My World and Me™

Living Things and Their Needs

Air and Breathing

Written by Nancy Moreno, Ph.D., Barbara Tharp, M.S., and Paula Cutler, B.A.

from *Living Things and Their Needs Teacher's Guide* and for *Tillena Lou's Day in the Sun*.

BioEd℠

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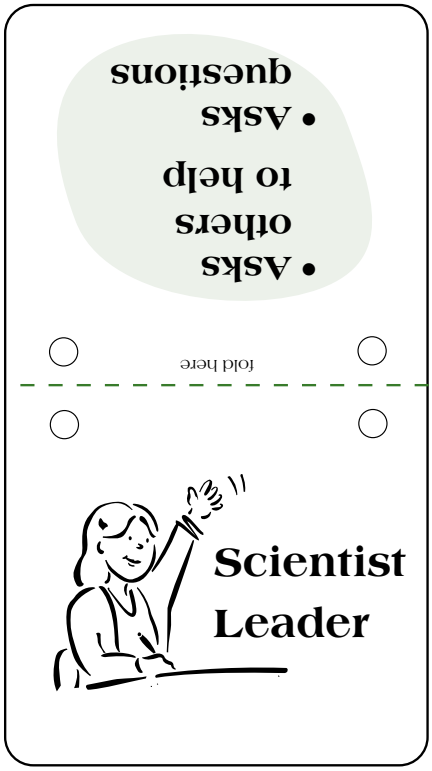
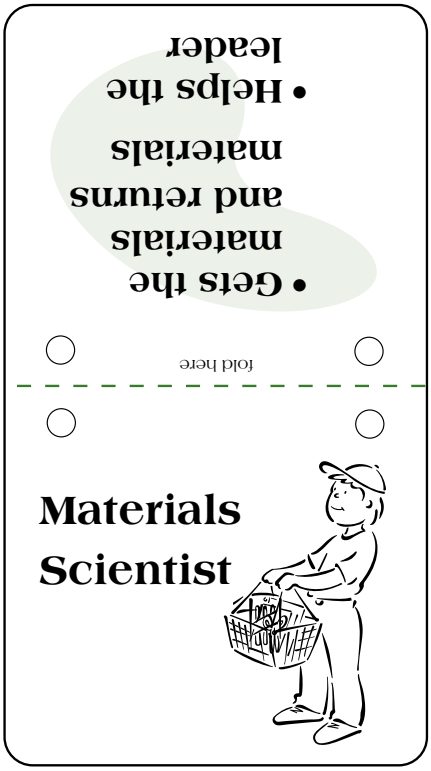
Using Cooperative Groups

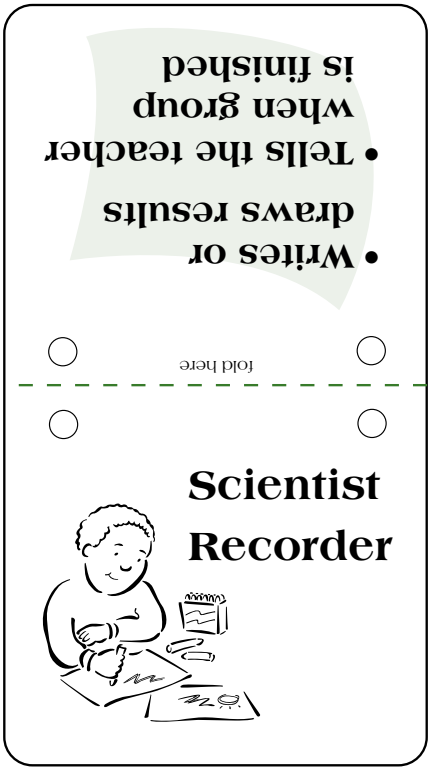
Cooperative learning is a systematic way for students to work together in groups of two to four. Quite often, early primary students need to have their own materials, but can work in groups to share ideas and to learn from one another. Through such interactions, students are more likely to take responsibility for their own learning. The use of cooperative groups provides necessary support for reluctant learners, models community settings where cooperation is necessary, and enables the teacher to conduct hands-on investigations in a more manageable environment.

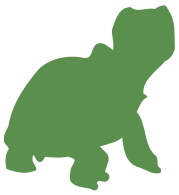
Students wear job badges that describe their duties. Tasks are rotated within each group for different activities so that each student has an opportunity to experience all roles. Teachers even may want to make class charts to coordinate job assignments within groups.

Once a cooperative model for learning has been established in the classroom, students are able to conduct science activities in an organized and effective manner. All students are aware of their responsibilities and are able to contribute to successful group efforts.









My Science Journal

Name _____ Date _____

Project Name _____

DRAWING

KEY WORD TO USE

I OBSERVED . . .

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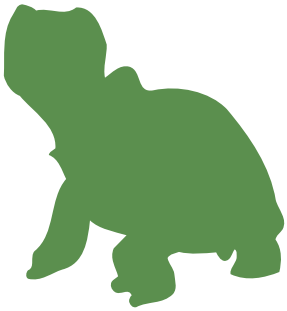
Air and Breathing



Students will explore breathing and air by blowing bubbles and by observing themselves and others during breathing.

Animals need oxygen from air to carry out the reactions that release and transform energy from food. Carbon dioxide is released as a waste product during these processes.

In mammals, including humans, air enters the body through the nose and mouth, and moves into the lungs. Once in the lungs, oxygen from air passes through the moist interior of the lungs and is dissolved into the bloodstream. The heart pumps oxygenated blood to the rest of the body. Some mammals, such as whales, porpoises and seals, breathe air, but are able to hold their breath for long periods of time while they are under water.

Other animals have evolved different ways to capture oxygen. A worm, for instance, breathes through the damp surface of its body. Oxygen dissolves in the surface moisture and passes into the body and the bloodstream. Fish and many other aquatic animals use gills to absorb oxygen from water. The gills of fish, for example, consist of thin sheets. Water is drawn in through the fish's mouth and flows across the gills, where oxygen passes directly into the bloodstream through tiny capillaries (blood vessels).

SETUP

To make bubble solution, gently pour 8 ounces of dishwashing detergent (Ivory or Dawn works best) and 4 ounces of drugstore glycerine (glycerol) into a gallon container that is nearly full of water. Mix slowly to avoid making bubbles. As an alternative, you may purchase the bubble solution.

Create bubble-makers for students to use by removing the bottoms from small paper cups.

Students should conduct this activity in teams of two.

PROCEDURE

1. Pour about a tablespoon of bubble solution onto the projection area of a standard overhead projector. Ask students, *What do you see?* (liquid on the overhead). Next, gently place the tip of a straw into the liquid and blow to create a bubble. Students will be able to observe the bubble as it is projected. Ask, *What is different about the liquid?* (it contains a bubble of air). You also can conduct this introduction by blowing the bubble on a table to form a dome full of air.
2. Mention that air is all around us, but usually cannot be seen. However, when air is trapped in a container, like a bubble, we are able to observe it. Ask students, *What do you think is inside the bubble?* Give students time to think and respond. Responses will vary. Prompt students' thinking with additional questions, such as, *Can you see*

CONCEPTS

- Animals need air to live.
- People and many other animals take in air by breathing.

SKILLS

Science: Observing, communicating, generalizing
Mathematics: Generalizing
Language Arts: Listening, communicating, developing comprehension skills, writing, using descriptive language, following directions

TIME

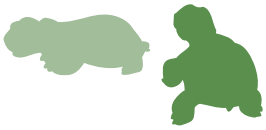
Set-up: 20 minutes
Class: 30 minutes

MATERIALS

- 2–3 drinking straws, cut in half
- Dishwashing detergent, 8-oz bottle (see Setup)
- Gallon container
- Glycerine, 4-oz bottle (drugstore, see Setup)
- Overhead projector
- Water

Per group of two

- 4 prepared paper cups, 3 oz (bathroom-size, see Setup)
- 2 clear plastic cups, 9 oz
- Paper towels
- Copies of the student sheet



EXTENSIONS

- Have students experiment with different sizes of bubble makers to discover whether bubble size is affected.
- Ask students, *How long can you hold your breath?* Most people can hold their breath for about one minute. Compare this to a hippopotamus, which can hold its breath for 15 minutes. Or to a beaver that can hold its breath for 20 minutes. Or to a whale that can go for an hour without taking a new breath!
- Challenge students to think of other ways we can detect the presence of air. Examples might include containers that hold air, such as balloons or automobile tires; or objects that are moved by air, such as flags or pinwheels. Have students draw different "air detectors."

what's in the bubble? Help students to conclude that the bubble contains air.

3. Tell students that they will be making bubble containers full of air.
   Note. You may wish to do this part of the activity outside.
4. Give each student a clear plastic cup that is about one-third filled with bubble solution.
5. Ask students to dip the larger end of the small cup—original opening—into the solution carefully. Then have students lift the small cup, aim their bubble blowers away from any other persons, and carefully blow on the smaller end. (Make sure students do not touch their mouths to the ends dipped in bubble solution.) Students should observe the bubbles.
6. Ask, *Where did the air in the bubble come from? Will a bubble form if you do not breathe into the cup?*
7. Have students draw a picture of the bubbles they created, and/or, depending on their ages, write three different words that describe the bubbles.
8. Conclude by having students think about where the air they blew into the bubble came from. Help them understand that they inhaled air into their bodies, and then exhaled air that wasn't needed (along with water products) back out.
9. Have students place their hands over their chests while sitting still for one minute. Ask, *What did you notice?* (students should note that the chest is moving in and out). Follow by asking, *What is happening?* Talk about the fact that all animals breathe: take air in and let air out. *What is happening when your chest is moving?* Help students understand that their chests' expand when they breathe air into their bodies (or lungs).
10. Conclude by having students imagine what a bubble might look like if it were created by a really large animal, such as a hippopotamus. Ask, *Do you think that the bubble would be larger or smaller than the ones you made?* Have students write a fun story or draw a picture about the possibilities.

Bubbles Away!

Name _____ Date _____

1. Draw and color the bubbles you created.

2. Write a story about or draw a picture of a giant bubble blown by a hippopotamus.