Eyepops

P4-2300

BACKGROUND:

The operation of the Eyepops is based on Bernoulli's principle (Daniel Bernoulli, 1700-1782). Bernoulli's principle states that as the velocity of a fluid is increased, the pressure in that fluid decreases. The air coming out of the hole beneath the (eye)balls is moving quickly. It gives the eyes energy to rise because it is moving upward. However, the fluid pressure (to the sides) is less than that of the surrounding air. Therefore, if the eyes move to the side, they are pushed back into the lower pressure air by the surrounding higher-pressure air.

Bernoulli's principle applies to all fluids. Therefore, the Eyepops can be used to study pressure and fluid motion. A sample content standard for fluids is: Investigate and identify properties of fluids including density, viscosity, and buoyancy.

PRODUCT INFORMATION:

The Eyepops consists of a reptile head with a mouthpiece, two openings with cups, and two foam eyeballs. If more than one person is using the Eyepops, it should be cleaned with a sanitary spray between uses.

ACTIVITIES:

Blow into the mouthpiece, gently at first, and then with increasing force. The eyeballs will float in the airstream above the openings. The steadier the breath, the easier it is to get them both to remain suspended. Decrease the air slowly and the eyeballs will come back down into the cups. This may take a little practice to be able to get them both to come back. One eyeball can be held in place with a finger or removed. Keeping one eyeball up is generally easier to do. How high can you make them hover?

Try tilting the reptile to the side gradually while an eyeball is suspended. Because of Bernoulli, it should be possible to tilt the device 10 or 20 degrees past vertical.

RELATED ACTIVITIES:

There are many demonstrations and activities with Bernoulli's principle. Some examples are provided here to get you started.

Use a **Sound Pipe** (P7-7200) to blow confetti around. Place bits of paper or confetti on a table. With one hand hold the Sound Pipe near the table. Put the other hand just above it and swing the sound pipe around in a circle. You should hear a tone being created. Since the upper end of the tube is moving while the lower part remains still, there is a pressure difference in the pipe. This causes air at the higher-pressure end (the lower, stationary end) to rush into the pipe. This air will pick up the confetti, carry it through the pipe and fling it out the other end.

Use a flexible straw and a cheese ball. Blow through the straw and suspend the cheese ball, similar to the *Eyepops*.

Hang two inflated balloons from the ceiling with string. Blow between the balloons. They will come together. Along similar lines – place two empty aluminum cans on drinking straws. The drinking straws should have some space between them and be parallel to a line separating the two cans. Blow between the cans parallel with the straws. The cans will come together.

Take an empty thread spool and a small piece of cardboard. Put a pin through the center of the cardboard. Place the cardboard horizontally against the underside of the spool with the pin in the hole of the spool. Blow through the spool and let go of the cardboard. The cardboard will stay suspended until you stop blowing.

RELATED PRODUCTS:

The **Cartesian Diver** (P1-2000) shows buoyancy, pressure, density, and compressibility of gases versus liquids.

The **Tornado Tube** (P1-1120) shows vortices in fluids. You can test liquids of different viscosities and have vortex races.

The **Fountain Connection** (P8-6000) uses air compression and partial vacuum formation to change two 2-liter bottles into a fountain.