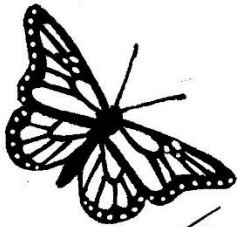




ECOQUEST

Fantastic Feast:

Who's Coming Over for Dinner?



_____ 's
Field Journal





A Note About the Illustrations

Unless otherwise noted below*, illustrations for this EcoQuest Field Journal and the EcoQuest Badges were created by two of our extremely talented high school Eco-Leaders, Jiali Pickering and Sadie Pickering. We thank them for their amazing contributions to EcoQuest!

Sincerely,

Ashley Alred & Amelia Goldstein

EcoQuest Authors + Educators

*Illustrations retrieved from *Eco-Inquiry* (1994) by Kathleen Hogan are cited below:

p. 16 *To be a careful observer*. *Eco-Inquiry* (1994), p. 67

p. 61 *Habitat chamber*. *Eco-Inquiry* (1994), p. 90

p. 61 *Supporting notetaking (Earthworm feeding)*. *Eco-Inquiry* (1994), p. 92

p. 62 *Food for Ants*. *Eco-Inquiry* (1994), p. 101

p. 64 *Signs of Animals Eating Plants*. *Eco-Inquiry* (1994), p. 360

p. 66 *Seed Stations*. *Eco-Inquiry* (1994), p. 103

Welcome to EcoQuest!



Join us on an EcoQuest to uncover the **secret ecosystem** where you live! How many different organisms live all around you, and what in the world are they eating?

Learn how to use **science tools** to understand fascinating **heterotrophs** and their bizarre eating habits in your home ecosystem.



A **heterotroph** is something that has to **eat** other things to live! A bird is a heterotroph...a tick is a heterotroph...**YOU** are a heterotroph!

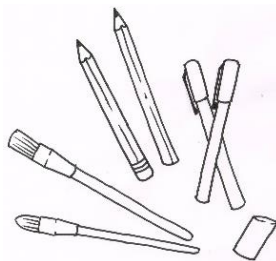
Each Eco-Challenge Badge will guide you in your quest. Always have a pencil ready, and your tools close by! Remember, Cary Educators are ready to help if you have questions or want to share your discoveries! We would love to hear from you.

Visit us on our Padlet webpage at <https://padlet.com/caryecoquest/FantasticFeast>, or you can email us at caryeducation@caryinstitute.org. Good Luck in your EcoQuest!

A Note about this Field Journal

This Field Journal is for **you** and your **discoveries** during this **Fantastic Feast EcoQuest!**

COLOR the drawings.



DRAW what you notice.

WRITE notes wherever you want.

And best of all...**TAPE** natural objects in here like pressed leaves, flowers, *even* tiny bugs that may have been accidentally squished!

You'll be saving your memories like a scrap book...

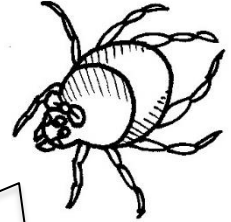
...and documenting data like an ecologist!

Get **creative**, have **fun**, & uncover the **mysteries** of... *Who's Coming Over for Dinner?*

EcoQuest Challenges

Complete 5* Eco-Challenge Badges:

- Naturalist Badge
- Field Tech Badge
- Field Ecologist Badge
- Artist Badge
- Teacher Badge



Hi! I'm Daisy the Deer Tick. Be sure to tune in to my "Tick Talk" during EcoQuest. I am full of fun facts, tips, and...surprises!

Complete a Master List:

You must identify 30 heterotrophs throughout your EcoQuest journey on page 9.

Complete the Food Frenzy:

You must identify 4 feeding relationships throughout your EcoQuest journey on page 11.

**Please Note:*

"Junior" EcoExplorers should complete the *Naturalist*, *Field Tech*, and *Artist* badges, while "Senior" EcoExplorers should complete all 5 badges (There is no age assignment for "Junior" or "Senior"—it's up to you!). Each badge is broken down into smaller challenges throughout this journal.

Remember to check in online on our EcoQuest Padlet page as you go for additional challenges, videos, feedback, and to see what other EcoExplorers are up to!" Visit our **EcoQuest Padlet**:

<https://padlet.com/caryecoquest/FantasticFeast>

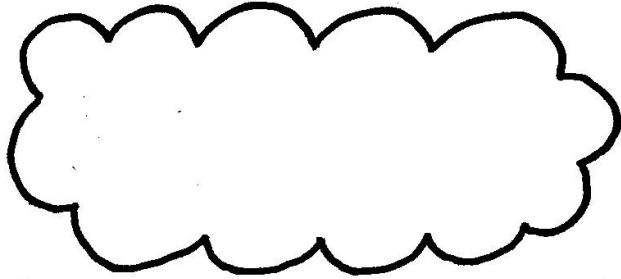
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ECO Explorer

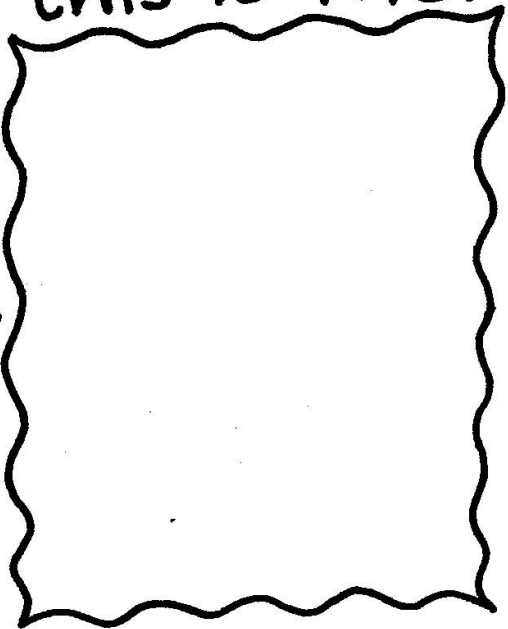
Bio

my name is

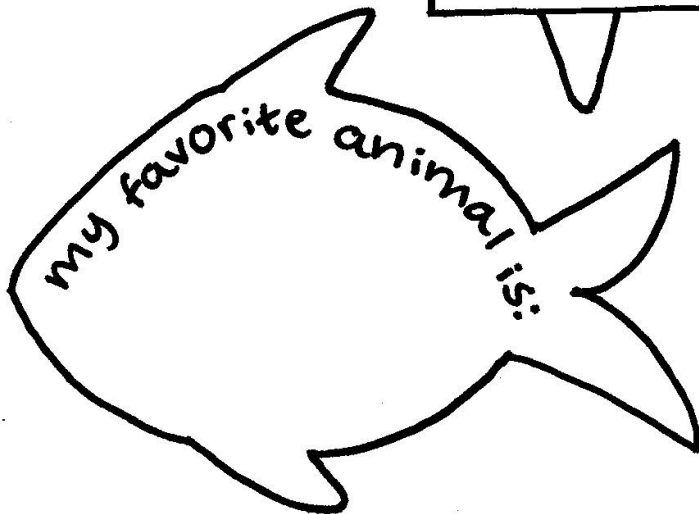


this is me!

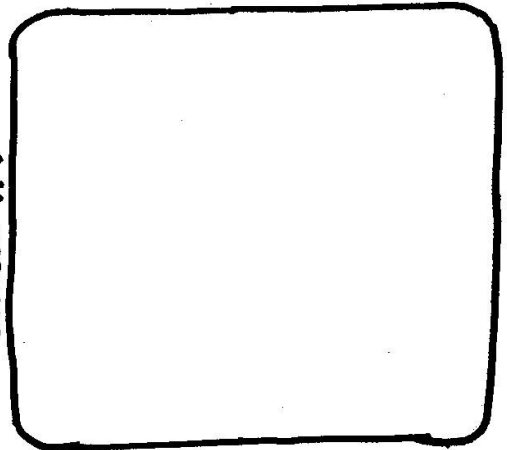
draw yourself! ↓



if I could be any animal, I would be...



draw it!



Introduction



A habitat is a **home** where an organism has everything it needs to live: food, water, & shelter.

Who is in Your Home Habitat?

Think about the nature outside your home...We will call this your Home Habitat.

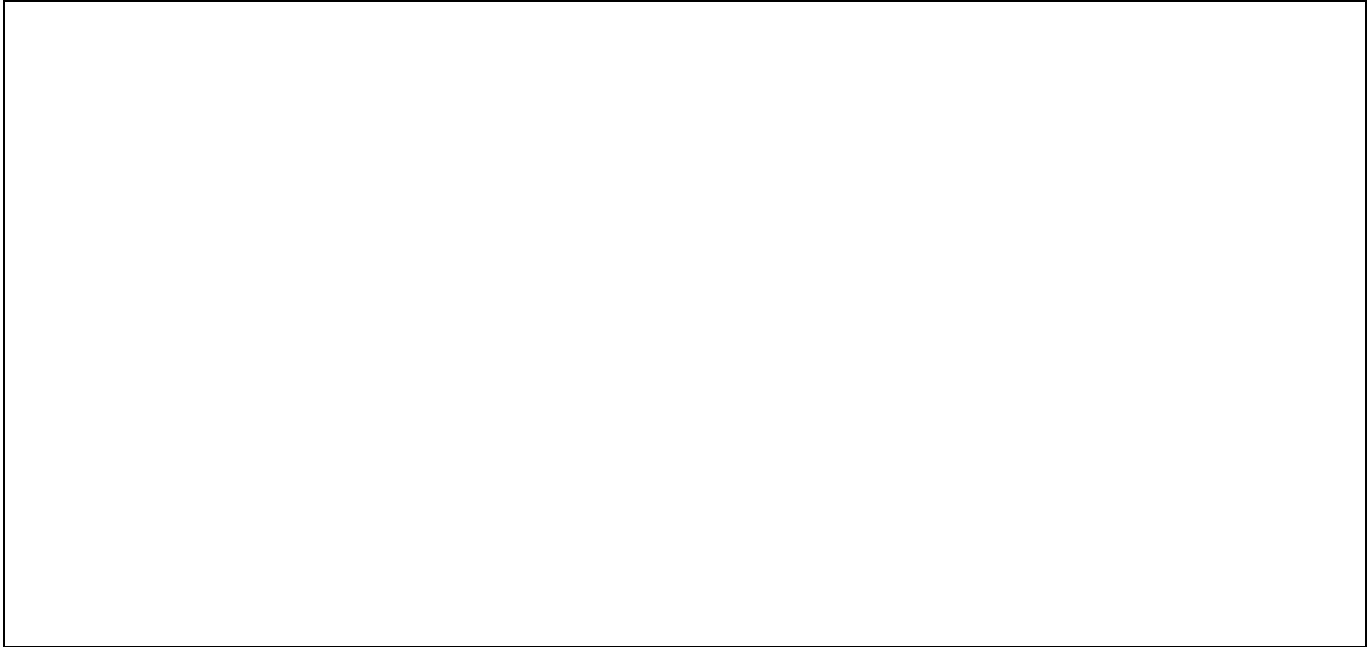
You probably already know *a lot* about your animal and plant neighbors.

Look through a window or step outside...what animals and plants do you notice?

What **ANIMALS** and **PLANTS** live outside in your home habitat?

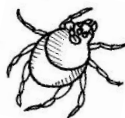
Draw or Write in the space below!

What makes your Home Habitat **special** to you?
Draw and color one thing outside that you think is really interesting!



<p>There are animals in your Home Habitat that <i>you might not see...</i></p> <p>What other animals do you guess could live in your home habitat?</p>	<p>Do you like food? Of course you do.</p> <p><i>So do animals!</i></p> <p>What do you guess animals eat for food in your home habitat?</p>
---	--

Scientists like to make
educated **guesses** about
things they don't know.
This guess is called a
PREDICTION.



Let's Explore!

Explore freely all over your Home Habitat for 10 minutes—or more!

Bring this **Field Journal** with you to make sketches & write notes as you go! Ready...Set...Go!

Did you know that ecologists always carry a **field journal** with them? And that *anyone* can **sketch**? It's true!



Animals	Plants
Signs of Animals	Signs of Animals Eating

EcoQuest Big Questions

What organisms (animals, fungi, & bacteria) live outside of our homes?

What do you think?

What do these organisms eat for food?

What do you think?

How do we even *begin* to answer these questions?

Can you think of ways?

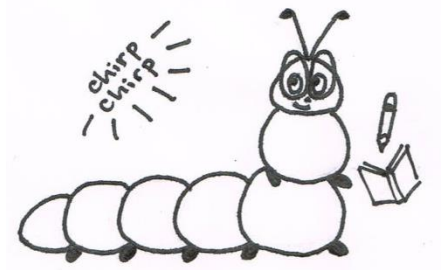
It's not always easy to see animals because they hide or are really small—how might we know animals are still around?

You are ready to begin answering these questions...by first working on your

Naturalist Badge!

Naturalist Badge

Naturalist (noun): a scientist who observes plants and animals, especially noticing changes in plants and animals through the seasons



Eco-Challenge

The mission of this badge is to notice and observe the different **organisms** in your Home Habitat.

To earn the **Naturalist** badge, you must:

- Develop a Sit Spot where you will make **observations**.
- Master the practice of seeing.
- Master the practice of listening.
- Master the practice of smelling.
- Explore the sense of taste in nature.
- Explore your sense of touch.

An **organism** is a living thing like a plant, animal, fungus, or bacteria.



An **observation** is anything you notice by using your *senses*. Scientists use observations to learn about the natural world!

Visit us online for the Naturalist Badge! <https://padlet.com/caryecoquest/Naturalist>

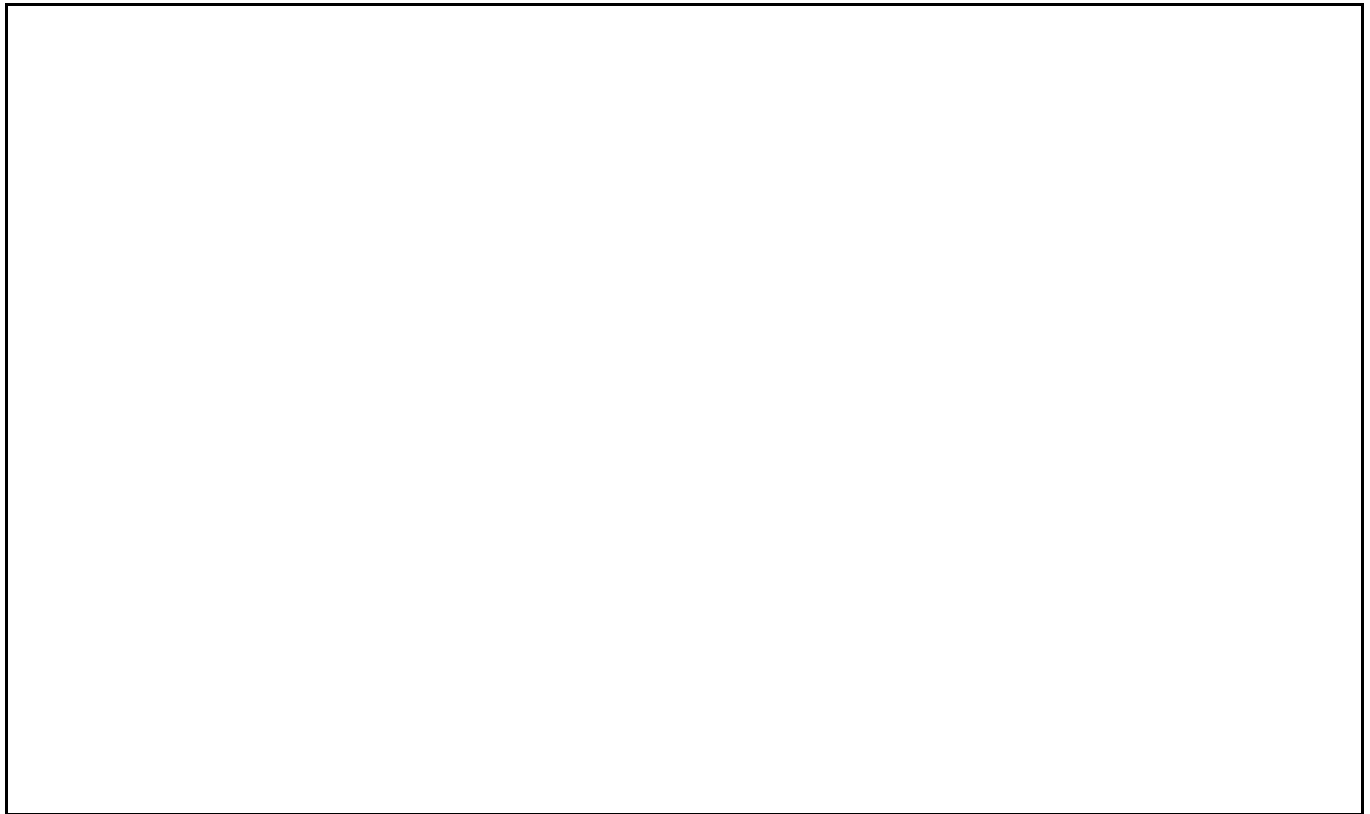
Finding a Sit Spot

To earn your Naturalist Badge, the first thing you must do is find a **SIT SPOT**. This can be a large or small spot, but it must be *outdoors*, it must be near *soil*, and it must be a place you can come to almost *every day*. Make sure it's comfortable!

**Hint: You can sit on steps or a porch, or bring a towel or crate if you are sitting on grass. Bring your journal and a pencil!*

Name your Sit Spot:

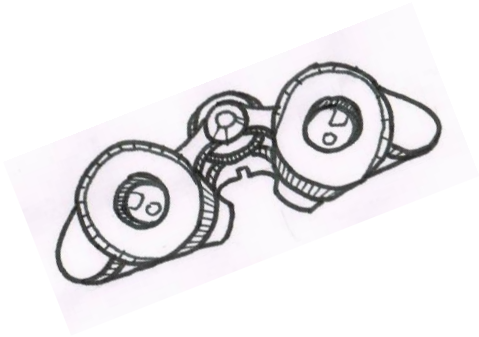
Spend as much time sitting still at your **Sit Spot** as long as you can. Write or draw anything you notice or observe around you.



Today I sat at my sit spot for _____ minutes.

The weather today was _____.

*Every day, when you discover a heterotroph (something that eats something else!) you haven't seen before, make sure to add it to your Master List on page 106!



To Be a Careful Observer
Look at something for a long time.
Look underneath stuff.
Keep your eyes peeled when you're somewhere new
Close your eyes and see how much you remember
about something.
Tell someone else exactly what something looks like.
Keep checking on a place to notice how things
change.

From *Eco-Inquiry* (1994) by Kathleen Hogan

Part 1: Seeing

Who are the little creatures you can see around your Home Habitat??

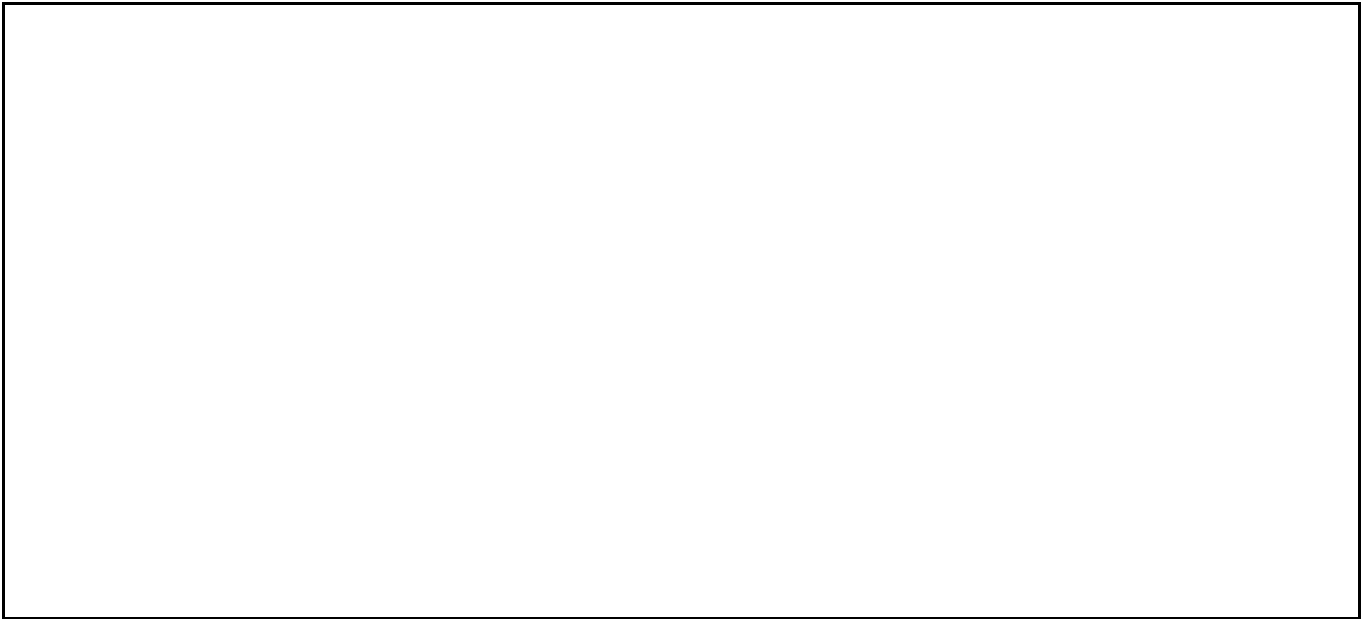
Any **living** things you observe are called **BIOTIC** factors.



We are looking for little living things that we can find in our Sit Spot. These can be plants, bugs, arachnids, worms, fungi—anything living! Look around your sit spot and use the space below to write sketches or notes about what you see.

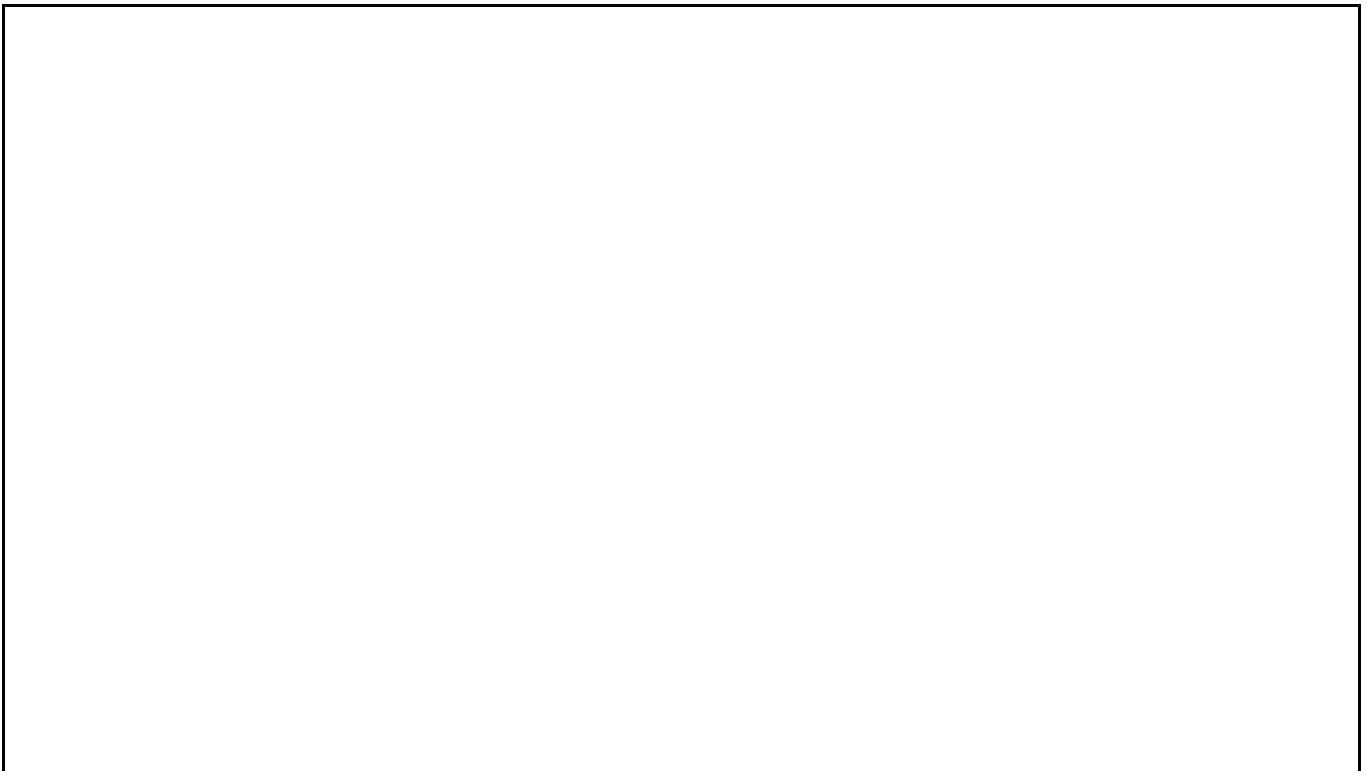
How many different kinds of bugs can you find?

Can you sketch them, identify them, trap them, dig them?



Now let's have some fun! Use binoculars, a magnifying glass, a microscope, a kaleidoscope, goggles, your dad's glasses (with permission), sunglasses, or anything else you can find to see if you can discover even more small creatures!

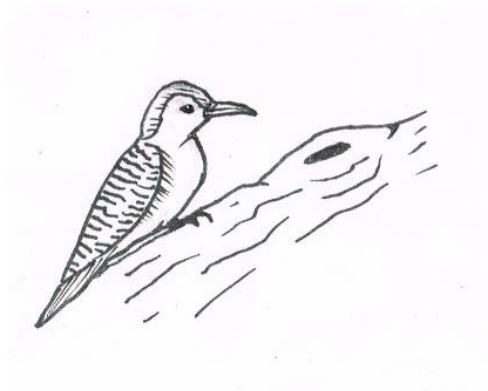
Create a drawing of what you saw below!



Part 2: Hearing

Who are the bigger creatures you can hear around your Home Habitat?

Start by coming back your Sit Spot. Again, spend a few minutes at your Sit Spot and write or draw anything you notice or observe around you.


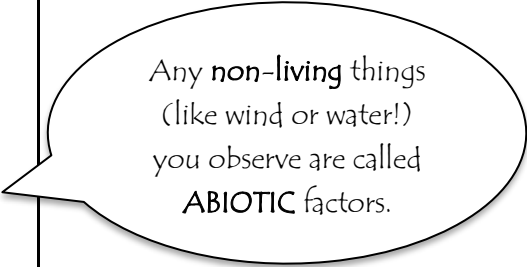


Today I sat at my sit spot for _____ minutes.

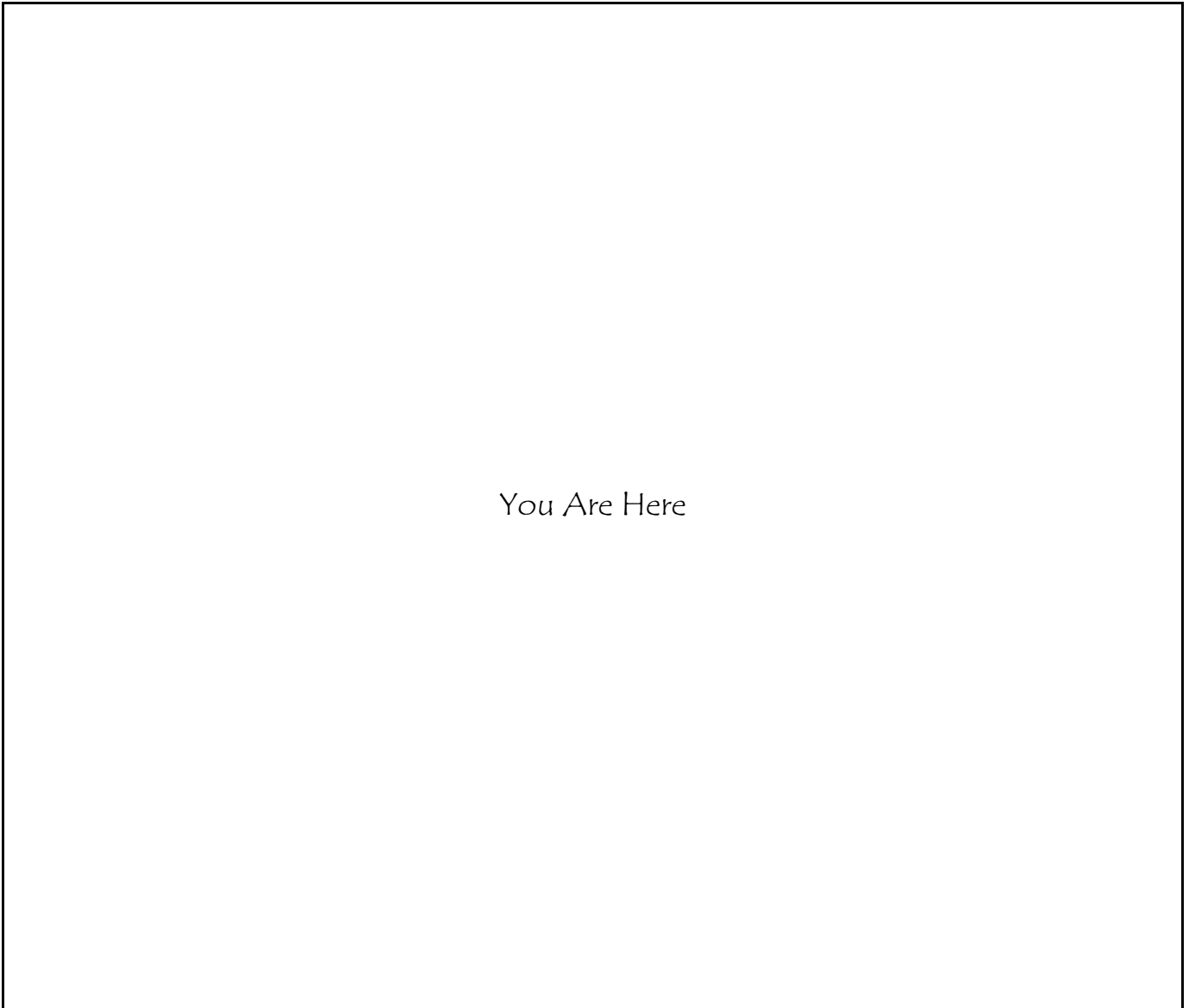
The weather today was _____.

Now we are going to focus on **hearing**. Take 5-10 minutes to close your eyes (or use a blindfold if you have one!) and notice as many sounds as you can.

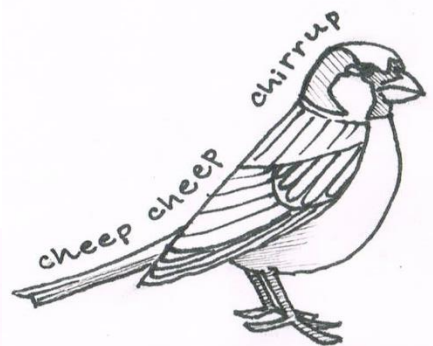
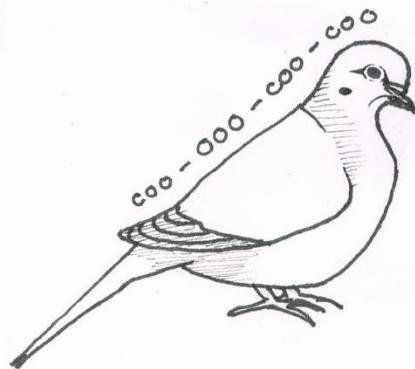
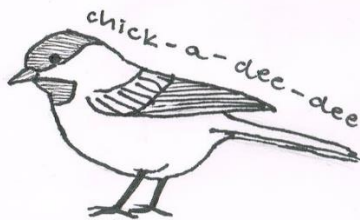
Share the sounds you heard in the spaces below:

Living (Biotic)	Nonliving (Abiotic)
	 <p>Any non-living things (like wind or water!) you observe are called ABIOTIC factors.</p>

Create a map of the different sounds you heard and where they came from:



You Are Here

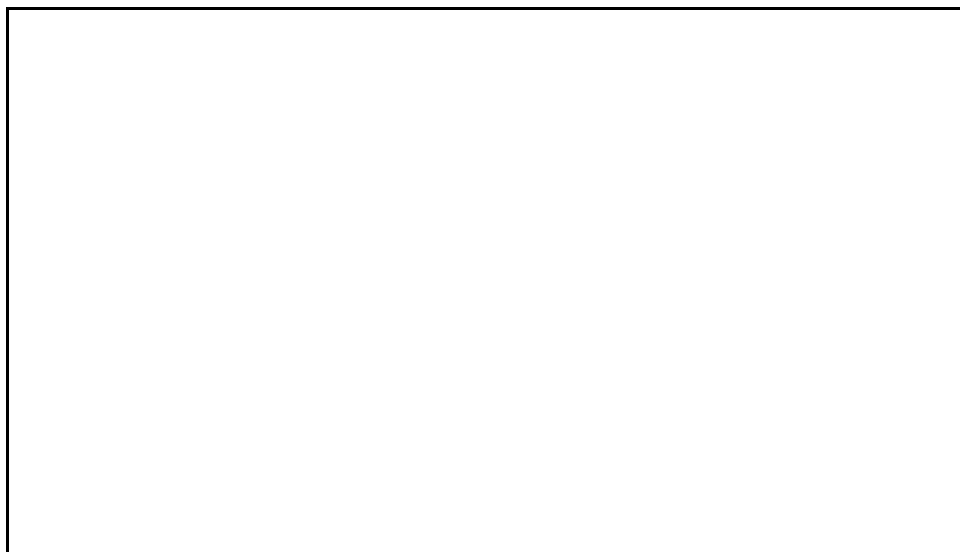


Animal Sounds

Pick one animal sound to focus on.

How would you spell out the sound? _____

Who do you think made the sound? Name or draw the animal below.



**Bonus: Go online and research where this animal came from, what it eats, and why it came to your home.*

Why do you think that animal made that sound?

Practice making the sound yourself!

- Show your imitation to a friend or family member.
- Teach your imitation to a friend or family member.
- Have a conversation using *only* that sound with a friend or family member.

Part 3: Smell

How do all of these creatures interact with one another?

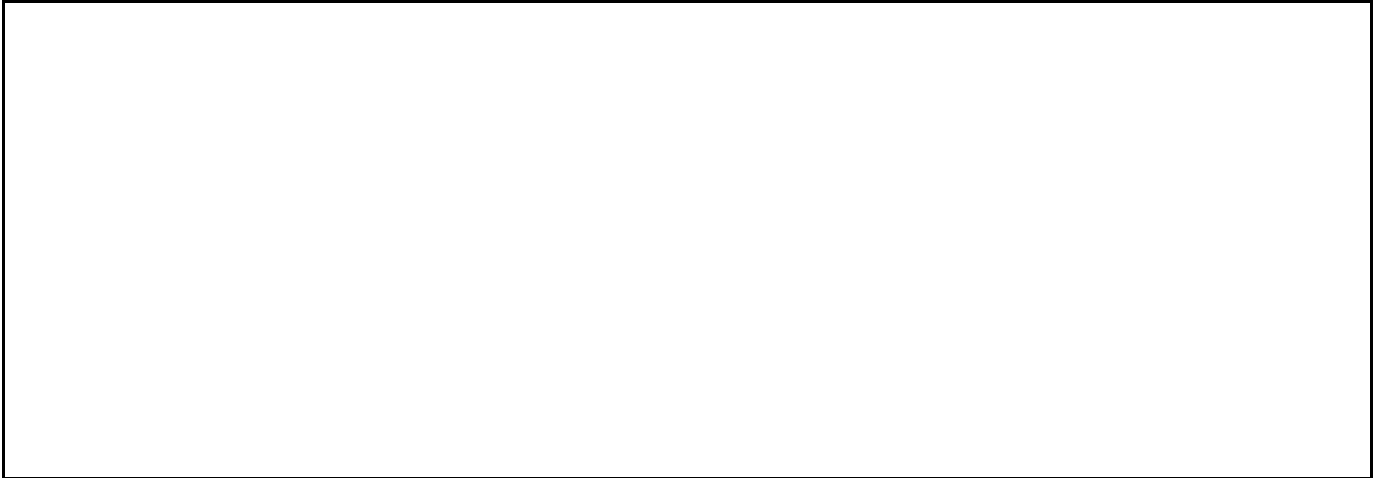
Start by coming back to your Sit Spot. Again, spend a few minutes at your Sit Spot and write or draw anything you notice or observe around you.



Today I sat at my sit spot for _____ minutes.

The weather today was _____.

What are the different smells you can smell from your spot? You may move around and explore beyond your spot a little today. List (or draw!) the smells below.

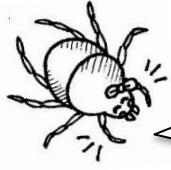


Tips: Pick and crush some plants to smell them better. Dig up a little soil and smell it.

BRAINSTORM BOX

Why do you think there are so many different smells in your spot?

Why do you think plants have their own smells? How does it help them to survive?



A **pheromone** is a *chemical* made by a living thing that helps it communicate with other living things of the same species. Whoa!

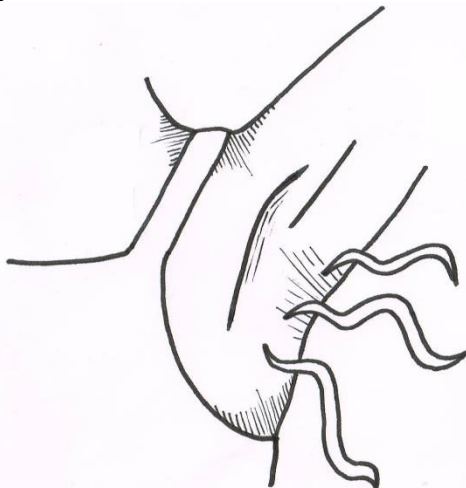
Did you know?

Leaves such as grass give off a **pheromone** called *Green Leaf Volatiles* that alerts other blades of grass when there is danger! That is why freshly cut grass gives off a strong aroma!



Did you know?

Human body odor does not come from our own sweat glands, but instead from bacteria living on the surface of our skin that thrives in sweaty environments. When you smell your sweaty armpits, that means you're smelling the microscopic neighbors that live all around you.



Smelleriffic!



Part 4: Taste

Which of these creatures are eating each other?

Start by coming back to your Sit Spot. Again, spend a few minutes at your Sit Spot and write or draw anything you notice or observe around you.



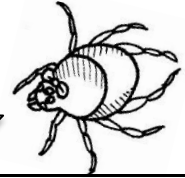
Today I sat at my sit spot for _____ minutes.

The weather today was _____.

Are any of the organisms you see edible to you (like a blueberry bush or mint leaves)?

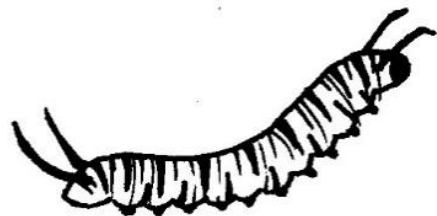
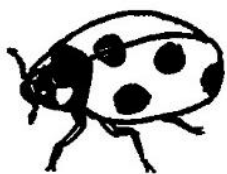
Which are edible to other living things?

Look for any evidence of **organisms being eaten** (like holes in plants!) and note them below.



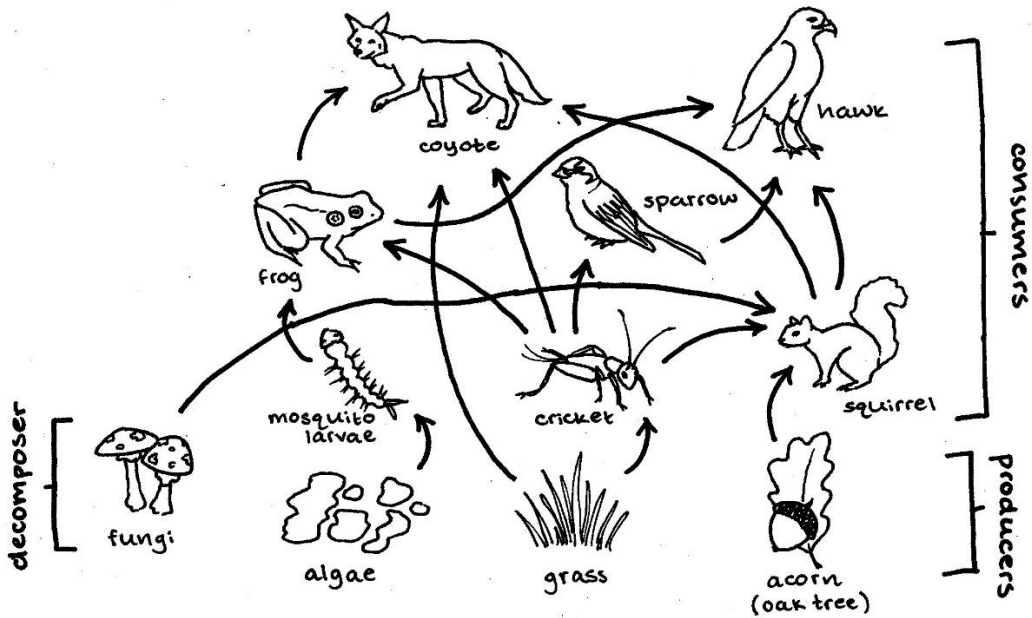
A living thing that eats another living thing is called a **heterotroph**!

What do ticks eat...?



Use this page to collect (tape or press) any leaves with evidence of eaters!

Example of a Food Web




Pick FIVE different living things you've observed. Use the space below to draw your own food web by drawing each living thing and using arrows to show who eats what.

What's MISSING from your food web? What must be nearby, but you haven't observed yet?

Part 5: Touch & Feel

How are our neighbors impacting us, and how do we impact them?

Start by coming back to your Sit Spot. Again, spend a few minutes at your Sit Spot and write or draw anything you notice or observe around you.



Today I sat at my sit spot for _____ minutes.

The weather today was _____.

Use the space below to write down what you **FEEL** at your Sit Spot.

Touch
What can you feel with your **hands**?

Feel
What do you feel in your **heart**?



Do you feel any wind?
Rain drops? These non-
living things you notice
are called **abiotic** factors.

Find a **rock** near your Sit Spot. Hold it in your hand and close your eyes. Describe how the rock feels in as much detail as you can. You can sketch it, too.

A large, empty rectangular box provided for students to write their descriptions or draw a sketch of a rock.

*Bonus: Give the rock a **name** and make it your **pet rock** to carry throughout your EcoQuest!

When you sit at your sit spot, what are the **living** things you come in contact with? Are you sitting on anything living, does anything crawl or land on you?

Which are the living things you interact with the **most**?

Which living things are you most **grateful** for?

Oh, me? I'm grateful for mice...and deer...and humans...but mostly my thousands of babies.



Imagine a world with no **bees**. What would it be like? Describe it below.

Imagine a world with no **ants**. What would it be like? Describe it below.

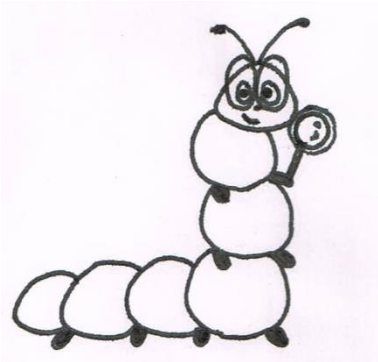
Imagine a world with no _____. What would it be like? Describe it below.

*Thank your sit spot and all the living things within it for teaching you to be a **Naturalist!***

Go online to the [Naturalist Badge Padlet](#) webpage to see more challenges you can complete!

Naturalist Badge Eco-Challenge Check

✓	Challenge Steps	Eco-Explorer Signature	Adult Initials
	Develop a Sit Spot where you will make observations.		
	Master the practice of seeing.		
	Master the practice of listening.		
	Master the practice of smelling.		
	Explore the sense of taste in nature.		
	Explore your sense of touch.		



Field Tech Badge

Field Technician (noun): a person who collects data in nature to learn more about animals, plants, and other organisms. They often set traps for animals for ecology research and identify what they catch.

Eco-Challenge

The mission of this badge is to learn techniques to “take attendance” of the animals that live in your habitat and practice identifying them.

To earn the **Field Tech** badge, you must:

- Set up a *Study Square*
- Observe the Study Square at least 5 different times
- Identify 5 heterotrophs
- Identify 2 pieces of *evidence* of heterotrophs
- Master at least 1 field investigation method



A **method** is a step-by-step way of doing something. It's like my recipe for chocolate chip cookies!

Visit us online for the Field Tech Badge! <https://padlet.com/caryecoquest/FieldTech>

Create a Study Square

Part 1: Set Up

The whole ecosystem is huge, and too big for scientists to study all at once. So, we use **samples**, or smaller pieces of an ecosystem, that help us understand the whole ecosystem.

One tool ecologists use to create a sample of their ecosystem is a **quadrat**: a small square of land they can use to study animals and plants.

You will use pencils and string to create your own quadrat, or **Study Square**! For this badge, you will work on recording the living organisms that you find within it.

Study Square Materials

- Small plot of land
- Pencils (4)
- String or yarn cut to 8-feet long & tied at ends
- Ruler or tape measure

Step 1: Find a spot with dirt, soil, or sand that you can stick a pencil into. Push & twist your first pencil into the ground. Leave at least half of your pencil above the ground.

Step 2: Measure 2 feet up from the first pencil and push the second pencil in the ground.

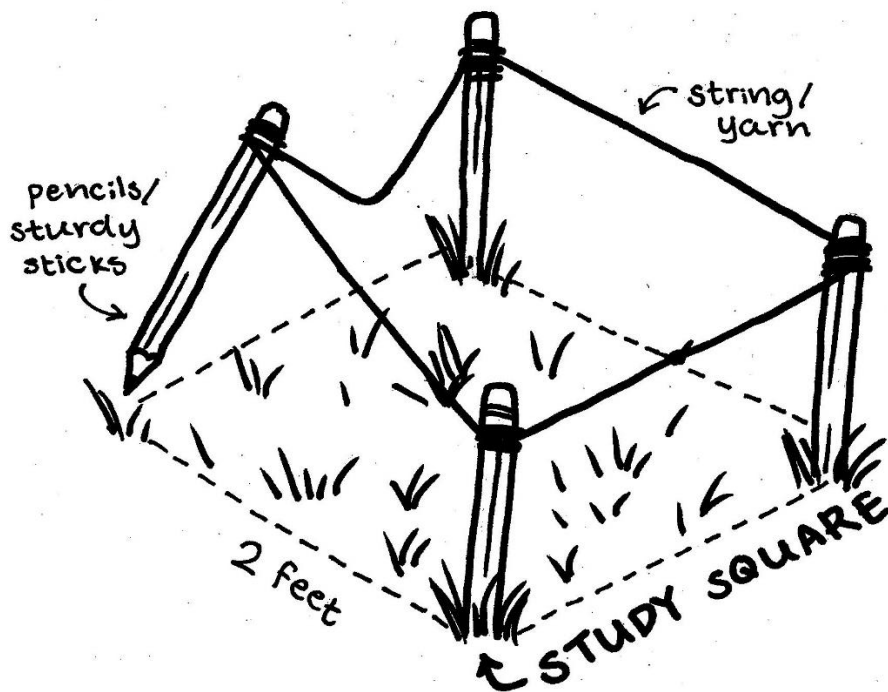
**Hint: If you don't have a ruler or tape measurer, hold out your arm straight in front of you. The length from your fingertips to your shoulder is about two feet.*

Step 3: Measure 2 feet to the right of the second pencil and push the third pencil into the ground.

Step 4: Measure 2 feet down from the third pencil and stake the fourth pencil into the ground.

Step 5: Your four pencils now form a SQUARE!

Step 6: Use a ruler or measuring tape to cut string or yarn to be 8 feet long. Tie the ends together so you now have a huge circle. Loop the string a few times around one pencil, then stretch the string to the next pencil. Loop the string a few times around this pencil, and stretch to the third pencil. Repeat until string is tight between the four pencils.



**You can also watch a video of how to set up a Study Square. Go to YouTube.com and search "Cary Institute Study Square."*

You are now all set to observe your Study Square!

Part 2: Observe Your Study Square



Just like at your Sit Spot...remember your Field Journal & a pencil!

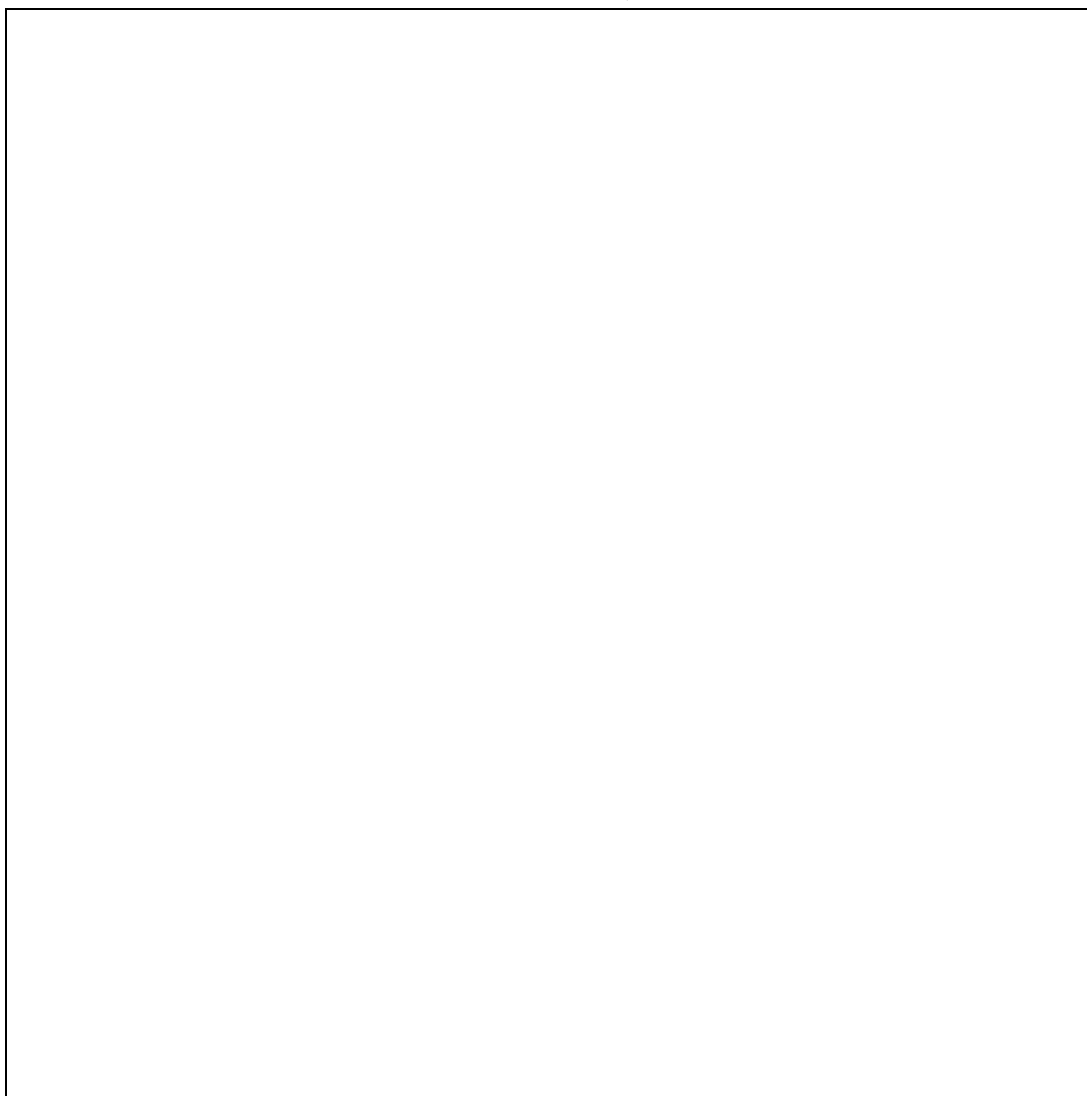
- Sit and get comfy –and move around a little, too!
- Carefully observe your Study Square for a few minutes—don't forget your magnifying glass!

What do you notice? Grass, flowers, leaves, any bugs? Are some things living and some things not?

What do you wonder? When you look at your square, what are you curious about? How many ants live in my entire home habitat? Why is the grass shorter in this part of my yard than in other parts?

Sketch what you see in your Study Square below. Add to this each day! Add color, too!

My Study Square



Study Square Observations

Day 1:	The weather today:
I notice...	I wonder...

Day 2:	The weather today:
I notice...	I wonder...

Day 3:	The weather today:
I notice...	I wonder...

Day 4:	The weather today:
I notice...	I wonder...

Day 5:	The weather today:
I notice...	I wonder...

What was your favorite thing you observed in your Study Square? Share it here!

--

***Eco-Alert!** Have you added all of the heterotrophs (organisms that eat other things) you found in your Study Square to your Master List on page 9?

Part 3 (Bonus): What does my Study Square tell me?

Think about your "I Wonder..." questions. Which question could be answered using your Study Square?

Example: How many yellow flowers are in my entire Home Ecosystem?

Let's learn how to think like an ecologist!

Step 1. Your study square is a 2ft x 2ft square that represents the whole of your outdoor space (aka your Home Habitat).

Use your ruler to figure out (roughly) how many study squares you could fit in your WHOLE Home Habitat you are studying.

I could fit _____ study squares in my Home Habitat.

Step 2. Pick an organism that lives inside your study square. This could be a blade of grass, a weed, an ant... anything you can see or count.

I picked _____.

Step 3. How many of this organism are in your study square?

I found _____ in my study square.
(Number) (Organism)

Step 4. Multiply the number of organisms you found in your square by the total number of study squares you could fit in your Home Ecosystem.

$$\frac{\text{_____}}{\text{(# of organisms)}} \times \frac{\text{_____}}{\text{(# of squares)}} = \frac{\text{_____}}{\text{(TOTAL number of organisms)}}$$

What OTHER questions could you answer using your study square?

I wonder...



IDENTIFICATION

What kind of creature is this, and how do I know?

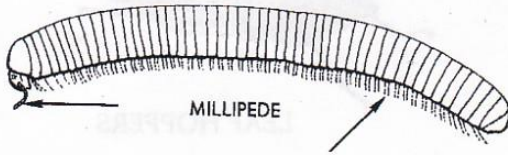
When you find a new bug, you can identify what it is by asking yourself the following questions:

Questions for Bugs

- ★ How many legs does it have?
- ★ Does it have wings? Are these wings parallel or do they stick out?
- ★ Did you find it near water?
- ★ Does it have antennae?
- ★ Does it have a parallel line down its back?
- ★ Did you find it near a specific plant?

You can also use the following field guides to identify common bugs and signs of bugs.

Common Soil and Litter Invertebrates



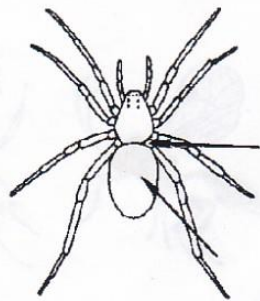
MILLIPEDE



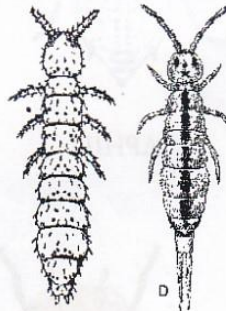
CENTIPEDE



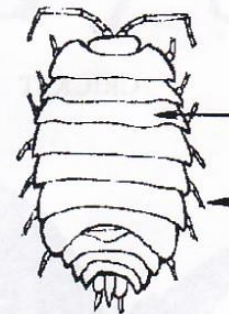
SLUGS & SNAILS



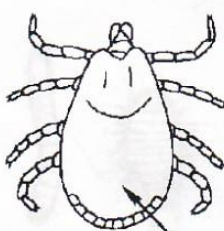
GROUND SPIDER



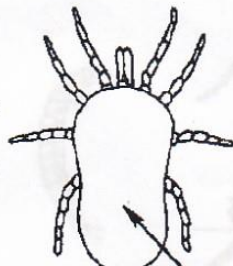
SPRINGTAILS



SOWBUG (isopod)



TICK



MITE



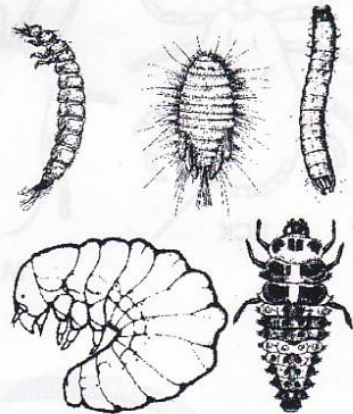
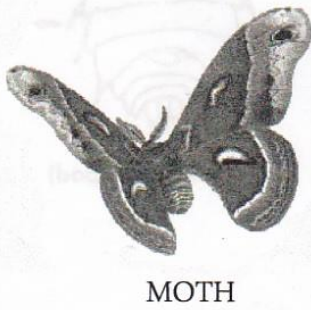
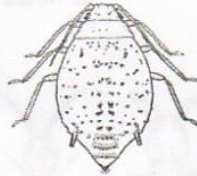
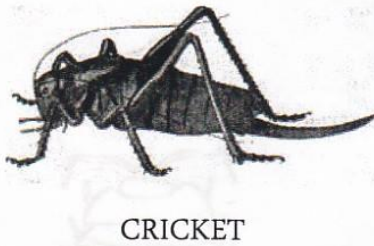
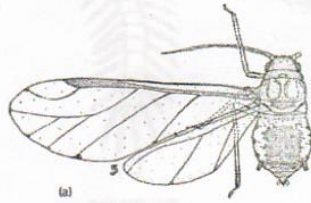
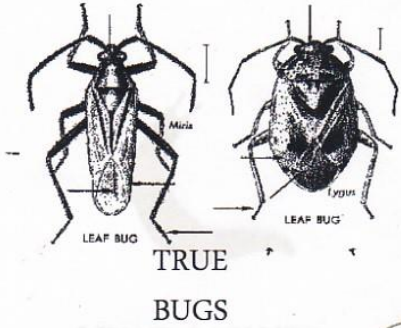
WORM



NEMATODE,
UNSEGMENTED WORM

Images taken from: <http://www.colby.edu/biology/BI131/Lab/Lab08SoilinvertGuide.pdf>

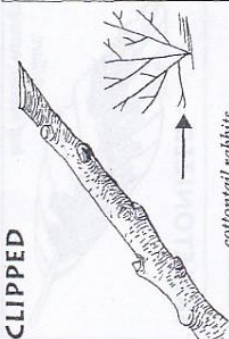
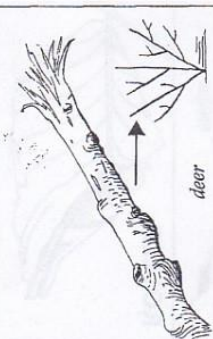
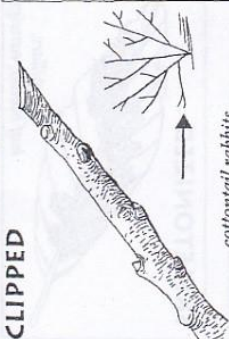
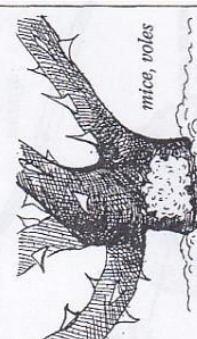




Common Flying Invertebrates







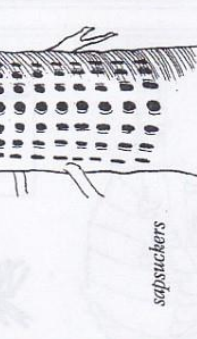



SIGNS OF ANIMALS EATING PLANTS

LEAVES		SEEDS, NUTS, AND FRUITS	
<p>CHEWED</p> <p><i>grouse, snowshoe hare</i></p> <p><i>leaf beetles, leafcutting bees</i></p> <p><i>caterpillars, grasshoppers</i></p>	<p>GALLED</p> <p><i>mites</i></p> <p><i>gall midges, aphids, mites</i></p> <p><i>gall midges</i></p> <p><i>oak gall wasps</i></p>	<p>BORED</p> <p><i>weevils</i></p> <p>Look for weevil larvae inside the acorns.</p>	<p>CHEWED</p> <p><i>kangaroo rats, orioles, coyotes</i></p> <p><i>red and gray squirrels, chipmunks, jumping mice, white-footed mice, deer mice</i></p> <p><i>white-footed mice, deer mice, fox, deer, opossum, woodchucks</i></p>
<p>MINED</p> <p><i>serpentine mine, fly and moth larvae</i></p> <p><i>blotch mine, fly and moth larvae</i></p> <p><i>needle mine, moth larvae, midges</i></p> <p><i>patch mine, beetles, moth and beetle larvae</i></p>	<p>ROLLED</p> <p><i>moths, butterflies, beetles</i></p>	<p>SKELETONIZED</p> <p><i>caterpillars, leaf beetles, earwigs</i></p>	

SIGNS OF ANIMALS EATING PLANTS *continued*

<p>CLIPPED</p>  <p>cottontail rabbits</p>	<p>CHEWED</p>  <p>deer</p>
<p>PRUNED</p>  <p>porcupines, red squirrels, beeltes</p>	<p>GNAWED</p>  <p>mice, voles</p>
<p>GALLED</p>  <p>midges, flies, gall wasps</p>	<p>GIRDLED</p>  <p>goldenrod gall flies</p>
<p>FROTHED</p>  <p>spittlebugs</p>	<p>GIRDLED</p>  <p>twig pruner beetles</p>

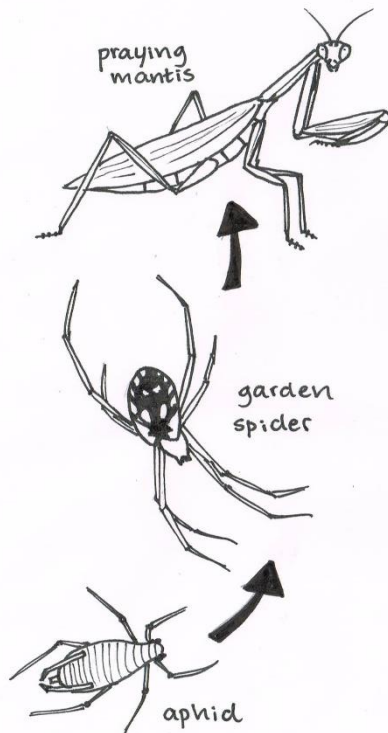
<p>BARK STRIPPED</p>  <p>porcupines</p>	<p>BORED</p>  <p>sapsuckers</p>
<p>BORED</p>  <p>woodchucks, squirrels</p>	<p>BORED</p>  <p>bark beetles</p>
<p>CHEWED</p>  <p>cottontail rabbits</p>	<p>CHEWED</p>  <p>cottonails, jackrabbits, ground squirrels, tortoises, woodrats, pocket mice</p>
<p>CHEWED</p>  <p>rabbits, bears</p>	<p>CHEWED</p>  <p>cottonails, jackrabbits, ground squirrels, tortoises, woodrats, pocket mice</p>

If you find any plants that have evidence of bugs, clip them and tape them into your booklet here!



If you use **glue**, be sure to let this page **dry** before closing— or else you'll have a **sticky** situation!

INSECT FOOD CHAIN



Hungry Heterotrophs

A **heterotroph** is any living thing that gets energy by **eating** other living things. Sometimes heterotrophs eat plants. Sometimes...they eat...other heterotrophs!

Are you a heterotroph?

Do you eat? Then YES, you are a heterotroph!

Which **heterotrophs** have you observed so far outside your home?

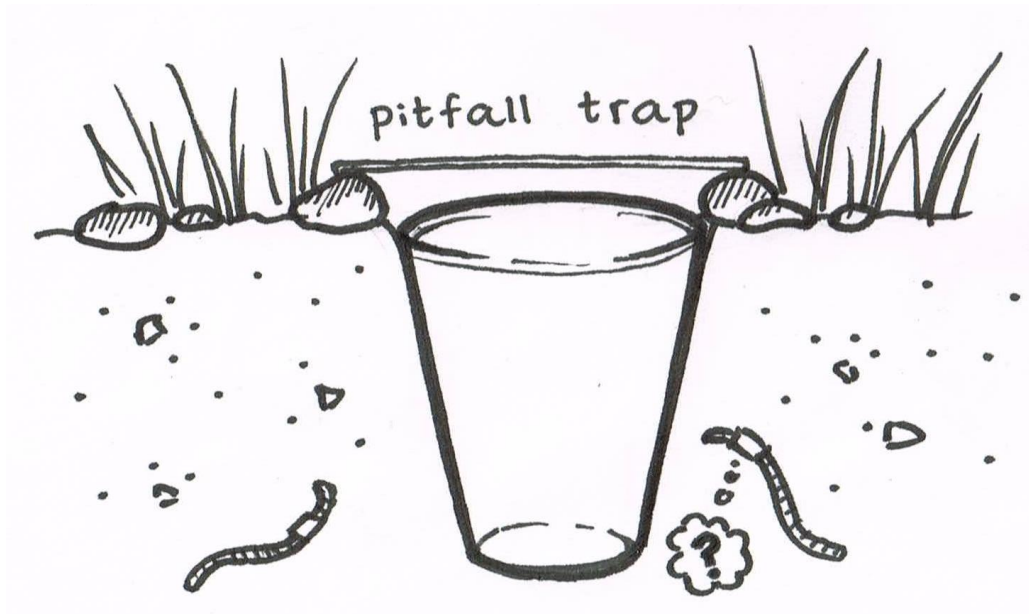
Which **heterotrophs** have you observed so far inside your Study Square?

Go to the [Field Tech Badge Padlet](#) webpage to learn more tools, apps, and activities you can use to identify plants, animals, and fungi!

Field Methods

How do field techs perform studies outside?

To earn your Field Tech Badge, you must complete at least ONE of the following field methods: Pitfall Trap, Coverboard, Critter Catching, or Beat Sampling.



***Online video tutorials are available on the [Field Tech Badge Padlet](#) page. If you cannot complete any of these methods at home, simply watch and respond to the videos to still earn your badge! ***

Pitfall Traps

Materials

- Empty yogurt cup
(or similar sized cup)
- Spoon or trowel for digging
- Soily area outside
- Large leaf or small piece of cardboard

Pitfall traps help us catch small creatures that are walking around above the surface of the ground.

Method:

Step 1. Simply dig a hole in the ground large enough to fit a cup (like a recycled yogurt container or something of similar size).

Step 2. Place the cup in the hole and make sure the top of the cup is even with the ground.

Step 3. Place a large leaf or small piece of cardboard loosely over the top of the cup.

Step 4. Leave it for insects to fall into.

That's all there is to it!

We recommend checking every 2 hours, or even leaving it overnight and checking in the morning!

Pitfall Traps

Use this space to record what you found!

Use your **field guides** or the naturalist app **Seek** to identify the organisms you find.

Critter Catching

Materials

- Net (DIY: <https://www.youtube.com/watch?v=Y6X2VZyy0dY>)
- Bug box

Method: To catch insects without fancy tools, simply stay still and swing your net in one swift motion. If you don't have a net, you can use a recycled plastic jar with a lid, a small bug box, or make a homemade net!

Think like a bug!
Where would
YOU want to
hide?



Critter Catching

Use this space to record what you found!

Use your **field guides** or the naturalist app **Seek** to identify the organisms you find.

Beat Sampling

Materials

- Tree or bush
- Sturdy stick
- Large light-colored piece of fabric like an old bed sheet

When they're not hiding underground, some animals climb up high to hide on branches or in bushes. Beat sampling is a tool ecologists use to release creatures that are climbing up trees or hiding in bushes by shaking the branch and catching them on a cloth.

Method:

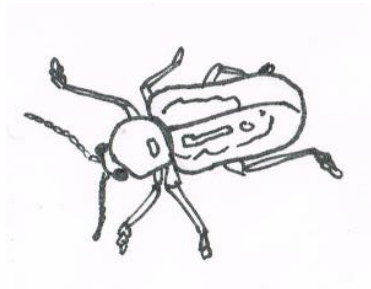
Step 1. Find a bush or tree with low-hanging branches.

Step 2. Lay the large piece of fabric on the ground.

Step. Carefully but firmly hit and shake the branches right above the fabric. You can also shake branches with your hand!

Step 4. Check out the sheet! What kind of bugs do you see?

Step 5. Capture some of the bugs in a bug box to take a closer look!



Beat Sampling

Use this space to record what you found!

Use your **field guides** or the naturalist app **Seek** to identify the organisms you find.

Hungry Heterotrophs

Now that you've mastered these field tech tools, which *new* heterotrophs (or animals that eat other things) have you observed?

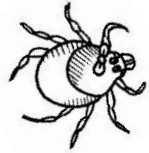
Which heterotrophs have you seen **evidence** (or *signs*) of?

This can include bite marks and poop, any sign that an organism was eating here.

***Eco-Alert!** Have you added all of the heterotrophs (organisms that eat other things) you found in during your **Field Tech Badge** to your Master List on page 106?

BRAINSTORM BOX

Now that you've mastered the practice of being a field tech, you are ready to become an ecologist!



An **ecologist** is someone who studies how **living things interact with their environment**.

Ecologists love to ask questions about the natural world. Use the space below to brainstorm some questions you might want to answer using the field methods you learned during this badge. **Hint: Think about what you learned during your naturalist badge, too!*

Examples:

Are there more bugs in this branch in the morning or evening?

Will more bugs fall into my pitfall trap if I leave a flower in it?

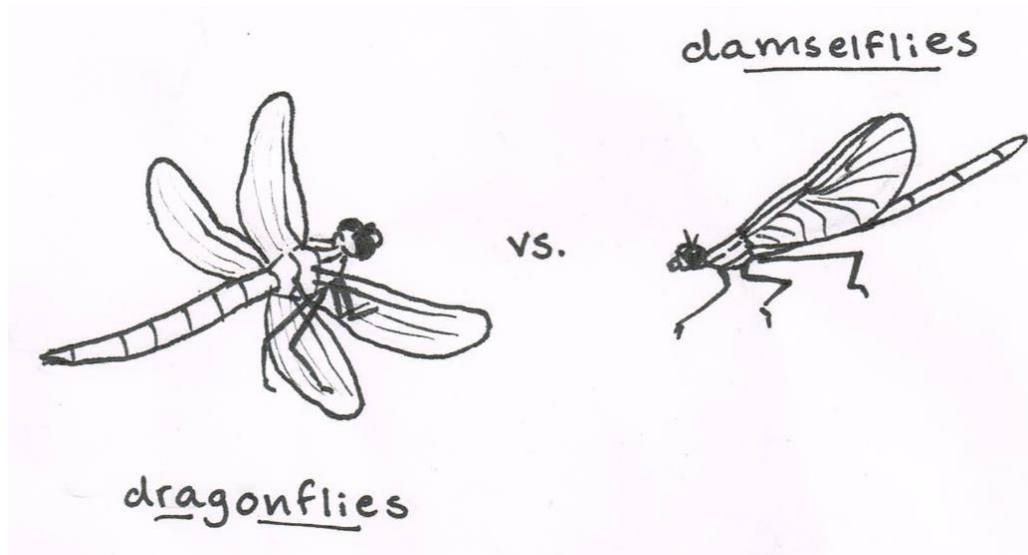
Will I catch more bugs if I dress in green?

Your Questions:

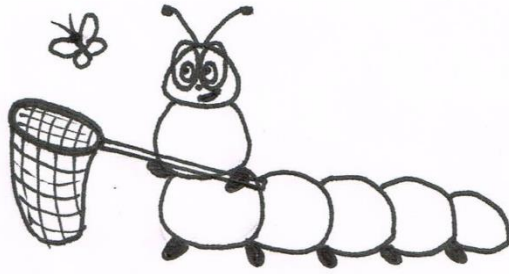
E-mail your favorite answerable question to an educator at caryeducation@caryinstitute.org so that you can get ready to conduct an experiment for your Field Ecologist Badge. We can help!

Field Tech Eco-Challenge Check

✓	Challenge Steps	Eco-Explorer Signature	Adult Initials
	Set up a Study Square.		
	Observe the Study Square at least 5 different times.		
	Identify 5 heterotrophs.		
	Identify 2 pieces of <i>evidence</i> of heterotrophs.		
	Master at least 1 field investigation method.		



Field Ecologist Badge



Field Ecologist (noun): a scientist who studies how living organisms are connected to each other and to their environment

Eco-Challenge

The mission of this badge is to design and conduct your own at-home field experiment to investigate more about animals and the food they consume.

To earn the **Field Ecologist** badge, you must:

- Ask a science question that will help you learn more about how an animal eats.
- Choose a field experiment to answer your question.
 - You can choose one we provide or design an experiment yourself.*
- Get your question + field experiment approved by a trusted adult.
- Predict what you think is going to happen in your experiment.
- Do your field experiment!
- Make observations and collect data.
- Share what you learned by completing your Investigative Report.



Visit us online for the Field Ecologist Badge!

<https://padlet.com/caryecoquest/FieldEcologist>

Ask a Science Question & Pick a Field Experiment

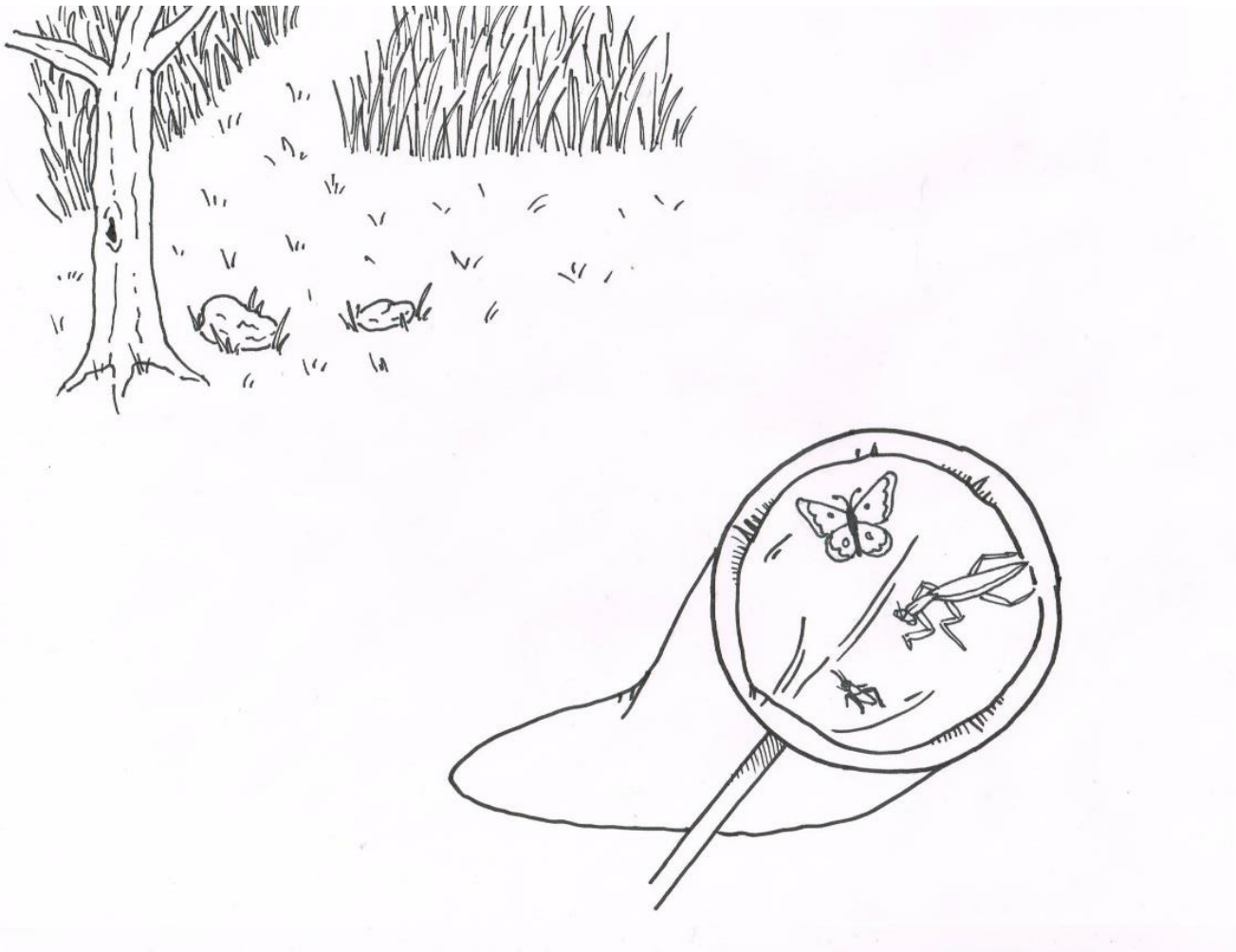
Field ecologists are curious about everything! They often wonder about the lives of animals. Before doing an experiment to learn more about an animal, they always *first* ask a science question.

Think about the study animal you picked. What is a question you could ask that you could *answer* by doing a field experiment?

Hmm...I wonder...

Asking a good science question is not always easy! Lucky for you, we have some ideas to get you started. After all, good field ecologists need practice!

If you would like to **Design Your Own Experiment**, skip ahead to page 66.

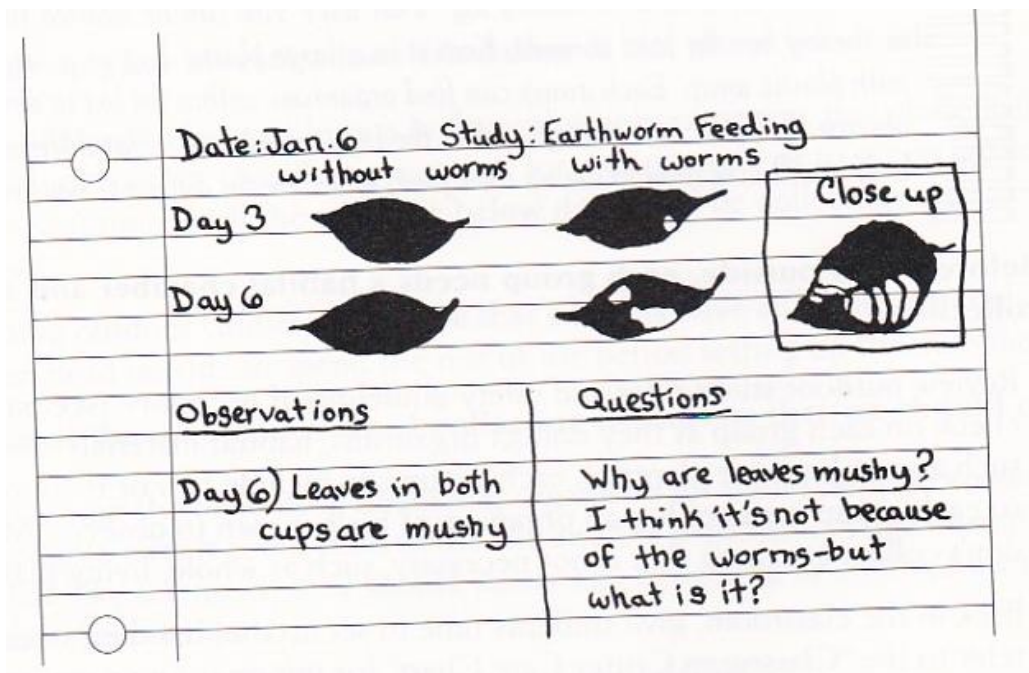


Option 1: Choose a Field Experiment

We have some field experiments for you to try if you'd like practice before designing your own experiment. Read through each field experiment and pick the one that is most interesting to you!

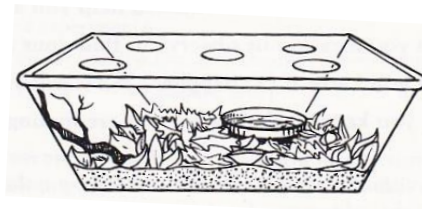
There are three experiments to choose from: *Ant Hotel*, *Plant Munchers*, and *Stupendous Seeds*.
Choose ONE of these for now.

After you complete your Field Ecologist badge, you are welcome to try more experiments!



From *Eco-Inquiry* (1994) by Kathleen Hogan

If you are interested in creating an indoor critter habitat for your experiment, email caryeducation@caryinstitute.org for ideas. Great for rainy days!



From *Eco-Inquiry* (1994) by Kathleen Hogan

OUTDOOR FIELD EXPERIMENTS



Field Experiment 1: Ant Hotel

Ants are everywhere—let's learn more about them and what they like to eat!

Check the field experiment you want to do. Pick ONE!	Research Question	Possible Method for Field Experiment
<input type="checkbox"/> Option 1	Do ants like some food better than others?	Create a bait station : In a jar lid or on a paper plate, put tiny amounts of food like peanut butter, honey, seeds, lettuce, or cookie crumbs—get creative with what you have! What foods do ants like best?
<input type="checkbox"/> Option 2	Do different kinds of ants like different kinds of food?	Create a bait station : In a jar lid or on a paper plate, put tiny amounts of food like peanut butter, honey, seeds, lettuce, or cookie crumbs. Do different kinds of ants (big black ants, small black ants) like certain foods?
<input type="checkbox"/> Option 3	Do ants that live in different habitats eat different things?	Put the bait station in different places or habitats outside to see if the type of ant attracted to the foods differ based on the habitat.
<input type="checkbox"/> Option 4	Are there differences in how ants eat their food? Do some ants take food away in big chunks, or do some suck liquid out of their food?	Take a close look (use a magnifying glass!) to watch ants at the bait station to see how different ants handle their food. Try to follow them to see where they take their food!

Adapted from *Eco-Inquiry* (1994) by Kathleen Hogan

Ant Hotel Data Collection – Use extra paper if you need & stick it in your Journal!

Date: _____ Time of day: _____ Weather: _____.

What do you PREDICT will happen in your field experiment?

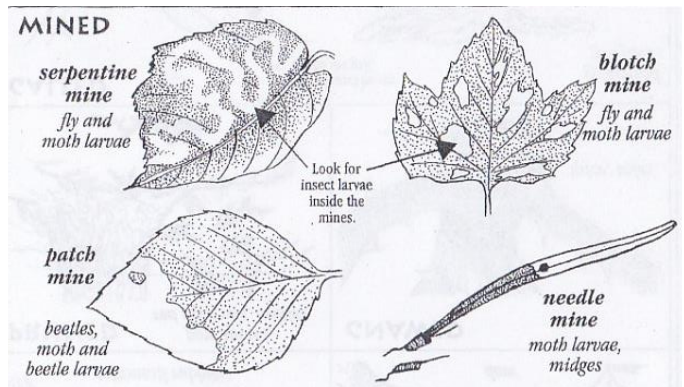
Sketch your Method for the field experiment:

What did you notice and observe?

What was the most interesting thing you noticed?

Field Experiment 2: Plant Munchers

A lot of bugs love to eat plants, but bugs have favorite plants—as well as interesting ways of eating them!



Check the field experiment you want to do. Pick ONE!	Research Question	Possible Method for Field Experiment
<input type="checkbox"/> Option 1	Do different bugs eat different parts of plants? (like fruits, flowers, branches, leaves, bark, buds, & roots)	Take a close look (use a magnifying glass!) on a plant to look for insects feeding on leaves. Notice what insects are found on different parts of the plant.
<input type="checkbox"/> Option 2	Do different kinds of plants have different kinds of bugs feeding on them?	Look for evidence of bugs eating leaves (like holes, tunnels, & scrapes). Compare different leaves to each other. Do different leaves have the same kind of evidence left by bugs?
<input type="checkbox"/> Option 3	Which plants have the most different kinds of insects?	Spread a light-colored cloth/sheet on the ground below tree branches or bushes. Gently shake branches (or use the "Beat Sampling" technique from your Field Tech Badge) to see what insects fall out. Note which types of insects fall off of different kinds of plants.

Adapted from *Eco-Inquiry* (1994) by Kathleen Hogan

Plant Munchers Data Collection – Use extra paper if you need & stick it in your Journal!

Date: _____ Time of day: _____ Weather: _____.

What do you PREDICT will happen in your field experiment?

Sketch your Method for the field experiment:

What did you notice and observe?

What was the most interesting thing you noticed?

Field Experiment 3: Stupendous Seeds

Create **seed stations** to see how some animals have special abilities for finding their food.



Check the field experiment you want to do. Pick ONE!	Research Question	Possible Method for Field Experiment
<input type="checkbox"/> Option 1	Do small or larger seeds disappear more quickly in the open or under cover?	Create a seed station : Put large & small seeds (like a bird seed mix, peanuts, sunflower seeds on three plates—get creative!) in three places: <ol style="list-style-type: none"> 1. Put seeds on a plate in an open space, like the middle of a yard. 2. Put seeds on a plate under a bush or other “shelter.” 3. Put seeds on a plate under a box with a hole cut out of it. *Check stations every day for a week.
<input type="checkbox"/> Option 2	Does the size and position of the entry holes into a container with seeds make a difference for how quickly the seeds disappear?	Put equal numbers of the same kinds of seed in two containers with different entry holes (like big or small, covered by a flap, located on the top or side of a container, etc.) to compare how quickly the seeds disappear.

Adapted from *Eco-Inquiry* (1994) by Kathleen Hogan

Stupendous Seeds Data Collection –Use extra paper if you need & stick it in your Journal!

Date: _____ Time of day: _____ Weather: _____.

What do you PREDICT will happen in your field experiment?

Sketch your Method for the field experiment:

What did you notice and observe?

What was the most interesting thing you noticed?

OFFICIAL ECO-EXPLORER INVESTIGATIVE REPORT

Field EcoExplorer Name:
Your study animal:
Type of food your study animal consumes:
Sketch your animal and its food.
From your field experiment, what did you discover about your animal and how it eats? What patterns did you notice?
What do you think is AMAZING about your animal?
Did you discover any other organisms during your study? <i>Sketch and write about them here!</i>

***Eco-Alert!** Have you added all of the heterotrophs (organisms that eat other things) you found during your Field Experiment to your Master List on page 106?

Option 2: DESIGN YOUR OWN EXPERIMENT

Reminder: Before setting up your study, please FIRST share your science question + field experiment design with a Cary Educator.

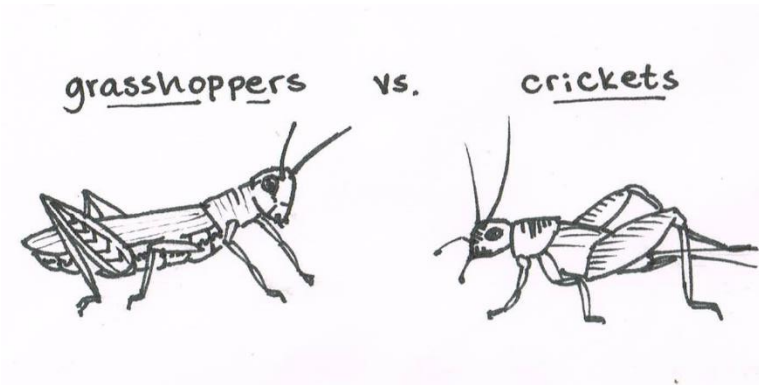
Reflection: Pick a study animal in your home habitat.

In all of the badges that you have done so far, which animal did you see (or see signs of!) that you would like to learn more about?

Why do you think this animal is interesting?

What do you think this animal eats?

Draw your animal here and what it eats.



Ideas for developing a Research Question:

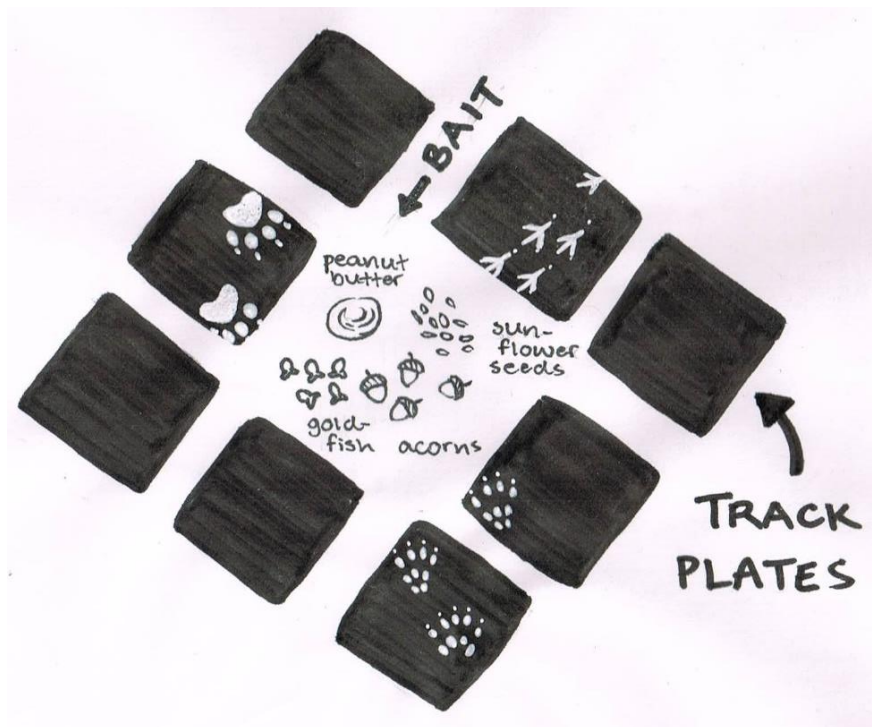
- Maybe you could use a question from your **Field Tech Brainstorm Box!**
- Compare and contrast different kinds of field methods you learned during the Field Tech Badge. *Are different kinds of bugs caught by using a coverboard versus a pitfall trap?*
- Study different habitats. *Are different bugs found in different habitats?*
- Study different food sources: *Are certain insects found on the plants they eat? Do ants prefer yogurt or peanut butter?*

Other Methods for designing a field study:

- Anything from your Field Tech Badge! (pitfall traps, cover boards, beat sampling, etc.)
- There might be another field method, like track plating, that could inspire your investigation!

<https://www.caryinstitute.org/eco-inquiry/teaching-materials/biodiversity/track-plates>

- Examples: Track plates, Leaf packs, Camera trapping, or Bait stations
- Aquatic studies like dip-netting, leaf packs, etc.



Have an idea but aren't quite sure how to set up a field experiment? Ask an Educator! Send us an email at caryeducation@caryinstitute.org or set up a phone call—we are happy to chat!

FIELD EXPERIMENT DESIGN

My Research Question

My Field Experiment

Supplies Needed:

Describe your Method:

How will you collect data/ make observations?

Example: I will collect data _____ times a day for _____ days. I will write observations in my Field Journal about...

What do you PREDICT will happen in your field experiment?

DATA COLLECTION

Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		
Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		
Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		

Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		
Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		
Date:		Time:		Weather:	
Observations: <i>What do you notice?</i> (Write & Sketch!)			Questions: <i>What do you wonder?</i>		

OFFICIAL ECO-EXPLORER INVESTIGATIVE REPORT

Field EcoExplorer Name:
Your study animal:
Type of food your study animal consumes:
Sketch your animal and its food.
From your field experiment, what did you discover about your animal and how it eats? What patterns did you notice?
What do you think is AMAZING about your animal?
Did you discover any other organisms during your study? <i>Sketch and write about them here!</i>

***Eco-Alert!** Have you added all of the heterotrophs (organisms that eat other things) you found during your Field Experiment to your Master List on page 106?

Field Ecologist Badge Eco-Challenge Check

✓	Challenge Steps	Eco-Explorer Signature	Adult Initials
	Ask a science question that will help you learn more about how an animal eats.		
	Choose <i>or</i> Design a field experiment to answer your science question.		
	Get your question + field experiment approved by a trusted adult.		
	Predict what you think is going to happen in your experiment.		
	Do your field experiment!		
	Make observations and collect data.		
	Share what you learned by completing your Investigative Report .		

Artist Badge

Artist (noun): A person who practices any of the creative arts, including but not limited to: painting, drawing, sculpting, music-making, writing, collaging, sewing, dyeing, gluing, building, filming, recording, singing, speaking, performing.



Wow! So this means...everyone is an artist in some way! Oh, me...? I'm really into playing the cello.



Eco-Challenge
The mission of this badge is to use artistic techniques to explore, celebrate, and share your habitat.

To earn this **Artist** badge, you must:

- Complete at least one leaf rubbing
- Complete at least one original drawing
- Write at least one nature poem
- Create a habitat restaurant
- Write a story
- Create a collage



Visit us online for the Artist Badge! <https://padlet.com/caryecoquest/Artist>

Part 1: The Autotrophs

Who are the autotrophs in our habitat who feed the local heterotrophs?

An **autotroph** is an organism that makes its own energy, without having to eat any other living things. Most plants are autotrophs because they create energy using sunlight.

For this badge, you will need a **Sit Spot** again. This can be the same sit spot from your Naturalist Badge or a new one! Anywhere you can comfortably sit for about an hour.

Worm-Up #1

1. Pick an autotroph in or near your spot. This can be a tree, a flower, a bush, a blade of grass.
2. Watch this autotroph for at least a minute.
3. Write down one thing you noticed about it:



Most **autotrophs** have **green** parts, like leaves or stems—these help them create energy for the sun through **photosynthesis!**

-
4. Draw the autotroph below:

5. Close your eyes and draw the autotroph again:

Now we are going to pick one leaf from our autotroph.
Look at the leaf and draw it below.



Draw the leaf *without* looking at it below.

Draw the leaf and all of **its edges and shadows** without picking up your pencil/pen.
This is called a *contour drawing*.

Draw the leaf **all at once**, without picking up your pencil, *without looking*.

Trace the outside of the leaf, and **color** in a new design to fill in the blanks.

Use the space below to make a **rubbing** of the leaf.

To make a rubbing, place the leaf right **underneath this page** and *gently* shade above it using a pencil, crayon, or colored pencil.

You should see some of the details of the leaf come through to this page!

Use the space below to produce more rubbings, to tape down your leaf, or to practice any leaf drawing activities again with new leaves!

Can you identify what kinds of leaves these are?
Try using field guides or online resources and label your drawings!

Part 2: Poet-tree

How can we use words to celebrate our surroundings?

Worm-Up #2

Fill this box with as many words you can use to describe the living things you have seen in your Home Habitat!

For an extra challenge, try to fill up the whole box in only 2 minutes.

For an extra extra challenge, draw an image to go with each word.

TO BE A LEAF MUST FEEL SO FREE
LOCAL TREES AND STALKS OF LOCAL FRUIT AND BUDS THROUGH ALL THE NEARBY BREEZES (MUSING)
LOCAL FRUIT AND BUDS THROUGH ALL THE NEARBY BREEZES (MUSING)
SHOES CRUNCHING UNDER FRIENDLY
SNOOZE IN A FRIENDLY SNOOZE
AND LAYING DOWN
SNEEZE CRUNCHING UNDER FRIENDLY
YOUR NEARBY
LOCAL TREES AND STALKS OF LOCAL FRUIT AND BUDS THROUGH ALL THE NEARBY BREEZES (MUSING)

Below are some examples of nature poetry.

Take some time to read through and respond to each poem.

PINE TREE TOPS

by Gary Snyder

in the blue night
frost haze, the sky glows
with the moon
pine tree tops
bend snow-blue, fade
into sky, frost, starlight.
the creak of boots.
rabbit tracks, deer tracks,
what do we know.

What do these poems make you think of?

How do they make you feel?

What images come to mind? (Feel free to draw!)

What words or phrases stand out?

FOR THE CHILDREN

by Gary Snyder

The rising hills, the slopes,
of statistics
lie before us.
the steep climb
of everything, going up,
up, as we all
go down.

In the next century
or the one beyond that,
they say,
are valleys, pastures,
we can all meet there in peace
if we make it.

To climb these coming crests
one word to you, to
you and your children:
stay together
learn the flowers
go light

Going out to the Garden

By Alice Walker

Going out to the garden
this morning
to plant seeds
for my winter greens
-the strong, fiery mustard
& the milder
broadleaf turnip-

I saw a gecko
who
like the rest of us
has been
reeling
from the heat.

Geckos like heat
I know this
but the heat
these last few days
has been excessive
for us
& for them.

A spray of water
from the hose
touched its skin:
I thought it would
run away.
There are crevices
aplenty
to hide in:
the garden wall
is made of stones.

But no
not only
did the gecko
not run away
it appeared
to raise
its eyes
& head
looking for more.

I gave it.

Squirt after
squirt
of cooling
spray
from the green
garden hose.

Is it the end
of the world?
It seemed to ask.
This bliss,
is it Paradise?

I bathed it
until we were both
washed clean
of the troubles
of this world
at least for this moment:
this moment of pleasure
of gecko
joy
as I with so much happiness
played Goddess
to Gecko.

Now it's time to write your own nature poetry! Below are a few types of poems for you to try.

The Acrostic

Step 1. Pick one of the heterotrophs in your spot that you have identified already.

Step 2. Write its name, but vertically.

Step 3. Fill in words that intersect with the letters of its name.

See this "CRICKET" example!

	C	an you hear the world outside your chirp?
	o	R are you so
	I	nundated with the loud
Chirp Chirp	C	hirp
causing such a rac	K	et
causing quit	E	a stir
	T	hat you cannot hear anything else?

Write your acrostic below. What animal did you choose? _____

The Shape Poem

Step 1. Pick one of the organisms you found and identified.

Step 2. Draw an outline of this organism without filling it in.

Step 3. Fill the inside of the shape with the words about your organism.

*Bonus: Color your creation, draw a background, add its habitat, or add a friend.



The Rhyme

Pick a heterotroph (something that eats something else) you have identified that you wish to write about. You can write your poem however you wish—it just needs to rhyme!

Example Rhyming Poem:

If I lived inside a birch
I'd never leave you in the lurch
If I were stuck inside a tree
Would you have stayed to play with me?

The Letter

Pick a heterotroph that you found and identified already: _____

Give a name to this creature: _____

What do you notice about this creature? What do you find interesting or curious?

I notice...	I wonder...
-------------	-------------

Starting with "Dear _____," write a letter to this creature. Ask or tell it anything you want.

*Bonus: Make it rhyme, give it a fun shape, or give it a creative structure.

Share your favorite poems on the [Artist Badge Padlet](#) webpage!

Part 3: Critter Characters

Who are the creatures around us? What is their story?

Worm-Up #3

Earlier, we asked you to find a rock. In the space below, tell us more about your rock. Name it, draw it, give it some clothes, give it a story. How old is it? What time did it wake up this morning? Where is it from? What are its favorite things to do? What is its favorite food?

These activities are all about **storytelling**. You will develop a story about the different creatures in your habitat.

Step 1. Characters

Use the space below to sketch and name some of the characters that live in your habitat.

Now that you've named your characters, use arrows to show their **relationships**, just like you did on page 29 when you made a food web. Are they predator and prey? Are they friends? Family? Enemies?

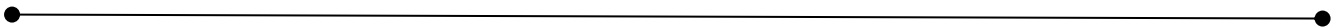
Step 2. Setting

By now, you are an expert on the habitat where your story will take place. Use the space below to jot down some words or characteristics that **describe this habitat**, the *setting* of your story.

The name of this habitat is _____.

Step 3. The Plot

Use the space below to illustrate a timeline of events in your story, from beginning to end. Make sure to include at least one exciting event or problem!



Step 4. Tell the Tale

Using words, drawings, or a combination of both, **tell the story** you have created about your creature characters in their habitat.

You may use a video or audio recording instead of paper.

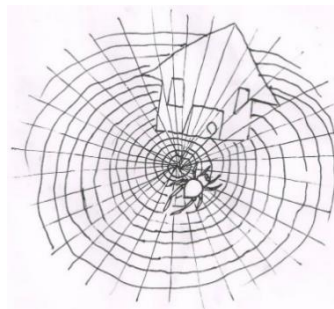
You may write a poem or script.

You may need some extra paper.

It's up to YOU!

Part 4: Il Ristorante Naturale

Who's coming over for dinner?



Worm-Up #4

Create an advertisement that shows off your *Sit Spot*. Why is it the best spot ever?

Throughout this program, you have looked for **evidence** of animals eating plants, you have asked *who eats what*, and you have watched different animals come and go. In other words, you have observed a **habitat restaurant**.

If your spot really were a restaurant, what would it be called?

What kind of restaurant would it be? How would it look? Draw it below.

Looking through the observations you have made throughout your EcoQuest, see if you can use what you have learned to design the **menu** for your habitat.

Be as creative and imaginative as you can, but make sure to use some of the observations you made to inform your menu!

Menu

Part 5: Nature's Palette

What can you use to create art?

Worm-Up #5

Pens and pencils are old news. **What else can you use to make marks on paper?**

See if you can use **leaves, mud, rocks**, or any other natural item you find outside to create markings on this sheet, or even create a **masterpiece**.

Part 1. Plant Presses

Sometimes, when an ecologist finds a plant they really like, they press it flat so that they can preserve it forever. This is called a **plant press**.

Materials:

- Pieces of paper, newspaper, or magazine paper
- 2 pieces of cardboard
- Extra books or boxes

Step 1. Pick a plant you like! Try to figure out what kind of plant it is.

Step 2. Find two pieces of paper (or newspaper). They can be small, but must be bigger than the plant you have chosen.

Step 3. Sandwich the plant between two pieces of paper.

Step 4. Sandwich the plant and paper between two pieces of cardboard.

Step 5. Weigh down your press by putting books or boxes on top of it. This should flatten your plant.

Step 6. Leave your plant press *for at least a few days*. After about a week, your plants will be fully dry!

Part 2. Eco-Collages!

If you can tape it down, you can collage it. A collage is a type of art made by **mixing a lot of different materials** into one big image.

Materials:

- Natural materials
- Scrap paper and other craft materials
- Paper, cardboard...something to be your "canvas"
- Scissors
- Tape and/or glue

Step 1. Find as many materials as you can that you would use to make a collage. Some should be natural materials from your habitat, but others might come from around your home.

Step 2. Find something to stick them down with. This can be glue or tape or both.

Step 3. Find something to stick them down *onto*. This can be paper, poster paper, cardboard, or anything your parents/guardians will let you stick things to.

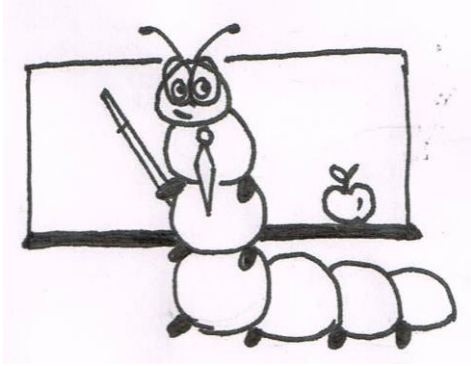
Step 4. Have some fun collaging! Can you use the materials you gathered to create an image? Or do you want to create something abstract?

Step 5. Name your creation. Take a picture and **share** it!

Artist Badge Eco-Challenge Check

✓	Challenge Steps	Eco-Explorer Signature	Adult Initials
	Complete at least one leaf rubbing		
	Complete at least one original drawing		
	Write at least one nature poem		
	Create a habitat restaurant		
	Write a story		
	Create an eco-collage		





Teacher Badge

Teacher (noun): a person who helps others learn and inspires understanding of new things

Eco-Challenge

The mission of this badge is to practice communicating ecology lessons by sharing what you have learned with your friends and family.

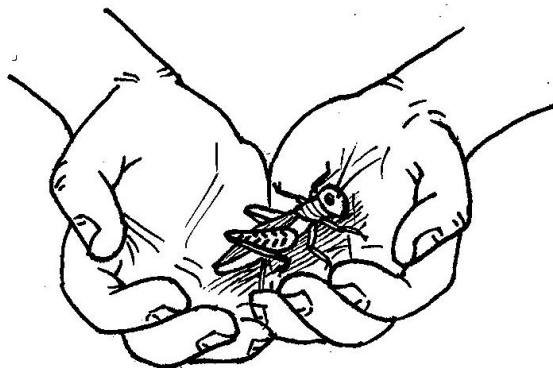
To earn the **Teacher** badge, you must:

- Make a creative, ecological **EcoQuest Finale!** You will help others learn about your EcoQuest investigations in your home ecosystem.
- Before you begin your EcoQuest Finale, share your idea with Cary Educators for feedback at caryeducation@caryinstitute.org
- Present your EcoQuest Finale to family or friends.
- Bonus: Share your project virtually with other EcoExplorers on Padlet!

Visit us online for the Teacher Badge! <https://padlet.com/caryecoquest/Teacher>

Get Inspired!

Sometimes a teacher really inspires us to want to learn and be the best we can be. Who is that teacher for you?



Write & draw your **favorite teacher** here.

What are some **words** that describe them?

Teacher's Name: _____

How did this teacher get you **excited** to learn?

What makes that teacher **special**?

How do they make the classroom **FUN**?

Teacher Bio

You reflected on your favorite teacher and what made them so great.

Now, let's learn more about YOU and what makes you a great teacher, too.



Write & draw yourself as a teacher here.

What are some words that describe you?

Your Name: _____

How would YOU get others excited about something?

What makes YOU special as a teacher?

How will YOU make learning FUN?

EcoQuest Finale!

On this EcoQuest, you have learned SO MUCH about amazing organisms and how they eat in your home habitat.

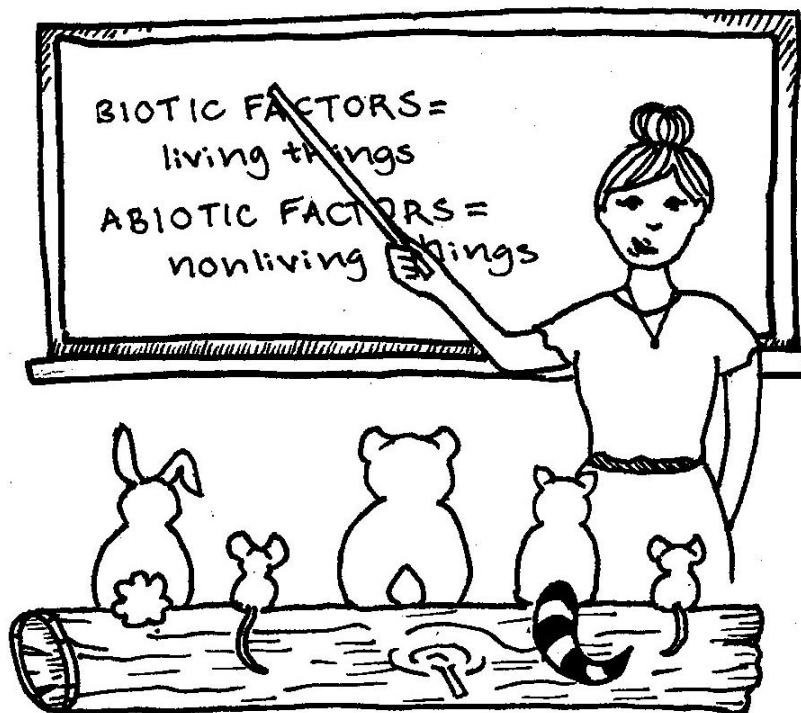
You've tuned in all 5 of your senses to observe things no one else might notice...

You've practiced field methods to catch all sorts of insects and other critters...

You've proven that you can do a field experiment *just like* a field ecologist.

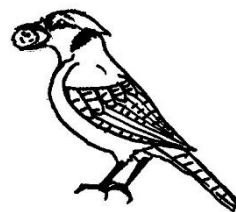
Not only that, you've wowed everyone with your creative skills as an ecologist artist!

Now it's your turn to **TEACH** others about
Who is Coming Over for Dinner for a Fantastic Feast
in your home ecosystem!



Brainstorm!

You can teach about anything you thought was really amazing during EcoQuest. The questions below are to help get your creative juices flowing...but these are just ideas. Follow your heart!



What are some of the coolest animals you learned about during EcoQuest?
(Remember, bugs are animals, too!)

What animal did you discover during EcoQuest do you want to teach others about?

What was amazing about this animal?

What did this animal eat?

Can you think of a really interesting food web that you discovered? Do you think you could teach others about the ENTIRE food web of your home ecosystem?

What field method was the most fun to do? What animals, or connections between animals, did you discover?

What was the most fun thing you did in EcoQuest? Is there a way that you could teach someone else how to do it, too?

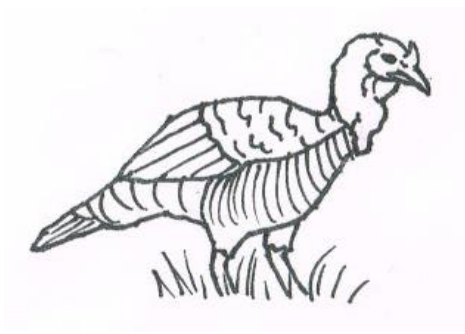
Close your eyes. Take a **snapshot in your mind** of your very favorite moment from EcoQuest. When you think of it, draw or write about it below:

EcoQuest Finale Guide

Since this badge is an Eco-Challenge, these are the challenges you must include in your lesson in some way.

Your EcoQuest Finale lesson must...

- Include *at least one* **heterotroph** you discovered in your Home Habitat
- Include the food that this **heterotroph** eats—and how it eats it!
- Include 2 **new science words** you learned during EcoQuest
- Be **artistic**.
 - What does this mean? Use *any* type of creativity to teach your ecology lesson. Remember, an artist *practices any of the creative arts, including but not limited to: painting, drawing, sculpting, music-making, writing, collaging, sewing, dyeing, gluing, building, filming, recording, singing, speaking, performing.*
 - This simply means...**get creative!** Make a lesson in **your own style**.
- Be **FUN** for you to create! This is not for a grade. This is for **YOU** and your loved ones.



EcoQuest Finale Planning

Brainstorm Box

Use this space to **plan** how you will teach others about what you have learned.
Will you make a poster? A video? A mural? A painting? A song?
The possibilities are **endless!**

Now is your time to shine!

We cannot wait to see what you create.

Please share with Cary Educators at caryeducation@caryinstitute.org and on
our [EcoQuest Teacher Padlet!](#)

Teacher Badge Eco-Challenge Check

✓	Challenge Steps	Eco-Explorer Signature	Adult Initials
	Before you begin your EcoQuest Finale , share your idea with Cary Educators.		
	Make a creative EcoQuest Finale that teaches an ecological lesson!		
	Present your EcoQuest Finale to family or friends.		
	*Bonus: Share your EcoQuest Finale virtually with other EcoExplorers !		

Master List Eco-Challenge

When you discover a new **heterotroph** (something that eats something else), **add it below!**

*Remember: You must find **at least 30 heterotrophs** to complete this Eco-Challenge.

1	18
2	19
3	20
4	21
5	22
6	23
7	24
8	25
9	26
10	27
11	28
12	29
13	30
14	31
15	32
16	34
17	35

36	56
37	57
38	58
39	59
40	60
41	61
42	62
43	63
44	64
45	65
46	66
47	67
48	68
49	69
50	70
51	71
52	72
53	73
54	74
55	75

Food Frenzy Eco-Challenge

Come back to this page to share your favorite feeding relationships you discover.

*Remember: You must find at least 4 relationships to complete this Eco-Challenge.

<p style="text-align: center;">Who...→ → → (The heterotroph)</p>	<p style="text-align: center;">→ → →...eats What? (the food)</p>
<p>1. Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Animal Fungi Bacteria</p>	<p>Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Plant Animal Fungi Bacteria Decaying matter (dead stuff!)</p>
<p>2. Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Animal Fungi Bacteria</p>	<p>Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Plant Animal Fungi Bacteria Decaying matter (dead stuff!)</p>

<p style="text-align: center;">Who...→ → → (The heterotroph)</p>	<p style="text-align: center;">→ → →...eats What? (the food)</p>
<p>3. Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Animal Fungi Bacteria</p>	<p>Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Plant Animal Fungi Bacteria Decaying matter (dead stuff!)</p>
<p>4. Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Animal Fungi Bacteria</p>	<p>Organism:</p> <hr/> <p>Circle the category it belongs to:</p> <p style="text-align: center;">Plant Animal Fungi Bacteria Decaying matter (dead stuff!)</p>

Final EcoQuest Checklist

As an EcoExplorer, I completed the...

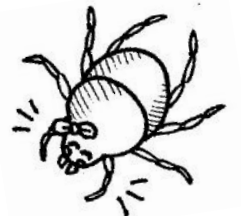
- Naturalist Badge
- Field Tech Badge
- Field Ecologist Badge
- Artist Badge
- Teacher Badge
- Master List of Heterotrophs
- Food Frenzy of Heterotroph Relationships



I, EcoExplorer _____, hereby certify that I have
(Your Name)
officially completed my Fantastic Feast EcoQuest!

EcoExplorer Signature: _____

Date: _____



Congratulations on completing your EcoQuest!!!



Thank You!

We at Cary Education created EcoQuest as a way to provide families with a fun ecology education opportunity since we had to cancel Cary Eco-Discovery summer camps during the COVID-19 Pandemic in 2020. We are incredibly grateful to all the families, teachers, and students who participate in this brand new program, as well as to our amazing team of high school Eco-Leaders for their creative ideas and dedicated educational contributions.

We are excited to inspire—and be inspired by—children discovering the ecosystem of their own homes and schoolyards.

Thank you for supporting our educational endeavors!

With Gratitude,

Cary Education

References

Hogan, Kathleen. *Eco-Inquiry: A Guide to Ecological Learning Experiences for the Upper Elementary/Middle Grades*. Kendall/Hunt Publishing Company, PO Box 1840, 4050 Westmark Drive, Dubuque, IA 52004-1840., 1994.

Cary Education Teaching Materials: <https://www.caryinstitute.org/eco-inquiry/teaching-materials>

About the Authors

The Cary EcoQuest (2020) curriculum and accompanying online materials were created by Ashley Alred and Amelia Goldstein, with priceless guidance from Dr. Alan Berkowitz, *Cary Head of Education*, and Shelly Forster, *Cary Educator*.

Ashley Alred, Cary Education Program Leader

Before joining Cary, Ashley served as a k-12 environmental educator at the Urban Ecology Center in Milwaukee, Wisconsin. She received her MS in Science Literacy Research at the University of Nebraska-Lincoln ('16) and her BS in Fisheries & Wildlife Biology from the University of Georgia ('12). Over the years, her academic research interests have ranged from captive chimpanzee behavior to understanding how undergraduates make decisions about conservation issues. She has been an environmental educator in five different states across the country.

As Education Program Leader, Ashley is excited to devote her skills in education, ecology, and research to teaching youth using inquiry-based and data-driven methods during local school field trips and summer camp, while also contributing to innovative ecology education research. Her career focus is to inspire youth to think critically and creatively about ecology and cultivate meaningful, fun connections to their local environment.

Amelia Goldstein, Cary Summer Camp Instructor

Amelia's path to becoming an ecology teacher began in college where she studied the *Sociology of Science*--that is, how scientists act, what rules they follow, who gets to be a scientist and how. She became passionate about making sure that everyone who *wanted* to do science *could* do science. She realized that the best way to make science accessible to everybody was to teach it! When in graduate school for *Biology Education*, Amelia discovered the incredible world of ecology, and she loved that there was room for everybody in it. There was no turning back!

Last year in summer 2019, Amelia became a summer camp instructor for the Cary Institute of Ecosystem Studies where kids spend every day outside exploring ecology. We were lucky enough to have Amelia back for a second summer as an instructor for EcoQuest. During the school year, Amelia is a high school science teacher. This fall, Amelia will be teaching a trifecta of Biology, Ecology, and Environmental Science to high school students at Oakwood Friends School in Poughkeepsie, New York.