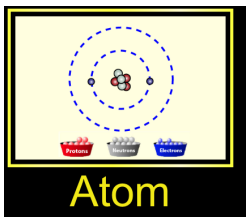
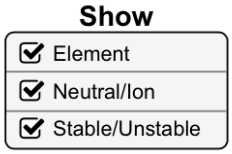
Atoms, elements and isotopes – PhET sim

Open the following simulation: https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_en.html

Select:



Check the following boxes:



Build the following atoms and record the information in the table below. Make sure the atom is stable.

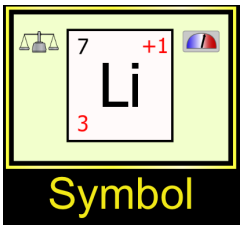
Atom	Symbol	No. protons	No. neutrons	No. electrons	Relative mass
carbon	C	6	6	6	12
sodium					
iron					
argon					
oxygen					
magnesium					
copper					

What do you notice about the number of electrons compared to the number of protons in each atom you have built? Why is this?

What did you need to add to make the atom stable?

Find out what relative mass is. How can you work out the relative mass from the number of neutrons, protons and electrons?

Now choose:



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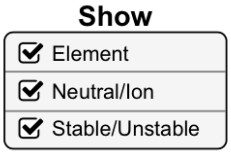


Build some stable atoms and record the symbol equations in the table below:

atom	Symbol representation
Carbon-12	$^{12}_{6}C$
Nitrogen-14	
Aluminium-27	
Fluorine-19	
Calcium-42	
Sulphur-32	
Carbon-13	

What does the top number in the symbol representation show?

What does the bottom number in the symbol representation show?

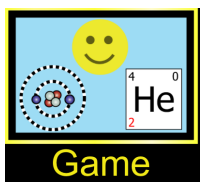
How are carbon-12 and carbon-14 different? What do we call them?

What happens when there are fewer electrons than protons?

What happens when there are more electrons than protons?

What do we call the particle when there is an imbalance of electrons to protons?

Now choose:



Play each of the games.