

BIOLOGY 11 - REVIEW FOR EXAM 3

Along with all your Blue Book Questions (BBQ's), Reading Assignments and Lab Activities, you should also be able to answer all of the following questions for the next exam. This review sheet is provided to help you learn how to organize your studying for the class, **it is not meant to be an exhaustive list of all possible questions** on the test. I highly recommend using the activities and practice quizzes in your textbook as well as the videos and other resources on my webpage: <http://zanniedallarasciencepage.weebly.com/>

Topics: Cell Division, DNA Structure, DNA Replication, Mendelian Genetics, DNA>RNA>Protein, Evolution, Ecology, Ecosystems
Chapters: 6, 8, & 9

Lecture #12: Cell Division (Mitosis and Meiosis) & Cancer

1. **STUDENT LEARNING OUTCOME: (2) CELL THEORY:** The students will be able to identify various cells and their structural components and differentiate the functions of each of their components.

Big Idea:

1. What makes a cancerous cell different from a healthy cell?
2. When and why do cells divide?

3. Draw out the cell cycle. Explain what is happening in G1, S, and G2 Phase.
4. What is happening in IPMAT?
5. What are the key differences between Mitosis and Meiosis?

Lecture #14: Genetics

1. Who was Mendel and what did he study?
2. What is the difference between character and trait?
3. What is the difference between P, f1 and f2 generations?
4. **REVIEW the BBQ on genetics problems.**

Be able to answer all the questions in the genetics chapter of your lab manual.

Be able to do:	Vocab
<ul style="list-style-type: none"> • Monohybrid and dihybrid crosses <ul style="list-style-type: none"> ○ Be able to predict the probability of getting particular offspring. • Sex linked crosses • Genotypic and phenotypic ratios 	<ul style="list-style-type: none"> • What is a <ul style="list-style-type: none"> ○ Karyotype? ○ Allele? ○ Loci? ○ Dominant allele? ○ Recessive allele ○ Homozygous, heterozygous genotype? ○ Genotype and phenotype? And their ratios. ○ Carrier? ○ Incomplete and co dominance?

Lecture #15: DNA Structure & Replication

STUDENT LEARNING OUTCOME: (3) DNA AND HEREDITY: The students will be able to 1) understand the significance of DNA as the basis for heredity, structure, function and disease in living organisms: 2) describe the DNA molecule and explain how it is used in living systems to create proteins: and 3) describe how proteins function in living cells.

Big Idea:

1. Why does DNA need to make EXACT copies of itself?
2. How does DNA allow traits to be inherited?

3. Define the following: nucleic acid, nucleotide, base, DNA, RNA
4. What are the three components of a nucleotide?
5. How are nucleotides linked together to form nucleic acids? (What kind of bonds?)
6. What are the 3 major differences between DNA and RNA?
7. Differentiate between Replication, Transcription and Translation.
8. Role of different enzymes: helicase, primase ligase and polymerase (1 & 3).
9. Why is DNA called a double helix? And what is the benefit of keeping DNA in this form? 8) What is a "sugar-phosphate backbone"?
10. What is 5' → 3' mean?

11. What type of bond holds the two strands of DNA together?
12. What are the DNA base pairing rules?

Example Questions:

<p>1. Nucleotides are linked together in a chain:</p> <ol style="list-style-type: none"> a. sugar to base b. sugar to sugar c. phosphate to base d. sugar to phosphate 	<p>If a sequence of DNA is: AATTTCGGG Its complimentary DNA strand would be:</p> <ol style="list-style-type: none"> a. AATTTCGGG b. TTAAAGCCC c. UUAAAGCCC d. TTUUUGCCC
<p>Both DNA and RNA</p> <ol style="list-style-type: none"> a. are single-stranded molecules b. contain the same four nucleotide bases c. are polymers of amino acids d. are made of sugar, phosphate, and a base 	<p>The role of DNA Helicase is to:</p> <ol style="list-style-type: none"> a) Unwind DNA at the H-Bonds b) Unwind DNA at the Covalent-Bonds c) Add new nucleotides in DNA Replication d) Add new nucleotides in Translation

Lecture #16: DNA → RNA → Protein

Big Idea:

1. How is DNA used to code for protein?
2. What affect does a mutation in DNA have on an organism?
3. Complete the central dogma of biology below:

Fill in the Blanks:



4. Original Piece of DNA:

ACGATACCCTGACGAG

5. Run Replication (Complementary DNA):
6. Run Transcription (Create complementary RNA strand from the original DNA)
7. Run Translation (Create the protein)

*Be able to run the steps above given only the key words replication, transcription and translation.

8. What makes a mutation good, bad or neutral?
9. What is a frame shift mutation?