

## Outdoor Activities

# Food Web Scavenger Hunt

## *Ridgefield National Wildlife Refuge Complex*

**Grades:** 2-5

### Summary

Students go on a scavenger hunt outside to find various organism cards, then use them to create a “food web.”

### Primary Outcome

- Identify the role of different organisms in an ecosystem

### Secondary Outcomes

- Recognize key species living on-site
- Analyze the ways in which organisms are connected beyond food, including humans
- Evaluate human roles in protecting food webs and ecosystems

### Supplies

- Site-specific organism data cards
- Site-specific food web board
- Rubber bands for food web board
- Food web board answer sheet
- Site-specific data collection sheets

### Set-Up

- Hide each organism data card within a set boundary
- Print data collection sheets for each pair of students

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### State Standards

#### NGSS

2 – LS4-1

5 – PS3-1; LS2-1

MS – LS1-6; LS2-1; LS2-3

HS – LS2-2; LS2-4; LS2-6

### Procedure

#### *Discussion*

1. Ask students what they know about food webs, ecosystems, and different roles organisms can play in an ecosystem.
2. Introduce the food web board.

#### *Scavenger Hunt*

3. Have students pair up and begin searching for the different data cards. As they find each data card, they will write down what that organism eats and is eaten by in their booklet
4. Allow time for all the groups to find the data cards and put together all their information!

#### *Assemble the Food Webs and Reflect*

5. Come back together as a group and allow students to come up and put rubber bands on the board using their data booklets.
6. Talk about patterns they noticed and what the board suggests!
7. **NOTE:** Let conversations flow naturally along with the interests and wonderings of the students. The conversations you have and interests they express will help you determine the direction to take the activity and which activity to conclude with.
8. Choose one (or more) of the following to complete the activity with:
  - a. If the students are interested in the specific animals on the board:
    - i. *Secondary Goal #1:* Talk about each animal more specifically, such as where it may live or other connections it might have not on the food web board.
  - b. If the students bring up that humans are not on the food web board:
    - i. *Secondary Goal #2:* Turn the discussion. What if we thought about more than just food? What do we give some of these organisms? What do some of them give us, even when we don't eat them? What do they give each other besides food?
  - c. If the students are worried about food web falling apart:
    - i. *Secondary Goal #3:* Start a discussion with the students about what humans can do to help these food webs. How is understanding the connectedness of an ecosystem an act of reciprocity towards these animals?



# Guided Art Project

## Ridgefield National Wildlife Refuge Complex

**Grades:** 1-12

### Summary

Students use the idea of fantasy and fiction to discover how nature plays a role as inspiration for artists, then watercolor their own fantasy worlds based on the nature of the Refuge.

### Primary Outcome

- Use nature as a source of inspiration for art

### Secondary Outcomes

- Observe natural elements and attempt to depict them accurately
- Utilize the imagination to picture nature in other worlds

### Supplies

- Watercolor template sheets
- Watercolor paints
- Jug of water
- Paintbrushes
- Aprons
- Mini clipboards
- Pencils
- Clothespins and yarn/cord to hand up pictures to dry
- Example painting

### Set-Up

- Fill water cups
- Check watercolor paints
- Hang up yarn/cord to hang pictures on

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### State Standards

NGSS

4 – LS1-2

### Procedure

#### *Discussion and Instructions*

1. Ask students to picture their favorite made-up world (Harry Potter, Fortnite, Wings of Fire, etc). Take a few answers on their favorite place in that world. Begin a conversation about how art interprets what we see.
  - a. Nature is a popular source of inspiration for artists, both for ones that want to replicate it and for people who put through their own creative lens. Use examples that they might know in which artists depict nature in fantasy, alien, or other ways but it is still ‘nature.’
  - b. You can share that for many people when trying to be creative, having a start point is super helpful! In this case, you do not need to come up with the scene itself, only its details.
2. Walk them through the two pictures they will need to make. They are the same scene, each taking inspiration from what’s around the students right now. The top one they want to be realistic and the bottom a fantasy version of the same scene.
  - a. Ask them questions about what might be included in each scene.
    - i. *Look around you! What colors would we use for a realistic wetland/forest? What animals might be included?*
    - ii. *What about for our fantasy world? How would it be different from the real world? What kind of cool creatures live there?*

#### *Sketching*

3. Start with a pencil to add more to the picture. It needs some life!
  - a. *What else could be in the picture to make it feel more realistic? More magical? Etc.*
  - b. Have them draw a few ideas in for each one.
  - c. Help them by throwing out ideas or brainstorming as a group! An animal they hope to see today, a plant they wish existed, etc...
  - d. You could even walk through drawing some of the simple ideas they come up with. How do we draw more grass or bigger plants?

#### *Painting*

4. After some sketching time, ease them into paints! Show an example of *how* to use watercolors. Explain carefully the process they will use to get their paints.
5. Once they have their paints, start with the realistic painting. Once most people are done and they’ve shown at least one person, have students move onto the fantasy painting. They can share what story would take place in their world.
6. If they finish early, they can draw or paint anything they want on the back or another piece of paper! Then, hang up their picture.

#### *Sharing*

7. At the end, if there is still time, you can have them share their pictures or what they decided to include. Discuss the differences between everyone’s pictures, highlighting how many ways a single scene can be interpreted.



# Nature Journaling

## Ridgefield National Wildlife Refuge Complex

**Grades:** 3-12

### Summary

Students use a scaffolded journal to practice observation through detailed sketching and notes.

### Primary Outcome

- Observe, track, sketch, and record details found in nature

### Secondary Outcomes

- Compare and contrast between two things of a similar type
- Develop artistic skills to represent organisms accurately
- Build a comprehensive image, with text and number, of an organism

### Supplies

- Nature journal booklets
- Pencils
- Collection of nature plant leaves (at least one per student)

### Set-Up

- Print out and staple enough nature journal booklets – one per student
- Sharpen pencils

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### State Standards

NGSS

3 – LS3-4

MS – LS1-5

### Procedure

#### Discussion and Instructions

1. Begin with a quick conversation about the journal, reminding students to approach it with an open mind. It is not about artistic skill or factual accuracy. It is about asking questions and diving in with curiosity!
  - a. *Has anyone journaled before? Why do people typically journal?*
  - b. *What are ways each of our senses can be engaged in our nature surroundings? How could we record our senses in a journal?*

#### Practice

2. Begin walking students through the drawing an oak leaf practice page. Break down the oak leaf into smaller shapes, then use the shapes to create the bigger picture. The goal here is to break down the process of drawing a bit for students before they are tasked with drawing something they see.
3. Next, begin walking students through the drawing a bird practice page. Break it down into shapes again. *What different shapes do we see that make-up the bird?*

#### Guided Activities (as you have time)

4. Begin with the **Comparison** activity.
  - a. Give them a boundary where they can search for two different things of the same type to compare (two leaves, two sticks, etc.). They can look for things already on the ground or they can try to sketch and observe plants/fungi that are still living (without moving it). Their goal is to draw both things with enough accuracy to them look different from each other on the page.
5. Next lead into the **To Each Its Own** activity.
  - b. Bring out the collection of native plant leaves and lay them out in a few piles on the ground. Have students form smaller groups and get in a circle around each pile of leaves. Students will draw one of the leaves in their journal with extreme detail. They can trace the leaf itself, add words, numbers, whatever they want. After all students finish their sketch, they will return their leaves to the center at random. Next, everyone will stand up and leave their journal on the ground. They will rotate around the circle, so they are now at a new person's journal. They now need to figure out which leaf that person sketched! This can be repeated until they do each journal in the circle or are ready for a new activity.
6. Finish off with the **My Secret Plant** activity.
  - c. Have the students pair up and then set a boundary where they can go out to search for a plant. Tell them to make sure they go to a completely different area than their partner. They will search for a plant and then try to depict it using pictures, feelings, numbers, or anything to give the most accurate portrayal of their plant. They want to make it as good as possible so their partner will be able to guess what plant they sketched! Then, they will come back together with their partner, trade booklets, and try to find their partner's plant! Repeat, making it simpler or more challenging.

#### Conclusion

7. Ask students to share with a partner their favorite and least favorite part of the journal. Ask students to share out what part of the journal they'll do at home.



# Nature Walk

## Ridgefield National Wildlife Refuge Complex

**Grades:** K-12

### Summary

Students follow their curiosity to explore a nature trail, using their senses and asking questions to observe the world from afar and in close detail.

### Primary Outcome

- Observe nature along the trail, allowing curiosity to guide exploration

### Secondary Outcomes

- Use all senses to experience the world
- Move in nature in a safe and respectful way

### Supplies

- Binoculars
- Magnifying glasses
- Identification guides (plants, birds, etc)

### Set-Up

- Carry bag of supplies with you or set them along the trail

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### State Standards

#### NGSS

K – ESS3-1; LS1-1

3 – LS4-3

4 – LS1-1; LS1-2

5 – ESS2-1

MS – LS1-5

HS – LS2-1; LS2-2; LS2-4

### Procedure

#### Discussion

1. **Ask students what it means to be curious.** How are they curious? Write down answers. *For young groups, you can just discuss them.* Explain that they are about to embark on a walk where they get to be curious. It will be guided by them and what they see, smell, or hear along the trail.
2. **Come up with a group word** that they can say while they walk that lets you know they want to stop to observe something. For example, “Oreo!”
3. **Ask students what it means to observe.** Write down answers. *For young groups, you can just discuss them.* Discuss how they can be the best observers (staying silent, wandering eyes, looking at details, wondering “why?”). Give them the framework of describing something with “I notice...” “I wonder...” or “This reminds me of...”
4. **Ask students what it means to be respectful in nature.** Write down answers. *For young groups, you can just discuss them.* Discuss with students that on their walk, they must be respectful, or they will not be allowed to continue on the trail. Being a Refuge means we have a special responsibility that is different from other natural areas. We are here to give animals a safe space. That’s what “refuge” means! Therefore, we need to be respectful of their home. Keep our hands gentle, keep our voices soft, and keep our bodies calm.

#### Walk

5. **Take students along the trail.** Be tuned in to what the students find interesting and allow the group to stop and explore at those moments. Give students tools along the way (binos, magnifying glasses, ID guides) that allow them to better observe things. Some guiding questions you can ask students:
  - a. “What do you notice about \_\_\_?”
  - b. “How did you find this?”
  - c. “What do you think its role is? What does it do?”
  - d. “What does this remind you of?”
  - e. “What else do you notice that gives us clues as to why it’s here?”
  - f. “I notice \_\_\_\_\_. What do you notice?”

#### Sharing

8. When you are back from the walk, **allow students a chance to share** what they found!



# Pollinator Preference

## *Ridgefield National Wildlife Refuge Complex*

**Grades:** 2-5

### **Summary**

Students use data cards to

### **Primary Outcome**

- Explore the preferential relationships between pollinators and plants

### **Secondary Outcomes**

- Become more familiar with pollinators & debunk myths about pollinators and bees
- Investigate how evolutionary relationships are formed and how that impacts the way organisms develop

### **Supplies**

- Blacklight flashlights
- Flowers to hide
- Pollinator Preference booklets (1 for each student or 1 per group)
- Pencils
- Essential Oil Scents

### **Set-Up**

- Print off enough booklets needed
- Refresh scents on flowers using essential oils
- Hide flowers around activity area (hide farther and harder to extend activity)

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### **State Standards**

#### **NGSS**

2 – LS2-2

4 – LS1-1; LS1-2

### **Procedure**

#### *Discussion*

1. Open a conversation about pollinators. What do students already know about bees and other pollinators?
2. Talk about how pollinators develop relationships with plants over time and vice versa!
  - a. What might cause a pollinator to prefer or be drawn to a certain flower or plant? Dig into which senses they might depend on.
  - b. How would a plant evolve to target certain pollinators and exclude others?

#### *Instructions*

3. Tell students the expectations for the activity. Explain that they will receive a book filled with pollinators and it is their job to figure which hidden flower is each of their favorite. They will need to look at color, shape, and smell! The flowers are hidden around the activity area.
  - a. Remind them to leave the flowers where they are when they find them.

#### *Pollinator Hunt*

4. Put the students in groups or let them work alone based on the group and your preference.
5. Give them time to explore and find all the matches!

#### *Make Your Own Flower*

6. When students finish, they can start the next part of the activity. They will receive a small sheet to draw their own flower!
  - a. Imagine they are a pollinator. What smell would draw them in? What is their favorite color? What shape would it be? (It could be the shape of their favorite food). Draw their ‘flower’ and color it.

#### *Reflection*

7. When everyone is finished, reflect on the activity, and talk about what might happen if either the pollinator or flower is no longer around.
  - a. Are there any plants that we are the pollinators to? (Talk about vegetables, flowers we plant, etc.)



# Animal Adaptations

## *Ridgefield National Wildlife Refuge Complex (Ridgefield only)*

**Grades:** 1-8

### Summary

Students investigate animal specimens to discover the idea of animal adaptations. Students sort specimens by adaptations and discuss how adaptations determine behavior and survival.

### Primary Outcome

- Discover how animals use adaptations to survive

### Secondary Outcomes

- Use different senses to observe the different parts of an animal
- Connect animal adaptations to human adaptations

### Supplies

- 15 animal specimens of a variety
- Paper and colored pencils
- Whiteboard & whiteboard markers

### Set-Up

- All materials will be set up for teachers

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### State Standards

#### NGSS

K – ESS3-1

1 – LS1-1

3 – LS2-1; LS3-2; LS4-3

4 – LS1-1

MS – LS4-4

HS – LS4 (general)

### Procedure

#### Introduction

1. Write the word “adaptations” on the board. Ask students to talk to someone next to them about what animal ability they would want to have if they could. Come back as a group and take a few responses. Tie the idea of these abilities to *adaptations*. Give the example of human skin being waterproof. What advantage does that give us?
2. Put students into groups of 2 or 3 (at most 15 groups). Then, ask for six brave volunteers. Don’t take more than one from a group. Line them up in front of the class and ask them to put their hands behind their backs. Then, so they can’t see but the rest of the class cannot, place an animal specimen into each volunteer’s hand. Allow them time to feel the specimen, then tell them they can look at it.

#### Study

3. Once the students settle down, let them know that the Refuge did not kill these animals to get these specimens. They were found dead and then preserved so that the students can look at them up close. Because this is taxidermy, it is very important that they wash their hands after handling the specimens.
4. Let them know that each group is going to receive an animal specimen. Their job is to study this specimen and make observations. Make sure each group has an animal specimen. Give them time to explore the specimens.
5. Come back as a group and share out a few of their observations. Point out the word “adaptations” on the board. Ask if anyone noticed any adaptations in their animal specimen?
6. Now, groups will go around the room and find other groups that have an animal specimen with a similar adaptation as theirs. There might be three or four groups clumped together with the same adaptation.
  - a. Examples of these adaptations might be *camouflage, sharp canine teeth, long noses, big eye holes, waterproof skin/fur/hair, etc.*
7. Once groups are clumped up, ask students to share out what connecting adaptation they found. Write them on the board. Ask students if humans share any of these adaptations?
8. Use any extra time to focus the students’ thinking on a particular aspect of adaptations of your choice. *Group adaptations, benefits of biodiversity, co-evolution, biomimicry, human affects, etc*

#### Discussion

9. Collect the animal specimens from the students and have them wash their hands and sit down. Have them discuss with each other: “How does each adaptation help an animal survive?” As students speak out, groupings might become apparent – *warmth, eating, reproduction, hiding, hunting, etc.* Mark these groupings on the board (circle, color code, etc). Extension: find human adaptations in each of these categories.

#### End Activity

10. If there is extra time at the end, have students choose an adaptation on the board and draw an animal actively using that adaptation. Make sure to stress the importance of drawing *where* that animal is – their environment.
11. Have them take their drawings home and wipe down tables.



# Aquatic Adventures

## *Ridgefield National Wildlife Refuge Complex (Ridgefield only)*

**Grades:** 3-12

### **Summary**

Students study macroinvertebrates collected at the Refuge to determine the quality of our water and reflect on how fieldwork is done.

### **Primary Outcome**

- Use keys and pollution tolerance charts to correctly identify animals and the clues they give us about water quality

### **Secondary Outcomes**

- Discover how studying macros can give us clues to water quality
- Reflect on why water quality is important in an ecosystem

### **Supplies**

- Collected macroinvertebrates split between four or five buckets
- Small containers to hold macroinvertebrates
- Fish nets to move macros
- Dichotomous keys
- Pollution tolerance charts
- Magnifying glasses
- Whiteboard & markers

### **Set-Up**

- All materials will be set up for teachers in the classroom

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### **State Standards**

#### **NGSS**

3 – LS4-3

4 – ESS3-2

MS – LS2-4; LS2-5; ESS3-3

HS – LS2-2; LS2-3; LS2-6; LS2-7; ESS3-4

### **Procedure**

#### *Discussion*

1. Write down the word “macroinvertebrate” on the whiteboard. Ask if anyone has seen this word. Break down the word into its parts – “macro” (we can see with our eyes), “in” (without), “vertebrate” (has a spine). A bug we can see with our eyes that has no spine.
2. Underneath that word, write “water quality.” Ask someone to define “water quality.” Ask students to discuss with each other how macroinvertebrates and water quality might be related. Take answers, but don’t reveal yet.

#### *Study & Identification*

1. Have students gather around the tubs of macroinvertebrates in groups of up to 5. Give them time to explore the macros with their eyes. Ask for observations.
2. Hand out fish nets, hand lenses, small cups, and dichotomous keys. Instruct students on how to use dichotomous keys and tools to identify the macros. Remind students that if they begin to be unkind or disrespectful to the macros, they will not be allowed to participate.
3. After students have time to identify their macros, write a chart on the board of the most common types of macros found on the Refuge. Ask each group to come tally how many of each macro their group found. If it's not on the board, they can add it.

#### *Discussion & Conclusion*

1. Hand out the water quality keys. Ask if anyone has a better idea of how macroinvertebrates can help us determine water quality. Explain that certain macros are very intolerant to pollution, so if we find them in the water, that means there isn’t a concerning amount of pollution!
2. Have students interpret the data they’ve collected with their key. If there are any macros present from the “very intolerant” section, that is a good indicator that our water quality is healthy.
3. Ask students if this is a one-and-done study. Does any more research need to be done? Yes! We can’t just do one study and call it good. We would need to do many studies across multiple sites and multiple days for this to be accurate, but it’s a good start.
4. Ask students what kinds of factors might affect the quality of our water in our community? What kinds of things can help the quality of our water? Why is water quality important? What can we do to help it?
5. Have the students place the macros back into the buckets and tidy up the space. Wipe up any water on the tables.

