

## Half-life worksheet

1. Scintigraphy is a method of medical imaging used to visualize certain organs as they are functioning. It involves a radioactive substance, which is injected into the patient. The radioactive substances used usually have a very short half-life. Explain why they are preferred over substances with longer half-lives.
  
2. Cesium-137 has a half-life of about 30 years. Is it normal that after more than 20 years, levels of radioactivity in the ground near Chernobyl are still very high? Explain your answer. Chernobyl nuclear explosion occurred in 1986.
  
3. Fill in the table which demonstrates the half life of 12 g of uranium which takes 35 000 years to decrease its radioactive substance by half.

Gram	Decay time	Percent

4. In the last column of the table, write the number of days necessary for each of the isotopes to weigh less than 1 g.

<b>Isotope</b>	<b>Half-life</b>	<b>Mass</b>	<b>Number of days</b>
Sodium 24	15 hours	90 g	
Phosphorus 32	14 days	50 g	
Iodine 131	8 days	120 g	

5. Carbon-14 is a radioactive isotope often used to date objects discovered on archeological digs. Its half-life is 5 770 years. An archeologist has discovered a piece of wood. Analysis of the wood shows that it contains only 10% of carbon-14. What is the approximate age of the piece discovered? Show work.

6. Explain when it would be useful to use polonium-216 which has a half life of 0.16 seconds and when you would want to use potassium-40 which has a half life of 1 300 000 000 years.