## 1. MS-LS1: From Molecules to Organisms — Structure and Processes

Students demonstrate understanding of cell and organism structure and processes by:

**MS-LS1-1**: Conduct an investigation to provide evidence that living things are made of cells (unicellular or multicellular).
**MS-LS1-2**: Develop and use a model to describe the function of a cell as a whole and how cell parts contribute to function.
**MS-LS1-6**: Construct a scientific explanation using evidence for the role of **photosynthesis** in the cycling of matter and flow of energy into and out of organisms.
**MS-LS1-7**: Develop a model to describe how **food is rearranged through chemical reactions** to support growth and/or release energy as it moves through an organism.

*(Depending on classroom/course organization, some Grade 7 implementations may also include MS-LS1-3 through MS-LS1-5 in broader unit sequences, but the core set above is widely used in Grade 7 life science curricula.)*

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## 2. MS-LS2: Ecosystems — Interactions, Energy, and Dynamics

Students analyze interactions within ecosystems:

**MS-LS2-1**: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations.
**MS-LS2-2**: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
**MS-LS2-3**: Develop a model to describe the **cycling of matter and flow of energy** among living and nonliving parts of an ecosystem.
**MS-LS2-4**: Construct an argument supported by evidence that changes to physical or biological components of an ecosystem affect organisms and populations.
**MS-LS2-5**: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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## 3. MS-LS3: Heredity — Inheritance and Variation of Traits

Students explore how traits are passed and vary:

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

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## 4. MS-LS4: Biological Evolution — Unity and Diversity

Students investigate patterns of evolution:

**MS-LS4-1**: Analyze and interpret data for patterns in the fossil record documenting existence, diversity, extinction, and change of life forms over time.
**MS-LS4-2**: Apply scientific ideas to construct an explanation for anatomical similarities and differences among modern and fossil organisms to infer evolutionary relationships.
**MS-LS4-3**: Analyze pictorial data to compare patterns of similarities in embryological development across multiple species.
**MS-LS4-4**: Construct an explanation based on evidence for how natural selection leads to changes in populations over time.
**MS-LS4-5**: Gather and synthesize information about **the influence of humans on the inheritance of desired traits in organisms** (e.g., artificial selection).
**MS-LS4-6**: Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.