

SLED KITE ENGINEERING

Adapted by J. DesAutels from Science Friday

SLED KITE CONSTRUCTION - MATERIALS AND EQUIPMENT

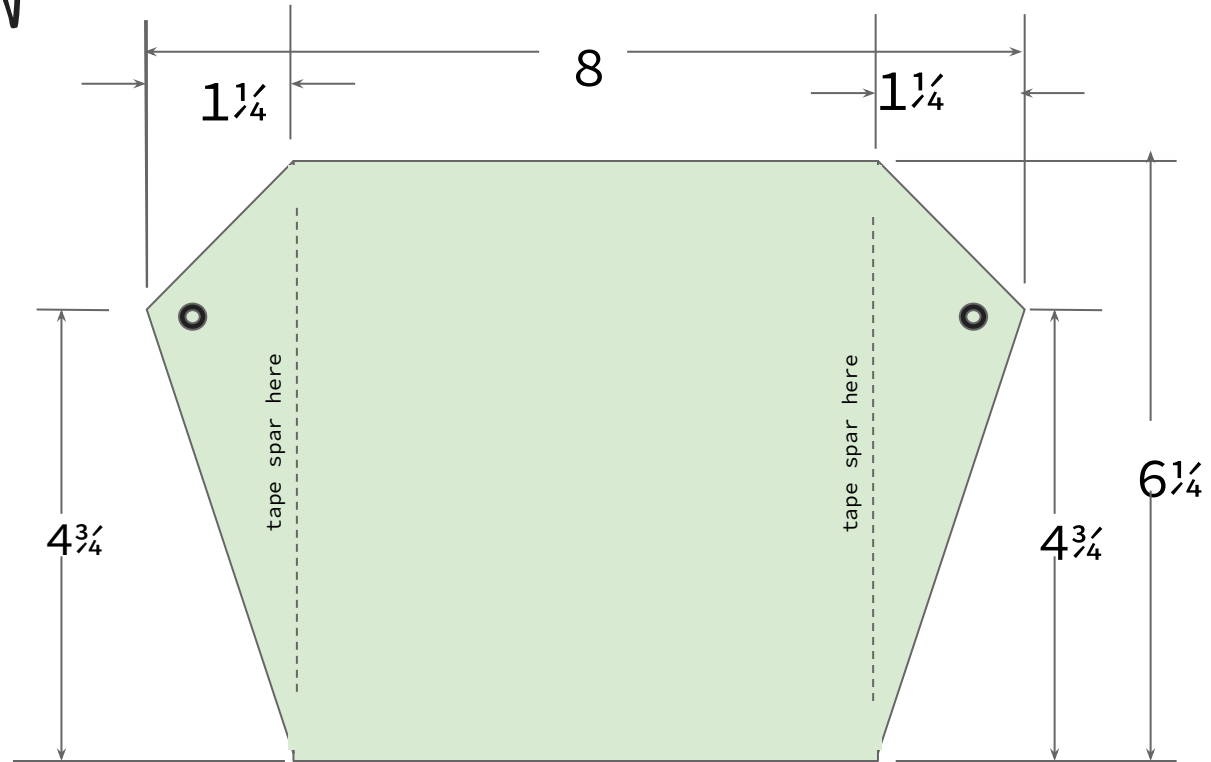
- Graph paper
- Pencil
- Ruler
- Scissors
- Printer paper
- Colored pencils, crayons, or markers
- Rolled paper spars (2)
- Tape
- Hole punch
- Kite string (6 m long)
- Meter stick, metric measuring tape, or metric ruler
- Paper clip
- Plastic grocery bag or other thin plastic bag
- Design notebook

SLED KITE CONSTRUCTION - STEPS

1. Carefully draft a template on graph paper following the diagram on the next slide.
2. Attach the template to printer paper and cut it out with scissors. You can decorate the kite using crayons, markers, or other media.
3. Trim the length of the two spars so they will fit on the dotted line location shown.
4. Tape the spars into place.
5. Place two or three pieces of tape in the marked areas covering the black circles. The tape will help reinforce the holes for the kite string.
6. Using the hole punch, carefully punch the two holes marked by the black circles.
7. Attach string. **String** instructions are on **page 5**.
8. Attach tail. **Tail** instructions are on **page 6**.
9. Complete your **Design Notebook** as you test your kite outside against different variables such as tail attachments and speed.

SLED KITE PATTERN

1. Using pencil and ruler, draft this pattern on graph paper.
2. Cut it out.
3. Make rolled paper tubes for spars and tape them on the marked locations.



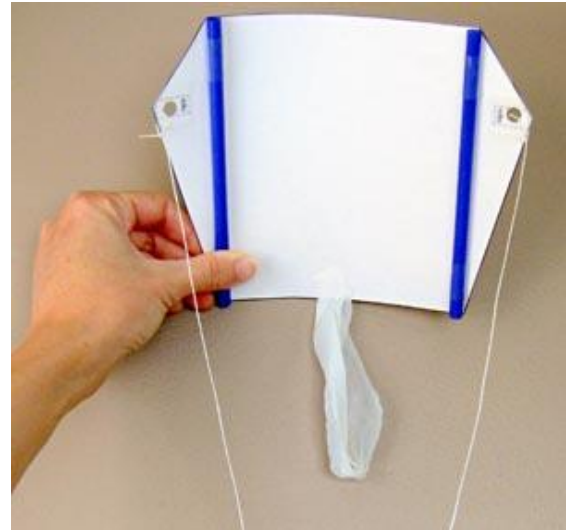
STRING ATTACHMENT

1. Cut a piece of kite string 90 centimeters (90cm) long. Tie one end of the string through each hole. Tie them tight, but not so tight that you tear the paper.
2. Hang the string from your finger to find the center and either tie a loop at that location, or hook it to one end of a paper clip (Tie it to the paper clip so it won't slip off). This is the bridle.
3. Cut a 1 meter (m) long piece of string. This is the tow line.
4. Tie one end of the tow line to the loop or paper clip in the center of the bridle (see picture).



TAIL CONSTRUCTION

When you attach a tail to your kite, attach it to the bottom center of the kite, as shown here with a 10cm-long tail. If you attach more than one tail to your kite, attach the tails symmetrically on the bottom of the kite.



TROUBLESHOOTING

Professor Kite Explains "How to Get Your Kite to Fly" (from <https://mypages.iit.edu/~smart/scavjoh1/lesson7.htm>)

Kiters know that a kite has no "spirit" until it has been flown. Even if your kite is only for decoration, it should be flown at least once.

Stand with your back to the wind. Hold your kite up by the bridle point and let the line out. If there is sufficient wind, your kite will go right up. Let the kite fly away from you a little, then pull in on the line as the kite points up so it will climb. Repeat this until your kite gains the altitude necessary to find a good steady wind.

Light Wind? Have a helper take the kite downwind and hold it up. On command, the helper releases the kite and the flier pulls the line hand-over-hand while the kite gains altitude. Practice this high-launch technique.

No Helper? Prop the kite up against a bush, post, or wall. Reel out enough line for altitude and simply pull the kite aloft.

If the kite sinks **tail first**, there might not be enough wind. Try to increase the size of the kite and/or reduce the weight wherever possible. If it comes down **head first or spins**, there might be too much wind. Different kites fly in different winds.

Tails: Adding tails to your kite helps it **remain stable in stronger winds**. Use light-weight materials so you can use lots! Looks great!

Bridles: If your kite has an adjustable bridle, move it higher (nearer the top) in higher winds, and lower (towards the tail) in lower winds. (Adjust no more than 1/2" at a time.)