

Around the World in Seven Greenhouses Teacher Resources

This activity focuses on geography and understanding how plants are distributed around the world. We've included goals for the activity, Next Generation Science Standards, vocabulary, talking points, and further activities for back in the classroom. We hope these resources help you integrate your field trip into your broader classroom experience!

Goals & Standards:

1. To engage with the plant collection at the Garfield Park Conservatory in a fun way
2. To practice recording data and observations
3. To better understand geography and think about how geography and climate affect plants
4. To introduce the concept of convergent evolution to students

Next Generation Science Standards: 2-LS4-1, 3-LS4-3, 3-LS4-4, 4-LS1-2, MS-LS2-1, MS-LS4-2

Vocabulary:

Geography – the study of physical features of the earth and its atmosphere

Biogeography – the study of how geography affects the distribution and evolution of plants and animals

Climate – the weather patterns of a specific area over a long period of time

Continent – one of the planet's large, continuous expanses of land

Ecosystem – a group of interacting organisms and their environment

Habitat – the natural home of a plant or animal

Evolution – the process by which populations of living organisms change over time in order to adapt to their changing environments. This is how different kinds of living organisms develop and diversify from earlier forms during the history of the earth.

Evolutionary pressure – something that forces an organism to adapt, like dry conditions, a contagious illness, or predation from other organisms

Convergent evolution – when two organisms seem very similar, because similar pressures and climate conditions caused them to evolve in similar ways

Talking points during your trip:

- Plants evolve based upon evolutionary pressures of their environment. In desert or arid



conditions, plants evolve to save and store water. In rain forests, plants evolve to deal with intense competition for space and light.

- Evolution is a very, VERY slow process. If a plant was relocated to a new environment it would be many thousands of years before it would look different than its ancestor.
- When there are no new evolutionary pressures, plants that reproduce asexually (create clones of themselves) are very successful. If anything in their environment changes however, they may not be able to survive. The banana, for instance, is under threat because of a fungus that attacks them. One of our major projects is cultivating new species of banana resistant to the fungus.
- The Desert House is a good example of plants that exhibit convergent evolution. Cacti are from North America, but *Euphorbia* are from southern Africa. Both of these regions have similar climates (very dry and hot) and face similar threats of predation by animals. Thus both cacti and euphorbs have swollen stems to store water, as well as spines (cacti) or thorns (euphorbs) to conserve water and defend against predators. Even though these groups look similar they are not closely related from an evolutionary perspective.

Back in the classroom:

- In the classroom practice graphing results with students from their tally tables. You can also take an average of what everyone found and graph that as a group result.
- Have students draw an ecosystem for a plant they found today. They can research what animals might be in the same ecosystem and incorporate those into the picture.
- Explore biogeography and ecosystems by looking at world maps showing elevation, daily temperature, and rainfall. What do these maps tell them about different places? Can they figure out what kinds of plants they'd find in a hot, dry place? What about a warm, wet place?



Around the World in Seven Greenhouses

Plants & Geography at the Garfield Park Conservatory

We have plants from all around the world at the Garfield Park Conservatory. Can you find plants from all seven continents? Find as many plants as you can!

To keep track of your findings, make a tally next to the continent in the table below. We've included one of our plant signs below for you to practice. See how many tally marks you can get in each continent! If you need help figuring out where a country or region is on the map, ask your chaperone or teacher to help you.



Map © of freevectormaps.com



The Golden Barrel Cactus is from Central Mexico, which is in North America. Because Central Mexico is in North America, one tally for plants from North America is added.

Continent	Plant tallies
Africa	
Antarctica	
Asia	
Australia	
Europe	
North America	
South America	

1. Out of the plants you found what continent were the most plants from?
2. Did you find plants from all seven continents?
3. What continent was missing? Why do you think this is?
4. Lots of plants are from all over the world and yet they're grown right next to each other in our greenhouse. For example, you can find a plant from South America growing next to a plant from southeast Asia. Why do you think this is possible?
5. Find two plants that are growing next to each other from different parts of the world. Draw each of these plants in the space below and label them with their names and their native region.

Name:

Native region:

Name:

Native region:

6. What are the similarities between these plants? Why do you think they share these similarities?
7. What are the differences between these plants?
8. What is a country you hadn't heard of before the scavenger hunt or needed help locating on the map?