

# End of Course Assessment Review Packet

Name:

## Unit 1:

1. Name 5 pieces of evidence that might be obtained at a crime scene that could help solve the crime.
2. Draw a diagram showing the relationship between the following terms: *nucleotide*, *gene*, *DNA Double Helix*, *chromosome*. **LABEL ALL TERMS.**
3. . Using simple shapes, draw and label all parts of a nucleotide:
4. Name all four bases of DNA – which bases are structurally similar to one another? Which bases pair with each other? Which base is NOT present in RNA?
5. What do restriction enzymes do?
6. What does gel electrophoresis do? Which way does DNA run on the gel?
7. . How does DNA differ from person to person?
8. Write the strand of DNA that would bind with this strand: ATCGTCAGG
9. . Mark on this strand of DNA where the restriction enzyme HaeIII would cut (GG-CC).

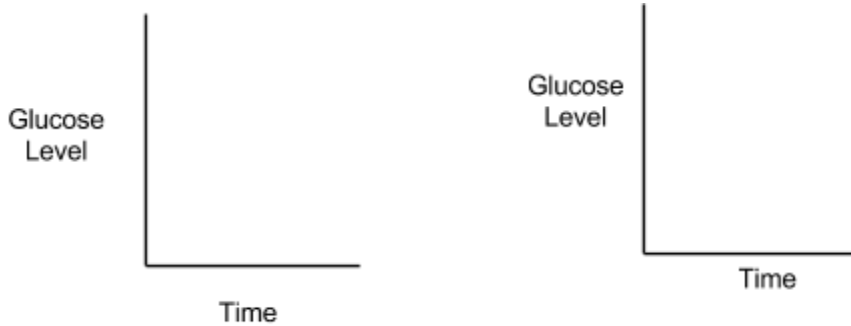
ATTCCGGTATACGGCTAATACCGGTTATAGCG  
TAAGGCCATATGCCGATTATGGCCAATATCGC

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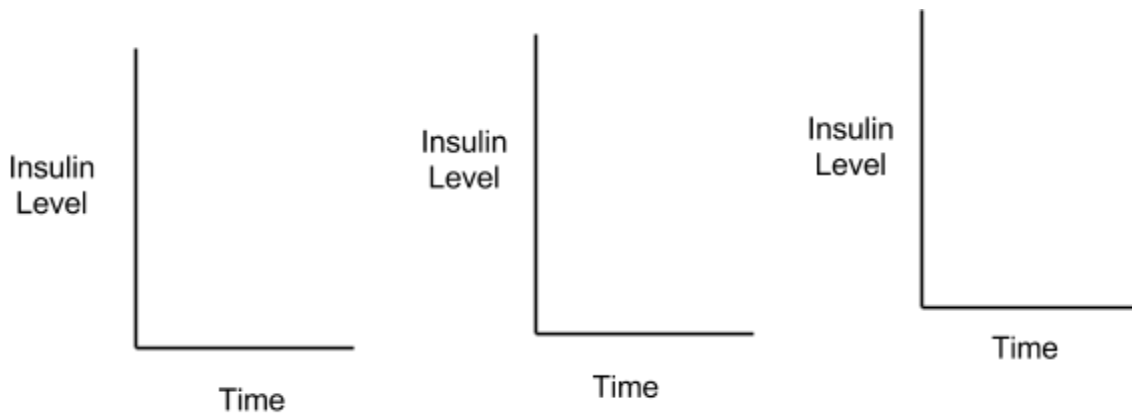
## Unit 2:

1. Create a chart that compares Type 1 and Type 2 diabetes - include symptoms, treatment, how it works, and who generally suffers from it.

2. Draw a graph showing the results of glucose tolerance testing for someone with Type I diabetes and someone with Type II Diabetes.



3. Draw a graph showing the results of insulin testing for someone with Type I Diabetes, someone with Type II diabetes, and a healthy person.



4. Explain the difference between negative and positive feedback. Give an example of each.
5. Diagram the feedback relationship of blood glucose and the hormones insulin and glucagon.

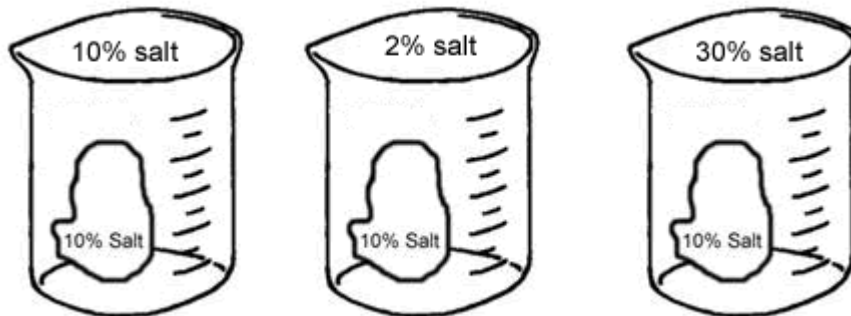
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6. Explain the difference between dehydration synthesis and hydrolysis.
7. Draw an example (include name of monomer and polymer) of each of the following:      a) lipid  
b) carbohydrate c) protein

8. Explain the process of calorimetry and how it is used to measure the amount of energy in a food.

9. What is osmosis - explain it in your own words. Draw a simple picture if you need to.

10. For each beaker below, a) label the solution as either hypotonic, hypertonic, or isotonic and b) draw an arrow showing water movement



11. Why are diabetics constantly dehydrated and urinating so often? Relate your answer to osmosis and the lab we performed using the model cells (dialysis tubing).

12. List 3 complications of diabetes, give a brief description of it, and tell what body system it affects.

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## Unit 3:

1. Draw normal blood cells and then draw sickled blood cells. Describe the differences between these two cells.
2. How is anemia diagnosed? Describe and name the procedure and give the results expected for someone with anemia (hint: see 3.1.1)

3. Name and describe the role of each of the four component of blood.

4. Name 3 main symptoms of sickle cell anemia and how they affect daily life.

5. Fill in the blanks with the correct word in describing protein synthesis:

All instructions for proteins, like hemoglobin, are stored in our \_\_\_\_\_, which is located in a cell's \_\_\_\_\_. This DNA must first be turned into \_\_\_\_\_, through a process called \_\_\_\_\_. This process takes place in the \_\_\_\_\_. The \_\_\_\_\_ then takes the message to the \_\_\_\_\_, specifically to a ribosome. This is where the process of \_\_\_\_\_ takes place. A tRNA matches its \_\_\_\_\_ to a \_\_\_\_\_ on the mRNA. The tRNA then drops off its \_\_\_\_\_. Many of these monomers make up the final \_\_\_\_\_ of hemoglobin.

6. Name and describe the job of each of the three types of RNA:

7. In Sickle Cell Anemia, Glutamic acid is changed to \_\_\_\_\_ through a type of mutation called a \_\_\_\_\_ in the DNA code. Glutamic acid is \_\_\_\_\_, meaning it likes water; but valine is \_\_\_\_\_, meaning it hates water. How does this property affect the entire hemoglobin protein?

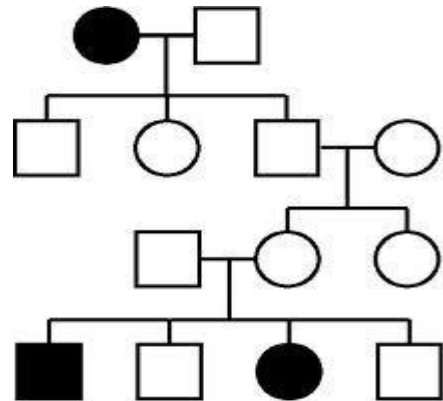
8. Transcribe this DNA sequence into mRNA, then tRNA, and then translate it into an amino acid sequence using the genetic code found in Activity 3.2.2

ATCCGAAAATTTGATTTG

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9. What is a karyotype? What sorts of diseases can and cannot be diagnosed using a karyotype?
10. This process makes new body cells for repair & replacement: \_\_\_\_\_  
This process makes sex cells of sperm and egg: \_\_\_\_\_
11. Each body cell has \_\_\_\_ chromosomes. Each gamete has \_\_\_\_ chromosomes.
12. What does HIPAA stand for and what does it say (in a one sentence summary)?
13. Why does sickle cell disease run in families, yet is not present in every generation?
14. Remember that Best's disease is a dominant disease. Draw a Punnett square to show the cross between a woman without Best's disease and a man who has one allele for Best disease and one allele without Best's disease. What is the chance that they will have a child with Best's disease?

15. Examine the pedigree below. Is this disease dominant or recessive - how do you know?



16. Draw the pedigree for the following family. Label all known GENOTYPES and put the individual's name on the pedigree: Natasha and Nathan are planning on having children. Each has a sister with sickle cell disease. Neither Natasha nor Nathan nor any of their parents have the disease, and none of them has been tested to see if they have the sickle cell trait.

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## Unit 4

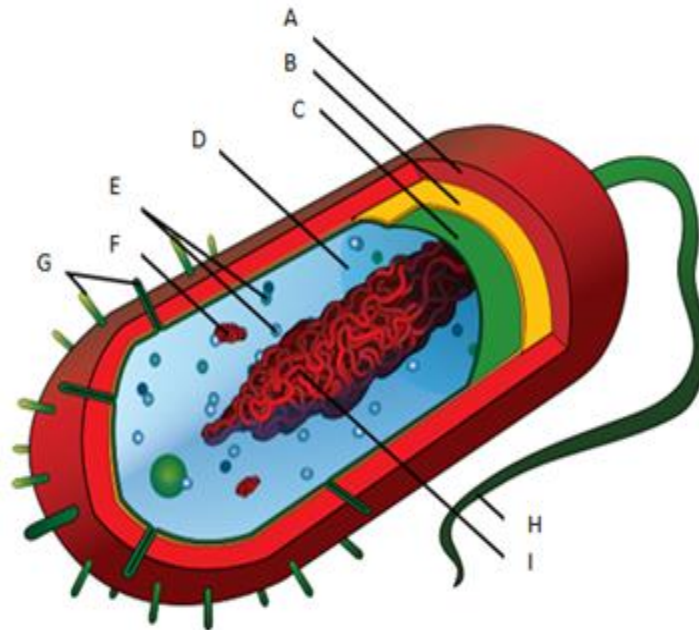
1. In most of the body the arteries carry oxygenated blood and the veins carry deoxygenated blood. The exception to this pattern is the heart. List the specific arteries and veins of the heart that are different from the pattern seen in the rest of the body and explain how and why they are different.
  
2. What is the pathway blood takes as it passes through the heart? Briefly state the path from body to heart to lungs to heart to body.
  
3. What is heart rate? (Be sure to include units of measure!!)
  
4. What is blood pressure? How is it measured? What are the units of blood pressure?
  
5. What does EKG stand for? What does it measure?
  
6. Name the two nodes of the heart and where each is located. Which one is called the “pacemaker”?
  
7. Trace the conduction of electrical impulses through the heart
  
8. What are two major functions of cholesterol in our bodies?
  
9. Is cholesterol hydrophobic or hydrophilic? How can it be carried in our hydrophilic bloodstream?
  
10. What is atherosclerosis? How can it affect blood pressure?
  
11. Name four risk factors for developing heart disease.
  
12. Make a chart comparing and contrasting LDL and HDL – include structure and function.
  - Which one is the major carrier of cholesterol?
  - Which one has more protein in its molecule?
  - Which one should have a level below 100 mg/dL?
  - Which one should have a level of above 40 mg/dL?

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13. What is a problem with a person with the FH mutation? Be specific.
14. What does PCR stand for? What is the purpose of PCR?
15. In this unit, we reviewed about **three** different DNA techniques from Unit 1. List them in the order that they are performed
16. What is a RFLP and how is it used in DNA analysis – be specific.
17. Name and explain 3 procedures that could help treat a blockage in the heart.

### Unit 5

1. Label all parts to the bacterial cell below:



2. Explain the structural differences between gram + and gram - bacteria. Which one stains pink?
3. How can viruses be prevented? How can bacterial infections be prevented? How can each be treated?

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4. Briefly explain the function of each part of the immune system below:

Skin

Phagocytes (like macrophages)

Inflammation

B Cells

T Cells

## Unit 6

1. Match the organ to its body system:

- |                     |                          |
|---------------------|--------------------------|
| ___ 1. Bladder      | A. Cardiovascular System |
| ___ 2. Heart        | B. Urinary System        |
| ___ 3. Lungs        | C. Respiratory System    |
| ___ 4. Trachea      | D. Digestive System      |
| ___ 5. Pancreas     | E. Immune System         |
| ___ 6. Kidneys      | F. Nervous System        |
| ___ 7. Brain        |                          |
| ___ 8. Gall Bladder |                          |
| ___ 9. Vein         |                          |
| ___ 10. Eye         |                          |
| ___ 11. Lymph Node  |                          |
| ___ 12. Teeth       |                          |
| ___ 13. Urethra     |                          |
| ___ 14. Thymus      |                          |
| ___ 15. Spleen      |                          |
| ___ 16. Larynx      |                          |