TEACHER'S NOTES 5

HOW SENSITIVE ARE THE LUNGS TO RADON?

BACKGROUND

In this exercise, students will explore the anatomy of the human respiratory system and elements of that anatomy that predispose the lungs to potential damage from radon and smoking. It would be helpful to show the students illustrations at both macro and micro scales, for example as in Figures 1 and 2 of Lesson Plan # 4. These figures could be copied and distributed to students or reproduced as overheads. This activity is best done in groups of 3 to 4 students.

MINIMUM RECOMMENDED TIME ALLOCATION

One or two class periods

STUDENT RESPONSES

Question 3: Students should consider that half-life is an important consideration because it reflects the probability that a radioactive isotope will emit its radiation while inside the respiratory system. Radon's half-life is so long (3.8 days) that it would probably be breathed in and then breathed out again before decaying. The half-life of polonium-214 is so short (164 microseconds) that it would not get very far into the system. Polonium-218 has a half-life just about right for maximum damage! The students should also consider that the greater range of penetration (in response to greater alpha energy) of the polonium alphas is potentially more dangerous than the lower energy alpha emitted by radon.

Question 4: Because cancer affects cell division, cells that undergo mitosis often will be more susceptible to cancer development than cells that divide only infrequently.

Question 5: The alpha particles emitted by a carcinogen inside the lungs must pass through the mucus and the surface epithelium before reaching the sensitive basal epithelial cells.

EXTENDED ACTIVITIES

1. Have the students research patents originating from the scientific community that pertain to the human respiratory system. These could be for respirators, artificial lungs, or deep sea diving equipment, for example. See Resources, Information Resources.

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.)