is an "experimental error"?
- What are characteristics of a question that make it testable in an experiment?

## **Instructional Procedures:**



### Hook:

- We will engage the children in the idea of scientific inquiry through a quick investigation of unknown objects. By feeling these objects without looking at them the students will create questions about what is in the bag. Students will play detective by figuring out what is in the bag. In small groups the students will be investigating different objects intuitively. Students will use their hands to touch the object and create questions based on their observation. Through these investigations students will be introduced to the notion of scientific inquiry. We will discuss the life cycle of a scientific experiment using academic as well as social language.

### **Background Information:**

- We will discuss the life cycle of investigation by visual diagram on the board. We will highlight key vocabulary and focus on the idea of variables both independent and dependent.

### Key Terms:

- Hypothesis
- Dependent Variable
- Independent Variable
- Controlled Variable
- Tangible Evidence
- Investigation
- Data
- Experimental Error

### **Materials:**

- 25 X 50 cm plastic sheet

- Two 100 cm lengths of string
- Scissors



- Washer
- Stop watch
- Data worksheet
- Pencil

### **Procedures:**

- Using the idea of scientific inquiry the students will build a toy parachute. They will begin by making a prototype parachute by using the materials we provide to them. The prototype parachute is the control part of the experiment.
  1. Cut a 50 cm X 25 cm rectangle from the plastic sheet.
  2. Cut two 100 cm lengths of string.
  3. Tie one side of each string to the neighboring corners of the rectangle.
  4. Place both strings through the washer.
  5. Tie the free ends of each string to the diagonal corner of the rectangle, so that the strings cross to form an "x".

### **Differentiated Instruction:**

In order to differentiate our instruction we will provide several levels of learning in our activity. We will have hands on activities, word bank, higher thinking questions, visuals and group work. Students with IEP's can participate in all elements of this activity.