

Local Animals & their ecosystem



Grade Level: 3-5

Time Needed: See procedures (estimates)

Overview:

In grade 3, you may only want the students to learn about specific local wild animals. In grade 4, you may want them to learn more about the entire ecosystem in which the students and animals live. By grade 5, you may be more concerned with challenges to the ecosystem. Of course, you can mix and match any way you want to accomplish your goals or fulfill your standards.

Essential Questions:

- What is an animal?
- How do all the parts of an ecosystem interact?
- What forces or activities can disrupt an ecosystem?

Standards:

NGSS:

- **LS2.C: Ecosystem Dynamics, Functioning, and Resilience**

When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.
(secondary)

- **LS4.D: Biodiversity and Humans**

Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

- **MS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics**

Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

- **MS-ESS3-3 Earth and Human Activity**

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Common Core:

- Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-4)
- SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS4-4)

National Council of Social Studies:

- investigate the impact of human activities on the environment. This enables them to acquire a useful basis of knowledge for informed decision-making on issues arising from human-environmental relationships.
- How do people interact with the environment and what are some of the consequences of those interactions?
- D2. Geo.1.6-8: Construct maps to represent and explain the spatial patterns of cultural
 - and environmental characteristics.
- D2. Geo.3.6-8: Use paper-based and electronic mapping and graphing techniques to represent
 - and analyze spatial patterns of different environmental and cultural characteristics.

International Baccalaureate:

- PYP 1: Approaches to teaching 1.1: Teachers use inquiry-based teaching strategies and learning engagements. (0403-01-0100)
- PYP 3: Approaches to teaching 3.1: Teachers ensure that there are clear examples of connections to local and global contexts in the curriculum. (0403-03-0100)
- Approaches to teaching 3.2: Teachers encourage students to transfer their conceptual understandings to unfamiliar contexts. (0403-03-0200)

Objectives:

- Identify types of local ecosystems
- Research specific animals in the local ecosystems
- Observe obscure or hidden creatures in a local ecosystem
- Identify problem issues in the local ecosystem
- Create products to protect the local ecosystem

Materials:

Research materials on animals:

- <https://climatekids.nasa.gov/10-things-ecosystems/> NASA Climate Kids: Ecosystems
- <https://www.animalspot.net/animals-in-us> lists of every animal in every state but not much information on them.
- <https://www.safesearchkids.com/> Google search engine for kids
- <https://pbskids.org/games/animals> Animal Games (many games here-you would need to search for your region)
- <https://pbskids.org/videos/wild-kratts> Wild-Kratts has several videos about animals

- <https://pbskids.org/videos/through-the-woods> Through the Woods has several videos about woodland plants and animals. It is meant for young children, probably pre-grade 3.
- <https://pbskids.org/videos/nature-cat> Nature Cat videos are about nature and would appeal to older kids. These videos are close to 30 minutes long.
- <https://rangerrick.org/animals/> Topic of Animals
- <https://www.ducksters.com/> Topic of science
- <https://kids.nationalgeographic.com/search> NatGeo kids research-animals
- <https://www.worldwildlife.org/teaching-resources> WWF Teaching Resources
- <https://www.teacherspayteachers.com/FreeDownload/Poster-Rubric-4277167> generic poster rubric

Research materials on local ecosystems:

- <https://www.teacherspayteachers.com/Product/Biodiversity-Field-Exercise-6001130?st=90513bd2b92e953658add724a1816bf> Biodiversity Field Exercise
- <https://www.teacherspayteachers.com/FreeDownload/Local-Ecosystem-and-Biodiversity-Survey-3109639> Local Ecosystem and Biodiversity Survey
- <https://www.youtube.com/watch?v=ptfxM2NqJZY> Ecosystems and Food Chains - 5th Grade
- https://www.sciencebuddies.org/science-fair-projects/project-ideas/EnvSci_p042/environmental-science/are-there-bugs-under-your-feet Are There Bugs Under Your Feet? You need to collect some common materials for this activity
- https://www.sciencebuddies.org/science-fair-projects/project-ideas/Zoo_p015/zoology/finding-phyla Finding Phyla
- <https://www.teacherspayteachers.com/Product/Charting-Biodiversity-7175335?st=e9369d5ce2887cfe815194744383d0a1> Charting Biodiversity (a free sample of a unit from Project Learning Tree)

- <https://www.teacherspayteachers.com/Product/Phylo-Educational-Ecosystem-Trading-Card-Game-Base-Deck-1842648?st=5165b8322733d06ab3de42e2a0eba552> Phyla: Educational Ecosystem Trading Card Game - Base Deck
Or...go to Phylo.org for different cards specific to your needs
- <https://phylogame.org/game-play/#ecosystem> video of game rules
- <https://phylogame.org/wp-content/uploads/2013/10/PHYLOrules2013.pdf> Easy Phylo rules

Problems or concerns in ecosystems:

- https://www.biologicaldiversity.org/programs/population_and_sustainability/T_and_E_map/ Map: U.S. Threatened and Endangered Species by County
- https://docs.google.com/document/d/1hD1R9hdJR2JvE22yR9O2C9Dv9OV6XtSRiGh_rDL4700/ view: It's an Alien Invasion! (you can use the entire lesson or just the game)
- <https://www.invasivespeciesinfo.gov/subject/lists> National Invasive Species Information Center: Species Lists (by state or other) Since this is a Dept. of Agriculture site, it is primarily concerned with plants, water, and pests. It could be used in conjunction with animals.
- https://www.teachengineering.org/activities/view/cub_environ_lesson08_activity1 This Land Is Your Land, This Land Is My Land-examining land use in your community
- <https://www.youtube.com/watch?v=y18o0mACCQs> What is biodiversity?
- https://files.worldwildlife.org/wwfmsprod/files/EducatorsToolkitFile/file/9ccgy12b4t_BIODIVERSITY_SOCIAL_STUDIES_LPR2020.pdf Biodiversity Audit:
 - Art supplies
 - Poster size paper
 - Hula hoops or other round devices
 - Old magazines with animal photos or a printer students can use

Note: Some lessons and activities require other materials and supplies. Be sure to review them before presenting them to the students.

Hook:

You will need a **Hula hoop or other circular device** for each group for this exercise

Divide the students into pairs or groups of 3.

- Distribute to each student:
<https://www.teacherspayteachers.com/Product/Biodiversity-Field-Exercise-6001130?st=90513bd2b92e953658add724a1816bf> Biodiversity Field Exercise Handout
- Go over the instructions on the sheet, explaining that everyone in the group is responsible for the observations.
- Distribute 1 hula hoop to each group
- Take the class outside and allow each group to place their hula hoop wherever they choose.
- Tell them the time and temperature.
- Complete the handouts. Each individual in the group should do the observing, but they can all write down each other's findings.
- After about 10 minutes, return to the class and discuss what everyone found.
 - Explain that they will be studying the animals in their local area over the next few days.
 - Ask them how their school ground observation relates to the study of local animals.
 - What is an animal? How can you tell an animal from a plant or a rock?
 - What animals did they see?
 - Why did they have to observe the plants if they will be studying animals?

Procedures:

Procedure 1: Local Animals.

Be sure to print out the Research My Animal worksheet and a set of all the names to pull out of a hat or other receptacle.

Begin by showing them the following:

- <https://climatekids.nasa.gov/10-things-ecosystems/> NASA Climate Kids: Ecosystems
 - Ask which kind of ecosystem(s) they live in or near.
 - Are there more than one ecosystem where they live? (ex: forest and grassland)
 - Do they live in one that isn't mentioned? (like eastern woodlands)
- Ask them to name all the animals they can think of that live in your local ecosystem, remembering that not all are mammals.
- List them on the board.
- Open the following website or ask them to open it on their own devices:
<https://www.animalspot.net/animals-in-us> lists of every animal in every state but not much information on them. Find your state and see all the animals that are listed. You can discuss them if you have time.
- Distribute the worksheet **Research My Animal**. Explain that they may each choose an animal to study, but no two students may choose the same animal, and to think about not just the mammals. Tell them to have a 2nd and 3rd choice in mind.
- Put the student names in a container, shake it well, and start pulling names. As a name is called, ask that student for the animal they want to study. If the last few students have all their choices taken, talk to them individually about making another choice. *If someone is near a meltdown, let them do a duplicate animal.*
- The following is a list of different places to search. Some are to read and some are to watch, depending on the individual's style:
 - <https://www.safesearchkids.com/> Google search engine for kids

- <https://pbskids.org/games/animals> Animals Games-many games here-you would need to search for your region
 - <https://pbskids.org/videos/wild-kratts> Wild-Kratts has several videos about specific animals
 - <https://pbskids.org/videos/through-the-woods> Through the Woods has several videos about woodland plants and animals. It is meant for young children, probably pre-grade 3. (reluctant readers)
 - <https://pbskids.org/videos/nature-cat> Nature Cat videos are about nature, and would appeal to older kids. These videos are close to 30 minutes long.(advanced)
 - <https://rangerrick.org/animals/> Animals
 - <https://www.ducksters.com/> science
 - <https://kids.nationalgeographic.com/search> NatGeo kids research-animals
 - <https://www.worldwildlife.org/teaching-resources> WWF Teaching Resources (advanced)
- Allow time for research or assign as homework if that is an option.

Procedure 2: Animal Posters.

You will need poster size paper for each student (plus extra for mistakes), art supplies if students don't have their own, glue, old magazines etc. for photos, unless you have a printer for student use.

- Distribute the poster paper to each student.
- Ask them to use their **Research My Animal** paper to create a poster of their animal.
 - Include:
 - A photo or drawing
 - Name of the animal (scientific name is your choice)
 - Use the research doc. to bullet point information on the poster
- Early finishers can find a game at: <https://pbskids.org/games/animals>

- Here is a generic poster rubric if you are interested.

<https://www.teacherspayteachers.com/FreeDownload/Poster-Rubric-4277167>

poster rubric

- Be sure to display them and allow time for students to view them. (The next activity will also contain items to be displayed, so be sure to allow extra room for them.)

Procedure 3: Ecosystems.

Be sure to have a copy of the Local Ecosystem and Biodiversity Survey cut into individual tasks and put into a container, and your art supplies.

- For Phylo, be sure to have enough cards on hand for all teams and be sure you understand the rules of the game.
- For outdoor activity, be sure to read about and collect all necessary materials.

1. Begin with a review of what an ecosystem is:

- Distribute half sheets of paper or smaller.
- Ask students to write their names on it.
- Tell them to write their own definition of an ecosystem on it, and place it in a container.
 - This can serve as a formative assessment.
- Pull out the definitions and read them aloud.
 - After each reading, ask students to name a key word in the definition and write them on the board.
 - Pull out a few more and repeat. If some words are duplicates, put a mark next to them
 - Repeat until all the definitions are read.
- There should be several words that come up repeatedly. Using those words, ask the class to come up with a class definition of ecosystem.

2. Show the video: <https://www.youtube.com/watch?v=ptfxM2NqJZY> Ecosystems and Food Chains - 5th Grade

- Refer back to the posters about the animal they researched.

- Either distribute their posters back to them for this assignment, or on their own paper, ask them to make a food chain for that animal as a flow chart.
- Ask students to either hang their poster back up where it was, or attach their new paper to the bottom of their poster.
 - If you choose to use this as a formative assessment, you can examine them later without taking up more class time.

3. Distribute to each student:

<https://www.teacherspayteachers.com/FreeDownload/Local-Ecosystem-and-Biodiversity-Survey-3109639> Local Ecosystem and Biodiversity Survey

- Put out the container of tasks and explain that each task is on a separate piece of paper in it.
- Put students in pairs, and have a student from each pair come up and pull out a question.*
 - If you have more pairs of students than questions, make duplicates. If you have fewer, choose the ones you think are most appropriate. For an odd number of students, make one group of 3.
 - ***Some of the tasks are more difficult than others. You may want to differentiate your pairs and assign the tasks by their complexity**
 - Allow time for them to research the answer to their task and to make a visual product of it.
- Allow each pair to present their product and to display it somewhere in the room.

4. Play some version of Phylo.

You have a sample deck and instructions, both written and on video. **Be sure you understand the game before giving it to students!**

<https://www.teacherspayteachers.com/Product/Phylo-Educational-Ecosystem-Trading-Card-Game-Base-Deck-1842648?st=5165b8322733d06ab3de42e2a0eba552>

Phyla: Educational Ecosystem Trading Card Game - Base Deck

- Or...go to Phylo.org for different cards specific to your needs

- <https://phylogame.org/game-play/#ecosystem> video of game rules
- <https://phylogame.org/wp-content/uploads/2013/10/PHYLOrules2013.pdf> Easy Phylo rules
- Students should play in pairs, so you need enough cards for the number of teams.

5. If time and weather permit, do the following activity:

https://www.sciencebuddies.org/science-fair-projects/project-ideas/EnvSci_p042/environmental-science/are-there-bugs-under-your-feet Are There Bugs Under Your Feet? **You may also choose to do this activity in Procedure 4, rather than here, or make the final observations part of Procedure 5**

- After gathering needed materials for Berlese funnels, instruct students to make their funnels.
 - 3-student teams will cut down on the amount of equipment needed
 - You can ask students to bring in some of the materials
- Once outdoor materials have been collected, you can wait a day or two before observing the result.
- Be sure to discuss the questions at the end of the experiment.

Procedure 4. Problems or Concerns in Ecosystems.

1. Introduce the topic with the video: <https://www.youtube.com/watch?v=y18o0mACCQs>

What is biodiversity?

- Allow time for questions if students didn't understand some of it-especially younger students

2. Do the backyard audit:

https://files.worldwildlife.org/wwfmsprod/files/EducatorsToolkitFile/file/9ccgy12b4t_BIODIVERSITY_SOCIAL_STUDIES_LPR2020.pdf Biodiversity Audit

On the board, make a list of all the species the students discover, with hash marks for every time a species was noted.

- Discuss the student reactions to the composite of their audits:
 - Did anything surprise them?
 - Did they find anything they didn't expect to find?
 - Did they not find anything they did expect to find?

3. Ask if they know what endangered and invasive species are. Introduce the topic with the following:

https://docs.google.com/document/d/1hD1R9hdJR2JvE22yR9O2C9Dv9OV6XtSRiGh_rDL4700/view: It's an Alien Invasion! (you can use the entire lesson or just the game)

- Be sure they understand the meaning of the words endangered and invasive.
- Divide the students into pairs and then divide the pairs into two halves.
- Give one half of the pairs:
https://www.biologicaldiversity.org/programs/population_and_sustainability/T_and_E_map/ Map: U.S. Threatened and Endangered Species by County
- <https://www.invasivespeciesinfo.gov/subject/lists> National Invasive Species Information Center: Species Lists (by state or other) Since this is a Dept. of agriculture site, it is primarily concerned with plants, water, and pests. It could be used in conjunction with animals.
- Allow time for the teams to locate your specific area and to make a list of the particular species in your area that are endangered or invasive.
 - When everyone has finished their task, compile their information on the board, so everyone can see the entire list of endangered and invasive species in your area.
 - Discuss the findings:
 - Has anyone seen any of the endangered species?
 - Has anyone seen any of the invasive species?
 - What might happen to your local ecosystem if one of the invasive plants drives out a different plant or plants?

Optional:

https://www.teachengineering.org/activities/view/cub_environ_lesson08_activity1 This Land Is Your Land, This Land Is My Land-examining land use in your community **(this activity requires some prep time on your part, acquiring a local map and enlarging it or making it work on a screen. It is, however, a very good activity to do before asking students how to help animals in their community.)**

- To save time, you can skip all the preliminaries with the students and just start with the procedure.
- 4. Discuss what your students can do to help a local wild animal(s) in your community.
 - List some local animals that the students would like to help.
 - Ask: if they could help only 1 animal, helping which one would help the most others?
 - As they make suggestions, be sure to ask them for their reasons for thinking this would be the best animal to try to help.
 - Brainstorm things they could do to help their selected animal.
 - These are the first 2 questions in a process called Creative Problem Solving. (CPS)
 - You can stop here and just ask each student to pick the solutions they prefer, or you can continue the process:
 - Select real world methods to evaluate your solution: possibilities:(older students should be able to come up with solutions on their own. Younger students may need help.
 - Is it the least expensive?
 - Is it the easiest to make happen?
 - Is it the one most other people will want to do?
 - Is it the most helpful to the animal?
 - Is the one that will help the quickest?
 - Rank order each solution by each criterion. (For criterion #1, which is the best solution, which is the next best, etc.)

- The way these questions were structured, you would want to add up the points at each criterion and find the **lowest** point value.
- That is your best solution.
- Now you discuss ways to implement this solution. Through another brainstorming session.
- You do not need to have only one solution or one implementation strategy. You can choose your 1 or 2 best solutions, and whatever implementation strategies any student chooses. For example some students may want to write letters to the EPA, some to the President, some to the mayor, etc. Some may only want to write a letter. Some may want to post one on the school webpage for others to sign, etc.

5. Implement your solution(s)

6. Be sure to follow up after some time to demonstrate to your students that they do have a voice for change. For example, if they write letters, at least some of the people they write to will respond. Share those responses. That usually excites most students that some adult paid attention.