

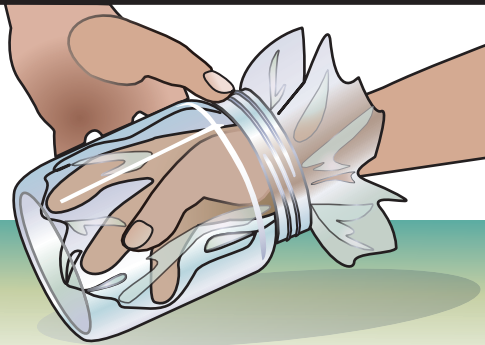
Another FREE SAMPLE LAB from TOPS LEARNING SYSTEMS!

This TOPS Idea is taken from an original series of black-and-white line masters, adapted to stand alone as an independent mini-lesson. Please purchase our original book to get the whole in-depth program.

air force

...adapted from **PRESSURE #16**
by TOPS Learning Systems

1. Push a sandwich bag deep into a wide-mouth jar or drinking glass.



2. Fold the plastic down over the rim, and wrap it as tightly as possible with a heavy rubber band to make an airtight seal.

3. Gently try to pull the bottom of the bag up out of the jar. Why is this hard to do?



A matter of air pressure...

© 2009 by TOPS Learning Systems. Photocopies permitted if this notice appears. All rights reserved.

OBJECTIVE

To feel the strong force of atmospheric pressure holding a plastic bag inside an airtight container.

LAB NOTES

Copy the lab above for student use.

Steps 1-3. We live under a heavy ocean of air that pushes equally in all directions. An inflated balloon, for example, is pressed inward by external air, and pushed outward by internal air. If these opposing pressures are equal, the balloon doesn't change size, collapse, or explode.



ANSWERS

3. The harder I pull, the more unbalanced the air pressure becomes on either side of the plastic. Because I am creating a partial vacuum under the plastic, I can feel more of the weight of the air on top of it. Our atmosphere is heavy! (As I pull more, the sealed air pushes less. The room air pressure remains constant.)

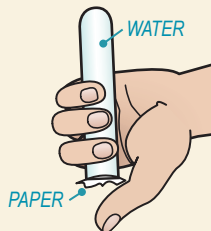
EVALUATION

Q. How would you use your head (and nothing more) to demonstrate that Earth's atmosphere exerts pressure?

A. Suck air out of your closed mouth to show that atmospheric pressure caves in your cheeks.

EXTENSION

Fill a test tube brim full of water. Press a square of paper over the mouth, and invert the tube over a sink. Take away your thumb. Why does the water stay inside?



Water remains in the inverted test tube because the atmosphere, pressing in from all directions, has greater force than the weight of the water pushing down.

MATERIALS

- A wide-mouth jar or drinking glass.
- A plastic sandwich bag.
- A heavy rubber band.
- A test tube of water and sink (for extension).

Find more at www.TOPScience.org!

- 01 PENDULUMS (gr 8-12)
- 02 MEASURING LENGTH (gr 6-10)
- 03 GRAPHING (gr 6-10)
- 04 BALANCING (gr 6-11)
- 05 WEIGHING (gr 5-10)
- 06 METRIC MEASURE (gr 8-12)
- 07 MATH LAB (gr 7-12)
- 08 PROBABILITY (gr 6-10)
- 09 FLOATING & SINKING (gr 7-12)
- 10 ANALYSIS (gr 5-10)
- 11 OXIDATION (gr 6-10)
- 12 SOLUTIONS (gr 6-10)
- 13 COHESION/ADHESION (gr 6-10)
- 14 KINETIC MODEL (gr 7-12)
- 15 HEAT (gr 8-12)
- 16 PRESSURE (gr 7-12)
- 17 LIGHT (gr 6-11)
- 18 SOUND (gr 7-12)
- 19 ELECTRICITY (gr 8-12)
- 20 MAGNETISM (gr 8-12)
- 21 MOTION (gr 7-12)
- 22 MACHINES (gr 7-12)
- 23 ROCKS & MINERALS (gr 6-12)
- 31 PERFECT BALANCE (gr K-12)
- 32 ELECTRICITY (gr 3-8)
- 33 MAGNETISM (gr 3-8)
- 34 PENDULUMS (gr 4-9)
- 35 METRIC MEASURING (gr 5-9)
- 36 MORE METRICS (gr 6-10)
- 37 ANIMAL SURVIVAL (gr 3-8)
- 38 Green Thumbs: RADISHES (gr 3-8)
- 39 Green Thumbs: CORN & BEANS (gr 4-12)
- 40 EARTH, MOON & SUN (gr 7-12)
- 41 PLANETS & STARS (gr 7-12)
- 42 FOCUS POCUS (gr 5-10)
- 43 FAR OUT MATH (gr 9-12)
- 44 SCALE THE UNIVERSE (gr 5-12)
- 45 PI IN THE SKY (gr 5-12)
- 61 A SUMMER START (gr 1-8)
- 62 Intermediate ABC SOUP (gr 4-8)
- 63 PEACEFUL PROCEDURES (gr 1-8)
- 64 Primary ABC SOUP (gr 1-3)
- 71 Primary LENTIL SCIENCE (gr K-3)
- 72 Intermediate LENTIL SCIENCE (gr 3-6)
- 73 GET A GRIP Workstation (gr K-6)
- 91 GLOBAL TOPS (gr 3-10)
- 100 TRIPLE MAGNIFIER (gr 3-12)
- 200 CARTESIAN DIVER (adapts K-12)

Change happens!

Check our home page for the latest update to our product list.



More science with simple things at www.topscience.org