Decoding Dinos

2nd Grade

Duration
Pre-Visit: 20-30 minutes
Museum Visit: 50 minutes
Post Visit: 45 minutes

Location
Dinosaur Hall

Supplies
- Worksheet
- Pencil
- Clipboard (optional)

Standards
NGSS
2-LS4-1
S+E Practices
1, 3, 4, 6
CCSS ELA
W.7, W.8, SL.1.a
CA State
Life Science: 3d

Vocabulary
Fossils · Extinct/Extant · Anatomy · Adaptation · Observation · Hypotheses · Evidence

Student Work

Concepts

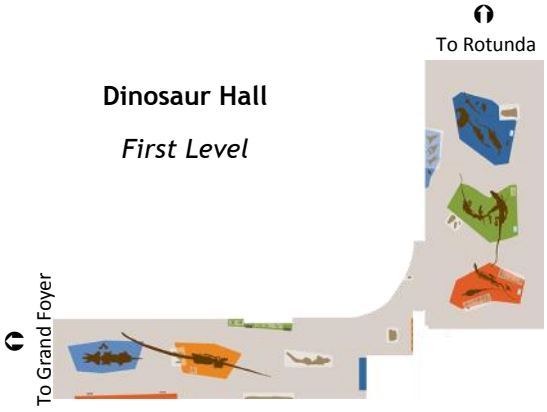
- Fossils tell us what life was like in the past.
- Scientists infer how extinct animals lived through observing their adaptations.

Objectives

- Students will carefully observe characteristics of dinosaurs and marine reptiles.
- Students will compare and contrast dinosaur anatomy with marine reptile and modern day bird anatomy.
- Students will make observations and formulate hypotheses.
- Students will apply knowledge of dinosaur adaptations to invent a dinosaur of their own.

Outline

1. In one classroom session, review content, vocabulary and practice formulating hypotheses based on observations.
2. At the Museum, students will collect observations in the Dinosaur Hall using worksheets.
3. Back in the classroom, students will form hypotheses using their observations, and complete an optional activity.



Pre-Visit

In your classroom, review the concepts and introduce the vocabulary.

Explain that fossils are any evidence of past life, which includes dinosaurs. Dinosaurs are large, land-dwelling animals that are now extinct (vs. extant, still alive today). Because they are no longer living, to understand how they lived, we make careful observations of their anatomy using their fossils and infer what their life was like. Anatomical adaptations (something an animal has that helps it survive in its habitat) are clues that tell us how that animal behaved and where that animal lived.

Review how to observe and make hypotheses based on observations and practice making observations using a picture of modern day animals and/or fossil specimen. Helpful questions to ask include:

- What do you notice about this animal?
- How might have _____ helped that animal survive?
- What do you see that makes you say that? (this is a great way for students to be asked to support their ideas with evidence.)

At this time don't worry about students getting the right answer, focus on them generating ideas based on what they see. After the discussion, briefly review the rest of the project.

Museum Visit

At the Museum distribute the Recording Observations worksheets. Prepare chaperones to assist students understand each exhibit as students explore the Hall, and encourage students to complete each section with as much detail as possible.

Post-Visit

Together, look over the observations students recorded and begin synthesizing their observations into hypotheses about the lives of ancient animals. For each section, discuss the following ideas:

- **Part 1**: What was the diet of the dinosaurs they found? What observations support their hypothesis? Do dinosaurs with certain diets have any common features? (For example, do all the carnivores have the same number of legs and size?). What might size or number of legs suggest about how that animal lived? Be sure students support ideas with observations they recorded.

- **Section 2**: What might be some reasons dinosaurs and marine reptiles have similar/different adaptations?

- **Section 4**: Were there many similarities between a bird skeleton and dinosaur skeleton? What might that mean?

You may choose to do this using the My Hypotheses worksheet included. Conclude the lesson with a reminder of the vocabulary and concepts— scientists infer what extinct animals used to be like by observing their adaptations, and supporting their hypotheses with observable evidence. Optional: have students complete the activity below.

Variations & Extensions

- Give students 2-3 parameters for a dinosaur lifestyle and have them create an imaginary dinosaur that has adaptations that meet those needs. For example, you may ask students to create a dinosaur that eats meat, lives in a forest and eats small prey in the trees. Students might imagine a dinosaur with sharp teeth that runs on two legs and has a long neck to reach up into the canopy. Use observations from student work to guide your parameters, and encourage students to use their worksheets for reference.

Decoding Dinos

Recording Observations: Part 1

Walk around the Dinosaur Hall and carefully observe five dinosaurs. For each dino, record its name, the number of legs it walks on, its relative size and describe its teeth. If you find it helpful, you may sketch your observations.

Dinosaur Name	Walking Legs *How many legs does this dinosaur walk on?*	Relative size *Compared to other dinosaurs, describe the size: is it very large, large, medium, small or very small?*	Teeth *Describe the shape and texture of the teeth.*

Recording Observations: Part 2

Pick one dinosaur and one marine reptile to sketch in the boxes below, be sure to write names above it! When you are done drawing both animals:

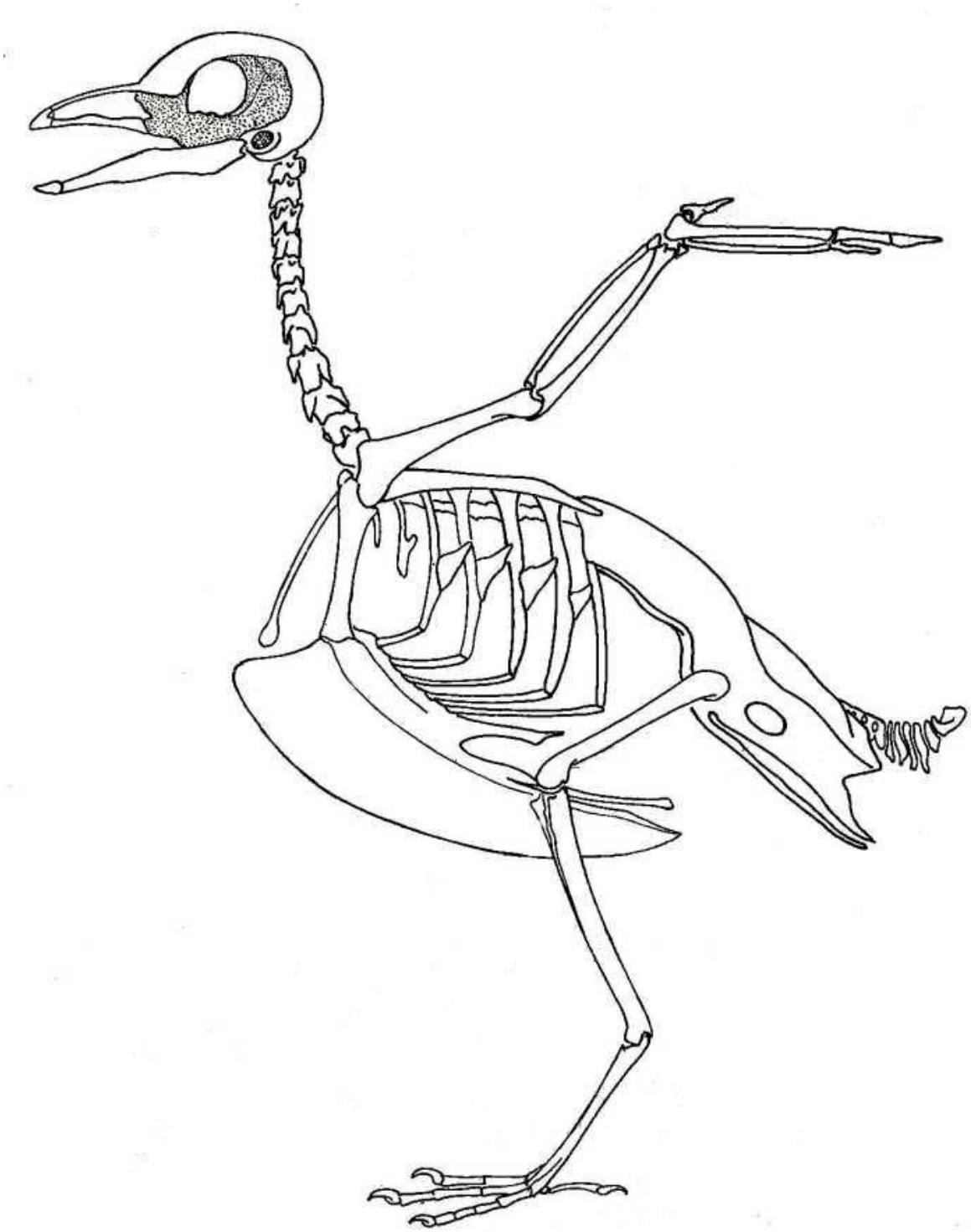
- Draw a circle around two body parts that are similar on the two animals ○
- Put a square around two body parts that are different on the two animals □
- Put a star next to body parts that are unique to each animal ∗

Name of Dinosaur:

Name of Marine Reptile:

Recording Observations: Part 3

Find one of these specimens: *Tyrannosaurus*, *Allosaurus*, or *Struthiomimus* and carefully examine the skeleton and compare it to the bird skeleton below. Circle the skeletal features of the bird that are similar to the skeletal features you see on the dinosaurs. Draw a line from the circled skeletal feature to its correct label in the world bank on the right.



Beak

Head

Neck

Backbone

Ribs

Arms

Fingers

Pelvis

Legs

Toes

Claws

Decoding Dinos

My Hypotheses

Use your gathered observations to answer the questions below. Be sure to use evidence (observations) to back up your ideas!

1. **How many of your dinosaurs ate meat? What do you see that makes you say that?**

2. **How many of your dinosaurs ate plants? What do you see that makes you say that?**

3. **Make a connection: What hypothesis (prediction) can you make about the connection between the number of legs a dinosaur walks on and the texture of its teeth? Why do you think this connection exists?**

4. **Make a connection: What hypothesis (prediction) can you make about the connection between the size of a dinosaur and the number of legs a dinosaur walks on?**

5. **Why might dinosaurs and marine reptiles have similar adaptations?**

6. **Why might dinosaurs and marine reptiles have different adaptations?**

7. **Make a connection: Hypothesize (predict) the connection between dinosaurs of long ago to birds of today.**