EVOLUTIONARY BIOLOGY WITH DR ASHLEY HEERS

TALKING POINTS

KNOWLEDGE

1. What is a rudimentary locomotor structure?
2. List four ways in which juvenile bird wings are less developed than those of adult birds.

COMPREHENSION

3. Explain Darwin's theory of natural selection.
4. Summarise the dilemma of rudimentary stages.

APPLICATION

5. What would you do to find out how a bird's muscles and bones work together to create particular movements?
6. How would you investigate how different wing movements affect a bird's ability to fly?

ANALYSIS

7. What is one example of a discovery showing that rudimentary stages can be useful, and why would this have been exciting to Darwin?
8. Can you think of some challenges that arise when working with live birds?

SYNTHESIS

9. How would you design a study to compare the behaviour and performance of a juvenile bird to that of an adult bird?
10. Other than underdeveloped wings, can you think of any other examples of rudimentary structures?

EVALUATION

11. How would you pick what species of birds to work with?

CREATIVITY

12. Can you think of another way in which scientists could study these questions without using live birds?

ACTIVITIES

1. THE EVOLUTION OF LIFE ON EARTH

Scientists think that life first evolved on earth almost four billion years ago. A lot has changed in that time. Starting from single-celled organisms, draw a timeline of events that eventually led to dinosaurs and then to birds capable of flight.

Get creative and include drawings or pictures to help visualise how these animals evolved. If you are unsure of where to start, have a look at this timeline (although yours does not need to be as detailed as this): www.newscientist.com/article/dn17453-timeline-the-evolution-of-life

2. VESTIGIAL STRUCTURES

Vestigial structures are parts of an organism's body that, over the course of evolution, have lost most or all of their original function. The wings of flightless birds like ostriches, for example, are no longer capable of flight. Vestigial structures are found all across the animal kingdom, including in humans, and even in plants and fungi too.

Based on some of your own research, compile a list of three or four vestigial structures found in other organisms. Think about what the structures were originally used for and why they became obsolete. In what way has each organism evolved so that it no longer has a need for the structure's original function?

Present your findings in a poster so you can share what you have found with your classmates. As a class, see how many different vestigial structures you can find.

MORE RESOURCES

- Explore Ashley's research in more detail here: **www.buildingabird.weebly.com**
- Play these games to take part in citizen science and learn about evolution at the same time: **www.sensoryecology.com/games**
- Watch this video of Ashley talking about her research and museum work: **www.youtube.com/watch?v=4gxBZbQcjeo**
- Take a closer look at Ashley's exhibit in Dinosaurs Among Us here: **www.amnh.org/exhibitions/dinosaurs-among-us**
- See more about the Flight Laboratory at the University of Montana: **hs.umt.edu/dbs/flightlab/default.php**