Activity One: Ping-Pong Ball

Purpose: The purpose of this activity is to apply Bernoulli's Principle to understand why birds, kites, and planes can fly.

Materials

- 1 clean funnel with a narrow opening of 1 cm or less
- 1 ping- pong ball

Procedure

1. Bend your head back so that you will be able to blow the ping-pong ball toward the ceiling.
2. Put the ball in the top of the funnel and blow hard and fast into the stem of the funnel.
3. Record in your science journal what happened to the ball.
4. Bend your head down so that you will be able to blow through the funnel straight down toward the floor.
5. Hold the ball inside the funnel close to the hole (temporarily) and take a deep breath.
6. Let go of the ball as you blow hard through the stem of the funnel until you use all air in your lungs.
7. Record what happened to the table tennis ball.

What's Happening?
Bernoulli's Principle states that when the speed of a moving fluid (air) increases, the pressure on its edges decreases. The ball clings to the funnel when it is pointed toward the ceiling when the air is blown hard and fast through the stem of the funnel. Still air exerts more pressure around the ball than that around a stream of moving air. The ball clings to the funnel when it is pointed toward the floor because the air moves away from it faster, creating a low-pressure area in the centre

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Activity Two: The Spool

Purpose: The purpose of this activity is to learn how the air pressure phenomenon works.

Materials

- thread spool
- cardboard, 7 cm by 7 cm, lightweight but firm
- pin

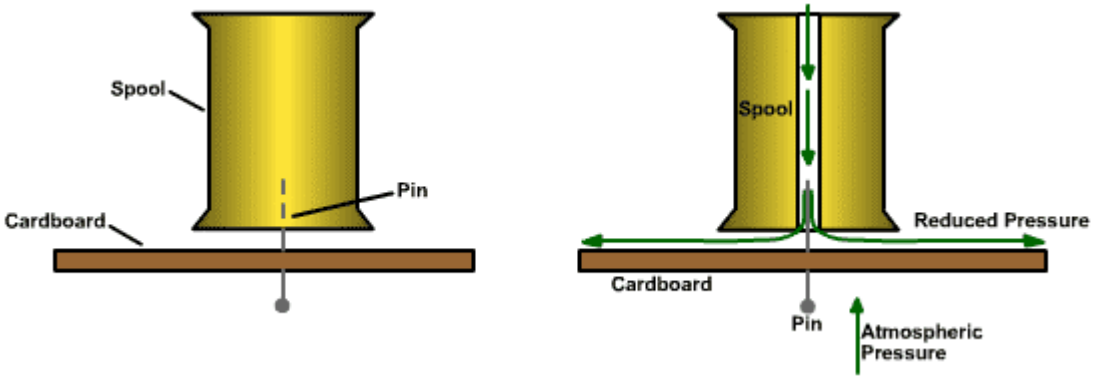
Procedure

1. Cut a piece of cardboard (from the back of a notebook) so that it measures 7 cm by 7 cm.
2. Stick a pin through the centre of the cardboard.
3. Place the spool over the pin so that the pin goes into the hole in the spool.
4. Hold the cardboard against the spool vertically. Blow firmly through the hole in the top of the spool and observe what happens to the cardboard.
5. Release your hand from underneath the cardboard.
6. Record your observations in the science journal.

Conclusion

- Explain why the cardboard did not fall once you removed your hand.

What's Happening?
As you blow through the top of the spool, a jet of air moves horizontally from the hole at the bottom of the spool and spreads out over the surface of the cardboard. As the air moves rapidly out of the bottom, it lowers the pressure between the cardboard and the spool. The higher pressure from the surrounding air pushes up against the bottom of the cardboard and demonstrates how the lift (pressure force) overcomes the weight (gravity) of the cardboard.



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Activity Three: The Dime

Purpose: To show the force that can be exerted upon an object by reducing the air pressure on one side of it.

Materials: One dime and plate.

Procedure: Place the plate on a table with the edge of the plate about 12 cm from the edge of the table. Put the dime about 4 cm from the edge of the table. Position your mouth to blow OVER the dime and toward the plate. Do not blow down on the dime. Use a quick hard puff and the dime would end up in the plate.

Conclusion: Why did the dime end up on the plate?

What's Happening? By blowing over the dime, the air pressure on top of the dime is reduced. The dime will then be pushed up into the stream of air by the pressure underneath it. The stream of air from your breath should blow the dime into the plate.

Activities of the Month – April 1996

Activity Four: The Cups

Find two disposable cups and some string. Cut the string into two -1 foot long pieces. Using tape, attach the end of one piece of string to the bottom of one of the cups, and attach the other end to the edge of a table. Repeat this with the other cup. Position the cups so they hang off the table two inches apart and at the same height. You might need to adjust the spacing between the cups. Blow between the two cups. What happens?

Why are the cups drawn together? Bernoulli's principle states that in areas where air moves rapidly, pressure is low. Blowing between the cups drops the pressure so the higher air pressure of the surrounding air pushes the cups together.

(From NEWTON'S APPLE Educational Materials Packet)