

A Tale of Two Species

Highlight the key points from the reading as you go, answer the questions at the end, and then discuss the story with your group in order to prepare for sharing with the class.

The Scarlet Monkey Flower and The Great Purple Monkey Flower... (and the birds and the bees)

Pollinators play a critical role in the reproductive cycle of many flowering plants. In fact, the amazing evolution of so many different kinds of trees, bushes and other plants that flower is in part the responsibility of pollinators like flies, bees, moths and birds.

Monkey flowers are a group of closely related plants that contains many species. One region where monkey flowers are particularly abundant is the west coast of the United States. In certain areas, the scarlet monkey flower's range overlaps with that of the great purple monkey flower.

Pollination researchers have shown that when either flower is exposed to the pollen from the other, viable (able to live) seeds are produced. Some flower plants get around this potential problem with hybridization by evolving differences in flowering time, but this pair has no need to do so.

Birds, including hummingbirds, are generally attracted to red coloration. Flowers that appear red or reddish-orange have in many cases evolved to rely on bird pollinators, most commonly hummingbirds. Bees on the other hand are drawn to a variety of colors and patterns. Some of these patterns are even invisible to humans as they appear in the ultraviolet frequencies, just beyond the most intense violets human eyes can detect. Many yellow, blue and purple flowers are likely pollinated by bees or butterflies.

Scarlet monkey flower, as the name implies, produces showy red tubes perfectly pollinated by hummingbirds. The pollen sticks to the birds' foreheads as they drink nectar from deep within the tube using their long beaks. The tubes of great purple monkey flower display the lighter colors attractive to bees who tunnel into the bell to get a nectar reward and collect pollen on their legs. So, when both plants are in bloom, each has a separate pollinator. In this way, the pollen from one plant is very unlikely to encounter the flower and seed of the other. Even though the two may be meters apart, never the two shall meet.

After you have highlighted some key points from the reading above, paraphrase three of them.

1.

2.

3.

Title: [What organisms are you looking at?]

Summary: [1-2 sentences summarizing what is happening in the system]

Focus trait: [what trait is keeping the species separate?]

Web Resources:

Wikipedia Article, "Erythranthe cardinalis" (https://en.wikipedia.org/wiki/Erythranthe_cardinalis)

Wikipedia Article, "Erythranthe lewisii" (https://en.wikipedia.org/wiki/Erythranthe_lewisii)

Scientific Articles:

Ramsey, Justin, H. D. Bradshaw Jr, and Douglas W. Schemske. "Components of reproductive isolation between the monkeyflowers *Mimulus lewisii* and *M. cardinalis* (Phrymaceae)." *Evolution* 57.7 (2003): 1520-1534.

Schemske, Douglas W., and H. D. Bradshaw. "Pollinator preference and the evolution of floral traits in monkeyflowers (*Mimulus*)." *Proceedings of the National Academy of Sciences* 96.21 (1999): 11910-11915.