Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_

**Semester 1 Study Guide 2019-20**: Students should review all concepts by completing this activity. and prepare

one sheet of notes (front only) to be used on the test. These note sheets are worth 5 points of extra credit on the

semester test and must be **handwritten**.

**Nature of Science Unit: Chapter 1 Nature of Science and Microscopes (p. 2-31 and A-1 through A-17)**

**Vocabulary Terms:**

\*experiment \*hypothesis \*scientific theory, law \*data
\*Independent variable/Manipulated variable \*conclusion
\*dependent variable/responding variable \*control variables/Constants

*Fill in the blank using the vocabulary terms.*
1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– proposed answer to the question; written as an **"if…., then….."** statement.
2. Plan a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– test of the hypothesis
3. Record and analyze \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– collected facts
4. State a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– final statement summing up the results

5. In an experiment, you want to test only 1 condition that varies/changes. This is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable.6. A factor that does NOT change and is consistent in the experiment is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable.

7. The variable the YOU change is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.
8. The variable that changes in response to what you have done is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.

**Practice Problems**An experiment is conducted to determine the effects of alcohol on an individual's driving ability. Groups A & B
have been matched for all factors such as age and sex. Each person in Group A is given the amount of flavorless
alcohol in soda pop needed to raise the blood alcohol level to 0.08%. Each person in Group B is given the same
quantity of soda pop to drink. Each person in Groups A and B is given a driving test. The test results are recorded.

9. Is this a controlled or uncontrolled experiment? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. What is the independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. What is the dependent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. What is the hypothesis being tested? **If \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, **then\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

13. What are the constants/control variables in this experimental setup? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

An experiment is conducted to determine the effect of classical music on the growth rate of marigolds. Two groups of
plants are grown from seed in identical soil types, exposed to identical light conditions, and given the same nutrients.
Group A is in a quiet atmosphere. The plants in Group B are provided with the same atmosphere except that classical
music is played for 12 hours daily. The scientist measures the plants in both groups each day and records the results.

14. Is this a controlled or uncontrolled experiment? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
15. What is the independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
16. What is the dependent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
17. What is the hypothesis being tested? **If \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ then\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

18. What are the constants/control variables in this experimental setup? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Microscopes**

19. How does the field of view change when magnification is increased?

20. To look at a specimen through the microscope, what objective and adjuster should you start with?

1. If the eyepiece has a magnification of 10X, and the objective you are looking through has a magnification of 10X, then the **total** magnification is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Ecology Unit– Chapters 3-5 (p.61-151)**

**Chapter 3: The Biosphere**

**Vocabulary Terms:**
\*Ecology \*biotic
\*species \*abiotic
\*populations \*primary producers
\*community \*Consumers
\*ecosystem \*herbivore
\*biome \*carnivore
\*biosphere \*scavenger
\*heterotroph \*omnivore
\*autotroph \*detritivore
\*photosynthetic \*decomposer
\*chemosynthetic \*biological components of carbon, nitrogen, phosphorus cycles
\*energy pyramid and 10% rule

1. What is the level of organization of the biosphere (entire planet)? Put in order
populations, community, species, biome, ecosystem, Species.

PRACTICE Energy in Ecosystems—REMEMBER the arrows point from the item being eaten to the eater.



23. Name a species that is a producer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

24. Name a species that is a primary consumer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Secondary consumers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tertiary Consumers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
25. Name a species that is a heterotroph? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Autotroph? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26. Name a species that is an omnivore? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Herbivore? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Carnivore? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

27. If 100% energy is available from producers, how much will be available for second level consumers?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Third level? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What happens to the energy that is not used for the next trophic level (given off as what)?

**Chapter 4: Ecosystems and Communities**

**Vocabulary Terms:**\*niche \*predator-prey relationships
\*habitat \*herbivore-plant relationship
\*tolerance \*symbiosis – mutualism, commensalism, and parasitism
\*competitive exclusion principle \*primary succession
\*keystone species \*secondary succession
\*biomes

*Use the vocabulary terms to fill in the blank.*

28. A bee pollinating a plant is an example of a relationship where both benefit-
29. A relationship where one organism is helped and the other is neither helped nor hurt is called
30. The relationship between a tick and its host is an example of .
31. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_states that only one organism can occupy a specific niche at one time.

32. Volcanic activity would result in succession; a wildfire would result in succession.

33. How does added nutrients affect the growth of algae and other species?

34. Why is nitrogen a limiting nutrient, when it is present in large concentrations in the air?

**Chapter 5: How Populations Grow**

**Vocabulary Terms:**

\*exponential growth \*carrying capacity \*emigration
\*logistic growth \*Limiting factors \*immigration
\*Niche \*density-dependent limiting factors \*keystone species
\*death rate \*density-independent limiting factors \*population density

35. The number of individuals of a single species per unit area is known as
36. The area inhabited by a population and the species food source is its
37. A species that reaches its carrying capacity such as deer are categorized by this type of growth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. An organism that maintains biodiversity of the area and keeps populations in check, for example and sea otter \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

39. Review the basic ways humans interact with our environment. Define a problem caused by human population growth (remember the Human Impact Project)?

**Biochemistry Unit: Chapter 2 Chemistry (p.32-59 and A-24)**

**Vocabulary Terms:**
\*atom \*atomic mass \*carbohydrates
\*proton \*Bohr model \*proteins
\*electron \*Lewis dot structure \*lipids
\*neutron \*covalent bonding \*nucleic acids
\*isotope \*ionic bonding \*Carbon
\*atomic number \*active cite

*Use the vocabulary terms to fill in the blanks.*

40. Where does the enzyme bind to the substrate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
41. A pure substance made of one type of atom is called a .
42. If an atom has an atomic number of 10, It has 10 protons. How many electrons does it have?
43. Carbon 12, Carbon-13, and carbon-14 all have the same number of \_\_\_ in the nucleus but different numbers of . They are called .

44. Define Compound-

45. A bond between ions that are opposite and attracted to one another \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

46. A bond that occurs when electrons are shared is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

47. What element is found in all organic compounds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| http://duch.sd57.bc.ca/%7Ermcleod/Chemists_Corner/Bohr_Chalco_Ion_files/Oxygen.jpg48. Draw your own Bohr model of - Aluminum – look up atomic number | 49. Show bonding of one sodium (Na) and 1 Chlorine (Cl)\*use Lewis dot structuresType of bond- |

**Polarity of water**50. Explain why water has physical properties such as adhesion and cohesion.

51. Why is water such a fantastic solvent?

52. In a solution, if water is the solvent, sodium chloride, or salt is the .

53.Draw a pH scale- label where H+ ions increase and OH- increase- label acids, bases, and neutral

54. Your stomach has a lot of HCL which dissociates into H+ and Cl-, increasing the H+ ions. Would the pH be closer to 3 or 10?

55. The smallest unit of an organism that can be considered alive is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fill in table.  | 56. Carbohydrates | 57. Proteins | 58. Lipids | 59. Nucleic Acids |
| Foods where molecules are found? |  |  |  |  |
| What is their function? |  |  |  |  |

**Chapter 7: Cell Structure and Function (p.188-223)
Vocabulary Terms:**\*ribosomes \*endoplasmic reticulum \*cytoskeleton \*diffusion \*prokaryotic \*Golgi apparatus \*centrioles \*osmosis \*eukaryotic \*chloroplasts \*chromosomes \*cell membrane
\*nucleus \*mitochondria \*lipid bilayer \*cell wall \*vacuoles \*lysosomes \*hypotonic \*passive transport \*isotonic \*active transport \*hypertonic \*DNA

*Use the vocabulary terms to fill in the blanks.*

60. This organelle is the “powerhouse” of the cell and is where cellular respiration occurs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
61. Regulates materials entering and leaving the cell; protects and supports cell
62. In eukaryotic cells, chromosomes carrying genetic information are found in the

63. The movement of water molecules across a semipermeable membrane is called
64. A plant cell is different from an animal cell because it has this organelle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

65. These types of cells do not store their genetic material in a nucleus and are single-celled \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
66. Transport requiring energy is called ; whereas, transport not requiring energy is called
67. If you placed your red blood cells in a \_\_\_\_\_\_\_\_\_\_\_ solution they would increase in volume.
68. If you placed your red blood cells in a \_\_\_\_\_\_\_\_\_\_\_ solution they would decrease in volume.

***For the test, three of these questions will be present. Complete all of them in preparation.***

*Modeling- create a diagram that is representative of the natural phenomenon.*

1. Draw a model of a water molecule and in the model include at least one property of water (one natural phenomenon of water).

2. Draw a model that shows the structure and function of a cell membrane.

*Constructed Response - Your answer should be in paragraph form and diagrams can be added to aid your answer.*

3. What are the optimal conditions for enzyme activity. Write a claim, with supporting evidence and reasoning.

4. Describe how a Keystone species effects their community and ecosystem (hint: watch the film “The Serengeti Rules” again)

5. If an animal cell was placed in salt-water what would happen to the cell. Write a claim, with supporting evidence and reasoning.

6. Explain how a buffer works and tell the reader the importance of a buffer in humans’ blood?