

Standardized Test Practice

Read the passage below and answer the questions that follow.

Imagine you were spelunking in a cave and your flashlights went out. How would you find your way in the dark? Maybe you would use your hands or the sound of a friend's voice.

For scientists, the atom is in the dark. Because scientists can't see inside an atom with their eyes, they must use other methods to find out what is inside. In the early 1900s, scientists wanted to know how much of an atom is made of "solid stuff" and how much of it is empty space.

Ernest Rutherford and his team of researchers wanted to determine whether the gold atoms that made up gold foil were as solid as they seemed. These investigators shot alpha (α) particles at a thin piece of gold foil. These α -particles were actually helium nuclei. Most of the particles passed straight through the foil without being affected. However, a few α -particles were deflected at various angles, and some even bounced right back at the α -particle emission source.

On the basis of this experiment, the scientists concluded that the atom was mostly empty space. Because atomic nuclei do not take up much space, scientists know that these miniscule atomic nuclei must be very dense. So, even though scientists were unable to actually see the atom, they still were able to find their way in the dark.

In the space provided, write the letter of the term or phase that best completes each statement or best answers each question.

- _____ 1. The word spelunking in this passage means
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| A baking. | C cleaning. |
| B studying. | D exploring. |
- _____ 2. To speak of atoms being in the dark
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| A means that scientists do not have enough light. |
| B is using a metaphor to clarify a concept. |
| C provides a realistic description of the atomic world. |
| D is the main point of the passage. |
- _____ 3. Which of the following reasons best supports the conclusion of Rutherford's team that the atom is chiefly empty space?
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| A Some α -particles bounced straight back toward the emission source. |
| B These α -particles were actually helium nuclei. |
| C Most α -particles passed straight through the foil without being affected. |
| D A few α -particles were deflected at various angles. |
- _____ 4. The word miniscule in this passage means
- | | |
|--------------------|--------------------|
| A extremely small. | C extremely heavy. |
| B extremely large. | D expansive. |