



## INVESTIGATION 9

## Can the radon problem be fixed?

### NOTES TO TEACHER

**PURPOSE:** to explore ways of fixing the radon problem.

### MATERIALS:

- Smoke alarms
- Punks (smoke sticks)
- Can of Sterno®
- Ice cubes
- Empty toilet paper rolls
- Scissors
- Fan

### BACKGROUND:

The lesson plan on mitigation provides opportunity for students to explore mitigation strategies as well as understand the processes involved in radon build-up in homes. Specifically, students will use a smoke experiment to emulate the Bernoulli Principle and simple convection currents to demonstrate how radon moves into a home based on temperature differentials in the building and/or changes in air pressure inside versus outside..

### WARM-UP:

Ask students to predict the outcome of the experiment outlined below by drawing a picture of their prediction.

### PROCESS SKILLS:

Science	Mathematics	Social Studies	Social or Group
Communicating Relating Comparing	Analyzing Investigating	Solving problems and drawing conclusions	Collaborating with others

### ACTIVITY SUMMARY:

#### STEP 1

Students construct their box houses by taking a cardboard box (3 feet X 2 feet) and cutting a hole at the top. In this hole will be placed a smoke alarm. The cardboard box itself will sit on a series of bricks or boxes. Students will punch holes in the bottom of the box to represent cracks or openings in the foundation.

## **STEP 2**

Students place two trays of ice cubes in the box, light a punk (smoke stick), and place it underneath the box. Next, they write down their observations.

## **STEP 3**

Students replace the ice cubes with a can of sterno in the box, light a punk, and place it underneath the box. Next, they write down their observations.

*Note: The teacher should be the only one in the classroom to light, position, and remove the Sterno® from the cardboard box. It is recommended that only one experiment take place at a time so that the teacher can always supervise any activity involving a heating element.*

## **STEP 4**

Students cut another hole in the top of the box and insert the empty toilet paper roll. Next, they turn on a fan located on top of the box, light a punk, and place it underneath.

## **MINIMUM RECOMMENDED TIME**

Four to six hours of instructional time.

*Note: Since multiple smoke alarms may be difficult to obtain for this investigation, it is recommended that only two boxes be constructed for students to make their observations. This also will reduce the amount of supervision time necessary to monitor student's contact with the cans of Sterno®.*

## **STUDENT RESPONSES**

Handout #1

Responses will vary.

Handout #2

Responses will vary.

Handout #3

Responses will vary.

## **EXTENSION ACTIVITIES**

1. Have students conduct similar experiments to demonstrate the Bernoulli Principle (e.g., airplanes).
2. Have students initiate a public awareness campaign on strategies for testing for and mitigating radon levels in homes throughout their neighborhood.





**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.)**