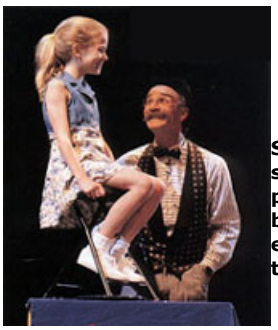

Study guides are available to complement each one of our shows. Every study guide reviews the basic concepts that underline the skills presented, gives a list of relevant vocabulary with definitions, includes a bibliography for further reading, and gives instructions for scientific experiments and educational activities for you to try that demonstrate the principles covered in the show.

Here's an activity that demonstrates principles introduced in The Phenomenal Physics Show:

Activity: Magic Balloon
Demonstrates: Air pressure and polymer effect
You will need: Balloon, Scotch tape, shishkebob skewer or long pin.
Activity:
1. Blow up the balloon as much as you can, then let a third of the air out so it feels spongy.

2. Tie the balloon closed.

3. Put two squares of Scotch tape on opposite sides of the balloon.

4. Slowly push and twist the pin into the balloon through one piece of tape and out through the other.

You're balloon will won't pop even with a pin through it!

Activity: Boomerang
Demonstrates: Air speed, aerodynamics, and air pressure
You will need: Cardboard pizza box, scissors, ruler, marker

Activity:
1. Take a 12" ruler, and trace around it on a pizza box.

2. Turn the ruler perpendicular to the middle of the tracing and trace it again. You will have drawn a symmetrical cross.

3. Cut it out, and trim the edges so the ends are rounded off a little.

4. Fold the ends up a little.

5. Go outside.

6. Hold your boomerang straight up like the statue of liberty. The curves should face you.

7. Throw it into the air! You don't need to throw hard, but do throw in an upward direction, not just straight out. Remember, it needs to start perpendicular to the floor. It won't work if you throw it on its side.

8. Catch the boomerang by letting it circle back to you!

9. Repeat. Have fun!

VOCABULARY

Gravity: The downward pull on all objects toward the center of the earth.

Friction: The resistance of motion of surfaces that touch. This is the force that pushes against a moving object, causing it to stop moving.

Inertia: The resistance that an object has to having its motion changed. Stationary objects continue to stay at rest. Moving objects continue to move in the same direction until friction stops them.

Centrifugal Force: An anti-gravitational force that is created when an object is spinning, causing the object to move away from the center.

Speed of Sound: Sound travels at a rate of 761 miles per hour, or 1100 feet per second, or 1225 kilometers per hour.

Sonic Boom: **The sound that is created when an object travels faster than the speed of sound.**

Aerodynamics: **The study of flight through the air.**

Velocity: **The speed at which an object travels.**

Air Pressure: **The amount of force that the air exerts upon all objects. Normal air pressure on the planet earth is 15 pounds per square inch.**

Arch: **A semi-oval structure that can be seen in bridges, churches, and the Roman Coliseum.**