Name:____ SAMPLE KEY NOT FOR USE __   Date:____   Period:_____

Determining the Mass of Element Beanium
Activity Key

Introduction

      On a periodic table, the values for atomic number and atomic mass are given for each element. The atomic number is the whole number and represents the number of protons in the atom. The atomic mass is a decimal number because it represents a weighted average of the masses of the isotopes of each element.

      In the following lab, you will determine the atomic mass for the element "beanium". There are three naturally occurring isotopes of beanium: white-beanium, brown-beanium, and speckled-beanium. You will calculate the average atomic mass of a given sample of beanium.

Objective

    1. Calculate average atomic masses

Materials (per lab group)
    Sample of Beanium
    Balance
    Calculator

The sample of "beanium" consists of 15 dry pinto beans (speckled), 25 dry northern beans (white), and 10 dry kidney beans (brown)

Procedure

    1. Separate the "atoms" of beanium in your sample into three groups based on type of isotope (white, brown, or speckled). Count the number of atoms of each isotope and record below:

        _____ atoms of white-beanium
        _____ atoms of brown-beanium
        _____ atoms of speckled-beanium

    2. Using your balance, find the mass of each isotope in the sample and record below:

        _____ grams of white-beanium
        _____ grams of brown-beanium
        _____ grams of speckled-beanium

    3. Calculate the grams in one atom of each isotope and record below:

        _____ grams per atom of white-beanium
        _____ grams per atom of brown-beanium
        _____ grams per atom of speckled-beanium

    4. Determine the percent abundance of each isotope in your sample. This can be done by dividing the number of atoms of each isotope by the total number of atoms in your sample and multiplying by 100. Record your results below:

        _____ % white-beanium
        _____ % brown-beanium
        _____ % speckled-beanium

    5. Determine the average atomic mass of beanium by adding the sums of the products of relative abundance and grams per atom. Record your answer below:

      % white-beanium X grams per atom white-beanium = _____

      % brown-beanium X grams per atom brown-beanium = _____

      % speckled-beanium X grams per atom speckled-beanium = _____

                Average Atomic Mass (Total) = _____

    6. Compare your average atomic mass with your classmates.