Objective

By the end of this lesson, the student will have designed and built a basic parachute, understanding the principles of aerodynamics, gravity, and design. The student will also explore the historical significance of parachutes and their evolution over time, while enhancing their English and math skills through creative writing and measurement activities.

Materials and Prep

- Lightweight fabric (e.g., a plastic bag or a piece of cloth)
- String or yarn
- Small weights (e.g., washers, coins, or small toys)
- Scissors
- Measuring tape or ruler
- Pencil and paper for notes and designs

Before starting the lesson, familiarize yourself with the basic concepts of gravity, air resistance, and the history of parachutes. Make sure to discuss safety when handling scissors and weights.

Activities

- **Research and Discussion:**

  Begin by researching the history of parachutes. Discuss with the student how parachutes were invented and their uses in modern times. This could include looking at famous parachutists or military applications.

- **Design Your Parachute:**

  Using the materials provided, sketch out a design for a parachute. Encourage the student to think about the shape, size, and materials they want to use. They should consider how these factors will affect the parachute's performance.

- **Build and Test:**

  Construct the parachute based on the design. After building it, conduct a drop test from a safe height (like a table or chair) to see how well it works. Take notes on the performance and discuss what could be improved.

- **Math Measurements:**

  As part of the building process, measure the dimensions of the parachute and the length of the strings. Use this opportunity to practice basic math skills such as addition and multiplication to calculate areas or ratios.

- **Creative Writing:**

  Have the student write a short story or a report about their parachute design process, including what they learned about parachutes, the history behind them, and how they felt during the testing phase.

Talking Points

- "Can you tell me who invented the parachute and what inspired them to create it?"
- "What are the forces acting on a parachute when it is in free fall?"
- "How does the size of the parachute affect its ability to slow down?"
- "Why is it important to test and improve designs in engineering?"
- "How can we use math to help us design better parachutes?"
- "What was your favorite part of the parachute design process?"