

DESERT INDOORS®

Environmental Education Activities for Students and Families at Home

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

Module: *Bee a Friend to Pollinators!*

Topic: Desert Habitat Conservation

Objective/Learning Goal: Children will use scientific knowledge to understand the importance of native bees in the desert habitat.

Glossary:

- **Adaptation** - A change or the process of change by which an organism or species becomes better suited to its environment.
- **Fertilization** - the process by which male and female gametes are fused together, initiating the development of a new organism (offspring).
- **Habitat** - The natural home or environment of an animal, plant, or other organism.
- **Pollen** - Fine powder dust that contains the sperm from the male part of a plant.
- **Pollinator** - An animal or insect that moves pollen from one flower to another.

Materials: Pencil, pens, or crayons. For the extension activity you'll need: a clean tin can open on one end, tape, string, a few sheets of paper or small cardboard tubes.

Indoor and/or Outdoor Activity:

Build Background Knowledge - Ask your children what they already know about bees? What do they know about bees native to the Mojave Desert? Why are they an important part of our ecosystem? How can they become a friend to bees and other **pollinators**?

There are over 4,000 different species of bees in the United States and an estimated 750 different bee species in the Mojave Desert! They are pollinators, crucial to our survival since they take **pollen** from one flower to another, also known as cross-pollination. **Fertilization** of flowers happens through this cross-pollination, allowing fruits and vegetables to grow. This also promotes new seed growth which then creates new flowers, and this process continues every year with new flowers. In California alone, bees are responsible for adding 4 billion dollars of our state economy through the

pollination services they provide to almond trees alone! Just think about all the other things (fruits and vegetables) they pollinate.

Through global warming, loss of habitat, and the use of pesticides, bee species in the Mojave and around the world, bee populations are decreasing at an alarming rate. There's so little known about non-honeybees that an accurate estimate of their decline is hard to determine.

While bee populations are in a precarious situation, all is not lost. There are many ways we can help advocate for their protection. We can also do things to help conserve and protect the bees! We can plant native flowers that pollinators rely on for food, which also helps protect native flora and the whole desert **habitat**. Provide and maintain open areas for native bees since many nest in the ground and not in hives. You can make a bee house for carpenter and mason bees (see extension activity for directions below). You can investigate ways of controlling garden pests without using pesticides. You can spread the word about the importance of pollinators and bees. You can also participate in citizen science projects like the one listed below. We can help protect the pollinators by taking these small steps and that's exciting!

Un-Bee-lievable Fun facts:

Only 10% of the world's bee populations live in hives. Many species in the Mojave, like miner bees, have a special **adaptation** for living in underground tubes.

Some bees, like mason and carpenter bees, build nests in wood. (This is why bee houses are important.)

Not all bees live in large colonies, most native bees live solitary lifestyles except during mating season.

Only honeybees die after they sting, solitary native bees can keep living even after they sting. Just remember that if you leave a bee alone it will leave you alone, they only sting out of self-defense. Think about how big you are; to a bee you're a scary giant!

Native bees are just as efficient at pollination as honeybees.

Native bees generally prefer to live within 1,500 feet of the area they pollinate. This is another good reason to keep some open space for those solitary pollinating friends of the desert.

The Crotch Bumble Bee (*Bombus crotchii*) lives in the Mojave Desert and is a California State candidate for listing as an endangered species, it is one of four bee species on the list!

Bonus facts!

Scientists hypothesize that bees evolved alongside flowers during the early Cretaceous period, about 145-100 million years ago. This means they lived at the same time as dinosaurs; they sure have been pollinating for a long time!

Dr. Charles Henry Turner, an African American biologist, studied social insects like bees in the late 1800s and is the first person to describe how bees communicate through “wiggle dancing”.

The ancient Maya of the Yucatan (current day southern Mexico, Belize, Guatemala, and Honduras) meticulously kept hives of stingless bees, called *Xunan-kab* in Mayan. Bees were so important for both economic and religious reasons that you can find bee and hive symbols in hieroglyphs like the *Kab’an* and *Imix* symbols!



Imix



Ah Muzen Kab (God of Bees)



Kab'an

Follow-up/ Discussion - *What did you learn? How do you feel about protecting some of the smallest and most incredibly important desert species?*

Students can fill out the activity page, drawing and writing then share it with others.

If you want to participate in citizen science studying bee populations, join the *iNaturalist* project titled Bees of California and submit observations through your phone!

(<https://www.inaturalist.org/projects/bees-of-california>) The best part about participating in these kinds of projects is that anyone can add observations anywhere; from your urban public park, to rural areas, to hiking trails on your public lands.

We would love to hear how your bee saving activity went, share your work with Mary- mary@mdlt.org.

Further Reading and Resources-

Abramson, Charles I. 2021. *Charles Henry Turner*. Encyclopedia Britannica, web version- <https://www.britannica.com/biography/Charles-Henry-Turner> Accessed June 8, 2021.

Asbell, Madena. 2020. *Know Your Desert Pollinators, and the Plants They Rely On*. <https://medium.com/age-of-awareness/know-your-desert-pollinators-and-the-plants-they-rely-on-f473eba863c4> Accessed June 23, 2021.

Bureau of Land Management- *Pollinators*. <https://www.blm.gov/programs/natural-resources/native-plant-communities/pollinators> Accessed June 21, 2021.

California Department of Fish and Wildlife. *Species of Special Concern*. <https://wildlife.ca.gov/Conservation/SSC> Accessed June 20, 2021.

Coe, Michael D., and Mark Van Stone. 2001. *Reading the Maya Glyphs*. Thames & Hudson, New York, New York.

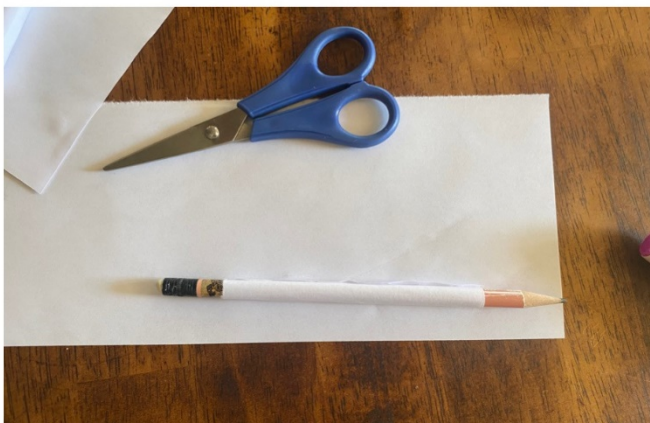
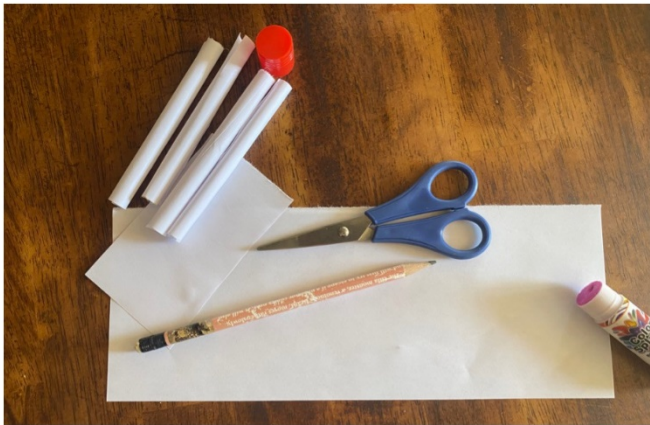
Frankie, Gordon W., Robbin W. Thorp, Rollin E. Coville, and Barbara Ertter. 2014. *California Bees & Blooms: A Guide for Gardeners and Naturalists*. Heyday in Collaboration with the California Native Plant Society, Berkley, CA.

Museum of the Earth. *Evolution & Fossil Record of Bees*. <https://www.museumoftheearth.org/bees/evolution-fossil-record> Accessed June 21, 2021.

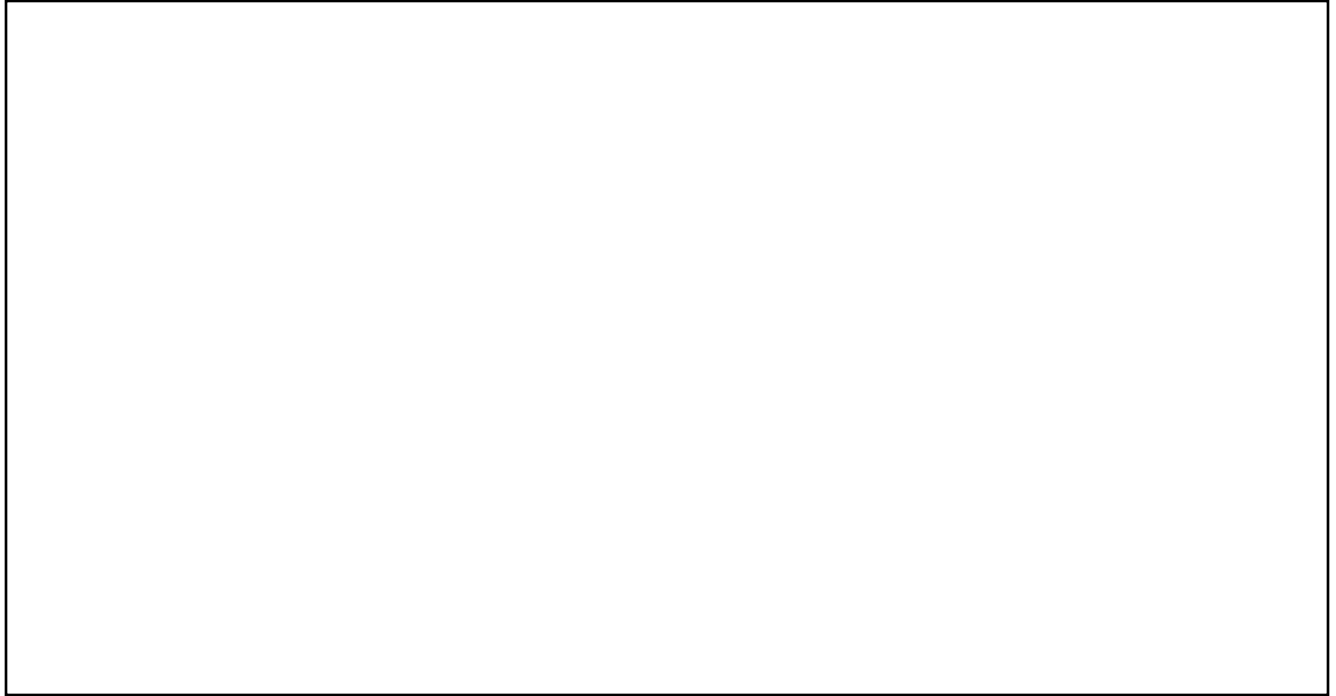
Pollinator Partnership. *About Pollinators*. <https://www.pollinator.org/pollinators> Accessed June 20, 2021.

Sharer, Robert J., 1994. *The Ancient Maya*. Stanford University Press, Stanford, CA.

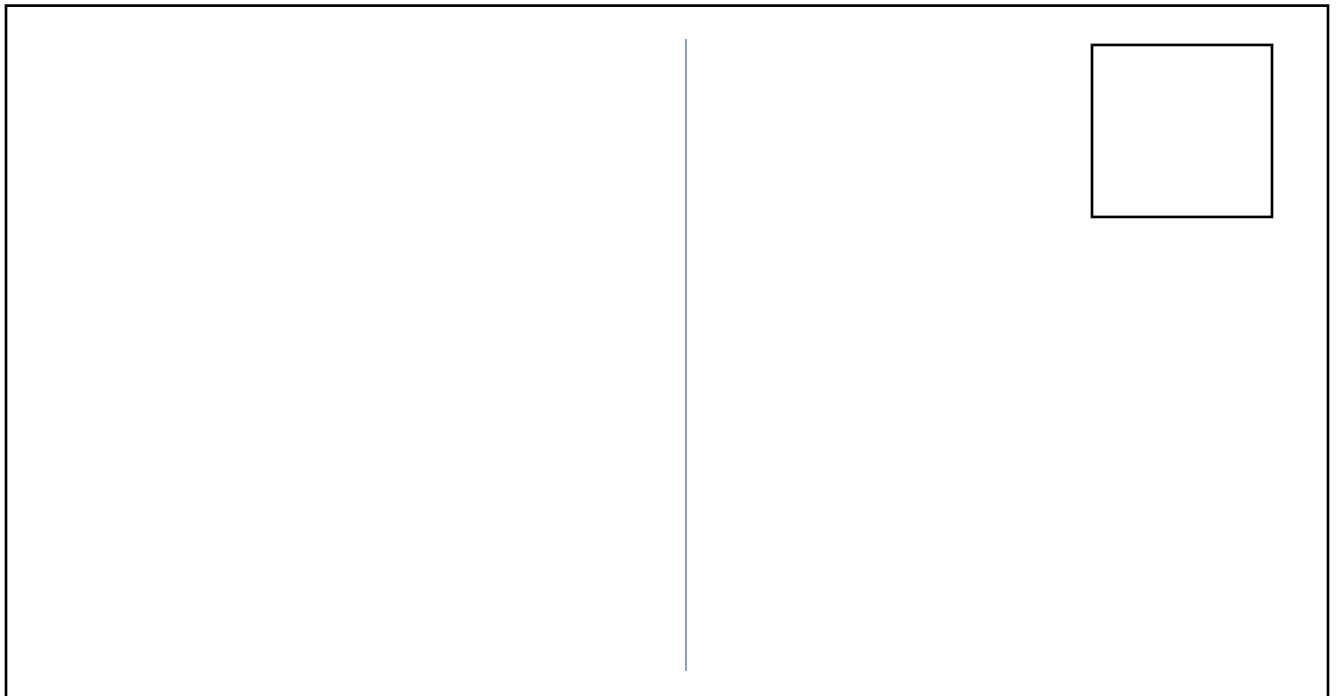
Building a native bee house: While you can purchase a bee house, you can also easily make your own. You'll need a clean and empty tin can, string, markers, and small cardboard tubes or pieces of paper that can be rolled into small tubes. Decorate the outside of your tin can with markers (or you can decorate a piece of paper and tape it around the can), attach a string around either side of the can so it hangs horizontally, then you'll roll the paper into tight tubes and insert them into the open end of the can or insert the small paper tubes into the open end of the can. Go outside and hang it up! That's all there is to it!



Activity: Design a postcard or poster that you can use to help spread the word about helping bees and other pollinators in your area. You can use any of your solutions, fun fact information or a combination of both.



Postcard Front: draw your picture.



Postcard Back: write about facts and solutions.