



Instructor: Ann Marchioni (2002 Science Teacher Workshop participant)
School District: Bloomfield, NJ
Lesson Title: What's the Connection Between Smoking and Ionizing Radiation?

Grade: 8

Subjects: Science, Health, Language Arts

Overview: To understand the effect of ionizing radiation on the smoker.

Objectives:

- The students will identify the smokers in their families.
- The students will understand ionizing radiation and its effect as part of the result of smoking.
- The students will write a persuasive letter incorporating their information about the effects of ionizing radiation.
- The students will develop a bulletin board to incorporate their personal data and the information about toxins, in particular Polonium-210.

Materials:

- Student survey
- Types of ionizing radiation sheet
- Electromagnetic spectrum sheet
- Data sheet
- Web sites for additional information

Student Survey

Name: _____ Period: _____

1. How many people in your family smoke? What are their names and ages?
2. Are they aware of the dangers of smoking?
3. Have any of them suffered any health problems because of their smoking? Please describe.
4. At what age did these people start smoking?
5. Have any of these people tried to stop smoking?

Data Sheet

1. Polonium attaches to the tobacco leaf. When inside the lung, it gathers in "hot spots" in small air passageways of the lung.
2. Tobacco absorbs this radioactive element from the phosphate fertilizer and nature.
3. For a "more flavorful tobacco", companies use high phosphate fertilizer apatite (contains radium, lead and polonium)
4. Polonium-210 has a half life of 22 years. It can build up during continued smoking
5. "Increase in the number of alpha induced structural changes in the chromosomes equals a tumor risk."
6. Dust particles may move blood vessels and be carried elsewhere. They accumulate in the lung, lymph nodes, liver and bone marrow.
7. Cilia is lost in the lungs, allowing particles and radioactive particles to be deposited in the lungs.
8. ???????? When you smoke, this substance is equivalent to 300 chest x-rays in one year.
9. 50% of cancers caused by smoking could be caused by radioactivity.

Web Sites

<http://www.webspawner.com/users/radioactivethreat/> "Radioactive Polonium in Tobacco"

<http://quitsmoking.about.com/library/weekly/aa070102b.htm> "I'm consuming What Toxins??, Part 2: Hot Smoking Carcinogens"

http://www.ccnr.org/nfb_uranium_0.html "Uranium – a Discussion Guide, Questions and Answers"

<http://medicolegal.tripod.com/toxicchemicals.htm> "Cigarettes' Deleterious Ingredients: "Toxic Tobacco Smoke" (TTS)"