



Download NOVA elements from self service

Guiding Question: What are the parts of an atom and how do we know how many of each part there is?

Learning Goal: Read a periodic table and tell the number of protons, neutrons, and electrons in an atom of a given element.

Agenda

- 1) Daily Science Review
- 2) Words of the day
- 3) Periodic Table and Parts of Atom C-notes
- 4) Periodic table activity
- 5) Practice # or P,N and E

Words of the day

Periodic Table

Atoms

Subatomic Particles

Parts of the Atom C-Notes

**Write
Questions**

Parts of an atom

Number of Electrons, Protons, and Neutrons

Reading the Periodic table

Example problem

Write a summary

PERIODIC TABLE ELEMENTS 1-20

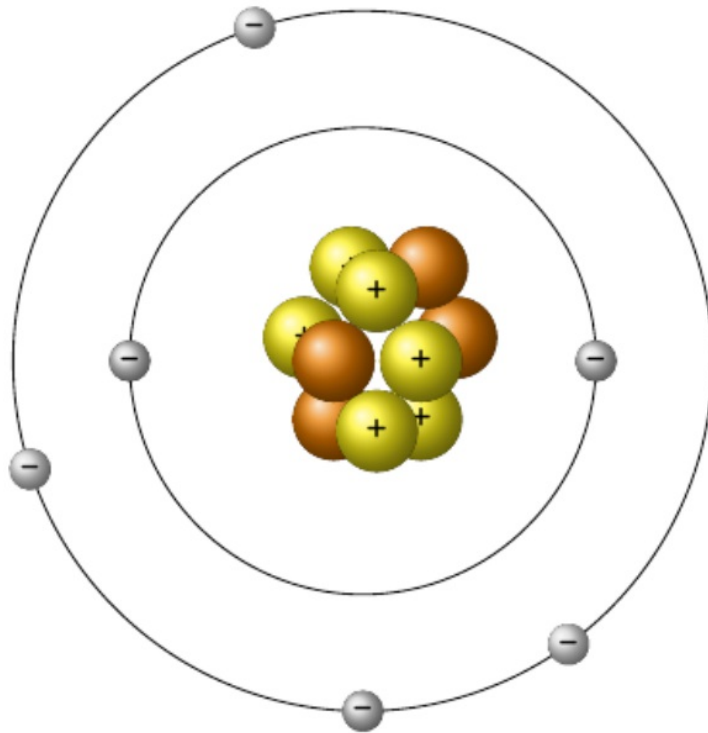
Write the number of protons, electrons, and neutrons in each element.

HYDROGEN 1							HELIUM 2
# of Protons:							# of Protons:
# of Electrons:							# of Electrons:
# of Neutrons:							# of Neutrons:
1.01							4.00
LITHIUM 3	BERYLLIUM 4	BORON 5	CARBON 6	NITROGEN 7	OXYGEN 8	FLUORINE 9	NEON 10
# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:
# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:
# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:
6.94	9.01	10.81	12.01	14.01	16.00	19.00	20.18
SODIUM 11	MAGNESIUM 12	ALUMINUM 13	SILICON 14	PHOSPHORUS 15	SULFUR 16	CHLORINE 17	ARGON 18
# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:
# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:
# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:
22.99	24.31	26.98	28.09	30.97	32.07	35.45	39.95
POTASSIUM 19	CALCIUM 20						
# of Protons:	# of Protons:						
# of Electrons:	# of Electrons:						
# of Neutrons:	# of Neutrons:						
39.10	40.08						

Note: Remember that the number of neutrons is not the same for every atom of an element. The number of neutrons you write in this chart will be a number, that when added to the number of protons, gives a sum as close as possible to the atomic mass.

Atom

The smallest particle of a substance that can exist by itself.



Periodic Table

A very powerfully chart that shows ALL of the known elements that make up matter and important information about them. ALL CHEMIST DO NO LEAVE HOME WITHOUT IT.

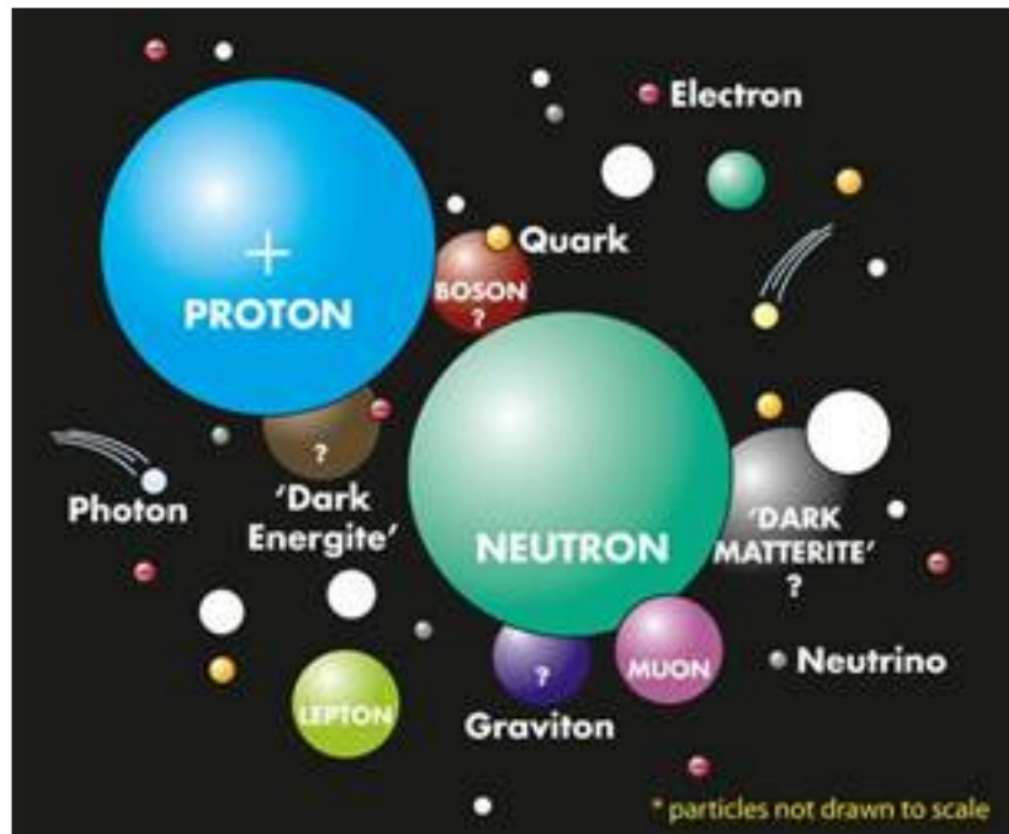
Periodic Table of the Elements

1 1IA 11A																	18 VIII 8A
1 H Hydrogen 1.0079																	2 He Helium 4.00260
3 Li Lithium 6.941	4 Be Beryllium 9.01218											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.0074	8 O Oxygen 15.9994	9 F Fluorine 18.998403	10 Ne Neon 20.1797
11 Na Sodium 22.989768	12 Mg Magnesium 24.305	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8 VIII 8	9 VIII 8	10 VIII 8	11 IB 1B	12 IIB 2B	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIII 8A
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.95591	22 Ti Titanium 47.88	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.64	33 As Arsenic 74.9216	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium 98.9072	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.9055	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.90447	54 Xe Xenon 131.29
55 Cs Cesium 132.90545	56 Ba Barium 137.327	57-71 Lanthanide Series	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.9665	80 Hg Mercury 200.59	81 Tl Thallium 204.3873	82 Pb Lead 207.2	83 Bi Bismuth 208.98037	84 Po Polonium [209]	85 At Astatine [209]	86 Rn Radon [222]
87 Fr Francium [223]	88 Ra Radium [226]	89-103 Actinide Series	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [289]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Uuq Ununquadium [289]	115 Uup Ununpentium unknown	116 Uuh Ununhexium [289]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown
			57 La Lanthanum 138.9055	58 Ce Cerium 140.116	59 Pr Praseodymium 140.90766	60 Nd Neodymium 144.24	61 Pm Promethium [145]	62 Sm Samarium 150.36	63 Eu Europium 151.9653	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
			89 Ac Actinium [227]	90 Th Thorium 232.0381	91 Pa Protactinium 231.03628	92 U Uranium 238.02891	93 Np Neptunium 237.04817	94 Pu Plutonium 244.0642	95 Am Americium [243]	96 Cm Curium [247]	97 Bk Berkelium [247]	98 Cf Californium [251]	99 Es Einsteinium [252]	100 Fm Fermium [257]	101 Md Mendelevium [258]	102 No Nobelium [259]	103 Lr Lawrencium [260]
			Alkali Metal	Alkaline Earth	Transition Metal	Basic Metal	Semimetals	Nonmetals	Halogens	Noble Gas	Lanthanides	Actinides					

Subatomic Particles

Parts of an atom that are smaller than an atom. NO longer an element

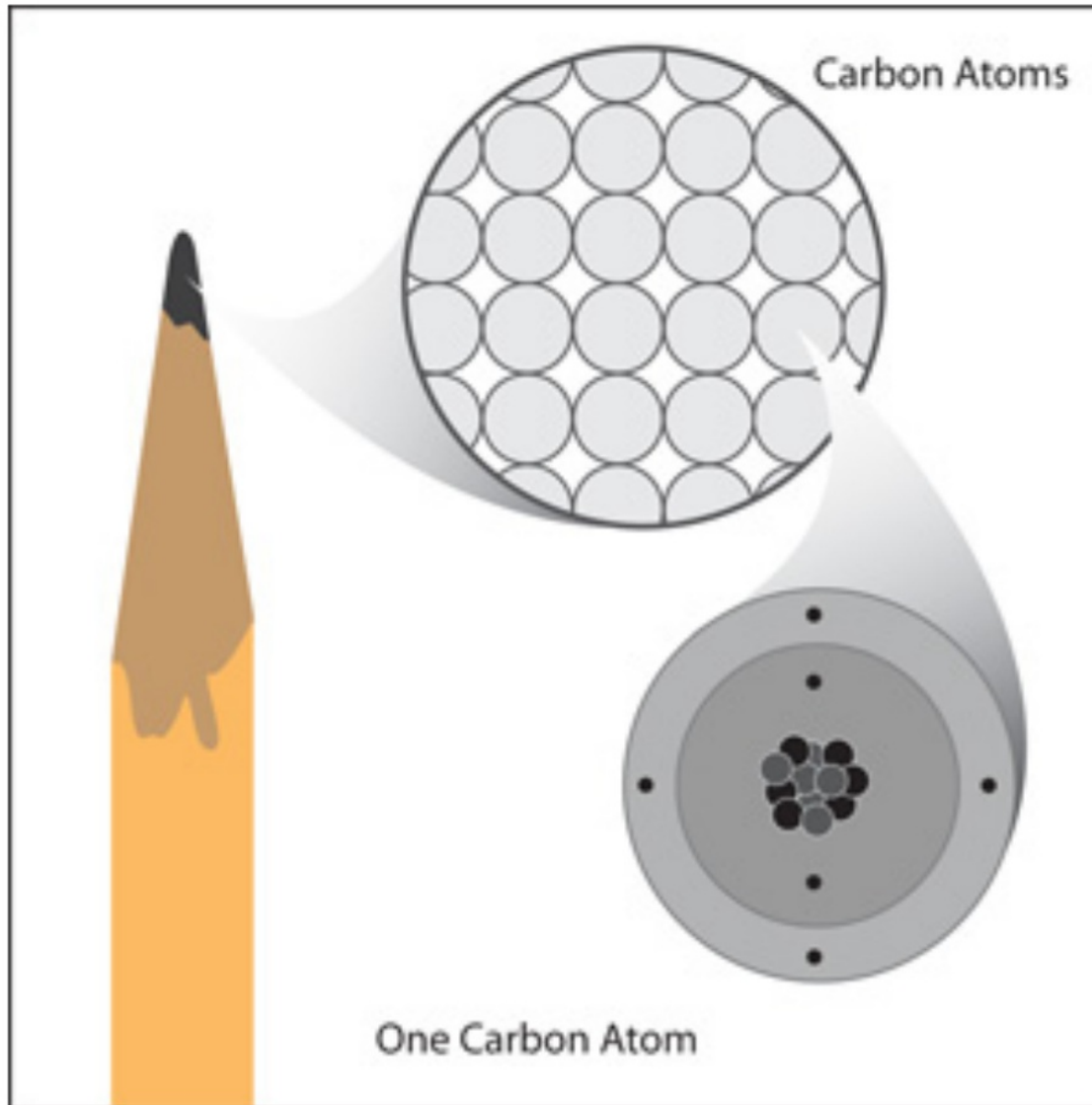
Sub= Below



DSR Today



What is this diagram showing?



Open Nova Elements

MUTE THE SOUND



ALFRED P. SLOAN
FOUNDATION

Click on explore

EXPLORE
THE INTERACTIVE
PERIODIC TABLE

NOVA
elements



with
David Pogue

WATCH
HUNTING THE
ELEMENTS

PLAY
DAVID POGUE'S
ESSENTIAL ELEMENTS

NOVA



DAVID POGUE'S APPS

ABOUT

CREDITS

SETTINGS

What rules did you find when building an atom?

Parts of the Atom C-Notes

**Write
Questions**

Parts of an atom

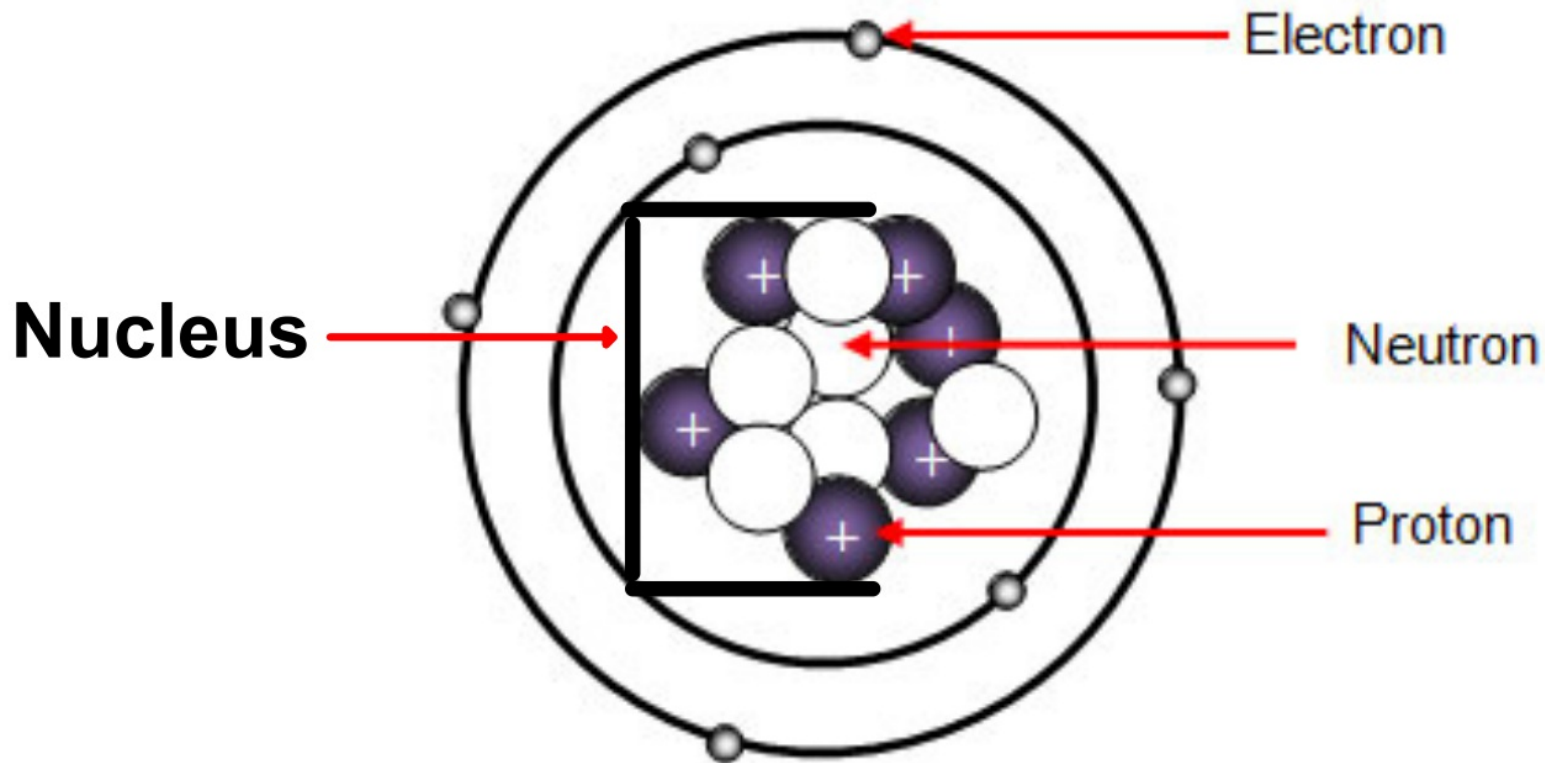
Number of Electrons, Protons, and Neutrons

Reading the Periodic table

Example problem

Write a summary

Parts of an Atom



Electron- Negative Charge VERY LITTLE Mass, 0 mass.

Proton- Positive Charge Makes up about 1/2 the mass of the atom

Neutron-NO CHARGE, Makes up about 1/2 the mass of the atom

Number of Electrons, Protons, and Neutrons

Number you need to find

Atomic Number

Average Atomic Mass rounded to the nearest whole number

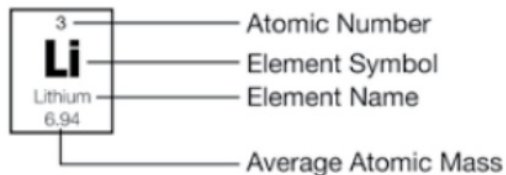
Rules

1. Number of Protons=Atomic Number, Tells what element you have.
2. Number of Protons = Number of Electrons
3. Number of Neutrons = Atomic Mass - Protons

KEEP YOUR PERIODIC TABLE IN YOUR NOTEBOOK

The Periodic Table of the Elements

1 H Hydrogen 1.01																	2 He Helium 4.00						
3 Li Lithium 6.94	4 Be Beryllium 9.01																	5 B Boron 10.81	6 C Carbon 12.01	7 N Nitrogen 14.01	8 O Oxygen 16.00	9 F Fluorine 19.00	10 Ne Neon 20.18
11 Na Sodium 22.99	12 Mg Magnesium 24.31																	13 Al Aluminum 26.98	14 Si Silicon 28.09	15 P Phosphorus 30.97	16 S Sulfur 32.07	17 Cl Chlorine 35.45	18 Ar Argon 39.95
19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.87	23 V Vanadium 50.94	24 Cr Chromium 52.00	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80						
37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29						
55 Cs Cesium 132.91	56 Ba Barium 137.33	57 La Lanthanum 138.91	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.84	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)						
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	104 Rf Rutherfordium 178.49	105 Db Dubnium (262)	106 Sg Seaborgium (266)	107 Bh Bohrium (264)	108 Hs Hassium (269)	109 Mt Meitnerium (268)	110 Ds Darmstadtium (281)	111 Rg Roentgenium (272)	112 Cn Copernicium (285)												



58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97
90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium 168.93	102 No Nobelium (259)	103 Lr Lawrencium (262)



Reading the Periodic Table

The Periodic Table of the Elements

1 H Hydrogen 1.01	2 He Helium 4.00																	18 Ar Argon 39.95	19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.88	23 V Vanadium 50.94	24 Cr Chromium 52.00	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.64	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80
37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium [98]	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.91	54 Xe Xenon 131.29	55 Cs Cesium 132.91	56 Ba Barium 137.33	57 La Lanthanum 138.91	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium [145]	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.05	71 Lu Lutetium 174.97		
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<p>CARBON</p> <p>6</p> <p>C</p> <p>12.01</p>
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Atomic number
The number of protons in the nucleus of the atom.

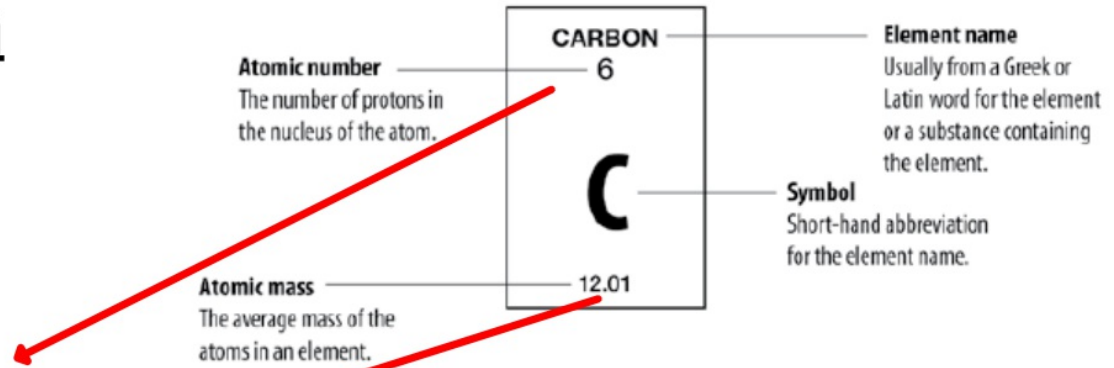
Atomic mass
The average mass of the atoms in an element.

Element name
Usually from a Greek or Latin word for the element or a substance containing the element.

Symbol
Short-hand abbreviation for the element name.

Example Problem

Carbon



Atomic Number=6

Atomic Mass = 12.01 **ROUNDED** to 12

Protons= 6 (Same as Atomic Number)

Electrons= 6 (Same as Protons)

Neutrons = 12(Atomic Mass)- 6(protons) = 6

PERIODIC TABLE ELEMENTS 1-20

HYDROGEN 1 H 1.01	PERIODIC TABLE ELEMENTS 1-20						HELIUM 2 He 4.00
LITHIUM 3 Li 6.94	BERYLLIUM 4 Be 9.01	BORON 5 B 10.81	CARBON 6 C 12.01	NITROGEN 7 N 14.01	OXYGEN 8 O 16.00	FLUORINE 9 F 19.00	NEON 10 Ne 20.18
SODIUM 11 Na 22.99	MAGNESIUM 12 Mg 24.31	ALUMINUM 13 Al 26.98	SILICON 14 Si 28.09	PHOSPHORUS 15 P 30.97	SULFUR 16 S 32.07	CHLORINE 17 Cl 35.45	ARGON 18 Ar 39.95
POTASSIUM 19 K 39.10	CALCIUM 20 Ca 40.08						

Period Table Game

1. Around the room there are the Symbols of the first 20 elements
2. Each group will get 10 cards that describe one of the 20 elements
3. Read the information on the card and figure out which card goes to which element. (Each Element will have 5 cards when done)
4. Use your periodic table to help you figure out where the cards go. Use your RULES you wrote in your notes today.



PERIODIC TABLE ELEMENTS 1-20

Write the number of protons, electrons, and neutrons in each element.

HYDROGEN 1							HELIUM 2
# of Protons:							# of Protons:
# of Electrons:							# of Electrons:
# of Neutrons:							# of Neutrons:
1.01							4.00
LITHIUM 3	BERYLLIUM 4	BORON 5	CARBON 6	NITROGEN 7	OXYGEN 8	FLUORINE 9	NEON 10
# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:
# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:
# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:
6.94	9.01	10.81	12.01	14.01	16.00	19.00	20.18
SODIUM 11	MAGNESIUM 12	ALUMINUM 13	SILICON 14	PHOSPHORUS 15	SULFUR 16	CHLORINE 17	ARGON 18
# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:	# of Protons:
# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:	# of Electrons:
# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:	# of Neutrons:
22.99	24.31	26.98	28.09	30.97	32.07	35.45	39.95
POTASSIUM 19	CALCIUM 20						
# of Protons:	# of Protons:						
# of Electrons:	# of Electrons:						
# of Neutrons:	# of Neutrons:						
39.10	40.08						

Note: Remember that the number of neutrons is not the same for every atom of an element. The number of neutrons you write in this chart will be a number, that when added to the number of protons, gives a sum as close as possible to the atomic mass.

Exit Ticket

1. What is the name of the element?
2. What is the element's symbol?
3. What is the Atomic Number?
4. What is the atomic Mass?
5. How many of each subatomic particles are there?
Protons:
Neutrons:
Electrons:

