

# Backyard Biodiversity Challenge

**Grade Level:**

5th - 8th grade

**Subject Areas:** Earth Science

**Activity time:** After school over one week.

**Setting:** Outdoors at home

**Skills:** Gathering information through observing, collecting and recording; Organizing information through classifying, drawing; Analyzing information.

**Vocabulary:**

- **Ecosystem:** all living organisms in a certain area as well as their physical environment.
- **Endemic species:** a species specific to only one ecosystem.
- **Exotic species:** species living in-but not native to-an area.
- **Invasive species:** usually an exotic species that displaces native species and threatens the balance of an ecosystem.
- **Keystone species:** a species so important that an ecosystem can't function properly without it.
- **Scientific nomenclature:** the way we name things in science. Based on evolutionary relationships.
- **Taxonomy:** the science of systematically naming and recording species.

**Objectives:** Students will:

- 1) develop a list of at least 20 species located near their home.
- 2) explain how at least two of the species they found depend on one another.
- 3) identify at least one keystone, exotic, endemic or other species from their list.

**National Standards:**

- Content Standard A: Science as Inquiry;
- Content Standard C: Life Science;
- Content Standard E: Science and Technology;
- Content Standard F: Science in Personal and Social Perspectives;
- Content Standard G: History and Nature of Science

**Materials:**

- Data sheet
- Field guides for the area

**Background:**

An important mission of the National Park Service is stewardship. Park stewardship is when someone takes personal responsibility for caring and protecting public lands. By observing the natural world in our own backyards, we begin the process of making personal connections. We hope that as students gain an understanding of the natural systems in their neighborhoods they will be more compelled to want to protect them.

By using some of the skills developed in Module 4, Mini-ATBI, students will develop their own inventory of their neighborhood. Taking it a step further, they will identify threats to their neighborhood by looking for exotic and invasive species.

**Introduction:**

One way to make a personal connection with nature is to start noticing what is around you. Park rangers do this in order to preserve and protect what lives in a park but anyone can do this wherever they live. The place to start is in your own neighborhood. In this activity, each of you will do a survey of what species are found in your neighborhood. Even in cities, nature has a way of fitting in to the man-made ecosystem. In this activity, you will do a survey of your neighborhood, not the people but the plants and animals around you every day.

**Procedure:**

1) Explain to students that they will be filling out a data sheet for their neighborhood. They are to list as many different plants and animals as they can, but are not to include people or pets.

2) To the best of their ability, identify to species. If that isn't possible, draw, photograph or write out a description of what the specimen looks like. They are not to collect any specimens.

3) Let students know they get extra credit if they are able to research whether or not each species is native to the area or has anything else special about it. For instance, if they identify a Starling (a common black bird) and then can tell you that it originally comes from England, they get an extra point.

4) Make sure students know the following:

- they shouldn't go onto private property without permission
- they shouldn't damage trees or other plants by digging them up or ripping off leaves
- they shouldn't chase after, yell at or throw anything at animals they may see
- don't touch or collect animal droppings, dead animals, trash, broken glass or other human refuse

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- don't reach under logs, rocks, crevices, or other spaces if you can't see into them.

5) Tell students they should do the following:

- be a careful observer
- take careful notes about what is found, including information about the locations and characteristics of plants and animals you can't identify
- respect everything you find, handle it as little as possible and with great care
- replace any logs or rocks that you move to the position you found them
- look for animal signs as well as animals, they can often lead you to the right place
- wash your hands carefully when you come in from the field

### Wrap Up:

Consolidate the lists from each student to create an overview of the area. Look over the list and determine if you have any unique or special species in your neighborhood. Use the internet to determine if any of the species are threatened or endangered.

Ask students if they think they missed some species? What would they like to do again to get more the next time? Ask students if they feel they are noticing more about the plants and animals around them? Were any of them surprised at how easy or difficult it was to find 20 different species?

### Assessment:

Grade student worksheets on the following:

- total number of species they found,
- the number that were identified down to the species level (*you can give partial credit for drawings when they can't find the actual species name*),
- the diversity of different groups

(i.e. did they focus only on trees and mammals with no insects?),

- don't expect students to identify invertebrates to the species level, give them full credit for identifying to Order level and extra credit if they can get further.
- give partial credit if a student puts down "Squirrel" and full credit if they are more specific and put down "Gray squirrel"
- give extra credit if a student uses latin names.

### Extension Activities:

- Repeat the activity at a different time of year. Were there any changes?
- Identify a keystone species that used to be in your area but is no longer. To figure this out, students will need to find out which species are gone and what role they played in the food chain. Many times, the loss of a producer has more impact than the loss of a consumer, ask students why this is true.

### Resources:

#### ATBI website:

<http://www.dlia.org/>

#### Internet databases:

<https://handsontheland.org/environmental-monitoring/terrestrial-invertebrate-study.html>

#### Guide to Insect Orders:

[https://handsontheland.org/monitoring/projects/inverts/order\\_guide.pdf](https://handsontheland.org/monitoring/projects/inverts/order_guide.pdf)

#### Guide to Spider Families:

[https://handsontheland.org/monitoring/projects/inverts/common\\_spider\\_fam\\_GSMNP.pdf](https://handsontheland.org/monitoring/projects/inverts/common_spider_fam_GSMNP.pdf)

#### Webpages for Insect Identification:

<http://www.insectidentification.org/>  
<http://bugguide.net/node/view/15740>

#### Tree ID:

many states have online guides through their extension offices.  
<http://www.realtimerendering.com/trees/trees.html>

#### Plant ID:

East Coast - <http://www.realtimerendering.com/flowers/flowers.html>  
 West Coast - <http://www.renyswildflowers.com/view.html#vs=5>

#### Bird ID:

<https://www.allaboutbirds.org/news/>  
<http://www.realtimerendering.com/birds/birds.html>

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Name \_\_\_\_\_

Date \_\_\_\_\_

You can use the back of the data sheet to draw any unidentified specimens.



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## Plants

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## Non-insect Invertebrates



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## Birds



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## Insects

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## Trees

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## Reptiles

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## Amphibians

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## Others (like Fish)



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