**Life Sciences**

**MS-LS3 Heredity: Inheritance and Variation of Traits**

**MS-LS3-1 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of an organism.**

Further explanation: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.

Developing and using models; inheritance of traits; variation of traits; structure and function

**MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.**

Further explanation: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and the resulting genetic variation. Connections can be made to Maine agricultural crops, i.e. strawberries, blueberries, and potatoes.

Developing and using models; growth and development of organisms; inheritance of traits; variation of traits; cause and effect