



# How Do We Know Birds Are Dinosaurs?

## Introduction

By observing the body parts of ancient dinosaurs and modern birds, students will learn how scientists determined that birds are a kind of dinosaur. When scientists classify an organism, they follow a detailed checklist marking the presence or absence of certain features. To find an organism's closest relative, they identify the features the two organisms have in common.

## Objective

Students compare and contrast features of ancient dinosaurs and modern birds and gain an understanding of how scientists classify dinosaurs based on their features.

## Time Frame

One class period (40 minutes)

## Materials Included

- Museum Display: Pigeon skeleton, *T. rex* model skeleton, *T. rex* furcula (wishbone) cast, *Velociraptor* skull, and *Archaeopteryx* plaque
- Skeleton Station: Pigeon skeleton, scale *T. rex* model skeleton
- Furcula Station: *T. rex* furcula, goose furcula
- Feather Station: *Archaeopteryx* plaque, turkey feathers, ostrich feathers, photo of *Archaeopteryx* feather
- Skull Station: Golden eagle skull, *Velociraptor* skull
- Foot Station: *Velociraptor* foot, bald eagle foot

## Online Materials to Print

- Student Worksheets (Grades K-2/Grades 3-5)
- Bird and Dinosaur illustrations (for Furcula station)
- Mystery Skeleton Worksheet (extension for Grades 3-5)

## Online Resources

- Slideshow with *T. rex* and pigeon skeletons
- [Are Dinosaurs Still Alive Today](#) (2-minute video)

## Classroom Setup

Set up five stations: Foot, Skull, Feather, Skeleton, Furcula

## Procedure

1. Ask students if they have heard that scientists consider birds a kind of dinosaur. Ask students to share what they know about the connection between birds and dinosaurs. Accept all answers and write them on the board. Tell students that they will be investigating body parts of modern birds and ancient dinosaurs to understand why scientists think that birds are dinosaurs. (5 minutes).
2. Pass out worksheets. Divide students into 5 groups and have them rotate among the 5 stations, filling out their worksheets as they go. They should spend about 5 minutes at each station. (25 minutes)

## Wrap up

Ask students: What is the evidence that birds are dinosaurs? What are the similarities between birds and dinosaurs? What are the differences? Are they more similar or more different? Point out that when scientists classify an organism, they follow a detailed checklist marking the presence or absence of certain features. To find an organism's closest relative, they identify the features the two organisms have in common. (5-10 minutes)

Show students the 2-minute video [Are Dinosaurs Still Alive Today](#).

## Extensions for Grades 3-5

Pass out the [mystery skeleton worksheet](#). Ask students to determine whether or not the animal was a dinosaur based on what they have learned about the body parts of dinosaurs.

## Standards

### NYS P-12 Science Learning Standards

**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.

**3-LS4-1:** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

### NYS Next Generation ELA Learning Standards

#### **K-2: SL1/SL2 (Comprehension and Collaboration):**

Participate in collaborative conversations with diverse peers and adults in small and large groups and during play. Develop and answer questions, and describe key ideas or details of diverse texts and formats.

**3-5: SL1 (Comprehension and Collaboration):** Participate and engage effectively in a range of collaborative discussions with diverse peers and adults, expressing ideas clearly and persuasively, and building on those of others.

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Name: \_\_\_\_\_

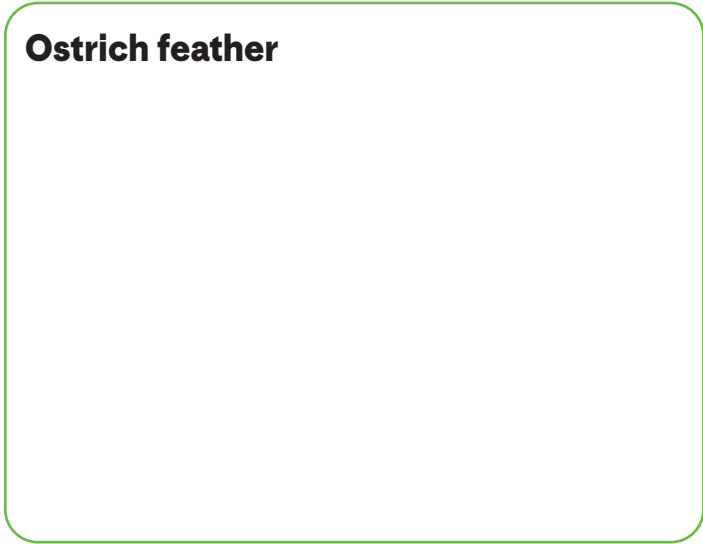
## Feather Station

Draw the two different types of feathers.

**Turkey feather**



**Ostrich feather**



Where are the feathers on this dinosaur fossil? Find them on the fossil at your table and draw them in here:



Are they more like turkey feathers or ostrich feathers?

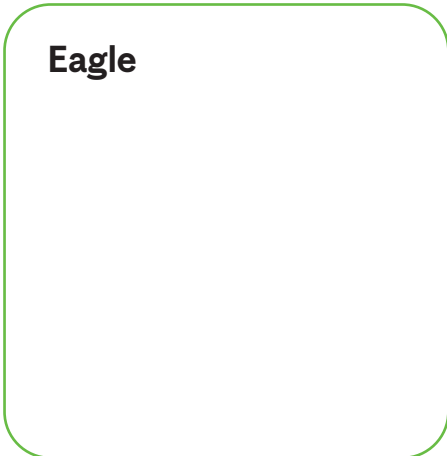
- Turkey
- Ostrich

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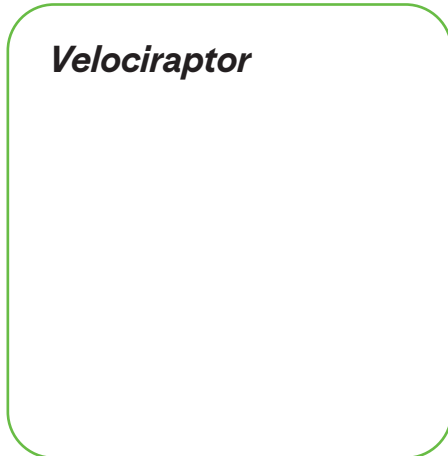
## Foot Station

Draw the shape of the foot

Eagle



Velociraptor



How many toes does each animal have?

### Eagle

- 3     
  4     
  5

### Velociraptor

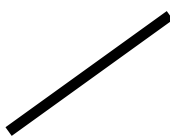
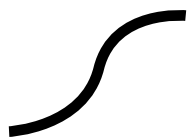
- 3     
  4     
  5

## Skeleton Station

Look at the necks of the skeletons. What shape are they?

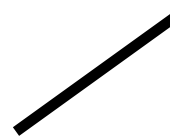
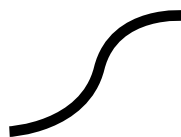
### *T. rex*:

- Curved     
  Straight



### Pigeon:

- Curved     
  Straight



Which animal had a long, bony tail?

- T. rex*  
 Pigeon

Did *T. rex* walk on two legs or four legs?

- Two  
 Four

Does a pigeon walk on two legs or four legs?

- Two  
 Four

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## Furcula Station

The furcula is sometimes called a wishbone. Where on the body is it? See if you can find it on the skeletons below and circle it.

T. rex:



Goose:



## Skull Station

Draw the rest of the skull.



Which animal had teeth?

- Velociraptor*
- Eagle



Which animal had a beak?

- Velociraptor*
- Eagle

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Name: \_\_\_\_\_

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## Station 1: Feathers

Observe the turkey and ostrich feathers.

What is similar?



What is different?

Examine the *Archaeopteryx* fossil and the photo of the feather. Is it more or like a turkey feather or an ostrich feather?

Turkey

Ostrich

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## Station 2: Foot

Examine the *Velociraptor* foot and bald eagle foot.

What is similar?



What is different?

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## Station 3: Skeleton

Examine the *T. rex* skeleton and pigeon skeleton.

What is similar?



What is different?

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# How Do We Know Birds Are Dinosaurs?

## Station 4: Furcula



Examine the *T. rex* and bird furculae.

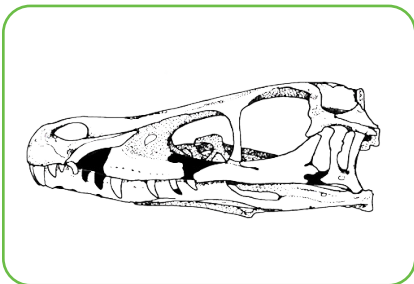
What is similar?

What is different?

See if you can find the furculae on the skeleton illustrations.

Where on the body do you see it?

## Station 5: Skull



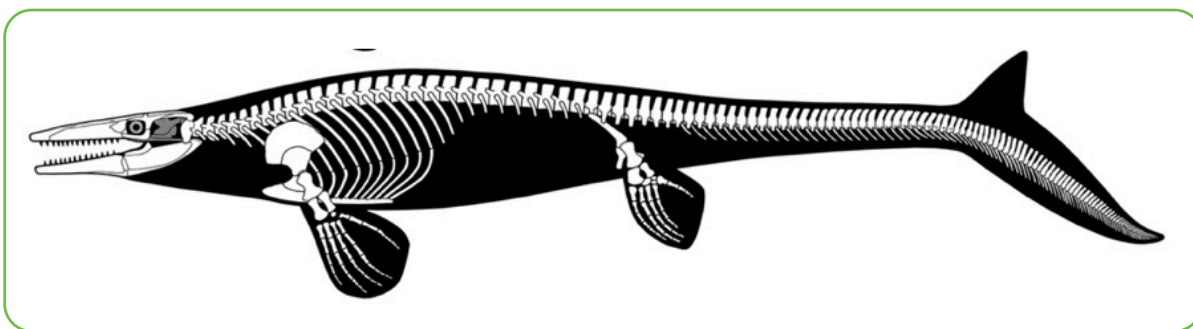
Examine the eagle and *Velociraptor* skulls.

What is similar?

What is different?

# How Do We Know Birds Are Dinosaurs?

This is an ancient animal called a mosasaur. It lived between about 100 and 66 million years ago.



Look at the skeleton and illustration. Based on its body parts, do you think it was a dinosaur? Why or why not?

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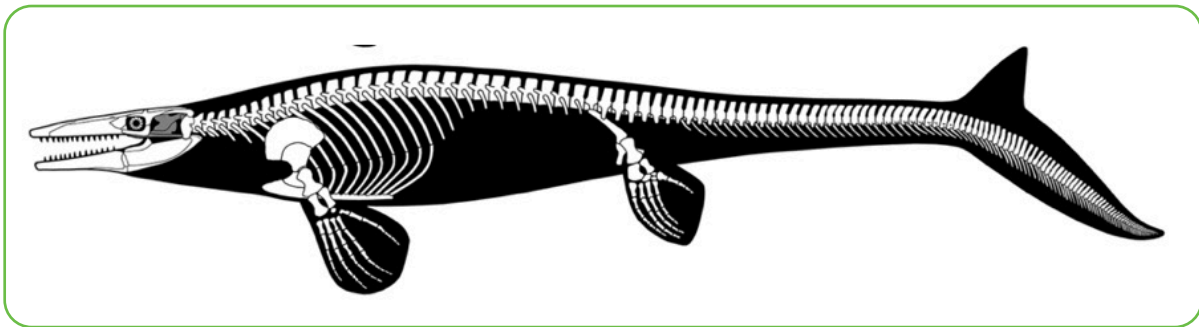
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# How Do We Know Birds Are Dinosaurs?

This is an ancient animal called a mosasaur. It lived between about 100 and 66 million years ago.



Look at the skeleton and illustration. Based on its body parts, do you think it was a dinosaur? Why or why not?

*Even though mosasaurs lived at the same time as dinosaurs, they were not dinosaurs. Some of the differences are: it had five toes, didn't have feathers, had flippers instead of legs, doesn't have a furcula, and has a short, straight neck.*