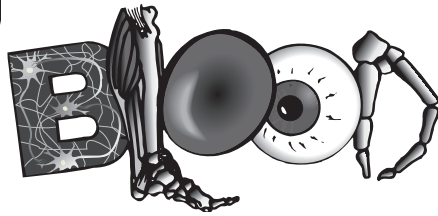
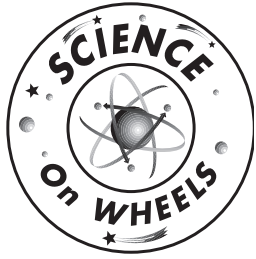
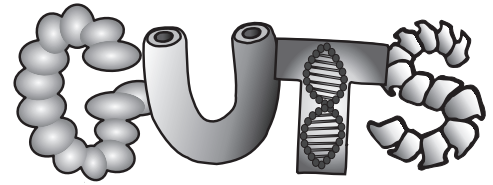


Teachers, please copy both sides of this page for your students to take home.



and



Dear Students and Parents,

We hope you enjoyed your recent day of science exploration and investigation with Pacific Science Center's *Blood and Guts* van. The *Blood and Guts* van provides students with hands-on science experiences. Students participate in a lively assembly, explore an interactive exhibit area and receive a 45-minute hands-on lesson in their classroom. Our goal is to foster an interest in science, technology and mathematics

We encourage you to talk about our visit and investigate the activities below. They require few materials, are easy to do, and support state adopted learning objectives. We have identified and listed corresponding Science Grade Level Expectations (GLEs) with each activity. Remember: your child and his or her friends will become our next scientists. We hope you enjoy doing these together!

~Science On Wheels Teachers

Make A Model Lung

Materials

- 1 clear plastic soda bottle (one or two-liter)
- 2 large rubber balloons
- masking tape
- scissors

This model shows how the diaphragm works with the lungs to allow us to breathe.

1.2.8 Understand human life functions and the interconnecting organ systems necessary to maintain human life.

1.3.1 Understand factors that affect the strength and direction of forces.

Procedure

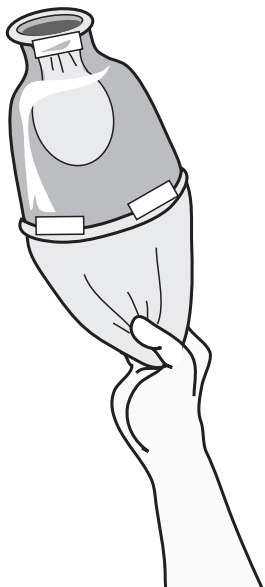
- Use the scissors to cut off the bottom few inches of the plastic bottle.
- Place one balloon in the mouth of the bottle, so that the opening is on the outside. Stretch the opening of the balloon around the mouth of the bottle and tape firmly into place.
- Cut off the narrow end of the other balloon. Stretch the remaining large piece of balloon over the cut end of the bottle and tape firmly in place.
- Grab the stretched balloon at the bottom of the bottle and pull down. The balloon inside the bottle should fill with air.

Challenge

Try pushing the stretched balloon up into the bottle and watch what happens to the balloon inside. Can you make the lung breathe faster or slower? What would a hiccup look like?

What's going on?

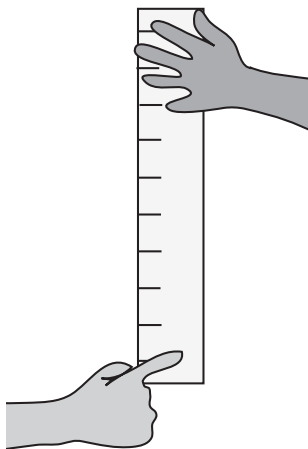
The balloon inside the bottle represents the lungs and the balloon stretched across the bottom represents the diaphragm. The diaphragm is a strong set of muscles below your lungs that pull down, bringing air into your lungs.



Reaction Time

Materials

- a ruler
- a wall



Our reflexes help us stay safe and alert. Measure your reaction time with this simple activity.

- 1.2.8** Understand human life functions and the interconnecting organ systems necessary to maintain human life.
- 2.1.2** Understand how to plan and conduct scientific investigations.

Procedure

- Place the ruler flat against the wall with the 12" side at the top. A partner should hold their finger level with the bottom of the ruler, about half an inch from the wall.
- Let go of the ruler, your partner should try to stop it between the wall and their finger.
- The shorter the distance the ruler falls, the quicker his/her reaction time.
- Switch tasks and try it again.

Challenge

Swap hands, does using your less dominant hand make it harder? If you practice a few times does your reaction time speed up? What happens if you hold your finger farther away from the ruler?

What's going on?

Human brains are divided into many parts that all work together. For this activity you must use your occipital lobe to see where the ruler is, your frontal lobe to process how the ruler is moving, and your parietal lobe to feel the ruler.

Blind Spot

Each of us has a small "blind spot" in our field of vision. Use this activity to find yours!

- 1.2.6** Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions.
- 2.2.5** Understand that increased comprehension of systems leads to new inquiry.

Materials

- the diagram provided here

Procedure

- Close your right eye and hold the diagram at arm's length with your right hand.
- Stare directly at the cross with your left eye.
- Slowly bring the diagram closer. The dot should disappear approximately 6 inches from your face.



Challenge

Draw a different diagram that allows you to find the "blind spot."
Turn the diagram upside-down and try with your other eye.

What's going on?

Rods and cones are the specialized cells that receive sensory input in our eyes and transmit that input to the brain. Where the optic nerve connects to the retina there are no rods and cones. The lack of these receptor cells in this particular location results in a "blind spot". This "blind spot" generally goes unnoticed because a person's eyes are constantly moving, which provides the brain with enough information to fill in this "gap" in vision.

Resources

Blood and Guts: A Working Guide to Your Own Insides,
by Linda Allison, 1999

Eyewitness: Skeleton, by Steve Parker, 2000

Reader's Digest: How the Body Works,
by Steve Parker, 1999

*The Usborne Internet Linked Complete Book of the Human
Body*, by Anna Claybourne, 2003

www.kidshealth.org

www.medtropolis.com/VBody.asp

www.michaelbach.de/ot/

www.hhmi.org/senses

www.colorcube.com/illusions/illusions.htm

Science On Wheels website:

www.pacificsciencecenter.org/education/sow

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