Biology 19-20
Semester 1 Final Exam Study Guide

- ✓ The final exam will be all multiple-choice and true false.
- ✓ There will be no rest room passes until you are done with the test.
- ✓ This study guide will be worth daily points for completing the assigned portions.
  - If you meet all of your daily goals you can choose to use a handwritten front and back index card (**3inx5in normal size**) on your final.
  - These must be turned in with your final.
- ✓ Bring something to work on/keep you busy after you finish your final.
  - There are no locker trips.
  - No electronics are allowed until EVERYONE is done taking the final exam.

"Success is a state of mind. If you want success, start thinking of yourself as a success."

- ✓ Keys to success:
  - Review your binder. You have all the information you need from Q1 and Q2.
  - Complete this study guide using your binder!
  - Use class time and resource periods before finals to get help.
  - Use old study guides in addition to this study guide for help and extra practice. Be sure to focus on what this study guide covers, but those old study guides help a lot.

Final exam will cover the following topics: Scientific Thought, Chemistry, Biochemistry, Cells, and DNA Replication, Mitosis, and Meiosis.

Wednesday, January 15th	
Resource	8:10-9:40
5th period	9:50-11:20
Lunch	11:25-12:15
6th period	12:20-1:50
7th period	2:00-3:30

Thursday, January 16th	
Resource	8:10-9:40
1st period	9:50-11:20
Lunch	11:25-12:15
2nd period	12:20-1:50
Resource	2:00-3:30

Friday, January 17th	
Resource	8:10-8:45
3rd period	8:50-10:20
4th Period	10:30- 12:00
Lunch	12:00-12:30
Busses Leave	12:30
8th period make-up	12:30-3:30

Nature of Science: Chapter 1 (20 Questions)

Science Process

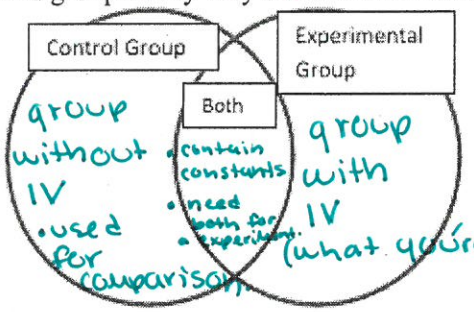
1. Define Observation = 5 senses to make factual statements (qualitative/quantitative)

2. Define Inference = Education guess/using prior knowledge to explain the world around you/opinion

3. Label the following statements either as an observation (O) or an inference (I)
   - A. O Zach is wearing a blue shirt.
   - B. I Anyone who wears a Yankees shirt likes baseball.
   - C. O There are 15 students on the bus.
   - D. I Julie must have gotten in trouble because I saw her go to the principal's office
   - E. I People who live in Alaska like winter.
   - F. I It is hot outside today.

4. Define Hypothesis. Education explanation for an observation: based upon research (must be testable)

5. Compare and Contrast the Control Group and Experimental Group in an experiment.
(You cannot use the word group or say they occur in science/science experiment as a comparison.)



6. If plants are watered (IV), then growth height (DV) will increase.

IV:	watering plants
DV:	height of plants
Constants:	type of plant, soil, sunlight.
Hypothesis:	If plants are watered, then growth height will increase because the water helps bring nutrients into the plant.

7. If trees have leaves (IV), then bird nests (DV) will increase.

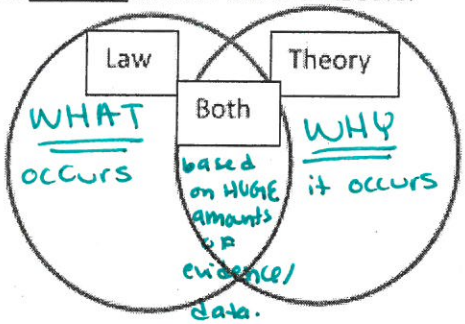
IV:	leaves on trees
DV:	number of nests
Experimental Group:	trees with varying amounts of leaves (↑ or ↓)
Control Group:	normal tree or no leaves at all

IV DV

8. If acid rain is in water, then fish population will increase.

IV:	presence of acid rain (↓ pH)
DV:	number of fish
Hypothesis:	If acid rain is present, then the fish population will increase because a lower pH helps fish regulate homeostasis.

9. Compare and Contrast a LAW and a THEORY.



- equally factual

10. Using scenario #1 below, answer the following questions:

SCENARIO #1 - Maggie's Plant Experiment

In this exercise you will read the following scenario and identify the parts of the scientific method in it.

Maggie read that some plants grow better if the soil is acidic. She can't believe that a plant can grow when exposed to acid. Maggie decides to test if the plants she has will grow better when acid is added to the soil. She puts potting soil in two planting containers and transplants two of her geraniums that seem about the same size into the pots. She puts the pots in the same location so that they both get the same sunlight each day, are at the same temperature and she makes sure they get the same amount of water. However, Maggie puts a tablespoon of vinegar in the water she gives to one of the plants. She measures the growth of the plants every week for five weeks and records the results in a data table below:

Week	Height of Plants in Container with Vinegar (cm)	Height of Plants in Container without Vinegar (cm)
1	10.0	10.0
2	12.4	11.5
3	14.8	13.0
4	18.0	15.7
5	21.4	17.8

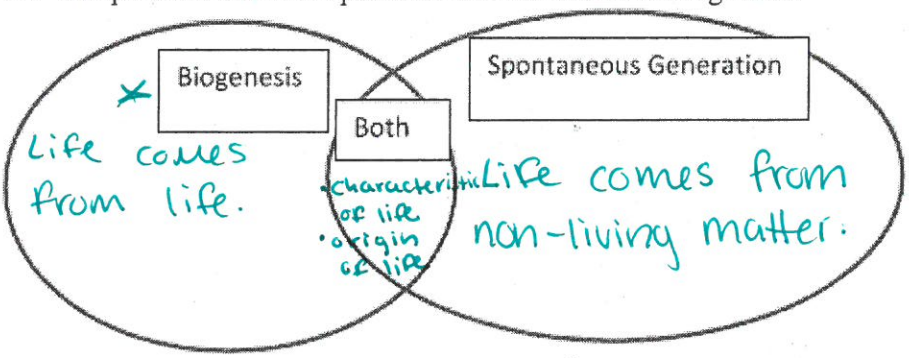
1. **Hypothesis:** If Maggie adds vinegar (acid) to the soil, then plants will grow taller because acid puts more nutrients in the soil.
2. **Dependent Variable:** Height of Plants
3. **Independent Variable:** Vinegar (acidity of water)
4. **Constants:** Sunlight, Temperature, Soil, water Amt.
5. **Control Group:** Plants without vinegar
6. **Experimental Group:** Plants with vinegar

11. Why do scientists repeat experiments and/or publish their work?

To check for correct results, fix mistakes in each others' work, and to get credit for your work.

Spontaneous Generation:

12. Compare and Contrast Spontaneous Generation and Biogenesis.



Characteristics of Life

13. Define Biology: Study of Living organisms

14. For each example below write which characteristic of life is represented by each statement.

A. Growth "That boy shot up five inches in only one year."
B. Reproduce "Our cat had a litter of kittens yesterday."
C. Develop "My dog has become much less clumsy now that he is a year old."
D. Energy (use) "Eat a good breakfast and you will be able to run longer."
E. Stimulus "When that car pulled in the driveway, my cat ran to hide under the porch."
F. Evolve "Owl's night vision can see movement of mice on even the darkest night." DNA/
G. Cells "Single-celled organisms live in the pond behind school."
H. Homeostasis Your body normally maintains a temperature of 98.6°F
I. ~~Energy (obtain)~~ A giraffe uses its long neck to eat from the high branches of a tree.

15. What characteristics of living things were absent from the examples in problem #~~13~~ 14 above?

DNA or Evolve (depending on answer to F)

16. How many characteristics of life does an organism have to possess to be considered alive?

All of them

Chemistry Review: Chapter 2.1 (18 Questions)

17. What are the three parts of an atom? proton, neutron, electron

18. Fill in the table below regarding parts of an atom

Atom Particle	Location in the Atom	Charge
Proton	nucleus (center)	+
Neutrons	nucleus (center)	Neutral
Electrons	Surrounding the Nucleus (In orbits, shells)	—

19. Using your periodic table, how do you find the number of protons? Atomic # (top)

20. Using your periodic table, how do you find the number of electrons? same as atomic # in a neutral atom.

21. Fill in the table below regarding electrons.

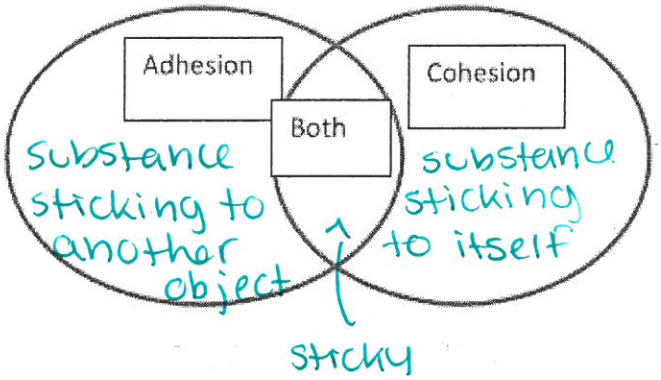
Electron Type	Definition	Purpose	How to find on the periodic table
Core	Closest to the nucleus	balance out (+) protons	Total e⁻ - ve⁻
Valence	Farthest from the nucleus	control chemical Reactions	column ↕

22. Complete the following table for normal atoms.

Element	Symbol	Number of Protons	Number of Electrons	Valence Electrons
Magnesium	Mg	12	12	2
Sodium	Na	11	11	1
Boron	B	5	5	3

23. What elements is water made of? Hydrogen & Oxygen

24. Compare and Contrast Adhesion and Cohesion (Make sure to cite specific examples from lab).



25. What is pH?

Measure of Hydrogen in Solution

26. Fill in the table below regarding pH.

	Acid	**Base**	**Neutral**
pH range	1-6	8-14	7
What molecules/ions are present?	H^+	OH^-	H_2O
What is the weakest pH of this substance?	6	8	
What is the strongest pH of this substance	1	14	

You did it!