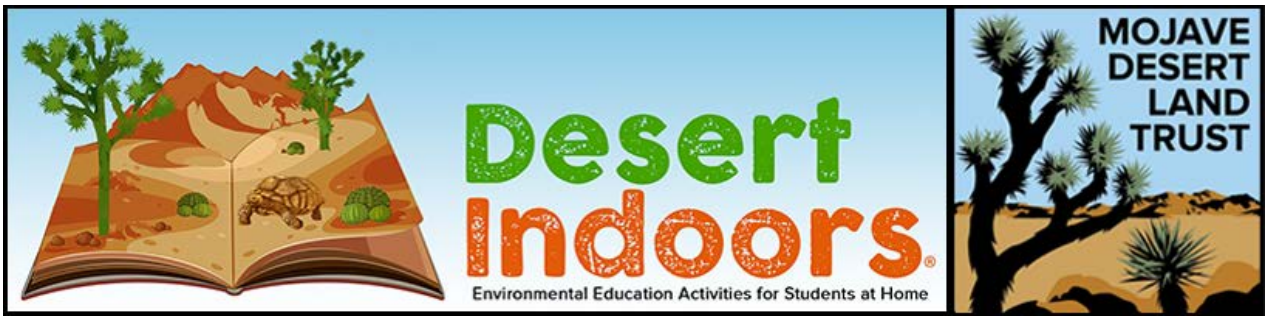

DESERT INDOORS®

Environmental Education Activities for Students at Home

(This activity was created in accordance with shelter-in-place. Remember to practice social distancing and stay local.)

Module: *What Owls Eat*

Topic: Desert Inhabitants: Owls in the desert ecosystem

Objective/Learning Goal: Students will be able to use scientific knowledge to explain the effects of resource availability on species within the California Desert learning about desert owls.

Glossary:

- **Adapt** - A change or the process of change by which an organism or species becomes better suited to its environment.
- **Biodiversity** - The number of living organisms (plants and animals) living in an environment together.
- **Carrying capacity** - The number or quantity of living things that an environment can support without degradation of the habitat.
- **Diurnal** - Animals that are active during the day.
- **Environment** - The surroundings (both living and non-living) of a geographical area in which species live.
- **Habitat** - The place where an organism lives and survives with adequate access to food, shelter, and water.
- **Nocturnal** - Animals that are most active at night.

Materials: access to the website https://kidwings.com/virtual-pellet/index2.html

Indoor Activity:
Build/Check Background Knowledge - Ask children what they already know about the relationship between different kinds of desert animals. What do they know about *nocturnal* animals and give some examples? What do students know about *diurnal* animals and give some examples?

Why does it seem like many diurnal animals have such large ears? What would be the best reason for an animal to *adapt* to a nocturnal lifestyle? How do desert animals adapt to the relative lack of water in the California desert? Where do their get their water?

For example: Jackrabbits, cottontails, and deer all have large ears not only to listen for predators, but also to help regulate body temperature. Having blood vessels near the surface of their ears allows for these animals to dissipate excess heat.

Many animals that are diurnal are most active in the early morning and late afternoon, preferring to rest during the hottest parts of the day. Ants, beetles, and many lizards extend their legs to reduce the amount of heat to which they are exposed. Sidewinders (rattlesnakes) move sideways so that their bodies from only having two points of contact with the hot ground. Another benefit to this, it helps keep them stable when moving on the sand.

Animals that are nocturnal, bobcat, bats, owls, scorpions, etc., take advantage of the cooler night temperatures to hunt prey or forage for food. This also means that they have developed very keen eyesight, or large ears in the case of bats. Since many desert animals are nocturnal it can make the desert seem uninhabited to humans who visit. However, if you visit the desert after a rainstorm or during the night, you will get to see more of the desert *biodiversity.*

Because of the lack of water many plant species grow slowly. Lack of access to water has lowered the number of animals and plants that can be sustained within the *habitat*. This is called *carrying capacity*. Desert animals have adapted to the scarcity of water within the desert *environment*. Animals like the desert tortoise, road runner, and many snakes have the ability to reabsorb water from the waste in their intestine. During the summer months, even coyotes eat plants to obtain the water they need. Tortoises have a special bladder where they store most of their water. Foragers (plant eaters) get the water they need from consumed plants. Kangaroo Rats even can convert the dry seeds they eat into water.

Owls are predators feeding on small mammals, birds, and reptiles found in the desert. They also swallow their food whole. Many birds have a specialized pouches or "*crops*" that they use to help them digest foods. Owls have no crop, instead they have a two chambered stomach (a *proventriculus* and a *ventriculus*). This allows owls to compress the indigestible parts of prey (bone, fur, and teeth) from one chamber to another. In the second chamber, the owl creates a wet slimy pellet from the undigested parts that is later regurgitated. Owls that live in the Mojave desert can produce up to two pellets a day.

By dissecting owl pellets, scientists can learn about changes to habitat, range, and the diet of an owl. Additionally, scientists can check the alkalinity of the pellet. From those measurements environmental health and impact predictions can be made.

Students can conduct a Virtual Owl Pellet Dissection by visiting:
https://kidwings.com/virtual-pellet/index2.html

Follow-up/ After Discussion -
What can the information gathered from looking at the pellet data tell you about habitat health?

We would love to hear how your citizen science projects went and to have you share your findings as scientists?