

GRADE 9 COURSE REVIEW

This review package is usually handed out to prepare for the final written exam.

However, this year this course DOES NOT HAVE A FINAL EXAM.

These are important concepts and vocabulary. Test yourself by trying out the work without notes, and then use your class notes or our Google Classroom to find the rest of the information you need. If you complete this, I will award you a mark out of 40 (10 marks for each section). Completing this package will help you prepare for grade 10 science.

PRACTICE – Chemistry

1. Describe the similarities and/or differences between each pair of terms. Give an example for each.

a. element, compound

b. atom, molecule

c. mixtures and pure substances

2. Define physical and chemical properties. Give examples of each.

3. Vinegar is a compound. The chemical formula for vinegar is $\text{H}_4\text{C}_2\text{O}_2$

Type of elements present	Number of atoms of each element

4. Describe the physical and chemical properties of vinegar. Compare the properties of vinegar to the properties of carbon and oxygen. Why are their properties different?

5. Describe 3 physical properties of:

a) metals-

b) non-metals-

c) metalloids-

6. Classify each of the following as either an element or a compound:

a) Hydrogen _____

b) Sugar ($\text{C}_6\text{H}_{12}\text{O}_6$) _____

c) Zinc Chloride _____

d) Water _____

e) Iron _____

7. Complete the chart:

Chemical Formula	Elements Present	Number of Each Type of Element
CH_4		

NaHCO_3		
Mg(OH)_2		

8. **Quiz a partner on the names and symbols of elements 1-20 and Fe, Zn, Pb, Au, Ag, Ni, Co, Br, I, Hg, Kr, Cu**

9. **Groups on the periodic table: (pg. 193-194)**

- where are the noble gases found on the periodic table? _____
- where are the alkali metals found on the periodic table? _____
- where are the halogens found on the periodic table? _____
- give an example of an alkaline earth metal: _____
- describe the reactivity of the following groups of elements:
 - noble gases (reactive or non-reactive) ? why: _____
 - alkali metals (reactive or non-reactive) ? why: _____
 - halogens (reactive or non-reactive) ? why: _____

10. **Match the family name to the list of elements that belong in that family.**

Alkali metals	He, Ne, Ar, Kr
Noble Gases	F, Cl, Br, I
Halogens	Be, Mg, Ca, Sr
Alkaline Earth Metals	Li, Na, K, Rb

11. **Circle the correct answers:**

- The number of valence electrons increases by one as you move (**across a period** OR **down a group**).
- The number of electron shells increases by one as you move (**across a period** OR **down a group**).
- The number of valence electrons in an atom is the same as its (**period #** OR **group #**).
- The number of electron shells in an atom is the same as the (**period #** OR **group #**).
- Reactivity increases as you move (**up a group** OR **down a group**).

12. **Draw Bohr-Rutherford Diagrams for the following ATOMS: (pg 196 – 199)**

a) K



b) N



c) Ar



13. Complete the following chart. Use your periodic table to help you.

Symbol	Element name	Atomic number	Atomic mass	# of protons	# of neutrons	# of electrons	Solid, liquid or gas	Metal, Nonmetal Metalloid
K								
			9					
	sulfur							
		35						
				8				

14. Why do elements lose or gain electrons? How do you determine how many they will gain or lose?

15. What is an isotope? Provide an example of an isotope.

16. Complete the following table:

Element	Number of Valence Electrons	Easier to gain or lose electrons?	Ionic Charge	Bohr-Rutherford Diagram of Ion
Lithium				
Nitrogen				
Chlorine				

17. Write the standard atomic notation for the following isotopes:

a) carbon -14

b) bromine – 81

c) nitrogen -17

d) platinum – 169



PRACTICE - Electricity

Static Electricity

1.
 - a. Objects with more electrons than protons have a _____ charge.
 - b. Objects with more protons than electrons have a _____ charge.
 - c. Objects with equal numbers of protons and electrons have a _____ charge.
2. **State the Law of electric charges:**
 - 1.
 - 2.
 - 3.

5. **Complete the following chart:**

Method of creating a charge	Definition	Charge obtained by a neutral object
Charging by Friction		
Charging by Contact		
Charging by Induction		

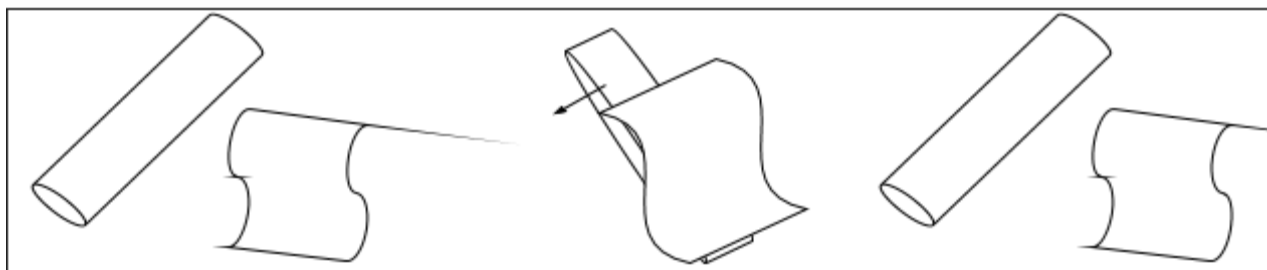
4. **The electrostatic series is a list that can be used to determine the type of charge produced when two objects are rubbed together. Explain how it works.**

acetate	weak hold on electrons
glass	
wool	
cat's fur/human hair	
calcium, magnesium, lead	
silk	
aluminum, zinc	
cotton	
paraffin wax	
ebonite	
plastic	
carbon, copper, nickel	
rubber	
sulfur	
platinum, gold	strong hold on electrons

5. Distinguish between the following terms:

- insulator , conductor
- static electricity, current electricity

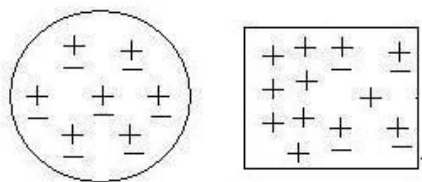
6. Show how an acetate rod and a piece of fur become charged by friction. Show the movement of the electrons.



- Neutral acetate rod and piece of fur.
- By rubbing them together, you cause electrons to move from the _____ to the _____.
- Separate the two objects
The rod has become _____ and the fur has become _____

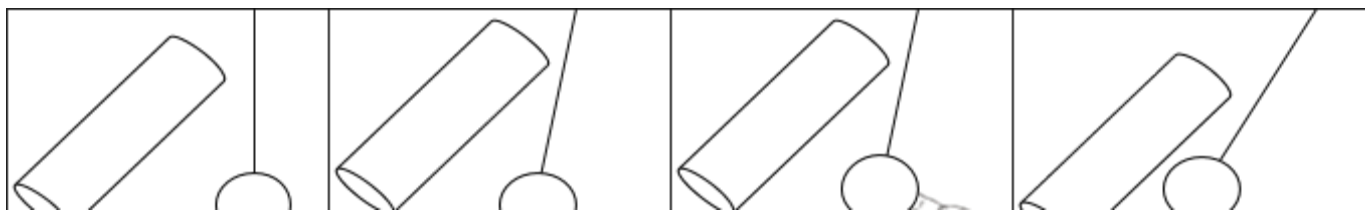
7. a. What is the initial charge is on the ball? What is the initial charge is on the square?

- b. Would they attract or repel each other?



- c. Redraw the ball and square after they have touched. Will they attract or repel each other?

8. Show how a negative ebonite rod charges a pith ball by induction. Show the movement of the electrons.



a)

b)

c)

d)

Current Electricity

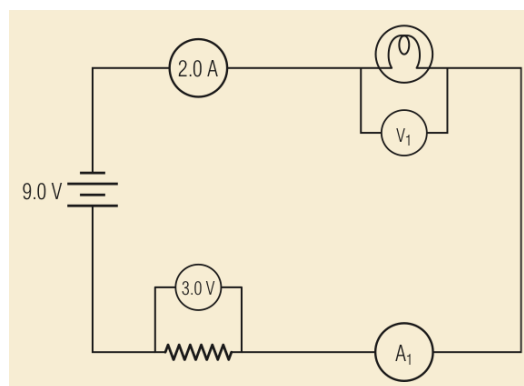
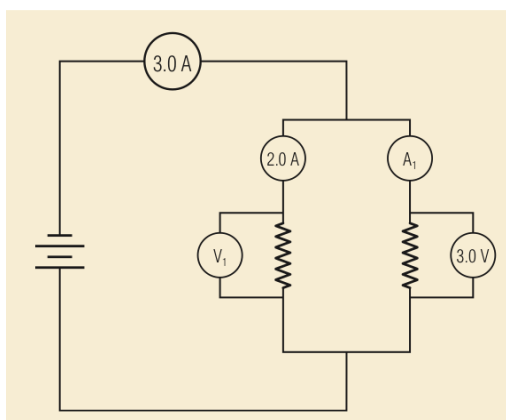
1. Define the following terms and state the proper unit used to measure each quantity.

- potential difference (voltage)
- electric current
- resistance

2. Complete the following chart:

Characteristics	Series circuit	Parallel Circuit
Number of paths in the circuit for the electrons to flow through		
Multiple loads . . . Ammeter reading at different places in the circuit		
Multiple loads . . . Voltmeter reading across the source compared to across the loads		
As more loads are added: The total current in the circuit will		
As more loads are added: Compare the brightness of the bulbs in the circuit		
In the complete circuit, what is the effect of removing one of the bulbs		

3. What is the voltage at V1 and the current at A1 in the circuits below?



V1 = _____

V1 = _____

A1 = _____

A1 = _____

Problems:

Review the formula for calculating Resistance Problems. $R=V/I$

7. If the voltage is 10 V and the current is 5 A of an electrical device, what is the resistance?

Given:
Required:

Analysis:**Substitution:
& Solution:****Statement:**

8. What is the current drawn from a vacuum cleaner from a 120 V circuit having a resistance of 28 Ω ?

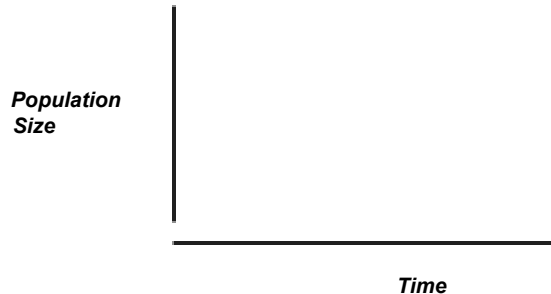
Given:
Required:

Analysis:**Substitution:
& Solution:****Statement****PRACTICE - Ecology**

1. What is sustainability? Examine the following list of terms. Identify each as a sustainable or unsustainable process and explain your choice. (pg 8 – 9)
 - a. Using chemicals such as pesticides like atrazine or BPA
 - b. Recycling
 - c. Solar powered electricity generation

d. Nuclear power generation

2. Draw a graph that represents how most natural populations grow. In your own words, describe what is happening at each stage.



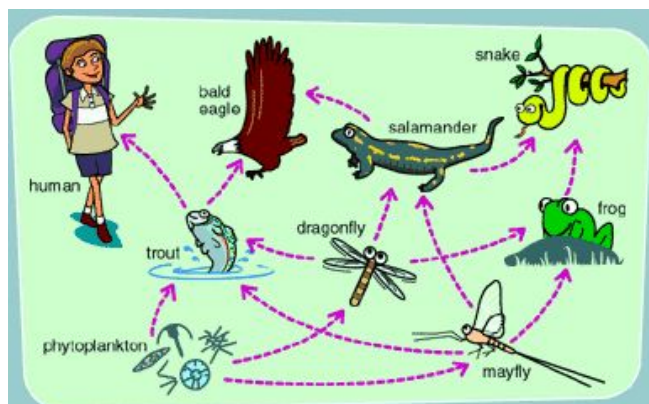
- b) Label the carrying capacity of the population. What does carrying capacity mean?
- c) Describe what would happen if the population exceeded the carrying capacity of the environment. Use the words natality, mortality, immigration and emigration.
- d) List 2 natural (not caused by humans) abiotic factors and 2 biotic factors that would impact the size of the population.
6. Provide one similarity and one difference between a mutualistic and a commensalistic relationship.
7. Provide one similarity and one difference between a predator-prey relationship and a parasitic relationship.
8. If an invasive species was introduced into a new ecosystem, what kind of relationship might exist between the invasive species and the native species?

9. **Fill in the blanks with one of the following terms:**

Biosphere, Lithosphere, Hydrosphere, Atmosphere, Community, Ecosystem, Population, Individual

- a) All of the brook trout in a stream is an example of _____.
- b) A lake _____ includes all living and non living components in the lake.
- c) All of the living organisms in a forest is an example of _____.
- d) This region on earth would contain marine ecosystems. _____.
- e) The region on earth where all life exists is called _____.
- f) All the grizzly bears living in Yellowstone park are an example of a _____.

10. Refer to the diagram below.



- Give an example of a producer.
- Give an example of a food chain (from the diagram) with three feeding levels.
- Identify an organism that is a predator of frogs. _____
- Identify an organism that is in competition with humans. _____

11. Answer the following questions about energy transfer.

- The energy that all living things use comes from the _____.
- The organisms that have direct access to energy from the sun are the _____.
- List three things for which organisms require energy:
- Only about _____ percent of the energy at one level at a food chain is available for use by the next feeding level.
- The energy in an ecosystem that isn't used by organisms is _____.

11. Complete the following chart:

	<i>Photosynthesis</i>	<i>Respiration</i>
Starting Materials		
What is produced?		
What group(s) of <i>organisms</i> perform the process?		

<i>What is the purpose of the process?</i>		
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12. Answer the following questions based on your knowledge of the carbon cycle.

a) Describe two ways that humans affect the natural carbon cycle.

b) Match the following terms to the correct descriptions:

- | | | | |
|------------------|---------------|--------------|----------------------|
| A. decay | B. combustion | C. diffusion | D. photosynthesis |
| E. respiration | F. erosion | G. burial | H. volcanic eruption |
| I. sedimentation | J. food chain | | |

_____ The process by which fossil fuels are burned.

_____ The process that exchanges carbon between the hydrosphere and the atmosphere.

_____ A natural release of large quantities of carbon dioxide from the lithosphere into the atmosphere.

_____ The process by which plants obtain carbon dioxide from the atmosphere.

_____ The process that transfers carbon through different feeding levels in the biosphere.

_____ When dead organisms break down to release their nutrients into the environment.

_____ The process that compacts calcium carbonate in the shells of marine organisms forming sedimentary rock.

_____ The process caused by weathering that releases carbon from the lithosphere and washing into the hydrosphere.

_____ The process by which all living things break down their food to get energy.

c) Draw a diagram of the carbon cycle that includes the following processes (photosynthesis, respiration, decomposition, food chains, combustion.) Label your diagram.

PRACTICE - Astronomy

1. Define Astronomical Unit and explain when this unit is used in measurements.

2. Define Light Year and explain when this unit is used in measurements.

3. List the planets in order from closest to farthest from the Sun. (Remember: My Very Excited Mother Just Served Us Nachos)! Provide at least 2 unique features for each planet.

4. List the inner planets and the common properties they share.

5. List the outer planets and the common properties they share.
7. Determine if the statements below are true (T) or false (F).
1. _____ During a solar eclipse the Earth is between the moon and the Sun.
 2. _____ A solar eclipse lasts for a long time.
 3. _____ A lunar eclipse can be viewed from more locations on Earth than a solar eclipse.
 4. _____ The entire Earth can be covered by the shadow of the moon.
 5. _____ During a solar eclipse part of the Earth is in the moon's shadow.
 6. _____ A solar eclipse can be seen at night.
 7. _____ A lunar eclipse occurs when the moon is in the first quarter moon position.
8. Describe two pieces of evidence that support the Big Bang Theory (from attached video in posting)
9. Complete the following table about low mass, intermediate mass and high mass stars.

	Lifetime	When it runs out of fuel it becomes...
Low Mass Stars		
High Mass Stars		

10. Order the colours of stars from coolest to hottest: red, blue-white, yellow, orange, blue