

Activity name: The Egg-Sucking Snapple Bottle

This activity is meant to provide a real-world application of the ATEEC Recommended Core Curriculum's math, science, technical, communications, or critical thinking knowledge and skill concepts identified by ATEEC Fellows as necessary preparation for environmental technology occupations.

Appropriate for which course(s)? Chemistry, physics, other high school courses

Concept/skill learned (i.e. from K/S Tables): Understanding of gas laws

Approximate time to complete activity: 15 minutes

Source of idea or activity (for published source, please include author, title, publisher, date): Brainstorming session with science teachers at school

Materials/resources needed (equipment, print media, electronic media, videos, supplies, etc.):

- hard boiled egg
- empty Snapple bottle, or other container (flask) with a mouth slightly smaller than the diameter of the egg
- paper scrap to burn
- matches
- safety goggles

Description of activity:

The purpose of this demonstration is to introduce simple gas laws. Set fire to a scrap of paper and drop into the Snapple bottle. Quickly place the egg over the mouth of the bottle. As the fire consumes the oxygen in the bottle it will decrease the air pressure in the bottle. If everything works right it should pull the egg into the bottle. This can also be done safer with a flask the right size if available but the Snapple bottles are more fun. The instructor needs to try this ahead of time to be sure the diameter is right; you may also need to wet the egg to make it slide into the bottle easier (a possible lesson on lubrication?).

Extension activities could include:

- try to suck into a plastic bottle and have students explain why it doesn't work with plastic (hint: the flexible plastic bottle will collapse before the pressure gets low enough to suck the egg)

- have the students brainstorm how to get the egg back out of the bottle without breaking the bottle or the egg (hint: turn bottle upside down and gently heat the bottle)
- this is great way to reinforce simple safety rules, like why you should wear the safety goggles
- have students try to repeat this experiment but do not allow them to touch the egg; they can turn the bottle over and suck the egg off the table
- have the students develop innovative ways to hard boil the egg in class
- use different material to burn up the oxygen, like steel wool or flammable liquid but be CAREFUL!
- use this to explain how a vacuum cleaner works, or how a low pressure system is created
- boil plenty of eggs, suck one into the bottle and dye the rest using natural dyes (this is fun at Easter)

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