

Name _____ Date _____

A VOCABULARY WORDS

Circle the word or words that complete the sentence. An example is done for you.

Example: Exposure to any kind of concrete / radiation can be dangerous.

1. Materials that have an unstable nucleus are called aluminum / radioactive.
2. Alpha particles are the most / least powerful type of radiation.
3. Gamma rays are the most / least powerful type of radiation.
4. Scientists wear special clothing when they work with radioactive samples / radioactive symbols.
5. Concrete / Paper can block beta particles.
6. Beta particles and gamma rays can pass through aluminum / paper.

B VOCABULARY IN CONTEXT

Choose a word or phrase from the box to complete the paragraph. An example is done for you.

| | | | |
|--------------------|--------------------|--------------------|-----------------|
| radioactive sample | radioactive symbol | atom | beta particles |
| radiation | gamma rays | nucleus | alpha particles |

Example: The center of an atom is called the nucleus.

Sometimes an (1) _____ gives off particles and energy. These particles and energy are called (2) _____. The slowest type of radiation is made up of (3) _____. (4) _____ are smaller and faster. (5) _____ are the most powerful type of radiation. Scientists wear special clothing when they handle a (6) _____. Radioactive materials are often marked with a (7) _____ to warn people of danger.

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C DISCOVERY OF RADIOACTIVITY

Reading Strategy Cause and Effect

Read the Discovery of Radioactivity on page 184 in your book. Then answer the questions.

1. *Cause*: What was put in the drawer with the photographic plate?

2. *Effect*: What happened as a result? _____

Cause and Effect

- ✓ The cause tells what happened.
- ✓ The effect is the result of the cause.

D RADIOACTIVE DECAY

Reading Strategy Main Idea and Details

Read about Radioactive Decay on page 184 of your book. Then complete the chart with details that support the main idea. An example is done for you.

Main Idea and Details

- ✓ The main idea is the most important thing the paragraph says.
- ✓ Details support the main idea.

| Main Idea: An atom decays when it gives off particles or energy. | | |
|--|--------|--------|
| Detail | Detail | Detail |
| An atom can release an alpha particle. | | |

E SCIENCE SKILL Comparing Data

People are exposed to radiation every day. Some radiation comes from natural sources. Some radiation comes from human-made sources. The table at the top of the next page shows the main sources of a person's contact with radiation.

Compare Data

- ✓ Scientists often compare data. Placing data in a table makes the data easier to compare.

| Source of Radiation | Natural or Human-Made | Percentage |
|--------------------------------|-----------------------|------------|
| radon (a gas found in the air) | natural | 55% |
| inside human body | natural | 11% |
| rocks and soil | natural | 8% |
| outer space | natural | 8% |
| consumer products | human-made | 3% |
| medical | human-made | 15% |

1. What is the source of the most radiation? _____
2. What percentage of a person's contact with radiation comes from medical uses? _____
3. What percentage of a person's contact with radiation comes from natural sources? _____

F USES OF RADIATION

Pairwork *How People Use Radiation*

Have you ever had an X-ray? Is there a smoke detector in your home? Work with a partner. Make a list of ways radiation helps people.

Apply Information

✓ Put information to use.

G WRITING Applying Information

What is the half-life of carbon-14? What does this mean? How do scientists use carbon-14? Write a paragraph.

GROUP WORK Model Half-Life**Question** How can you make a model of half-life?**Procedure**

1. Put 200 pennies tails up in a shoebox.
2. Put the cover on the box. Then, shake the box with one quick up-and-down motion.
3. Open the box. Remove all pennies that are heads up. These pennies model atoms that decayed.
4. Record the number of pennies removed. Then record the number of pennies left in the box. Use the data table below to organize your data.

Materials

- shoe box with cover
- 200 pennies

| Trial | Number of Pennies Removed | Number of Pennies Left in the Box |
|-------|---------------------------|-----------------------------------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

5. Do steps 2–4 nine more times.

Analysis

1. How many times did you have to shake the box to remove half the pennies?

2. Each shake represents one year. What is the half-life of the atoms?
