



INVESTIGATION 4

How can you detect the invisible?

NOTES TO TEACHER

PURPOSE: to explore the characteristics of radon.

MATERIALS:

- Clay
- Pins
- Toothpicks
- Magnets
- Different objects (unknown to the students)

BACKGROUND:

A multitude of research papers, radio commercials, public awareness meetings, and newspaper and magazine articles have addressed radon and its link to lung cancer. Regardless of the amount of coverage given to this topic, radon, for all its danger to human health, is still not considered a major threat. Part of the reason may be due to its physical presence or, perhaps, its lack of a physical presence. Radon is an odorless, colorless gas.

This activity lets students explore ways of building models based on indirect evidence. In this manner, students can better understand radon gas as a health hazard regardless of its apparent absence of any observable characteristics.

WARM-UP:

Bring into class different objects such as a basketball, potted plant, or a clock radio for students to draw what they think is inside the object. In the case of the potted plant, have them draw what they think is under the soil. Have students discuss how they were able to draw something that they could not see.

Next, introduce the Radon Fact Sheet to discuss another object (radon gas particles) that cannot be seen.

PROCESS SKILLS:

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

ACTIVITY SUMMARY:

STEP 1

Students draw what they think is inside the clay ball. Students can insert toothpicks, pins, magnets, and other objects into the clay balls to uncover the unknown object's identity.

Note: Prepare students' clay balls by placing an unknown object inside the balls of clay. Students will then try to sketch a model of what is inside the ball based on their observations.

STEP 2

Students make observations from their experimentation and enter their observations on a chart.

STEP 3

Students use different instruments to help them identify the hidden object. After each round of testing, students draw an updated version of their model based on their observations.

STEP 4

Students draw what a radon gas atom might look like based on the model from the Radon Fact Sheet.

MINIMUM RECOMMENDED TIME

Six to eight hours.

STUDENT RESPONSES

Handout #2 Responses will vary.

Handout #3 Responses will vary.

Handout #4

1. Helium
Nitrogen
Oxygen
Hydrogen
2. All of these elements are gases with no color, taste, or odor.
3. The model of the radon atom should contain 86 electrons.

Handout #5

1. Radon is considered a health hazard because radon can cause serious damage to lung tissue (in the form of cancer) once it gets inside the lungs.

EXTENSION ACTIVITIES

1. Have students research a sample radon detector such as a charcoal canister, electret ion chamber, or an alpha track detector.
2. Have students send a letter to a local professional radon contractor requesting him or her to address their class on the subject of radon and its detection and mitigation. (See Resources, State Radon Programs)





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.)