

**Chapter 23**

Use with Section 3

**ENRICHMENT****• Absolute Ages of Rocks****Calculating Half-Lives**

You learned in the chapter about the half-lives of carbon-14 and radium. Here is a table of some other isotopes and their half-lives. Use the table to answer the questions that follow.

| Isotope         | Half-life   |
|-----------------|-------------|
| Plutonium-238   | 86 years    |
| Americium-241   | 433 years   |
| Curium-242      | 163 days    |
| Berkelium-249   | 314 days    |
| Californium-249 | 360 days    |
| Einsteinium-253 | 20 days     |
| Nobelium-259    | 1 1/2 hours |
| Lawrencium-260  | 180 seconds |
| Element 103-262 | 40 seconds  |

1. If you had a 100-gram sample of plutonium, how much would still remain in 43 years?  
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2. What happened to the part of the plutonium that is no longer there? \_\_\_\_\_  
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3. If you had a 5-gram sample of Lawrencium, how much would still remain in 30 minutes?  
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4. If you had a 100-gram sample of Einsteinium, how much would you have left after 40 days?  
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5. A rock sample contains 7.5 grams of Californium-249 and 52.5 grams of the product into which the Californium has changed. How old is the rock? \_\_\_\_\_