

PROJECT REPORT

Northern Wyoming Community College District / National Science Foundation
Summer Energy Education Program 2012

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TITLE

Risks of Radiation

SUMMARY

So many people associate the word radiation with danger, but have no real knowledge of what the word means or how much risk is associated with it. This lesson is designed to help rectify some of these misconceptions and allow students to distinguish safe radiation from dangerous, and to understand the quantity of radiation required to reach dangerous levels.

ENERGY CONTEXT

Since most energy is acquired or transferred using radiation of one kind or another, and it is difficult for students to compare sources of energy when they only associate some with radiation. This lesson is designed to help them understand radiation, better understand, and compare our sources of energy.

ANTICIPATED TIME REQUIRED

One class period (50 minutes):

- Pre-survey as homework – 8 minute discussion
- 2 minute video
- 10 minute discussion
- 15 minutes – Prezi
- 15 minute – Interactive
- Homework

INTENDED STUDENT LEVEL

Science classes grades 6-12.

ASSUMED PRIOR KNOWLEDGE

None

LEARNING OBJECTIVES

The student will:

- Learn that there are various forms of radiation in the world, some natural and some human-made
- Understand that some forms of radiation can be highly dangerous when they exceed certain levels
- Discover that some forms of radiation are harmless and, in fact, necessary for life on Earth
- Understand that decisions can be made that help create safe, radiation-limited environments
- Realize that there are actions individuals can take to help create safe, radiation-limited environments

MATERIALS

Technology for students to watch video – downloaded or on YouTube.
Use of computers by students for interactive portion.

INTRODUCTION / MOTIVATION FOR STUDENTS

Survey of students and parents prior knowledge about radiation.

Survey attached as a Word document, feel free to use Survey Monkey or Google docs to create a survey students can use electronically.

PROCEDURE

- Prior to first lesson, send students home with surveys or have them take this one online: <http://www.pbs.org/wgbh/pages/frontline/shows/reaction/interact/survey.html>
- Collect and discuss surveys (10 minutes)
- Watch Video *Everyday Radiation*: <http://youtu.be/OBqwxVI-XjA> source: *FRONTLINE*: “Nuclear Reaction” provided by WGBH, funded by NSF. (2minutes)
 - Have students get into groups and list sources of radiation they encounter each day.
 - Have them answer the following questions:
 - Do you feel the radiation?
 - Does it impact your life?
 - How might it affect you in the long term?
 - Show Prezi: <http://prezi.com/jo4rdj2ed08i/xkcd-radiation-dose-chart/> while discussing amounts of radiation
 - *FRONTLINE* site with similar (but less) comparisons: <http://www.pbs.org/wgbh/pages/frontline/shows/reaction/interact/facts.html>
 - Have them discuss ways they can reduce exposure to radiation in their own lives.
 - Have them go <http://www.pbs.org/wgbh/nova/dirtybomb/sour-flash.html> click through interactive and learn about types of radiation around them.

SAFETY ISSUES

Only safety issues are related to Internet use. Make sure students follow appropriate Internet policy.

TROUBLESHOOTING TIPS

Make sure all links and technology work before class

ASSESSMENT

Have students answer the following questions:

1. What are several harmless forms of radiation that we encounter in our daily lives?
2. What are some common sources of radiation on Earth that are dangerous to human life?
3. What decisions can you make in your life to limit your exposure to dangerous radiation?

SUGGESTED EXTENSIONS

Have students work in groups to study and present information about the various sources of radiation, including the health risks involved.