Proposed Kite Designs

Idealized Task:
Create an easy to build, easy to fly kite. This kite will be used for communication use, possibly as a signal kite. Our plan is to attach some reflective material in order for people to see it. We want the kite to be able to fly an approximate height of 50 feet, and be able to fly for extended periods of time.

Delta Kite Concept:
I propose building a 1-skewer delta kite. This kite is the simplest to build out of the delta kites and flies up to heights of 150 feet. The kite is idealized for kids, and therefore is easy to fly in light or moderate winds. However, this kite tends to loop around in one direction, it's possible to tweak it straight by adding a tiny amount of tail to one wing tip. If the wind is too strong, nothing will stop the kite from being unstable. This kite uses a limited amount of materials, and therefore would make a low impact on the environment.

Materials:
- 2-ply plastic bags
- hardwood dowel (5 mm diameter)
- electrical insulation tape or glue
- string

How to build:
1. Measure a flat 58 inch long and 28 inch high flat plastic piece from the bag. Hold the piece in half. Starting from just below the top-left corner of the bag, measure and mark 3 dots on the plastic. The picture to the right shows these dots highlighted in yellow.
2. Cut the sail. Using the measurements made cut a triangle shape in the plastic. Don’t cut down the center line. When the plastic piece is open it should like the picture shown.
3. Next build the spars.
   a. Lay a 28 inches long wooden dowel down the center line of the sail.
   b. Now cut off 2 more lengths, each 32 inches in length. Lay these down over the leading edges of the sail as shown in the picture.
c. Cut off a 28 inch length of dowel and lay it across the sail, 12 1/4 inch from the nose.
d. Carefully secure all the dowels with the electrical insulation tape. The picture to the right shows an idea of what this step should look like.

4. Attach the fly line. Poke a hole in the plastic sail, right over where the horizontal and vertical dowels cross each other.

Box Kite Concept:
I propose building a traditional box kite. This type of kite is the simplest of the box kites, and offers up the best results in terms of flight. It is more effective than the hargrave kite which is in more of a bi-plane shape than the rectangular kite. A typical box kite with a fiberglass frame weighs approximately 10 ounces, but for our purposes in building a wooden kite, the height of the kite will compensate for the extra weight. The kite leaves a very small footprint since there are very little materials used and no machining necessary in order to create the kite. This kite generates the most lift out of all of the kites that we have researched.

Materials:
- 8 dowels - commonly 36 inches long
  - 1/4 inch for the spreaders and 5/16 inch for the main body
- Twine or string
- 2 yards of light fabric

How to build:
1. Attach all dowel rods together using square lashings
   a. Long rods used for vertical rectangle
   b. Shorter rods used for spreaders that keep kite taught by putting diagonals in the middle
2. Size cloth by cutting into cloth to make knots
3. Wrap cloth around frame and making cuts where necessary
4. Attach cloth at top and bottom of the vertical rectangle, making sure to leave the middle section open
5. Use attached material dimensions to determine where parts go

Sled Kite Concept:
I think the sled kite will be our group's best option. The sled kite is often very small and easy to build. The kite I have proposed will only be 30 inches and will be very inexpensive because it is only made out of wooden skewers and a plastic bag/trash bag.

Materials:
- Large plastic bag or nylon fabric
- two 30“ wooden skewers
- tape
- string

How to Build:
1. Trace and Cut out a boxed-heart shape in a piece of plastic bag or nylon
2. Place 2 30” wooden barbecue skewers down from the top points of the kite, to the bottom corners.
3. Cut off remaining wood that is longer than the kite.
4. Tape the spars securely to the kite
5. Tie a string to the middle of each spar and tie another not in the middle so the kite flies flat.
6. (Optional) Create a tale for the kite by cutting out two thin, long, rectangles out of plastic bag and tie them around the bottom of each spar.

Diamond Kite Concept:

I think we should build a Dowel Diamond Kite. This type of kite is the simplest and most cost effective to build. The structure of the Diamond kite is two sticks laid perpendicular to each other with sail laid on top.

Materials:
- 120 cm by 120 cm plastic bag
- Two 120cm dowel rods.
- String

Construction:
1. Take the plastic bag and trace a diamond shape on it to the size of the bag.
2. Next cut the traced shape of the diamond
3. Cut the one of the dowel rods to the length of the diamond and cut the other dowel rod to the width of the diamond.
4. Lay the dowel rods down on top of each other in a cross section in the center of the diamond.
5. Tie or tape the center of the two dowel rods together and glue/tape it to the diamond.
6. Tape the ends of the dowel rods to the tips of the diamond.
7. Have one string tied to the center and another string tied to the tail of the kite. Connect these two strings together to one long string.