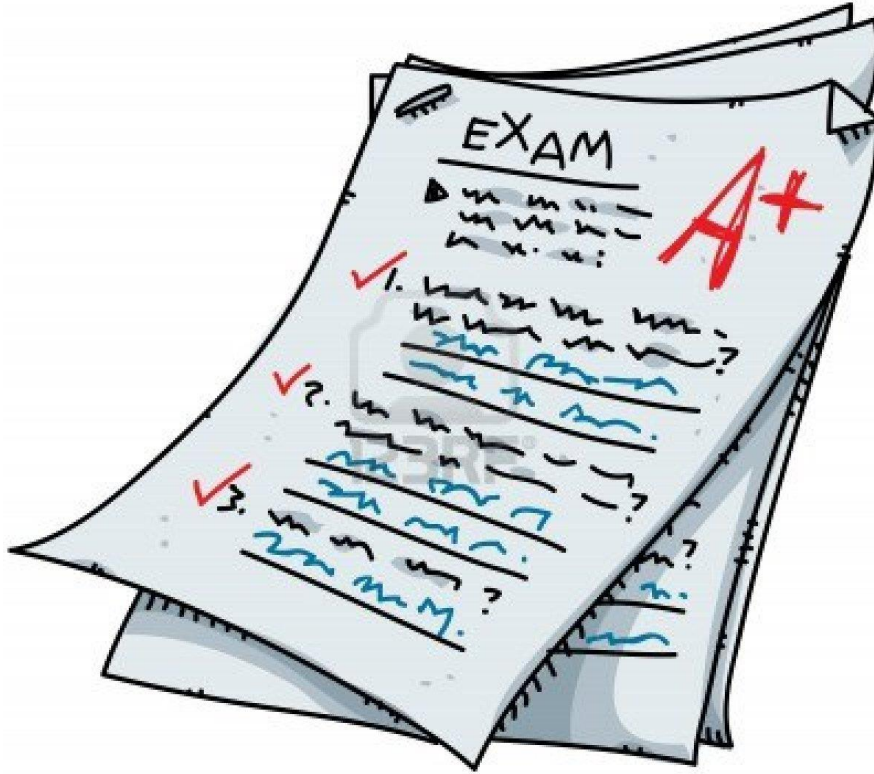


**Stone Bridge High School  
Science Department  
Honors Biology**



**Mid Term Review**

**Name:** \_\_\_\_\_

**Period:** \_\_\_\_\_

**Date:** January, 2015

**Honors Biology Mid-Term Exam Review 2014 – 15****Unit 1 Scientific Investigation**

1. List the steps of the scientific method in order:

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. What do we call a possible explanation for an event or a set of observations? \_\_\_\_\_
3. A logical interpretation of an observation is called \_\_\_\_\_.
4. The information gathered during the experiment is called \_\_\_\_\_
5. What do we call variable that influences the outcome of an experiment? (I change?) \_\_\_\_\_
6. What do we call an experimental setup in which the experimental variable is missing? \_\_\_\_\_
7. What do we use to measure small volumes of liquids? \_\_\_\_\_ What units do we use? \_\_\_\_\_
8. What basic metric units do we use to measure length: \_\_\_\_\_, mass: \_\_\_\_\_,  
volume: \_\_\_\_\_, temp: \_\_\_\_\_
9. What is human body temp \_\_\_\_\_
10. The total magnification of the low powered lens (with the ocular lens) is \_\_\_\_\_
11. The total magnification of the medium powered lens (with the ocular lens) is \_\_\_\_\_
12. The total magnification of the high powered lens (with the ocular lens) is \_\_\_\_\_
13. Which microscope is used to view internal structures? \_\_\_\_\_
14. Which microscope is used to view surface structures? \_\_\_\_\_
15. List Metric base units from largest to smallest – \_\_\_\_\_
16. How many millimeters would 27.76 centimeters be? \_\_\_\_\_
17. What is the name of the process that allows organism to keep their internal conditions stable?  
\_\_\_\_\_
18. All forms of life on earth use \_\_\_\_\_ for growth/development, reproduction, repair.
19. What is the name of the idea that life could come from nonliving matter? \_\_\_\_\_

20. Who was the scientist that disproved the hypothesis of spontaneous generation by using a curved neck flask? \_\_\_\_\_

21. Which scientist had the hypothesis that flies produce maggots and tested it using jars and meat? \_\_\_\_\_

22. Explain the experiments conducted by the following scientist: Be familiar with the experiments of Redi, Needham, Spallanzani and Pasteur.

Redi- \_\_\_\_\_

Needham- \_\_\_\_\_

Spallanzani- \_\_\_\_\_

Pasteur- \_\_\_\_\_

23. Review all of the guidelines in the safety handout, "Safety First!"

What should you do if chemicals are splashed on someone's clothes? \_\_\_\_\_

What should you do if chemicals are splashed into someone's eyes? \_\_\_\_\_

### Unit 2 Classification

1. The practice of using two word names for scientific names is known as \_\_\_\_\_

2. The scientific name consists of what two parts? \_\_\_\_\_ and \_\_\_\_\_

3. Write the name CANIS LUPUS correctly. \_\_\_\_\_

4. A \_\_\_\_\_ key gives a list of choices that lead to the name of an organism being identified.

5. Derived characteristics are used to generate a \_\_\_\_\_, a diagram that shows relationships among groups of organisms in terms of evolution.

6. List the 7 levels of taxonomy, from largest (most inclusive) to smallest.

\_\_\_\_\_

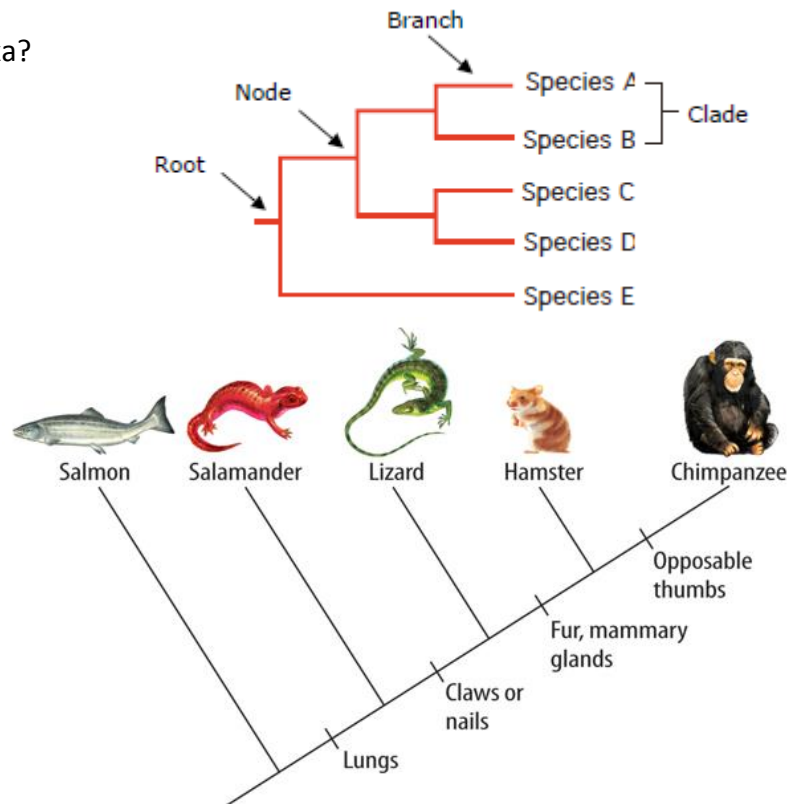
7. Complete the chart below.

Domain	Kingdom
Archaea	
Bacteria	
Eukarya	

8. Organisms that do not contain a nucleus are called \_\_\_\_\_  
Organisms that DO contain a nucleus are called \_\_\_\_\_
9. An organism that can produce its own food is known as a(n) \_\_\_\_\_  
An organism that must obtain food is known as a(n) \_\_\_\_\_
10. A new organism was discovered. It has no nucleus and lives in a high-temperature pool (extremophile).  
To what kingdom does it belong? \_\_\_\_\_
11. Another new organism was found nearby. It is a heterotroph, has a cell wall, and gets nutrients from decomposing matter. To what kingdom does it belong? \_\_\_\_\_
12. Scientists have found that humans and yeasts have similar genes for the assembly of certain proteins.  
Similar genes are evidence of \_\_\_\_\_ ancestry.

13. Which of the following are sister taxa?

- D & E
- B & C
- A & D
- C & D



14. According to the cladogram above, which is (are) correct?

- i. salamanders and lizards are sister taxa
- ii. lizard evolved from salamanders
- iii. lizards, hamsters, and chimpanzees have claws

A. i    B. ii    C. iii    D. i and ii    E. i and iii    F. ii and iii    G. i, ii, and iii

15. If two organisms are similar and can produce fertile offspring, they are probably members of the same \_\_\_\_\_

16. Organisms, such as humans, that get their body heat from metabolism are called \_\_\_\_\_.  
Reptiles, amphibians, etc that have to use the outside environment to maintain their temp are \_\_\_\_\_.
17. Earth's early atmosphere contained little or no \_\_\_\_\_ gas. Cyanobacteria, single-celled prokaryotic produced oxygen, as an end product of photosynthesis.
18. The length of time that two species have been evolving separately can be estimated using \_\_\_\_\_.

### Unit 3 Biochemistry

- What are the three subatomic particles and their charges? \_\_\_\_\_
- Where are protons and neutrons found in an atom? \_\_\_\_\_ Where are electrons found in an atom? \_\_\_\_\_
- If an atom has an atomic number of 35 and a mass number of 75.  
How many protons does it have? \_\_\_\_\_ electrons? \_\_\_\_\_ neutrons? \_\_\_\_\_
- Vocab review: define/explain
  - atomic number - \_\_\_\_\_
  - mass number- \_\_\_\_\_
  - Isotope- \_\_\_\_\_
  - Ion - \_\_\_\_\_
  - Polarity – \_\_\_\_\_
  - Cohesion - \_\_\_\_\_
  - Adhesion - \_\_\_\_\_
  - Compound – \_\_\_\_\_
  - Solute- \_\_\_\_\_
  - Solvent- \_\_\_\_\_
  - suspension- \_\_\_\_\_
  - solution- \_\_\_\_\_
  - buffer- \_\_\_\_\_
- What happens when a positive ion is formed? Electrons are lost/gained (circle one)
- How does a ionic bond form? \_\_\_\_\_

7. How does a covalent bond form? \_\_\_\_\_
8. What are the forces called that allow a gecko to climb up vertical surfaces? \_\_\_\_\_
9. 1 oxygen bonds with 2 hydrogen atoms by 2 \_\_\_\_\_ bonds to form one water molecule.
10. Polarity (slightly + and slightly – side) of a water molecule causes water molecule to bond with 4 other water molecules by weak bonds called \_\_\_\_\_
11. What is a substance with a pH of 8 or above? BASIC/ACID/NEUTRAL  
 What is a substance with a pH of 6 or below? BASIC/ACID/NEUTRAL  
 What has a pH of 7?
15. What does the pH scale measure? \_\_\_\_\_
16. In a glass of salt water, what is the solute? \_\_\_\_\_ What is the solvent? \_\_\_\_\_
17. A change of one unit on the pH scale represents a tenfold increase in the concentration of hydrogen ions. How much greater is the hydrogen ion concentration in rainwater than in sulfuric acid? \_\_\_\_\_ X

Substance	pH
sulfuric acid	1.2
rainwater	6.2

18. Which element is present in all ORGANIC molecules? \_\_\_\_\_
19. Polymers are formed by the joining together of \_\_\_\_\_, in a reaction called \_\_\_\_\_ where water is taken out to join two molecules.
20. Polymers can be broken down into monomers in a reaction called \_\_\_\_\_
21. What are the four organic compounds found in living things and what do they do?
- Carbohydrates – \_\_\_\_\_
  - Lipids – \_\_\_\_\_
  - Proteins – \_\_\_\_\_
  - Nucleic acids – \_\_\_\_\_

22. What are the monomers of following four organic compounds?

a. Carbohydrates – \_\_\_\_\_

b. Lipids – \_\_\_\_\_

c. Proteins – \_\_\_\_\_  
\_\_\_\_\_

d. Nucleic acids – \_\_\_\_\_

23. The function of the protein depends on its shape (depends on organization of amino acids/ how they fold in protein)

Describe 4 levels of organization (shape) of proteins.

Primary structure – \_\_\_\_\_

Secondary structure: \_\_\_\_\_

Tertiary structure: \_\_\_\_\_

Quaternary structure: \_\_\_\_\_

24. Vocab review: define/explain

a. Monosaccharide- \_\_\_\_\_

b. Polysaccharide- \_\_\_\_\_

c. Amino acid- \_\_\_\_\_

d. Activation energy- \_\_\_\_\_

e. Exergonic reaction - \_\_\_\_\_

f. Endergonic reaction - \_\_\_\_\_

25. Which macromolecules (Ex wax, oil) is made up of glycerol and fatty acids? \_\_\_\_\_

26. Nucleotides consist of a phosphate group, a nitrogenous base, and a \_\_\_\_\_

27. When 2 hydrogen and 1 oxygen combine to form water, what would the product(s) be? \_\_\_\_\_

What would the reactant(s) be? \_\_\_\_\_

28. The energy that is required to get the chemical reaction started is called \_\_\_\_\_.

29. The enzymes act as a \_\_\_\_\_, speed up chemical reaction by reducing \_\_\_\_\_ energy.

30. Enzyme Peroxidase can break down specific substrate hydrogen peroxide in cells. It accomplishes this because of its specific structure. What part of the enzyme is involved in catalytic activity? \_\_\_\_\_
31. Enzymes only work with specific substrates because each substrate has a specific \_\_\_\_\_ site for enzyme attachment.
32. What are the two factors that affect enzymes? \_\_\_\_\_
33. How does the following conditions affect the enzyme's functions and the rate of the chemical reaction.
- Optimal pH – \_\_\_\_\_
- above optimal pH - \_\_\_\_\_
- below optimal pH - \_\_\_\_\_
- Optimal temperature - \_\_\_\_\_
- above optimal temperature - \_\_\_\_\_
- below optimal temperature - \_\_\_\_\_

#### Unit 4 Cells

- Who first used the term "cells?" \_\_\_\_\_  
 Who was the first person to identify and see cells? \_\_\_\_\_  
 Who concluded that all plants are made of cells - \_\_\_\_\_  
 Who concluded that animals are made of cells - \_\_\_\_\_  
 Who studied cell reproduction - \_\_\_\_\_
- What are the 3 things stated in the **Traditional Cell Theory**
  - living things are composed of \_\_\_\_\_  
 and cells come from \_\_\_\_\_ by the process of cell reproduction
  - cells are the \_\_\_\_\_ of structure and function of all living things
  - cells contain specialized \_\_\_\_\_ necessary for life

- Differentiate between prokaryotes and Eukaryotes** in the table below.

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- What is common in both prokaryotic and eukaryotic cells? \_\_\_\_\_



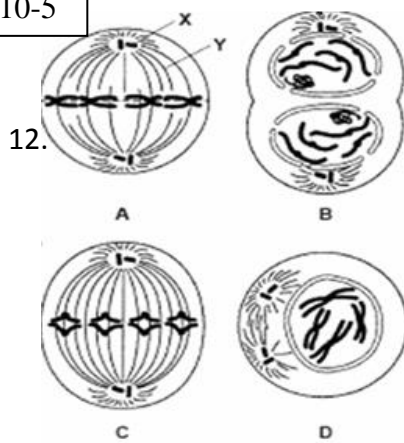
5. According to endosymbiotic theory, prokaryotes were engulfed by eukaryotes. Instead of getting digested they survived and function as which organelles - \_\_\_\_\_
6. What are the organelles that make proteins? \_\_\_\_\_
7. A cell with lots of ribosomes is probably specialized for \_\_\_\_\_ synthesis.
8. The condensed strands of chromatin (the genetic material) of cells are called \_\_\_\_\_
9. Which organelle converts food into compounds that the cell uses for energy? \_\_\_\_\_
10. What is the main function of a cytoskeleton? \_\_\_\_\_
11. What is the main function of a cell wall in plant cells? \_\_\_\_\_
12. Plant and animal cells both have Mitochondria. Plant cells have large \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ that animal cells do not have. Animal cells have \_\_\_\_\_, \_\_\_\_\_ that plant cells do not have.
13. An important difference between viruses & living cells are that viruses cannot \_\_\_\_\_ outside of cells
14. What is the phospholipid layer of a cell that controls what enters and leaves the cell?  
\_\_\_\_\_
15. The channels are embedded in the cell membrane that can move large polar molecules into and out of the cells. What are these channels made of? \_\_\_\_\_ What kind of transport uses them?  
\_\_\_\_\_
16. What is the diffusion of water called? \_\_\_\_\_
17. During diffusion, which way do the molecules move? \_\_\_\_\_ → \_\_\_\_\_  
Where do molecules move from during active transport? \_\_\_\_\_ → \_\_\_\_\_
18. What kind of transport needs energy? \_\_\_\_\_
19. The concentration of solutes in a(n) \_\_\_\_\_ solution is the same inside and outside the cell.  
What happens when a cell is placed into an isotonic solution? \_\_\_\_\_
20. The concentration of solutes in a(n) \_\_\_\_\_ solution is higher than the inside of a cell.  
What happens when a cell is placed into a hypertonic solution? \_\_\_\_\_
21. The concentration of solutes in a(n) \_\_\_\_\_ solution is lower than the inside of a cell.  
What happens when a cell is placed into a hypotonic solution? \_\_\_\_\_

22. If an animal cell is surrounded by fresh water, what will happen to the cell? \_\_\_\_\_  
What kind of solution is fresh water for animal cell: hypertonic, isotonic or hypotonic? \_\_\_\_\_
23. If a cell had a salt concentration of 10% inside it and it was placed in a 5% salt solution, what would happen to the cell? \_\_\_\_\_ What kind of solution is outside: hypertonic, isotonic or \_\_\_\_\_.
24. Bulk transport/ Phagocytosis is active transport in which large molecules are packaged in membrane-bound sacs. Removal of material from cell is called \_\_\_\_\_ and taking material into the cell by means of infoldings is called \_\_\_\_\_
25. Bacteria and plants have cell walls and a protist like paramecium has \_\_\_\_\_ that pump water out that prevents them from over-expanding.
26. Blood is considered a tissue because it is composed of different types of \_\_\_\_\_ working together and having specific functions.
27. Starting with a cell and ending with an organ system, what are the four levels of organization in multicellular organisms? \_\_\_\_\_

## Unit 5 Mitosis

- The period of cell growth and development prior (before) division (the longest phase) is called as \_\_\_\_\_.
- Together, the  $G_1$  phase, S phase, and  $G_2$  phase are called \_\_\_\_\_.
- The process by which a cell divides into two daughter cells is called \_\_\_\_\_
- Another name for cell division is the \_\_\_\_\_ phase.
- When during the cell cycle are chromosomes visible? \_\_\_\_\_
- Uncondensed DNA - \_\_\_\_\_
- When chromosomes replicate, you get sister \_\_\_\_\_  
A cell that has 5 chromosomes in the  $G_1$  phase will have \_\_\_\_\_ chromatids in the  $G_2$  phase.  
The number of sister chromatids in a human body cell that is entering cell division is \_\_\_\_\_  
If a parent cell has 8 chromosomes, how many will each daughter cell have after mitosis \_\_\_\_\_
- What are the four phases of the cell cycle? \_\_\_\_\_
- The two main stages of cell division are \_\_\_\_\_ and \_\_\_\_\_.
- What are the four phases of mitosis in their correct order? \_\_\_\_\_

10-5



11. In Figure 10-5 The structure labeled X is \_\_\_\_\_ & structure labeled Y is \_\_\_\_\_

13. The structure labeled A in Figure 10-3 is called the \_\_\_\_\_

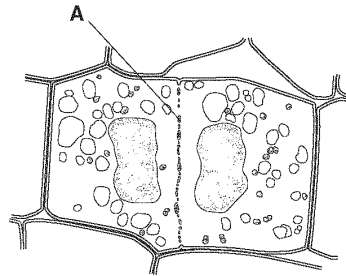


Figure 10-3

The process shown in Figure 10-3 occurs only in \_\_\_\_\_ cells that have just divided.

14. Look at Figure 10-3. The process shown occurs directly following mitosis (division of nucleus). This process is called \_\_\_\_\_

15. During late telophase, \_\_\_\_\_ begins.

16. During metaphase, each chromosome is connected to a(an) \_\_\_\_\_ at its centromere and is lined up in the \_\_\_\_\_ of the cell.

17. The spindle helps to \_\_\_\_\_ the chromosomes during mitosis.

18. What makes normal cells grown in a petri dish tend to stop growing once they have covered the bottom of the dish? \_\_\_\_\_

19. If a normal cell is touched on all sides by other cells and is injected with cyclin from a dividing cell, it probably will \_\_\_\_\_ dividing.

20. Proteins called \_\_\_\_\_ regulate the timing of the cell cycle in eukaryotic cells.

21. Proteins that regulate the cell cycle based on events inside the cell are called \_\_\_\_\_ regulators.

22. In all forms of \_\_\_\_\_, the cancerous cells fail to respond to the signals that regulate the cell cycle of most cells.

23. What happens during each phase of interphase?

G1 - growth

S – DNA replicates (The structure that holds 2 sister chromatids together is called \_\_\_\_\_)

G2 – \_\_\_\_\_

24. All other body cells except sex cells are called as \_\_\_\_\_ cells.

25. Diploid cells have \_\_\_\_complete sets of chromosomes. \_\_\_\_\_ cells have 1 set of chromosome.
26. What is a tumor? \_\_\_\_\_
27. Surface area to volume ratio \_\_\_\_\_ as cells get larger.

28. Calculate the following (use formula from the notes)

Cell Size (cm)	Surface Area (cm <sup>2</sup> )	Volume (cm <sup>3</sup> )	SA : V ratio
1 x 1 x 1			
2 x 2 x 2			
1 x 1 x 8			

29. Will the 2x2x2 cell and the 1x1x8 cell have the same volume? \_\_\_\_\_
30. Which of the above cell had highest SA:V ratio? \_\_\_\_\_
31. Which cell had lowest SA:V ratio? \_\_\_\_\_
32. Which of the three will have the shortest diffusion times the same? (look at SA:V ratio) \_\_\_\_\_  
Explain why? \_\_\_\_\_
33. Which of the three will have the longest diffusion times the same? (look at SA:V ratio) \_\_\_\_\_  
Explain why? \_\_\_\_\_

**NOTE: Semester exam may have questions which are not listed above. Please study from your notes (also available on my website), class work/assignments, homework, labs, quizzes and text-book.**

- ✓ Know the "Lab safety rules".
- ✓ Look over SI system notes, Be able to do metric conversions and conversions of English to Metric (formula will not be provided )
- ✓ Be able to label the parts of the microscope.
- ✓ Review 6 kingdom chart
- ✓ Know how to read/interpret a cladogram.
- ✓ Read Miller and Urey's experiment
- ✓ Know similarities and differences between viruses and living cells.
- ✓ Review pH scale. Be familiar with acids and bases & calculations for hydrogen ion concentration.
- ✓ Review structures, functions of monomers and polymers of carbon compounds.
- ✓ Review organelle chart and label organelles.
- ✓ Study all the diagrams from mitosis notes and be able to label the phases and structures.
- ✓ Research questions will be based on graphs, stats (descriptive), experimental design, results, discussion.
- ✓ Know how to add standard deviation bars to a graph and read a line of best fit.
- ✓ Review research notes (Graphs/Stats), Enzyme inquiry lab, Osmosis inquiry lab.

## ➤ Enzyme Lab

1. Graph the data (means) and draw **standard deviation bars**.


Table 1: Minutes of Homework Daily Per Subject		
Student groups	Science	English
Mean	15	26
Standard Deviation	3.1	6.5

## Osmosis Lab

1. What is the concentration of solute of the animal cell in this graph?
2. Is a 0.2M solution a hypotonic, hypertonic, or isotonic solution?
3. What happens to an animal cell placed in a hypertonic solution?

