

Topic Review Guide: Evidence for Evolution (Videos #3 and #4)

To Think About: How is natural selection a major mechanism of evolution? In what ways does natural selection act on phenotypic variations in a population? In what ways do organisms share many conserved core processes and features?

Watch: [Mr. Andersen's "Evidence for Evolution" video.](#)

Then: [Mr. Andersen's "Essential Characteristics of Life" video.](#)

Read: Chapter 16, Hillis' [Principles of Life](#) 1st ed. (2012), p. 315-318.

Supplementary Resources: Click the links below for more information to help you learn more about this lesson.

- [Crash Course's "Evolution: It's a Thing" video.](#)
- Kimball's Biology Pages: [Mutation and Evolution](#), [Examples of Evidence of Evolution](#)
- University of Utah Learn.Genetics site: [Sources of Variation](#)
- [Nature: 15 Evolutionary Gems](#)

Listen and Look: Here is a list of key terms you will hear and see during this podcast. Get to know them! Be able to connect them to one another using a concept map.

KEY TERMS

Evolution	Biogeography	Homologies (Homologous structures)	Vestigial structures
Fossils	Mutation	Eukaryotes	Prokaryotes
Central dogma	ATP	Endomembrane system	Endosymbiosis

Recall and Review: Use the lecture in the video and your textbook to help you answer these questions in your BILL.

1. **Explain**, using the Galapagos tortoises, how the diversity of their species is related to biogeography.
2. Using a specific example, **describe** how fossil evidence provides support for the idea that species have changed over time.
3. Homologies indicate common ancestry between and among species. **Explain** how natural selection drives the development of organisms into various species with similar origins.
4. **Explain** the significance of mutations in the development of biodiversity and how mutations provide evidence of evolution.
5. **Explain** how population genetics modeling software can demonstrate evidence of evolution.
6. What is the relationship between these pairs of words:
 - a. Natural selection and artificial selection
 - b. Homologous structures and vestigial structures
7. Explain how the following pieces of evidence for evolution support Darwin's theory of evolution through natural selection:
 - a. Comparative embryology
 - b. Molecular biology (DNA and proteins)
 - c. Comparative anatomy
 - d. Biogeography
 - e. Fossil record

- f. Vestigial structures
8. **Describe** how the following items indicate common ancestry for all life on Earth:
- Common metabolic processes
 - The “central dogma”
 - The genetic code (DNA)
9. **Describe** how endosymbiosis provides an explanation for the development of eukaryote cells.

Learn More: For more examples of evidence for evolution, use the links below:

- UC Berkeley’s Understanding Evolution: [Homologies and Analogies](#)
- Learn.Genetics: [All Living Things are Related](#) (also use the HHMI Lectures linked below the main page)
- [Early Theories of Evolution: Evidence of Evolution](#) (Palomar College)
- BBC’s GCSE Bitesize Biology: [Evidence for Evolution](#)
- TalkOrigins: [Evidence for Evolution](#)

