Design a Slow Flyer

RECORD ALL INFORMATION ON YOUR (each person) PROPERLY LABELED PAPER

How do heavy jet planes fly high above Earth's Surface? Their shape, wing design and high thrust all contribute to their flying capabilities. Engineers use many physics principles to design flying machines to move fast, glide or maneuver quickly.

Problem: Can you design a paper glider to fly as slowly as possible?

Hypothesis: Write a hypothesis about what types of design features will help a paper glider fly as slowly as possible. One important design feature will be the size and shape of the wings.

Objectives

Design a paper glider to fly as slowly as possible.
Measure distance and time and calculate your glider's speed.

Materials

- Stopwatch or timer with second hand
- Meterstick or metric tape measure
- Goggles
- String
- Paper sheets of various types
- Transparent tape
- Paper clips and stapler

Safety Precautions

Make sure you have a clear area to launch your glider; DO NOT THROW IT TOWARD/NEAR ANOTHER PERSON.

Plan the Experiment: (RECORD YOUR PLAN ON YOUR PAPER!)

1. When you plan your experiment, decide how you can measure the speed of a paper glider.
2. In constructing your glider, be sure to consider its balance and stability.
3. Think about how the way you launch your glider will affect its speed.
4. If you need a data table, design one on your paper so it is ready to use as your group collects data.

Check the Plan

1. Be sure you have considered all the factors that can affect glider speed.
2. Will you have more than one trial run with each design? (SHOULD YOU MEASURE THE SPEED OF EACH GLIDER MORE THAN ONCE)
3. What measurements will you need to make to determine the speed of your glider?
4. Will the data be summarized in a graph?
5. Be sure to make adjustments to your glider after your first trials to try to improve its performance. It will be best to adjust one factor at a time.
6. MAKE SURE YOUR TEACHER APPROVES YOUR PLAN AND THAT YOU HAVE INCLUDED ANY CHANGES SUGGESTED IN THE PLAN.

Do the Experiment

1. Carry out the experiment as planned.
2. Be sure to record all useful information/data so you can make effective adjustments to your glider.

ANALYZE AND APPLY *(RECORD AND LABEL PROPER ANSWERS TO THE FOLLOWING)*

1. Compare your results with those of other groups.
2. Calculate your glider's maximum, minimum and average speeds.
3. If your glider travels a curved path, which distance measurement will give the slowest speed calculation – along the curved path or along the straight line between the starting and ending points?
4. What factors affected your glider's flight? How could you change some of these factors?
5. Why is average speed easier to determine?
6. Why does the speed vary during flight?