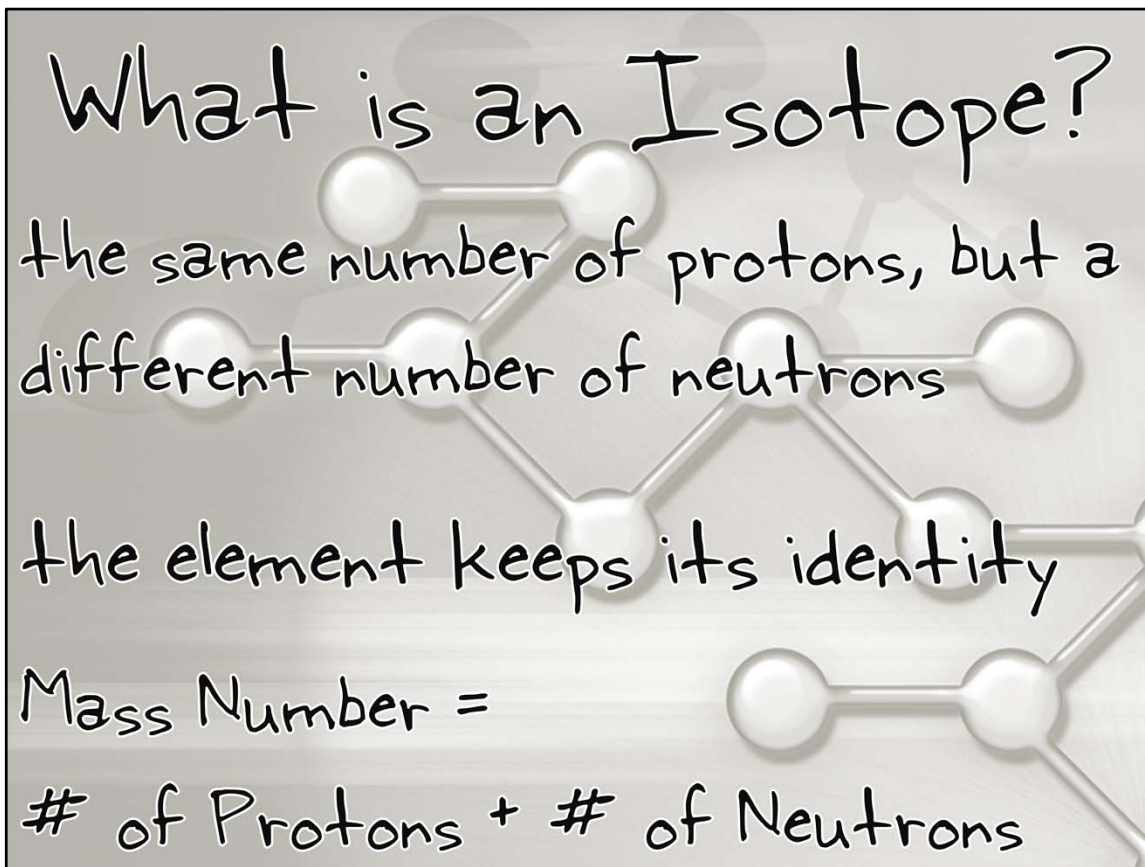


**Module 5: Minerals**  
**Topic 1 Content: Isotopes Presentation Notes**



Isotopes

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What is an Isotope?

the same number of protons, but a different number of neutrons

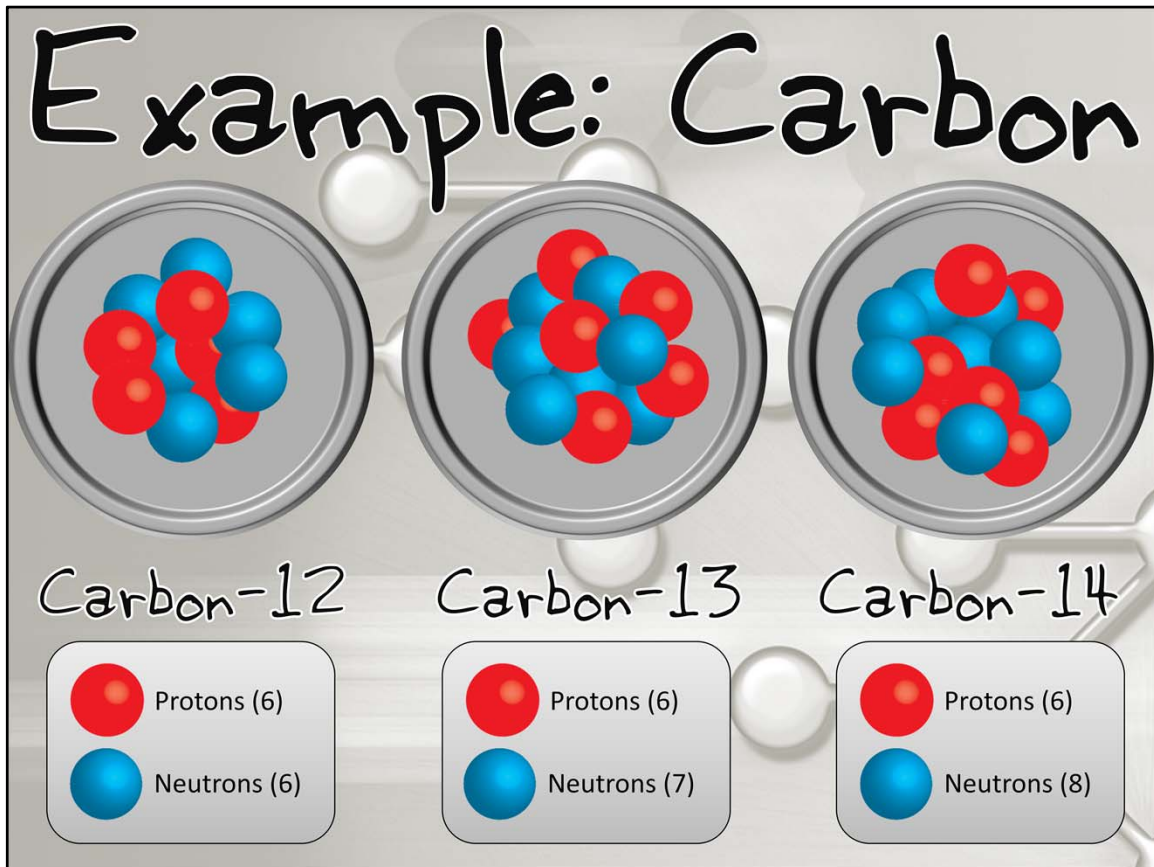
the element keeps its identity

Mass Number =

# of Protons + # of Neutrons

Once the neutron was discovered, scientists learned that elements contain isotopes. Isotopes are like twins for an element. Isotopes have the same number of protons, but a different number of neutrons. Since the number of protons remains the same, the element keeps its identity. Only the number of neutrons will change. It is important to know that the mass number is calculated by adding the number of protons and neutrons in an atom.

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The element carbon is a great example because it has fifteen different isotopes. Three isotopes of carbon; carbon-12, carbon-13, and carbon-14, are shown here. While all three of these isotopes have six protons, carbon-12 has six neutrons, carbon-13 has seven neutrons, and carbon-14 has eight neutrons. The atomic masses of all of these isotopes vary.