Kites

Family Friday Project

Possible Materials

Sail – plastic or paper

Frame – drinking straws, sticks, or straw

Bridle & Line – fishing line, lightweight string, or yarn

Connectors – tape or staples

About Kites

History

Kites were used in Asia nearly 3,000 years ago. They might have been invented in China using silk and bamboo, in Malaysia using leaves, or in both places at the same time. From there, kites spread throughout Asia, the Middle East, and North Africa, finally reaching Europe around 800 years ago.

Kites have been used for fishing, lifting, pulling, delivering, signaling, measuring, spying, discovering, flying, generating energy, dueling, celebrating, and, of course, having fun. The Wright Brothers even used kites to their airplane designs.

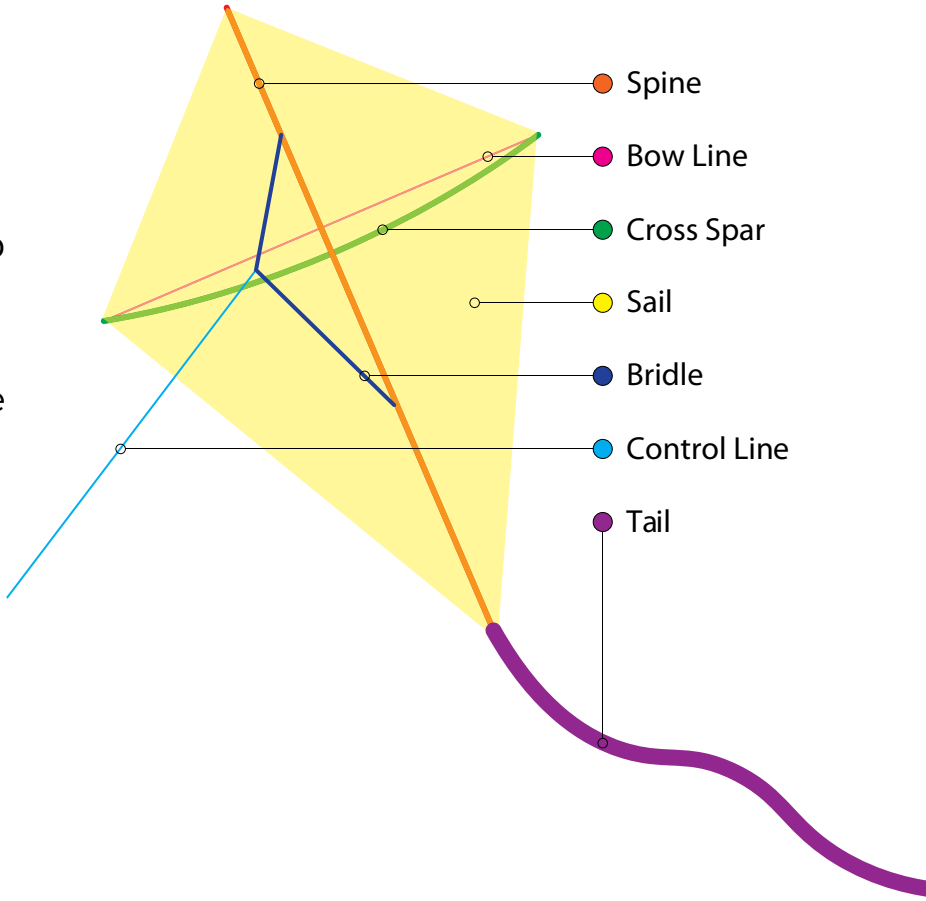
Learn more about the history of kites at kite.org/education/history-of-kites/

Structure

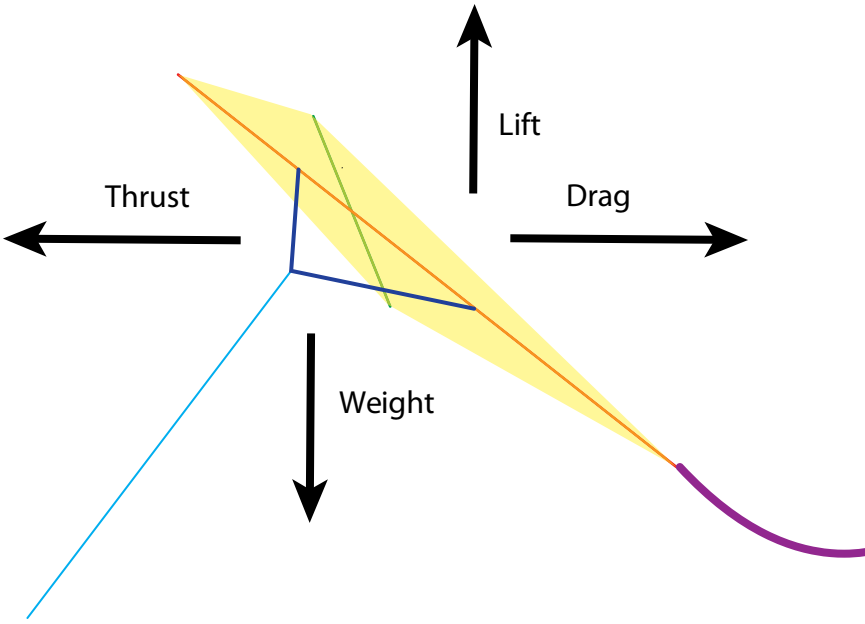
Kites come in many different forms, but they have three main parts:

1. **Body**: catches the air. It is made up of a sail and often a frame.
2. **Bridle (or harness)**: determines the angle of the body to the control line.
3. **Control line (or tether)**: lets the flyer hold and apply force to the kite.

Tails and bow lines can be added to help stabilize the kite.



How Kites Fly



There are four forces on a kite:

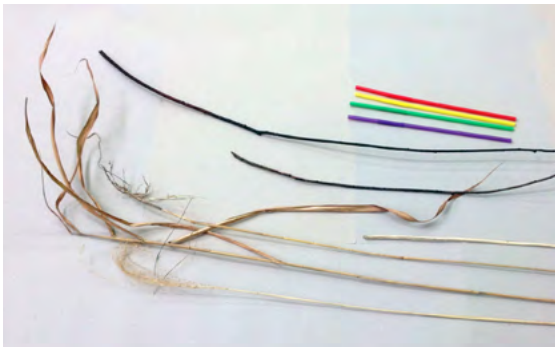
1. **Lift**, created by the difference in pressure between the faster air moving over the kite and the slower air moving under it, pushes the kite up.
2. **Drag,** caused by the difference in air pressure between the front and back of the kite as well as the friction of air against the surface, pushes the kite back.
3. **Weight,** the force of gravity acting on the kite, pulls it down.
4. **Thrust,** created by the tension the flyer puts on the kite with the line, pulls it forward.

When thrust and drag as well as lift and weight are balanced, the kite is motionless in the air. Learn more about the physics of kites at airandspace.si.edu/stories/editorial/how-kites-fly and sciencefriday.com/educational-resources/kite-engineering/

The Art of Kite Making

Kite making is an important artistic tradition in China. This handicraft was passed to Ha Yiqi, shown painting a miniature kite, down through the family from his great-grandparents. To learn more about how he makes kites and see finished pieces, visit artsandculture.google.com/story/the-has%E2%80%99-kites/3gli50dR_vsAKA

Let’s get started



Supplies

You can use many things to make your kite, but the key is to use things that are strong and lightweight.

For my frames, I used either plastic drinking straws or the dried stalks of some ornamental grasses I found outside. Straw, straight sticks, and bamboo skewers are good alternatives.

Some ideas for the sail include garbage bags, paper bags, grocery bags, wrapping paper, newspaper, press’n seal wrap, or a tyvek FedEx envelope is great. You will also need scissors to cut out your sail.

Use tape to put things together. If you are low on tape, use staples.

Fishing line, lightweight string, sturdy thread, or even yarn can make the bridle and control line. To poke holes for your bridle, use a toothpick, nail, needle, or pin.

Resources

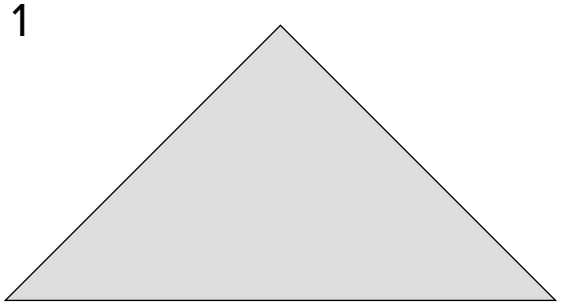
youtube.com/watch?v=welKVuAYuAM

kiteplans.org/

my-best-kite.com/

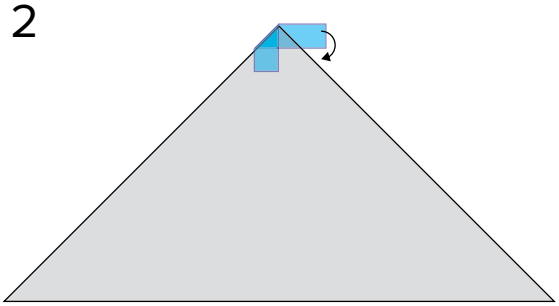
Assembly

1



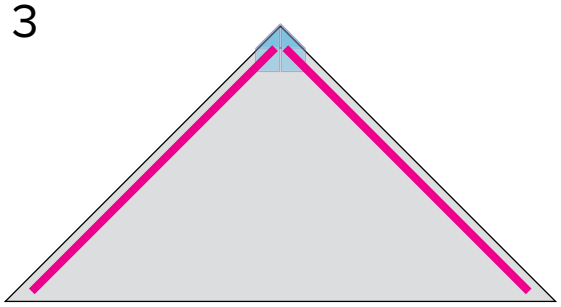
Cut a triangle for your sail.

2



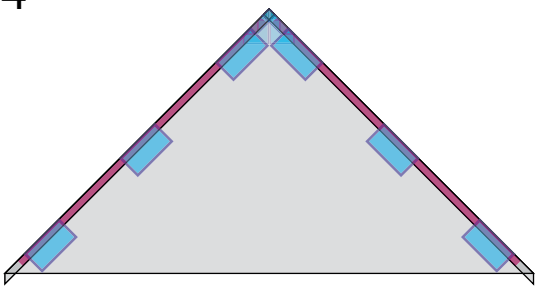
Fold tape over the top
to reinforce the tip.

3



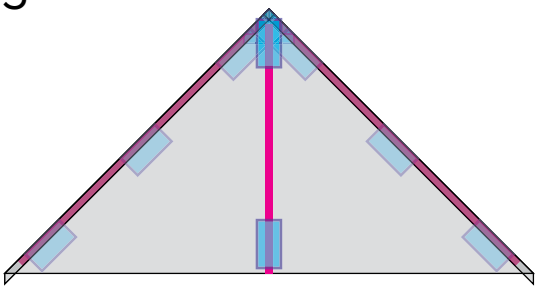
Place the spars.

4



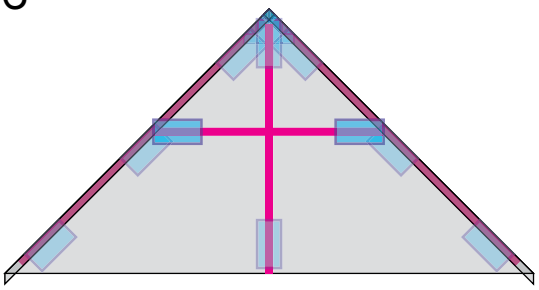
Fold the edges over the spars
and tape them in place.

5



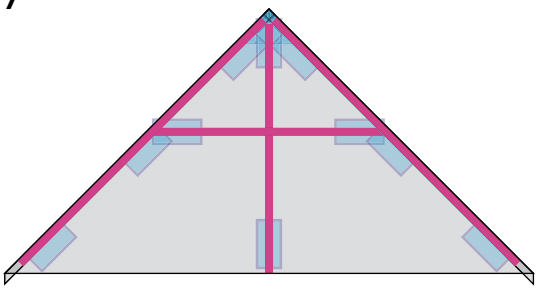
Tape the spine in place.

6



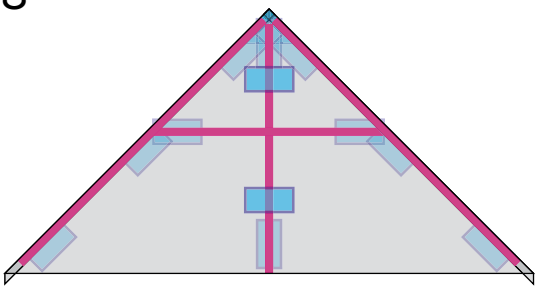
Tape the cross-spar in place.

7



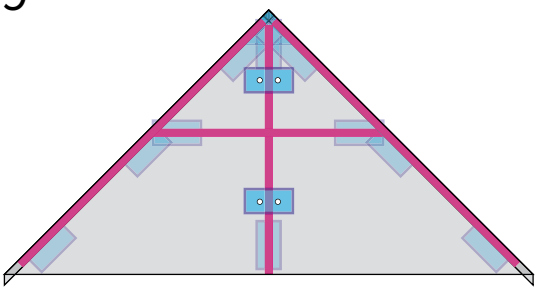
Flip the kite over
so the smooth side is facing up.

8



Reinforce connection points
for the bridle with tape.

9



Poke holes for the top and bottom
of the bridle on both sides of the spine.

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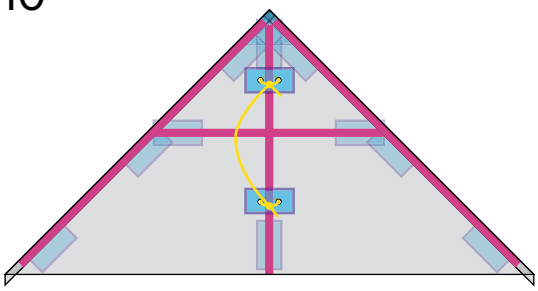
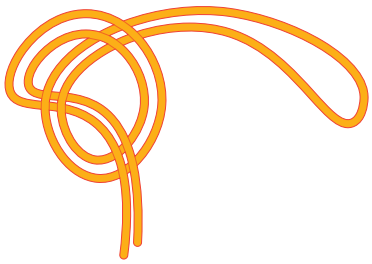


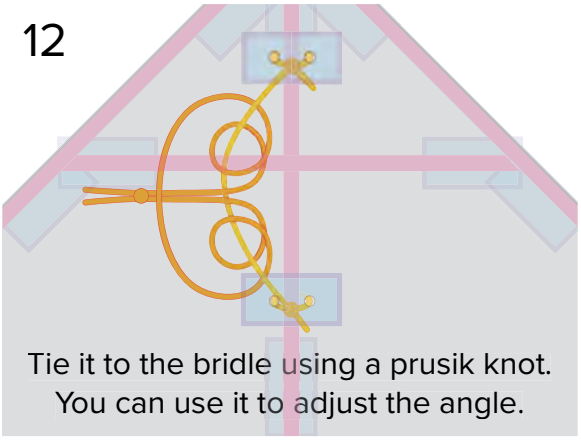
Tie on a loose string
for the bridle.

11



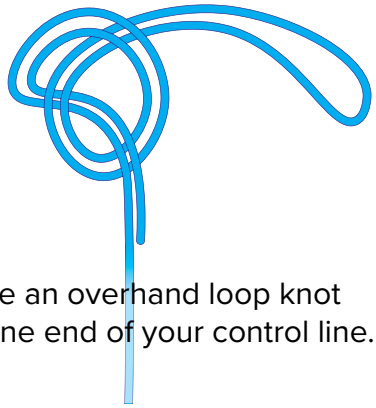
Fold an 8-inch piece of string in half,
and tie an overhand loop knot
at one end.

12



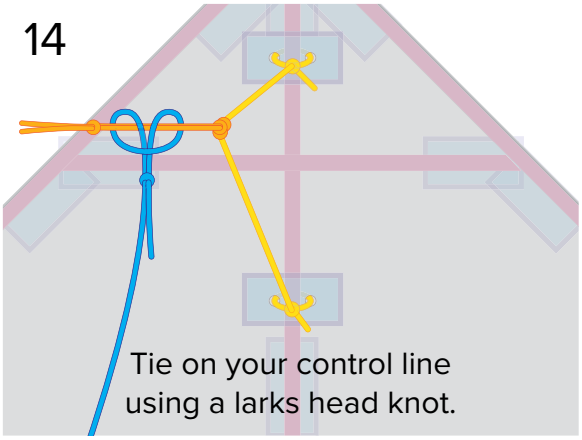
Tie it to the bridle using a prusik knot.
You can use it to adjust the angle.

13



Tie an overhand loop knot
at one end of your control line.

14



Tie on your control line
using a larks head knot.

Share what you made!

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