

Code for the standard name      Standard Title      BLUE FONT designates a "Science and Engineering Practice"      ORANGE FONT designates a "Disciplinary Core Idea"      GREEN FONT designates a "Cross Cutting Concept"

<b>STANDARD</b>	<b>MS.LS-GDRO Growth, Development, and Reproduction of Organisms</b>						
<b>FOUNDATION BOXES</b>	<p><b>Essential Questions:</b> How do organisms grow and develop? How are the characteristics of one generation related to the previous generation? Why do individuals of the same species vary in how they look, function, and behave? Students will demonstrate understanding of the growth, development, and reproduction of organisms by:</p> <ol style="list-style-type: none"> <li><b>Using evidence to support explanations of how environmental and genetic factors affect the growth of organisms.</b> Assessment Boundary: The genetic factors affecting growth are normal growth ranges (e.g., inherited traits for growth potential, species normal size, growth rate).</li> <li><b>Developing an explanation for how plant growth continues throughout the plant's life through production of plant matter through photosynthesis.</b> Assessment Boundary: Reproduction is not treated in any detail here, for more specifics of grade level see LS3.A.</li> <li><b>Using models and/or simulations to construct an explanation of how the genetic contribution from each parent in sexual reproduction contributes to variation in individuals.</b> Assessment Boundary: The emphasis is on the impact of gene transmission in reproduction, not the mechanism.</li> <li><b>Constructing an argument explaining how specialized plant structures and specific animal behaviors (e.g., placement of stamen and bees gathering nectar, hard shells on pine nuts, squirrels burying nuts) are related to successful reproduction of plants.</b></li> <li><b>Identifying and evaluating the impact of birds building nests to protect young, brown trout spawning in late fall when predators are less active) of animals on their odds of successfully reproducing.</b></li> <li><b>Providing explanations of how changes (mutations) to genes, which are located on chromosomes, affect specific inherited traits resulting in harmful, beneficial, or neutral effect.</b></li> </ol> <table border="1"> <thead> <tr> <th data-bbox="714 600 1050 641">Science and Engineering Practices</th> <th data-bbox="1050 600 1617 641">Disciplinary Core Ideas</th> <th data-bbox="1617 600 1879 641">Crosscutting Concepts</th> </tr> </thead> <tbody> <tr> <td data-bbox="714 641 1050 1250"> <p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>Use models to explore relationships between variables, especially those representing input and output. 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Animals' growth is controlled by genetic factors, food intake, and interactions with other organisms, and each species has a typical adult size range. (a)</li> </ul> <p><b>LS3.A: Inheritance of Traits</b></p> <ul style="list-style-type: none"> <li>Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. (g)</li> <li>Each distinct gene chiefly controls the production of specific proteins, which in turn affect the traits of the individual (e.g., human skin color results from the actions of proteins that control the production of the pigment melanin). (c)</li> <li>Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (f)</li> <li>Sexual reproduction provides for transmission of genetic information to offspring through egg and sperm cells. 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<b>CONNECTION BOXES</b>	<p>Connections to other topics in this grade-level: Will be added in future draft releases          Articulation across grade-levels: Will be added in future draft releases          Common Core State Standards Connections:          ELA – Will be added in future draft releases          Mathematics – Will be added in future draft releases</p>						

**STANDARD**

**FOUNDATION BOXES**

**CONNECTION BOXES**

RED FONT designates a "Assessment Boundary Statement"

Lowercase letters designates which of the student performance expectations use this practice

Lowercase letters designates which of the student performance expectations use this disciplinary core ideas

Lowercase letters designates which of the student performance expectations incorporates this cross cutting concept