



Evolution: Where did flying reptiles come from?

LESSON PLAN

Introduction

This lesson walks students through the different pieces of evidence for evolution. It gives students the opportunity to analyze data from real-life situations and come up with their own conclusions about how this demonstrates evolution and common ancestry.

Guiding Questions

- How do we know that organisms change over time?
- What are the different pieces of evidence of evolution?
- What evidence can we use to determine common ancestry?

Learning Objectives

After the lesson, students should be able to:

- Explain how anatomy can be used as evidence of evolution.
- Describe how the different pieces of evidence – DNA, anatomical structures, embryology, biogeography, and fossil record – can explain the process of evolution.

Key Terms

- anatomy
- homologous structures
- analogous structures
- evolution
- embryology
- adaptation

Time Requirement

Two 50-minute class periods or one block period.

Grade Level

5th-10th grade (with adjustments)

Materials

- Internet connection and projector with sound for the video
- One student handout per group
- Scissors (to cut out the bone photos)
- Printed (or digital) article **Where did flying reptiles come from?** from Science Journal for Kids
- [Optional] Printouts for the extension activity

Background Information

In this activity, students will be exploring the different pieces of evidence to help explain how the process of evolution and common ancestry occurs. The following pieces of evidence are most commonly used to determine the common ancestry of different organisms.

1. Molecular Evidence through DNA

2. Fossil Record

3. Biogeography

4. Embryology

5. Anatomical Structures

Students should have basic knowledge about what evolution is and how it occurs through natural selection. If you would like more teaching resources on evolution, go to:

- UC Berkeley's Understanding Evolution: evolution.berkeley.edu
- HHMI Biointeractive: free interactive activities and videos: www.biointeractive.org
- Teacher's Institute for Evolutionary Science: TIESeducation.org

Lesson

1 PART 1: OPENING VIDEO

Watch the video What is the **What is the Evidence for Evolution?** by Stated Clearly. Have the students fill out the graphic organizer.

Time: 15 minutes

2 PART 2: MATCHING AND OBSERVATION

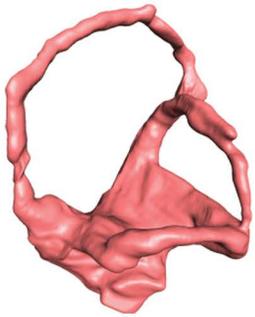
Let the students cut out the pictures of bones and match them together. Help them identify similarities and differences. Some of them are described on the next page.

After they complete this activity, go through some key anatomical vocabulary: homologous structure, analogous structure, and vestigial structures.

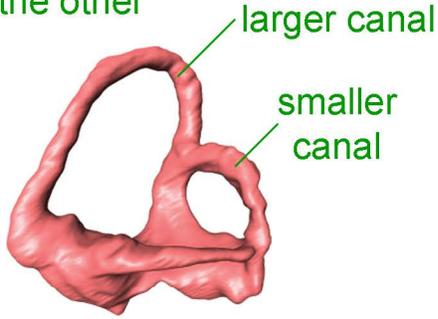
Time: 10 minutes

Inner ears

one canal considerably larger than the other



lagerpetid



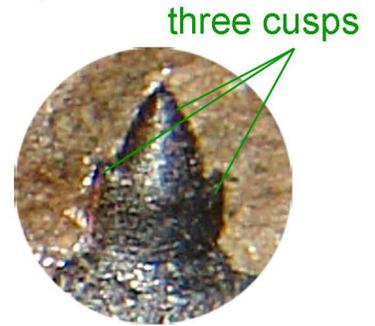
pterosaur

Teeth

tooth crowns with three cusps



lagerpetid



pterosaur

Humeri

size of crest for important arm muscles differently developed



lagerpetid



pterosaur

Femora

hook-shaped head of femur



lagerpetid



pterosaur

3 PART 3: READING ACTIVITY

1. Students should read **Where did flying reptiles come from?** from Science Journal for Kids. Discuss any misconceptions.
2. Answer the comprehension questions at the end of the article. This could be done as homework if needed. (Teacher's key available on the article's page.)

Time: 30-40 minutes

Extension: Stations

In this activity, the students will be participating in stations looking into the evidence for evolution in more detail. Students can work individually in pairs.

- Save a copy of **Evidence of Evolution Slides** from the article's page.
- Print 4-5 copies of each slide on cardstock. Each station should be a different color.
- All students should receive an answer sheet.
- All student instructions are located on the slides.
- Station One and Station Four require you to cut out the individual pieces for students to place on the station.
- Put a timer up on the board and give students 6 minutes per station. You can rotate the stations or students can rotate around the room depending on your classroom conditions.

These stations can be adjusted to be completed online. Some stations (such as the drawing station) may need to be omitted or modified to fit your needs.

Time: One 50 minute class period.