



## Student Handout 1

### GET A HALF-LIFE

### Radioactive Decay

Radioactive carbon decays at a known rate. This allows scientists to look at the amount of decay in a fossil's radioactive carbon and determine a relative date.

Students should view articles in the following web sites for back ground information before they begin the experiment. If these web sites are no longer available, use key phrases—“calculate your radiation dose and radiation basics—to locate current resources

<https://www.epa.gov/radiation/calculate-your-radiation-dose>

<https://www.epa.gov/radiation/radiation-basics>

#### Materials:

- 100 Pennies
- Sturdy bag large enough to hold pennies with room to shake

#### Directions:

1. Use the Data Chart to record your observations.
2. Put the coins in the bag. Close the bag securely and shake the bag.
3. Now spill the coins out on the table in front of you. Do not lose any!
4. Gather and count all the coins that are heads. Put them aside. In the Data Chart record this number of coins in the column Coins Removed. Now subtract and calculate the number remaining and put that number in the Coins Remaining column.
5. Collect the coins that were tails and put them back in the bag. Close the bag and shake!
6. Repeat steps 3, 4, and 5 until you have run out of coins to put back in the bag.
7. Create a bar graph to display the data.
8. Answer the analysis questions



**Data Chart**

<b>Trials</b>	<b># of Coins Removed</b>	<b># of Coins Remaining</b>
#1		
#2		
#3		
#4		
#5		
#6		
#7		
#8		
#9		
#10		

**Analysis Questions:**

1. Explain what each coin represents.

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2. Note how many times you had to toss the coins before they were all used up. Did you find a pattern? What does the bar graph show?

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3. If you repeated this experiment again, do you think you would get the same or different results? Why?

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4. Explain why this experiment was useful in replicating a model of radioactive decay.

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5. Why were the coins a good way to model half-lives? Would the model work as well if we used 1000 coins?

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6. Why do we categorize fossil fuels as nonrenewable energy resources?

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7. Explain how this activity this relates to fossil fuels?

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