

**TEACHER'S NOTES 2****WHAT IS RADIOACTIVITY?****BACKGROUND**

Most people, including most students, should have more knowledge about the phenomenon of radioactivity because radioactivity and radioactive substances are natural and important parts of our daily lives. Please be sure that you review the material presented in Section III-Background Information on Radon before beginning this lesson plan. It is important for students to recognize that the half-life of the radioactive element as well as the kind of radiation emitted and the energy of the radiation determine any possible biological effects from radiation.

The half-life of an isotope is important in influencing the behavior and effects of the isotope and its radiation. Half-life tells us how long the isotope will last before decaying into something else. It also provides information on the frequency of radioactive disintegrations. An extremely long-lived radioisotope (radioactive isotope) will only infrequently emit its radiation. A radioisotope with a short half-life will repeatedly emit its radiation during a short period of time. The concept of probability will help students understand radioactive half-life. The procedures outlined in this lesson plan should help communicate this concept to the students.

*Note:* If you write a letter on school stationery to the M&M/Mars Candy Company, you can get a coupon for a free bag of m&m's to use in this exercise. Have the students compose the letter, and also compose a "thank you" letter afterwards. See Resources, Equipment/Materials.

**MINIMUM RECOMMENDED TIME ALLOCATION**

One class period.

**WARM UP**

This lesson plan should be preceded by a hands-on geiger counter activity, which will help tremendously to get the students excited about the content material. Have students record changes in the amount of radioactivity detected by the geiger counter in response to 1) changing the distance from the radioactivity source, and 2) shielding the source with different kinds of materials (e.g., paper, thin plastic, aluminum foil, wood, etc.). See Resources, Equipment/Materials.

**STUDENT RESPONSES**

Question 7: The appropriate response is one roll.

Question 8: The appropriate response is two rolls (one-half of one-half to arrive at 1/4 remaining).

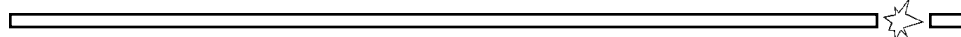
Question 9: The appropriate response is one roll.

Question 11: The appropriate responses are as follows:

- 4.5 billion years
- 2.5 grams
- about 18 billion years.

**EXTENDED ACTIVITIES**

1. Have students research current articles in periodicals relating to radiation in general, including both beneficial uses and harmful effects. See Resources, Information Resources.





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

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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:**

\_\_\_\_\_

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**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.)**