

MAP 2 MASTERY Unit 4: DNA, PROTEINS, AND GENES (OH MY!!)

1. THESE ARE THE IMPORTANT CONCEPTUAL UNDERSTANDINGS I NEED TO MASTER FOR THIS UNIT:

A. Demonstrates an understanding of Nucleic Acid structures and basic function " I CAN... "	RESOURCES THAT MAY SUPPORT MY LEARNING:	RESULTS/SCORES FROM LEARNING ASSESSMENTS	MASTERY REFLECTION: WHAT DO I STILL NEED TO MASTER BEFORE THE EXAM? (What is your strategy for <u>improvement</u>?) 1 ON 1 : HELP Most effective <u>DURING</u> instruction... do not wait until the end of the unit!
<ul style="list-style-type: none"> * identify common structures of nucleotides (sugar, phosphate, N-base) * contrast purines and pyrimidines * identify all nitrogen base pairings * explain complementarity in terms of size of N-bases and the H-bonds - how is this critical to DNA structure? * Compare/contrast nucleotides & nucleic acids * identify processes that build/take apart nucleic acids * Contrast structure and function of DNA & RNA * identify the major function of nucleic acids & explain why the order of base pairs is critical to this function * explain the relationship between DNA, genes, and chromosomes 	See Weebly/edline and text for: <ul style="list-style-type: none"> • Sect. 3.11 • Sect 8.5 * Essential Study Partner: <ul style="list-style-type: none"> • Unit: Cells Topic: Chemistry → Nucleic Acids • Unit: Genetics Topic: DNA * Text Website * other docs or links on Bb	SELF ASSESSMENT(s) MASTERY CHECK(s)	INSTRUCTOR VERIFICATION:
B. Demonstrates an understanding of Protein structures & general protein functions " I CAN... "	RESOURCES THAT MAY SUPPORT MY LEARNING:	RESULTS/SCORES FROM LEARNING ASSESSMENTS	MASTERY REFLECTION: WHAT DO I STILL NEED TO MASTER BEFORE THE EXAM? (What is your strategy for <u>improvement</u>?) 1 ON 1 : HELP Most effective <u>DURING</u> instruction... do not wait until the end of the unit!
<ul style="list-style-type: none"> * explain the relationship between amino acids and proteins * identify general processes used to build/break apart proteins * compare/contrast primary, secondary, tertiary, and quaternary protein structures * Describe several causes of folding that create each of the structures above. (hydrophobic/hydrophilic, H bonds, disulfide bridges, ions etc...) * Explain general functions of proteins (transportation, communication, identification, immune response, controlling rates of reactions) * Explain how the function of a protein depends on its structure. 	See Weebly/edline and text: <ul style="list-style-type: none"> • Sect. 3.10 • Page 77, Sect 4.14, 4.16 • Sect 5.4 * Protein folding PPT on Bb * Essential Study Partner: Unit: Cells Topic: Chemistry → Protein * Text Website * other docs or links on Bb... http://www.chemguide.co.uk/organicprops/aminoacids/proteins.html	SELF ASSESSMENT(s) MASTERY CHECK(s)	INSTRUCTOR VERIFICATION:

THESE ARE THE IMPORTANT CONCEPTUAL UNDERSTANDINGS I NEED TO MASTER FOR THIS UNIT:

E. Demonstrates an understanding of the process of gene expression " I CAN... "	RESOURCES THAT MAY SUPPORT MY LEARNING:	RESULTS/SCORES FROM LEARNING ASSESSMENTS	MASTERY REFLECTION: WHAT DO I STILL NEED TO MASTER BEFORE THE EXAM? (What is your strategy for <u>improvement</u> ?) 1 ON 1 : HELP Most effective <u>DURING</u> instruction... do not wait until the end of the unit!
*Explain why gene expression is important * Describe an operon? * Compare/contrast a promoter, repressor and activator * Explain how a repressor protein can block the movement of RNA polymerase? * Describe what an activator is and its importance in gene expression.	* G R Q 's on Bb • Sect. 8.11 * Essential Study Partner: Unit: Genetics Topic: Protein Synthesis→ Gene Regulation * Text Website * other docs or links on Bb... (there are many animations linked from Bb on this topic)	SELF ASSESSMENT(s) MASTERY CHECK(s)	INSTRUCTOR VERIFICATION:

F. Demonstrates an understanding of mutations " I CAN... "	RESOURCES THAT MAY SUPPORT MY LEARNING:	RESULTS/SCORES FROM LEARNING ASSESSMENTS	MASTERY REFLECTION: WHAT DO I STILL NEED TO MASTER BEFORE THE EXAM? (What is your strategy for <u>improvement</u> ?) 1 ON 1 : HELP Most effective <u>DURING</u> instruction... do not wait until the end of the unit!
*Define mutation? *Compare/contrast mutations in germ-line tissue and mutations in somatic tissue. * Explain the difference and effect of the following point mutations: base substitution, insertion and deletion. * What causes frame-shift mutations? What is the usual outcome of this type of mutation? *What is a mutagen? Give several examples. *Be able to show the consequences of a mutation on a strand of DNA and the subsequent protein.	• Sect. 8.12 – 8.14 * Essential Study Partner: Unit: Genetics Topic: Protein Synthesis→ Translation * Text Website * other docs or links on Bb	SELF ASSESSMENT(s) MASTERY CHECK(s)	INSTRUCTOR VERIFICATION:

PATH 2 COLLEGE READINESS SCIENTIFIC SKILLS &/OR APPLICATION OF RESEARCH

<p><i>2. In order to become "college ready," I will work to master these standards during this unit (as well as throughout the course):</i></p> <p>" I CAN... " (13 - 15) reflects level of complexity</p>	<p>RESOURCES THAT MAY SUPPORT MY LEARNING:</p>	<p>RESULTS/SCORES FROM LEARNING ASSESSMENTS/ LAB EXPERIENCES</p>	<p>MASTERY REFLECTION: WHAT DO I STILL NEED TO MASTER BEFORE THE NEXT LAB/EXAM? OR the PLAN TEST, ACT, etc</p> <p>1 ON 1 : What is your strategy for improving your reasoning and data presentation/analysis skills?</p>
<ul style="list-style-type: none"> • Understand the methods and tools used in a simple experiment (16-19) • Understand basic scientific terminology (16 - 19) • Find basic information in a body of text (16 - 19) • Determine how the value of one variable changes as the value of another variable changes in a simple data presentation (16 - 19) • Understand a simple experimental design (20 - 23) • Translate information into table or graph (20 - 23) • Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation (20 - 23) • Identify the steps needed to extract DNA from any organism • Explain why each of the above steps is necessary for a successful extraction • Extract DNA from representative organism(s) • Analyze protein molecular data using multiple tools (PDB, JMOL etc) in order to: <ol style="list-style-type: none"> 1. Locate and identify primary, secondary, tertiary, and quaternary structures of a protein 2. Locate and identify examples of bonding (hydrogen, peptide, and sulfide bridges) that contribute to the folding and overall structure of the protein 3. Locate active or binding sites, or the presence of a substrate 4. Show how amino acid side chains affect the bonding and folding of a protein (polarity, hydrophobic/-phylic, presence of ions) 5. Explain how the structure/shape of the protein is related to its function. 6. Produce <u>computer images</u> of a protein that effectively communicates numbers 1-5 above. 	<p>See Weebly/edline for:</p> <ul style="list-style-type: none"> • documents and links posted in Course Documents and presented in class. • JMOL training docs and guides • Lab report guidelines 	<p>SELF ASSESSMENT(s)</p> <hr/> <p>DNA EXTRACTION LAB WRITE UP/ CONCLUSION</p> <hr/> <p>PROTEIN PROJECT (Research and creation of JMOL Images in order to analyze the structure & function of a protein.)</p>	<hr/> <p>INSTRUCTOR VERIFICATION:</p>