
What Do Scientists Do?

Kindergarten
Ocean Literacy
Unit

2010 Pilot



Table of Contents

Curriculum Summary 3-4

Activities

Pictorial Input Chart 5-6

Process Grid 7-10

5 Senses Go on Safari 11-12

Schoolyard Scavenger Hunt 13-14

How Big is It? 15-16

Bugamatic 3000 17

Who Lives in a Tree? 18-20

Wildlife Water Safari 21-24

Ant Parade 25-26

Crafts

Leaves- A Medley of Crafts 27-31

Seed Mosaic 32-33

Bird's Midwinter Tree 34-35

Songs

Cleaner Water is for Me 36

Gray Squirrel 36

Five Little Squirrels 36

The Bird Song 37

Thirsty Animals 37

Additional Resources

Suggested Book List 38-39

Curriculum Summary

Theme: The schoolyard is full of plants, animals, insects, and puddles to explore. This unit encourages students to explore this natural environment using the science process skills.

Goal:

Students will be able to use science process skills to explore the schoolyard habitat.

Objectives:

1. Students will be able to make observations.
2. Students will be able to compare and contrast.
3. Students will be able to collect data.
4. Students will be able to ask questions.
5. Students will distinguish between living and non-living things.

Oregon Content Standards:

SCIENCE

- K.1. **Structure and Function:** The natural world includes living and non-living things.
 - K.1P .1 Compare and contrast characteristics of living and non-living things.
 - K.1L.1 Compare and contrast characteristics of plants and animals.
- K.2 **Interaction and Change:** Living and non-living things move.
 - K.2E.1 Identify changes in things seen in the sky.
- K.3 **Scientific Inquiry:** Science explores the natural world through observation.
 - K.3S.1 Explore questions about living and non-living things and events in the natural world.
 - K.3S.2 Make observations about the natural world.

Ocean Literacy Principals

7. THE OCEAN IS LARGELY UNEXPLORED.

- 7.a. The ocean is the last and largest unexplored place on Earth—less than 5% of it has been explored. This is the great frontier for the next generation’s explorers and researchers, where they will find great opportunities for inquiry and investigation.

Unit Lessons:

This unit is designed to include interdisciplinary instruction to achieve student objectives. Each lesson independently supports specific learning objectives but when taught as a comprehensive unit will achieve the larger learning objectives.

Activity	Overview	Vocabulary	Subject(s)
What Do Scientists Do? Big Book	The big book introduces students to the activities of a scientist	Scientist, question, data, observation	Vocabulary, science, reading
Pictorial Input Chart	Assess students prior knowledge about how they view science and the 5 senses	scientist, tool, senses	Science process skills
Process Grid	Students will begin to explore the skills and practice of a scientist	Question, observations, data, conclusions, tools	Science process skills, vocabulary
Five Senses Go on Safari	Students will explore the school yard and concentrate on using their senses to make observations	Observations, see, smell, hear, touch	Life science, science process skills, writing, crafts, play
Schoolyard Scavenger Hunt	Students will use their senses to observe things in the schoolyard that meet their scavenger hunt criteria	Observations, living, non-living	life science, vocabulary, science process skills
Bugamatic 3000	This activity encourages the students to use their imagination and observe the world from an insects perspective	Observation, see, smell, hear, touch	Science, writing
Who lives in a tree?	Students will make observations and collect data regarding the species that live in different parts of a tree	Observations, data	Life science, science process skills, math and writing
Wildlife Water Safari	Students will explore animal and plants need for water and identify water sources in the school yard		life science, science process skills, writing, drawing
Ant Parade	Students will perform an inquiry with schoolyard ants and diet	Questions, observations, data	Inquiry, life science

Pictorial Input Chart

Lesson at a glance:

In this lesson, students will focus on the five senses and tools scientists use to study the natural world.

Goal:

Students will be able to use their senses to observe the natural world.

Oregon Content Standards:

SCIENCE

- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.2 Make observations about the natural world.

Materials:

- Large piece of butcher paper
- Markers in different colors
- Image of the scientists
- Overhead projector
- Clipboards, paper and pencils (optional)

Time: 30 minutes inside, 20 minutes outside

Activity:

Preparation:

1. Use an overhead projector to project the image onto your large piece of butcher paper.
2. Copy the scientists onto the butcher paper in pencil.

Activity:

1. Gather students in close and draw the parts of the picture in markers as you talk. Use different colored markers to highlight different parts of the scientists.
2. There is a male and a female scientist. Choose either one to start with. You will be repeating this activity later and you can draw the other gender at that time.
3. Start with the outline of the head. Ask students: What do scientists do with their heads? Write their responses next to the head. Make sure to include *asking questions*.
4. Add the ears. Ask students: What do scientists do with their ears? Write their responses.
5. Add the eyes. Ask students: What do scientists do with their eyes? Write their responses.
6. Add the nose. Ask students: What do scientists do with their nose? Write their responses.

7. Add the mouth. Ask students: What do scientists do with their mouths? Write their responses. Make sure students know that most scientists do NOT taste things. It's generally not safe. They use their mouths for talking—sharing what they learned with other people.
8. Draw the torso and hands. Ask students: What do scientists do with their hands? Write their responses. Make sure to include *feeling the texture of things*.
9. Draw the legs and feet. Ask students: What do scientists do with their feet? Make sure to include *they go outside and find things out for themselves*.
10. Draw the beaker. Tell students that scientists use tools. Ask students if they can think of any other tools that would help scientists use their senses. (Eye glasses, binoculars, cameras, etc) Different kinds of scientists use different kinds of tools.

Later:

1. As you study places in the schoolyard, return to this image or create a new one and discuss how the senses were used differently to make observations about different things.

Summary:

Review with students that scientists observe with all their senses, except taste.

Extensions:

1. Add questions. Ask students what kind of questions scientists might ask. Write down their responses and choose questions that are answerable. As you go outside and study your schoolyard habitat, see if your class can answer any of the questions.
2. Add compare and contrast.

Image of Scientists:



Process Grid

Lesson at a glance:

In this lesson, students will focus on how different types of scientists apply similar skills. All scientists ask questions, observe using all their senses, collect data, and share their results.

Goal:

Students will be able to explain how different scientists use the same methods: ask questions, observe using all their senses, compare and contrast, collect data, and share their results.

Oregon Content Standards:

SCIENCE

- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.1 Explore questions about living and non-living things and events in the natural world.
 - K.3S.2 Make observations about the natural world.

Materials:

- Large sheet of butcher paper
- Markers

Time: 20 minutes

Activity:

Preparation:

Copy the first two lines of the blank process grid on a large sheet of butcher paper

Activity:

1. Before each section of this unit (plants, wildlife, bird, and insects) have students brainstorm how scientists would use their science skills to explore that topic: what kinds of questions, how would they use their senses to make observations, etc.
2. After students have gone out and studied plants during one of the plant lessons have students add to the process grid.
 - a. Ask students what kinds of questions they have about the plants on the schoolyard. Write them down in the Ask Questions column. (*Look at the filled out process grid to get ideas of what you might write, but try to get students to think of things.*)
 - b. Ask students what kinds of things they saw as they looked at plants. Write them down in the See column.
 - c. Ask students what kinds of sounds they heard as they looked at plants. Write them down under the Listen column.
 - d. Ask students what kinds of things they smelled as they looked at plants. Write them down under the Smell column.

- e. Ask students what kinds of textures felt on the plants they looked at. Write them down under the Touch column.
 - f. Tell students that collecting data means counting, measuring, and drawing. Ask students what kinds of things on the plants they were looking at that a scientist might want to count, measure or draw. Write those down.
 - g. Finally, tell students that all scientists share what they found out so that others can answer their questions, too. Ask students how a scientist might share what they found out. Write that down.
3. The next time students go out to study plants, have them review this information and add to it.
 4. Return to the process grid and add to the sections for the different topics the students explore.

Summary:

1. Review that all scientists ask questions about the world around them.
2. Review that all scientist answer those questions using science skills.

Extensions:

Have students pick one question (as a class or individually) that they might want to try to answer the next time they go out to study the schoolyard.

What Do Scientists Do?

	?	Observe:				Collect Data	Share
		See	Listen	Smell	Touch		
	Ask Questions						
All Scientists 							

Scientists:	Ask Questions	Observe:				Collect Data	Share
		See	Listen	Smell	Touch		
All Scientists	Why do clouds float in the sky?	Stars at night	Animal sounds	Flowers, Scat, Decaying kelp on the beach	Rough bark Sticky spiderwebs Cold fog	Draw the moon's shape as it changes	They tell people what they discovered
	How tall do pine trees grow?	Colors and shapes or leaves and flowers	Chirps of insects living on plants	Flowers and leaves and sap	Sticky sap Rough bark Smooth leaves	Count seeds Measure the height of trees	They tell people what they discovered
	Who is making that chirping noise I hear?	Color of fur, scales, and feathers Shape of tails and teeth	Barks, Howls, Meows, Chirps, Squeeks Squawks	Skunk spray, Scat, Milk	Soft fur Stiff feathers Slick shells Sticky skin	Count the number of baby squirrels Measure how much bears weigh	They tell people what they discovered
	Where do birds build their nests?	Color and shape of feathers and beaks	Bird songs	Bird droppings, Nests	Soft, fluffy feathers Long, stiff feathers	Count the number of eggs Measure the length of wings	They tell people what they discovered
	How long do butterflies stay in their cocoons?	Color and shape of different insects	Hums Chirps	Sprays, honey	Scaly wings, Slick bodies Fuzzy legs	Measure grasshopper wings Count the spots on ladybugs	They tell people what they discovered
	How many ants live in one colony?	Colors and shapes of ants, Shape of anthills	Squeeks, Buzzes	The signals ants give each other	Hard body Soft eggs Sticky food	Count how many tunnels are in a colony	They tell people what they discovered

The Five Senses Go on Safari

Lesson at a glance:

Scientists use all their senses to observe and collect data. Students will learn how to use their five senses to work like scientists.

Goal:

Students will be able to use their four out of five senses (not taste) to make observations about the schoolyard habitat.

Oregon Content Standards:

SCIENCE

- **K.3 Scientific Inquiry:** Science explores the natural world through observation.
 - K.3S.2 Make observations about the natural world.

OTHER CONTENT AREAS

Writing

Materials:

- Safari hats (optional)
- Clipboard and pencils
- Observation Sheets (page 71 of Project Wild)

Time: 30 minutes

Activity:

Preteach:

1. *What Do Scientists Do?* Big Book
2. Five Senses
3. Scientists observe the natural world with all their senses

Activity:

1. Go outside and have students sit in a circle facing you. Ask students what their five senses are, and have them point to their eyes, their nose, their mouth, the ears, and their hands.
2. Remind students that scientists use all their senses when observing, except their mouth. There are things that are dangerous to eat, so scientists don't taste things.
3. Have students close their eyes and turn around to face the other direction. Let them listen quietly for a minute, with their eyes closed. When a minute is up, discuss what they heard. Discuss what was natural and what was un-natural in what they heard.
4. Again, have them close their eyes and turn around to face the other direction. Let them smell quietly for a minute. When a minute is up, discuss what they smelled. Discuss what they might have smelled if they were closer to things. Discuss what was natural and what was un-natural in what they smelled.

5. Finally, have students face outside the circle, have them close their eyes and open them. Have students share the first thing they saw and categorize it as natural or man-made.
6. Continue with the Matching Cards Scavenger Hunt.

Extensions:

1. Take a Sound Walk outside. Every once in a while, stop the group and have children close their eyes. Ask them to raise a finger every time they hear a new sound. How many new sounds did they hear? Can they hear better with their eyes closed? Which sounds were natural and which un-natural? Now do a Smell Walk or a Touch Walk.
2. Do this activity again, this time *inside* the school. Compare which animals live inside and which live outside. Make a Venn Diagram.
3. Have your class write a *Wildlife Is Everywhere!* book. Have each student draw a picture of an animal they saw and write where they saw it and what it was doing. Bind it together into a book.

Craft Project:

Homemade binoculars. With two toilet paper tubes, masking tape, yarn, and a hole punch, students can build their own pair of binoculars. Afterward making these, go outside and use them to look for wildlife!

Imaginative Play:

Create a jeep out of a large box with paper plate steering wheel construction paper tires, and so on. Have students make homemade binoculars, canteens or water bottles, toy cameras, compasses, pencils, and vests with lots of pockets. Invite children to go on a pretend journey into the wood to find wild animals.

Schoolyard Scavenger Hunt

Lesson at a glance:

In this lesson, students hone their observation skills by exploring the schoolyard looking for things that match the criteria the teacher has set.

Goal:

Students will be able to compare things found in the schoolyard to a set of criteria.

Oregon Content Standards:

SCIENCE

- K.1 Structure and Function: The natural world includes living and non-living things.
- K.3 Scientific Inquiry: Science explores the natural world through observation.

Materials:

- Paper bags, one for each team of two students
- Matching Squares Cards, printed on cardstock, one for each team of two students. In the one blank square, attach something with a texture, such as a piece of emery board, sand paper, or a satiny piece of cloth.

Time: 30 minutes

Activity:

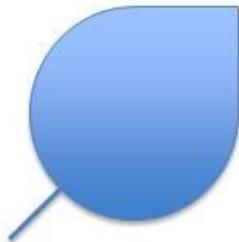
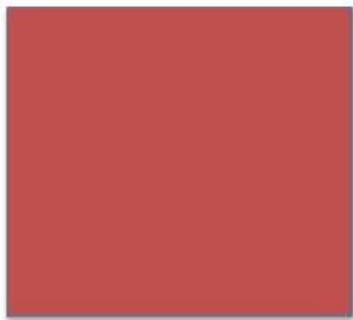
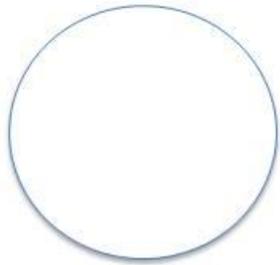
1. Separate students into teams of two students.
2. Give each team a paper bag and a Matching Squares Card.
3. Take students out to the schoolyard to look for six items that match their card: something round, something red, something leaf shaped, something textured, something living, and something non-living. Remind them not to bring in anything actually alive, or attached to something alive.
4. Go back inside and compare. “Everyone pull out the round thing you found. Look, Maria and Gabi found a bottle cap! Jonathan and Angel found a round rock!”

Summary:

1. Ask the students what senses and observations they made to find items that met the criteria on their scavenger hunt cards.
2. Begin to evaluate students understanding of living vs. non-living things.
3. Scientists do the same thing. They may be looking for a bird’s nest, a spider web, or an agate. They go out and hunt until they find what they need.

Extensions:

1. What things did they see that matched their card, but couldn’t fit in the bag? (Water, sky, bricks, playground equipment...) Make a list of them.
2. Make a display of each collection: all the round things students found, the red things, etc.
3. Use the items collected to do a larger collage of living vs. non-living things.



Living



Non-living



How Big Is It?

Measuring

Lesson at a glance:

In this lesson, students will measure the length of common animals found in Oregon. Some animals can be found in a schoolyard and some are the largest plants and animals found in Oregon.

Goal:

Students will be able to collect data and compare and contrast living things in the natural world by measuring.

Oregon Content Standards:

SCIENCE

- K.1P .1 Compare and contrast characteristics of living and non-living things.

Materials:

- ❑ Animal picture cards, printed on cardstock and cut apart
- ❑ Hole punch and string
- ❑ Clothespins
- ❑ Butcher paper
- ❑ 2 lengths of rope or twine, 50 foot long

Time: 45 minutes

Activity:

1. First choose a student to measure. It doesn't matter who.
2. Use that student "Sam" as your measurement unit. If Sam is 4 feet tall, 1.2 meters, then Sam is 120 ants long (an ant is 1cm).
3. Hang your rope along a long hallway or outside. Pin the ant picture to the rope at 1 cm from the beginning of the rope. Use the whole punch and hang the card from a string so that students can see exactly how big 1 cm is.
4. Find something on Sam's body that is 1 cm long (try the length of a fingernail.)
5. Have all students look at that part of their body to see how long (approximately) 1 cm is.
6. Pin a picture of Sam to the rope, too. (1.2 m from the beginning of the rope).
7. Measure each animal in how many it would take to make one Sam, or how many Sams it would take to make that animal. Find a body part that would be the equivalent. Pin the picture cards to the rope.

Summary:

1. Scientists collect data about the plants and animals they study. One of the things they find out is how big an animal is.
2. Discuss why it is important to know how big a plant or animal is if you are studying it.

Extensions:

1. Choose some of the plants and animals in your schoolyard and add them to the rope. Have students draw the pictures or print them off the internet.
2. Have students take rulers out to the schoolyard and choose a small plant to measure. Have them draw a picture of the plant, as accurately as possible, measure it, and then write the measurement on their picture.

Bugamatic 3000

Lesson at a glance:

Kindergarten is the age of imagination. This lesson harnesses students' ability to roll play to increase their observation skills.

Goal:

Students will be able to use explore the habitat of invertebrates in the schoolyard.

Oregon Content Standards:

SCIENCE

- K.3 **Scientific Inquiry:** Science explores the natural world through observation.
 - K.3S.1 Explore questions about living and non-living things and events in the natural world.
 - K.3S.2 Make observations about the natural world.

Materials:

- Large box
- Paint
- Rope and stakes, or equivalent

Time: 30 minutes

Activity:

Preparation:

1. Tape the flaps of a cardboard box open, both on the top and on the bottom, creating a tunnel.
2. Have students paint the box any way they like.
3. Paint in bold letters "Bugamatic 3000" on the box.
4. Use your rope and stakes to create a path for students to follow on the playground that does not lead them through anything hazardous to crawl through.

Activity:

1. Tell students that the Bugamatic 3000 automatically shrinks anyone who goes through it to bug sized. They are going to go through the Bugamatic 3000, shrink to bug size, and explore the schoolyard as a bug.
2. Have students crawl through the Bugamatic 3000 one at a time and follow the maze through the schoolyard.
3. Remind them that they need to use their bug senses to observe the bug world—what do they hear, see, smell, and feel in their new world? (Don't taste!)
4. Have the students draw and journal about their observations.

Summary:

1. Have students go back through the Bugamatic 3000 to return to their normal size.
2. Discuss with them what life is like for a bug. What did they see, feel, hear, or smell?

Who Lives in a Tree?

Lesson at a glance:

Students visit a tree and discover what animals live there.

Goal: Students ask and explore questions about trees and make observations about the animals that live there.

Oregon Content Standards:

SCIENCE

K.3 **Scientific Inquiry:** Science explores the natural world through observation.

- K.3S.1 Explore questions about living and non-living things and events in the natural world.
- K.3S.2 Make observations about the natural world.

OTHER CONTENT AREAS

Math—sorting, counting, least, and most

Materials:

- A good sized tree in the schoolyard
- Magnifying lenses (optional)
- *Tall Oak Tree* poem and flannel board (optional)
- *Camera (optional)*

Time: 30 minutes or more

Activity:

1. Read aloud *Tall Oak Tree* and use the felt tree and characters to illustrate the poem.
2. Ask students which animals live in the Tall Oak Tree.
3. Brainstorm with students what kind of animals might live in a tree in the schoolyard. Discuss the different layers of a tree (canopy, trunk, roots, under bark) and what animals might live in each location.
4. Practice being still and quiet so as not to scare off the animals.
5. Visit a large tree in the schoolyard and look for animals and evidence of animals—holes dug into the ground by the roots, nesting holes in the tree, nests, woodpecker holes, leaf galls, insects, spiderwebs, chewed leaves, and so on.
6. Use the rhyme “Look up, look down, look all around” to help students focus on different layers of the tree.
7. Keep a record of what students find on their tree by taking notes on paper or taking pictures with a camera.
8. Use butcher paper to create a bulletin board of your tree. Have students draw the animals and evidence of animals they found. Cut them out and attach them to the tree.
9. Visit the tree several times over the next weeks or months. Focus on a different sense with each visit, changing the rhyme to “Listen up, listen down, listen all

around” or “Touch up, touch down, touch all around.” Visit the tree during the different seasons, during dry times or after a rain, and see how the tree and its inhabitants change.

Summary:

1. Discuss: What animals live in our tree? How do we know?
2. Discuss: What was the biggest animal living in our tree? The smallest?

Extensions:

1. Go for a nature walk and collect different things that come from trees—leaves, needles, cones, bark, twigs, etc. Put them in a paper bag, but don’t take things that are attached to the tree because the tree needs them! Use magnifying glasses to look at things close up.
2. Math—students can sort their collections by size, color, shape, or other ways. Have them count the items in each group. Which group has the most? The least?

Tall Oak Tree

by Project Wild

All is dark and quiet
In Tall Oak Tree at night
See a spider spin her web
In the pale moonlit night

A moth flutters near
Drinking nectar in the dark.
He lands on Tree and disappears!
He looks just like the bark.

A bat swoops and zooms
Wow, what a stunt!
Flying bugs should be aware
Bat s on the hunt!

Tree frog breaks the silence
With his throaty call
High in Tree's top branches
Sticky feet won't let him fall

Moth flies up into the night
But gets caught in spider's web
She wraps him up carefully
With her silken spider thread

The sky is getting lighter now
The tree frog stops his song
Nighttime creatures coming home
Daytime won't be long

The morning sun is rising
And dove begins to sing
Coo...ooo...ooo...ooo
And stretches out her wings

She preens her feathers
Flaps her wings and leaves her cozy nest
She'll search for seeds all day long
Coming back to Tree to rest

Squirrel wakes up and looks around
Breakfast on his mind
He climbs among Tree's branches
Eating every nut he finds

Rat-a-tat-tat goes woodpecker
On a broken limb that died
She drills a hole to catch the bugs
From her they cannot hide

A snake is climbing up the tree
Looking for a nest
He likes to eat many things
Bt birds' eggs are the best!

Caterpillar crawls along
Munching every leaf in sight
When she hatches from her chrysalis
She'll be ready to take flight

Tall Oak Tree is a home
For animals big and small
The tree gives food to some
And provides shelter for them all

Wildlife Water Safari

Lesson at a glance:

Students discover water sources for the wildlife that lives in the schoolyard and create a field notebook.

Goal:

Students will be able to use science skills to explore the schoolyard habitat.

Oregon Content Standards:

SCIENCE

- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.1 Explore questions about living and non-living things and events in the natural world.
 - K.3S.2 Make observations about the natural world.

OTHER CONTENT AREAS

Writing

Materials:

- Wildlife Water Safari Field Notebook
- Clipboards and pencils
- Magnifying glasses and flashlights (optional)
- Handmade binoculars and paper safari hats (optional)
- Snack to eat in the field (optional)

Time: 30 minutes

Activity:

Preparation:

1. Discuss with students what animals they have seen in the schoolyard.
 - What do those animals need to live?
 - All living things, plants and animals both, need water to live.
 - How much water do insects need? (not much)
2. Where do the animals on the schoolyard find their water?
3. Have students come up with their own questions about water and how schoolyard wildlife get their water.

Activity:

1. Tell students that they will go on safari to look for wild animals and the places they might get water. Discuss what a safari is.
2. Give students their clipboard and Wildlife Water Safari Notebooks. Pack your “gear” and go outside to the schoolyard, neighborhood, or park.
3. Look for wildlife and clues that wildlife have been in the area (droppings, tracks, nests, feathers, holes, etc.)
4. When an animal has been spotted, have students draw it on their Wildlife Water Safari Field Notebook and write its name. Include in the drawing landscape elements that indicate where the animal was found (tree, building, bush, etc.)

5. Help students look for a water source that the animal might have used (under leaves, in puddles, in sidewalk cracks, etc.) Write the name of the water source next to the water symbol on the Wildlife Water Safari Field Notebook.

Summary:

1. Back in the classroom, provide students with crayons, markers, or colored pencils to further enhance their field notes.
2. Discuss as a group what wild animals live in the schoolyard. Were the animals big or small? Where do the animals get the water they need? Were these places big or small?

Extensions:

Map the schoolyard and the water sources. Draw a rough outline of your school with the major features, such as playground equipment. Have students put construction paper water droplets symbols ♠ that you have prepared on the map in the correct locations.

Craft Projects:

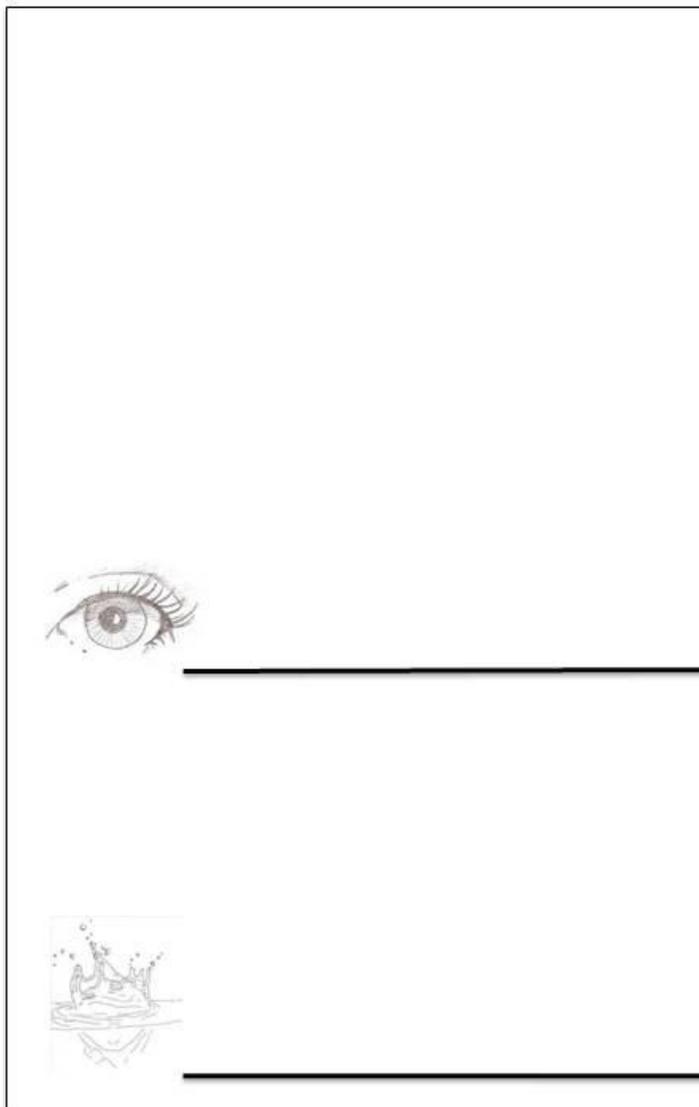
1. Safari Hats. Cut a circle about one inch smaller than the diameter of a paper bowl into a paper plate. Have students decorate the plate and bowl, tape the paper plate to the paper bowl, and punch holes into the plate for a yarn tie.
2. Homemade binoculars. With two toilet paper tubes, masking tape, yarn, and a hole punch, students can build their own pair of binoculars. Afterward making these, go outside and use them to spy birds!

Songs:

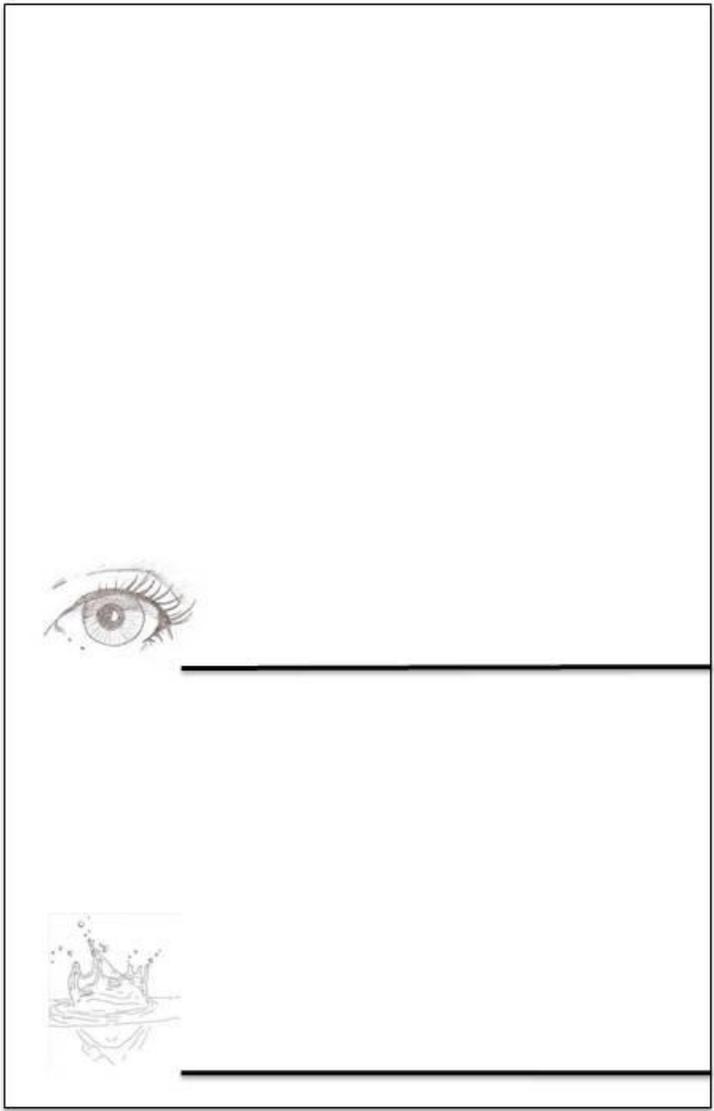
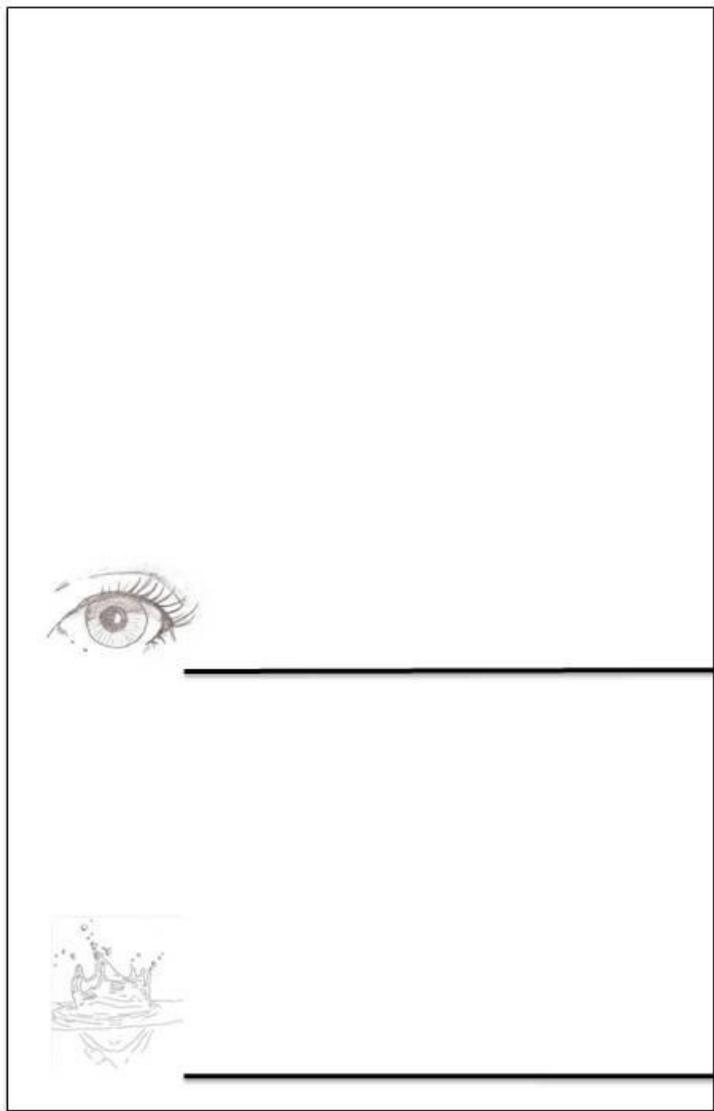
1. *Thirsty Animals*
2. *Cleaner Water is for Me*

Wildlife Water Safari Field Notebook

Name: _____



The form is a large rectangular box with a thin black border. On the left side, there is a detailed drawing of a human eye looking to the right. A horizontal line runs across the middle of the box. In the bottom left corner, there is a small illustration of a boat with several people on board, sailing on water. Another horizontal line runs across the bottom of the box, just above the bottom edge.



Ant Parade

Lesson at a glance:

Ants are one of the most common animals on the planet! Every schoolyard has them. Students will perform a simple experiment with the ants they find.

Goal:

Students will ask questions, observe, and collect data about ants in this simple experiment.

Oregon Content Standards:

SCIENCE

- K.3 **Scientific Inquiry:** Science explores the natural world through observation.
 - K.3S.1 Explore questions about living and non-living things and events in the natural world.
 - K.3S.2 Make observations about the natural world.

OTHER CONTENT AREAS

Math—bar graph

Materials:

- Magnifying glasses
- One paper plate, divided into four sections with a marker
- Ant food, such as ripe fruit, sugar, meat, cheese, grass, bread, etc.

Time: 30 minutes

Activity:

1. Begin by asking students if they've ever seen an ant before. How did they know it was an ant? What did it look like? What did it do? Where was it? Draw an ant based upon their descriptions and record any other information they provided.
2. Tell students that they will be *biologists* for the day, scientists who living things. Show them the food you have selected for ants. Tell them the scientist question is: 'which food they think the ants would be most likely to eat?'
3. Ask them what they expect to happen and why.
4. Take students outdoors for an "ant hunt." (Remind students that some ants and other bugs can bite or sting, so don't touch, swat at, or harass insects.) Look for an anthill or free roaming ants on the sidewalk, under rocks, along the bricks of your school building, etc.
5. When you have found your ants, place the plate of food nearby. Allow time for ants to locate the food. This is the test. As students wait, encourage them to observe the ants and their behavior. (You can also give them time for free play.)
6. Count the ants as they arrive at the different foods. Record the results by making a tally mark next to each food name on a sheet of paper. This is your data.
7. Graph the results. Draw a picture of each food at the bottom of a sheet of butcher paper. Have students take turns taping the Ant Graphing Unit above each food item. Each Ant Graphing Unit represents one ant.

Summary:

1. Discuss with students:
 - a. Based on the graph, which food do ants like the most? The least? (This is the conclusion. Sometimes tests don't give clear result. Real scientists repeat their experiments.)
 - b. What new questions could they ask about ants from today's experiment?
2. Look at the drawing you made during before they did the experiment. Is it accurate? Do you need to change anything? Why?

Extensions:

Observe ants closely. See how they touch their antennae—that's how they communicate. Their antennae are sensitive and can detect chemical signals. Ants leave a trail of chemical signals called pheromones which other ants follow with their strong sense of smell. This is how ants make it back to the anthill after a long day of looking for food.

Crafts:

Paint small rocks to look like insects.

Songs:

The Ants Go Marching One by One

Snacks:

Ants on a log: Spread cream cheese or peanut butter on a celery stick. Put a row of ant raisins on top.

Leaves- A Medley of Crafts

Lesson at a glance:

There are over 330,000 kinds of leafy plants in the world, and all of them are different. Students will learn about plants and leaves as they make crafts with them.

Goal:

Students will make observations about leaves and compare and contrast them.

Oregon Content Standards:

SCIENCE

- K.1L.1 Compare and contrast characteristics of plants and animals.
- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.2 Make observations about the natural world.

DRYING LEAVES

Materials:

- Leaves
- Newspaper
- Heavy book

Time: several days

Activity:

1. Have students help you collect the leaves you want to use.
2. Cut the leaves you want to dry on a sunny morning after the dew has dried for best results.
3. Leaves are sturdier than flowers and are more likely to stand up to little hands.
4. Press the leaves:
 - Lay the leaves on several layers of or newspaper without overlapping.
 - Cover them with more newspaper.
 - Stack a heavy book on top.
 - Leave for several days.

Summary:

1. Discuss how leaves are the same and different. Have students look at the leaves they are working with and see how they are the same and different.
2. Have students use their senses to observe their leaves: sight, smell, sound and texture.

GIFT TAGS, BOOK MARKS, AND NOTE CARDS

Materials:

- ❑ Construction paper
- ❑ Pressed leaves
- ❑ Paint brush
- ❑ White glue
- ❑ Clear self-sticking plastic with removable backing

Time: 30 minutes

Activity:

Preparation:

1. Cut the construction paper to the size you want for your project.
2. If you're making note cards or gift tags, fold the construction paper in half and decorate only the front.
3. After students have glued on their leaves, you'll want to do the clear self-sticking plastic yourself. Cut it to the correct size, start at one end, smooth down the plastic, press firmly in place, and trim.

Activity:

1. Have students lay your pressed leaves on the tag in the pattern they like. (Remind students to handle their leaves gently.)
2. Use a *little* white glue on the back of your leaves to glue them down. Glue one piece at a time, and don't worry about the stems or small parts.
3. Let dry.

Summary:

1. Discuss how leaves are the same and different. Have students look at the leaves they are working with and see how they are the same and different.
2. Have students use their senses to observe their leaves: sight, smell, sound and texture.

LEAF PRINTING

Materials:

- ❑ Paper with a circle drawn on it lightly in pencil
- ❑ Fresh leaves and/or flowers
- ❑ Paintbrushes
- ❑ Poster or tempera paints
- ❑ Tissues

Time: 30 minutes

Activity:

1. Have students brush paint on the back of a leaf and place it carefully on the drawn circle.
2. Cover the leaf with tissue and smooth it down flat. Lift the tissue and gently peel off the leaf.
3. Repeat the process until the circle has been covered in leaf prints.

Summary:

1. Discuss how leaves are the same and different. Have students look at the leaves they are working with and see how they are the same and different.
2. Have students use their senses to observe their leaves: sight, smell, sound and texture.

STAINED GLASS LEAVES

Materials:

- ❑ Waxed paper
- ❑ Pressed leaves
- ❑ Scissors
- ❑ An iron
- ❑ Old newspapers

Time: 20 minutes

Activity:

Preparation:

1. You'll have best luck doing this project as a station. Students will only take a few minutes to assemble their stained glass leaves, but you'll need an adult supervising the iron, and you'll only be able to iron one at a time.
2. Cut wax paper into squares slightly larger than you want the finished product.

Activity:

1. Lay one piece of newspaper on top of several sections of old newspaper.
2. Arrange leaves on top of several sections of old newspaper.
3. Put the second piece of waxed paper on top of the leaves.
4. Put a sheet of newspaper on top of the waxed paper to protect the iron.
5. With the iron set on low, gently press the waxed paper sandwich. You will see the pieces of paper joining together. Keep moving the iron in circles until the whole top piece of paper is fused to the leaves and the bottom piece.
6. Trim the edges to make them straight.
7. Hang your stained glass in a window.

Summary:

1. Discuss how leaves are the same and different. Have students look at the leaves they are working with and see how they are the same and different.

2. Have students use their senses to observe their leaves: sight, smell, sound and texture.

LEAF AND BARK RUBBINGS

Materials:

- ❑ Fresh leaves
- ❑ Trees
- ❑ Drawing paper
- ❑ Crayons

Time: 15 minutes

Activity:

Leaves:

1. Lay a piece of drawing paper on top of a leaf.
2. Use the flat side of a crayon to rub over the leaf.
3. Continue until the whole leaf has been imprinted.

Bark:

1. Tape a sheet of drawing paper onto the bark of a tree.
2. Use the flat side of a crayon to rub over the bark.
3. Continue until the whole paper is covered.

Summary:

1. Discuss how leaves and bark are the same and different. Have students look at the leaves and bark they are working with and see how they are the same and different.
2. Have students use their senses to observe their leaves and bark: sight, smell, sound and texture.

Extension:

Have students make a book of rubbings, two from each tree—bark and leaf.

EVERGREEN CONE MOBILE

Materials:

- ❑ A variety of cones
- ❑ An interesting branch, 1-2 feet long
- ❑ String, twine, or fishing line

Time: 30 minutes

Activity:

Note: Each student can make their own cone mobile, or you can make just one big one for the whole class, adding new pinecones as you discover them.

1. Collect a variety of pinecones with your students, enough so that each student has at 3-5, or just a variety if you are making just one.
2. Collect enough interesting branches, strong enough to support a mobile, one for each student, or one big one for the class.
3. Tie the pinecones onto the branches at regular intervals.

Summary:

1. Discuss:
 - Conifers are trees and shrubs that bare cones and have needle-like leaves.
 - Only pine trees bare pinecones! Alder trees bare alder cones, fir trees bare fir cones, etc.
 - Cones contain the seeds of coniferous trees.
 - The greatest stand of timber on earth is the northern coniferous forest of the Pacific coast of America from Alaska down to northern California!
2. Have students use their senses to observe their cones: sight, smell, sound and texture.

Extensions:

1. Compare the leaves of broad leaved plants to those with needle-like leaves.
2. Dissect a cone and see if you can find its seeds. (Pick one that doesn't have spines or a lot of sap!)
3. Spread peanut butter on a big cone and tie it outside for a quick and easy bird feeder.

Seed Mosaic

Lesson at a glance:

In this lesson, students will look at seeds while they make a craft project.

Goal:

Students will make observations about seeds.

Oregon Content Standards:

SCIENCE

- K.1L.1 Compare and contrast characteristics of plants and animals.
- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.2 Make observations about the natural world.

Materials:

- A piece of heavy cardboard
- Pencil
- White glue
- A variety of seeds

Time: 30 minutes

Activity:

1. Sketch a design lightly on the cardboard. Students can draw real things, like animals, or just geometric shapes.
2. Glue the seeds on the cardboard to fill in the design.
3. For very tiny seeds, use a paintbrush to paint glue on the cardboard, then sprinkle the seeds onto the glue. Use fingers to push the seeds into place.
4. When the picture is dry, turn the cardboard over and lightly tap the back to knock off extra seeds.

Summary:

1. Discuss what seeds are: how plants reproduce themselves.
2. Seeds have a small plant enclosed in a covering called a seed coat, usually with some stored food.
3. Go outside with your class and hunt for seeds in your schoolyard.

Extensions:

1. Go outside and look at different dispersal system of the seeds in your schoolyard. Give students paper bags to collect their seeds. Bring them inside to observe.
 - a. “Parachute” seeds, like the dandelion, ride the wind.
 - b. Cotton Tree seeds are encapsulated in tufts of cotton to float far away.
 - c. “Winged” seeds, like those found on maples, twirl and spin like helicopters.
 - d. Cones drop when they are green and closed up tight, so they roll away from their parent tree and open up there.

- e. “Papery” seeds are so light that they fly away in the wind.
 - f. “Velcro” seeds are sticky or prickly and hitchhike on the fur (or clothes) of animals.
 - g. Fruit seeds are eaten by birds and other animals, and deposited with their own little piles of manure fertilizer to help them grow.
 - h. Acorns and other nuts are food for animals and are buried by squirrels and other rodents.
 - i. “Exploding” seeds are literally thrown into the air when touched. Jewelweed and witch hazel pods do this.
 - j. Alder trees grown along streams and rivers. Their small cones have tiny pockets of air that keep them afloat as they find a new home.
2. Discuss why plants need to disperse their seeds away from them.

Birds' Midwinter Tree

Lesson at a glance:

Students will attract birds to the schoolyard by making a midwinter fruit garland. They can then observe them and collect data about birds in their schoolyard.

Goal: Students will make observations and collect data about birds.

Oregon Content Standards:

SCIENCE

- K.3 Scientific Inquiry: Science explores the natural world through observation.
 - K.3S.2 Make observations about the natural world.

OTHER CONTENT AREAS

Graphing

Materials:

- Whole cranberries or other red edible berry
- Peanuts in their shells
- Apples
- Kiwi fruit
- Popcorn, popped and left overnight to get stale
- Heavy cotton thread
- Large needles
- Heavy string or cord
- Small screwdriver

Time: 30 minutes

Prep:

1. String doubled up lengths of cotton thread onto large needles, about a foot long.
2. Slice apples and kiwi 1/4" thick. Poke holes into them with the screwdrivers.
3. Pop popcorn and let it get stale (stale popcorn doesn't break as easily when trying to string it.)

Activity:

1. Give each student a doubled up length of cotton thread on a large needle.
2. Make a garland of cranberries, popcorn, and peanuts by stringing them on the thread.
3. Put a loop of cord through the edge of each apple and kiwi.
4. Tie all the students' individual garland together into one or several strands. Decorate a tree with the garland and hanging apples and kiwis.
5. Observe which birds come to eat at your Midwinter Tree. Are they the same ones as come to your birdfeeders or different?
6. Add another bar to your *Who Eats What?* bargraph and chart how many birds come to your Midwinter Tree.

Summary:

1. Explore with students how ornithologists identify birds—size, color, shape, and behavior.
2. Explain how bar graphs help scientists keep track of their data.

Extensions:

1. Make pinecone birdfeeders with large pinecones and peanut butter. Smear the pinecones with peanut butter and tie a loop around the top. Add it to your Midwinter Tree.
2. Birds that eat fruit can be different than the ones that eat seed. Common birds are orioles, warblers, robins, and tanagers. Identify your new species and post their pictures.

Cleaner Water is for Me (to the tune of “Frere Jacques”)

Drinking water, drinking water
Can be found—all around.
Wildlife drinks from ponds and
Lakes and rivers, also—
But not me. But not me.

Cleaner water, cleaner water
Is for me. It’s healthy.
I drink from the fountain
And from the faucet.
It is clean. It is clean.

Gray Squirrel

Gray Squirrel, Gray Squirrel
Shake your bushy tail.

Gray Squirrel, Gray Squirrel
Shake your bushy tail.

Wrinkle up your little nose.
Hold a nut between your toes.

Gray Squirrel, Gray Squirrel
Shake your bushy tail.

Five Little Squirrels

Five little squirrels sitting in a tree.

(Hold up five fingers.)

The first one said, “These nuts are for
me!”

(Point to thumb.)

The second one said, “I like to eat!”

(Point to pointer.)

The third one said, “Nuts are a treat!”

(Point to tall man.)

The fourth one said, “Do you want
some?”

(Point to ring man.)

The fifth one said, “You may have one.”

(Point to pinkie.)

Then five little heads went nod, nod,
nod.

(Nod heads.)

Five little bodies went bob, bob, bob.

(Jump.)

Ten little feet went patter, patter, patter.

(Stomp.)

Five little mouth went chatter, chatter,
chatter.

(Clap hands.)

Five little squirrels scolded you and me.

(Shake finger.)

As they sat and ate nuts in the big, tall
tree.

(Stretch arms up.)

The Bird Song (to the tune of “Here We Go ‘Round the Mulberry Bush”)

This is the way we flap our wings,
Flap our wings,
Flap our wings.
This is the way we flap our wings,
Just like a sea gull.

This is the way we peck at a work...
Just like a robin.

This is the way we use our talons...
Just like an owl.

This is the way we paddle our feet...
Just like a duck.

This is the way we drink our nectar...
Just like a hummingbird.

This is the way we scoop our fish...
Just like a pelican.

This is the way we crack our seeds...
Just like a finch.

This is the way we catch our insects...
Just like a swallow.

Thirsty Animals (to the tune of “I’m a Little Teapot”)

I’m a little bluejay, near the creek.
Here are my feathers; here is my beak.
When I’m very thirsty, I fill my bill
Then tilt it up ‘till I am full.

I’m a little beetle on the ground.
Here is a dewdrop that I have found.
When I’m very thirsty, I suck it up
Like using a straw that’s in a cup.

I’m a little squirrel in a tree.
Here is a puddle, bigger than me.
When I’m very thirsty, I use my tongue
Lapping up water can be fun.

I’m a caterpillar, in a hedge.
I like to eat leaves here on the edge.
I always have water, here with me.
It’s inside the plants I eat with glee.

(Add new verses for the animals
that you found!)

Books:

Animal Books:

- *Rabbits, Squirrels, and Chipmunks* by Mel Boring
- *The Wildlife ABC and 123: A Nature Alphabet and Counting Book* by Jan Thornhill
- *Tame and Wild* by Alison J. Auch
- *In My Backyard* by Margriet Ruurs
- *Over in the Meadow* by Olive A. Wadsworth
- *One Small Square Backyard* by Donald M. Silver
- *In the Tall, Tall Grass* by Denise Fleming

Ant Books:

- *Ant Cities* by Arthur Dorros
- *How Many Ants* by Larry Brimer
- *Two Bad Ants* by Chris Van Allsburg
- *The Ant and the Grasshopper* by Amy Lowry Poole

Spider Books:

- *Are you a Spider* by Judy Allen and Todor Humphries
- *Spiders* by Gail Gibbons
- *A House Spider's Life* by John Himmelman

Plant Books:

- *Leaf Man* by Lois Ehlert
- *Red Leaf, Yellow Leaf* by Lois Ehlert
- *The Giving Tree* by Shel Silverstein
- *First Guide to Trees* by George A. Petrides
- *Look At This Tree* by Susan Canizares
- *Who Lives in a Tree?* by Susan Canizares and Daniel Moreton
- *One Small Place in a Tree* by Barbara Brenner
- *Who Needs Plants?* by Lisa Trumbauer
- *From Seed to Plant* by Allan Flower
- *From Seed to Plant* by Gail Gibbons
- *How and Why Seeds Travel* by Elaine Pascoe
- *In a Nutshell* by Joseph Anthony
- *The Tiny Seed* by Eric Car

Insects and Invertebrate Books:

- *The Very Quiet Cricket* by Eric Carle
- *Diary of a Worm* by Doreen Cronin
- *Under One Rock: Bugs, Slugs, and other Ughs* by Anthony D. Fredericks

Bird Books:

- *Beaks* by Sneed B. Collard
- *Have You Seen Birds?* by Joanne Oppenheim

- *Unbeatable Beaks* by Stephen Swinburn
- *Backyard Birds* by Jonathan Latimer and Karen Stray

Water Books:

- *A Cool Drink of Water* by Barbara Kerley
- *Drop of Water* by Gordon Morrison
- *Precious Water* by Brigitte Weninger
- *The Water Hole* by Graeme Base
- *Water, Water* by Eloise Greenfield
- *In My Backyard* by Balarie Giogas