Core Idea LS1

**From Molecules to Organisms: Structures and Processes**

*How do organisms live, grow, respond to their environment, and reproduce?*

- life
- organism
- cells
- nonliving
- died
- structure
- function
- hierarchical structure
- chemical foundation
- elements
- atoms
- species
- populations
- ecosystems
- animals
- plants
- algae
- fungi
- bacteria
- microorganisms
- respond to stimuli
- environment
- homeostasis
- grow/th
- reproduce/tion
- genetic information
- offspring
- genetic information
- mutation
- gene
- generations
- natural selection
- evolve
- energy

LS1.A: STRUCTURE AND FUNCTION

*How do the structures of organisms enable life's functions?*

- anatomy
- morphology
- functions
- molecular-scale processes
- organism-level physiology
- behaviors
- neurobiology
- psychology
- tissue
- organ /systems (e.g., circulatory, respiratory, nervous, musculoskeletal)
- chemical reactions
- water
- proteins
- carbohydrates
- lipids
- nucleic acids
- DNA
- Chromosomes
- Enzymes
- Plant
- Root
- Stem
- Leave
- flower
- fruits
- survival
- behavior
- macroscale systems
- microscopic
- unicellular
- multicellular
- microorganisms
- cell membrane
- Feedback
- internal condition
- external temperature
- positive feedback
- negative feedback
- living system

## LS1.B: GROWTH AND DEVELOPMENT OF ORGANISMS

*How do organisms grow and develop*?

- cell division
- mitosis
- daughter cells
- differentiation
- sexual reproduction
- meiosis
- sex cells
- gametes (sperm and eggs)
- spores
- chromosome
- parent cell
- unique and diverse life cycles
- birth
- sprouting in plants)
- sexual
- asexual
- offspring
- photosynthesis
- fertilized egg
- embryo
- sexual reproduction

## LS1.C: ORGANIZATION FOR MATTER AND ENERGY FLOW IN ORGANISMS

*How do organisms obtain and use the matter and energy they need to live and grow?*

- energy inputs
- matter inputs
- matter and energy capture, transformation, transport, release, and elimination
- matter and energy flow
- organizational levels—cells, tissues, organs, organisms, populations, communities, and ecosystems—of living systems
- chemical
- element
- products
- chemical
- molecules

- energy needed for life is ultimately derived from the sun through photosynthesis
- energy is derived from reactions involving inorganic chemicals in the absence of sunlight—e.g., chemosynthesis
- Plants, algae (including phytoplankton)
- energy-fixing microorganisms
- carbon dioxide
- photosynthesis
- plant matter
- oxygen
- decomposers—are energy-fixing organisms that sustain the rest of the food web.
- energy-fixing organisms
- food
- food web
- minerals
- anaerobic life
- bacteria
- body repair
- growth and
- digestion
- body warmth (cold and warm blooded)
- Plants, algae (including phytoplankton)
- microorganisms
- sugars (food)
- carbon-containing
- hydrocarbon backbones
- amino acids
- proteins
- DNA
- aerobic (in the presence of oxygen)
- cellular respiration
- muscles
- anaerobic (without oxygen)
- ecosystem