

Praxis “Making Science Fun”

Just Go Fly a Kite!



We usually think of Spring for flying kites but it is an excellent way to get a feel for aerodynamic forces.

For this experiment, we are going to choose different designs of paper kites. An excellent place to look is the Virtual Kite Zoo <http://blueskylark.org/zoo/class.html> for instructions on how to make these kites. I recommend trying the Uncle Jonathan’s “20 Kids – 20 Kites – 20 Minutes” and John Staplehurst’s “Basic Sled Kite”. You can

use any design you like, as long as they are different but use the basically the same amount of material. In this experiment, you are going to test which design flies best. Be sure to stay away from power lines when flying any kites.

And as always “be sure to have your parent’s permission” and they have the time to watch and help as you do your experiment.

Materials (What you'll need):

- Sheets of A3 (8 ½ by 11) paper - same size you would use in a computer printer.
- Scotch tape.
- String or strong thread.
- Crepe paper ribbon or any light weight ribbon to use as a tail. You could make your own out of paper and tape.
- Barbeque stick (shish kabob stick).
- Scissors to cut the stick if it is too long.
- Loads of open space with no overhead wires. Check out your nearby school yard or park but it must be on a day with a gentle wind and don’t fly the kite where it could get stuck in a tree (Just ask Charlie Brown how frustrating that can be) or fly onto the street.
- A chart to record your results on.

Method (Procedure):

- Make a chart to record your results. Have a space in your chart for each of the 2 or more kite designs and 3 different days of “flights” for each kite with sections for ease of launch (getting it to fly) and ability to stay up and stability (doesn’t suddenly crash to the earth.)
- Next, make 2 or 3 paper kites of at least two different designs. Take your time to make sure that the kites are as similar as possible.
- When you are ready to do the experiment fly each type of kite on each of three days; each day will have slightly different wind conditions (wind speed). But don’t bother to try to fly the kite on days with no wind or very windy days.

- Try to use the same kite for each day (wind condition), but if it gets damaged, use another that you already have prepared.
- Record your results.

What's happening?

Although kites may look different, the forces acting on each kite is exactly the same. In fact according to the NASA website*, with the exception of thrust, the forces acting on a kite are also the same forces which act on an airliner or a fighter plane. Like a plane, kites are **heavier than air** and must rely on aerodynamic forces to fly. Gas balloons and bubbles, on the other hand, are **lighter than air** and rely on buoyancy forces to fly. And like the plane, kites have a solid frame normally made of wood or plastic, and this frame is covered by a paper, plastic, or cloth "skin" to generate the lift necessary to overcome the kite's weight. A kite must be made as light as possible for good performance, yet be strong enough to withstand the wind.

<http://www.grc.nasa.gov/WWW/K-12/airplane/kite1.html>

Project Extension:

While the forces on all kites are the same, each kite flies a little differently. Some kites are highly maneuverable and other kites are very stable. There are kites with multiple control lines that can perform stunts, while other kites can be flown to high altitudes. Check out the Virtual Kite Zoo mentioned at the beginning of this article. It has plans and link to kites made out of some very surprising materials.

Regardless of the type of kite, you must always fly safely; for the protection of others, for your own protection, to protect property, and to insure that the kite can be flown again.

Background:

This experiment was based on the "Air and Aerodynamics" learning kit. This type of experiment and many more may be found in our kits. Each of our teaching kits is loaned out for FREE to help give classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways

Lorne Cooper, Regional Executive Director

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