DCI: From Molecules to Organisms: Structures and Processes

**MS.LS1.B: Growth and Development of Organisms**
Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (MS-LS3-2)

DCI: Heredity: Inheritance and Variation of Traits

**MS.LS3.A: Inheritance of Traits**
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)

**MS.LS3.B: Variation of Traits**
In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (MS-LS3-2)

Science and Engineering Practices

**Developing and Using Models**
Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. Develop and use a model to describe phenomena. (MS-LS3-1), (MS-LS3-2)

Crosscutting Concepts

**Cause and Effect**
Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2)

**Structure and Function**
Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS3-1)