

# ***Granny's Garden School, Inc.***

## **Teaching in the Gardens**



SchoolGarden@fuse.net

20 Miamiview Lane, Loveland, OH 45140

513-324-2873

[www.GrannysGardenSchool.com](http://www.GrannysGardenSchool.com)

### **What is Biodiversity? Grade Four**

#### **Suggestions for using this lesson in the garden cycle:**

- Use this lesson in the spring as part of your Earth Day discussion to emphasize the importance of diversity in plants and animals.

#### **Ohio Standards Connections:**

##### **Science - Life:**

- Diversity and Interdependence of Life B5: Describe how organisms interact with one another in various ways (e.g., many plants depend on animals for carrying pollen or dispersing seeds).

#### **Lesson Summary:**

Students understand the meaning of biodiversity and why variety in plant and animal species is desired.

#### **Estimated Duration:**

30-40 minutes

#### **Materials:**

Sunflower seeds  
Popcorn seeds  
Water bottles requested in advance from students  
4 buckets for water

#### **Background information:**

1. **John McConnell came up with the idea to celebrate life on Earth on the first day of spring. The first Earth Day honoring the beauty of the earth was celebrated March 21, 1970.** The idea was supported by the United Nations, and a proclamation was issued to celebrate the United Nations Earth Day on the first day of spring each year (the spring equinox – the day when the sun is directly above the equator and the length of day and night is equal). The Japanese Peace Bell at the United Nations in New York is rung on the first day of spring in honor of the United Nations Earth Day.
2. **Another Earth Day was proposed by Senator Gaylord Nelson to promote awareness of and solutions for environmental issues.** This Earth Day was first celebrated April 22, 1970. This is the date more commonly referred to as Earth Day.
3. Also in 1970, The Environmental Protection Agency (EPA) was formed by President Nixon. The EPA is a national agency that recommends and enforces regulations to protect human health by keeping air, land, and water resources safe.

4. Earth Day reminds us to be respectful of nature and to conserve and protect our resources.
5. A **habitat** is the place a plant or animal lives.
6. An **ecosystem** is a habitat of interdependent organisms. A healthy ecosystem has the right balance of plants and animals.
7. **Biodiversity** is the number of different plant and animal species in a habitat or the Earth as a whole. High biodiversity means there are many species. A healthy ecosystem has good biodiversity of species.
8. Plants and animals are connected in an ecosystem. When there is good biodiversity the ecosystem is in balance. Food, water, shelter, and living space are available to meet the needs of the organisms in the ecosystem.
9. **The biodiversity of a habitat is affected by natural and human changes.** Changes caused by nature include fire, wind, lightning, ice, disease, drought, or erosion. Changes caused by humans include fire, cutting trees for timber, vandalizing trees, planting non-native plants, introducing non-native animals, or clearing land for farms, homes, or businesses.
10. The loss of biodiversity means that some living things are dying. In severe loss, living things could become threatened or extinct if they cannot adapt to the changes or relocate.
11. Healthy ecosystems with high biodiversity have a better chance to recover from habitat changes. Some of the living things may have adaptations that help them to survive.

**Activity:**

1. In advance, fill four buckets with water for students to use to water their planting. Collect empty water bottles in the event students don't bring their own.
2. Pick an area to plant sunflowers that is convenient to your garden beds – the front courtyard in the flower beds, the LES playground fence by the front driveway, the McDonald's fence, the Sunflower Reading Room (all beds), along the building in front of LES, Perennial/Herb garden near the building, Hill Gardens along the chain link fence (not outside of the fenced area and not along the wood fence), not in the Primary Playground Gardens. Do not plant sunflower seeds in or along the outside of the garden beds.
3. Plant popcorn along the outside narrow edge of the garden boxes. Do not plant along the wood fence of the Hill Gardens.
4. **Explain that the class will plant sunflower and popcorn seeds in honor of Earth Day.** Ask the students what Earth Day is. Briefly discuss what Earth Day is.
5. Because it's Earth Week, students will plant seeds to increase the biodiversity in Granny's gardens.
6. **What is biodiversity?** Break down the word to make it easier to remember. Bio means life. Diversity means variety. Biodiversity studies the variety of living things. Biodiversity in a habitat is a count of plant and animal species in a **habitat**. Ask students what a habitat is. When biodiversity is high, there are many plants and animals that depend on each other for survival. A habitat with interdependent plants and animals is an **ecosystem**.

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7. **How do plants and animals depend on each other?** Some of the ways plants and animals depend on each other are pollination for seed production; plants attract animals; decomposers for healthy soil; plants and animals are food for animals; animal homes; plants provide protection for other plants and animals (e.g., leaf litter protects forest floor plants in winter, places for animals to hide from predators); living space and food for fungi and lichens which are food for animals; dead plants and animals provide food and energy sources to plants and animals.
8. **A healthy ecosystem has good biodiversity of species.** What does this mean? It means that there are many different plant and animal species in the ecosystem. There are plenty of food sources, places to find shelter, spaces to live without crowding.
9. **Why should I care about biodiversity?** Humans rely on plants and animals for food, shelter, medicine, and other products. Thirty percent of our medicine found their beginning in plants. Living things have a role to play in a habitat. Relate this to food chains and the inter-relatedness of producers, consumers, and decomposers. Variety in food provides needed nutrients to plants and animals. Healthy soil grows healthy food.
10. **What can cause low biodiversity?** Discuss some of the natural and human impacts on an ecosystem.
11. **What is the impact of low biodiversity on living things?** Low biodiversity means plants and animals die if they cannot adapt or relocate. Older species that cannot survive competition for basic needs in a habitat die.
12. Scientists believe that 1% of all species that ever lived on Earth are alive today. That leaves 99% of all species that have lived on Earth are extinct. With habitat changes, species are becoming extinct at a faster rate.
13. Scientists believe it is important to save species because they aren't sure what might happen if a species becomes extinct. New species continually evolve and others are just being classified. The loss of one species can have an effect on the survival of other species. Maybe an endangered fly is the only insect that pollinates a certain plant. If the fly is extinct, the plant will disappear. Maybe that plant has a yet undiscovered chemical to cure a disease. Others say this does not outweigh the benefit derived from building a home, farm, or business on the land.
14. **How can people help?** People can help by controlling air, water, and land pollution, by using caution when developing an area, by protecting some habitats, by reclaiming habitats with the introduction of native species. A project called Seeds of Success is collecting seeds – especially those from threatened species – to increase species with the goal of maintaining and restoring public lands.
15. We're planting sunflower and popcorn seeds to increase our food diversity and to attract beneficial animals to the gardens.
16. **Sunflower seeds are planted one inch deep in an area with full sun along the middle or back of the planting area in which you are planting.** The seeds germinate in 10-12 days. Some of our sunflower varieties grow up to 12 feet tall, but there are sunflower varieties that grow to only 12 inches. Our sunflowers will bloom in 60 to 90 days. Sunflowers come in a variety of colors.
17. **Popcorn seeds are planted one inch deep on the outside edge of your garden boxes that is closest to a wall or fence.** If your beds are not by a wall or fence, plant at one end of your beds. Seeds germinate in

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18. Have students dip their water bottle into a bucket to water their planting. Have students take the water bottle with them to the planting spot being careful not to spill it.
19. Students water their planted spots.
20. Return water bottles to storage container so other classes can use them.

**Sources: \_**

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- “Biodiversity in Your Own Backyard”, Backyard Science by Shar Levine and Leslie Johnstone. New York, New York: Sterling Publishing Company, 2005.

