

## PARACHUTE LESSON PLAN

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**Rationale:** Elementary student may not have a good grasp of the scientific method and this experiment allows the student to build knowledge and practice skills in setting up a scientific investigation.

6. Content standards: (TPE 1) 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:
  - b. Develop a testable question.
  - c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
  - d. Identify the dependent and controlled variables in an investigation.
  - e. Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
  - f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
  - g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
  - h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.
  - i. Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.

### Learning Objectives:

#### *Conceptual understanding*

Students will be able to develop a testable question, plan and conduct a science investigation, collect and graph data, and answer questions using data.

#### *Science process skills*

Students will be able to collect and graph data, using meter sticks and use appropriate units.

Students will be able to identify the dependent variable and independent variable in their investigation.

**Purpose:** The purpose of this lesson is to practice the science method by having students collect data, make one variable change and test the results. They will be instructed to change the design that they believe will aid the parachute for a longer flight time.

1. **Formal and Informal Assessments:** (TPE 2, 3)
2. The students will create a modified parachute to test.
3. Students will use modified parachute to test, collect data to record on the provided worksheet. Data should be measured and recorded using the correct tools and measurements.
4. Students will orally demonstrate an understanding of dependent and controlled variables.
5. Student will summarize the process of a science investigation in writing.

### Instructional Procedures

1. Teacher will lead and facilitate a discussion regarding science and the progress and changes it has made in our lives. I will use the poster board to cite examples of the modifications on flying aircrafts throughout the centuries and discuss the many scientists and how their errors and observations have all helped in building aircraft that save lives transport people and are also used for enjoyment (e.g. skydiving, hang-gliding, hot-air ballooning, flying single engines planes, trikes, powered para-gliders or simple kites etc...). I will also point out how it provides employment for some people.

Inquiry questions include:

- 1.1.1. What types of jobs are out there for people who use flying aircrafts?
- 1.1.2. How do you think science has helped humans?
- 1.1.3. Why is it so important to observe measure and collect information when doing science investigations?
- 1.1.4. I will also ask who know's what specified vocabulary means; Data, measure, chart, graph, variable, independent, dependent, constant, (to gauge comprehension).

*I will end my discussion with a Chinese Proverb*

*"I hear and I forget,*

*I see and I remember*

*, I do, and I understand.*

2. Students will then break into groups and brainstorm their ideas on how to modify their newly designed parachute.

3. Students will make a new parachute with a variable change.
4. Students will work cooperatively in a group. Each student has a task when gathering data for their graph
5. Students will record by completing a variables chart data. They will list the different parts they could change and give a prediction of why they think the change will affect the parachute.
6. Student will be organizing and graph data collected.
7. Student will review vocabulary
8. Students will present to another small group their findings if time permits.

### **Differentiated instruction/ Accommodation strategies**

Directions are given verbally and in writing. Instructors are both bilingual (Russian & Spanish) so this could be helpful with English learners.

Individual assistance for students who need more instruction is possible in this small setting.

Group work allows students to assist each other. This accommodation allows students to socialize in the realm of science.

Vocabulary words are discussed and explained to expand their knowledge and comprehension.

Visual example of modifications throughout history of flying crafts gives students a chance to see science at work and the progress it makes in our lives.

Kinesthetic learners are given hands-on building experiences.

Closure: I will thank the student for their time and effort and encourage them to look at the world through scientific eyes. I will remind them that measuring (math, numbers) are critical to our development as students and that science provides a deeper understanding of the world.

### **Resources and Materials:**

For each group of (3-4 students):

- Copies of vocabulary review and summary fill in worksheet in and additional information to provide a time line of flight aircraft.

- Parachute building materials

- Pencils

Materials for building the parachutes:

- Plastic table cloth

Tissue paper (enough for (2) 25 cm X 50 cm canopies

- Ruler with cm markers
- Scissors
- Enough string to cut (4) 100 cm length strings
- 3 washers
- 2 stop watches