



## G-E-T Middle School Curriculum

### Align, Explore, Empower

Scope and Sequence

Grade 7 Science

#### Inquiry Skills

~throughout school year

We are dedicated to enhancing the inquiry skills of all learners that come through our district. The inquiry skills we value are basic process skills and integrated process skills. Basic process skills include skills such as observing, predicting, and classifying. While integrated process skills include developing hypotheses, interpreting data, and drawing conclusions. In 7<sup>th</sup> grade, students will develop these skills throughout the year at a level two.

#### Unit 1 - Ecology and the Environment

~ 11 weeks

In this unit, students will gain understanding of...

1. The organization of parts within an ecosystem.
2. How environmental changes affect living things and how they react to these changes.
3. The energy roles that organisms play in an ecosystem and the part they play in cycles of matter.
4. The importances of natural resources and how to use them in a sustainable way.

#### Standards for Grade 7 Science

The students will:

- LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- LS2-5 Evaluate competing design solutions maintaining biodiversity and ecosystem services.
- ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

- LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

## Unit 2 - Cells and Heredity

~ 11 weeks

In this unit, students will gain understanding of...

1. The structures and functions of cells and how they are organized in many-celled organisms.
2. How cells obtain and use energy.
3. Heredity and how traits result from inheritance and environmental factors.
4. How organisms adapt over time due to environmental changes and some species have similar structures that support the theory of evolving from a common ancestor.
5. Advances in genetic engineering technologies.

## Standards for Grade 7 Science

The students will:

- LS4-2 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
- LS4-5 Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- LS1-2 Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.
- LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- 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 the organism.

- 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.
- LS4-4 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- 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.

Unit 3 - Diversity of Life

~ 10 weeks

In this unit, students will gain understanding of...

1. The structures and environmental roles of microscopic organisms.
2. The structures and environmental roles of plants and animals.

Standards for Grade 7 Science

The students will:

- LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Unit 4 - Human Body Systems

~ 4 weeks

In this unit, students will gain understanding of...

1. The levels of organization and system interactions in the human body.
2. How body systems interact to maintain homeostasis and defends against pathogens.
3. The structures and functions of the nervous system.
4. How the nervous system processes the sense of sight.

## Standards for Grade 7 Science

The students will:

- LS1-8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Blue = Mastery Level Standard

Red = Content Knowledge Standard