

Habitats of Virginia

LESSON OVERVIEW

EDUCATION STANDARDS

1.5	1.8	2.5	2.7	3.4	3.5	3.8	4.2	4.3
LS.6		LS.7		LS.8		LS.9		BIO.8

OVERVIEW & PURPOSE

Driving Question: What are the major animal habitats in Virginia and how are they impacted by both human activity and natural events?

Students will understand the key elements of a habitat by exploring some of Virginia's animal habitats:

- Part 1: Define what a habitat is and understand that different animals need different habitats to survive and understand how habitats change.
- Part 2: Assess a local habitat and learn about ways we can lower our ecological footprint and provide basic wildlife needs.
- Part 3: Students develop projects that help dive deeper into animal habitats and interdependent relationships.

OBJECTIVES

- Provide students with inquiry-based learning opportunities.
- Use scientific processes to safely investigate the natural world.
- Help students become familiar with primary and secondary research sources, conduct experiments and collect data.
- Engage students through project-based learning and STEM where applicable.

ESTIMATED TIME

PART ONE

Approximately 45 minutes as written, but additional time can be spent with large or small group discussions. This lesson plan is compatible with a virtual learning model.

PART TWO

Approximately 45 minutes as written, but additional time can be spent with large or small group discussions. This lesson plan is compatible with a virtual learning model.

PART THREE

This project should take place over several class periods. Virtual project options are available in the project choice boards.

MATERIALS NEEDED

PART ONE

- Google folder for your class to use.
- Student Page 1 – Each student should have access to this page in order to complete the activities and links to supplemental resources. Younger students may need assistance with reading the directions or completing the activities.
- Habitat Word Cloud – Have students think of at least 3 words they associate with a habitat. Ask students to submit words prior to lesson. Find the word cloud generator here: <https://www.wordclouds.com/>. On the website, select "File" and then "Create New Word Cloud". Under "File" you can also type in or paste the students' word choices. You can use the finished image to start a discussion about what a habitat is and point out some of the more interesting words that students came up with.
- You can watch the Habitats of Virginia video with your students or instruct them to view it separately. The video will introduce the concept of habitats, introduce them to specific habitats of Virginia, discuss what animals might live in specific habitats, and how a habitat might change.

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LESSON OVERVIEW

MATERIALS NEEDED CONTINUED

PART ONE CONTINUED

- Animal and habitat videos
 - [Diamondback Terrapins Video](#)
 - [Amphibian Video](#)
 - [Sturgeon Video](#)
 - [James River Video](#)
 - [Choose Your Own Adventure: Muskrat Mission](#)
 - [Wanted: Habitat](#) – Digital story about threats to wildlife and where they live
 - [Wetlands Exploration](#) – Google 360 experience
 - [Choose Your Own Adventure: Sea Turtle Resiliency](#)
 - [Habitats Game](#)
 - [Migratory Flyways](#) – Virginia is part of the [Atlantic Flyway](#) and habitat loss is a big concern
 - [Migratory Connectivity Project](#)
 - [Monarch Migration](#)
 - [StoryMap](#) – Tour oyster reef restoration in the Chesapeake Bay (5 locations in Virginia)
- [Interdependence](#) – explore relationships between organisms and learn about [symbiotic relationships](#)
 - [How Wolves Change Rivers Video](#)
 - [How Whales Change Climate Video](#)
 - [How Beavers Engineer the Land Video](#)
- Reading Selection – [Thinking Like a Mountain](#) by Aldo Leopold, [A Sand County Almanac](#)
- [Virtual Discussion](#)

PART TWO

- [Student Page 2](#) – Each student should have access to this page in order to complete the activities and links to supplemental resources.
- [Habitat Assessment](#) – This activity allows students to go outdoors to answer questions about their yard, a park or school yard. Students collect information about the outdoor habitat and can make recommendations of ways to improve it. Remember to follow the [Leave NO Trace](#) principles for outdoor ethics.
- What you can do:
 - [Ecological footprint calculator](#)
 - [Rain Garden exploration](#) – Google 360 tour
 - [Pollinator Garden Video](#)
 - [Habitats at Home](#) – Department of Natural Resources online booklet
 - [Recycling video](#)
 - [Rain Barrel video/resources](#)

PART THREE

- [Student Page 3](#) – Using the resources or habitat assessment data students collected, students will create a product showcasing their understanding of habitats and how habitats change for a project of their choice.
- [Guiding Questions](#) for students to use in the project type of their choice.
- [Project Choice Board](#)

Habitats of Virginia

VIRGINIA STANDARDS OF LEARNING CORRELATION

GRADE 1

- 1.5 The student will investigate and understand that animals, including humans, have basic life needs that allow them to survive. Key ideas include:
- a) animals need air, food, water, shelter, and space (habitat);
 - b) animals have different physical characteristics that perform specific functions; and animals can be classified based on a variety of characteristics.
- 1.8 The student will investigate and understand that natural resources can be used responsibly. Key ideas include:
- a) most natural resources are limited;
 - b) human actions can affect the availability of natural resources; and
 - c) reducing, reusing, and recycling are ways to conserve natural resources.

GRADE 2

- 2.5 The student will investigate and understand that living things are part of a system. Key ideas include:
- a) plants and animals are interdependent with their living and nonliving surroundings;
 - b) an animal's habitat provides all of its basic needs; and
 - c) habitats change over time due to many influences.
- 2.7 The student will investigate and understand that weather patterns and seasonal changes affect plants, animals, and their surroundings. Key ideas include:
- a) weather and seasonal changes affect the growth and behavior of living things;
 - b) wind and weather can change the land; and
 - c) changes can happen quickly or slowly over time.

GRADE 3

- 3.4 The student will investigate and understand that adaptations allow organisms to satisfy life needs and respond to the environment. Key ideas include:
- a) populations may adapt over time;
 - b) adaptations may be behavioral or physical; and
 - c) fossils provide evidence about the types of organisms that lived long ago as well as the nature of their environments.
- 3.5 The student will investigate and understand that aquatic and terrestrial ecosystems support a diversity of organisms. Key ideas include:
- a) ecosystems are made of living and nonliving components of the environment; and
 - b) relationships exist among organisms in an ecosystem.
- 3.8 The student will investigate and understand that natural events and humans influence ecosystems. Key ideas include:
- a) human activity affects the quality of air, water, and habitats;
 - b) water is limited and needs to be conserved;
 - c) fire, flood, disease, and erosion affect ecosystems; and
 - d) soil is a natural resource and should be conserved.

GRADE 4

- 4.2 The student will investigate and understand that plants and animals have structures that distinguish them from one another and play vital roles in their ability to survive. Key ideas include:
- a) the survival of plants and animals depends on photosynthesis;
 - b) plants and animals have different structures and processes for obtaining energy; and
 - c) plants and animals have different structures and processes for creating offspring.
- 4.3 The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include:
- a) interrelationships exist in populations, communities, and ecosystems;
 - b) food webs show the flow of energy within an ecosystem;
 - c) changes in an organism's niche and habitat may occur at various stages in its life cycle; and
 - d) classification can be used to identify organisms.

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VIRGINIA STANDARDS OF LEARNING CORRELATION CONTINUED

LIFE SCIENCE

- LS.6 The student will investigate and understand that populations in a biological community interact and are interdependent. Key ideas include:
- relationships exist between predators and prey and these relationships are modeled in food webs;
 - the availability and use of resources may lead to competition and cooperation;
 - symbiotic relationships support the survival of different species; and
 - the niche of each organism supports survival.
- LS.7 The student will investigate and understand that adaptations support an organism's survival in an ecosystem. Key ideas include:
- biotic and abiotic factors define land, marine, and freshwater ecosystems; and
 - physical and behavioral characteristics enable organisms to survive within a specific ecosystem.
- LS.8 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time. Key ideas include:
- organisms respond to daily, seasonal, and long-term changes;
 - changes in the environment may increase or decrease population size; and
 - large-scale changes such as eutrophication, climate changes, and catastrophic disturbances affect ecosystems.
- LS.9 The student will investigate and understand that relationships exist between ecosystem dynamics and human activity. Key ideas include:
- changes in habitat can disturb populations;
 - disruptions in ecosystems can change species competition; and
 - variations in biotic and abiotic factors can change ecosystems.

BIOLOGY

- BIO.8 The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include:
- interactions within and among populations include carrying capacities, limiting factors, and growth curves;
 - nutrients cycle with energy flow through ecosystems;
 - ecosystems have succession patterns; and
 - natural events and human activities influence local and global ecosystems and may affect the flora and fauna of Virginia.

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PROJECT CHOICE BOARD

DESIGN A PERFECT HABITAT

Create a habitat design that you think would be perfect for 2-3 animals of your choice. Make sure your habitat has all of the basic needs for your animals. Also, you may want to design protections for the habitat and its inhabitants. You can create your perfect habitat in:

- Draw on paper or poster
- Google Draw
- Legos or other building materials
- Diorama

Take a photo of your creation and share with your classmates.

WRITE A HABITAT IMPACT STORY

Research one of Virginia's habitats. Write a story about the habitat including what animals are present in the habitat, natural and man-made impacts and how the habitat might change over time, and which animals leave or come into the habitat as it changes. Highlight how someone could reduce their ecological footprint. Use PowerPoint, Google slides or Prezi to create a digital story.

MAKE SOMETHING FOR WILDLIFE

Using the results of the habitat assessment, make any of the following items for animals that you feel is missing.

- Bird or squirrel feeder
- Area to collect/provide water
- Animal shelter
- Plant some native plants in pots or your yard

Examples with pictures are [here](#). Then keep a log of what animals you see each day for a week.

CREATE A VIRTUAL PRESENTATION

Research one or two habitats of Virginia. Create a presentation or an exhibit on the interdependent relationships within a habitat. including symbiotic relationships. If you research two habitats, you could discuss similarities and differences in comparing them. You can create your virtual presentation/exhibit in Google slides, PowerPoint or Prezi.

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GUIDING QUESTIONS

These questions will help guide you in creating your project. You can use a variety of resources to research one or more habitats of Virginia of your choice. Make sure to cite your sources for information, photographs/illustrations and videos.

What is the habitat I chose?

Where is this habitat located in Virginia?

What are the main features of this habitat?

What are three animals and any adaptations they have specifically for living in that habitat?

What are three common plants?

Other geographical characteristics (example -- mountainous, rocky, flat, meadows, etc.)

In what ways do these animals and plants interact in the habitat?

What human or natural impacts change this habitat?

What actions could someone take to reduce their impact on local habitats?

Are there ways to improve animals' basic needs within your yard, nearby park or community?

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IDEAS FOR FEEDERS, WATER FEATURE & SHELTERS

FEEDERS

Citrus Rind feeder – Make use of your leftover orange, lemon, or grapefruit rind by turning it into a mini bird feeder. It won't last long, but if you eat a lot of citrus fruit, you can easily replace it.



Tin Can bird feeder – Re-purpose an empty tin can as a bird feeder. All you have to do is decorate it, put a handful of bird seed in, and attach string to hang in a tree.



Milk or water bottle feeder – Milk cartons are an easy starting point for a bird feeder. All you have to do is cut holes for the bird food and hanger, and then decorate it.



Pine cone bird or squirrel feeder – Find an open pine cone, cover it in Crisco or peanut butter and then roll it in birdseed. Use string to hang it from a tree branch.



WATER FEATURES

Similar to the above feeders, water for wildlife can be constructed from a variety of reusable items.



SHELTER

Toad homes can be made from whole or broken clay pots.



Mason bee tubes can be made from paper, non-toxic white glue wrapped around a 5/16 inch dowel.



NATIVE PLANTS FOR WILDLIFE

There are a lot of great resources available:

- [Habitat at Home](#)
- [Native Plants for Wildlife Habitat and Conservation Landscaping](#)

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STUDENT PAGE 1

DRIVING QUESTIONS

What are the major animal habitats in Virginia and how are they impacted by both human activity and natural events?

OBJECTIVES

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MATERIALS NEEDED

Note: Younger students may need assistance with reading the directions or completing the activities.

- Habitat Word Cloud – Have students think of at least 3 words they associate with a habitat. Ask students to submit words prior to lesson. Find the word cloud generator here: <https://www.wordclouds.com/> On the website, select “File” and then create new word cloud. Under “File” you can also type in or paste the students’ word choices. You can use the finished image to start a discussion about what a habitat is and point out some of the more interesting words that students came up with.
- You can watch the [Habitats of Virginia video](#) with your teacher or your teacher may instruct you to view it separately. The video will introduce the concept of habitats, introduce specific habitats of Virginia, discuss what animals might live in specific habitats, and how a habitat might change.
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ACTIVITY

To begin this part of the lesson, provide your teacher with a descriptive word(s) about habitats. These descriptive words can define what a habitat is, what needs a habitat, or describe some of Virginia's habitats. Your teacher will take these words and create a word cloud that will be shared with the class. The word cloud can help you and your classmates to discuss important elements of habitats.

Next you can watch the Habitats of Virginia video on your own or with your teacher. As you watch, think about different places you may have traveled in Virginia (beach, state parks, national parks and scenic highways) and see if you recognize any of these locations. There are a lot of different habitats and lots of wildlife that live in Virginia. There are lots of videos, choose your own adventures, games and digital stories to explore. They highlight specific animals, but also the habitats where those animals live.

Ecologist study the relationships of organisms and the environments in which they are found. Understanding these relationships can better help us to conserve and protect the environments where animals live. We are just beginning to understand some animals and the key roles they play in their environments. Take a look at the Prezi and the three videos that focus on three different species and the roles they play in shaping their environments. Afterwards, your teacher may conduct a virtual discussion.

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STUDENT PAGE 2

DRIVING QUESTIONS

What are the major animal habitats in Virginia and how are they impacted by both human activity and natural events?

OBJECTIVES

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MATERIALS NEEDED

Note: Younger students may need assistance with reading the directions or completing the activities.

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- What you can do:
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 - [Rain Garden](#) – Google 360 exploration
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 - [Recycling video](#)
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ACTIVITY

To begin this part of the lesson, you will conduct a habitat assessment. You may assess your backyard, neighborhood, park or school yard. Click on the Habitat Assessment link above. You can copy the assessment into a google doc or you are welcome to print the page and write your answers on the paper.

The next section of this part in the lesson is to learn about your impact on the environment and ways you can help conserve, protect and/or restore an environment in order for wildlife to have what they need to find their basic needs. As you are exploring these resources, make notes of ideas you have to enhance or restore your habitat. These ideas will assist you in completing the third section of this lesson.

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STUDENT PAGE 3

DRIVING QUESTIONS

What are the major animal habitats in Virginia and how are they impacted by both human activity and natural events?

OBJECTIVES

I will understand the key elements of a habitat by exploring some of Virginia's animal habitats.

MATERIALS NEEDED

Note: Younger students may need assistance with reading the directions or completing the activities.

- [Guiding Questions](#) for students to use in the project type of their choice
- [Project Choice Board](#)

ACTIVITY

Using the resources or observation data from activities and resources in Part 1 and 2, you will create a product showcasing your understanding and research of the Virginia habitat of your choice in this project based learning opportunity.

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INTERDEPENDENCE VIRTUAL DISCUSSION

Teachers: You may use the following questions to facilitate a virtual class or small group discussion or you may want to have students respond to these questions and post them in a google doc or discussion board.

- What is the relative importance of direct (consumption, competition) vs. indirect (induced behavioral change) interactions in determining the effect of one species on others?
- What is the role of parasites and mutualists in generating and maintaining host species diversity?
- How does species loss affect the extinction risk of the remaining species?
- To what extent is primary producer diversity a driver of wider community diversity?
- Which ecosystems and what properties are most sensitive to changes in community composition?
- What is the magnitude of the 'extinction debt' following the loss and fragmentation of natural habitats, and when will it be paid?
- Under what circumstances do landscape structures such as corridors and stepping stones play important roles in the distribution and abundance of species?
- What are the ecosystem impacts of world-wide top predator declines?

CITATION

Sutherland, W.J., Freckleton, R.P., Godfray, H.C.J., Beissinger, S.R., Benton, T., Cameron, D.D., Carmel, Y., Coomes, D.A., Coulson, T., Emmerson, M.C., Hails, R.S., Hays, G.C., Hodgson, D.J., Hutchings, M.J., Johnson, D., Jones, J.P.G., Keeling, M.J., Kokko, H., Kunin, W.E., Lambin, X., Lewis, O.T., Malhi, Y., Mieszkowska, N., Milner-Gulland, E.J., Norris, K., Phillimore, A.B., Purves, D.W., Reid, J.M., Reuman, D.C., Thompson, K., Travis, J.M.J., Turnbull, L.A., Wardle, D.A. and Wiegand, T. (2013), Identification of 100 fundamental ecological questions. *J Ecol*, 101: 58-67. doi:10.1111/1365-2745.12025

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WILDLIFE HABITAT ASSESSMENT SHEET

FIELD SCIENTIST: _____

DATE: _____

SITE DESCRIPTION

Where is the site located? _____

What are the first three things you notice about this habitat? _____, _____ and _____.

What kinds of **plants** do you see? Can you identify three of them?

SKETCH YOUR PLANT HERE	PLANT NAME

Are there animals living in this habitat? If yes, list them. If you're unsure, look for clues!

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WILDLIFE HABITAT ASSESSMENT SHEET

IMPORTANT HABITAT FEATURES

Do you think animals are able to find **food** here? **YES** **NO**

If you answered no, explain why.

If you answered yes, list four kinds of food animals might find in this habitat.

Do you think animals are able to find **shelter** here? **YES** **NO**

Explain why or why not.

If you were an animal living here, where would you take shelter? Describe or draw a shelter.

Do you think animals have **space** here? **YES** **NO**

Explain why or why not.

Do you think animals are able to find **water** here? **YES** **NO**

HABITAT DEGRADATION

Do you see any natural impacts on this habitat (fire, flooding, etc.)? **YES** **NO**

Do you see any evidence of human impacts on this habitat? **YES** **NO**

If you answered "YES" above, check the box next to any of the following problems you see in your habitat:

- Chemicals
- Trash
- Dumping
- Erosion/cloudy water
- Non-native plants
- Human structures
- Other: _____

REFLECT

Look over your habitat assessment. What might make the habitat better?
