

## Task 2: The Secret of Our Success (1)



Five different types of beetles. Images courtesy of USDA unless otherwise noted.

National Park Service photo.

**Question:** We represent successful surviving descendants of our beetle ancestors. We have the highest species diversity known on Earth. There are an estimated 350,000 different species of beetles! How did this happen?

F

**Answer:** Even though we share a common ancestor, we evolved in different habitats and different niches through the process of natural selection. Our adaptations are different because they solve different environmental challenges, but we still share many of the traits of our ancestor.

What's the term that you use to communicate about this phenomenon?

O

**Term:**

**Divergent Evolution or Adaptive Radiation**



N

## Task 2: The Secret of Our Success (2)



Captured Lesser Long-nosed Bat covered in pollen at Organ Pipe Cactus National Monument. Nectar-feeding bats visit night-blooming flowers such as Organ Pipe Cactus flowers. National Park Service photo.



Organ Pipe Cactus in bloom. Flowers of the Organ Pipe Cactus bloom for one night only and close by about 8:30 am. National Park Service photo.

**Question:** We represent successful surviving descendants of each of our ancestors. We are not closely related, but our lives are in sync. I feed on nectar at night and rely on night-blooming flowers that are easy to see and smell. There are only a few types of night-blooming species so I only visit them. Our yearly routines are also in sync. My migration occurs at the same time of year that the Organ Pipe Cactus blooms. How did this happen?

Q

**Answer:** We evolved together through the process of natural selection. On the plus side, our relationship can mean less competition for resources and more efficiency. On the negative side, a change that affects the survival rate of one of us, can directly affect the survival of the other.

What's the term that you use to communicate about this phenomenon?

E

**Term:**

**Coevolution** through **mutualism**



D

## Task 2: The Secret of Our Success (3)



Non-venomous Bull Snake in defensive posture at Big Bend National Park. Bull snakes will also vibrate their tail against the ground to produce a rattling sound. National Park Service photo.



Venomous Western Diamondback Rattlesnake in defensive posture at Big Bend National Park. Note the blur of the rattle indicating movement. National Park Service photo.

**Question:** We represent successful surviving descendants of our ancestors. We share similar coloration and a similar behavior, but not the same key physical trait. We don't even belong to the same family of snakes! Even though our predators think we are equally as dangerous, only one of us has fangs that can inject venom. How did this happen?

S

**Answer:** Even though we took different evolutionary paths at some point in our evolutionary history, we evolved together in the same habitat with the same predators. Our adaptations are different because they evolved independently, but they solve the same challenge to survival through the power of natural selection.

What's the term that you use to communicate about this phenomenon?

A

**Term:**

**Coevolution** resulting in **mimicry** (Batesian mimicry)



C



## Task 2: The Secret of Our Success (4)



Armadillos are a common sight in parts of Texas. Like other species in the armadillo family, their diet consists of insects and other invertebrates. The unique adaptation of body armor in armadillos is formed by bony plates with small epidermal scales composed of bone and horn. Armadillos evolved in South America. National Park Service photo.



Pangolins evolved in the tropics of Africa and Asia and feed mainly on ants and termites. In contrast to armadillos, the unique body armor of pangolins is formed from keratin – the protein that makes up hair and fingernails in mammals. Photo courtesy of USFWS.

**Question:** We represent successful surviving descendants of our ancestors. We evolved on opposite sides of the globe. We are not closely related but we resemble each other. How did this happen?

Z

**Answer:** Even though we have different evolutionary paths, we evolved in similar habitats and have the same niche. Our adaptations are different because they evolved independently, but they solve the same challenge to survival through the power of natural selection.

What's the term that you use to communicate about this phenomenon?

L

**Term:**

**Convergent evolution of analogous structures**



R