



INVESTIGATION 6

How might radon affect me?

NOTES TO TEACHER

PURPOSE: to explore the relationship between the respiratory system and the threat from indoor radon exposure.

MATERIALS:

- Drinking straws
- Masking tape
- Large empty plastic milk jugs with cap
- Rubber tubing
- Grease
- Plastic dishpan
- Measuring cup

BACKGROUND:

Most people, including most students, have very little understanding of the phenomenon of radioactivity and its effect on the human body. This is unfortunate, because radioactivity and radioactive substances have become increasingly important in our daily lives.

In this investigation, students will explore the respiratory process and relate their own breathing patterns to radon exposure.

WARM-UP:



Prior to initiating the lung capacity experiment, demonstrate to students how the respiratory system works and specifically demonstrate the role of the diaphragm in the breathing process. To perform this demonstration, you will need a two liter plastic bottle, two round balloons, scissors, and two rubber bands. Cut the bottle in half. Place one of the balloons through the opening over the bottle. Stretch the balloon opening over the bottle opening. Hold the balloon in place with a rubber band. Think of this balloon as the lungs. Cut the neck off the other balloon. Stretch this balloon across the bottom of the bottle. Hold the balloon in place with a rubber band. Think of this balloon as the diaphragm. Pull down on the stretched balloon. What happens to the balloon inside the bottle? Explain to students how this action is like that of the lungs and the diaphragm.

PROCESS SKILLS:

Science	Mathematics	Social Studies	Social or Group
Communicating Categorizing Comparing	Classifying Analyzing	Judging information related to a problem	Collaborating with others

ACTIVITY SUMMARY:

STEP 1

Prior to beginning this activity, students predict the lung capacity (in liters) for themselves and their teacher or parent.

STEP 2

Students place a piece of masking tape on a plastic milk jug from top to bottom.

STEP 3

Students fill the jug with water and then screw the cap on the jug. Next, students fill a dishpan about one third full of water and place the jug upside down in the water. Students will then carefully remove the cap ensuring that no air bubbles enter the jug.

STEP 4

Students ask their partners to hold the jug so that it does not tip over. Next, students place one end of the tubing inside the jug and put a straw in the other end of the tubing. Students will then take a deep breath and blow through the straw.

Note: Each student should use their own straw

Note: The water will be forced out of the jug and be replaced by the air.

STEP 5

Students replace the cap on the jug ensuring that no extra water escapes from the jug.

STEP 6

Students remove the jug from the dishpan. Next, students turn the jug right side up and mark the level of water on the tape.

STEP 7

Students use a measuring cup to fill the jug with water. The amount of water added represents the volume of air blown into the jug.

STEP 8

Students repeat Steps 3-7 two more times and enter their data on the lung capacity chart.

STEP 9

Students compute the amount of radon exposure for an average person based on an intake of 15 liters of air per minute.

MINIMUM RECOMMENDED TIME

Four to six hours of instructional time.

STUDENT RESPONSES

Handout #1

Responses will vary.

Handout #2

1 hour - 3,600

1 day - 86,400

1 month - 2,592,000

1 year - 31,104,000

10 years - 310,104,000

Handout #3

Responses will vary.

EXTENSION ACTIVITIES

1. Have students research specific health effects from prolonged exposure to radon gas.
2. Have students develop a display outlining the respiratory system and the effects of radon exposure on the lungs.





Radon Alert
Lesson Plan Evaluation Sheet
and FREE POSTER AND STORYBOOK offer

The New Jersey Department of Environmental Protection is happy to provide these lesson plans for use by teachers. In order to evaluate the use of the lesson plans, we would greatly appreciate your response to the following questions. All teachers who return these forms will receive a FREE RADON POSTER depicting information about radon in a colorful format and a STORYBOOK about a Native American child and his experience with radon in his home.

1. Which Radon Alert lesson plan(s) did you use?

2. How useful did you find it/them (check one) ?

- Not useful
- Slightly useful
- Moderately useful
- Very useful
- Extremely useful

3. Do you plan to use them again in the future? Yes No

4. In your view, what would make the lesson plans MORE useful:

Your name: _____ **Phone Number:** _____

Subject area: _____ **Grade:** _____

Mailing address:

To receive your FREE RADON POSTER and STORYBOOK, mail or fax this completed form to:

NJDEP Radon Program, P. O. Box 415, Trenton, NJ 08625

Fax: 609-984-5595.

(Questions? Call the Radon Program at 1-800-648-0394.)