

HOMEWORK #6

This assignment is due at the start of the class band on _____.

The username for the BrainPOP video is _____ and password is _____.

- A. Watch the following online video: “BrainPOP: RNA” (see your teachers for password)
<https://www.brainpop.com/science/cellularlifeandgenetics/rna>
- B. Read Miller & Levine (textbook) pp. 311–315 and answer the following questions in **complete sentences** on a **separate sheet of paper**. You may type or neatly handwrite your answers.
- Use the DNA sequence below and the Universal Genetic Code to answer the questions that follow.

TAATGCCCTGAAAGT

- write the complementary DNA for the bases above
 - explain how you can tell that the code above is DNA and *not* mRNA
 - transcribe the DNA sequence into an mRNA sequence
 - use the genetic code chart to translate the mRNA sequence you just wrote into a sequence of amino acids
- Explain how DNA makes you the unique individual that you are. In your answer, be sure to:
 - identify the place in the cell where DNA is found
 - identify the place in the cell where proteins are synthesized
 - identify the building blocks that make up a molecule of DNA
 - identify the building blocks that make up a molecule of protein
 - fill in the blanks in the sentence below:

The _____ that make up your _____ code for the production of the _____ that make up the _____ in your body.

HOMEWORK #7

This assignment is due at the start of the class band on _____.

- A. Watch the following online video: “BrainPOP: Genetic Mutations” (see your teachers for password)
<https://www.brainpop.com/health/geneticsgrowthanddevelopment/geneticmutations>
- B. Read Miller & Levine (textbook) pp. 316–319 and answer the following questions in **complete sentences** on a **separate sheet of paper**. You may type or neatly handwrite your answers.
- Define the term *mutation*.
 - Use the following DNA sequence to answer the questions below: **GGTCACACG**
 - Transcribe the DNA bases into mRNA bases, then translate the mRNA into an amino acid sequence.
 - Show how the following *substitution* would change the amino acid sequence: **GCTCACACG**
 - Explain why the following *substitution* would NOT change the amino acid sequence: **GGGCACACG**
 - Explain why it is more dangerous for a nucleotide to be added or deleted from a DNA sequence than for one nucleotide base to be substituted for another.
 [Hint: why are additions and deletions called “frameshift mutations”?]

EXTRA CREDIT

This assignment is due on the date of Quiz 2 and will not be accepted late.

Look up the instructions for performing a DNA extraction on the Resources page at www.spraguescience.com. Complete the experiment (individually or in pairs), provide a photograph or video of you performing the experiment (a photograph should show you in it), and write *one* paragraph summarizing exactly what you did and what you learned.

HOMEWORK #8

This assignment is due at the start of the class band on _____.

- A. Watch the following online video: “BrainPOP: Cloning” (see your teachers for password)
<https://www.brainpop.com/science/cellularlifeandgenetics/cloning>
- B. Read Miller & Levine (textbook) p. 354 and pp. 362–366. Answer the following questions in **complete sentences** on a **separate sheet of paper**. You may type or neatly handwrite your answers.
1. One group of cows have lean muscles that are used as low-fat meat. Another group of cows have strong immune systems and rarely get sick. Describe how selective breeding could be used to create cows that have both lean muscles and strong immune systems.
 2. Only humans have genes that control the production of Human Growth Hormone. Describe how genetic engineering could be used to create bacteria that produce Human Growth Hormone.
 3. A child is born with a genetic disorder to parents who show no symptoms of the disorder. Explain the type of information that a genetic counselor might provide to these parents. In your answer, be sure to:
 - explain why the child exhibits symptoms of the genetic disorder even though the parents do *not*
 - describe how prenatal genetic screening techniques could be used to detect a genetic disorder

HOMEWORK #9

This assignment is due at the start of the class band on _____.

- A. Check all your grades for this course on PupilPath. Review your work on the two quizzes and the first exam.
 [If you do not have access to Pupil Path, you must see Ms. DeInnocentiis in room 118 or visit your teachers in room 403 during your OPTA.]
- B. Write a letter to your teachers in which you reflect on your progress so far this semester. Be sure to:
- state the grades you received on Quizzes 1 and 2 and on Exam 1, as well as the overall letter grade estimate for the course so far that PupilPath has calculated for you
 - describe how you studied for the two quizzes and the first exam [*be sure to include exactly what you did while studying and for how long*]
 - identify any changes that you plan to make in your study habits for the next quiz/exam
 - identify a goal for this course— what is lowest grade that you will be satisfied with at the end of the semester? [*be realistic—do not set a goal that is very very far away from where you are now*]
 - state whether you are happy with your performance so far this semester, including why or why not
 - describe a few steps that you could take to realistically improve your performance in this class [*even if you are meeting your goal grade right now, you should be able to come up with at least one thing that you can improve*]
 - include anything else that you would like us to know about your performance or attitude towards this course

Note: Your response must address all seven bulleted asks to earn full credit. You should bullet your answers, using complete sentences.