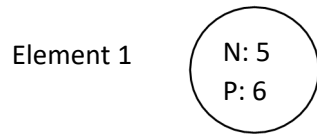


# Atomic Stability Worksheet-Teacher Answer Key

1. Create a pretend radioactive nucleus for Element 1 including 5 neutrons (N) and 6 protons (P).

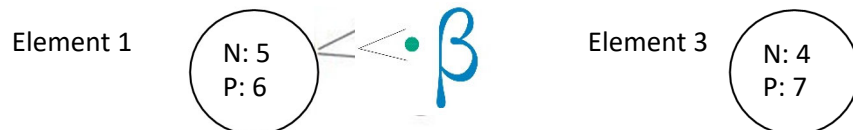


2. Demonstrate what happens to Element 1 when the pretend radioactive nucleus emits an alpha particle and a new element (Element 2) is formed. Then enter the number of neutrons and protons in the nucleus of Element 2. **Students should remove two protons and two neutrons.**



What differences do you observe between the number of protons and neutrons in Element 2 and Element 1? **When a radioactive atom releases an alpha particle, the number of protons and neutrons each decrease by two.**

3. Return Element 2 to its original form: Element 1 (5 neutrons and 6 protons). Demonstrate what happens to Element 1 when it emits a beta particle and a new element (Element 3) is formed. Then enter the number of neutrons and protons in the nucleus of Element 3. **Students should change a neutron to a proton and an electron (-1). The proton stays in the nucleus and the electron is released or ejected from the nucleus in the form of beta particles.**



What differences do you observe between the number of protons and neutrons in Element 3 and Element 1? **The release of a beta particle decreases the number of neutrons by one and increases the number of protons by one.**

4. Every element has a different number of protons. What happens to unstable (radioactive) atoms when they release an alpha or beta particle and the number of protons change? **When the release of energy changes the number of protons in the nucleus, the atoms transform into a new radioactive element. Radioactive atoms decay and transform into new elements until they become stable.**
5. Observe the changes in the number of protons and neutrons between the two elements below. Determine whether the examples show the release of an alpha particle or a beta particle. Circle the correct answer.

**Example 1: Alpha particle. The number of protons and neutrons decrease by two.**

**Example 2: Beta particle. The number of protons increases by one and the neutrons decrease by one**