

Vocabulary review document:

As per your quiz reflection, start with the page you need the most review on...

Unit 1: Matter

Fill in the blanks using the word bank below.

- Physical combination of two or more elements where the ratios can vary is defined as a(n) Mixture.
- Simplest form of matter is defined as a(n) atom element.
- Chemical combination of two or more elements in a fixed ratio is defined as Compound.
- Heterogeneous mixtures have visibly different parts like soil.
- Homogeneous mixtures look the same throughout and have no visible particles like kool-aid.
- Examples of intermolecular force(s) are hydrogen bonding, dipole dipole and Van der Waals forces.
It is defined as attractions between molecules.
- The Kinetic molecular theory states that gas particles are separated by large distances, take up no space, have no attractive forces between them and when they collide they lose no energy.
- When gas particles collide with the sides of the container this creates Pressure. When (same word as previous blank) pressure increases the volume (or space something takes up) will decrease. This is an inverse proportion.
- When the average kinetic energy (or temperature) of molecules increases, the pressure will increase. This is an direct proportion.
- The values of 101.3 kPa and 273K are known as STP and are found on table A (you need to find this on your table, not in bank at bottom).
- When ideal gases bump into one another and don't lose energy this is called an elastic collision.
- Kinetic Energy is known as the energy of motion.
- The Combined gas law can be used to find an unknown value given pressure, temperature and volume values for ideal gases. This FORMULA can be found on table T (you need to find this on your table, not in bank at bottom).
- Although ideal gases don't really exist, Real (gas) gases act ideal when they have a low mass, high temperature and low pressure.

Word Bank

~~Elastic collision~~

~~Intermolecular force~~

~~heterogeneous Kinetic molecular theory~~

~~Pressure~~

~~Temperature~~

~~Increase~~

~~Decrease~~

~~Real gas STP~~

~~mixture~~

~~Combined gas law~~

~~space something takes up~~

~~Homogeneous~~

~~Direct~~

~~Inverse~~

~~Kinetic energy~~

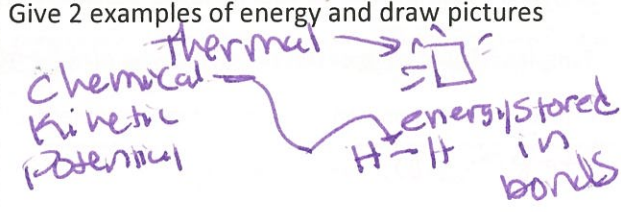
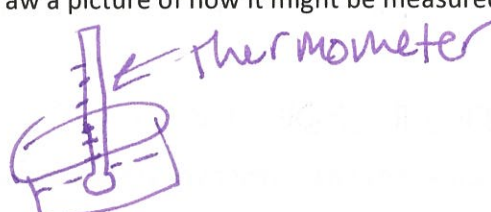
~~Real gas~~


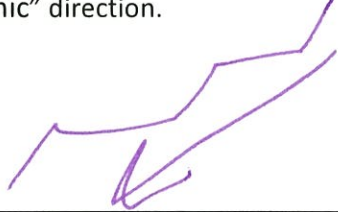
~~element~~

~~Compound~~

Unit 2: Energy

Complete the table below for each vocabulary word. There has been research that shows the more ways you look at a definition (including creation of pictures) the better you will remember and understand them ☺. (note that p.20 of your notes packet for this unit should have correct definitions on it).

Word	Definition (in your own words)	Picture/ task (do what's described)
Energy	ability to do work - comes in many forms	Give 2 examples of energy and draw pictures 
Temperature	a measure of average kinetic energy	Draw a picture of how it might be measured 
Law of conservation of energy	Energy can't be created or destroyed	Draw a picture
Freezing	when a substance goes from a liquid to solid	Draw a picture
Melting	when a substance goes from a solid to a liquid	Draw a picture
Evaporation	when a substance goes from liquid to gas like boiling & vaporization	Draw a picture

Condensation	when a substance goes from a gas to liquid	Draw a picture
Sublimation	when a substance goes from solid to liquid gas	Draw a picture
Deposition	When a substance goes from gas to solid	Draw a picture
Endothermic	when energy is put <u>in</u>	Draw a heating curve with an arrow pointing in the "endothermic" direction. 
Exothermic	when energy is released	Draw a heating curve with an arrow pointing in the "exothermic" direction. 
Heat of vaporization	amount of heat required to vaporize a substance (or condense)	Find the formula that this is in and give the value for water... $Q = m H_v$ $H_v \text{ water} = 2260 \text{ J/g}$
Heat of fusion	amount of heat required to melt or freeze a substance.	Find the formula that this is in and give the value for water... $Q = m H_f$ $H_f \text{ water} = 334 \text{ J/g}$

atom:	ion:	atomic mass:	atomic mass unit:	atomic number:	mass number:
isotope:	nucleus:	electron:	proton:	neutron:	subatomic particles:
atomic mass unit:	nuclear charge:	orbital:	valence electrons:	energy level	
ground state:	excited state:	electron configuration:	line spectrum:	wave-mechanical model:	

Unit 3: The Atom: Match the vocabulary word from the word bank above (and on next page) and draw a picture for each definition in table below for each vocabulary word. There has been research that shows the more ways you look at a definition (including creation of pictures) the better you will remember and understand them☺. (note that the front of your notes might be useful to help you know the definition).

Vocab word from below	Definition	Draw a Picture (OR do what's described)
<i>atomic mass unit</i>	$\frac{1}{12}$ the mass of a carbon-12 atom	
<i>atomic #</i>	the number of protons atoms of a particular element have	
<i>ion</i>	a charged particle that results when an atom gains or loses one or more electrons. Losing electrons produces an ion with a positive charge; gaining electrons results in an ion with a negative charge.	
<i>atomic mass</i>	the (weighted) average mass of all the isotopes of a particular element	
<i>nucleus</i>	extremely dense center of an atom; contains the atom's protons and neutrons. Positively charged due to presence of protons in it.	
<i>atom</i>	the smallest amount of an element that can enter into a chemical reaction. Or, the smallest amount of an element that retains the properties of the element.	
<i>wave mechanical model</i>	the modern model of the atom, in which the nucleus is a dense positively charged center of the atom, surrounded by electrons found in <u>orbitals</u> of particular energy. Electrons are viewed as having properties of both particles and waves.	
<i>excited state</i>	the state of an atom when at least one electron has absorbed energy and moved to a higher energy orbital. An unstable condition.	
<i>ground state</i>	the state of an atom when all electrons are occupying orbitals with the lowest possible energy.	
<i>nuclear charge</i>	the charge on the nucleus of an atom due to the presence of positively charged protons within the nucleus. The nuclear charge is equal to the number of protons in the nucleus. So, the nuclear charge is equal to the atomic number.	

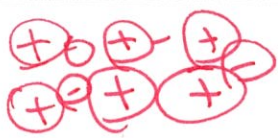
mass #	total number of protons and neutrons in an atom. To find it, take the element's atomic mass (from periodic table) and round it to the nearest whole number. In isotopic notation (for example $^{14}_6\text{C}$) the upper number is the mass number and the lower is the atomic number.	
Subatomic particles	particles that are smaller than atoms and found within atoms. Include protons, neutrons, electrons, and many other smaller particles.	
isotopes	two atoms are isotopes of the same element if they contain the same number of protons but different numbers of neutrons.	
atomic mass unit	the mass assigned to a proton or a neutron is 1 atomic mass unit, or 1u.	
electrons	one of three major types of particles that make up atoms. Has a -1 charge and a very small mass compared to protons and neutrons. (It takes 1836 of them to equal the mass of one proton or neutron.) Located outside the atoms' nucleus.	
protons	one of three major types of particles that make up atoms. Has a +1 charge, mass of 1 amu. Present in an atoms' nucleus	
neutron	one of three major types of particles that make up atoms. Has no charge, mass of 1 amu. Present in an atoms' nucleus.	
orbital	a region outside the nucleus of an atom where an electron with a particular amount of energy is likely to be located.	
valence electrons	electrons in the outermost occupied energy level (farthest from the nucleus)	
energy level	regions of space surrounding the nucleus; each is composed of 1 or more orbitals. The farther from the nucleus the energy level is, the more energy the electrons in it must have.	
line spectrum	also known as an <u>emission spectrum</u> , a line spectrum shows a few individual colored lines, separated by blank spaces. Created when electrons move from a higher energy state to a lower one.	
electron configuration	a way of showing the distribution of electrons in the atom's energy levels and orbitals.	

atom:	ion:	atomic mass:	atomic mass unit:	atomic number:	mass number:
isotope:	nucleus:	electron:	proton:	neutron:	subatomic particles:
atomic mass unit:		nuclear charge:	orbital:	valence electrons:	energy level
ground state:	excited state:	electron configuration:	line spectrum:	wave-mechanical model:	

Unit 4: The Periodic table: Find the vocabulary term in the question and circle it. Define the term then answer the question.

Question (circle vocab word)	Definition of vocab word	Answer to question.
1. Which list of elements consists of <u>metalloids</u> , only? 1) B, Al, Ga 3) O, S, Se 2) C, N, P 4) Si, Ge, As	<u>elements</u> w/ properties of metal & non-metal, found on stair case of per. table	4
2. At STP, which element is solid, <u>brittle</u> , and a <u>poor conductor</u> of electricity? 1) Al 2) Ne 3) K 4) S ← <u>solid</u> ← <u>gas</u>	<u>Non-metals</u> have poor conductivity & are brittle	4
3. Which elements are malleable and <u>good conductors</u> of electricity? 1) iodine and silver 2) tin and silver 3) iodine and xenon 4) tin and xenon	<u>metals</u> are able to be flattened (malleable) & are good conductors	2
4. On the modern Periodic Table, the elements are arranged in order of increasing 1) atomic mass 2) mass number 3) <u>atomic number</u> 4) oxidation number	→ # of protons = atomic #	3
5. Which list of elements contains a metal, a metalloid, a nonmetal, and a noble gas? 1) Be, Si, Cl, Kr 3) K, Fe, B, F 2) C, N, Ne, Ar 4) Na, Zn, As, Sb	left side metalloid - staircase non-metal - R side of group 10	1
6. At STP, which list of elements contains a <u>solid</u> , a <u>liquid</u> , and a <u>gas</u> ? 1) Hf, Hg, He 3) Ba, Br ₂ , B 2) Cr, Cl ₂ , C 4) Se, Sn, Sr	2 liquids = Hg & Br	1
7. Which element is an <u>alkali metal</u> ? 1) hydrogen 3) sodium 2) calcium 4) zinc	group 1	3
8. Which element exists as a <u>diatomic</u> molecule at STP? 1) bromine 3) sulfur 2) argon 4) rubidium	always 2 in compound 7 H Cl O ₂ or H O B F I N C ₂	1
9. Which group is known as the <u>halogens</u> ? 1) 1 3) 17 2) 2 4) 18	group 17	3
10. An element with multiple positive oxidation states in the ground state is classified as 1) a halogen 3) an alkali metal 2) <u>a transition metal</u> 4) an alkaline earth metal	center (groups 3-12) of periodic table	2
An aqueous solution of XCl ₂ contains colored ions. Element X could be 1) Ba 3) Ni 2) Ca 4) Bi	only w/ transition metals	3

Unit #5 Chemical Bonding Vocabulary –Match the vocabulary word from the word bank next page (and on next page) and draw a picture for each definition in table below for each vocabulary word.

Word	Definition	Picture
1. <i>Metallic</i>	Type of bond characterized by mobile electrons floating in a sea of positive ions	
2. <i>dipole-dipole</i>	Type of Intermolecular force characterized by two oppositely charged ends of polar molecules attracting each other.	
3. <i>ionic</i>	Type of bond that involves a transfer of one or more electrons.	
4. <i>non-polar bond</i>	This type of bond occurs when the electronegativity difference between the two atoms is basically zero (0.0 – 0.4)	
5. <i>ionic character</i>	This is a measure of how ionic a substance is. Ionic substances normally have big differences in electronegativities (>1.7)	
6. <i>hydrogen bond</i>	A dipole force that occurs between a hydrogen on one polar molecule and either a F, O, or N on another polar molecule.	
7. <i>electronegativity</i>	The attraction an atom has for electrons in a chemical bond.	
8. <i>Van-der Waals</i>	An intermolecular force that occurs when temporary dipoles are formed on nonpolar molecules.	
9. <i>non-polar molecule</i>	A symmetrical molecule	
10. <i>molecular solid</i>	A type of solid which is held together by weak intermolecular forces and are characterized by having low melting points.	
11. <i>ion-dipole</i>	The attraction force that occurs between a polar molecule (usually water) and an ionic compound.	

12. <i>Covalent bond</i>	Type of bond involved in a sharing of electrons between nonmetal atoms.	
13. <i>Polar covalent bond</i>	Type of bond that has unequal sharing of electrons between two nonmetal atoms.	
14. <i>Polar molecule</i>	Characterized by an uneven distribution of electrons in the molecule.	
15. <i>Network solid</i>	Very hard solids that have high melting points, such as diamonds and SiO_2 .	

Ionic Bond	Covalent Bond	Polar Covalent Bond	Nonpolar Covalent Bond	Metallic Bond
Electronegativity	Ionic Character	Polar Molecule	Nonpolar Molecule	Network Solid
Molecular Solid	Hydrogen Bonding	Dipole-Dipole Force	Van der Waals Force (Dispersion)	Ion-dipole force

Unit 6A: math of chemistry

Complete the table below for each vocabulary word. There has been research that shows the more ways you look at a definition (including creation of pictures) the better you will remember and understand them 😊. (note that the front of your packet has definitions)

Word	Definition (in your own words)	Picture/ task (do what's described)
subscript	small # below chemical formula	Draw a picture
coefficient	# used to balance chemical eqns in front of formula	Draw a picture
reactant	left side of equation chemicals	Draw a picture
product	right side of eqn	Draw a picture
synthesis	when 2 things (reactants) come together to form 1	Draw a picture
decomposition	when 1 reactant becomes 2 or more products	Draw a picture
combustion	when a hydrocarbon & O_2 react to form CO_2 & H_2O	Draw a picture
single replacement reaction	when an element & compound are reactants & the element replaces part of the compound.	Draw a picture
double replacement reaction	when 2 compounds are reactants & the metals switch places to form 2 compound products	Draw a picture

empirical formula	lowest ratio of elements in formula	Draw a picture
molecular formula	all elements rep. in a formula	Draw a picture
mole	6.02×10^{23} of something	Draw a picture
formula mass	mass of all parts of a formula w/ unit "u"	Draw a picture
gram formula mass	mass of all parts of formula w/ unit "g/mol"	Draw a picture
percent composition	how much of something is in the total	Give a formula
hydrate	solid compound w/ water	Give a formula example $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
Converting between grams and moles	gram formula mass & what do you need? one of other 2 parts of formula	Give a formula