🌿Module 4: Biological Sciences - Life, Ecology, and Living Systems

(Science – Life Science & Environmental Systems)

🌿Core Focus

From microscopic cells to vast ecosystems, this module explores the systems of life that thrive on Earth.
Students examine biological structures, interactions among organisms, and the balance required for sustainable ecosystems across land, sea, and air.

Key Concepts & Learning Goals

Theme	Topics
1. What is Life?	- Characteristics of living things - Cells as the basic unit of life - Classification of life (domains and kingdoms)
2. Cell Biology	- Structure and function of cells - Cell organelles and their roles - Photosynthesis and cellular respiration
3. Genetics & Inheritance	- DNA, genes, chromosomes - Traits and heredity - Variation and mutation
4. Organism Structure & Function	- Human and animal body systems - Plant structures and adaptations - Functionality in relation to survival
5. Ecosystems & Habitats	- Food chains and webs - Biomes (forest, desert, ocean, tundra, grassland) - Producers, consumers, and decomposers
6. Environmental Science	- Climate change and pollution - Natural resource management - Biodiversity and conservation
7. Interdependence & Adaptation	- Symbiosis, predation, competition - Evolution and natural selection - Adaptation in extreme environments
8. Sustainability in Living Systems	- Human impact on the biosphere - Sustainable agriculture and green living - Ecological design and restorative practices

---

🍁Hands-On Activities

- **Build-a-Cell Craft Project**
- **Microscope Life Lab**
- **DNA Modeling Activity**
- **Local Ecosystem Field Study**

- **Carbon Cycle Simulation**
- **Design a Sustainable Microhabitat**

🍂STEAM Integration

- **Science**: Cell biology, anatomy, ecology, genetics
- **Technology**: Microscopy, genetic analysis, ecosystem modeling
- **Engineering**: Sustainable system design, biotechnologies
- **Arts**: Habitat illustrations, ecosystem posters
- **Math**: Population graphs, probability in genetics, carbon impact models

---

21st Century Skills Emphasized

- Environmental Literacy
- Systems Thinking
- Analytical Observation
- Sustainable Design Mindset