



Unit 2 Genetics

High School Biology

Unit Length and Description:

9 Instructional Weeks

- **Bend 1:** Students will investigate genetics and heredity, and ask questions about the phenomenon of a group of boys with Duchenne Muscular Dystrophy. Students will investigate the function and role of proteins, DNA, and inheritance in the disorder. Students figure out the role of a heritable genetic mutation, and how heritable traits and disorders are related to the structure and function proteins. Students will also explore different ways that heritable diseases are passed to offspring.
- **Bend 2:** Students will investigate genetics and heredity, and ask questions about the phenomenon of a group of boys with Duchenne Muscular Dystrophy. Students will investigate the function and role of proteins, DNA, and inheritance in the disorder. Students figure out the role of a heritable genetic mutation, and how heritable traits and disorders are related to the structure and function proteins. Students will also explore different ways that heritable diseases are passed to offspring. Students then ask questions about how we can use genetic engineering technologies to cure genetic disorders and explore the ethical implications of need technologies such as CRISPR-Cas9.

Science Standards:

- HS-LS1-1** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
- HS-LS1-4** Use a model to illustrate the role of the cell cycle and differentiation in producing and maintaining complex organisms.
- HS-LS3-1** Formulate, refine, and evaluate questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
- HS-LS3-2** Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
- HS-LS3-3** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**Enduring Understandings-
Unit Anchor Phenomenon:**

**Essential Questions-
Reflective Summaries:**

Bend 1 & Bend 2:

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| <ul style="list-style-type: none">• Bend 1: Several young boys experience progressive weakness, wasting, and degeneration of their skeletal muscles.• Bend 2: CRISPR gene therapy techniques seem more promising than others in treating genetic disorders. | <ul style="list-style-type: none">• Construct an explanation based on evidence for how structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.• Describe the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.• Make a claim supported by evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.• Apply the concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. |
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