education OUTSIDE

RESOURCES

# KINDERGARTEN CURRICULUM TABLE OF CONTENTS:



## Kindergarten Unit 1: Five Senses

### OVERVIEW:

In this unit Kindergarteners hone their observational skills by carefully using each sense to notice new things about the garden. In Lesson 1 (Five Senses Introduction) students are introduced to using each of their senses. In Lessons 2 through 6 (Sight, Smell, Hearing, Touch, & Taste) students focus on using just one sense to observe details in the garden.

### FOCUS QUESTIONS:

1. How do we learn about the world around us?
2. How do our eyes help us learn about the world around us?
3. How do our noses help us learn about the world around us?
4. How do our ears help us learn about the world around us?
5. How do our hands help us learn about the world around us?
6. How do our tongues help us learn about the world around us?

### NGSS:

[ETS1.A] Defining and Delimiting Engineering Problems: Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
[ESS3.C] Human Impacts on Earth Systems: Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)
[ESS3.A] Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

*Note: Images retrieved from the internet, source unknown.*

## Unit 1: Five Senses

| Lesson # | Title | In this lesson, students will... |
|---|---|---|
| 1. | **Five Senses Introduction** | Practice using their five senses by finding and observing different objects from the garden. |
| 2. | **Site** | Explore the garden using their sense of sight, practice using magnifying glasses and play a game. |
| 3. | **Smell** | Practice using their sense of smell by identifying mystery scents and exploring smells in the garden. |
| 4. | **Hearing** | Use “deer ears” to closely listen to and identify sounds in the garden and surrounding area. |
| 5. | **Touch** | Practice using their sense of touch to identify mystery objects and find different textures in the garden. |
| 6. | **Taste** | Learn new vocabulary to describe different tastes and try new flavors from the garden and beyond. |

# TITLE | FIVE SENSES INTRODUCTION

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 1

## OVERVIEW | In this lesson, students will discuss the five senses and practice using them in the garden.

**Time**: 35 minutes

**Focus Question**: How do we learn about the world around us?

**Key Terms:** SENSES, SIGHT, SMELL, HEARING, TOUCH, TASTE, SCIENTIST

**Objectives:** Students will be able to…
1. name the five senses.
2. practice using each of the five senses in the garden.

## Materials/Prep Work:

- ☐ **Five Senses posters**, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **Fragrant leaf/flower** from garden
- ☐ **Leaves with different textures**
- ☐ **Edible snack** from the garden, one per student (piece of a leaf, fruit or vegetable)

## Lesson Steps:

**Introduction: Two-minute challenge** *(10 minutes)*

- **Greet** students at the garden entrance
- Ask: "What do scientists do?"
  - **Have** students share out
- Say: Today our science question is, "How do we learn about the world around us?"
- **Instruct** students to walk carefully through the garden to find a garden "treasure." (It is helpful to set expectations about how to choose a treasure. For example, instruct students to find an object smaller than their hand.)
- **Instruct** students to return to the seating area, holding their object carefully.
  - *(Note: Use this as an opportunity to practice transitions and returning to the circle with new students)*
- **Think-pair-share**: Have students hold their treasures in front of them and ask them to take turns describing their treasure to a neighbor.
- **Ask** students to close their eyes and describe what they notice about the treasure in their hands. (Demonstrate first with your own object.)
- **Ask** students what changed when they couldn't use their eyes. What other body parts did they use to help them describe their treasures?
  - **Write** student answers on the board.

## Activity 1: What are the Senses? *(15 minutes)*

- **Introduce** the term SENSES (tools we use to observe and understand the world around us) using visuals.
- **Discuss** each of the senses.
  - SIGHT: **Ask** "what do we use our eyes for?"
    - **Say**: We use our Owl Eyes to see! *(Form each hand into a circle and place over eyes.)*
    - Play a short round of I Spy with the class, then have them play with a partner.
  - SMELL: **Ask** "what do we use our nose for?"
    - **Say**: We use our Pig Nose to smell! *(Place hand over nose to form a snout, or make a piggy nose.)*
    - Pass around a fragrant leaf or flower from the garden. If there's time, ask students to find their own fragrant leaf in the garden.
  - HEARING: **Ask** "what do we use our ears for?"
    - **Say**: We use our Deer/Fox Ears to hear! *(Place hands behind ears.)*
    - Have students close their eyes and listen for a minute, focusing on "nature sounds." Share out.
  - TOUCH: Ask "what do we use our hands for?"
    - **Say**: We use our Racoon Touch to feel! *(Rub hands together.)*
    - Pass out leaves of different textures. If there's time, have students explore different textures in the garden.
  - TASTE: **Ask** "what do we use our tongues for?"
    - **Say**: We use our Lizard Tongue to taste! *(Stick out tongue.)*
    - Pass out an edible snack from the garden and have students describe it to a partner.

## Closing: *(10 minutes)*

- **Think-pair-share**: Give each pair of students an object and ask them to describe it, one sense at a time, as a way to check for understanding.
  - Ex. How does your object look? How does it feel? How does it smell? How does it sound? How does it taste? (Only if it's something edible.)
- **Revisit** focus question: How do we learn about the world around us?"
  - Have students share out, write answers on the board
- **Explain** that you hope students will use their senses every time they come to the garden.

Additional Activity: If time permits, play a few rounds of Simon Says or have students go on a garden safari to practice using each of the five senses (ex. Find a flower that smells sweet, a plant that feels soft, etc.)

# TITLE | SIGHT

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 2

## OVERVIEW | In this lesson, students will investigate the garden using their sense of sight and practice using magnifying glasses. They will learn the "I notice, I wonder, it reminds me of"[1] prompt as a way of acting, communicating, and thinking like a scientist.

**Time**: 35 minutes

**Focus Question**: How do our eyes help us learn about the world around us?

**Key Terms:** SENSE, SIGHT, MAGNIFYING GLASS

**Objectives:** Students will be able to…
1. observe the garden with their sense of sight.
2. use a magnifying glass to examine objects more closely.

## Materials/Prep Work:

☐ **Five Senses posters**, available in *Curriculum Visuals* linked in Table of Contents
☐ **Magnifying glasses or hand lens**, one per student

## Lesson Steps:

**Introduction: Welcome and I Spy** *(10 minutes)*
- Meet students at the garden entrance or seating area.
- **Ask** students if they can remember what they learned about in the last garden lesson.
- **Review** the five SENSES with the Five Senses posters and hand motions (as explained in L1: Five Senses Introduction)
- **Explain**: Today we will be practicing our observation skills by using one of our five senses.
  - **Lead** a round of I Spy in the garden, then have students play with a partner.
  - Instruct students return to seating area.
  - **Ask**: What sense are we using when we play I Spy?
- **Think-pair-share**: What kinds of words did you use to describe what you saw?
  - Write student answer on board.
- **Say**: Today our science question is, "How do our eyes help us learn about the world around us?"

## Activity 1: Magnifying Glass Practice *(10 minutes)*

- **Show** students a magnifying glass and ask: "Have you seen this before? If not, what does it remind you of?"
- **Explain** that a MAGNIFYING GLASS is a tool used by scientists to look at things closely.
- **Demonstrate** how to safely and effectively use a magnifying glass
- **Distribute** magnifying glasses to each student. Have students practice using them on the ground, their clothes, their hands, a partner's hair, etc. while staying seated.

- Exploration: Give students a few minutes to explore the garden freely with magnifying glasses.
  - It can be helpful to establish areas for students look at prior to the class (ex. Place a cone/flag/identifying mark near a flowering plant, an area with lots of pollinators, worms, etc.)
- **Instruct** students to return to the seating area
- **Think-pair-share** some of the findings from their time looking in the garden.

Collect magnifying glasses.

## Activity 2: Introduce I notice, I wonder, It reminds me of... *(10 minutes)*

- **Instruct** students to collect an object smaller than their hand from the garden and bring it back to the seating area.
- **Introduce and Play**: "I notice, I wonder, It reminds me of..." Demonstrate how to use the prompts to make observations about an object from the garden, then provide time for students to practice with their own objects:
  - What do you notice about this object? Think in your head first, now share with a partner.
  - What do you wonder about this object? Think in your head first, now share with a partner.
  - What does it remind you of? Think in your head first, now share with a partner.

## Closing: *(5 minutes)*

- **Think-pair-share**: What did you learn about magnifying glasses?
- **Revisit** focus question: "How do our eyes help us learn about the world around us?"

## References:

1. BEETLES Project, The Lawrence Hall of Science, U.C. Berkeley. Retrieved on June 1, 2019 from: http://beetlesproject.org/resources/for-field-instructors/notice-wonder-reminds/

# TITLE | SMELL

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 3

## OVERVIEW | In this lesson, students will practice using their sense of smell by identifying mystery scents and exploring smells in the garden.

**Time**: 35 minutes

**Focus Question**: How do our noses help us learn about the world around us?

**Key Terms:** SENSES, SMELL

**Objectives:** Students will be able to…
1. describe different scents.
2. discuss how smells make them feel.

## Materials/Prep Work:

- ☐ **Five Senses posters**, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **Images of people making different faces** (happy, disgusted, confused, calm, content, etc)
- ☐ **Fragrant leaves**, one per student, from many different plants in the garden
- ☐ **Scented objects** (spices, herbs, soil, etc.) in small jars covered with wet cotton balls so the contents are not visible
- ☐ **Pictures** of the objects in the scent jars listed above
- ☐ **Images** of where the scents came from (or better yet, the actual plant!)
- ☐ *Optional: Ingredients for making scented play dough*[1]

## Lesson Steps:

**Introduction: Welcome and Leaf Hunt** *(10 minutes)*

- **Meet** students at the garden entrance or seating area.
- **Ask** students if they can remember what they learned about in the last garden lesson.
- **Review** the five SENSES with the Five Senses posters and hand motions (as explained in L1: Five Senses Introduction)
- **Distribute** one leaf to each student.
    - **Ask** students if they notice anything special about the leaf (give them a hint to use their noses if needed)
- **Instruct** students to explore the garden with their noses to find the plant that their leaf came from.
    - **Demonstrate** how to gently rub and sniff leaves to get a stronger smell.
    - Once they have found the matching plant, have students return the seating circle.
- **Say**: Today our science question is “How do our noses help us learn about the world around us?”
    - Have students share out ideas and record them on board

## Activity 1: Smell Safari *(10 minutes)*

- **Explain** that students will be exploring how different smells make us feel.
- Pass around a scented flower. **Ask** students to smell the flower and make a face to show how the smell makes them feel.
    - **Repeat** with something that most students will not like the smell of.

- **Show** students a picture of someone making an excited face. Ask students to look for a smell in the garden that makes them feel what is shown in the picture (i.e. a plant, the worm bin, etc.)
- **Play** a few rounds with different cards.
- **Ask** "Why do you think different smells make us feel different ways?"
    - **Discuss**: Why might something smell bad? What is that telling our body? Why might something smell sweet? What is that telling our body?

## Activity 2: What's that Smell? *(10 minutes)*

- **Explain** that students will be acting like scientists to observe different objects using only their noses.
- **Distribute** a jar with a smell inside and have each student smell it and pass it on, putting their hand on their head if they think they know the smell.
- **Reveal** the answer, showing an image of the object or allowing students to open the jars at the end of the session.

> *Optional Activity: Make scented play dough[1] before class. Give groups of students a variety of scent jars (as used above) and a piece of play dough. Ask them to match the scent of the play dough to the correct jar. Reveal answers at the end.*

## Closing: *(5 minutes)*

- **Think-pair-share**: What do different smells tell our body?
- **Revisit** focus question: "How do our noses help us learn about the world around us?"
    - Have students share out, write answers on the board

## References:

1. James, C. (March 10, 2016). Fall Play Dough Recipes [Blog post]. Retrieved on June 6, 2019 from https://nurturestore.co.uk/fall-play-dough-recipe

# TITLE | HEARING

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 4

## OVERVIEW | In this lesson, students will hone their careful listening skills by practicing deer ears, matching sounds to their origin, and going on a sound safari.

**Time**: 35 minutes

**Focus Question**: How can our ears help us learn about the world around us?

**Key Terms:** EARS, HEARING

**Objectives:** Students will be able to…
1. observe and record different sounds they hear.
2. explain why hearing is an important skill for animals.

## Materials/Prep Work:

- ☐ **Five Senses posters**, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **Small speaker** with predetermined sounds that will be played for the class (ex. Airplane, duck, cow, rain, etc.)
- ☐ **Pictures** that match each sound played for students
- ☐ **Pictures of animals** with ears that stand up (i.e. a deer, rabbit, fox, etc.)

## Lesson Steps:

**Introduction: Welcome and Deer Ears** *(10 minutes)*

- **Meet** students at the garden entrance or seating area.
- **Ask** students if they can remember what they learned about in the last garden lesson.
- **Review** the five SENSES with the *Five Senses* posters and hand motions (as explained in L1: Five Senses Introduction)
- **Show** pictures of a deer, a rabbit, a fox, etc. Ask what the creatures have in common.
  - Answer: They all have ears that stand up!
- **Think-pair-share**: How does a strong sense of hearing help deer and rabbits?
- **Demonstrate** Deer/Fox Ears (placing open palms behind ears).
  - Have students listening silently for 10 seconds. (Count down on your hands so students know how long to stay silent.)
  - **Ask**: What is the loudest thing you can hear? The quietest?
- **Say**: Today our science question is, “How can our ears help us learn about the world around us?”

## Activity 1: What’s That Sound? *(10 minutes)*

- **Tell** students they will be using their ears to be scientists and make observations about different sounds.
  - Have students practice sitting quietly ready to listen.
- **Explain** that you will be playing a sound on a speaker and then holding up different pictures. Students should listen and point at the picture of the thing that they think made the sound.

- Play as many rounds as you want.
- Throughout the game, **ask**: “What does this sound remind you of? How does the sound make you feel?”

## Activity 2: Sound Safari *(10 minutes)*

- **Ask** students to line up and practice deer ears.
- **Explain** that they will be walking quietly around the garden (or school campus) listening for new sounds.
- **Demonstrate** how students should silently signal when they hear a sound.
- **Walk** around listening for different sounds. When you return, create a list of the sounds you heard on the safari together.

## Closing: Synthesize Observations *(5 minutes)*

- **Think-pair-share**: Why is it important for animals to be able to hear?
- **Revisit** focus question: “How can our ears help us learn about the world around us?”
  - Have students share out, write answers on the board

# TITLE | TOUCH

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 5

## OVERVIEW | In this lesson, students will practice using their sense of touch to identify mystery objects and find different textures in the garden.

**Time**: 35 minutes

**Focus Question**: How do our hands help us learn about the world around us?

**Key Terms:** TOUCH, TEXTURES, ROUGH, SMOOTH, BUMPY, SOFT, HARD

**Objectives:** Students will be able to…
1. closely observe objects using their sense of touch.
2. compare and contrast the texture of various objects.

## Materials/Prep Work:

- ☐ **Five Senses** posters, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **5 Paper bags** filled with garden objects with varying textures (i.e. rocks, pine cones, lemon slices, dry leaves, damp soil etc.)
- ☐ **Egg carton** with 6 compartments. Label each compartment with a different texture (rough, smooth, bumpy, soft, hard, etc.) Use the word and a picture in the label to help students who aren't able to read.

## Lesson Steps:

**Introduction: Welcome and Mystery Bag** *(10 minutes)*

- **Meet** students at the garden entrance or seating area.
- **Ask** students if they can remember what they learned about in the last garden lesson.
- **Review** the five SENSES with the Five Senses posters and hand motions (as explained in L1: Five Senses Introduction)
- **Walk** around with a mystery object inside of a paper bag. Ask students what they think is inside of the bag. (They can guess but won't know because they can't see it.)
    - **Ask**: "If we can't use our eyes, what other ways could observe the bag?"
- **Explain** that students will be using their Racoon Touch (fingers lightly rubbing together) to explore the objects Demonstrate and practice.
- **Walk** around to give each student a chance to feel the object inside of the bag. Remind students to close their eyes while they touch the object. Have students keep the answer a secret until everyone has had a chance to feel it.
    - **Think-pair-share**: What do you think is in the bag? What are some words we can use to describe how it feels?
- **Say**: Today our science question is "How do our hands help us learn about the world around us?"

## Activity 1: Texture Hunt *(10 minutes)*

- **Explain** that students will be using their hands/sense of touch to be scientists and observe different TEXTURES (how things feel).
- **Distribute** labeled egg cartons to pairs of students and explain what the TEXTURE words mean. It helps to have a symbol/hand motion for each texture. (For example, use a squiggly line to represent "bumpy.")

- **Have students hunt** for objects in the garden that match the different textures, placing a small piece of the object in the matching egg carton compartment.
- **Check** for understanding and redirect students if necessary.
- **Share** out the objects they found.

## Activity 2: More Mysteries *(10 minutes)*

- **Remind** students of how they used their sense of touch at the beginning of the lesson to explore the mystery object in the paper bag.
- **Repeat** the mystery bag activity for additional objects (i.e. rocks, pine cones, lemon slices, dry leaves, damp soil etc.)
- **Ask** the following questions:
  - What was challenging about the activity?
  - How did your body feel when you touched something soft / hard / slimy?
  - What was your favorite and least favorite texture?

## Closing: *(5 minutes)*

- **Think-pair-share**: What was one new thing you touched today?
- **Revisit** focus question: “How do our hands help us learn about the world around us?”

# TITLE | TASTE

## GRADE | Kindergarten

## UNIT | 1

## LESSON | 6

## OVERVIEW | In this lesson, students will learn new vocabulary to describe different tastes and try new flavors from the garden and beyond.

**Time**: 35 minutes

**Focus Question**: How can we use our tongues to learn about the world around us?

**Key Terms:** SALTY, SWEET, SOUR, BITTER, SPICY, TASTE

**Objectives:** Students will be able to…
1. describe bitter, sour, salty, spicy, and sweet tastes.
2. find new flavors in the garden.

### Materials/Prep Work:

- ☐ **Five Senses posters**, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **Small pieces of parsley, mint, cilantro, lettuce** (or any other green leaf that looks somewhat similar)
- ☐ **Tasting samples** in small bowls:
  - ☐ Sweet: blueberries or strawberries
  - ☐ Salty: pretzel
  - ☐ Sour: lemon
  - ☐ Bitter: kale
  - ☐ Spicy: radish or arugula
- ☐ **Serving spoons or gloves** to serve samples
- ☐ **Labels with pictures of TONGUES** that can be stuck on a plant or in the ground. Place these labels near edible plants throughout the garden.
- ☐ **Science notebooks/paper** *(optional)*
- ☐ **Crayons** (*optional*)
- ☐ **Clipboards** (*optional*)

**Note: This lesson involves eating. Before the lesson, check in with the classroom teacher about students with food allergies!**

### Lesson Steps:

**Introduction: Welcome** *(10 minutes)*

- **Welcome** students at the garden entrance and tell them you have a secret treat for them.
  - **Review** the five SENSES with the *Five Senses* posters and hand motions (as explained in L1: Five Senses Introduction)
- **Hand** each student one piece of a small green leaf (i.e. mint, parsley, cilantro, etc).
- **Ask** the students to describe their leaf using their hands, nose, eyes, and ears.
- **Ask** students to name the final sense (taste). Have them taste their leaf.
  - Ask students to share how it tasted and record their answers on the board.
  - Repeat with a different leaf to demonstrate that not all leaves taste the same.

- **Explain** that students will be using their Lizard Tongues for the rest of the lesson.
- **Say**: Today our science question is, "How can we use our tongues to learn about the world around us?"

## Activity 1: Tasting Exploration *(10 minutes)*

- **Ask** students to sit in the seating area, stick out their tongues and make a fun noise.
- **Observe** tongues. **Ask**: Do you know what parts of the tongue helps us taste food?
  - Answer: Tastebuds
- **Explain** that students will use their tongues to make observations about different foods.
- **Distribute** the first sample to taste. Ask students to wait until everyone has been served before tasting. Prompt them to use their other senses to observe the food while waiting.
- After students taste, **ask** the following questions:
  - What are some words to describe the flavor?
  - What other foods that taste similar?
  - How did your body react to the taste?
- **Introduce** the words SALTY, SWEET, SOUR, BITTER, and SPICY when appropriate.
- **Repeat** with the other tasting samples, taking time to discuss each one.
- **Have students vote** for their favorite taste.
  - *Optional: Record votes on the board.*

## Activity 2: Tasting in our Garden *(10 minutes)*

- **Ask**: Do you think any of the flavors that you tasted in the samples can be found in our garden?
- **Tell** students that as a class they will hunt for different flavors in the garden.
- **Explain** that students will be walking in a line behind the instructor, looking for "flavor cards" with a number and a picture of a tongue. Show students an example. Explain that once the class finds a card, each student (with the help of the educator) will get to pick one piece of the plant to taste.
  - **REMIND** students that they should never eat anything from the garden without asking an adult first.
- **Lead** students on the flavor safari, stopping at 2-4 locations and tasting different flavors.

## Closing: *(5 minutes)*

- **Think-pair-share**: What was your favorite thing you tasted today?
- **Revisit** focus question: How can we use our tongues to learn about the world around us?

*Optional Activity: If time permits, have students draw their favorite thing they tasted in their science notebooks or on a piece of paper, adding words to describe the taste.*

# Kindergarten Unit 2: Trees, Wood, and Paper

## OVERVIEW:

This unit introduces students to trees in the schoolyard and prompts them to explore and discuss why trees are important in our lives. In Lesson 1 (Introduction to Trees in Our Garden) students familiarize themselves with trees in the garden, and in Lesson 2 (Tree Parts) they learn about tree parts and their functions. In Lesson 3 (Wood Investigations), students learn how people use wood from trees and explore the properties of wood. In Lessons 4 and 5 (How is Paper Made? and Making Recycled Paper), students learn how new paper is made and how this process affects our environment. They also make their own piece of recycled paper. Students celebrate the foods from trees in Lesson 6 (Food from Trees) by making their own tree food trail mix.

## FOCUS QUESTIONS:

1. Why are trees important?
2. How are trees the same and how are they different?
3. How do humans use wood from trees?
4. How does a tree become paper?
5. What happens to our recycled paper?
6. What foods grow on trees?

## NGSS:

[ESS3.C] Human Impacts on Earth Systems: Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)
[ESS3.A] Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

### Unit 2: Trees, Wood, and Paper

| Lesson # | Title | In this lesson, students will... |
|---|---|---|
| 1. | **Introduction to Trees in our Garden** | Observe trees around the garden. Students will also practice scientifically drawing a tree, which they will revisit at the end of the unit to compare changes. |
| 2. | **Tree Parts** | Learn/review the main parts of a tree and their functions with a tree part costume. |
| 3. | **Wood Investigations** | Brainstorm the ways in which humans use wood for building. Students will manipulate a piece of wood with a variety of objects, talk about other kinds of building materials, and build an insect/fairy house using natural materials. |
| 4. | **How Paper is Made** | Observe various samples of paper. They will learn how paper is made through The Story of Paper book. Students will prepare to make their own recycled paper by tearing up old paper. |
| 5. | **Making Recycled Paper** | Make their own piece of recycled paper. In their extra time, they will revisit their initial drawing of a tree to see if anything has changed. |
| 6. | **Food From Trees** | Make their own trail mix using ingredients that come from trees. |

## Extensions:

- In the spring, revisit the tree drawings from **L1: Introduction to Trees in Our Garden** to discuss seasonal changes.
- Read and discuss Dr. Seuss's *The Lorax*.

# TITLE | INTRODUCTION TO TREES IN OUR GARDEN

GRADE | Kindergarten

UNIT | 2

LESSON | 1

OVERVIEW | In this lesson, students will observe trees around the garden, become familiar with some of their different characteristics, and question what makes trees important to humans. Students will also practice their scientific drawing skills by making a detailed drawing of a tree in the garden.

**Time**: 35 minutes

**Focus Question**: Why are trees important?

**Key Terms:** TREE, SCIENTIFIC DRAWING

**Objectives:** Students will be able to…
1. search for trees based on verbal clues about their characteristics.
2. scientifically draw a tree in its winter state.

## Materials/Prep Work:

- ☐ **Parts of a Tree poster**, available in *Curriculum Visuals* linked in Table of Contents
- ☐ **Tree drawing worksheet** (attached below) or **science notebooks**
- ☐ **Clipboards, pencils**
- ☐ **Colored pencils/crayons**

## Lesson Steps:

**Introduction: Welcome and Tree Stretches** *(5 minutes)*
- **Greet** students at the garden entrance.
- **Challenge** students to find (or point to) the largest plant in the garden.
  - Did anyone point to a tree? Have all students look towards the tallest tree in the garden and ask students take 5 seconds to look quietly at the tree.
    - **Ask**: What do you notice about the tree?
    - Have students share out and record answers on the board.
- **Lead** students to the seating area and sit down.
- **Introduce** tree characteristics through a variety of stretches/acting.
  - Call out a prompt and have students act it out. (For example: Act like a tall tree swaying in the wind, stretch your arms and fingers out like branches, be tree with a short trunk, act like a tree growing apples, etc.)
  - Use the *Parts of a Tree* poster to point out the various tree parts during the activity
- **Say** "Today our science question is, "Why are trees important?"

## Activity 1: Verbal Scavenger Hunt *(10 minutes)*

- **Ask** students to think silently about why trees are important.
- **Tell** them that they will have to make a big choice. They will have to go into the garden and, in 10 seconds, find and stand next to the tree that they think is the most important tree in the garden.
  - Let students know there are no wrong choices in this game but they do have to make a choice and stick to it.

- **Ask** students go into the garden (or surrounding school yard if you have limited trees) and choose their tree to stand under.
- **Ask** students to return to the seating area and pair-share why they think their tree is important.
  - Have some students share out their answers and record them on the board.

> *Alternative or Additional Activity: Have students share out reasons why they think trees are important, and record on board. Then lead students through a tree scavenger hunt by calling out prompts and having students find a tree that matches that prompt. Examples: Find a tree that gives us food, find a tree that gives us shade, find a tree that gives us wood, etc.*

## Activity 2: Tree Drawings *(15 minutes)*

- **Ask**: How could you show someone about trees without using words?
- **Discuss** what it means to scientifically draw (drawing only what you see).
  - **Demonstrate** the difference between drawing and SCIENCE DRAWING. Make a weak scientific drawing on the board (make it small, put a scarf and sunglasses on the tree, etc.) and ask students how to make it stronger.
- **Explain**: Students will make a SCIENTIFIC DRAWING of a tree in the garden to remember how the tree looks now. At the end of the unit (or later in the year), students will have the opportunity to draw their tree again in order to observe changes.
- **Provide** crayons for students to add color once they have drawn the tree in detail using pencil.

## Closing: *(5 minutes)*

- **Revisit** focus question: "Why are trees important?" Get students excited about continuing to answer this question in future lessons.
- *Optional*: Do a **gallery walk or pair share** to share tree drawings.

## Blog Links:

1. K. Owyang (2015, April 25). "Roots, Trunk, Branches, Leaves" [Web log post]. Retrieved June 14, 2019, from https://educationoutsideafy.wordpress.com/2015/04/26/roots-trunk-branches-leaves/

Name _____

**Tree Name** _____

| | |
|---|---|
| **Winter:** Date _____ | **Spring:** Date _____ |

# TITLE | TREE PARTS

GRADE | Kindergarten

UNIT | 2

LESSON | 2

OVERVIEW | In this lesson, students will learn and review the main parts of a tree with a tree part costume. Students will apply their knowledge of tree parts by making nature art representations of trees using materials from the garden.

**Time**: 35 minutes

**Focus Question**: How are trees the same and how are they different?

**Key Terms:** ROOTS, TRUNK, BRANCHES, LEAVES, FLOWERS, FRUIT, SEEDS

**Objectives:** Students will be able to…

1. identify the four main parts of a tree (roots, trunk, branches, leaves), plus the two parts that trees have at certain times of the year (flowers and fruit).
2. explain the function of each part.

## Materials/Prep Work:

- ☐ **Tree part costume** with roots, trunk, branches, leaves (optional: flowers and fruit). This can easily be made out of construction paper or cardboard (example below).
- ☐ **Parts of a Tree poster** (Available in *Curriculum Visuals*, linked in Table of Contents). Note: This poster does not show flowers, fruit or seeds, but these parts can be added if desired.
- ☐ **Pictures of different trees and tree parts** that have specific characteristics for students to compare to trees in the garden (i.e. a tree with leaves, a tree without leaves, a tree with fruit on it, a tree with large leaves, a tree with small leaves, etc.).
- ☐ *Optional*: **Nature art materials** (branches, leaves, wood chips, rocks, etc.)

## Lesson Steps:

**Introduction: Welcome and Tree Observations** *(10 minutes)*

- **Greet** students at garden entrance.
  - **Ask** students to share what they learned in the last lesson.
- Explain that they will be using their observation skills to look at the trees in the garden.
  - **Lead** students on a walk through the garden to look quietly at each tree.
- Return to the seating area and **ask** students to list out the things they saw as they looked at each tree.
  - **Record** student responses on the board.
  - Circle all the similarities and star all the differences.
- **Say**: “Today our science questions are, “How are trees the same?” and “How are trees different?”

## Activity 1: Tree Scavenger Hunt *(10 minutes)*

- **Tell** students they will explore the similarities (how things are the same) and differences (how things are different) in our garden trees.

- **Show** students the tree cards and **explain** that they will work in pairs to match the picture they see on the card to a tree in the garden (ex. picture of branch with leaves and picture of branch without leaves).
  - Go through an example as a class.
- Have students play a few rounds of the game, coming back and exchanging their cards each time.
- **Gather** students back together and share out findings.

## Activity 2: Tree Parts and Functions *(10 minutes)*

- **Explain**: All trees have these same four main parts. (Use the *Parts of a Tree* poster to demonstrate.) At different times of year, some trees have additional parts: flowers and fruits.
- **Sing** tree parts song to the tune of "Head, Shoulders, Knees, and Toes," acting out the parts with students.
  *Roots, trunk, branches, leaves (branches, leaves)*
  *Roots, trunk, branches, leaves (branches, leaves)*
  *Buds and flowers and fruits and seeds*
  *These are the parts of a tree!*
- **Select** one student (or the teacher) to be dressed up as a tree. Add one part at a time and discuss the function of each part. Involve other students by having them act out the parts.
  - ROOTS (wiggle toes in ground): Hold tree in the ground and absorb water/nutrients from the soil.
  - TRUNK (stand up tall and strong): Hold up the branches and has tubes inside to carry water from roots to branches.
  - BRANCHES (put out arms): Hold up the leaves and carry water from trunk to leaves.
  - LEAVES (spread hands out to sun): Make food for the tree to grow and make clean oxygen for us to breathe.
  - FLOWERS: Attract bees, butterflies, hummingbirds, and other pollinators. They're beautiful for us to enjoy and they turn into fruit.
  - FRUIT: For us and other animals to eat and to carry SEEDS that grow into new trees.
- Review the parts of a tree with the *Parts of a Tree* poster.

## Closing: *(5 minutes)*

- **Revisit** focus questions: "How are trees the same? How are they different?"

> *Alternative or Additional Activity: Have students collect materials (sticks, leaves, small flowers, etc) off the ground to create mini 2-D tree models. Make sure students know to include the four main parts of a tree.*

## Additional Information:

**Sample Tree Part Costume**

## Blog Links:

1. K. Owyang (2015, April 25). “Roots, Trunk, Branches, Leaves” [Web log post]. Retrieved June 14, 2019, from https://educationoutsideafy.wordpress.com/2015/04/26/roots-trunk-branches-leaves/

# TITLE | WOOD INVESTIGATIONS

## GRADE | Kindergarten

## UNIT | 2

## LESSON | 3

OVERVIEW | In this lesson, students will brainstorm the ways in which humans use and modify wood for building. Students will manipulate a piece of wood with a variety of objects, talk about other kinds of building materials, and build an insect/fairy house using natural materials.

**Time**: 35 minutes

**Focus Question**: How do humans use wood from trees?

**Key Terms:** WOOD, BUILDING, SAWDUST, MATERIALS

**Objectives:** Students will be able to…

1. explore how humans use wood from trees.
2. brainstorm how people use tools and machines to change tree trunks into wooden objects.
3. manipulate their own piece of wood using various materials and explain the changes they see taking place.

### Materials/Prep Work:

- ☐ **Piece of unprocessed wood** (ex: tree branch, trunk, or stump)
- ☐ **Piece of processed wood** (ex: a piece of a 2x4)
- ☐ **Small pieces of wood** (size of a deck of cards), at least one for every 2 students
- ☐ **Materials to manipulate wood** (aluminum foil, sandpaper, rocks, pencils, etc.)
- ☐ **Images of tools** that people use to manipulate wood (sander, saw, etc.)
- ☐ **Trays**

### Lesson Steps:

**Introduction: Welcome** *(10 minutes)*

- **Meet** students at the garden entrance or seating areas. **Ask** students if they can remember what they learned about in the last garden lesson. Have students share out.
  - *Optional*: Lead students through a short round of tree stretches (as explained in L1: Introduction to Trees in Our Garden).
- **Ask** students to search the garden for 5 different items that came from trees.
  - Share out and record on board
- **Ask**: How can you tell if an object came from a tree?
- **Say** Today our science question is: “How do humans use wood from trees?”

### Activity 1: Manipulating Wood *(15 minutes)*

- **Show** students a wooden chair, table, desk, etc.
- **Ask**: How did a tree change into this chair/table/desk/other object?
  - Have students share out answers and **record** on board.

- **Show** other examples of unprocessed wood and processed wood for comparison.
  - Pass them around for students to observe.
  - Have students share what they notice about each example:
    - How does it feel?
    - How does it look?
    - Do you see anything not made out of wood?
- **Show** students pictures of a variety of tools that humans use to change wood (i.e. saws, drills, hammers, etc.)
- **Ask** students to say/guess what the tools are used for. Record answer on the board.
  - **Tell** students that these tools are used to change wood from trees into things that humans use every day.
- **Explain** that students will be able to use different tools to change their own piece of wood.
- **Provide** students (individually or in pairs) with a small piece of wood and various materials with which to manipulate it (i.e. aluminum foil, rocks, pencils, sandpaper, etc.).
- **Review** which materials changed the wood the most by asking students to share their observations.
  - **Demonstrate** how wood creates SAWDUST when sanded with sandpaper.

## Activity 2: Building with Natural Materials *(10 minutes)*

- **Demonstrate** how to use natural materials from the garden to build a mini house. Prompt students to work individually or in small pairs to build their houses.
- *Optional*: Do a gallery walk in order for students to observe houses made by other students.

## Closing: *(5 minutes)*

- **Revisit** focus question: “How do humans use wood from trees?”

## Additional Information:

**NGSS**:
[ESS3.A] Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

# TITLE | HOW PAPER IS MADE

## GRADE | Kindergarten

## UNIT | 2

## LESSON | 4

## OVERVIEW | In this lesson, students will observe various samples of paper. They will learn how paper is made and the importance of recycling through The Story of Paper book. Students will prepare to make their own recycled paper by tearing up old paper.

**Time**: 35 minutes

**Focus Question**: How does a tree become paper?

**Key Terms:** PAPER, RECYCLE, PULP

**Objectives:** Students will be able to…
1. explain how paper is made.
2. understand that paper can be made from trees or recycled paper.

### Materials/Prep Work:

- ☐ **Samples of paper**, one per student (construction paper with obvious paper fibers is best)
- ☐ **Examples of a variety of paper types** (i.e. cardboard, construction paper, tissue paper, paper towel, etc.)
- ☐ **Picture of a tree**
- ☐ ***The Story of Paper* book** (attached below). In addition to the assembled book, print some of the main pictures without assembly. These pictures will be used for one of the full group activities described below.
- ☐ **Recycled paper scraps**, ripped into small pieces (about the size of a post-it note)
- ☐ **Bins/trays** to collect torn paper
- ☐ *Optional*: **Papermaking supplies** to show to students (recycled paper, blender, and a screen)

### Lesson Steps:

**Introduction: Welcome** *(5 minutes)*

- **Greet** students at the garden entrance. **Prompt** students to think silently about all of the ways they've used paper that day while walking to the seating circle.
- Show samples of different kinds of paper, including toilet paper, paper towels, construction paper, a cardboard box, tissue paper, etc.
- **Think-pair-share**: When in our lives do we use paper? Record student answers on the board.
- **Say**: Today our science question is "How does a tree become paper?"

### Activity 1: Observing Paper Pieces *(5 minutes)*

- **Distribute** small piece of construction paper to each student.
- **Ask**: What do you notice about this paper? What do you see? Where did this paper come from?
- Have students share in pairs and then as a full group.
- **Discuss** the dots and lines you see in the paper and **explain** that these are the fibers, or small pieces of paper that make up the whole paper.
- **Collect** paper pieces.

## Activity 2: How is Paper Made? *(15 minutes)*

- **Show** students a picture of a tree. Place the picture at one end of the board. Walk to the other side of the board. Show students a piece of paper and place it on the board. Draw a line between the two.
- **Ask**: How does a tree become a piece of paper?
  - Have students share out.
  - **Use** photos from *The Story of Paper* to guide students through the process. For example, if a student mentions cutting down a tree show the picture of machines cutting down a tree. **Place** that photo in-between the photo of the tree and the piece of paper in the correct order. Eventually you should create a timeline that demonstrates the different steps of making paper.
- Once the timeline is complete, **read** *The Story of Paper* in full.
  - As you read through the story, ask students to get involved by acting out/adding sound (ex: make loud noises when machines are running, mimic rolling out a large sheet of paper, etc.)
- **Say**: We will be making our own paper out of recycled paper next week. Instead of using large paper mill machines, we will use a blender, miniature screens, and our hands.

## Activity 3: Preparing to Make Recycled Paper *(10 minutes)*

- **Demonstrate** how to tear paper into small pieces (about the size of your fingernail).
- **Distribute** recycled paper and a bucket/tray to groups of 3-4 students.

## Closing: (5 minutes)

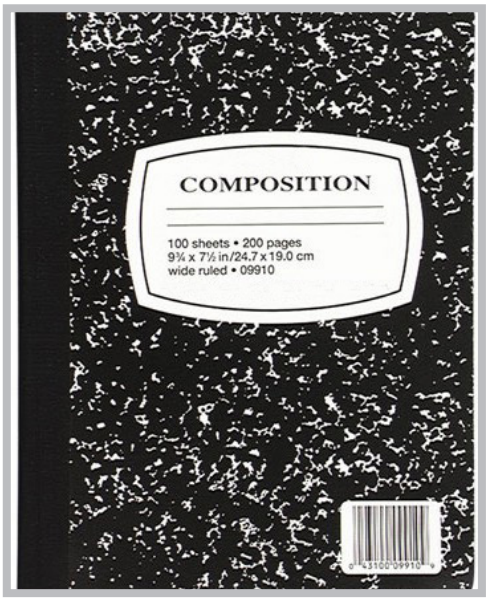
- **Collect** all torn paper into one bin.
- **Explain** that you will be soaking the pieces of paper in water overnight so the PULP will be ready to be made into recycled paper in the following class.
- **Revisit** focus question: “How does a tree become paper?”

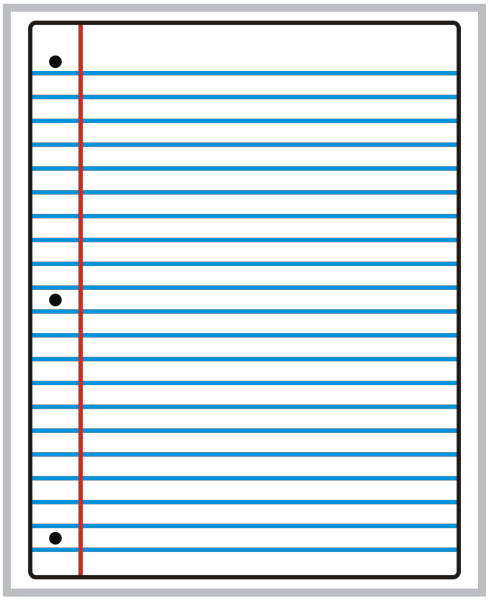
## Additional Information:

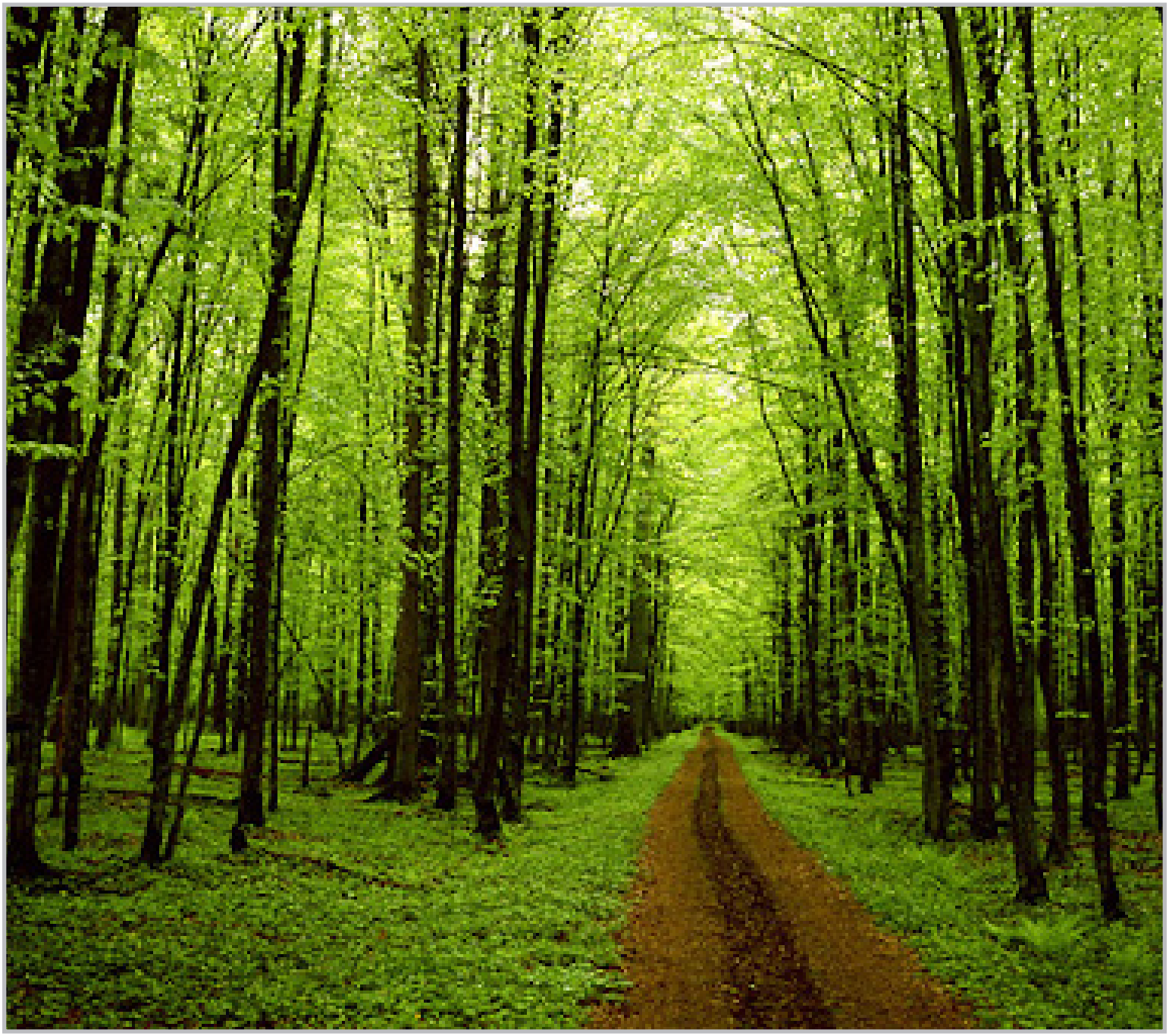
**NGSS**:
[ESS3.A] Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)
[ESS3.C] Human Impacts on Earth Systems: Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (*secondary to K-ESS2-2*)

**Classroom Extensions:**
- Show videos from paper mills in order to further demonstrate the process of paper production.

# The Story of Paper





# Paper is made from the trunks and branches of trees.


# People use large machines to cut down trees in the forest.

A big truck carries the wooden logs to a paper mill, a factory that makes paper. The trucks have to travel a long way to get to the paper mill.

# At the papermill, a large machine takes the bark off of the logs.


# Another machine cuts the logs into small pieces of wood called wood chips.

Workers at the papermill mix the wood chips with water to make pulp (it looks like oatmeal). Sometimes different colors are mixed into the pulp to make colored paper. Sometimes chemicals are added to the pulp to make strong, white paper.

A third machine rolls this pulp into long, flat sheets of paper. The paper sheets go through a drying machine.

The long sheets of paper are cut into smaller pieces and put into packages. Another big truck brings these packages of paper to different stores so people can buy and use the paper.

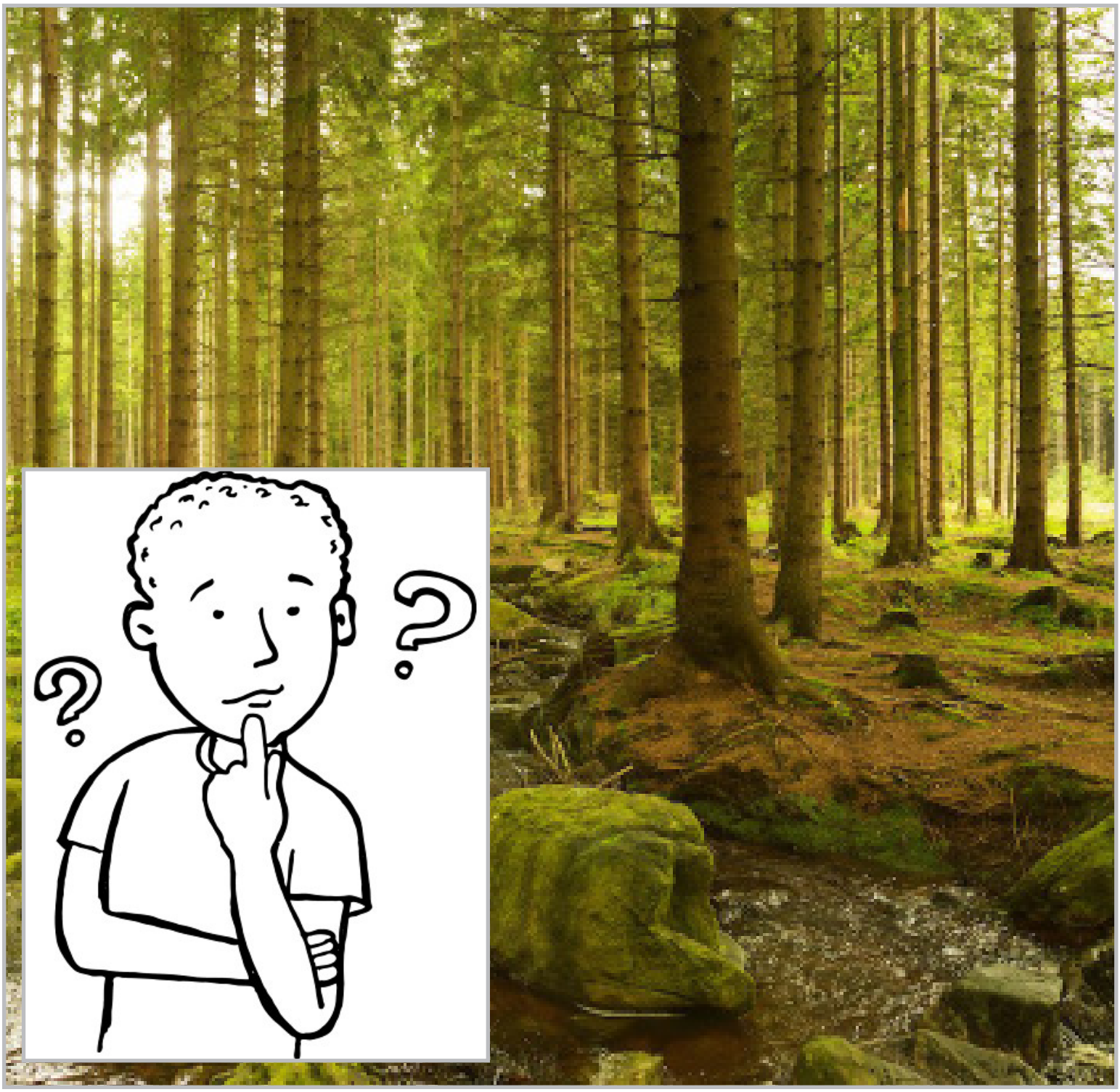
# Billions and billions (that's a LOT!) of trees are cut down every year to make paper.

It takes a lot of time and energy to cut down all of these trees.

Animals lose their homes when trees are cut down.

Trees can't make oxygen after they are cut down.

# What can you do to help so that fewer trees get cut down?



You can help save trees when you recycle!

# We can make new paper from the paper we recycle!

# TITLE | MAKING RECYCLED PAPER

## GRADE | Kindergarten

## UNIT | 2

## LESSON | 5

## OVERVIEW | In this lesson, students will make their own piece of recycled paper. In their extra time they will revisit their initial tree drawing from L1: Introduction to Trees in Our Garden, to see if anything has changed.

**Time**: 35 - 45 minutes (This lesson could take longer depending on the number of materials you have available).

**Focus Question**: What happens to our recycled paper?

**Key Terms:** PULP, RECYCLED PAPER

**Objectives:** Students will be able to…
1. make a piece of recycled paper.
2. make observations about trees.

## Materials/Prep Work:

- ☐ **Small pieces of paper soaked in water** for at least 12 hours
- ☐ **Blender**
- ☐ **Large bowl/bin**, to hold paper pulp
- ☐ **Trays**
- ☐ **Papermaking screens**
- ☐ **Felt pieces** to dry paper
- ☐ **Wax paper** to store paper as it dries
- ☐ **Marker**
- ☐ **Tree Drawing Worksheet** from L1: Introduction to Trees in Our Garden (also linked below). Note that the worksheet contains one place to draw a winter tree and another place to draw a spring tree. The worksheet might need to be modified slightly, depending on the current season.
- ☐ **Crayons/colored pencils**
- ☐ **Clipboards**

**Student Prior Knowledge:**
- An understanding of how paper is made in a papermill (as explained in **L4: How Paper is Made**).

## Lesson Steps:

**Introduction:** *(5 minutes)*
- **Greet** students at the garden entrance
- **Prompt** students to recall the process of making paper and talk in pairs as they walk to the seating area
  - **Record** student answers on the board
- **Show** students the pieces of paper they ripped in the last lesson.
- **Ask**: How can we reuse this? Do we have to put it in the trash?
  - **Prompt** students to brainstorm ways to reuse or make something new out the pieces of paper.
- **Say**: Today our science question is, “What happens to our recycled paper?”

## Activity 1: Making Paper Pulp *(5 minutes)*

- **Explain and remind** students about soaking the torn paper in water to make it soft.
- **Call** students up one at a time to help make paper PULP in the blender. Add extra water as needed so the consistency matches oatmeal or brownie batter.
- Transfer the pulp to a large bin. **Show** students the paper PULP and remind them that the pulp contains all of the little fibers that press together to make one big piece of paper.
- **Give** each student a small sample of the pulp to feel and observe.

## Activity 2: Making Paper *(15 minutes)*

- **Review** the steps to make paper, then aid students in making their own:
  - Put scoops of paper pulp in the middle of each paper screen
  - Gently use fingertips to spread the paper pulp on screen as thin as possible. Shape into desired shape
  - Lay felt flat over paper and press down with an open palm. Squeeze water from the felt and repeat until the paper is semi-dry.
  - Flip paper from the screen onto a piece of wax paper to dry (label with student names)

> *Organize the papermaking as you see fit, depending on how much adult help you have and the number of papermaking screens you have. You can split the class in half, call small groups, or work together with the whole class. If you need an alternative activity, another adult can read a book on recycling. Two recommendations include "Why Should I Recycle?" by Mike Gordon and "Don't Throw That Away" by Lara Bergen.*

## Activity 3: Tree Drawings

- While students wait for their turn to make recycled paper, have them revisit their worksheets from L1: Introductions to Trees in Our Garden.
- **Remind** students that they will be drawing the same tree that they drew during their first lesson.
- **Instruct** students to draw any changes or differences they see in the tree

## Closing: (5 minutes)

- **Ask**: How was our paper making process different from the process that happens in a papermill? What happens to our recycled paper when we put it in the recycling bin?
- **Revisit** focus question: "What happens to our recycled paper?"

## Additional Information:

**NGSS**:
[ESS3.A] Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)
[ESS3.C] Human Impacts on Earth Systems: Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)

## Classroom Extensions:

- Once the paper is dry, students can use it to draw a picture, make a bookmark, etc.

Name _____

**Tree Name** _____

| | |
|---|---|
| **Winter:** Date _____ | **Spring:** Date _____ |

# TITLE | FOOD FROM TREES

## GRADE | Kindergarten

## UNIT | 2

## LESSON | 6

## OVERVIEW | In this lesson, students will read a book about how chocolate is made. Students will make their own trail mix using ingredients that come from trees.

**Time**: 35 minutes

**Focus Question**: What foods grow on trees?

**Objectives:** Students will be able to…
1. name some foods that come from trees.
2. make a trail mix.

### Materials/Prep Work:

- ☐ At least 4 ingredients that come from trees, such as **coconut, dried apples, dried apricots, chocolate chips, almonds/walnuts, etc.**
- ☐ **Bowls** for each ingredient
- ☐ **Dixie cups**
- ☐ **Spoons** for each ingredient
- ☐ *Optional*: Book about how chocolate (or another tree fruit) is made, such as *From Cocoa to Chocolate* by Robin Nelson.
- ☐ *Optional*: Printed copies of Tree Trail Mix Recipe (attached below).

**Note: This lesson involves eating. Before the lesson, check in with the classroom teacher about students with food allergies.**

### Lesson Steps:

**Introduction:** *(10 minutes)*
- **Greet** students at the garden entrance.
- **Ask**: "Have you ever eaten food from a tree?"
  - **Record** student answers on the board
- **Ask**: "How do you know it came from a tree?"
  - **Have** students share their answers with a partner or the whole class.
- **Say**: Today our science question is, "What foods grow on trees?"

### Activity 1: Make Tree Trail Mix *(15 - 20 minutes)*

- **Read** the **Tree Trail Mix Recipe** together.
- Have students vote on which ingredients come from a tree
  - Using a pre-made chart **record** their answers on the board, listing the number of students who agree or disagree for each ingredient.

- Have students make their own trail mix by adding a scoop of each ingredient into their dixie cup. (See recipe attached below for additional details.)
- **Share** appreciations for trees as a full class before eating.
- *Optional Activity*: **Read** a book about how chocolate is made as students enjoy their snack.

## Closing: *(10 minutes)*

- **Revisit** science question: "What foods grow on trees?"
  - **Return** to the answers that were recorded on the board at the beginning of class and have students vote again to see if any of their answers change.
  - **Share** that all of the trail mix ingredients came from different trees.
- **Revisit** the focus question from the beginning of the unit ("Why are trees important?"). Have students share additional responses.

## Additional Information:

**NGSS**:
[ESS3.A]: Natural Resources Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

## Blog Links:

1. K. Owyang (2015, April 25). "Roots, Trunk, Branches, Leaves" [Web log post]. Retrieved June 14, 2019, from https://educationoutsideafy.wordpress.com/2015/04/26/roots-trunk-branches-leaves/

# Tree Trail Mix

## Materials:

- ☐ At least 4 ingredients that come from trees such as **coconut, dried apples, dried apricots, almonds/walnuts** (check for nut allergies with the classroom teacher)
- ☐ **Bowls** for each ingredient
- ☐ **Paper cups**
- ☐ **Spoons** for each ingredient

## Recipe:

Ingredients

- Dried coconut flakes
- Dried fruit (apple, apricot, cherries)
- Dried banana chips
- Nuts - ***These can be included, however most schools have strong policies around nuts given the high possibility of allergies. Please check.***

Instructions

1. Before the lesson put each ingredient in a bowl with 2-3 spoons.
2. Number the bowls and place them in different locations throughout the garden.
3. *Optional*: Place arrows between each bowl to direct students from one bowl to the next.
4. Demonstrate how to properly add ingredients to their paper cups.
5. Divide students into groups and have them rotate between each station, adding one ingredient at a time.
6. Return to the group and taste the trail mix together.