

Student directions *Isotopes and Atomic Mass:*

What is an isotope? What does the mass on the periodic table mean?

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Learning Goals: Students will be able to:

- A. Define “isotope” using mass number, atomic number, number of protons, neutrons and electrons.
- B. Compare and contrast: element, atom, isotope
- C. Given the number of protons, neutrons and electrons, find the mass and name of an isotope
- D. Given the name of an element and the number of neutrons, find the mass of an isotope
- E. Give evidence to support or dispute: “In nature, the chance of finding one isotope of an element is the same for all elements.”
- F. Find the average atomic mass of an element given the abundance and mass of its isotopes

Directions:

1. Use the sim and your text to develop your own ideas about the learning goals A-D. You may want to practice with a partner by writing quiz questions to test each other.
2. For goal E, use the sim and cite references to write a paragraph for your argument.
3. You and your friend, Bill, are given a rock that you know has some Silicon. You just learned that there are 3 common isotopes of silicon- Silicon-28, Silicon-29, and Silicon-30. Bill suggests that the rock might have equal parts of each isotope. What would be the average mass of Silicon in the rock? How could you check to see if your ideas are correct?
4. Iron has many isotopes but only 4 are found in significant amounts in naturally found mixtures. The amounts by mass percent are: 5.845% of ^{54}Fe (53.9396 amu) 91.754% of ^{56}Fe (55.9349 amu), 2.119% of ^{57}Fe (56.9354 amu) and 0.282% of ^{58}Fe (57.9333 amu). What would you determine the average mass of iron to be? How do your results compare to the information on the periodic table in your text?