Aim: To find all naturally occurring isotopes of the first ten elements.

1. Open the Applet Isotopes and Atomic Mass sent to you via Firefly.

(or go to <https://phet.colorado.edu/en/simulation/isotopes-and-atomic-mass>)

1. Expand the Symbol and Abundance in nature boxes.
2. Notice that the first isotope $$ is stable and has abundance 99.9885%.
3. Add a neutron by dragging it from the basket to the isotope. Write the new symbol, stability and abundance in the table at position proton number, Z=1 and mass number, A = 2. (the box below$$).
4. Try adding a second neutron. Notice that the isotope is now unstable with only a very small abundance in nature. Add this information to the appropriate square on the grid.
5. Add a third neutron. Notice that the abundance drops to 0%. This means the isotope does not exist naturally.
6. In the periodic table on the right, click on He. Complete the square for $$. Try taking away a neutron from the isotope.
7. By changing element and adding/taking away neutrons complete the table for all elements up to neon. (If an isotope doesn’t exist leave the box empty).

QUESTIONS Use your completed table to answer the following

1. Which elements have no isotopes?
2. Which elements have 3 or more isotopes?
3. Which elements have unstable isotopes?
4. Write the symbol for the most abundant isotope of
5. Oxygen
6. Carbon
7. Neon
8. Do the following isotopes exist? If yes, write down their symbol.
9. Z=3, A=10
10. Z = 10, A =15
11. Z=8, A=4
12. Z=10, A =22
13. Calculate the relative atomic mass of
14. Lithium
15. Boron
16. Oxygen
17. Click on the ‘Mix Isotopes’ tab and explore further.