Biology Final Exam Review

Experiment or Controlled Variables:

Problem: Will changing my diet to vegetarian lower my cholesterol?
What is the Independent variable? ________
What is the dependent variable? ________
The factor that is changed on purpose ________
What is measured as a result of the change ________

What is a control group in an experiment? ________
The group that does not have a changed variable. They are used as a comparison.

Which kind of graph would be used for the following? (line or bar)
What students had for lunch on Monday ________
How much the baby elephants grew each week for two months ________
Height of all students in this class ________

What is the purpose of a conclusion? ________
To explain hypothesis correct or incorrect

Identify the following & label it on the model to the right:
Oxygen ________ Covalent Bond ________
Hydrogen ________ Positive side (+) ________
Negative side (-) ________ Hydrogen Bond ________
Water sticking to water is ________ Cohesion ________
Water sticking to other charged material ________ Adhesion ________
When a molecule has a positive side & a negative side it is ________ Polar ________

In salt water the ________ Salt ________ would be the solute and the ________ Water ________ would be the solvent

Why is polarity (being polar) important? ________ It allows water to dissolve other materials ________

Prokaryotic (P), Eukaryotic (E) or Both (B)

B. Have DNA ________ P. No complex organelles ________
E. DNA surrounded by a nucleus ________ P. Bacteria ________
E. Animal cells are an example of these ________ B. Have a cell membrane ________

Levels of Organization of Life
List the following terms in order from smallest to largest
Organism, tissue, cell, organ, organelle, organ system

Characteristics of Life
Name four of the characteristics of life and give an example for three of them. Respond to environment, metabolize, use energy, reproduce, maintain homeostasis

List two misconceptions that are not characteristics of Life: Breathing and movement are NOT characteristics of life

Osmosis
Draw an Arrow showing which way the water will move
Allows TO hypertonic

Solutions:
Label each side of each tube as Hypertonic (HE), Hypotonic (HO), or Isotonic (I)

Carbohydrate (C), Protein (P), Lipid (L), Nucleic Acid (N)

DNA is made up of units called ________ Nucleotides ________

Label the photo with these units.

DNA is in the shape of a ________ double helix ________ Specific sections of DNA are called ________ genes ________
DNA makes ________ DNA ________ RNA ________ Proteins ________

A. Ribosome ________ K. tail like structure ________
B. Nucleus ________ C. site of photosynthesis ________
C. Chloroplast ________ A. makes protein ________
D. Mitochondria ________ G. clear fluid surrounds organelles ________
E. Golgi apparatus ________ O. Allows material in and out ________
F. DNA ________ D. turns sugar into ATP ________
G. Cytoplasm ________ E. shipping and receiving ________
H. Vacuole ________ H. stores materials ________
I. Lysosomes ________ L. hair like projections ________
J. Cell Wall ________ N. covered in ribosomes ________
K. Flagellum ________ B. contains DNA ________
L. Cilia ________ I. rids cell of bacteria/viruses ________
M. Smooth ER ________ M. detoxifies poisons in cell ________
N. Rough ER ________ F. Gives instructions on protein production ________
O. Cell Membrane ________ J. provides structure and support ________
**DNA Replication**  
Helicase - Unzips DNA  
DNA Polymerase - Rebuilds DNA  
Write the complementary base pairs under  

<table>
<thead>
<tr>
<th>A</th>
<th>T</th>
<th>C</th>
<th>G</th>
<th>T</th>
<th>G</th>
<th>C</th>
<th>A</th>
</tr>
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**Genotypic ratio**  
Cross two heterozygous  
50% TtSS, 50% ttSS  
100% Ttss  
50% TTss, 50% ttSS  

**Mitosis or Meiosis**  
Meiosis – cell division in reproductive organs where sex cells are made.  
*Purpose is to make sex cell for _sexual reproduction_ (4 daughter cells)  

Mitosis – cell division that occurs in all cells of an organism except sex cells.  
Ex: skin, brain, and liver (2 daughter cells)  
* Purpose is to cause organism to Repair by making more body cells.

**DNA (D), RNA (R), Both (B)**  
_R_ Jobs include carrying a code out of the nucleus, transferring amino acids, & building protein  
_B_ made of nucleotides  
_R_ contains Uracil  
_R_ small enough to fit through the pores on the nuclear envelope  
_B_ contains cytosine, adenine, and guanine  
_D_ Hydrogen bonds between nitrogen bases  
_D_ the primary set of instructions that codes for all proteins comes from this molecule

Transcribe the following template DNA  
A T C G G C T A  
T A G C C G A T

**Karyotype**  
46 Chromosomes  
44 Autosomal Chromosome  
22 Autosomal Pairs  
23 Homologous Pairs Girls  
22 Homologous Pairs Boy  
23 Number in Gametes  
19 20 21 22 23 24 25 26 27 X Y

**Interphase** – longest phase of cell cycle, DNA replication  
**Prophase** - chromosomes condense and nuclear envelope dissolves  
(Prophase I: crossing over occurs)  
**Metaphase** - Chromosomes line up in the middle of the cell  
(Metaphase I: homologous pairs line up)  
**Anaphase** - sister chromatids are pulled apart (Anaphase I: homologous pairs are pulled apart)  
**Telophase** - a cell plate forms to create two separate cells  
areas, nuclear envelope reappears  
**Cytokinesis** - complete cellular division occurs

The graph shows data for botulism, a form of food poisoning. The conclusion in the box is based on these data. Which of the following is the best reason this conclusion may be unreliable?  
A The greatest number of reported botulism cases was 50.  
B The number of reported botulism cases remained relatively constant from 1988 to 1995.  
C The number of reported botulism cases decreased after 1994.

If a plant that is homozygous tall and wrinkled is crossed with a short, wrinkled plant, which percentage of genotypes would most likely be found in the first-generation offspring?  
_TTrr_ X _tt rr_  
50% TTss, 50% ttSS  
50% TtSS, 50% ttSS

**Cross two heterozygous parents**  
Genotypic ratio  
1: 2: 1

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**Straight hair is dominant to curly. Red skin is recessive to green**  
SSGG or SsGg straight, green  
SSgg or Ssgg straight, red  
Ssgg curly, red  
ssGg curly, green

**Round seeds are dominant to wrinkled seeds. Green leaves are recessive to yellow leaves.**  
RRGG _Round Yellow__  
RrGg _Round Green__  
rRgg _Wrinkled Yellow__

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### Measurement

**Determining volume with a graduated cylinder**

1. Determine the units
2. Read the bottom of the meniscus
3. (If an irregular object) Find the difference (subtract) from the original cylinder.

A.

![Graduated Cylinder A](image)

Volume of A is: 38 ml

Volume of B is: 5 ml

Of the round object

B.

**Determining mass with a balance**

ON TEST

Remember to be specific with place value.

### Label the cell membrane

**Carbohydrate**

**Hydrophilic**

**Hydrophobic**

**Tail**

**Phospholipid Bilayer**

**Protein Channel**

...**movement across the membrane:** Label as Diffusion, Facilitated Diffusion or Active Transport & write one fact

What does it mean to be semi-permeable? To allow only certain materials to pass

### Chromosome Structure

Label the following parts: DNA, Cell, Chromosome, gene, nucleus

- Nucleus
- Cell
- Chromosome
- Gene
- DNA

### Graphs

**Why/when would a line graph be used over a bar graph?**

- Bar graphs show comparisons of categories.
- Line graphs show change IN TIME

Write where the independent and dependent variables would be on the graph below.

### Scientific Method:

List the steps to match the function.

- **Problem** a question that addresses the purpose
- **Hypothesis** a cause and effect statement that predicts the outcome
- **Materials** a list of the supplies and tools needed for the experiment or investigation
- **Data** the collected results in an organized detailed form such as a table or graph
- **Conclusion** a discussion of the outcome of the experiment that addresses the original hypothesis

### Equipment

Identify which piece of equipment would be best in each of the following situations: (GC) graduated cylinder, (P) pipette, (B) beaker, (TBB) balance

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>GC</td>
<td>50 ml</td>
</tr>
<tr>
<td>TBB</td>
<td>67.8 g</td>
</tr>
<tr>
<td>P</td>
<td>0.02 ml</td>
</tr>
<tr>
<td>B</td>
<td>500 ml</td>
</tr>
<tr>
<td>TBB</td>
<td>345.00 g</td>
</tr>
<tr>
<td>GC</td>
<td>87 ml</td>
</tr>
<tr>
<td>P</td>
<td>6.6 ml</td>
</tr>
<tr>
<td>B</td>
<td>867 ml</td>
</tr>
</tbody>
</table>

### My Vocabulary List:

**Example:** Hypothesis, Independent Variable, Dependent Variable, Control Group, Biomolecule, monomer, polymer, amino acid, saccharide, nucleotide, protein, carbohydrate, lipid, nucleic acid, enzyme, catalyst, denatured,