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The following lessons were created by **Cathy Tucker**, a teacher participating in a National Endowment for the Humanities Summer Institute for Teachers entitled Touch the Past: Archaeology of the Upper Mississippi River Region.

### **Using Radioactive Dating to Better Understand Isotopes**

**Grade Level:** High School

**Subjects:** General Chemistry

**Objectives:** To use radioactive dating and its application to archaeology to enhance interest and show application to isotopes.

**Standards:** Standard #2: Understands and applies principles of physical science.  
Power Benchmark: Understands and applies knowledge of the structure and properties of matter.

**Duration:** 45 minutes. This is a portion of the structure of atom in Chapter 3 of the textbook. 5 days of block scheduling (90 minute classes) for the full chapter.

**Materials/Supplies:** PowerPoint. (The unit on isotopes also includes a lab and an optional extra credit activity.)

**Vocabulary:** radioactive, radioactivity, half-life, isotope, C-12, C-13, C-14, frequency in nature, atomic mass unit (amu), atomic number, atomic mass, alpha and beta decay

**Background:** In Chapter 3 students will previously covered the history of the atom, history of the discovery of subatomic particles, Rutherford's experiment, and an introduction to alpha, beta and gamma radiation.

**Setting the Stage:** The isotope portion of the PowerPoint is inserted midway, and at the end of the chapter 3 notes.

**Procedure:** The notes will be given over a period of 3-4 days (depending on the school's schedule.) In addition there will be 2 isotope worksheets and textbook questions assigned. I also have written an isotope lab and an extra credit activity.

**Closure:** Class discussion

**Evaluation:** Formative assessment:

Openers and discussion during class

Summative Assessment:

Chapter 3 exam (multiple choice question and problems.)

Lab and optional activities write-up

**Links/Extension:** Carbon-12 is the basis for the periodic table.