

**Puzzle #1 (4 pts)**

Fill in the missing numbers in the following table:

Chemical symbol	Atomic number	Number of protons	Number of neutrons	Number of electrons	Mass Number
$^{53}\text{Cr}^{2+}$	24	24	29	22	53
$^{65}\text{Cu}^{+}$	29	29	36	28	65
$^{63}\text{Tc}^{3+}$	41	41	52	38	93
$^{33}\text{S}^{2-}$	16	16	17	18	33

**Piece #1 (1/2 pt)** – I have 360 eggs. How many dozen eggs do I have?

$$360 / 12 = 30. \text{ dozen eggs (2SF)}$$

**Piece #2 (1/2 pt)** – Each egg has a mass of 45 g. What is the mass of a dozen eggs?

$$12 * 45\text{g} = 540\text{g (2SF)}$$

**Piece #3 (1/2 pt)** I have 896 g of eggs. How many dozen eggs do I have? How many individual eggs do I have?

$$896\text{g} / 540 \text{ g} = 1.66 \text{ dozen (3SF)}$$

$$1.66 \text{ dozen} * 12 \text{ eggs} = 19.92 \text{ eggs} \rightarrow 20 \text{ eggs (2SF)}$$

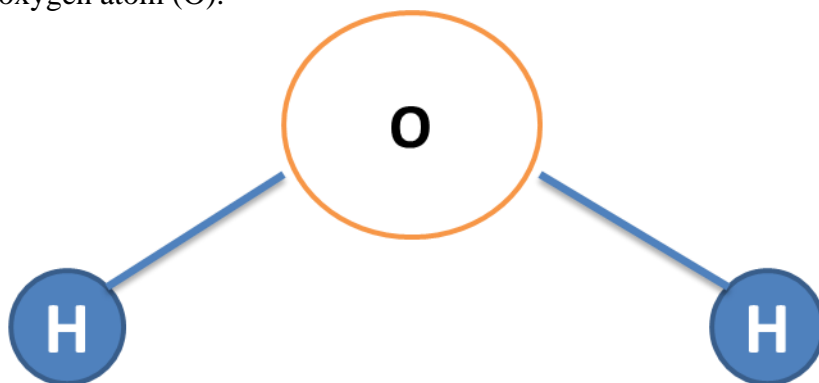
**Piece #4 (1/2 pt)**  $6.022 \times 10^{23}$  anything make up 1 mole. I have 896 g of eggs. How many moles of eggs do I have?

$$20 \text{ eggs} / 6.022 \times 10^{23} \text{ eggs} = 3.3 \times 10^{-23} \text{ mol}$$

**Puzzle #2 (2 pts)** Exactly 1 mole of magnesium atoms has a mass of 24.301 g. If I have 500.0 g of magnesium, how many moles of magnesium do I have?

$$500.0\text{g of Mg} / 24.301\text{g} = 20.58 \text{ mols of Mg (4SF)}$$

**Puzzle #3 (2 pt)** Water is a molecule made by assembling 2 hydrogen atoms (H) and 1 oxygen atom (O).



I have 0.35 moles of water molecules.

- A) How many moles of hydrogen atoms are there in my water?
- B) How many moles of oxygen atoms are there in my water?

- A)  $0.35 \text{ mol} * 2 = 0.7 \text{ mol of H}$
- B)  $0.35 \text{ mol} * 1 = 0.35 \text{ mol of O}$

a.

The Periodic Table of the Elements

1	2											3
<b>H</b> Hydrogen 1.00794	<b>He</b> Helium 4.003											
3	4											10
<b>Li</b> Lithium 6.941	<b>Be</b> Beryllium 9.012182											<b>Ne</b> Neon 20.1797
11	12											18
<b>Na</b> Sodium 22.989770	<b>Mg</b> Magnesium 24.3050											<b>Ar</b> Argon 39.948
19	20	21	22	23	24	25	26	27	28	29	30	36
<b>K</b> Potassium 39.0983	<b>Ca</b> Calcium 40.078	<b>Sc</b> Scandium 44.955910	<b>Ti</b> Titanium 47.867	<b>V</b> Vanadium 50.9415	<b>Cr</b> Chromium 51.9961	<b>Mn</b> Manganese 54.938049	<b>Fe</b> Iron 55.845	<b>Co</b> Cobalt 58.933200	<b>Ni</b> Nickel 58.6934	<b>Cu</b> Copper 63.546	<b>Zn</b> Zinc 65.39	<b>Kr</b> Krypton 83.80
37	38	39	40	41	42	43	44	45	46	47	48	54
<b>Rb</b> Rubidium 85.4678	<b>Sr</b> Strontium 87.62	<b>Y</b> Yttrium 88.90585	<b>Zr</b> Zirconium 91.224	<b>Nb</b> Niobium 92.90638	<b>Mo</b> Molybdenum 95.94	<b>Tc</b> Technetium (98)	<b>Ru</b> Ruthenium 101.07	<b>Rh</b> Rhodium 102.90550	<b>Pd</b> Palladium 106.42	<b>Ag</b> Silver 107.8682	<b>Cd</b> Cadmium 112.411	<b>Xe</b> Xenon 131.29
55	56	57	72	73	74	75	76	77	78	79	80	86
<b>Cs</b> Cesium 132.90545	<b>Ba</b> Barium 137.327	<b>La</b> Lanthanum 138.9055	<b>Hf</b> Hafnium 178.49	<b>Ta</b> Tantalum 180.9479	<b>W</b> Tungsten 183.84	<b>Re</b> Rhenium 186.207	<b>Os</b> Osmium 190.23	<b>Ir</b> Iridium 192.217	<b>Pt</b> Platinum 195.078	<b>Au</b> Gold 196.96655	<b>Hg</b> Mercury 200.59	<b>Rn</b> Radon (222)
87	88	89	104	105	106	107	108	109	110	111	112	
<b>Fr</b> Francium (223)	<b>Ra</b> Radium (226)	<b>Ac</b> Actinium (227)	<b>Rf</b> Rutherfordium (261)	<b>Db</b> Dubnium (262)	<b>Sg</b> Seaborgium (263)	<b>Bh</b> Bohrium (262)	<b>Hs</b> Hassium (265)	<b>Mt</b> Meitnerium (266)				
71	70	69	68	67	66	65	64	63	62	61	60	71
<b>Lu</b> Lutetium 174.967	<b>Yb</b> Ytterbium 173.04	<b>Tm</b> Thulium 168.93421	<b>Er</b> Erbium 167.26	<b>Ho</b> Holmium 164.93032	<b>Dy</b> Dysprosium 162.50	<b>Tb</b> Terbium 158.92534	<b>Gd</b> Gadolinium 157.25	<b>Eu</b> Europium 151.964	<b>Sm</b> Samarium 150.36	<b>Pm</b> Promethium (145)	<b>Nd</b> Neodymium 144.24	<b>Lu</b> Lutetium 174.967
103	102	101	100	99	98	97	96	95	94	93	92	103
<b>Lr</b> Lawrencium (262)	<b>No</b> Nobelium (259)	<b>Md</b> Mendelevium (258)	<b>Fm</b> Fermium (257)	<b>Es</b> Einsteinium (252)	<b>Cf</b> Californium (251)	<b>Bk</b> Berkelium (247)	<b>Cm</b> Curium (247)	<b>Am</b> Americium (243)	<b>Pu</b> Plutonium (244)	<b>Np</b> Neptunium (237)	<b>U</b> Uranium 238.0289	<b>Lr</b> Lawrencium (262)