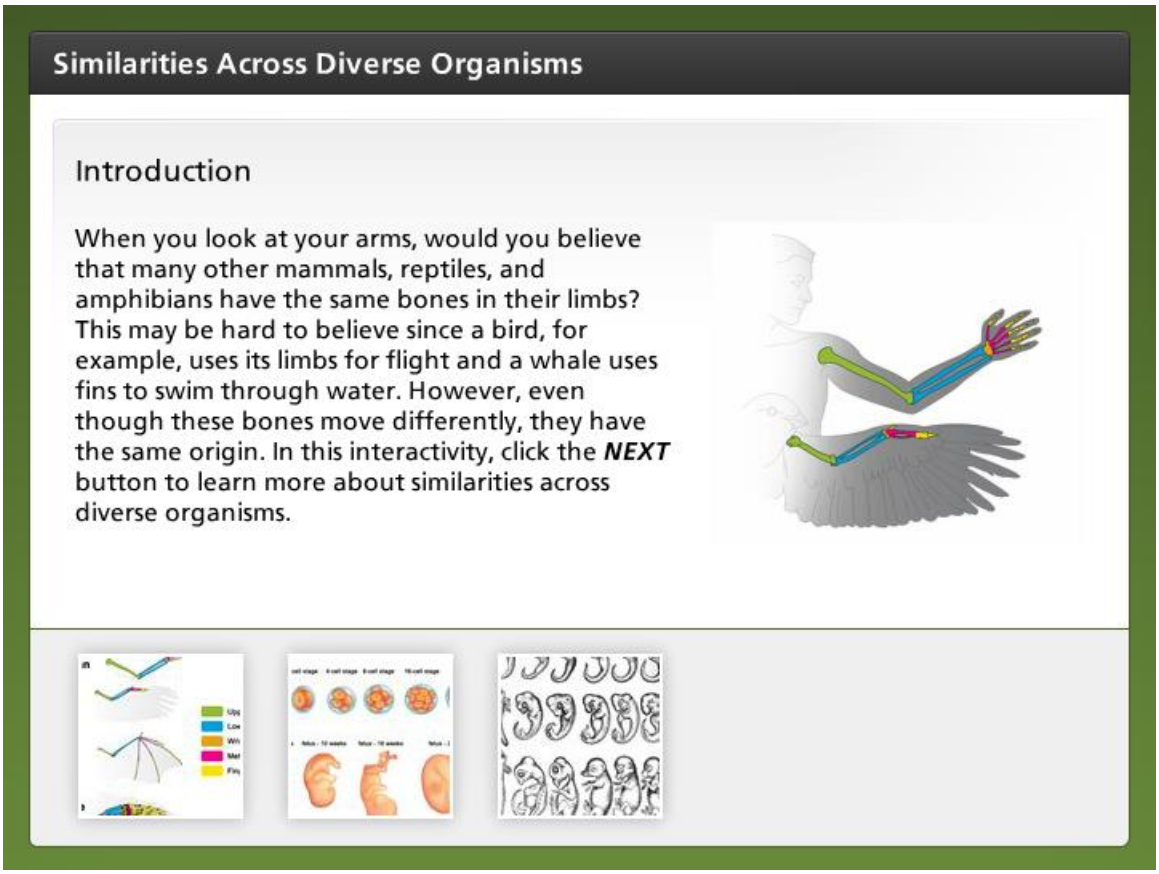
Module 9: Classification – The Basics
Topic 3 Content: Similarities Across Diverse Organisms

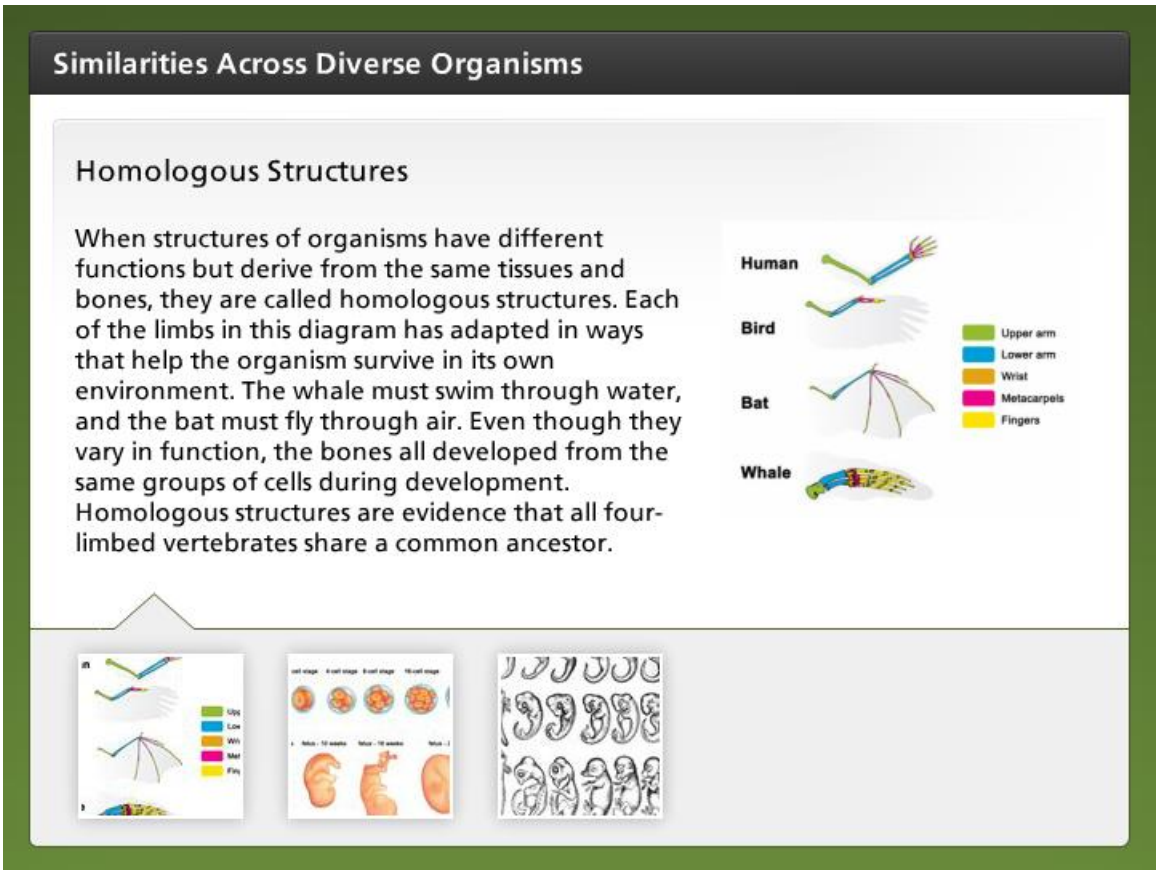
Introduction



When you look at your arms, would you believe that many other mammals, reptiles, and amphibians have the same bones in their limbs? This may be hard to believe since a bird, for example, uses its limbs for flight and a whale uses fins to swim through water. However, even though these bones move differently, they have the same origin. In this interactivity, click the ***NEXT*** button to learn more about similarities across diverse organisms.

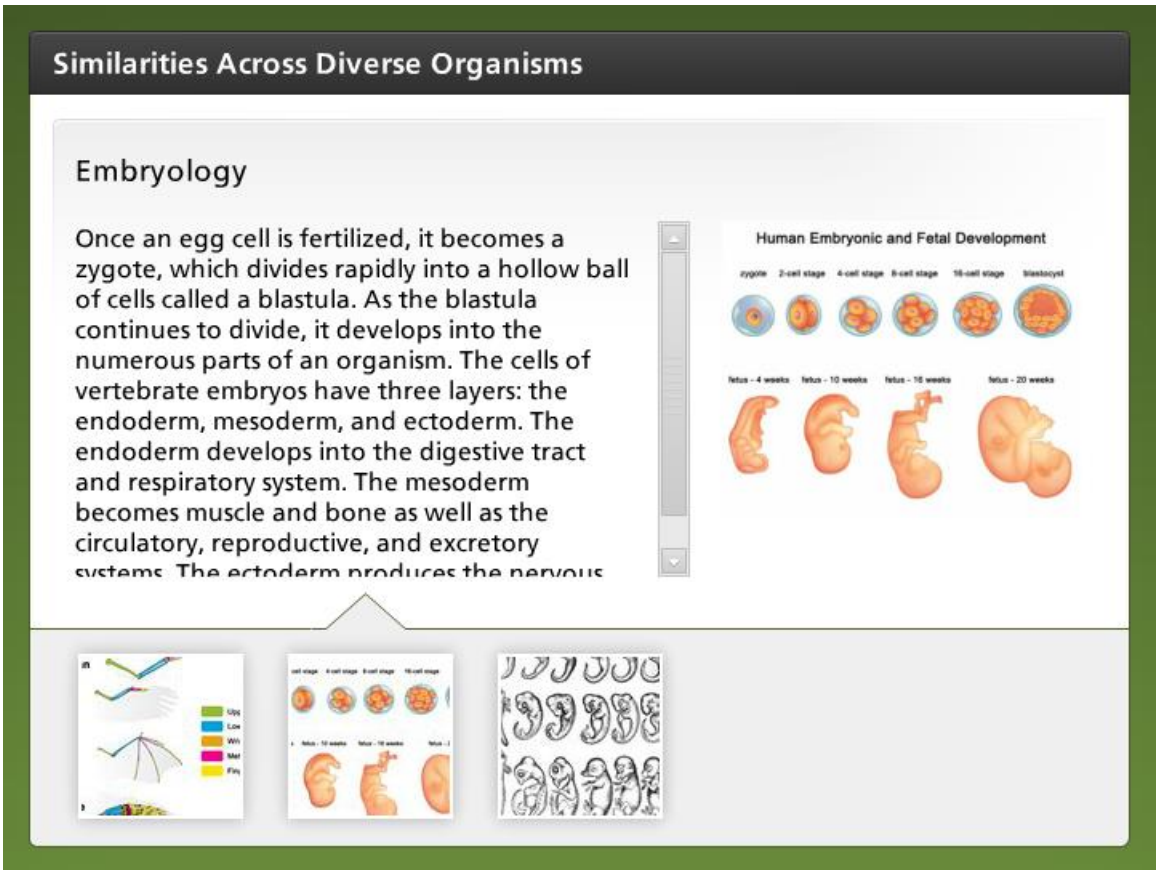
Module 9: Classification – The Basics
Topic 3 Content: Similarities Across Diverse Organisms

Homologous Structures



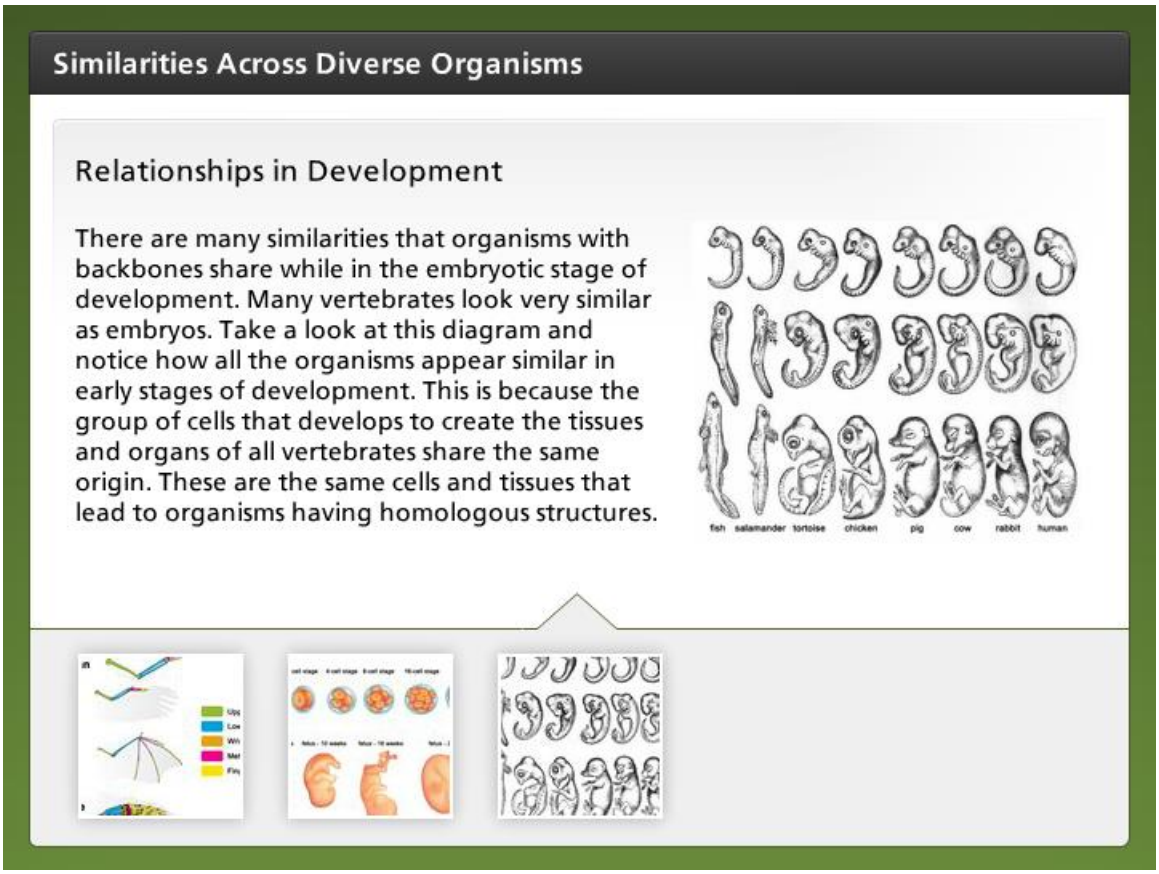
When structures of organisms have different functions but derive from the same tissues and bones, they are called homologous structures. Each of the limbs in this diagram has adapted in ways that help the organism survive in its own environment. The whale must swim through water, and the bat must fly through air. Even though they vary in function, the bones all developed from the same groups of cells during development. Homologous structures are evidence that all four-limbed vertebrates share a common ancestor.

Embryology



Once an egg cell is fertilized, it becomes a zygote, which divides rapidly into a hollow ball of cells called a blastula. As the blastula continues to divide, it develops into the numerous parts of an organism. The cells of vertebrate embryos have three layers: the endoderm, mesoderm, and ectoderm. The endoderm develops into the digestive tract and respiratory system. The mesoderm becomes muscle and bone as well as the circulatory, reproductive, and excretory systems. The ectoderm produces the nervous system and the skin.

Relationships in Development



There are many similarities that organisms with backbones share while in the embryonic stage of development. Many vertebrates look very similar as embryos. Take a look at this diagram and notice how all the organisms appear similar in early stages of development. This is because the group of cells that develops to create the tissues and organs of all vertebrates share the same origin. These are the same cells and tissues that lead to organisms having homologous structures.