

SKELETONS: Museum of Osteology

Pathology

Teacher Resource

Grade Levels: 9th-12th

9-12th Grade:

Florida Next Generation Sunshine State Science Standards

SC.912.N.1.2 -- Describe and explain what characterizes science and its methods.

SC.912.N.1.3 -- Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.

SC.912.L.14.1 – Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.

SC.912.L.14.6 - Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.

SC.912.L.14.12 - Describe the anatomy and histology of bone tissue.

SC.912.L.14.14 - Identify the major bones of the axial and appendicular skeleton.

SC.912.L.14.17 - List the steps involved in the sliding filament of muscle contraction.

SC.912.L.14.19 - Explain the physiology of skeletal muscle.

SC.912.L.14.50 - Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems.

SC.912.L.14.52 - Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.

SC.912.L.16.8 - Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.

SC.912.L.16.10 - Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.

SC.912.L.17.8 - Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

Program Overview:

The *Pathology* 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 discover the possible 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.

Learning Objectives:

- Students will identify and compare a damaged bone versus its undamaged counterpart.
- Students will examine various pathological specimens, and attempt to determine how the trauma, disease, or infection would have impacted the animal's life.
- Students will work in teams and communicate their ideas with their peers.

Background:

The pathology of a bone can tell you what may have caused an animal's death. Pathology is the study of damage that may be the result of trauma, disease or infection. These pathologic conditions might tell you if the animal was hit by a car, shot by a gun, died from a disease or was killed by another animal.

Vocabulary:

Cannon: The fused (reduced) foot bones of deer, cows, etc. that connect the ankle to the toes

Femur: The upper hind leg bone

Humerus: The upper front leg bone (arm)

Mandible: The jaw bone

Metatarsal: The bones of the hind foot located between the ankle and toe bones

Pathology: Damage as a result of trauma, disease or infection

Radius/Ulna: The two bones that comprise the lower forearm (front leg)

Tibia: The lower hind limb bone (shin)

Reference: visit the SKELETONS: Museum of Osteology Education web page at:

<http://skeletonmuseum.com/education>

Recommended Reading:

Gilbert, B. Miles

1990 *Mammalian Osteology*. Missouri Archaeological Society, Columbia, MO.

Roest, Aryan I.

1991 *A Key Guide to Mammal Skulls and Lower Jaws*. Mad River Press, Inc., Eureka, CA.

Searfoss, Glen

1995 *Skulls and Bones*. Stackpole Books, Mechanicsburg, PA.

While at SKELETONS:

- Visit the exhibit on pathology and have your students discuss the scientific process they would use to evaluate the pathology.
- Have student try and determine the possible cause(s) of a particular pathology.
- Visit the Pathology Exhibit and have your students discuss the scientific process they would use to evaluate pathologies.
- 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.