

## LAB – Isotopic Mass vs. Average Atomic Mass

*Introduction: If atoms were as large as beans they could be sorted, counted, and weighed. In this experiment, the analogy is made between atoms and beans, with different types of beans representing different isotopes of the same element.*

*Purpose: To show the relation between isotopic mass, isotopic abundance, and atomic mass.*

*Materials: balance*

*4 cups*

*approximately 500 beans (of four different types)*

*Procedure:*

- 1. Sort the isotopes (beans) into groups. Record the total number of atoms (beans) in your sample, as well as the quantity of each isotope in the "Data" section.*
- 2. Sketch a picture of each isotope in the data section. Try to clearly show the differences in each isotope.*
- 3. a. Find the total mass of each isotope. Record this mass in the "Data" section.  
b. Find the mass of one atom of each isotope. (Divide the total mass of each isotope by the number of atoms in that sample of isotope.) Record this in the "Data" section*
- 4. Determine the percent abundance of each isotope using the following formula:  
$$\frac{\text{\# of atoms of isotope}}{\text{total atoms}} = \% \text{ abundance of that isotope}$$*

*Record this information in the "Data" section. Repeat for each isotope.*

*Data:*

*Total number of beans (atoms): \_\_\_\_\_ 470 \_\_\_\_\_*

<i>Type of bean (isotope)</i>	<i># of beans (atoms)</i>	<i>Sketch of bean (atom)</i>
<i>Navy</i>	<i>131</i>	
<i>Pinto</i>	<i>263</i>	
<i>Lima</i>	<i>24</i>	
<i>Kidney</i>	<i>52</i>	

<i>Type of bean</i>	<i>Total mass of</i>	<i>Mass of one atom of</i>	<i>Percent abundance of</i>
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# Bean Lab Answers

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