



## 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: Solutions for Solving Climate Change One Step at a Time

**Topic:** Designing a path to minimize your impact on the desert ecosystem.

**Objective/Learning Goal:** Students will be able to understand the impacts that humans unintentionally have on the environment and think of ways that they can help protect our remaining open spaces. Remember that they are the future, students are going to be the next generation of land stewards and advocates.

#### Glossary:

- **Carbon Cycle-** The process in which carbon travels from the atmosphere into organisms and the Earth and then back into the atmosphere. For example: Animals eat food and carbon from the food is stored in their bodies, then the carbon is released through respiration.
- **Carbon Dioxide-** A colorless, odorless gas produced by the burning of carbon, organic compounds, and by respiration.
- **Climate Change-** The change in global or regional climate patterns; in particular, the change from mid to late 20<sup>th</sup> century increase of carbon dioxide levels in the atmosphere largely due to the burning of fossil fuels. Climate change is a natural cyclical process, though has been sped up by human usage of natural resources.
- **Leave No Trace™-** A series of 7 outdoor ethic principles that help humans “sustain healthy and vibrant natural lands.” These include plan ahead and prepare, travel & camp on durable surfaces, dispose of waste properly, leave what you find, minimize campfire impacts, respect wildlife, and be considerate of others.
- **Ozone Layer-** A layer of the earth’s atmosphere (altitude of 6.2 mi) containing a high concentration of ozone, which absorbs most of the ultraviolet radiation reaching the earth from the sun.

**Activity:** Scientific studies reveal that humans are having great impacts on the climate and that *climate change* is becoming an ever-increasing problem for our future generations. Climate change is affecting deserts more than any other ecosystems. Evidence has demonstrated that we already experience times of long hot dry spells, but

as the climate changes our desert communities are seeing more weather extremes. Climate change scientists, Iknayan and Beissinger (2018) found that many places in the Mojave have lost on average 43% bird species. Many places in the desert have seen a significant decline in the number of breeding birds, from 135 to 39 bird species. Additionally, Archer and Predick (2008) note that increases in atmospheric CO<sub>2</sub> or *carbon dioxide* levels decrease the ability of native plants to grow, while allowing for an expansion of invasive plant species in the area.

**This is where people, including students like you come in.** You're just a kid, right? How can you solve these problems? What can you do to help the environment? You must remember that you are future conservationists, the next generation of land stewards and advocates. There are small steps that we can take to help lower our own impact and reduce our carbon footprint. Let's focus on positive solutions by creating a plan to implement small changes and to help protect our earth, our home, the beautiful desert.

Let's talk about things we can do starting now! We know that picking up after ourselves is a good idea, no one likes to look at trash in the desert. We can stop releasing things like mylar balloons, the endangered desert tortoise will try to eat them. Maybe you can remember to turn off the lights when you're not using them or covering your trash to keep animals from eating it then getting sick. This might be a good time to review the *Leave No Trace*<sup>™</sup> seven outdoor ethics principles. They are: 1) plan ahead & prepare; 2) travel & camp on durable surfaces; 3) dispose of waste properly; 4) leave what you find; 5) minimize fire impacts; 6) respect wildlife; and 7) be considerate of others. There were almost 3-million visitors last year at Joshua Tree National Park, what would happen is all those visitors just walked off trail wherever they wanted? What about all those visitors taking a single flower? Talk to your learning partner about the effects just these two questions would have on the desert ecosystem. How would that impact the environment and local desert habitat?

**Materials:** blanket, pen or crayons, and footprint paper

Experiment: Demonstrating the carbon cycle. Grab a blanket (any blanket), imagine that you are the earth. Your blanket is the atmosphere. What happens when you wrap the blanket around yourself? Do you get warmer? Why? Your body heat becomes trapped between your body (the earth) and the atmosphere (the blanket). You can think of your own body heat as carbon. As more carbon is released into our atmosphere it slowly warms up the earth. If you leave your blanket on too long you can get overheated and start to feel kind of ill. (Please don't leave your blanket on that long though, you can get really sick from getting overheated.) If you think of yourself as a warming earth how do you think the real earth will feel, adapt, and change as it starts to warm up?

What can we do now to help stop our planet of feeling that effect of being too warm? Using what you've learned and the things you've talked about with your learning partner, start drawing or writing your solutions into your carbon footprint paper.

**Working together we can help protect our fragile ecosystem!**

**References:**

Archer, Steven R. and Predick, Katherine I. 2008. Climate Change and Ecosystems of the Southwestern United States. *Rangelands*, 30 (3): 23-28.

Iknayan, Kelly J. and Bessinger, Steven R., 2018. Collapse of a Desert Bird Community of the Past Century Driven by Climate Change. PNAS.

<https://www.pnas.org/content/pnas/115/34/8597.full.pdf>

Leave No Trace: Center for Outdoor Ethics™. 2021, The 7 Principles.

<https://lnt.org/why/7-principles/>

Mojave Desert Discovery: An Educator's Guide to Cultural and Natural History

# Lowering My Carbon Footprint

