

Diversity and Adaptation

Dinosaur Anatomy 101

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Standards Addressed:

Science: **A13** Understand the theory of natural selection as an explanation for evidence of changes in life forms over time (Evolution and Natural Selection); **B1** Use the processes of science

Language: **A4** Oral Communication; **D4** Written Communication

Cultural: **E1** Interrelationships

Science Concept: Students will describe how living organisms have changed over time. Students will observe and compare the fossil remains of “Sue”, Tyrannosaurus rex, with that of the skeleton of a present day bird.

Grade levels: 4

Process Skills: Observation, classification, communication, questioning, inference

Vocabulary:

fossil	vertebrae	tail	neck	ribs	femur
pelvis	shoulder	joints	tibia	fibula	ulna
radius	adaptation	structure	function	lateral	evolution

Materials: For each group of two students

“Sue”, T-rex , skeleton-lateral view-has shaded bones that match *Anatomy 101*

2 bird skeleton-lateral view

Anatomy 101-The Field Museum Exhibition -Teacher Guide- disarticulated “Sue” bones

1 blank *Anatomy 101-to* be used for the bird cut apart bones

overheads of all pages 58-59 from *The Field Museum Exhibition -Teacher Guide*

skeletons and recording sheets

colored pencils

scissors

glue

Gear Up: Students have already viewed the “Sue” exhibit at the Anchorage Museum of History and Art. Teacher says: I’d like you to close your eyes and think about what you saw, heard, and learned about “Sue”, and the other dinosaurs when we were at the museum (give a few minutes of silence.) What are three words that you would use to describe what your experience there? Have students do a paired share. Record some of the students response on the board. Review with the students the book , *The Field Mouse and the Dinosaur Named Sue*, by Jan Wahl. How did the field mouse know when he had found his special “roof” bone? Response should be that he found the bone in the foot of “Sue”. How do you think the field mouse knew?...Similar size, shape, texture, and color. Scientists believe that dinosaurs, birds, and crocodiles evolved from the same group of reptiles. While they are different species, they share some common features. Today, we will look at specific fossilized bones from “Sue” and see if we can find the similar bones in a bird.

Explore: As a team of two paleontologists, each group will receive the skeletal views of “Sue” and a bird. Review the Anatomy 101 sheet with the students (shaded bones on “Sue” skeleton match disarticulated bones.) Read through the descriptions for each bone. The task will be for students

to find the similar bone on the bird. Have students work together locating the bones and use a colored pencil to shade the bone that is also found in the “Sue” skeleton. Do a few of these together. Guide the students as needed.

Generalize: After the students have identified and colored each of their bones. Review the results, whole group. Correct any misidentified bones. Guide students with the following questions: What direction does the shoulder socket faces? (backwards) Which bones is smaller the femur or tibia? (femur) How many toes how each animal have? (3) Which direction are the toes pointing? (forward) Describe the angle and shape of the femur to the hip and tibia? (right angle-ball-shaped near the tibia) In a round robin format have the students compare any other similarities and differences between “Sue” and the bird bones. Record their responses on a chart to refer to later.

Apply/Assess: With the non-colored skeletons of the bird, have the students cut out the bones and glue them in the correct place on the blank *Anatomy 101*. Students will write a short description of each bone similar to the “Sue’s” *Anatomy 101*. Student “paleontologists” will write a “newspaper article” trying to convince the “general public” about their “theory” that birds and dinosaurs are related. “Paleontologists” need to address specific bones found in “Sue” and the bird.

Extensions:

- Students can compare skeletons of other animals.
- Students can compare fossil remains of other dinosaurs to “Sue”
- Students can research other methods that scientists use to compare fossil remains.
- Invite Anne Pasch, local paleontologist and retired UAA geology professor, to discuss the state of paleontology in Alaska, and to share her experiences of dinosaur “digs”.

Reference: The Field Museum, The Sue Exhibition Educators’ Guide, 2000, pages 58-59, 77-80.

Assessment

Rubric will be shared with the students prior to the final assessment.

1	2	3	4
Work is incomplete, shows little evidence of understanding Article includes only 1 bones found in “Sue” and the bird.	Work may be incomplete, shows limited evidence of understanding. Article includes only 2 bones found in “Sue” and the bird.	Work show logical thinking, shows evidence of understanding Article includes at least 3 bones found in “Sue” and the bird.	Work is complete & logical, extensive evidence of understanding. Article includes at least 4 or more specific bones found in “Sue” and the bird.
Little work accomplished	Some off task behavior	Worked cooperatively	Leadership demonstrated
Sloppy difficult to read	Some problems in neatness and readability	Neat and easy to read	Very neat and easy to read