

**Faculty Submitting:** Allison Kelly

**Specify here whether “Pre” or “End” of Unit and the Unit #:** End Unit 2

<i>Describe the properties of protons, neutrons, electrons, atoms, ions and isotopes</i>	
<b>Unit 2_</b> <b>Question 1</b>	<b>Canvas Question Type:</b> Fill in Multiple Blanks QUESTION Group
1a	Identify the number of subatomic particles for neon-22
	Number of Protons [10] Number of Neutrons [12] Number of Electrons [10] Mass Number [22] Atomic Number [10]
1b	Identify the number of subatomic particles for sulfur-33
	Number of Protons [16] Number of Neutrons [17] Number of Electrons [16] Mass Number [33] Atomic Number [16]
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>
<b>Unit 2_</b> <b>Question 2</b>	<b>Canvas Question Type:</b> Fill in Multiple Blanks QUESTION Group
2a	Identify the number of subatomic particles for tungsten-182
	Number of Protons [74] Number of Neutrons [108] Number of Electrons [74]

	<p>Mass Number [182]</p> <p>Atomic Number [74]</p>
2b	Identify the number of subatomic particles for gadolinium-152
	<p>Number of Protons [64]</p> <p>Number of Neutrons [88]</p> <p>Number of Electrons [64]</p> <p>Mass Number [152]</p> <p>Atomic Number [64]</p>
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<b>Unit 2_</b> <b>Question 3</b>	<b>Canvas Question Type:</b> Fill in Multiple Blanks QUESTION GROUP
3a	Identify the number of subatomic particles for ${}_{46}^{98}\text{X}$
	<p>Number of Protons [46]</p> <p>Number of Neutrons [52]</p> <p>Number of Electrons [46]</p> <p>Mass Number [98]</p> <p>Atomic Number [46]</p>
3b	Identify the number of subatomic particles for ${}_{53}^{110}\text{X}$
	<p>Number of Protons [53]</p> <p>Number of Neutrons [57]</p> <p>Number of Electrons [53]</p> <p>Mass Number [110]</p> <p>Atomic Number [53]</p>
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>

<b>Unit 2_ Question 4</b>	<b>Canvas Question Type:</b> Fill in Multiple Blanks QUESTION GROUP												
4a	Identify the number of subatomic particles for $^{115}_{55}\text{X}^{2+}$												
	Number of Protons [55] Number of Neutrons [60] Number of Electrons [53] Mass Number [115] Atomic Number [55]												
4b	Identify the number of subatomic particles for $^{76}_{35}\text{X}^{2-}$												
	Number of Protons [35] Number of Neutrons [41] Number of Electrons [37] Mass Number [76] Atomic Number [35]												
<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">Read More</a>	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>												
<b>Unit 2_ Question 5</b>	<b>Canvas Question Type:</b> Formula												
	What is the average atomic mass in amu for the following element Z <table border="1" data-bbox="310 1327 896 1528"> <thead> <tr> <th>Isotope</th> <th>Mass (amu)</th> <th>Percent Abundance</th> </tr> </thead> <tbody> <tr> <td><math>^{32}\text{Z}</math></td> <td>[massA]</td> <td>75.463</td> </tr> <tr> <td><math>^{33}\text{Z}</math></td> <td>[massb]</td> <td>18.108</td> </tr> <tr> <td><math>^{34}\text{Z}</math></td> <td>[massc]</td> <td>6.429</td> </tr> </tbody> </table>	Isotope	Mass (amu)	Percent Abundance	$^{32}\text{Z}$	[massA]	75.463	$^{33}\text{Z}$	[massb]	18.108	$^{34}\text{Z}$	[massc]	6.429
Isotope	Mass (amu)	Percent Abundance											
$^{32}\text{Z}$	[massA]	75.463											
$^{33}\text{Z}$	[massb]	18.108											
$^{34}\text{Z}$	[massc]	6.429											
	Answer: $\text{massA} \cdot 0.75463 + \text{massb} \cdot 0.18108 + \text{massc} \cdot 0.06429$  MassA: 31.9 to 32.1, four decimals massb: 32.9 to 33.1, four decimals massc: 33.9 to 34.1, four decimals												

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<b>Unit 2_ Question 6</b>	<b>Canvas Question Type:</b> Formula												
**	<p>What is the mass of isotope <math>^{64}\text{X}</math> if the average atomic mass of element X is [mass] amu?</p> <table border="1"> <thead> <tr> <th>Isotope</th> <th>Mass (amu)</th> <th>Percent Abundance</th> </tr> </thead> <tbody> <tr> <td><math>^{58}\text{X}</math></td> <td>[massA]</td> <td>38.032</td> </tr> <tr> <td><math>^{60}\text{X}</math></td> <td>[massb]</td> <td>36.890</td> </tr> <tr> <td><math>^{64}\text{X}</math></td> <td>????</td> <td>25.078</td> </tr> </tbody> </table>	Isotope	Mass (amu)	Percent Abundance	$^{58}\text{X}$	[massA]	38.032	$^{60}\text{X}$	[massb]	36.890	$^{64}\text{X}$	????	25.078
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$^{58}\text{X}$	[massA]	38.032											
$^{60}\text{X}$	[massb]	36.890											
$^{64}\text{X}$	????	25.078											
	<p>Answer: <math>(\text{mass} - \text{massA} * 0.38032 - \text{massb} * 0.36890) / 0.25078</math></p> <p>Mass: 60.1 to 60.3, four decimals  massA: 57.9 to 58.1, four decimals  massB: 59.9 to 60.1, four decimals</p>												
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>												
Video	<p>Youtube: <a href="https://youtu.be/GjKtfU6WCF8">https://youtu.be/GjKtfU6WCF8</a>  Gdrive: <a href="https://drive.google.com/file/d/1DZVFqv4bas7kjlNCtuQ9KgB2MgHIaR14/view?usp=sharing">https://drive.google.com/file/d/1DZVFqv4bas7kjlNCtuQ9KgB2MgHIaR14/view?usp=sharing</a></p>												
<b>Unit 2_ Question 7</b>	<b>Canvas Question Type:</b> Formula												
**	<p>An element with two stable isotopes <math>^{78}\text{X}</math>, 78.009 amu and <math>^{81}\text{X}</math>, 81.200 amu has an average atomic mass of [mass] amu. What is the percent abundance of <math>^{78}\text{X}</math>?</p>												
	Mass: 79 to 80, four decimals												
	$(\text{mass} - 81.200) / (78.009 - 81.200) * 100$												
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>												
Video	<p>Youtube: <a href="https://youtu.be/_OGWdqQB4GQ">https://youtu.be/_OGWdqQB4GQ</a>  Gdrive: <a href="https://drive.google.com/file/d/19t7zqVPD0TEdrwp23Zj-KaVtHCZU-1BK/view?usp=sharing">https://drive.google.com/file/d/19t7zqVPD0TEdrwp23Zj-KaVtHCZU-1BK/view?usp=sharing</a></p>												
<b>Unit 2_ Question 8</b>	<b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP												
8a	Which of the following are isotopes?												

	${}_{14}^{28}\text{X}$ ${}_{14}^{30}\text{Z}$ ${}_{16}^{30}\text{Y}$
	<p>Correct Answer: X and Z</p> <p>Wrong Answers: Z and Y X and Y</p>
8b	<p>Which of the following are isotopes?</p> ${}_{19}^{40}\text{X}$ ${}_{18}^{40}\text{Z}$ ${}_{19}^{41}\text{Y}$
	<p>Correct Answer: X and Y</p> <p>Wrong Answers: Z and Y X and Z</p>
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym">https://openstax.org/books/chemistry-2e/pages/2-3-atomic-structure-and-symbolism#CNX_Chem_02_03_AtomSym</a>
<p><i>Write formulas and names for elements, cations and anions, oxoacids; and ionic and covalent compounds</i></p>	
Unit 2 Question 9	<p><b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP</p>
9a	<p>What is the most likely ion for Sr?</p>
	<p>Correct answer: +2</p> <p>Wrong Answers: +1,+3, -1, -2, -3</p>
9b	<p>What is the most likely ion for Li?</p>
	<p>Correct Answer: +1</p> <p>Wrong Answers -1,+2,+3, -2,-3</p>
Unit 2 Question 10	<p><b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP</p>
10a	<p>What is the most likely ion for O?</p>
	<p>Correct answer: -2</p>

**Commented [KMA1]:** Question 9 and 10 are very googable, but this is an important skill and I can't think of a way to test it simply (it will also come up in nomenclature etc. so for the moment I am keeping these in. The students who don't google will benefit and the students who google will take the short cut and hurt themselves in the long run

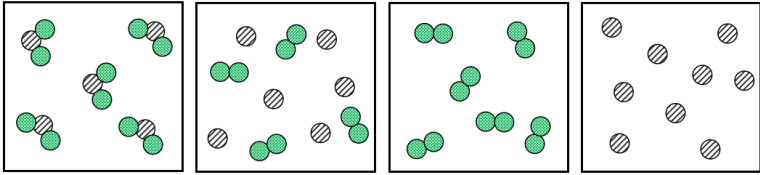
	Wrong Answer: -1, -3, +1, +2, +3
10a	What is the most likely ion for S?
	Correct answer: -2  Wrong Answer: -1, -3, +1, +2, +3
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-6-ionic-and-molecular-compounds#CNX_Chem_02_06_IonCharges">https://openstax.org/books/chemistry-2e/pages/2-6-ionic-and-molecular-compounds#CNX_Chem_02_06_IonCharges</a>
<b>Unit 2_</b> <b>Question 11</b>	<b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP
11a	A compound is formed between a nonmetal in Group 16 (Y) and a metal in Group 2 (X). What is the most likely formula for this compound?
	Correct Answer: XY  Wrong Answers: X <sub>2</sub> Y, Y <sub>2</sub> X, X <sub>2</sub> Y <sub>3</sub>
11b	A compound is formed between a nonmetal in Group 15 (Y) and a metal in Group 2 (X). What is the most likely formula for this compound?
	Correct Answer: X <sub>3</sub> Y <sub>2</sub>  Wrong Answers: X <sub>2</sub> Y, Y <sub>2</sub> X, X <sub>2</sub> Y <sub>3</sub>
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-6-ionic-and-molecular-compounds">https://openstax.org/books/chemistry-2e/pages/2-6-ionic-and-molecular-compounds</a>
<b>Unit 2_</b> <b>Question 12</b>	<b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP
12a	What is the formula for potassium sulfite?
	Correct Answer: K <sub>2</sub> SO <sub>3</sub>  Wrong Answer: KSO <sub>3</sub> , KSO <sub>4</sub> , K <sub>2</sub> SO <sub>4</sub> , KS, K <sub>2</sub> S
12b	What is the formula for calcium nitrite?
	Correct Answer Ca(NO <sub>2</sub> ) <sub>2</sub>  Wrong Answers: Ca <sub>3</sub> N <sub>2</sub> , CaN, CaNO <sub>2</sub> , CaNO <sub>3</sub>
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature</a>

**Commented [KMA2]:** Again, questions 12 -16 can be answered via google—but I don't see away around this so I blunder on

<b>Unit 2_</b> <b>Question 13</b>	<b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP
13a	What is the formula for Chromium (II) Oxide?
	Correct Answer: CrO Wrong Answers: Cr <sub>2</sub> O, CrO <sub>2</sub> , Cr <sub>2</sub> O <sub>2</sub>
13b	What is the formula for Scandium (III) Oxide?
	Correct Answer: Sc <sub>2</sub> O <sub>3</sub> Wrong Answers: ScO, Sc <sub>2</sub> O, ScO <sub>2</sub> , Sc <sub>3</sub> O
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature</a>
<b>Unit 2_</b> <b>Question 14</b>	<b>Canvas Question Type:</b> Multiple Choice QUESTION GROUP
14a	What is the formula for carbon tetrabromide?
	Correct Answer: CBr <sub>4</sub> Wrong Answers: CBr, C <sub>4</sub> Br <sub>4</sub> , CBr <sub>7</sub>
14b	What is the formula for sulfur trioxide?
	Correct Answer: SO <sub>3</sub> Wrong Answers: S <sub>3</sub> O <sub>2</sub> , S <sub>2</sub> O <sub>3</sub> , SO, S <sub>3</sub> O
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature</a>
<b>Unit 2_</b> <b>Question 15</b>	<b>Canvas Question Type:</b> Multiple Choice
	What is the correct name for NO <sub>2</sub>
	Correct Answer: Nitrogen Dioxide Wrong Answers: Nitrogen Oxide Nitrogen (II) Oxide Nitrogen (IV) Oxide
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature</a>

<b>Unit 2_</b> <b>Question 16</b>	<b>Canvas Question Type:</b> Multiple Choice
	What is the correct name for $\text{RbClO}_4$
	Correct Answer: Rubidium Perchlorate Wrong Answers: Rubidium (I) Perchlorate Rubidium Chlorine Oxide Rubidium Chloroxide
<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">Read More</a>	<a href="https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature">https://openstax.org/books/chemistry-2e/pages/2-7-chemical-nomenclature</a>
<b>Unit 2_</b> <b>Question 17</b>	<b>Canvas Question Type:</b> Multiple Answer
	Which of the following are compounds?
	Correct Answers: $\text{CH}_4$ $\text{BaClO}_3$ Wrong Answers: $\text{O}_2$ Mg
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<b>Unit 2_</b> <b>Question 18</b>	<b>Canvas Question Type:</b> Multiple Answer
	Which of the following are elements?
	Correct Answers: Al $\text{P}_4$ Wrong Answers: $\text{H}_2\text{O}$ $\text{CaCl}_2$
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<i>Distinguish elements from compounds, pure substances from mixtures, homogeneous from heterogeneous mixtures (solutions), and physical from chemical properties</i>	
<b>Unit 2_</b> <b>Question 19</b>	<b>Canvas Question Type:</b> Multiple DropDowns



	Identify each of the following as either a chemical change or a physical change
	The copper in the statue of liberty oxidizes to copper oxide and other minerals [dropone] After a heavy rain, the puddles of water will evaporate [droptwo] Cookie dough placed into a hot oven bakes [droptthree] Gasoline is burned in a car engine [dropfour]
	Dropone: chemical physical Droptwo: physical Chemical Droptthree: chemical Physical Dropfour: chemical Physical
Read More	<a href="https://openstax.org/books/chemistry-2e/pages/1-3-physical-and-chemical-properties">https://openstax.org/books/chemistry-2e/pages/1-3-physical-and-chemical-properties</a>
<b>Unit 2_</b> <b>Question 20</b>	<b>Canvas Question Type:</b> Multiple DropDowns
	Correctly identify each of the following as a compound, mixture, or element  <p style="text-align: center;"><b>A</b>                      <b>B</b>                      <b>C</b>                      <b>D</b></p> <p>ALT TEXT: The figure shows four scenarios. Scenario A has molecules made of two types of atoms. Scenario B has molecules made from two of the same atom and also individual atoms of another type. Scenario C has only molecules made from two of the same atom. Scenario D has only individual atoms all of the same type.</p> <p>A: [dropone] B: [droptwo] C: [droptthree] D: [dropfour]</p>

	Dropone: compound Mixture, element
	Droptwo: mixture Compound, element
	Droptthree: element Compound, mixture
	Dropfour: element Compound, mixture