



5th Grade Body Systems Unit Bones and Skeletons Module Overview

The Body Systems unit is taught using two modules: Insights *Bones and Skeletons* and Insights *Human Body Systems*. The modules provide opportunities for students to investigate the relationship between structure and function in living organisms as well as the interconnected nature of the body systems.

In the *Bones and Skeletons* module, students are first introduced to “mystery bones” extracted from an owl pellet, which they use as a tool to investigate their own skeletal and muscular systems. These “mystery bones” offer an inquiry-based approach to studying the skeletal and muscular systems. The students make and record observations of the “mystery bones” and then draw inferences about these bones as well as their own skeletal and muscular systems. In this way, students are able to study body systems that are not easily observed.

Essential Questions:

Bones and Skeletons Module

1. How do the parts of an animal relate to its needs and habitat?
2. How are systems in the human body like systems in other animals?
3. How do the skeletal and muscular systems work together to create movement?
4. What are “scientific investigations?”

Unit Questions:

Bones and Skeletons Module

1. What does the skeletal system do?
2. What does the muscular system do?

Lesson Summary

Bones and Skeletons Module (Sections paraphrased from *Bones and Skeletons*, pp I37-I39)

Learning Experience 1 (The Mysterious Object): Students are introduced to their “mystery object,” an owl pellet. Students make and record observations of the object. During the lesson, students come to understand that scientific investigations may take many different forms and that observational work of specimens constitutes scientific investigations.

Learning Experience 2 (The Clues): Students continue to investigate the mystery object by opening it and extracting the bones. The bones are sorted by shape and size. Through discussion, the students are encouraged think of other ways in which the bones can be categorized as well as their structure and function. Students are also encouraged to make inferences about the bones and communicate the evidence that supports these inferences.

Learning Experience 3 (Mystery Bones): Each pair of students will pick one bone that they find interesting. The students will describe this bone in as much detail as they can. Students are also asked to infer what they think the bone might be and its function. These inferences are to be supported by evidence from their observations. As a class discussion, each pair will share one observation and one question that they have concerning their mystery bone.

Learning Experience 4 (Human Bones): Students are asked to reflect on past learning experiences and respond to the question “What don’t we know about our bones?” The students share all they know about the human skeleton during a small group brainstorm session. Using their own bodies as reference, students sketch in the bones of the human body on a body outline. As a group, students create a new drawing that illustrates the bones they “know exist,” bones they “think exist,” and the areas of the human skeleton that they “want to know what is in this area.”

Learning Experience 5 (Major Bone Groups): Working in small groups, students use “bone group” cards to identify six major bone groups of the human skeleton. They are then asked to use the characteristics of the bones in each group to discuss and describe the functions of the groups.

Learning Experience 6 (Mystery Bone Groups): Students apply what they learned about the six major bone groups in Learning Experience 5 to their mystery bones. Students classify the mystery bones into the six major bones groups and begin to make connections between the structure and function in humans and the structure and function in other animals.

Learning Experience 7 (Teeth and Jaws): Students continue to investigate the relationship between structure and function by examining their own teeth and the teeth of other animals. They identify the various forms of teeth and their functions. Students apply these ideas when they look at drawings of skulls, jaws, and teeth of other animals. They are asked to infer what the animals eat and classify them as carnivore, omnivore and herbivore.

Learning Experience 8 (Mystery Teeth): Students apply the ideas from the previous lesson to their mystery bones. They look for evidence of a skull, jaw, or teeth among the mystery bones and sketch the structures that they find. The students attempt to classify the animal skeletons found in the owl pellets as omnivore, herbivore, or carnivore.

Learning Experience 9 (Comparing Animal Skeletons): Students look at the full skeleton of different animals. They compare five animal skeletons and focus closely on the similarities and differences in shape. Using information from the animal skeleton cards as well as information from the previous lessons, students make inferences about the way the animal moves, the kind of food it eats, and how it behaves in its habitat.

Learning Experience 10 (Types of joints): Students investigate the different types of joints that allow the skeleton to move. They observe movement in their bodies, record

where they think that movement occurs, and describe the movement. Students are introduced to three major joint types: hinge joints, ball and socket joints, and gliding joints. Once the students understand how these joints allow for different types of movement, they look for evidence of these joints in their mystery bones.

Learning Experience 11 (Human Bones Revisited): In this embedded assessment, students draw the bones of the body on an outline of the human body. The exercise facilitates student reflection on what they have learned concerning the major bone groups, the placement of the bones in the body, and how the bones are connected (at joints). The students will compare these sketches with those complete in Learning Experience 5.

Learning Experience 12 (Movement): Students are guided through a series of activities that allow them to investigate how their bodies move. Through this exploration, the students decide what else is needed besides bones and joints for movement to occur. After exploration and discussion, students draw the bones in their upper arm. With the guidance of the teacher, students begin to understand the muscles involved in movement.

Learning Experience 13 (Chicken Wing Dissection): Through this activity, students investigate how the chicken wing moves. They observe the role of muscle, tendons, and ligaments in allowing for movement. They also gain an understanding of how the bones and muscles (and tendons and ligaments) work as a system to facilitate movement.