

QUICK REFERENCE SHEET

Learn Nuclear Science *with Marbles*

A JINA/FRIB outreach service by Zach Constan

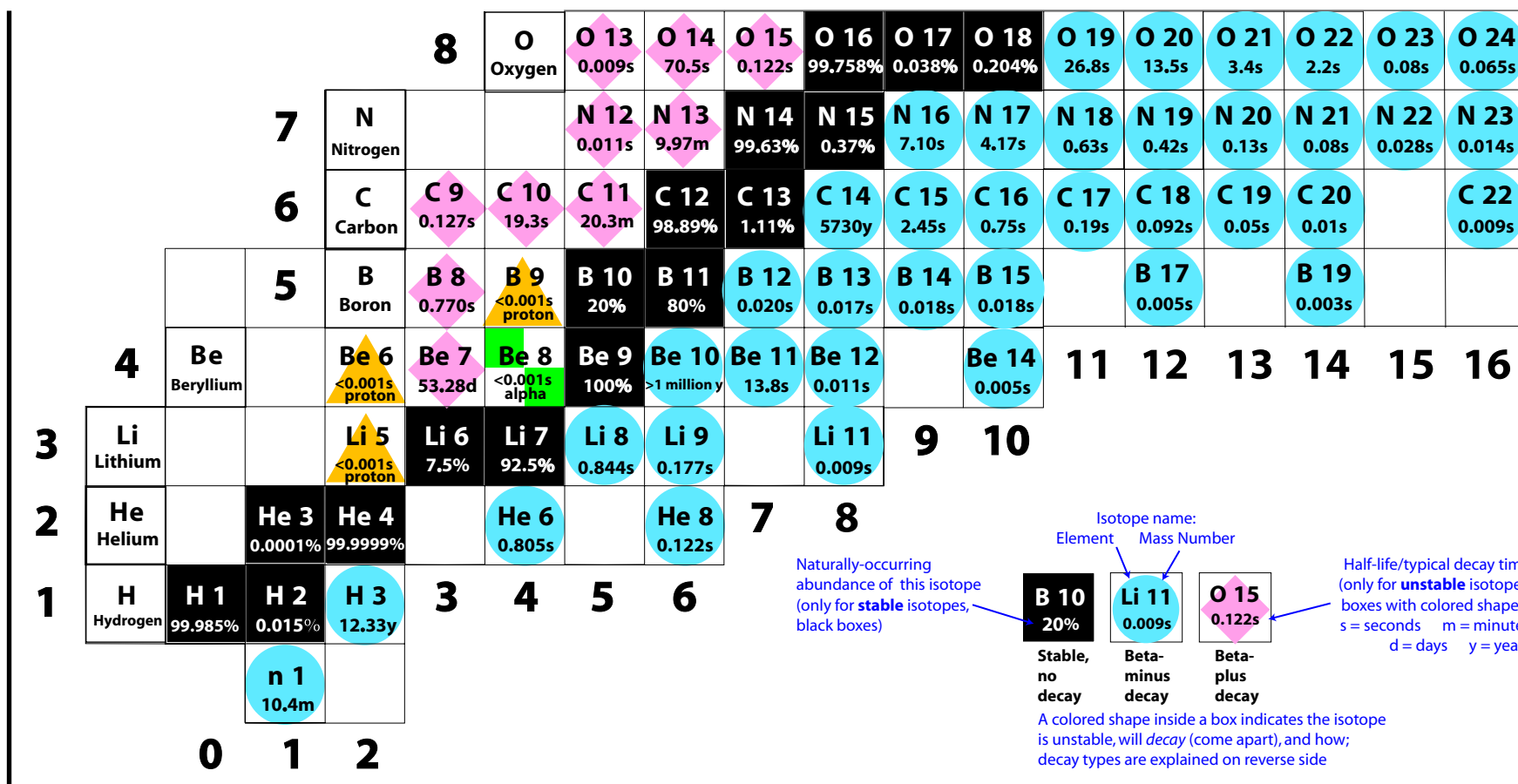
www.jinaweb.org/educational-outreach/marble-nuclei-lessons

Version 4.3 • January 2019

CHART of the NUCLIDES

featuring the first eight elements

Protons (Elements)



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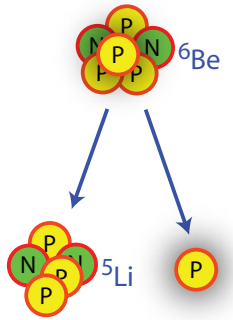
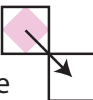
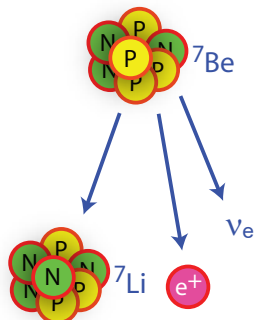
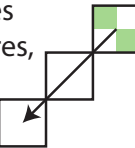
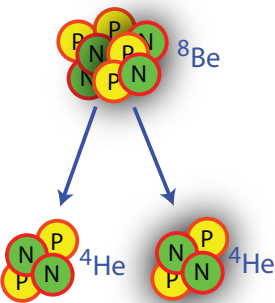
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Types of radioactive decay

Be 6 <0.001s proton	Be 7 53.28d	Be 8 <0.001s alpha	Be 9 100%	Be 10 >1 million y
Yellow triangle = proton decay Nucleus ejects one proton —  Isotope moves down one square on chart  	Pink diamond = beta-plus decay Turns a proton into a neutron, emits a positron & a neutrino —  +  Isotope moves down one square, right one square on chart  	Green checkerboard = alpha decay Nucleus ejects an alpha particle (two protons & two neutrons) —  +  Isotope moves down 2 squares, left 2 squares on chart  	Black square = stable isotope, no decay % = abundance of this isotope found in nature	Blue circle = beta-minus decay Turns a neutron into a proton, emits an electron & antineutrino —  +  Isotope moves left one square, up one square on chart 