3rd Grade: From Molecules to Organisms: Structures and Processes

Life Cycles and Traits: Growth, development and Reproduction is essential to the continued existence of every kind of organism.

Vertebrates : Animals with backbones.
Vertebrates can be further divided into fish, amphibians, reptiles, birds, and mammals.

Invertebrates : Animals without a backbone
Some have a hard outer covering or a shell. Examples include insects, crabs, or clams.
Others do not have a hard outer covering or shell. Examples include jellyfish and worms.
Other examples of invertebrates are shrimp, crayfish, sponges, sea stars, or snails.

Animal Family	Stages of Development	Examples
Mammal	Young—Adult	Raccoon, whale
Reptile	Egg – Young – Adult	Snake, turtle, lizard, alligator
	Young – Adult	Rattlesnake (live birth)
Amphibian	Egg – Young – Adult	Frog, toad, salamander
Insect	Egg—Larva—Pupa—Adult	Butterfly, beetle, housefly, mosquito
	Egg—Young—Adult	Grasshopper, cockroach, praying mantis
Bird	Egg – Young – Adult	Chicken, robin, hawk, duck
Fish	Young—Adult	Most Sharks: Ex: Hammerhead, Great White, Bull Sharks
	Egg – Young— Adult	Seahorse, minnows, @25% sharks (“mermaid purse)

Some animals begin as an egg and then undergo changes in their life cycle. These changes may be in appearance, color, shape, or growth of new structures. These changes in form are called **metamorphosis.**

Plant terms introduced in 1st grade Plant pollination introduced in 2nd grade

Mature Plant: have the same structures (roots, stems, leaves) as seedlings, They are able to reproduce using flowers or cones, which produce seeds.

- **Flowering plants** make seeds within their flowers.
- **Seed** : After pollination (spreading of pollen from flower to flower) occurs, seeds are produced and may be stored in fruits. Seeds contain tiny undeveloped plants and enough food for growth to start. Seeds need water and warmth to **germinate** (begin to grow).
- **Non-flowering plants** are those plants that make seeds within cones or produce spores instead of seeds.

South Carolina is divided into regions. Each region has similar geographic features.

- Blue Ridge Region has mountains and forests.
- Piedmont Region has rolling hills, valleys, and rivers. The word piedmont means “foot of the mountain.” The Sandhills Region has rolling hills made up of sand and clay.
- Inner Coastal Plain has rich farmland.
- **Coastal Zone** is long, narrow, and closest to the ocean. It has beaches, **salt marshes, swamps, harbors, and barrier islands.**

Ecosystems: Interactions, Energy, and Dynamics

Introduced in 2nd grade* ***Habitat*

If those habitats are degraded or lost, it's bad news for the living things that depend on them for their survival. Ex: erosion

Ecosystems The living organisms (ex: plants and animals) and the nonliving organisms (ex: rocks

and water) that interact in an environment. **Salt marsh:** ecosystem between land and ocean

Salinity of the water is a major factor determining which plant and animal species will successfully inhabit the salt marsh tidal creek ecosystem.

Population All members of one kind of organism that live in a particular area.

Communities All of the different populations of organisms in an area that are coexisting at the same time.

Heredity: Inheritance and Variation of Traits Many characteristics of organisms are **inherited** from their parents. Some characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.

- Examples of animal characteristics may be type and color of body coloring, type and shape of sensory organs, or body structure. (Fish- Similarities: tails, fins, scales Differences: color, size, mouth shape)
- Examples of plant characteristics may be the shape of leaves, color of flowers, or type of fruit.

Natural Selection

Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.

- Examples: plants that have larger thorns than other plants may be less likely to be eaten
- Ex: animals that have better camouflage may be more likely to survive and produce offspring.

Environmental factors or physical changes in habitat such as temperature, availability of resources, exposure to sunlight may affect the traits that an organism develops. Examples:

- not enough water produces plants that are shorter and have fewer flowers than plants that had more water available, etc.)
- amount or food, amount of water, amount of exercise an animal gets, chemicals in the water, etc.) that may influence organisms' traits

*Organisms in the salt marsh- tidal creek ecosystem must be adapted to survive changes in salinity.

How might touching things in nature disturb them? Why is it important to leave nature alone?

*For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all***.**

Structural Adaptations allow for:

- Locomotion: climbing and traction (squirrel claws), flying (bird wings) , crawling (webbed lizard feet), walking (dog paws), or hopping (grasshopper legs)
    - In the water: floating (jellyfish), swimming (fish fins), or diving (dolphin and penguin flippers)
- Obtaining resources: Ex: beaks of birds are shaped according to the available food. Teeth or claws are shaped in different ways depending on the type of food they can eat.
- Some plants have leaves that turn toward the Sun so they can get the most sunlight possible.
- Some plants have leaves that wilt when they get too hot or when the plant does not get enough water.
- In the autumn, some leaves change color. In winter, some trees shed their leaves.

Behavior (a complex set of responses to stimuli) Responses

- **Camouflage** is a color or pattern that allows an animal to blend into its environment and protects it from being seen by its enemies or allows it to sneak up more easily on its food.
- **Mimicry** When weaker animals copy stronger animals' characteristics to warn off predators.
- **Hibernation**
- **Migration**
- **Grouping**: Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.

- ❖ Groups can be collections of equal individuals, hierarchies with dominant members, small families, groups of single or mixed gender, or groups composed of individuals similar in age. Some groups are stable over long periods of time, others are fluid, with members moving in and out. Some groups assign specialized tasks to each member, in others, all members perform the same or a similar range of functions.

Biological Evolution: Unity and Diversity

Fossil: Analyze and interpret **fossils** to provide evidence of organisms and the environments in which they lived long ago.

Earth's Systems: **Weather vs Climate**

Weather Conditions: The typical weather conditions expected during a particular season

Temperature,Precipitation, Wind Direction and **Wind Speed** (measured with an anemometer) changes can indicate storms or temperature changes

Clouds: can indicate weather conditions

Climate: Describes the range of an area's typical weather conditions over a long period of time. **Seasons:** effects on Earth due to the change in the amount of sunlight caused by the tilt of Earth's axis. (discussed in 1st grade)

Natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

Severe weather conditions called storms occur when pressure differences cause rapid air movement.

- **Thunderstorms are** a storm with thunder, lightning, heavy rains and strong winds; form within large cumulonimbus clouds; usually form along a cold front but can form within an air mass.
  Action: Do not stand under a tree; stay away from water (pools, bathtubs)
- **Tornado** is a rapidly whirling, funnel-shaped cloud that extends down from a storm cloud; the very low pressure and strong winds can cause great damage to people and property; they are likely to form within the frontal regions where strong thunderstorms are also present.
  Action: Stay indoors away from windows
- **Hurricane** is a low pressure tropical storm that forms over warm ocean water; winds form a spinning circular pattern around the center, or eye, of the storm; the lower the air pressure at the center, the faster the winds blow toward the center of the storm.
  Action: Stay indoors away from windows