**BIOLOGY 2022-23 January 23, 2023**

**Today’s Agenda (Day 93)**

1. HOUSEKEEPING ITEMS

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1. Homework Check:

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1. Class Activity:

🡪 Day 15: Science Fair

\*Finalize Experimental Setup – Gather all materials, prepare all supporting apparatus

\*Begin Day 1 of your experiment – AFTER approval by teacher!

🡪Day 5: Chapter 12 PPT Review

1. **Section 12.3 – DNA, RNA, and Protein**
2. Section 12.4 – Gene Regulation and Protein

HOMEWORK:

* READ: Chapter 12 – Molecular Genetics
* COMPLETE: Chapter 12 Reading Guide Questions
* **STUDY**: Chapter 12 Test

REMINDERS:

* **TEST: Ch 12🡪 Tuesday, Jan. 24**

**CHAPTER 12 VOCABULARY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Codon | DNA polymerase | Double helix | Gene regulation | Intron |
| Exon | Messenger RNA | Mutagen | Mutation | Nucleosome |
| Okazaki fragment | Operon | Ribosomal RNA | RNA | RNA polymerase |
| Semiconservative replication | Transcription | Transfer RNA | translation |  |

**CHAPTER 13 VOCABULARY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bioinformatics | Cloning | DNA fingerprinting | DNA ligase | DNA microarray |
| Gel electrophoresis | Gene therapy | Genetic engineering | Genome | Genomics |
| Haplotype | Inbreeding | Pharmacogenomics | Plasmid | Polymerase chain reaction |
| Proteomics | Recombinant DNA | Restriction enzyme | Selective breeding | Single nucleotide polymorphism |
| Test cross | Transformation | Transgenic organism |  |  |

Chapter 14 – The History of Life

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cambrian explosion | Endosymbiont theory | Eon | Epoch | Era | Fossil |
| Geologic time scale | Half-life | K-T boundary | Law of superposition | Paleontologist | Period |
| Plate tectonics | Radiometric dating | Relative dating | Spontaneous generation | Theory of biogenesis |  |

Chapter 15 – Evolution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Adaptive radiation | Allopatric speciation | Analogous structure | Ancestral trait | Artificial selection | Biogeography |
| Bottleneck | Camouflage | Derived trait | Directional selection | Disruptive selection | Embryo |
| Evolution | Fitness | Founder effect | Genetic drift | Gradualism | Hardy-Weinberg principle |
| Homologous structure | Mimicry | Natural selection | Post-zygotic isolating mechanism | Pre-zygotic isolating mechanism | Punctuated equilibrium |
| Sexual selection | Stabilizing selection | Sympatric speciation | Vestigial structure |  |  |

**BIOLOGY 2022-23 READING GUIDE**

**Chapter 12 Molecular Genetics Reading Guide**

DIRECTIONS: Refer to your textbook to respond to the following questions.

1. Describe Frederick Griffith’s experiment shown below.



1. How did Oswald Avery identify the molecule that transformed the R strain of bacteria into the S strain?
2. Describe how Hershey and Chase definitively proved DNA was the transforming factor.
3. List the three parts of a DNA nucleotide.
4. Label the parts of the nucleotide below.



1. Name and draw DNA’s two purines.
2. Name and draw DNA’s two pyrimidines.
3. What is the most obvious difference between your drawings in number 6 and 7 above?
4. List three important features of Watson and Crick’s proposed DNA molecule.
5. Draw a DNA double helix and label the sugar, phosphate, and nitrogen bases.
6. Describe the orientation (direction) of the two strands in a DNA molecule.
7. How do nucleosomes form?
8. What is semiconservative replication?  What are the three main stages of this type of replication?
9. Describe the 3 main events during the unwinding stage of replication.
10. What is the role of DNA polymerase in replication?
11. Explain why DNA replication is more complex in eukaryotes than bacteria.
12. Describe the function of each of the following in protein synthesis: rRNA, mRNA, and tRNA
13. What happens during transcription?
14. Why is mRNA so much shorter than the DNA it is made from?
15. Differentiate between codons and anticodons.
16. What happens during translation?
17. Why has Beadle and Tatum’s “one gene, one enzyme” hypothesis been modified since they presented it in the 1940s.
18. What are the three parts of an operon?
19. Describe AND give an example of three types of DNA mutations.
20. Why do you think most mutations in eukaryotes are recessive?

**BIOLOGY 2022-23 READING GUIDE**

**Chapter 13 Genetics & Biotechnology**

DIRECTIONS: Refer to your textbook to respond to the following questions.

1. Describe how genetic engineering was used in regards to GFP.
2. What is a genome?
3. What are restriction enzymes used for?
4. In gel electrophoresis, why is an electric current necessary?
5. How is the pattern created by gel electrophoresis achieved?
6. How is recombinant DNA produced?
7. Explain the process of transformation.
8. Why is DNA sequencing useful to scientists?
9. What is polymerase chain reaction (PCR) used for?
10. Describe the three main steps involved in PCR.
11. How are transgenic organisms created?
12. What was the goal of the Human Genome Project?
13. How was one continuous human genome sequenced?
14. The protein coding regions of DNA are virtually identical in all humans. How does DNA fingerprinting distinguish between people?
15. What is the amino acid sequence of a start codon? The 3 stop codons?
16. What is a SNP?
17. What must be true for a variation to be considered a SNP?
18. Describe the HapMap Project.
19. List three disease of how gene therapy may someday be used to cure them.
20. Compare and contrast genomics and proteomics.