THE SCIENCE OF
Air

What is Air?

Pre-assessment activity from *The Science of Air Teacher's Guide* and for *Mr. Slaptail's Secret*

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The activities described in this book are intended for school-age children under direct supervision of adults. The authors and Baylor College of Medicine cannot be responsible for any accidents or injuries that may result from conduct of the activities, from not specifically following directions, or from ignoring cautions contained in the text.

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What Is Air?

Pre-assessment

Air surrounds us, yet we rarely think about its composition or why it is important. It is a mixture of colorless, odorless gases, one of which, oxygen, is necessary for functions within cells. Another gas, carbon dioxide, is produced as waste by most living things and also is required for photosynthesis.

Gas molecules are in constant motion. Because heat makes the movement of gas molecules more pronounced, warm air rises and cool air sinks. Many tiny substances can be suspended in air. Some, such as pollen, dust or smoke, can lead to allergies or asthma in some people. Other substances in air, such as chemicals, can be toxic to everyone. Most people think of air pollution as being outdoors. But frequently, pollutants can become more concentrated in indoor environments because of limited fresh air circulation. Fortunately, there are many ways to improve the indoor air quality of homes, schools or offices.

This unit uses indoor air pollution as a unifying, real-world theme to teach students important physical and life science concepts about gases, air and the respiratory system. It also presents important environmental health concepts related to air quality and indoor spaces.

SETUP

Have students work individually to complete the preassessment.

PROCEDURE

1. Ask students to think about the question, *What questions do you have about air?* Record students' questions on a sheet of chart paper to be displayed in the classroom. Allow opportunities for students to answer their own questions as they complete this unit.
2. Have students complete the pre-assessment individually; then collect and save each student's form. Students will refer back to their pre-assessment answers at the conclusion of this unit.

CONCEPTS

Allows teacher to estimate students' prior knowledge related to air, gases, breathing and respiration, and environmental health.

OVERVIEW

Unit pre-assessment designed for use with students before beginning any unit activities. It will be revisited as part of the Post-assessment.

SCIENCE, HEALTH & MATH SKILLS

- Observing
- Recording observations
- Drawing conclusions
- Applying prior knowledge to a new situation

TIME

Preparation: 5 minutes
Class: 30 minutes

MATERIALS

Teacher (see Setup):
- Several sheets of chart paper to record and display student questions

Each student will need:
- Copy of "What Do We Know About Air" page

IMAGE CITATIONS

Source URLs are available at the front of this guide.

PRE-ASSESSMENT ANSWER KEY

1.	d	6.	c
2.	b	7.	b
3.	b	8.	a
4.	c	9.	b
5.	a	10.	c

What Do We Know About Air?

Name _____

Please circle the letter beside the correct answer to each question below.

1. Which one of these statements about the air we breath is not true?
   a. Air has pressure.
   b. Air is a mixture of several gases.
   c. Air is made mostly of nitrogen.
   d. The air we take into our lungs is made only of oxygen.

2. What happens to air when it is heated?
   a. It sinks.
   b. It rises.
   c. It turns into rain.
   d. It shrinks.

3. What makes air move into the lungs?
   a. The nose
   b. Changes in the size of the chest cavity
   c. Alveoli (tiny pockets) within the lungs
   d. Movement of the throat

4. The maximum amount of air that can be blown out of the lungs is known as . . .
   a. essential breath volume.
   b. normal air.
   c. vital lung capacity.
   d. breathing rate.

5. What might cause someone to have an allergy attack?
   a. Dust in the air
   b. Not getting enough sleep
   c. Not taking vitamin supplements
   d. Having a bad cold

6. When you exercise . . .
   a. your heart beats faster and your breathing slows down.
   b. your heart beats slower and your breathing speeds up.
   c. your heart beats faster and your breathing speeds up.
   d. your heart beats slower and your breathing slows down.

7. Which of these is not in dust?
   a. Dead insect parts
   b. Gases
   c. Flakes of skin
   d. Food crumbs

8. To which group does mold belong?
   a. Fungus
   b. Plant
   c. Animal
   d. Bacteria

9. Where does fungus grow?
   a. Dark, dry areas
   b. Dark, damp areas
   c. Sunny, dry areas
   d. Sunny, damp areas

10. Which is one way to improve our indoor air?
    a. Install a "dust catcher" air sampler.
    b. Keep the building closed up.
    c. Change air conditioner filters.
    d. Keep bathrooms damp.

¿Que sabemos acerca del aire?

Mi Nombre _____

Favor de poner un círculo alrededor de la letra junta a cada respuesta correcta.

1. ¿Que declaración acerca del aire es falsa?
   a. El aire tiene presión.
   b. El aire es una mezcla de varios gases.
   c. El mayor componente del aire es el nitrógeno.
   d. El aire que inhalamos se compone exclusivamente del oxígeno.

2. ¿Que pasa cuando el aire se calienta?
   a. Se va para arriba.
   b. Se va para abajo.
   c. Se convierte en lluvia.
   d. Se contrae.

3. ¿Que hace que el aire se mueve en los pulmones?
   a. La nariz
   b. Los cambios en el tamaño de la cavidad de pecho
   c. Los alvéolos (bolsitas) dentro de los pulmones
   d. Los movimientos de la garganta

4. La cantidad máxima del aire que se puede vaciar de los pulmones se conoce como . . .
   a. el volumen esencial de respiración.
   b. el aire normal.
   c. la capacidad vital pulmonar.
   d. la tasa de respiración.

5. ¿Que prodría provocar un ataque de alergia?
   a. Polvo en el aire
   b. No dormir suficiente
   c. No tomar vitaminas
   d. Estar acatarrado

6. Cuando haces ejercicio . . .
   a. tu corazon late más rapidamente y tu respiración es más lenta.
   b. tu corazon late más lentamente y tu respiración es más rápida.
   c. tu corazon late más rapidamente y tu respiración es más rápida.
   d. tu corazon late más lentamente y tu respiración es más lenta.

7 ¿Cual de los siguientes no se encuentra en el polvo?
   a. Unos pedazos de insectos muertos
   b. Algunos gases
   c. Unas escamas de la piel
   d. Algunas migas del alimento

8. ¿A cual grupo pertence el moho?
   a. Los hongos
   b. Las plantas
   c. Los animales
   d. Las bacterias

9. ¿Donde crece el moho?
   a. Los lugares oscuros y secos
   b. Los lugares oscuros e húmedos
   c. Los lugares asoleados y secos
   d. Los lugares asoleados e húmedos

10. ¿Cual de las siguientes acciones puede ayudar a mejorar la calidad del aire adentro de los edificios?
    a. Instalar un "atrapapolvos" para tomar muestras del aire.
    b. Mantener cerrado el edificio.
    c. Cambiar los filtros del acondicionador del aire.
    d. Mantener húmedos los baños.