Kit: $3.00

RAFT IDEAS

Topics: Sound, Waves, Forces, Motion

Materials List
(Per Buzz Off unit)
- ✓ 1 Wide rubber band
- ✓ 2 Adhesive backed foam pieces, 2-2.5 cm (¾”-1”) wide, 4-5.5 cm (1½”-2½”) long, about 6 mm (⅛”) thick
- ✓ 1 Index card ~8 cm x ~14 cm (3” x 5”) or equal
- ✓ 1 meter (3 ft) String or yarn
- ✓ 1 Jumbo craft stick (tongue depressor)
- ✓ Scissors

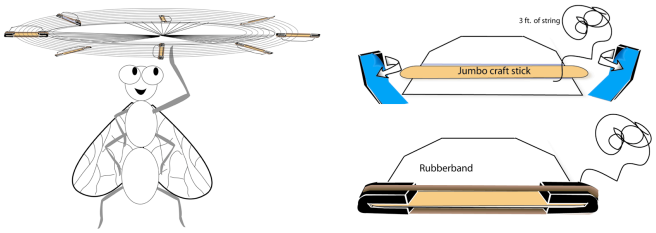
This Activity can be used to teach:
CO Science Standard 1: Physical Science
- Sound and Sound Waves
- Investigation and Experimentation
- Forces and Motion

Grades: k, 2, 4, 8, HS

raft resource area for teaching
2875 Blake Street • Denver, CO 80205

Buzz Off

The faster it spins, the more it buzzes!



This simple noisemaker is a great way to gain attention and to investigate the variables in creating sounds using a vibrating rubber band.

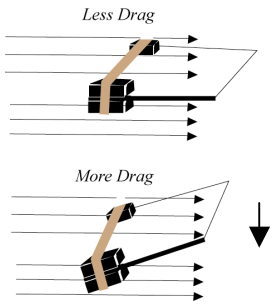
Assembly

1. Trim 2 corners from the long side of the index card or piece of stiff paper.
2. Cut thick adhesive foam into two pieces about 2 cm x 5 cm (¾” x 2”).
3. Overlap the long, uncut edge of the index card with the jumbo craft stick such that the index card covers ½ of the width of the jumbo craft stick.
4. Peel the backing from one of the pieces of adhesive foam. Fold the foam piece over the end of the craft stick so that the craft stick and the index card are joined together (see the illustration at the top of the page).
5. Lay a string across the adhesive side of the second foam piece, leaving a loose end of several inches. Place this second piece of foam over the other end of the craft stick in the same way as step 4. Use the short end of the string to knot a loop around the foam, making a secure attachment.
6. Stretch the rubber band over the foam covered ends of the craft stick as shown. Untwist the rubber band if twisted.

To Do and Notice

Twirl the Buzz Off overhead, **but first make sure the flight path is clear!** How does the sound change as the Buzz Off is spun at different speeds or in circles of different sizes? Change a variable and note the effect on the sound that is produced.

The Science Behind the Activity



The air flowing above and below the Buzz Off causes the rubber band to vibrate due to turbulence, eddy currents, and vortex shearing. The rubber band will produce the most sound when the rubber band is at the leading edge of the card with the card moving parallel to the direction of the airflow. Aerodynamic **drag** on the card keeps the rubber band parallel to the airflow. The drag will increase if the card is at any other angle. The increased drag will automatically move the card back to being parallel with the airflow. The frequencies produced by the rubber band will depend on several variables such as the rotation speed, the rubber band tension, the rubber band’s dimensions, foam thickness and the size of the gap between foam pieces. A change in any of these variables can affect the sound that is produced.

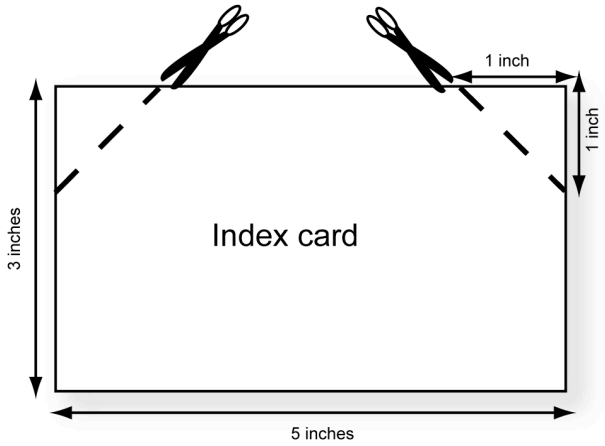
Taking it Further

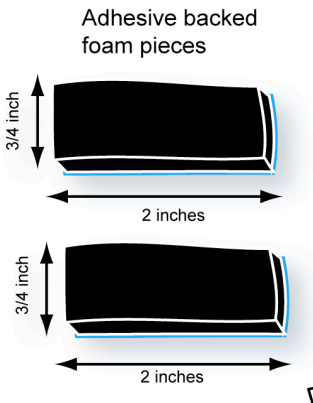
Try different size or number of rubber bands. Experiment with cutting the index card into different shapes (a fly?). Try stretching the rubber band so that the top and the bottom are at different tensions. What happens if the rubber band is twisted?

Web Resources - Visit www.raft.net/more for how-to videos and more ideas!

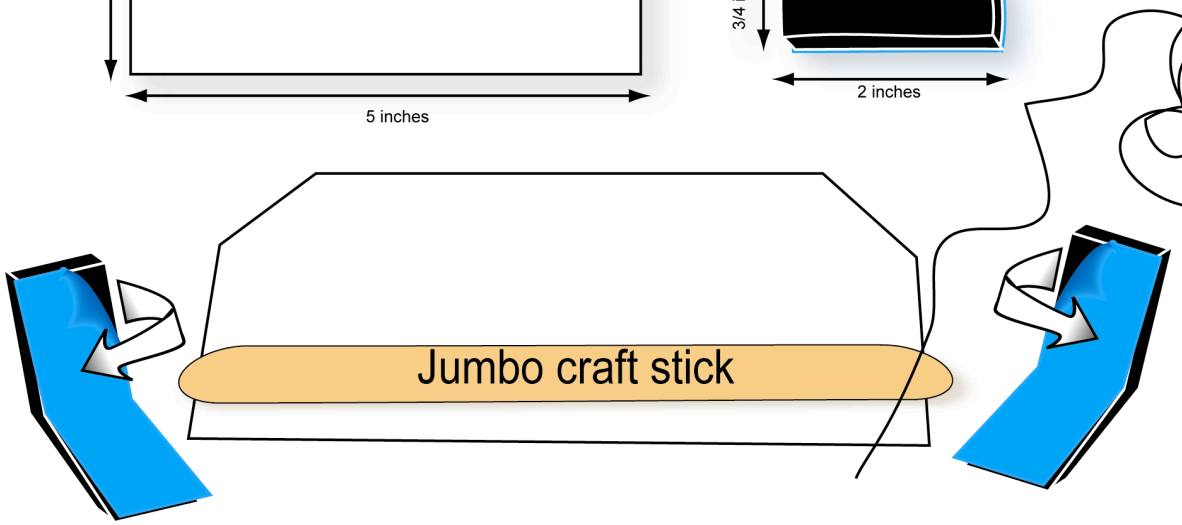
Developed and written by Michael Pollock (RAFT) and Jay Gluckman (RAFT)
Copyright 2006, RAFT

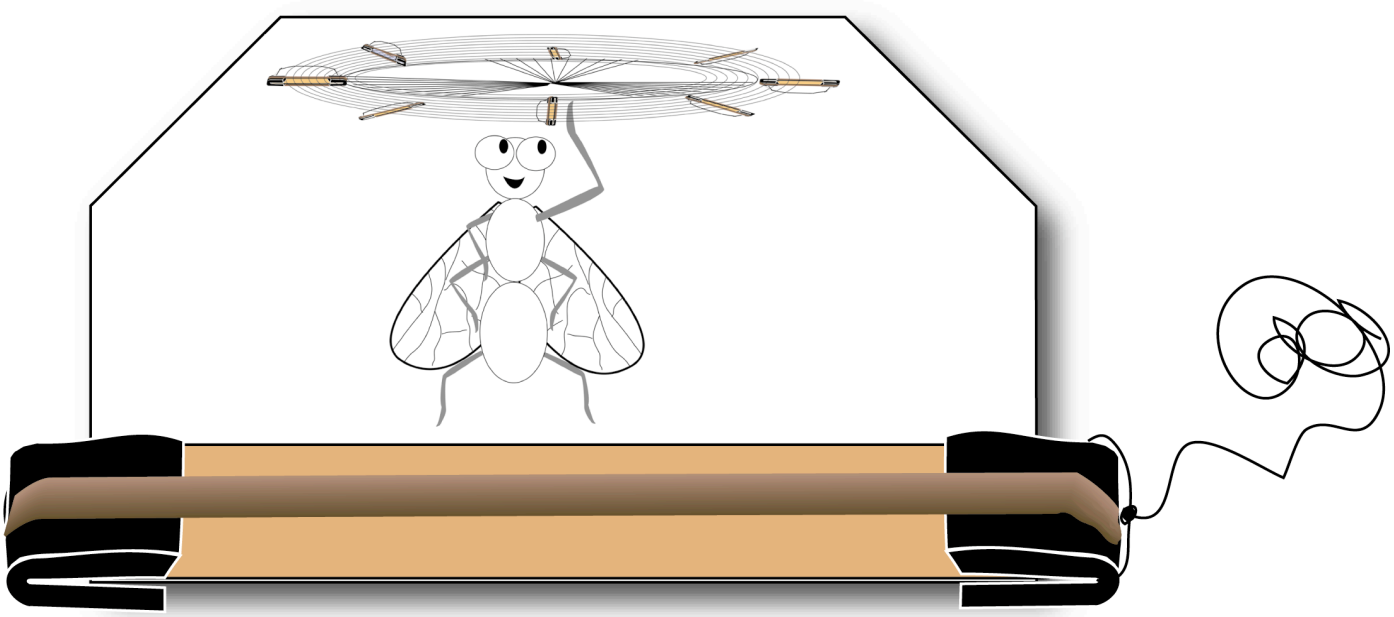
Buzz Off Assembly Guide

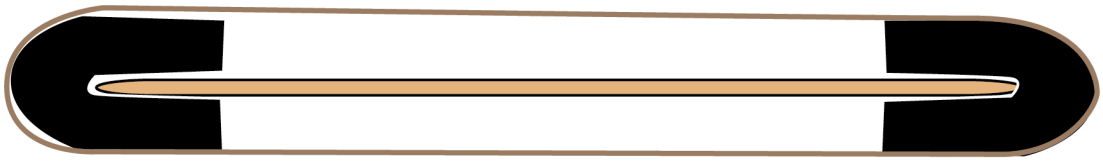




3 ft. of string







Copyright 2006, RAFT