Name_____ Section_____ Date_____

CONCEPTUAL PHYSICS: Hewitt/Baird | **Tech Lab**

Chapter 33: Atomic Nucleus and Radioactivity — Radiometric Dating

Radioactive Speed Dating X

Purpose

Correctly estimate the age of the various virtual objects (skulls, rocks, etc.) using the principles of radiometric dating

Apparatus

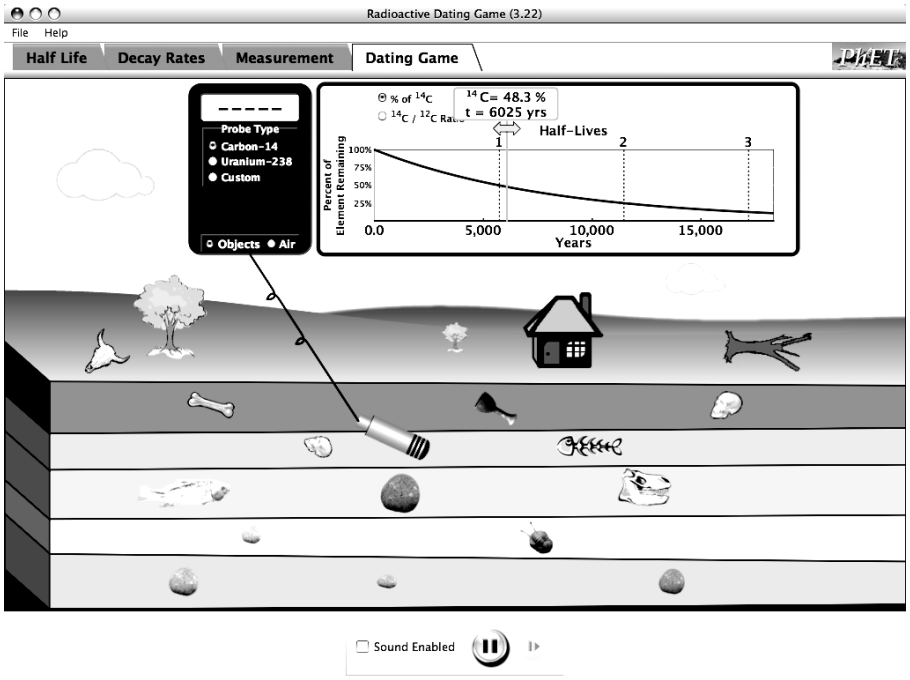
computer
PhET simulation: "Radioactive Dating Game" (available at http://phet.colorado.edu)

Discussion

Radiometric dating is groovy. It's a nuclear decay-based method for determining the age of old things. Carbon-14 is a good method for fossils up to a point. Uranium-238 is good for older, inorganic things. Other methods with different half-lives work nicely, too. More.
More.

Procedure

Step 1: Open the "Radioactive Dating Game" simulation. Click on the "Dating Game" tab in the simulation window.



Step 2: Use scientific techniques applicable to the simulation to estimate the ages of all the objects that allow estimates. Do not attempt to hack. Do not use any other reference sources. Do not cheat.

Step 3: When you have entered six correct estimates, record the time displayed on the computer screen and obtain a stamp from the instructor. Booty begins at six smilies and increases with each additional three smilies. Record the time and obtain a stamp at each milestone.

More curriculum can be found in Pearson Addison Wesley's **Conceptual Physics Laboratory Manual: Activities · Experiments · Demonstrations · Tech Labs** by Paul G. Hewitt and Dean Baird. ISBN: 0321732480

Smilies	Total Booty	Computer Time	Instructor's Stamp
6			
9			
12			
15			
18			

Summing Up

1. Carbon dating isn't a valid technique for dating fossils beyond a certain age. And it's not a valid technique for dating inorganic items (such as rocks). How did you overcome its limitations?

2. What are the limitations of uranium-238 dating? How did you overcome its limitations?

3. Two "accepted" ages are clearly in error. What are they, and why do they produce invalid "correct" responses? (Scientists do not use radiometric dating techniques on such objects.)

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