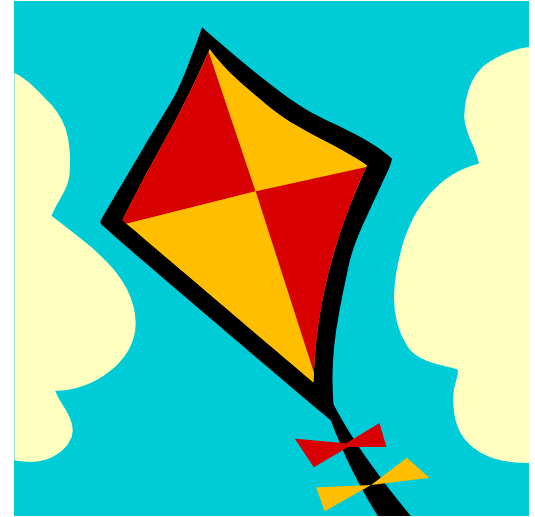


# The Science of kite Flying

Most people connect kite flying with a stiff wind to get the kite into the air but most kites are designed for light breezy conditions. Although you do not need to know anything about aerodynamics to fly a kite, it helps you control your kite if you understand basic wind flow and lift.

The basic principle of kite flying has to do with a difference in air pressure. When air moves quickly over a surface, the pressure is decreased. When air moves more slowly, the pressure is increased. This difference in pressure is what creates lift.

Thrust is the other force keeping the kite in the air. Thrust is created by the wind blowing. The wind pushes against the airfoil shape of the kite to create thrust. Think about wind blowing a sailboat. The wind pushes against the sail and moves the boat forward. Wind pushes against the kite, but because the kite is stationary and tilted, the wind is deflected downward, pushing the kite up.



Drag; determined by the weight, design and the set of the bridle line of the kite, and gravity pulls down on the kite. A kite must have more lift than drag to fly; however, some drag is needed to add stability.

Lift and drag are important to remember in the performance of your kite. For your kite to fly stationary in the sky the lift and drag must be equal and opposite to the force pulling it down. To move up, your kite must have more lift than drag.

A kite consists of these basic parts:

- The Spine- the up and down, vertical stick that you build the kite around.
- The Spar- the side ways, horizontal stick over the spine. Shorter than the spine
- The Frame- the joined spine and spar with a string frame that forms the shape of the kite and supports the cover.
- The Cover- the paper, plastic, or cloth that covers the frame of the kite.
- The Tail- a long strip of paper, plastic, or ribbon that helps balance the kite during flight.
- The Reel- what you wrap your string around to keep it from getting tangles and to wheel in your kite.
- The Bridle- One or more strings attached to the spine or spars, which help control the kite in the air.

*Do you want to Make your own Kite? See how on the next page!*

# How to build a Diamond Kite

## Materials:

- 2 wooden sticks, dowel rods, or bamboo (one longer than the other)(3ft and 2.5 ft)
- Strong paper to make the cover of the kite.
- Ribbon for the tail
- String for the frame, to bind the sticks, about 4 feet for the bridle, and enough to fly the kite (however high you want it to go!)
- Glue or tape to bind the sticks together
- Items to decorate the front of your kite

1. Take the two sticks and lay the shorter one, the spar, on top of the longer one, the spine.
2. Bind the sticks together using the glue, tape, or extra string.
3. Tip: the best place to bind the two sticks is slightly ahead of the center of gravity
4. Now cut notches in the spine and spar so that you can wrap string around the sticks to form the frame. The notches should be cut parallel to the spine on the spar and parallel to the spar on the spine.
5. Take 4 feet of string, knot one end and begin wrapping the string around the sticks to make the frame. The string should be placed in the notches you cut earlier. When you come to the end of the string, knot it around the closest stick. You want the string to be taut but not so tight that it bends or warps the sticks.
6. Cut the paper so that it will cover the frame and have about a 2-3 in margin so that you can fold the paper over the frame. Use glue or tape to attach the cover to the frame. You want the cover to be tight so that the wind will catch it.
7. To attach the bridle make two loops out of two separate pieces of string and attach one to the top of the spine and another to the bottom of the spine. Then take a piece of string about 3 ½ feet long and make a small loop in the middle of it. Attach this piece of string to the two smaller loops you attached to the frame. This is what you will attach the flying line to.
8. Make a tail out of ribbon about 3 feet long and attach small bow to it. This will keep the kite more stable in the air.
9. Attach the tail to the bottom of the spine and the flying line to the bridle.
10. Decorate the cover of the kite.
11. Go fly your kite!

Check Out the Picture on the back to see  
how to put your kite together!

