



Name: _____

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Student Exploration: Half-life

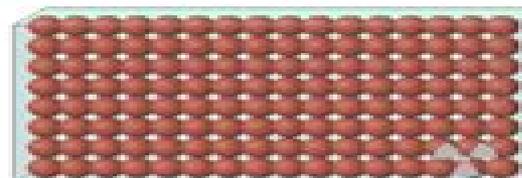
Vocabulary: daughter atom, decay, Geiger counter, half-life, isotope, neutron, radiation, radioactive, radiometric dating

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. Have you ever made microwave popcorn? If so, what do you hear while the popcorn is in the microwave? **Popping kernels.**
2. If you turn the microwave on for two minutes, is the rate of popping always the same, or does it change? Explain. **It depends on if it just started or at the end of its cycle.**

Gizmo Warm-up

Like an unpopped kernel in the microwave, a **radioactive atom** can change at any time. Radioactive atoms change by emitting **radiation** in the form of tiny particles and/or energy. This process, called **decay**, causes the radioactive atom to change into a stable **daughter atom**.



● Radioactive atom ● Daughter atom

The *Half-life* Gizmo allows you to observe and measure the decay of a radioactive substance. Be sure the sound is turned on and click **Play** (▶).

1. What do you see and hear? **the kernels popping gently popping.**

Note: The clicking sound you hear comes from a **Geiger counter**, an instrument that detects the particles and energy emitted by decaying radioactive atoms.

2. What remains at the end of the decay process? **A daughter atom.**
3. Is the rate of decay fastest at the beginning, middle, or end of the process? **At the beginning.**

Activity A:
Decay curves

Get the Gizmo ready:

- Click **Reset** (↺). Be sure that **User chooses half-life** and **Random decay** are selected.
- Check that the **Half-life** is 20 seconds and the



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Lingjun Ying



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