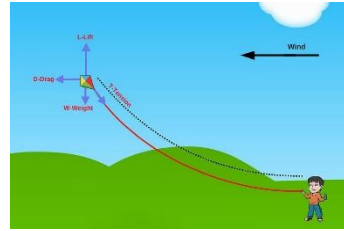
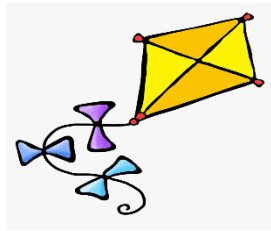


# Go Fly a Kite

60+ minutes



You are going to learn all about kites. You will research and find a few facts about kites, understand why a kite flies, and finally design and build your own kite.

**Carefully read the instructions below to complete this lesson!**

1. Go to the Internet and find the following facts about kites. Record your answers on Word, PPT, or paper and pencil

- Who invented the kite and when?
- Kites have been used throughout history for many practical reasons- list three
- What was the largest kite ever flown?
- What is the smallest kite ever flown?
- What type of kites did Alexander Graham Bell invent? Please include a picture of one of his kites
- List three different types of kites. Include a picture for each one

2. Carefully read the information on the next page. It explains why a kite flies using the 4 forces of flight.

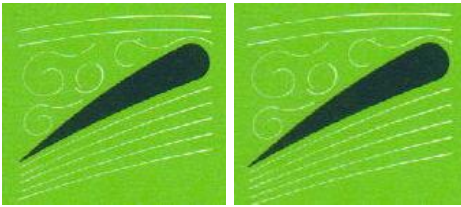


# Why a Kite Flies

## LIFT, DRAG, AND GRAVITY:

A kite and airplanes are heavier-than-air object that are flown by the lift created by air in motion over their wings. An airplane relies on **thrust** from its engines. A kite is tethered in place and needs moving air (wind) to fly.

There are many possible kite shapes. Each of these shapes, and how they use their aerodynamic features (either built in or added on) will determine if or how it flies.



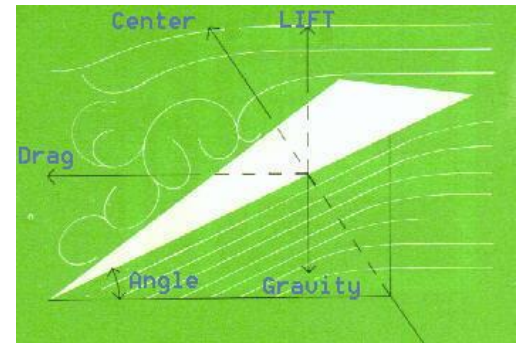
Wind moving across the sail of a kite creates pressure. **Lift** results from this wind pressure being deflected along the face of the kite. In other words, the wind pushes up on the kite. Think of wind pressure like a hand, pushing the kite up into the sky and holding it there. If the hand is removed, the kite will fall.

At the same time, wind passing over the top of the kite creates an area of low pressure, like a vacuum, along the back of the kite. This creates a pull from behind.

A kite is affected by **thrust, drag and by gravity**.

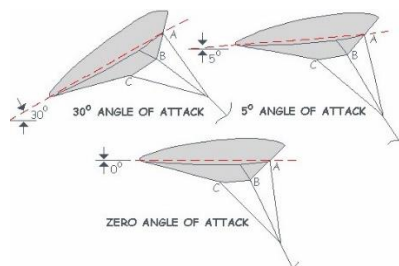
**Drag** is created by wind resistance on the kite's surface (and tail). Drag can also result from turbulence behind the kite. **Gravity** is the downward force created by the weight of the kite. **Thrust** is the power of the wind which creates lift.

To fly, a kite needs to have enough lift to overcome gravity and drag.



All of these forces - lift, drag, gravity, and the thrust of the wind come together in the kite at a place called the **center of pressure**. And not surprisingly, that's where you tie your kite string. We call this special place the **tow point**.

By moving the place your string is attached to the kite on the bridle line, you can change the amount of lift that is created. You do this by changing what we call the **angle of attack**. This is the angle that the kite leans into the wind.



# Build a Kite



There are many websites with plans to build your own kite. There is more to designing a kite than you might think- it will not fly if it is not designed and constructed properly. Here are the instructions for three kites. If you want to try a different design, feel free- the sky's the limit

MBK Minimum Sled: <https://www.my-best-kite.com/make-a-minimum-sled-kite.html> requires only paper, tape and string

Kite with Tail: <https://www.origami-resource-center.com/kite-shop.html>

Diamond Kite: <https://recipes.sainsburys.co.uk/articles/cooking/step-by-step-guide-to-making-your-own-kite>

Requires more materials but should be easy to build if you want a challenge

If you are successful at building and flying one or more of the kites above, please take pics or a video and share it!

**Safety Reminder: Always fly a kite in an open area that is not near power lines, trees, houses or other obstacles. Fly Safe!**

*Kites rise highest against the wind - not with it.*

Winston Churchill

