

Pre-Lab, Skills, and Standards Alignments

**OBSERVING MUTANT ORGANISMS**

Mutations are changes in DNA that can sometimes lead to variation in traits. Through a comparison of wild-type and mutant strains of *Drosophila* fruit flies - a common model organism in genetic research - students will observe how mutations can affect genetic traits, and draw conclusions about the role that mutations play in natural selection, evolution, and genetic disease.

**Lab Length:** 1 hour

**Suggested Pre-Lab Teaching**

- DNA structure and function
- Heredity

**Lab Skills**

- Use a stereo microscope to magnify and view *Drosophila* fruit flies
- Record and describe observations of wild type and mutant fruit fly traits.

**Conceptual Knowledge/Skills (Post Lab)**

- Classify the shared characteristics of model organisms used in genetic research.
- Draw conclusions about the fitness of flies with different observed trait variations.
- Describe the role of mutations in species survival and evolution.
- Explain why sometimes mutations have no effect on an organism's traits.

**New York State Science Learning Standards/NGSS**

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Constructing Explanations and Designing Solutions</u> Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.</p> <p><u>Developing and Using Models</u> Develop and use a model to describe phenomena.</p>	<p><u>LS1.A: Growth and Development of Organisms</u> Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (MS-LS3-2)</p> <p><u>LS3.A: Inheritance of Traits</u> Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (MS-LS3-1)</p> <p><u>LS3.B: Variation of Traits</u> In addition to variations that arise from sexual reproduction, genetic</p>	<p><u>Structure and Function</u> Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.</p> <p><u>Cause and Effect</u> Cause and effect relationships may be used to predict phenomena in natural or designed systems.</p>



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	information can be altered because of mutations. Some changes are beneficial, others harmful, and some neutral to the organism. (MS-LS3-1)	
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