

■ Background

The paper parachute activity is designed for you to complete the scientific process by developing questions, choosing a question to study, organizing an experiment to come up with an answer to your question, conducting the experiment and drawing conclusions based on the outcome of the experiment. You will share your experiment with others by writing a formal Laboratory Report.

Research and Formulating Questions

The scientific process begins by making observations and asking questions about what you observe. To begin this activity you will build and observe a paper parachute noting its physical characteristics and design. Launch the parachute. Do this several times to observe the result. Based on your observations consider: would all parachute designs behave the same? Would they fall at the same rate? Would they all spin in the same direction? What happens if you refold the blades in the opposite direction? Do environmental conditions influence the flight of the parachute? What will happen if you increase the weight of the parachute or change the length of the wing? Can you predict what would happen if you altered the parachute design in another way?

To formulate thought-provoking questions think about the purpose of an actual parachute, research some information from acceptable sources. Use your research to formulate some insightful questions regarding parachute design.

Constructing a paper parachute (refer to these in your Experimental Design/ Procedure)

1. Cut the attached sheet into three strips that look like Diagram 1. These strips can be folded to form three individual parachutes.
2. Cut along the dotted lines and fold along the solid lines.
  - a. Cut along the dotted line between sections A and B.
  - b. Fold the section labeled A behind section B.
  - c. Fold section C behind section B.
  - d. Fold section D behind section B as well.
  - e. Complete the parachute by folding blade X in one direction and blade Y in the opposite direction. (see Diagram 2.)

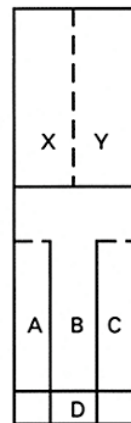


Diagram 1



Diagram 2

Note: Paper clips may be added to section B for additional weight. Many other modifications are possible as well.

**For HOMEWORK: Do some research. Record source information then take notes on the topics noted below (write information related to parachute fall—not just definitions).**

Source (Book, Article, URL): \_\_\_\_\_

Author: \_\_\_\_\_ Date: \_\_\_\_\_

Publishing information, Page number(s): \_\_\_\_\_

Free fall: \_\_\_\_\_

Air resistance: \_\_\_\_\_

Terminal speed/velocity \_\_\_\_\_

■ Write 3 questions related to your research that could be answered with paper parachutes:

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

■ **Choose a question to study**

As a lab group, choose one question to focus on for this activity that really sparks your interests.

Draft a **Design Outline**.

■ **Procedures**

1. Use class time to refine your experimental design.
2. Practice launching/dropping various parachute designs/modifications.
3. Make plans to have all materials needed to build and launch your design on block day.
3. Draft data tables.
4. Have final draft data tables and all materials needed to build and launch in class with you on block day.
5. Referring to the **Formal Lab Report** handout complete a typed formal lab report.

Take photos of your designs.  
Include one page of pictures  
with your **Formal Lab Report**

Title: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

Independent Variable: \_\_\_\_\_

Treatments of I.V. (indicate control treatment):					
# of trials you will conduct for each treatment:					

Dependent Variable (s): describe quantitative and qualitative data

Quantitative Measurements (include units):

Qualitative Measurements:

Constants: \_\_\_\_\_