

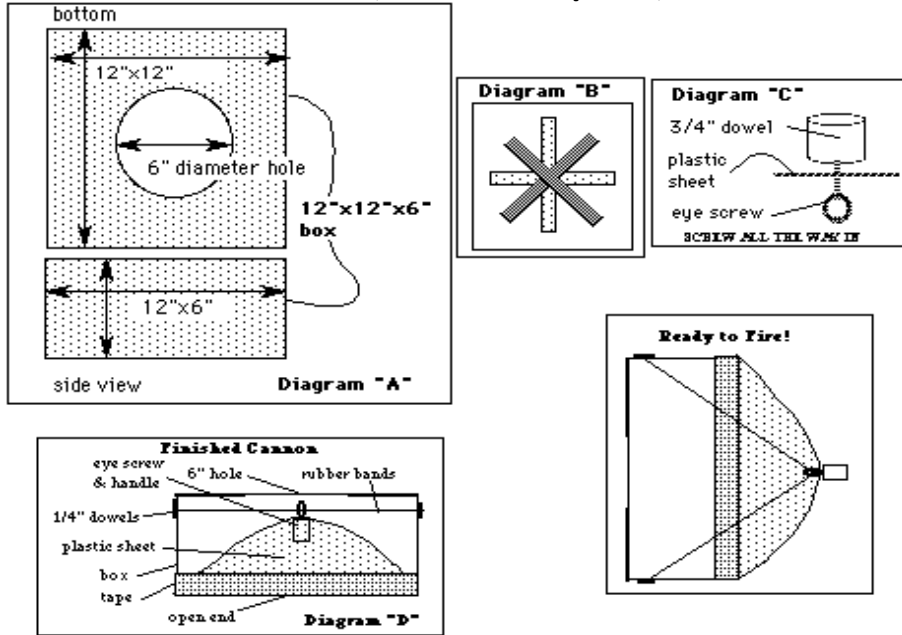
The Air Cannon: *A great toy, a fascinating scientific exhibit.*

As a toy, the cannon is useful for shooting at friends, flags, cats on couches, and card board cut-outs. As a scientific demonstration, the cannon shoots a "torus" (doughnut) shaped blast of air 30 feet or more.

Materials Needed: Card board box approximately 1 ft. by 1 ft., a heavy plastic sheeting (a heavy duty garbage bag will do) about 2 ft. x 2 ft., 2 one inch pieces of 1/4 inch dowel rod (Pieces of a pencil work), 1 one inch eye screw, 1 half inch piece of 3/4 inch dowel rod for the handle, heavy standard rubber bands.

(The cannon can be made any size. It has been made out of 5 quart plastic ice cream tubs and 55 gallon plastic drums.)

Directions (for a box 1 foot by 1 foot):



- Diagram "A"** 1. Cut a 6" diameter circle from the bottom of the box.
 2. If the cardboard is heavy duty you may cut off the top of the box so it is about 6" deep. Or, you may fold the top edges out and down for extra strength to form a box about 6" deep.
- Diagram "B"** 1. In the center on the plastic sheeting, place an "X" made of 4" strips of duct tape.
 2. Turn plastic sheeting over and place another "X" made of 4" strips of duct tape at a 45 angle to the first "X".
- Diagram "C"** 1. Push the eye through the center of the "X"'s on the plastic sheeting.
 2. Attach the 3/4" diameter dowel knob firmly to the eye.
- Diagram "D"** 1. Make a hole on each of two opposite sides of the box close to the bottom edge of the box (near the surface with the 6" hole).
 2. Thread the rubber bands through one hole and put the 1/4" dowel through the rubber bands to keep them from pulling through the hole. (Fasten several rubber bands together (depending on size) so that they can stretch into firing position fairly easily. Experiment with the length needed.) (A hook made from a paper clip may help you thread the rubber bands.)
 3. Thread the rubber bands through the eye piece on the plastic and then out the other side of the box. Use the second 1/4" dowel to hold the rubber bands in place.
 4. Loosely stretch the plastic over the edges of the box and tape them securely, making a loose diaphragm. After all four sides are taped in place, run an extra piece of tape around the whole box to anchor the plastic.

Fire the cannon by standing at nearly right angles to the target and placing one edge of the box against your body. Hold it in place by reaching across the top of the box with one hand. Use the other hand to pull back the knob. Let go! Kids are surprised at the strength of the blast and the length of time it takes the blast to reach the target. We timed the torus at ten feet per second. We also noticed that the torus is about the same size at 30 feet as at 3 feet.