

FOCUS

Wild Arizona

Key Words:

Commensalism: a relationship between two organisms in which one benefits and the other is neither harmed nor helped

Dependent: relying on or needing someone or something

Ecosystem: a group of animals and plants living in the same environment

Mutualism: a relationship between two organisms in which both benefit

Organism: a plant or animal

Parasitism: a relationship between two organisms in which one benefits and one is harmed

Symbiotic Relationship: a relationship between two organisms in which at least one benefits from the other

John Muir, well-known author and naturalist, once wrote, “Tug on anything at all and you’ll find it connected to everything else in the universe.” But what did he mean?

The animals and plants within an **ecosystem** live in a delicate balance, each species connected to another. If you push on one species, other species often feel the effect. Sometimes, an animal or plant actually becomes **dependent** on another species in order to survive.

In a **symbiotic relationship**, at least one animal or plant is directly helped by



another animal or plant. However, these relationships aren’t always good. Sometimes, one **organism** may be helped while the other is harmed. In fact, there are three main types of symbiotic relationships:

- **Mutualism:** a relationship in which both species benefit and are dependent on each other.
- **Parasitism:** a relationship in which one species benefits while the other is harmed.
- **Commensalism:** a relationship in which one species benefits but the other species is neither harmed nor helped.

We often represent mutualism with a “+/+” because both species receive a positive benefit. Commensalism is shown as a “+/0” relationship because one species receives a positive benefit while the other receives no benefit.

How do you think parasitism is represented?

For one species in a parasitic relationship, there is a benefit, so we would show a “+” sign. However, for the other species, the relationship is negative because it is harmed. In this case, we would show a “-” sign. Therefore, parasitism can be represented by a “+/-”.



By Eric Proctor

Do the Science:

Below are examples of three different symbiotic relationships found in the Sonoran Desert. Read the description of each one. Put a “+”, “-” or “0” by the name of each animal or plant depending on whether it is helped, harmed or receives no benefit in the relationship. Then, try to determine which type of symbiotic relationship it is. Answers are provided at the end.

Relationship 1: The cactus wren builds its large football-shaped nest in the cholla cactus. The cholla, with its long spines, provides a well-protected home for the cactus wren and its young, and does not seem to be harmed.

Cactus Wren: _____ Cholla Cactus: _____ Type of Relationship: _____

Relationship 2: The cowbird often puts her eggs in the nest of the oriole. When the eggs hatch, the oriole feeds and raises the young cowbirds along with her own babies. So, the cowbird does not have to worry about feeding or caring for its young. However, the young cowbirds often take food away from the young orioles, which can make it difficult for the young orioles to survive.

Cowbird: _____ Oriole: _____ Type of Relationship: _____

Relationship 3: Desert tortoises often feed on prickly pear cactus fruit in the early morning and late afternoon. The fruit is full of seeds. By eating this fruit, the tortoise gets some good food. In the process, it spreads the seeds, causing the cactus to grow in new locations.

Desert Tortoise: _____ Cactus: _____ Type of Relationship: _____

Do the Research:

Great job. Now let’s explore symbiotic relationships a little bit more. Below are some additional animals and plants that have symbiotic relationships. Use the Internet or a reference book to learn a little more about these species. Try to determine which type of relationship each pair has.

- Gila woodpecker and saguaro
- Yucca and the yucca moth
- Mistletoe and mesquite
- Mexican long-tongued bat and agave

■ This feature is part of the Arizona Game and Fish Department’s Focus Wild Arizona program, a free educational program for teachers, parents, students or anyone interested in learning about wildlife and habitat. Visit our Web site, www.azgfd.gov/focuswild, to find exciting lessons and resources.

Answers for “Do the Science” – Relationship 1: Commensalism (+/0); Relationship 2: Parasitism (+/-); Relationship 3: Mutualism (+/+)