Activity 9 Overview

The students will investigate the nucleus of an atom and learn how the atomic mass of an element is determined. They will also learn that elements contain isotopes and that some of these isotopes are not stable. This will lead to an understanding of how radioactive isotopes gain stability. Also, they will learn what a nuclear fission reaction is and how it is different from a nuclear fusion reaction.

Safety Requirements

None

Preparation and Materials Needed

Preparation

None

Materials/Chemicals needed

- Rolls of Magic-Tape® or any transparent tape equivalent: however, this activity does not work with cellophane tape.

Learning Strategies for Students with Limited English Proficiency

1. Point out new vocabulary words in context and practice using the words as much as possible throughout the activity.

Concentrated	Magnitude	Neutral	Increments	Designate
Account for	Notation	Accelerate	Attractive	Repulsive
Repel	Affected	Long-range	Short-range	Fragment
Conserved	Flawed	Mystery	Reside	Interchangeably
Weaken	Increase	Decrease	Decay	Overwhelmed
Convert	Systematic	Maximum	Accomplish	Harness
Submarine	Power plant	Variety	Interplay	Insight
Incorporate	Bombard	Inject	Well-being	Abundance
Pertain				

2. Nuclear fragmentation processes provide an excellent opportunity for students to practice using the principle of conservation of matter. It is helpful for students to develop mental images of conservation. In processes like the one in **Step 6** of **Part B**, consider asking students to represent the nuclei with pictures, using one color for protons and another for neutrons. Rather than the labor-intensive process of counting 92 protons and 143 neutrons, students may wish to write 92 p^+ in one color and 143 n^0 in another color. Encourage students to write charges with particles; it is likely that some students will discover that charge is conserved in these processes as well. Students' representations will look similar to this: