

#9043

BILL NYE THE SCIENCE GUY: SIMPLE EXPERIMENTS YOU CAN DO AT HOME

DISNEY EDUCATIONAL PRODUCTIONS
1997

Grade Levels: 4-9
26 minutes



DESCRIPTION

Bill Nye demonstrates simple experiments that can be done at home. These show scientific ideas about air pressure, weighing gas, bending light, static electricity, and others. Emphasizes that a good experiment is repeatable.

ACADEMIC STANDARDS

Subject Area: Science: Nature of Science

- Standard: Understands the nature of scientific inquiry
 - Benchmark: Plans and conducts simple investigations (e.g., formulates a testable question, makes systematic observations, develops logical conclusions)
 - Benchmark: Designs and conducts a scientific investigation (e.g., formulates hypotheses, designs and executes investigations, interprets data, synthesizes evidence into explanations, proposes alternative explanations for observations, critiques explanations and procedures)

INSTRUCTIONAL GOALS

1. To perform simple scientific experiments.
2. To demonstrate the effects of air pressure and gravity on a bottle.
3. To depict the strength of shapes and structures.
4. To dramatize Newton's Law of Action and Reaction, showing that unbalanced forces produce motion.
5. To observe how potential energy is changed to kinetic energy.

AFTER SHOWING

Discussion Items and Questions

1. Where does all food come from?
2. How many phases (states) does matter have?
3. Does air have pressure?

Applications and Activities

1. Fill a large bowl with ice cubes and cold tap water. Fill a 2-liter plastic bottle with hot tap water and put the bottle cap on tightly. Let stand for 10 minutes. Remove bottle cap and empty hot water. Replace the bottle cap and submerge the bottle in the ice water. Observe the effect of internal and external air pressure.
2. Place a 2-liter bottle cap on a flat surface with its open end facing up. Place the bottom of one egg on the top of the bottle cap. Place another bottle cap on top of the same egg. Try balancing a book or other heavy object on the top of the bottle cap.
3. Tie one end of a 6-foot length of string to the back of a chair. Cut a 6-inch piece from a straw and thread the other end of the string through the straw. Place the straw at one end of the string. Blow up a balloon (long and slender if possible) and twist the end to keep the air in the balloon. While holding the balloon, tape it to the bottom of the straw. Make sure the straw will still slide on the string. Let go of the twisted end of the balloon and observe Newton's Law of Motion.
4. Tape one end of a ruler to the end of a desk. Cut 3 12-inch pieces of strings and tape the ends of the strings to the free end of the ruler. Using small pieces of tape, tape a small ball to the end of each string hanging below the ruler. With the balls in place we have potential energy. Pull one ball back and release, allowing the ball to hit the next ball. This result is *kinetic energy*. This movement will continue until stopped by some other force, such as friction.

RELATED RESOURCES



Captioned Media Program

- Conducting an Experiment #2367
- Eggs #3457
- Energy #3459



World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **NASA SPACELINK**

<http://spacelink.nasa.gov/spacelink.cool.picks/>

Solve a variety of problems, including Hubble's 2002 Servicing Mission where technicians found that a computer virus had scrambled the mission master plan; design a space food product; how well do you smell?; and much more!



- **ENERGY & SCIENCE PROJECTS**

<http://www.energy.ca.gov/education/projects/projects-html/projects.html>

Find out what makes a good science project and perform some experiments, such as “How much energy is in a single peanut,” “Determine which brand of battery lasts the longest,” “Create three activities that bring the sun to life,” and several other experiments!

- **THE SCIENCE EXPLORER**

http://www.exploratorium.edu/science_explorer/index.html

Try several scientific activities, such as “Blowing, Bouncing, Bursting Bubbles” where you can pop a plastic bag with the power of fizz; “Dramatic Static” where you can make very tiny lightning; “Taking Things Apart” where you can find out what’s inside a floppy disk; and several other simple experiments.