Name: _____ Period: ____ **Biology 1st Semester Objective Review**

## THE BASICS

1. List the steps of the scientific method.
2. Define each step of the scientific method.
3. Give an example of each step of the scientific method.
4. Distinguish between an independent variable and a dependent variable.
5. Define control group and experimental group.
6. What are the base units of the metric system?
7. What is the metric system based on?
8. At what temperature does water boil and freeze in degrees Celsius and Fahrenheit?
9. List and define each property of life (How do you know something is alive?).
10. List the levels of organization in order and define each level.

## BIOCHEMISTRY

1. Name each part of the atom and define each part.
2. Give the location and the charge for each subatomic particle.
3. Name the 3 main types of bonds and define each type.
4. Distinguish between solute and solvent. Give an example of each.
5. What is the most abundant compound in living organisms?
6. Define macromolecule.
7. Describe the structure, function and building blocks for carbohydrates.
8. Describe the structure, function and building blocks for proteins
9. Describe the structure, function and building blocks for lipids
10. Describe the structure, function and building blocks for nucleic acids.
11. Define element, compound, ion and atom.
12. Name the two parts of a chemical reaction.
13. Draw and label a pH scale.
14. Distinguish between and acid and a base. Give an example of each.

## ENERGY

1. What is the overall equation for photosynthesis?
2. In what part of the cell does photosynthesis take place?
3. Draw and label a chloroplast. Define each part of the chloroplast.
4. Name the pigment that is responsible for absorbing the light energy from the sun during photosynthesis.
5. What are the 2 types of reactions that occur during photosynthesis?
6. What is another name for light independent reactions?
7. What part of the chloroplast contains chlorophyll?
8. What is the overall equation for cellular respiration?
9. In what part of the cell does cellular respiration take place?
10. What is ATP?
11. How many ATPs are produced (net) when cellular respiration is finished?
12. What is fermentation?
13. What are the 2 types of fermentation? Describe each type.
14. What is the difference between aerobic respiration and anaerobic respiration?

## CELLS

1. Explain the differences between plant cells and animal cells.
2. Explain the differences between eukaryotic cells and prokaryotic cells.
3. What are the parts to the cell theory?
4. Draw and label a picture of an animal cell including the names and functions of the structures located in the nucleus and the cytoplasm.
5. List and describe the types of passive transport.
6. Explain the differences between hypotonic, hypertonic and isotonic.
7. List and describe the types of active transport.

**HEREDITY**

1. Define chromosome.
2. How many chromosomes do humans have?
3. Where are chromosomes located in a prokaryotic cell? A eukaryotic cell?
4. Define karyotype. What is a karyotype used for?
5. What is the difference between chromatid and a chromosome?
6. Draw and label sister chromatids and a centromere.
7. Define the cell cycle.
8. What are the 3 main steps to the cell cycle? Define each step.
9. What is the first phase of the cell cycle?
10. What are the 3 phases that make up the first phase of the cell cycle?
11. Define each phase mentioned in #10.
12. What is the second phase of the cell cycle?
13. What are the 4 phases of the second phase of the cell cycle? IN ORDER.
14. Draw, label and describe what happens in each phase mentioned in #13.
15. Define spindle, centriole and aster.
16. In what phase(s) of mitosis does cytokinesis begin?
17. Describe the differences between mitosis and meiosis. Be very specific.
18. What is the difference between parent cell and daughter cell?
19. What is the difference between haploid and diploid?
20. How many daughter cells are produced from mitosis? Meiosis?
21. How is the chromosome number changed in mitosis? Meiosis?
22. Name some reasons why cells divide.
23. What is cancer?
24. Define tumor.
25. Describe the basic structure of DNA.
26. What are the building blocks of DNA and RNA?
27. What is the sugar in DNA? RNA?
28. Where is DNA located in a cell?
29. In which phase of the cell cycle is DNA replicated?
30. Describe the base-pairing rules for DNA and for RNA.
31. Who discovered DNA?
32. Explain the process of DNA replication.
33. What are chromosomes made of?
34. Explain the differences between DNA and RNA.
35. Describe the process of protein synthesis.
36. Define transcription.
37. Define translation.
38. Define codon. Define anticodon.
39. Define mutation. Name some ways mutations occur.
40. Define frameshift mutation and point mutation.
41. What is the difference between gene mutations and chromosomal mutations?
42. Define amino acid.
43. What are the 3 types of RNA?
44. Define genotype, phenotype, dominant, recessive, heterozygous and homozygous.
45. Describe the work of Gregor Mendel.

- Be able to convert in the metric system.
- Make sure you can identify basic lab equipment.
- Be familiar with lab safety.
- Be able to use the genetic code table.
- Be able to define each "Branch of Biology."
- Be able to use your base-pairing rules to find DNA and RNA.
- Be able to work genetics problems (incomplete dominant, co-dominant, sex-linked, one-factor, two-factor)