

Radioactivity and Nuclear Decay Lesson Plan

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High School Chemistry

1 hour 25 minutes

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Stage 1 – Desired Results	
<p>Established Goal(s): To introduce nuclear decay and radiation and give students an understanding of nuclear decay as a nuclear phenomenon.</p>	
<p>Understanding(s): <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Nuclei are divisible and sometimes break apart causing emission of particles or photons--Radiation. It has various effects on surrounding environment. • There are different types of radiation in daily life, both natural and artificial 	<p>Essential Question(s):</p> <p>What is radiation? What does radiation do? How is radiation related to atomic structure and isotopes?</p>
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> • How isotopes and atomic structure relate to radioactive decay • A Geiger counter senses actual particles being emitted. • Effects of radioactivity on human organisms • Different forms of radioactive decay • Radiation is a nuclear process, not a chemical process. 	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • explain above concepts. • Use a Geiger counter and explain what's going on/what it's reading. • create a model of nuclear decay
Stage 2 – Assessment Evidence	
<p>Performance Task(s)</p> <ul style="list-style-type: none"> • explanatory presentation of radioactive decay • apply atomic structure concepts to explain radioactive decay equation 	<p>Other Evidence:</p> <p>participation in discussions (i.e anticipation exercise, geiger counter guestimations, participation in radioactivity worksheet, group model work)</p>
Stage 3 – Learning Plan	
<p>Learning Activities (sequenced with time estimates):</p> <p>7:45-7:55 <u>Isotopes and Radiation</u> (Heather)</p>	<p>Materials</p> <p><u>Isotope Review</u></p>

Write challenge question and equation on board. How does what you know about isotopes relate to radiation? Turn to a neighbor and discuss question and equation. Discuss as a class briefly.

7:55-8:15 Anticipation Guide (Mariah)
Hand out anticipation guide worksheets to pairs. Students will work together to determine whether statements are T or F. Statements will focus on relationship between isotopes, nuclear decay and radiation.

8:15-8:50 Geiger counter/Radiation in Your Life (Linda- Geiger, Mariah- Worksheet, Heather- Write different radiations on board and support)
Break students into two groups. Students should bring anticipation guides with them.

Group 1- circle around Geiger counter. Guess the relative radiation of different objects.
Bring out Geiger counter and test different objects. What is this counting? What is going on? Prove or disprove (address) statements from anticipation guide.

Group 2- circle around radiation graphs. Handout to students- why do we care about radiation? Calculate levels of radiation exposure in a year.

Large Group- Review Anticipation Guide Debrief (EVERYONE)

---Brainstorm what we're learned about radiation, radioactive decay---

Put Radiation types on Board

8:50-9:10 - Nuclear Decay Models (Linda)
Translate equation of nuclear decay into a working model.

Pair Share/Anticipation Guide
anticipation guide

Geiger counter
Geiger counter (L)
Graph Handout and candy (M)
pottery (L)
lead (L)
glow sticks (H)
granite (M)
banana (H)
chart paper, markers (H and Michele)

Radiation Worksheet/Handout

Nuclear Decay Models
Equation on Board
String (L)
Ping pong balls (L)
Pom-poms (L)
Markers, chart paper (H)
M&Ms?, beads (L)
more....

