SKELETONS: Museum of Osteology

Junior Veterinarians

Teacher Resource

Grade Levels: 3rd – 5th Grade

3rd Grade:
Florida Next Generation Sunshine State Science Standards

SC.3.N.1.1 – Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.

SC.3.N.1.2 – Compare the observations made by different groups using the same tools and seek reasons to explain the differences across groups.

SC.3.N.1.3 – Keep records as appropriate, such as pictorial, written, or simple charts and graphs, of investigations conducted.

SC.3.N.1.5 – Recognize that scientists question, discuss, and check each other's evidence and explanations.

SC.3.N.1.6 – Infer based on observation.

SC.3.N.1.7 – Explain that empirical evidence is information, such as observations or measurements, that is used to help validate explanations of natural phenomena.

SC.3.L.15.1 – Classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates, those having live births and those which lay eggs) according to their physical characteristics and behaviors.

4th Grade:
Florida Next Generation Sunshine State Science Standards

SC.4.N.1.1 – Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.

SC.4.N.1.2 – Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups.

SC.4.N.1.5 – Compare the methods and results of investigations done by other classmates.

SC.4.N.1.6 – Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.

SC.4.L.16.2 – Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment.

SC.4.L.17.4 – Recognize ways plants and animals, including humans, can impact the environment.

SC.4.N.2.1 – Explain that science focuses solely on the natural world.

5th Grade:
Florida Next Generation Sunshine State Science Standards

SC.5.N.1.1 – Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.5.N.1.4 – Identify a control group and explain its importance in an experiment.

SC.5.N.1.5 – Recognize and explain that authentic scientific investigation frequently does not parallel the steps of "the scientific method."

SC.5.N.1.6 – Recognize and explain the difference between personal opinion/interpretation and verified observation.

SC.5.L.14.1 – Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs.

SC.5.L.15.1 – Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

SC.5.L.17.1 – Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.
SC.5.N.2.1 – Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.

Program Overview:
As *Junior Veterinarians*, students will work hands-on with osteological specimens that feature different pathologies or abnormalities, working together to decide how the animal was injured and what steps would have been taken if the animal had received veterinary care to prevent or cure the pathology.

Learning Objectives:

- Participants will successfully identify types of diseases, illnesses, or traumas by examining a variety of specimens (skeletal and otherwise).
- Participants will successfully work in a team environment and communicate their observations to their fellow classmates.

Background:

The *Jr. Veterinary* program introduces students to the world of forensic science. After a basic introduction, students will break-up into teams for hands on evaluation of the pathology of various specimens. Students will attempt to determine the cause of the abnormality, and the effect it would have had on the animal's life. After the analysis is completed, the team will report their discoveries to the class.

Vocabulary:

Antibiotics: Antibiotics are types of medicines that will search out and destroy bacteria

Bone Remodeling: the process of old bone being removed and new bone growing

Cannon: A bone in the legs of hoofed animals made up of long fused hand and foot bones

Carnivore: animals that primarily eat meat

Defense: a behavior exhibited by an animal to protect itself from attack

Femur: thighbone

Herbivore: animals that primarily eat plants

Humerus: the long bone between the arm and the elbow

Infection: when a parasite, disease, or virus invades the body

Mandible: an animal's jawbone

Omnivore: an animal that eats meat and plants

Parasite: an organism that lives in or on a host and survives by taking nutrients from the host to survive

Pathology: the study of diseases

Predator: animals that attack and eat other animals

Prey: animals that are attacked and eaten by other animals

Stitches: a thread that is used to hold tissue together after an injury or surgery

Tibia/Fibula: the bones between the knee and the ankle

Trauma: a physical injury or wound

Vertebrate: animals with backbones

X-ray: waves of energy that can show images or pictures inside of an object, such as the human body

Reference: visit the SKELETONS: Museum of Osteology Education web page at:
http://skeletonmuseum.com/education

While at SKELETONS:

- Visit the Pathology Exhibit and have your students discuss how they would tell the difference between healthy bone versus diseased bone.
- Locate the 6 Pack Turtle in the Pathology Exhibit and discuss how this injury would have impacted this animal's ability to survive.
- Have students try and determine the possible cause(s) of a particular pathology.
- Locate different healed and broken bones of animals throughout the museum.
- Find the reptile with the pathology in the Comparative Anatomy Exhibit.
- Find the pathologies in the Manatee Exhibit and discover what caused them.