



The Origin of Species: The Beak of the Finch

OVERVIEW

[The Beak of the Finch](#) is one of three films in HHMI's Origin of Species collection. Naturalists from Charles Darwin to E. O. Wilson have marveled at the incredible number and diversity of species on Earth. Understanding why there are so many species on our planet is an active area of current research. This film follows Princeton University biologists Peter and Rosemary Grant as they study the finches endemic to the Galápagos Islands. Their work, conducted over the course of four decades, shows how geography and ecology can both drive the evolution of new species.

Darwin's finches. Charles Darwin brought the finches living on the Galápagos Islands to scientists' attention following his famed voyage on HMS *Beagle*. Thirteen distinct species of Galápagos finches are adapted to living in different habitats and eating different diets. One of the most striking differences among species is the shape and size of their beaks. (Photos courtesy of John van de Graaff.)



KEY CONCEPTS

- Habitats and ecological niches are constantly changing; even entire ecosystems change over time. New species can arise as populations adapt to changes and new opportunities in the environment.
- Newly formed islands provide many new habitats for species to occupy. In the Galápagos Islands, a single ancestral population of finches has given rise to 13 separate species, each adapted to different habitats and niches.
- An adaptation is a structure or function that confers greater ability to survive and reproduce in a particular environment.
- When two groups within one species become geographically isolated—separated by a physical barrier, such as a river, canyon, or mountain range—genetic changes in one group will not be shared with members of the other, and vice versa. Over many generations, the two groups diverge as their traits change in different ways.
- For two groups to become distinct species, traits must change in ways that will keep members of each group reproductively isolated, meaning that they will not mate or produce fertile offspring with members of the other group even if they come to be in the same geographic location.
- Evolutionary change can occur rapidly, in only a few generations, if there is genetic variation among individuals in a population and if natural selection acting on this variation is strong. However, major change, such as the origin of new species, often takes many thousands of generations.

CURRICULUM CONNECTIONS

Standards	Curriculum Connection
NGSS (2013)	LS2.A, LS3.B, LS4.B, LS4.C
AP Bio (2015)	1.A.1, 1.A.2, 1.A.4, 1.B.2, 1.C.1, 1.C.2
IB Bio (2016)	5.1, 5.4, C.1
AP Env Sci (2013)	II.C
IB Env Systems and Societies (2017)	3.2
Common Core (2010)	ELA.RST.9-12.4, WHST.6-12.9, MP2
Vision and Change (2009)	CC1, CC5

KEY REFERENCES

Grant, P. R., and B. R. Grant. 2008. *How and Why Species Multiply*. Princeton University Press, Princeton, New Jersey.
Weiner, J. 1994. *The Beak of the Finch*. Alfred A. Knopf, Inc., New York.