**Biology Textbook:** Chapters 12 and 13

**Standard:** BIO.B.1.2 Explain how genetic information is inherited

BIO.B.2.2 Explain the process of protein synthesis

BIO.B.2.3 Explain how genetic information is expressed

**Key Concepts:**

DNA Discovery and Structure DNA Replication Role of RNA RNA Synthesis The Genetic Code Translation Transcription Mutations

**Essential Questions**

1. How was the basic structure of DNA discovered?
2. What is the structure of DNA, and how does it function in genetic

material?

1. How do cells copy their DNA?
2. How does information flow from the cell nucleus to direct the synthesis

of proteins in the cytoplasm?

1. What is RNA?
2. How does RNA differ from DNA?
3. How does the cell make RNA? How does information flow from the cell nucleus to direct the synthesis of proteins in the cytoplasm?
4. How do cells make proteins?
5. What happens when a cell’s DNA changes?
6. How do cells regulate gene expression?
7. What is the genetic code and how is it read?
8. What is the central dogma of molecular biology?
9. What are mutations?
10. How do mutations affect a gene?

Can you show what you know?

Fold along the line and glue this side down in your Interactive Science Notebook.

**Vocabulary:** (+)= Can explain it; (-)= Only heard it 0=No Idea

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| --- | --- | --- | --- | --- |
| Page | Term | Pre | Post | Memory Clue |
|  | 1.DNA |  |  |  |
|  | 2.Nitrogenous Base |  |  |  |
|  | 3.Nucleotide |  |  |  |
|  | 4.Hydrogen Bond |  |  |  |
|  | 5.Double Helix |  |  |  |
|  | 6.Base Pairing Rule |  |  |  |

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**What I need to know/ Be able to do**

* **Diagram** the structure of a DNA molecule and describe its parts
* **Describe** the history of the DNA molecule and the scientists involved in its discovery
* **Use** the base pairing rule to replicate a DNA molecule
* **Describe** the function of DNA in heredity
* **Summarize** the relationship among DNA, chromosomes and a genome
* **Explain** the basic process of DNA replication
* **Compare and Contrast** DNA and RNA in terms of structure, nucleotides and base pairs
* **Diagram** the structure of a RNA molecule and describe its parts
* **Compare and Contrast** the different forms of RNA
* **Use** the base pairing rule to create an mRNA molecule
* **Describe** the function of RNA in protein creation
* **Summarize** the relationship among DNA, RNA and Protein
* **Explain** the basic process of the central dogma of molecular biology
* **Define mutations** and describe the different types of mutations.
* **Describe** the effects mutations can have on genes

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| Page | | Term | | Pre | | Post | | Memory Clue | |
|  | | 7. RNA | |  | |  | |  | |
|  | | 8. Genome | |  | |  | |  | |
|  | 9.Chromosome | |  | |  | |  | |
|  | 10.DNA Replication | |  | |  | |  | |
|  | 11. DNA Polymerase | |  | |  | |  | |
|  | 12. RNA Synthesis | |  | |  | |  | |
|  | 13.Messenger RNA | |  | |  | |  | |
|  | 14. Ribosomal RNA | |  | |  | |  | |
|  | 15. Transfer RNA | |  | |  | |  | |
|  | 16. Transcription | |  | |  | |  | |
|  | 17. RNA Polymerase | |  | |  | |  | |
|  | 18. Promoters | |  | |  | |  | |
|  | 19. Polypeptide | |  | |  | |  | |
|  | 20. Codon | |  | |  | |  | |
|  | 21. Translation | |  | |  | |  | |
|  | 22. Anticodon | |  | |  | |  | |
|  | 23. Mutation | |  | |  | |  | |
|  | 24. Point Mutation | |  | |  | |  | |
|  | 25. Frameshift Mutation | |  | |  | |  | |
|  | 26. Polyploidy | |  | |  | |  | |
|  | 27. Cancer | |  | |  | |  | |
|  | 28. Benign | |  | |  | |  | |
|  | 29. Malignant | |  | |  | |  | |
|  | 30. Karyotype | |  | |  | |  | |