

Activity Ten: Simple, Fun, Foam Flying Machine

The SR-71

AS A SIMPLE, FUN, FOAM FLYING MACHINE

OBJECTIVE – An easy, yet fun activity that can be built for about 50 cents and will give the entire squadron an evening of fun. It is also a test of some most unusual flying skills.

NATIONAL STANDARDS –

Next Generation Science Standards (www.nextgenscience.org):

Disciplinary Core Idea Progressions

Physical Science Progression

- PS2.A: Force and motion
- PS2.B: Types of interactions

Cross-cutting Concepts

- Systems and system models



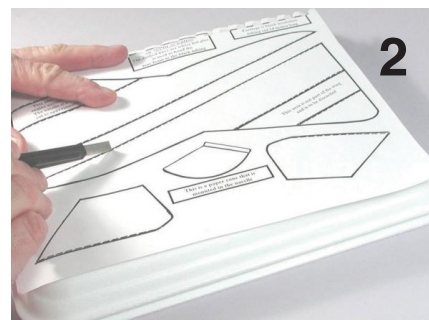
BACKGROUND – This lesson focuses on the construction of the remarkable flying craft, the Blackbird SR-71.

MATERIALS –

- 14" of pipe foam tubing used to insulate $\frac{3}{4}$ " copper tube.
 - Used as the fuselage
- Foam meat tray to use as a template (should be larger than a sheet of paper)
 - Used as wings and fins
- Pointed drinking cups
 - Used as nacelle inlet cones
- #64 Rubber band (for launch mechanism)
- 2 nylon cable ties (for launch mechanism)

PROCEDURE –

- The foam tubing is cut to a length of 14 inches. This seems to be the length that flies the best.
- The template is used to cut out the meat tray foam parts. See page 99 for template.
- A piece of sandpaper glued to a flat surface, like a paint stirring stick, works well to dress the edges of the foam pieces.
- The inner wing is glued using a hot glue gun.



The wings and fins template is placed down on the foam meat tray as shown. Spray the backside of the template with a low-tack glue, like “Elmer’s” Spray glue, as this makes it easier to trace and cut. Just be careful when cutting the foam tray - we recommend either a snap-knife (shown) or an X-Acto knife with a #11 blade.

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5. NOTE: DON'T use the hot glue on the BLACK FOAM TUBING. It will burn a hole through it. THE WHITE FOAM MEAT TRAY TAKES THE HEAT MUCH BETTER.

6. Cut out the nacelles. These should be about 6 inches long-or the same length as a soda can.

7. The nacelles are glued to the outboard edge of the inner wing panel.



8. Glue the small wing tips to the outside edge of the nacelles.



*Hot glue works on white Styrofoam® but not well on black foam tubing.

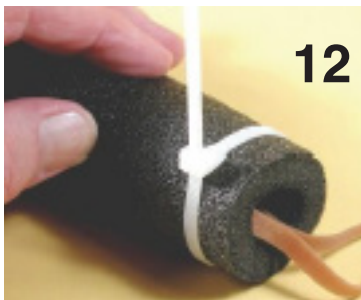
9. The fins are glued into position at this point. Note that they slant inward.



10. It's time to install the "power plant." Using a cable tie, wrap it through a #64 rubber band. Cinch it down to a one inch diameter and cut off the remaining "tail."

11. Stick the cable tie and rubber band into the open end of the fuselage. Leave about 1.5 inches of rubber band sticking out.

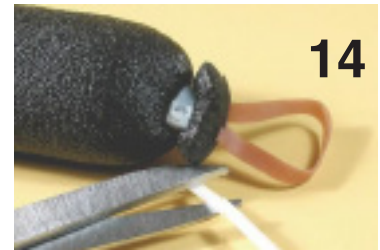
12. Take another cable tie and wrap it around the nose, about 3/8ths of an inch from the end of the tube.



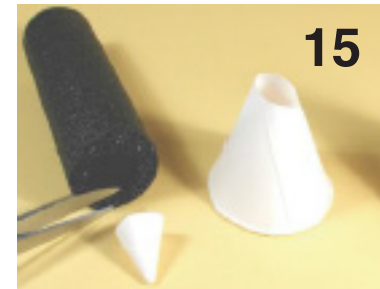
This will then be cinched down very tight to keep the rubber band and inner cable tie from coming out during launch.

13. With a strong tug, cinch this outer cable tie down hard. This will keep your inner rubber band and cable tie from slipping through.

14. Trim the tail off the fuselage tie. It is recommended to put a bead of hot glue on the cable tie so as to cover any sharp edges.



15. If you wish to install the pointed nacelle tips, use the ends of two drinking cups and hot glue into the nacelles. If you can't find the pointed cups, simply make cones by folding paper.



The nacelle points can be made from drinking cups.



Here they've been installed with hot glue.

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THE SR-71 CONSTRUCTION ILLUSTRATION.

This illustration shows how all of the pieces are to be placed. Use this as a guide along with the how-to sequence of images.

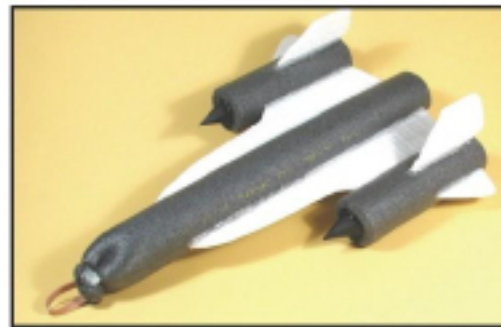
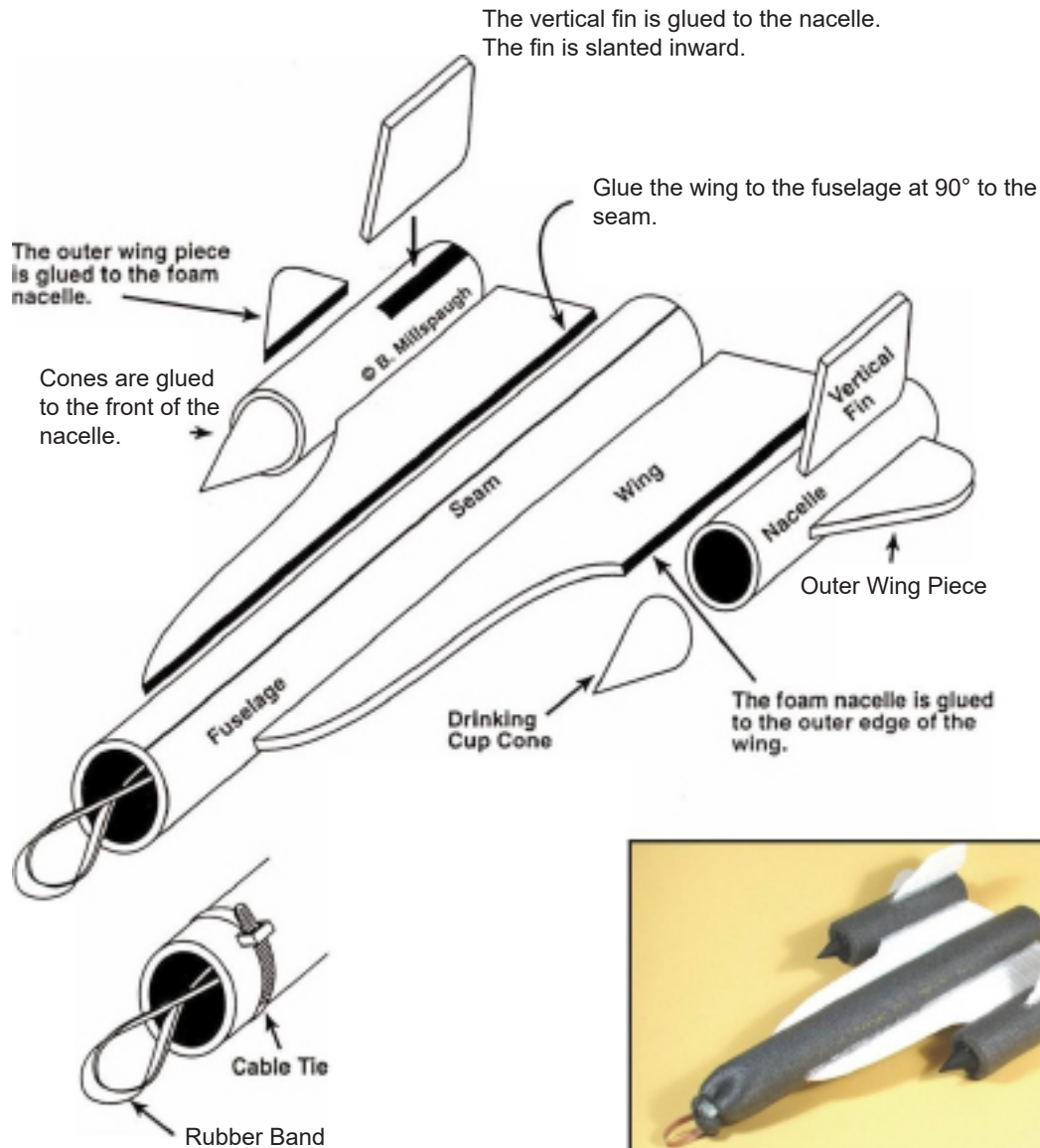


Illustration by Seth Stewart 2000

TO FLY THE SR-71

- Pinch the end opposite the rubber band with your forefinger and thumb.
- Put the other thumb into the rubber band. Pull the rubber band to about 4-6 inches.
- When you launch the SR-71, pitch outward in a slight arc.

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