



MAY THE FOREST

BE WITH YOU ALWAYS

GRADES K-8

EDUCATION AND LESSON PLANS GUIDE



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Dear Conservation District Educators and Staff,

Welcome to the National Association of Conservation Districts (NACD) newly developed Education and Lesson Plan Guide. This comprehensive resource has been carefully designed to support and enrich your conservation district's education initiatives.

The guide covers a variety of topics for environmental stewardship, including ecosystems, water conservation, sustainable agriculture, climate change, biodiversity conservation, land use planning, and environmental policy and advocacy. It is designed to be versatile and adaptable, making it suitable for various educational settings and accommodating different age groups, grade levels, and learning styles.

To ensure an engaging learning experience, the guide offers a variety of interactive activities, visually appealing materials, and discussion prompts and encourages further exploration and discovery.

One notable aspect of this guide is its flexibility. While it can be effectively used for the listed grade levels, it can also be adapted and customized for other educational contexts. The modular structure allows educators to select and modify the content according to the needs and preferences of their students.

This flexibility enables the guide to be applied in diverse educational settings, including workshops, community events, and informal learning environments. We believe this guide will significantly enhance your conservation education efforts, amplifying their impact and effectiveness.

Your feedback and suggestions are highly valued as we continue to improve and expand this resource, ensuring its ongoing relevance and value. You can always reach out to us for comments or assistance at stewardship@nacdnet.org.

NACD sincerely appreciates your unwavering dedication to conservation education. It is our privilege to provide you with this educational guide, and we look forward to hearing about the positive outcomes it brings to your teaching and outreach endeavors.

Best regards,

NACD Stewardship and Education Staff



PRIMARY

SUGGESTED FOR GRADES K-2





INTRODUCTION TO TREES

STUDENTS ARE INTRODUCED TO THE BASICS OF TREES FROM SEED TO SAPLING AND BEYOND!

PRIMARY
Kindergarten - 2nd

DURATION: 60 MINUTES

OBJECTIVES:

- Students will develop a basic understanding of trees and characteristics.
- The basic needs of a tree and the importance of trees in our environment.

MATERIALS:

- Picture books about trees
- Video links about trees
- Large paper or whiteboard
- Colored markers

STANDARDS:

Next Generation Science Standards (NGSS):

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Common Core State Standards (CCSS): English Language Arts:

- Reading Standards for Informational Text (CCSS.ELA-LITERACY.RI.K-2.1): Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- Writing Standards (CCSS.ELA-LITERACY.W.K-2.2): Use a combination of drawing, dictating, and writing to compose informative and explanatory texts.

INTRODUCTION:

Gather the students in a circle and show them pictures or illustrations of trees.

- Ask students what they know about trees and invite them to share ideas.
- Explain that trees are living and need certain things to survive and grow.



VIDEO LINKS, BOOK AND DISCUSSION:

- Smartkids - Discover what makes up a tree:
 - youtu.be/QaUJNaDrJZE
- Kids STEM #TeamTrees:
 - youtu.be/SWPqQxz-7gg
- Book: "The Busy Tree" by Jennifer Ward
- Discussion:
 - What did you learn about the basic needs of trees?
 - Identify things that trees need to survive and grow?
 - Share places where you have seen trees.

BASIC NEEDS OF A TREE:

- Show more pictures of trees, including pictures of trees that have experienced too much water, insufficient light, or other poor conditions, and discuss the basic needs of a tree: sunlight, space, soil, and water.

EXPLAIN THE IMPORTANCE OF EACH NEED BRIEFLY:

- Sunlight: Trees need sunlight to make food through a process called photosynthesis.
- Space: Trees need enough space for their roots to grow and spread out in the soil.
- Soil: Trees need healthy soil that provides nutrients and anchors the roots.
- Water: Trees need water for hydration and to transport nutrients throughout their structure.



INTRODUCTION TO TREES

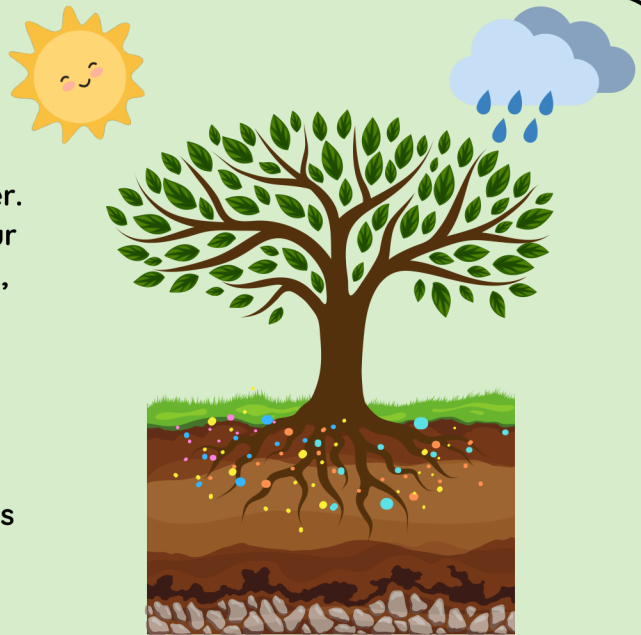


EXPLAIN THE EFFECTS ON TREES THAT EXPERIENCE POOR GROWING CONDITIONS:

- Sunlight: When trees don't receive enough sunlight, their growth and ability to produce food are hindered, leading to stunted growth and weak branches.
- Space: When trees are crowded or have limited space, their root systems can become cramped, affecting their ability to absorb water and nutrients, resulting in poor overall health and development.
- Soil: Poor soil quality can lack essential nutrients, making it difficult for trees to obtain the necessary nourishment. It can also lead to weak root anchorage, making trees more susceptible to being uprooted during storms or strong winds.
- Water: Insufficient water availability can cause trees to experience drought stress, resulting in wilted leaves, reduced growth, and even tree death. On the other hand, excessive water or poor drainage can lead to waterlogged soil, suffocating the roots and causing root rot or other diseases.

CREATING A TREE DIAGRAM:

- Draw a simple tree diagram on a large paper or whiteboard, including the basic needs of a tree: sunlight, space, soil, water. Tip! Add in the soil nutrients that feed your tree. Blue dots can reference water in soil, while colorful dots reference nutrients.
- Invite students to come up and add their own drawings or labels to the diagram, guided by your instructions.
- Encourage participation and ask questions to reinforce their understanding of the basic needs of a tree



CONCLUSION:

- Summarize the main points covered during the lesson, emphasizing that trees need sunlight, space, soil, and water to survive and grow.
- Discuss the importance of trees in providing oxygen, shade, and homes for animals.
- Encourage students to observe and appreciate trees in their everyday lives.

EXTENSIONS:

Take a nature walk around the school or neighborhood to observe and identify different trees and discuss their basic needs. Invite a local forester, arborist, or tree expert to visit the classroom and share insights about trees and their basic needs.





INTRODUCTION TO TREES

Parts of a tree "question-and-answer session."

During this activity, pose these questions to the class, and encourage the students to raise their hands and provide answers verbally.

1) Trees are living or non-living things that need certain things to survive and grow?

Answer: Living

2) One of the basic needs of a tree is moonlight or sunlight?

Answer: Sunlight

3) Trees need enough of two things for their roots to grow and spread out in the soil.

Answer: Space and water

4) What is important for trees as it provides nutrients and anchors the roots.

Answer: Soil

5) Which of the following is essential for a tree's hydration? Air or Water?

Answer: Water

6) Poor soil quality can make it difficult for trees to obtain necessary what?

Answer: Nutrients

7) Insufficient water availability is called a?

Answer: Drought

8) Trees provide this and it allows us to breathe.

Answer: Oxygen

9) Trees are important habitats to many animals. Can you name a few animals that rely on trees for shelter, food, or other resources? Students may share the names of animals that depend on trees as habitats.

10) Discussion Prompt: "Students, Think about the place where you live, your home, and the surrounding area. What are some key features that make it a suitable habitat for humans? Raise your hand to share one characteristic or element that make your habitat a good place for humans to live."





PARTS OF A TREE

EXPLORING PARTS OF TREES, FROM THE ROOTS TO THE LEAVES, THROUGH HANDS-ON ACTIVITIES

PRIMARY
Kindergarten - 2nd
DURATION: 60 MINUTES

OBJECTIVE:

Students will learn the basic parts of a tree (roots, trunk, branches, leaves) and their functions by exploring actual parts of trees brought into the classroom and creating a tactile tree diagram using recycled materials.

STANDARDS:

Next Generation Science Standards (NGSS):

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Common Core State Standards (CCSS) - English Language Arts:

- Reading Standards for Informational Text (CCSS.ELA-LITERACY.RI.K-2.1): Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

This lesson plan aligns with Next Generation Science Standards by focusing on the needs of plants (trees) and conducting an investigation to understand their requirements for sunlight and water. It also addresses Common Core writing standards by incorporating drawing and composing informative texts. In addition, the lesson plan covers key elements of scientific inquiry and understanding, as well as concepts related to life science, as outlined in the National Science Education Standards.

INTRODUCTION:

Begin by discussing trees and asking students what they notice about them. Encourage discussion and ask if they have ever climbed a tree or studied a tree up close.

Share interesting facts about trees, such as their height, age, and the different types of trees found in forests.

Exploring Prior Knowledge:

- Ask students if they know any parts of a tree already. Write their answers on the board and discuss their responses.

Introduce the Parts of a Tree:

- Show actual parts of a tree such as roots, twigs, branches, and leaves. Discuss the different parts and their functions. (in illustration or as a seedling/sapling)
- Explain the function of each part:
 - Roots: Explain that roots help the tree stand up and act like the tree's feet. They also absorb water and nutrients from the soil.
 - Trunk: Describe the trunk as the tree's main support system, like a backbone. It helps transport water and nutrients from the roots to the rest of the tree.
 - Branches: Discuss how branches extend from the trunk and provide support for the leaves. They also serve as homes for birds and other animals.
 - Leaves: Explain that leaves are like the tree's food factories. They use sunlight to make food through a process called photosynthesis.





PARTS OF A TREE

MY HAND TREE

MATERIALS:

- Half-sized poster paper
- Construction paper (various colors)
- Scissors
- String or yarn
- Glue
- Crayons or markers

INSTRUCTIONS:

- Begin by tracing the student's hand onto a sheet of brown construction paper. This will serve as the tree trunk and branches.
- Cut out the traced hand shape carefully.
- Use a pencil or marker to draw lines representing branches on the hand cutout. Be creative and make the branches reach out in different directions.
- Cut small pieces of string or yarn and glue them onto the bottom of the hand cutout to create the roots of the tree.
- Next, cut out leaf shapes from different colored construction paper scraps. These can be any shape you like, such as oval or teardrop.
- Apply glue to the branches of the hand cutout, and carefully stick the paper leaves onto the glue.
- Allow the glue to dry completely.
- Once the craft is dry, students can personalize their tree by adding details such as drawing a background or additional decorations around the tree.
- Encourage students to share their hand trees with their classmates and discuss the different parts of a tree they created.



GREAT IDEA!

HOW ABOUT A FOREST THEMED SNACK WHILE WE MAKE OUR HAND TREES?





EXPLORING THE LIFE CYCLE AND GROWTH OF TREES

STUDENTS WILL LEARN ABOUT THE LIFE CYCLE OF TREES, THE FACTORS THAT AFFECT TREE GROWTH

PRIMARY

Kindergarten - 2nd

DURATION: 2-3 CLASSES

OBJECTIVE:

Students will understand the life cycle of a tree, including the stages of germination, seedling, sapling, maturity and describe the factors necessary for tree growth, such as sunlight, water, nutrients, and suitable environmental conditions.

STANDARDS:

Next Generation Science Standards (NGSS):

- 1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Common Core State Standards:

- CCSS.ELA-LITERACY.RI.K.7: With prompting and support, describe the relationship between illustrations and the text in which they appear.
- CCSS.ELA-LITERACY.W.K.8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- CCSS.ELA-LITERACY.SL.K.4: Describe familiar people, places, things, and events with prompting and support.

National Science Education Standards:

- Content Standard C: Life Science (K-2)
- Content Standard D: Earth and Space Science (K-2)

INTRODUCTION:

Begin by discussing the importance of trees and introducing the concept of a tree's life cycle. When discussing the importance of trees and introducing the concept of a tree's life cycle, it's essential to engage students with clear and concise explanations.



ORAL DISCUSSION:

Importance of Trees : "Today, we are going to learn about trees and why they are so important to us and our planet. Trees are like nature's champions! They provide us with many benefits. First, they give us something vital for our survival: oxygen. Just like we need air to breathe, trees produce oxygen for us to breathe too. They also help clean the air by absorbing carbon dioxide, which is a gas that can be harmful if there is too much of it in our atmosphere. So, trees help us have fresh, clean air to breathe."

"Trees are not just important for the air we breathe. They also provide homes for many animals. Animals like birds, squirrels, and insects make their homes in trees. Trees also give us shade on sunny days and help keep our environment cool. They even help prevent soil erosion, which is when soil gets washed away by rain. Without trees, the soil can be carried away, making it hard for plants to grow."

Tree Life Cycle: "Now, let's talk about the life cycle of a tree. Just like people, trees have a life cycle too. It starts with a tiny seed. This seed needs certain things to grow, just like we need food and water. Trees need sunlight, water, and nutrients from the soil. When a seed gets the right conditions, it begins to sprout and grow roots. This stage is called germination."

"As the seed grows, it becomes a seedling. The seedling starts to develop a stem and leaves. It's like a baby tree! With time and proper care, the seedling becomes a sapling. It grows taller, and its branches get bigger. Finally, after many years, it becomes a mature tree. A mature tree can be very tall and strong, providing shade and homes for animals. Remember, just like we grow and change, trees do too. It's fascinating to observe and learn about the different stages of a tree's life cycle. By understanding this life cycle, we can appreciate the beauty and importance of trees even more."





EXPLORING THE LIFE CYCLE AND GROWTH OF TREES

Color, cut and paste the pictures in the correct order

1

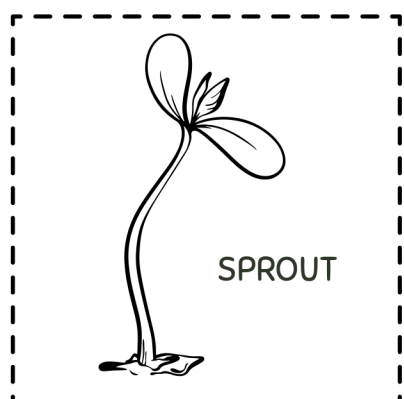
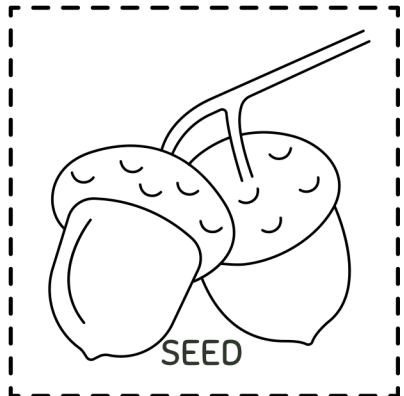
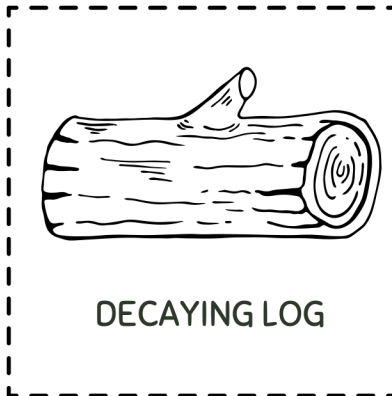
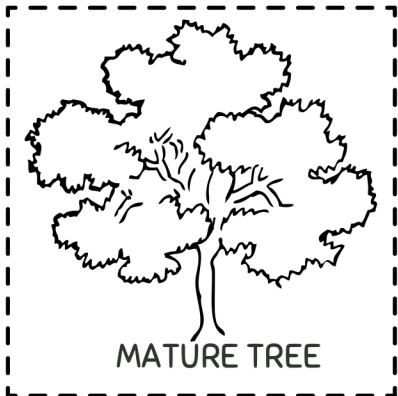
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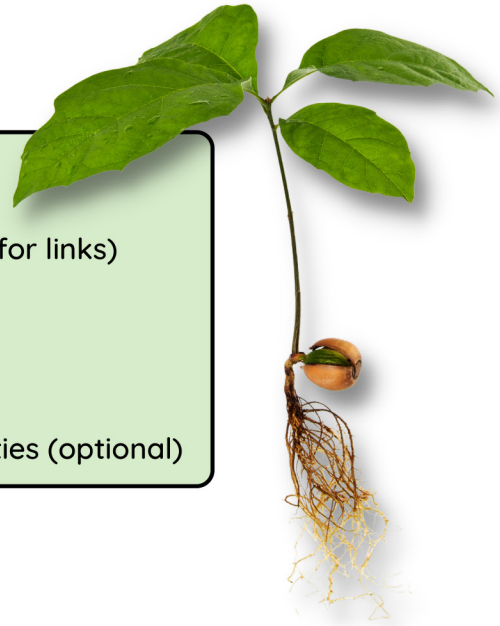
EXPLORING THE LIFE CYCLE AND GROWTH OF TREES

Session 2 - Tree Planting

Session 3 - Ongoing Observation

Materials:

- Tree seeds sourced from local trees
- Planting pots made from heavy duty paper (see index for links)
- Potting Soil
- Recycled squeeze bottles
- Sunny Window or grow lights
- K-2 Student Journals
- Cameras or devices with time-lapse recording capabilities (optional)



SESSION 2:

HANDS-ON TREE PLANTING AND OBSERVATIONS

- Provide each student with a planting pot or cup, soil, and a tree seed (acorn, apple seed, or any suitable tree seed).
- Instruct students to fill their pots with soil and plant the tree seed according to the provided instructions.
- Discuss the importance of watering the seeds and finding an appropriate location for sunlight exposure.
- Encourage students to maintain observation journals or notebooks to record daily observations of their planted seeds. They can draw pictures, write descriptions, or use a combination of both.
- Explain the purpose of documenting the growth process and discuss the concept of time-lapse videos, if available.



Use recycled paper pots for your tree plantings!

SESSION 3:

ONGOING OBSERVATIONS AND REFLECTION

- Begin by reviewing the previous sessions' concepts of the tree life cycle and growth factors.
- Allow students to share their observations and discuss any changes they have noticed in their planted seeds.
- Encourage students to continue maintaining their observation journals and record any growth they observe.
- If time-lapse recording is available, guide students in creating short time-lapse videos of their planted seeds' growth process.
- Conclude the lesson by facilitating a group discussion to reflect on their observations, experiences, and newfound understanding of tree life cycles and growth.



FOREST HABITATS

A JOURNEY THROUGH THE FOREST TO LEARN ABOUT PLANTS, ANIMALS, AND ENVIRONMENTAL FEATURES OF A FOREST HABITAT

PRIMARY
Kindergarten - 2nd
DURATION: 60 MINUTES

OBJECTIVES:

- Students will explore the forest habitat, identify its characteristics, and learn about the plants and animals that live in forests.
- Students will learn about the interdependence of these organisms and how they all contribute to a healthy forest ecosystem.
- Students will apply their knowledge of forest habitats and animal adaptations by designing and constructing a habitat for a specific animal using materials found in nature and provided plastic toy insects or animals.

STANDARDS:

Next Generation Science Standards (NGSS):

- Functioning, and Resilience - Students explore the characteristics of a forest habitat, including the presence of trees, shrubs, undergrowth, and various types of animals. They also learn about the adaptations of plants and animals in the forest ecosystem.

Common Core State Standards (CCSS):

- ELA-LITERACY.SL.K.1: Participate in collaborative conversations - Students engage in collaborative conversations during the introduction, forest habitat exploration, and habitat presentation, explaining their design choices and discussing their observations.
- ELA-LITERACY.SL.K.5: Add drawings or other visual displays - Students create visual displays of the forest habitat through the diorama activity and may also choose to write or draw about their experience.
- ELA-LITERACY.W.K.2: Use a combination of drawing, dictating, and writing to compose informative/explanatory texts - Students have the option to write or draw about their experience, describing the animal they designed a habitat for and explaining why their design is suitable.

INTRODUCTION:

Show images or videos of forest habitats and discuss with students what they notice about these environments. Ask questions to activate their prior knowledge about forests, such as "What kind of plants and animals do you think live in the forest?"



VIDEO LINKS, BOOK AND DISCUSSION:

- Learnforests.org
 - youtu.be/QaUJNaDrJZE
- Learn Bright - Habitats for Kids:
 - youtu.be/SWPqQxz-7gg
- Book: "A Day and Night in the Forest" by Caroline Arnold

DISCUSSION:

- Engage students in a discussion about the characteristics of a forest habitat, such as the presence of trees, shrubs, undergrowth, and various types of insects and animals.
- Introduce vocabulary words related to the forest habitat. (Educators choice)

FOREST HABITAT EXPLORATION:

- Take the students on a virtual or actual walk through a forested area if available. (Youtube has great virtual walks! Preview for content, ensure the virtual tour includes animal sightings and sounds)
- Encourage students to observe their surroundings and identify the characteristics discussed earlier, such as different types of trees, plants, and animals they could encounter and what their habitats may be.
- Guide students to use their senses to explore the forest habitat, listening for animal sounds and looking for signs of animal life.



FOREST HABITATS



PLANT AND ANIMAL ADAPTATIONS:

- Discuss how plants and animals in the forest habitat have special adaptations to survive in this environment.
- Provide examples of plant adaptations, such as broad leaves to capture sunlight, and animal adaptations, such as camouflage or strong climbing abilities.
- Encourage students to share their observations of plant and animal adaptations during the forest habitat exploration.

Activity: Forest Habitats



INTRODUCTION:

Review the concept of habitats and animal adaptations discussed in the previous lesson

INSTRUCTIONS:



- Distribute plastic toy insects or animals to each student, representing different forest animals.
- Explain to students that their task is to create a suitable habitat for their assigned animal using materials found in nature and provided materials.
- Discuss the essential components their habitat should include, such as access to food or water, shelter from elements, and camouflage.



SCAVENGING AND GATHERING MATERIALS:



- Instruct students to go outdoors and gather natural materials such as leaves, twigs, rocks, and pinecones that can be used to build their habitats.
- Explain to students this is how insects and animals must collect their construction materials as well! Remind the students that gathering materials would be very difficult and labor intensive and they should be mindful of that when destroying habitats of animals.
- Alternatively, allow students to bring materials from home that they think would be suitable for their habitat.



Remember! The Forest Habitats project is supposed to be fun! Reuse your colorful Easter eggs or even fall leaves from decorations. Use your imagination!





FOREST HABITATS



DESIGNING AND CONSTRUCTING THE HABITAT:

- Provide students with additional materials brought from home or provided in the classroom (e.g., craft paper, cardboard, fabric, cotton balls) to complement their natural materials.
- Encourage students to plan and design their habitat, considering the specific needs and characteristics of their assigned animal.
- Assist students as needed in cutting, shaping, and assembling the materials to create the habitat.

INCORPORATING ESSENTIAL ELEMENTS:

Instruct students to ensure their habitat includes the necessary elements for their animal to survive, such as food sources (e.g., leaves, flowers, fruits), water sources (e.g., small bowls or puddles), hiding spots, and appropriate camouflage.



Habitats Presentations Today!

- Habitats Need:
- 1) Space
 - 2) Shelter from elements
 - 3) Food and Water
 - 4) Camouflage for protection



PRESENTATION AND EXPLANATION:

- Give students the opportunity to present their habitats to the class.
- Encourage each student to explain the design choices they made and how their habitat meets the needs of their assigned animal.
- Allow time for questions and discussions among students.
- Engage students in a class discussion, reflecting on the importance of habitats for animals and the connections to their own lives.



NATURE'S FEAST: THE FOREST FOOD CHAIN

The web of life and the interdependence and diversity of species through exploration of the forest food chain.

PRIMARY
Kindergarten - 2nd
DURATION: 60 MINUTES

OBJECTIVES:

- Students will explore the different plants and animals that live in forests and the interdependence of these organisms and how they all contribute to a healthy forest ecosystem.
- Students will be able to identify the different organisms in a forest food chain and understand their roles.
- By engaging in the hands-on project, students will have a visual representation of the forest food chain and gain a deeper understanding of how energy flows through an ecosystem.

CORRELATION TO STANDARDS:

- Next Generation Science Standards (NGSS): LS1.C: Organization for Matter and Energy Flow in Organisms: Students learn about the forest food chain, understand the roles of different organisms, and gain an understanding of how energy flows through an ecosystem.
- Common Core State Standards (CCSS): ELA-LITERACY.SL.K.1: Participate in collaborative conversations: Students engage in collaborative conversations during the introduction, activity, and presentation, explaining their food chains and discussing the relationships between organisms.
- CCSS.ELA-LITERACY.SL.K.5: Add drawings or other visual displays Students create a visual representation of the forest food chain through the mobile activity and may also use drawings to decorate their construction paper.
- CCSS.ELA-LITERACY.W.K.2: Use a combination of drawing, dictating, and writing to compose: informative and explanatory texts. Students have the option to write or draw about their food chains, explaining the significance of each organism and the overall balance in the forest ecosystem.

INTRODUCTION:

We are going to discuss the concept of a forest food chain. This lesson will increase understanding of the importance of ecological balance and understanding how energy flows in a forest ecosystem.

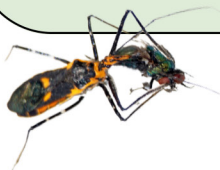
Use age appropriate language. The food chain can be challenging for young children to comprehend due to the harsh reality of predation and the concept of animals relying on one another for survival.



Introduce the concept of a food chain and its importance: Begin by explaining that a food chain is like a line that shows us who eats whom in the forest ecosystem. It helps students understand what animals and plants eat and how they are connected. Emphasize the significance of understanding how energy flows in an ecosystem.

Here's an example of an oral introduction:

"Good morning, everyone! Today, we're going to explore the forest's food chain. The food chain is like a line that shows us who eats whom in the forest. Just like we eat food for energy, animals and plants in the forest depend on each other too. Let's take an example: plants in the forest, known as producers, make their own food using sunlight, water, and air. Then, there are insects that feed on these plants, known as herbivores. And guess what? Animals like squirrels come along and enjoy a snack of those insects. These squirrels are known as carnivores because they eat other animals. Do you see how everything is interconnected? The food chain helps maintain a delicate balance in the forest's ecosystem. By understanding this chain, we can appreciate the significance of each creature, big or small. So, let's explore the stories of the forest's food chain together!"





NATURES FEAST: THE FOREST FOOD CHAIN

Encourage curiosity and interactivity: Foster a sense of curiosity by posing thought-provoking questions and encouraging students to ask their own questions. Make the learning experience interactive by incorporating hands-on activities or group discussions related to the topic.

Here's a few teaching tips!

- Start with the producers: "In the forest, we have plants called 'producers' that make their own food using sunlight, water, and air. These are the start of the food chain. Can you think of some plants in the forest?"
- Move on to the herbivores: "Next, we have animals called 'herbivores' that eat the plants. Herbivores are plant-eaters. They get their energy by eating leaves, fruits, and other plant parts. Can you think of an animal that eats plants?"
- Introduce the carnivores/omnivores: "After the herbivores, we have animals called 'carnivores' or 'omnivores.' Carnivores are meat-eaters, and omnivores eat both plants and meat. They get their energy by eating other animals. Can you think of an animal that eats other animals?"
- Explain the energy flow: "When an animal eats another animal, it gets the energy from that animal. This is how energy flows in the food chain. It's like passing the energy from one to another. Can you imagine the energy going from the plants to the herbivores, and then to the carnivores or omnivores?"
- Reinforce the concept: "Remember, a food chain shows us who eats whom. It helps us understand how energy moves in the forest. Every living thing is a part of this chain, and if something changes in one part, it can affect the whole chain."



- Use visual aids: You can show pictures or use simple drawings of plants and animals to illustrate the food chain concept. Additionally, consider using props or puppets to make the explanation more interactive and fun. (finger puppets are inexpensive and easy to acquire!)
- Recap and relate to real-life examples: Summarize the main points and relate the concept to everyday examples. For instance, you can mention that we are also a part of the food chain when we eat plants or animals for our meals.



NATURES FEAST: THE FOREST FOOD CHAIN



Activity: Forest Food Chain

Explain that students will be creating a mobile to illustrate the forest food chain. Remember to use age-appropriate language, ask questions to check for understanding, and allow students to share their thoughts and observations throughout the explanation. Encourage their curiosity and make the learning experience interactive and engaging.

- Divide the students into groups or let them work individually. Each group will focus on a specific forest habitat and its food chain (e.g., deciduous forest, rainforest, coniferous forest).
- Provide the necessary materials: construction paper, scissors, glue sticks, and other materials found in nature. Instruct the students to draw and cut out various forest organisms from construction paper or use images/printouts of forest animals and plants. Encourage creativity and accuracy in their representations. (OPTIONAL: Use magazine or printed photos)
- Have students arrange the cutouts in a sequence that represents the food chain. The producers (plants) should be at the bottom, followed by the primary consumers (herbivores), and then the secondary consumers (carnivores or omnivores). Remind them to consider the relationships and energy flow between the organisms.

Materials

- Construction paper
- Glue sticks
- Scissors
- Yarn or string
- Pencils or markers
- Magazines (optional)
- 8" to 12" twigs
- Hole punch

For an upcycled project, use old magazines to find your forest food chain organisms! You can find plants, wildlife, insects and more in the colorful pages of magazines.

QUICK TIPS



- Once the organisms are arranged, assist the students in attaching the cutouts to the yarn or string using glue sticks. They can use hole punchers to create holes in the cutouts for the string to pass through.
- Allow the students to decorate the construction paper with additional drawings, colors, or natural materials found. They can create a background representing the forest habitat using brown paper for the ground and green paper for trees, or by gluing on leaves, twigs or other natural items found.
- Help the students tie the ends of the yarn or string to a twig, creating a mobile. (two twigs can be used and crisscrossed) Hang the mobiles in the classroom or a designated area where they can be displayed.
- Encourage students to explain their food chains and the relationships between the organisms in their mobiles. They can present their projects to the class, discussing the significance of each organism and the overall balance in the forest ecosystem.



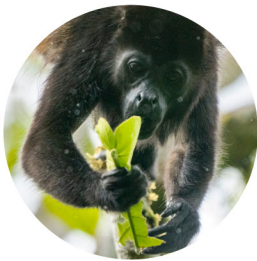
NATURES FEAST: THE FOREST FOOD CHAIN

Activity: Forest Food Chain

EDUCATOR CLASS EXAMPLES

Deciduous Forest Food Chain:

- Producers: Oak tree leaves and acorns
- Primary Consumer: Eastern cottontail rabbit eats oak leaves
- Secondary Consumer: Red-tailed hawk preys on the rabbit
- Tertiary Consumer: Gray wolf hunts and eats the red-tailed hawk
- So, the food chain in the deciduous forest looks like this: Oak tree leaves and acorns → Eastern cottontail rabbit → Red-tailed hawk → Gray wolf.



Rainforest Food Chain:

- Producers: Tropical rainforest plants, like bananas and coconuts
- Primary Consumer: Howler monkey eats bananas and coconuts
- Secondary Consumer: Harpy eagle catches and consumes the howler monkey
- Tertiary Consumer: Jaguar preys on the harpy eagle
- The rainforest food chain looks like this: Tropical rainforest plants → Howler monkey → Harpy eagle → Jaguar.

Coniferous Forest Food Chain:

- Producers: Pine tree needles and cones
- Primary Consumer: Snowshoe hare eats pine needles and cones
- Secondary Consumer: Northern spotted owl feeds on a snowshoe hare
- Tertiary Consumer: Gray wolf preys on the northern spotted owl
- The coniferous forest food chain looks like this: Pine tree needles and cones → Snowshoe hare → Northern spotted owl → Gray wolf.



The aquatic food chain in both saltwater and freshwater ecosystems involves a series of interactions among various organisms, starting with primary producers like phytoplankton and algae. Remember that food chains can be more complex and interconnected in actual marine ecosystems. The food chain plays a vital role in maintaining ecological balance in aquatic environments.

- Phytoplankton (primary producers) -> Zooplankton (secondary consumers) -> Small Fishes (primary consumers) -> Large Fishes (tertiary consumers)

NOTES:



NATURES FEAST: THE FOREST FOOD CHAIN

DISCUSSION AND QUESTIONS:

Engage students in discussions and ask questions to assess their comprehension. Ask open-ended questions, such as:

"Can you explain what a food chain is?" "What role do plants play in the food chain?" "Can you give an example of a herbivore?" "How does energy flow in a food chain?"

PRESENTATION OR EXPLANATION:

Provide an opportunity for students to present or explain their mobiles to the class or in small groups. Assess their ability to articulate the relationships within their food chains, describe the energy flow, and discuss the importance of balance in an ecosystem.

OPTIONAL:

Written or Drawing Task: Assign a simple task where students can demonstrate their understanding through writing or drawing. For example: Have students write a short sentence explaining the role of a specific organism in the food chain, or, ask students to draw a diagram of a forest food chain, labeling the different components.

Remember, assessment at this age level should focus on formative assessment, providing feedback, and identifying areas where students may need further support. Encourage students' participation, creativity, and critical thinking throughout the assessment process.



ADDITIONAL TEACHERS NOTES:



Do you have great ideas or suggestions on improving this, or other lesson plans? See edits that need made? We appreciate your participation! Email us! stewardship@nacdn.net

ASSESSMENT:

Observational Assessment: Throughout the lesson, observe students' engagement, participation, and understanding. Take note of their ability to identify and describe the different components of the forest food chain, including producers, herbivores, and carnivores/omnivores.

Informal Assessment: Engage in informal conversations with students while they are working on their mobiles or participating in activities related to the lesson. This will allow you to gauge their understanding, address any misconceptions, and provide individual support as needed

Mobile Creation: Assess students' ability to create their forest food chain mobiles. Observe if they sequence the organisms correctly and include appropriate representations of plants and animals. Pay attention to their attention to detail, creativity, and use of materials.



ADAPTATION: SURVIVING IN THE FOREST

Discover how plants and animals adapt to their surroundings.

PRIMARY
Kindergarten - 2nd

DURATION: 60 MINUTES

OBJECTIVES:

- Students will learn about the various adaptations of plants and animals in forest ecosystems and how these adaptations help them survive and thrive in their environment.
- Students will create forest creature sculptures using recycled materials to reinforce their understanding of forest adaptations and foster creativity.

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Common Core State Standards (CCSS)

- SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- W.K.2: Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

INTRODUCTION:

Recap the previous lessons on the forest food chain and forest habitat, reminding students of the interdependence of plants and animals in the forest ecosystem. Explain that today's lesson will focus on how plants and animals have unique adaptations that help them survive and thrive in the forest.

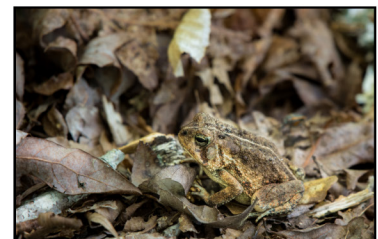


Keyword: Adaptation (noun) a modification of an organism or its parts that makes it more fit for existence.

Begin this lesson by engaging your students in a discussion about what adaptations are and why they are important for living things. Adaptations are vital to living things as they enable organisms to effectively respond to challenges in their environment, ensuring survival and successful reproduction.

Teacher presentation points: In a forest ecosystem, where resources and conditions can vary drastically, adaptations play a role in helping plants and animals thrive. From the camouflage of forest animals to blend with their surroundings, to the specialized feeding habits that allow creatures to secure essential food sources, these adaptations enhance an organism's chances of avoiding predators, finding food, and successfully reproducing, ultimately contributing to the delicate balance and biodiversity of the forest ecosystem.

Forest adaptation refers to the special features and behaviors that plants and animals develop to survive and thrive in forest habitats. These adaptations help organisms meet their basic needs, such as obtaining food, water, shelter, and protection from predators.



Frogs camouflage in the forest by developing skin colors and patterns that mimic their surroundings, such as the green tones of leaves or the brown hues of tree bark. This adaptation helps them avoid predators and remain inconspicuous while resting on leaves or near the forest floor, increasing their chances of survival in their natural habitat.



ADAPTATION: SURVIVING IN THE FOREST

Discover how plants and animals adapt to their surroundings.

Here are some simplified explanations of forest adaptations for students in grades K-2:

Plant Adaptations:

- **Broad Leaves:** Many forest plants have broad leaves to capture sunlight effectively for photosynthesis, which is the process plants use to make their food.
- **Tall Trees:** Trees in the forest often grow tall to reach above the lower vegetation and compete for sunlight.
- **Strong Roots:** Forest plants have strong roots to anchor them in the ground and absorb water and nutrients from the soil.

Animal Adaptations:

- **Camouflage:** Some animals in the forest have colors or patterns that help them blend into their surroundings, making it harder for predators to spot them. For example, a brown butterfly can camouflage among tree bark.
- **Climbing Abilities:** Many forest animals, such as squirrels and monkeys, have adaptations like strong limbs or claws that allow them to climb trees and move easily between branches.
- **Nocturnal Behavior:** Some animals in the forest are active at night and have adaptations like night vision or keen hearing to help them navigate and find food in the dark.

Seed Dispersal:

- Some plants in the forest have adaptations to disperse their seeds so they can spread and grow in new areas. For example, seeds may have wings or be surrounded by fruits that are eaten by animals. The animals then carry the seeds away and deposit them in different locations.

Hibernation:

- Many forest animals have adaptations for surviving the winter when food is scarce. Some animals, like bears, hibernate, which means they sleep for long periods and lower their body temperature to conserve energy until spring when food becomes more abundant.

Decomposition:

- Forests have a lot of dead plant material, and decomposers like fungi and bacteria have adaptations to break down this organic matter into nutrients that can be used by other plants. They play a crucial role in recycling nutrients in the forest ecosystem.

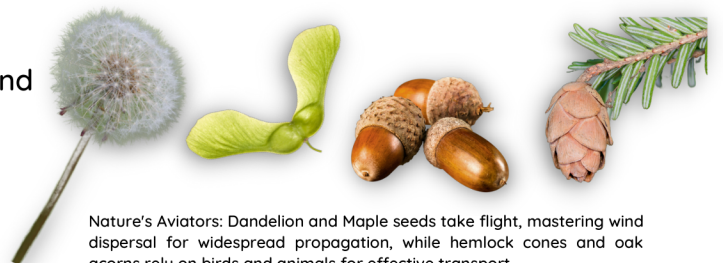
CLASS DISCUSSION: ADAPTATIONS IN FORESTS:

Facilitate a discussion on the different adaptations identified by the students.

Explore how these adaptations help organisms survive in the forest, such as how camouflage helps animals hide from predators or how wide leaves capture sunlight for photosynthesis.

CONCLUSION:

Studying forest adaptations helps us understand how organisms are uniquely suited to their environments and how they contribute to the overall health and balance of the ecosystem.



Nature's Aviators: Dandelion and Maple seeds take flight, mastering wind dispersal for widespread propagation, while hemlock cones and oak acorns rely on birds and animals for effective transport



ADAPTATION: SURVIVING IN THE FOREST

Discover how plants and animals adapt to their surroundings.

This interactive activity encourages collaboration, critical thinking, and enhances students' understanding of the various adaptations that enable plants and animals



Interactive Activity: Match the Adaptation:

1. Divide the students into groups and provide each group with this worksheet providing adaptation cards representing various plant and animal adaptations found in the forest ecosystem.
2. Instruct students to cut out the adaptation cards and place them face down on their desks.
3. Start a timer for 5 minutes, and have the students take turns flipping the cards one by one.
4. When the group flips a card, they will write down one corresponding plant or animal that possesses that adaptation.
5. Students can use the cards multiple times until the timer runs out.
6. After 5 minutes, gather the groups and discuss the matches as a class. Have students explain their reasoning for each match, fostering a deeper understanding of the adaptations and their significance in the forest ecosystem.
7. Declare the group with the most correct and diverse matches as the winners, acknowledging their keen observation and knowledge of forest adaptations.

Camouflage	Sharp Claws	Nocturnal Behavior	Tree-Climbing
Hibernation	Burrowing	Enhanced Senses	Web-Building
Migration	Color Changing	Grow Tall	Deep Root System
Seed Production and Wind Dispersal	Drought Resistance	Photosynthesis	Shade Tolerance





FOREST CONSERVATION: EMPOWERING ACTIONS

Forest conservation matters to your local community, even if you do not live in a forest!
Learn ways you can effectively promote forest conservation in your community.

PRIMARY
Kindergarten - 2nd
DURATION: 60 MINUTES

OBJECTIVES:

- Students will develop an understanding of the importance of forest conservation and identify actions they can take to protect and preserve forest habitats.
- Students will participate in the Nationals Association of Conservation Districts 2024 Stewardship Week Poster Contest themed "May the Forest Be with You, Always."

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.

Common Core State Standards (CCSS)

- Mathematics: Operations and Algebraic Thinking (CCSS.MATH.CONTENT.K.OA.A.2): Solve addition and subtraction word problems and add and subtract within 10.
- Reading Standards for Informational Text (CCSS.ELA-LITERACY.RI.K-2.1): Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- Writing Standards (CCSS.ELA-LITERACY.W.K-2.2): Use a combination of drawing, dictating, and writing to compose informative/explanatory texts.
- National Core Arts Standards: Visual Arts (VA:Cr1.1.K-2): Generate and conceptualize artistic ideas and work.
- Visual Arts (VA:Cr2.1.K-2): Organize and develop artistic ideas and work.

INTRODUCTION:

Show pictures a powerpoint or videos of forests to the class and ask them what they notice about them.

Conservation Districts across the United States sponsor and promote the NACD Annual Stewardship Week events, including poster, photo, and digital poster contests, to educate, promote conservation efforts, and raise awareness about their role in their communities. Encourage your district to get involved today!



Want to know more about how you can get involved? Scan the code for more information!



Laklin Stallbaumer, KS
Newman County, CO
2021 NACD Stewardship Week

Engage in a discussion about the importance of forests, such as providing habitat for animals, producing oxygen, and maintaining the water cycle.

Forest Conservation Discussion: Facilitate a discussion on the concept of forest conservation.

Discuss how human actions can impact forests, such as deforestation, pollution, and habitat destruction.

Talk about the consequences of these actions on the environment, animals, and people.

Brainstorming Actions for Forest Conservation: Brainstorm with the students actions they can take to protect and conserve forests.

Write their ideas on chart paper or the whiteboard.

Encourage creative and practical suggestions, such as recycling paper, planting trees, and spreading awareness about forest conservation.

Introduction to NACD Poster Contest Project:

"Good morning, class! Today, I have something exciting to share with all of you. As you know, we've been learning about forests and how important they are for the environment. Well, I have fantastic news! The National Association of Conservation Districts, or NACD, is hosting a special contest that I think you'll love!"



FOREST CONSERVATION: EMPOWERING ACTIONS

Forest conservation matters to your local community, even if you do not live in a forest!

Oral and Visual Presentation:

- Display a few sample posters created by previous Stewardship Week contest winners by scanning the QR code or use this link:

<https://www.flickr.com/photos/nacd/albums/with/7217772030596555>



"The National Association of Conservation Districts helps our local conservation district educate students through this contest. The poster you will create is not about being the best artist, it's all about using your creativity to raise awareness about conservation and the incredible work of conservation districts in our communities."

"Conservation districts help protect our forests, wildlife, and natural resources, and they play a crucial role in making sure our environment stays healthy and vibrant for future generations."

- Show the contest guidelines and rules on a slide or poster.

"For this contest, you get to create your own posters with eye-catching designs and powerful messages about the importance of conservation. You can use colors, drawings, and even words to share your ideas! You'll have the chance to express what you've learned about forests and conservation in a fun and artistic way."

"I've set up a poster-making station right here in our classroom! You'll have access to various art supplies to help you bring your ideas to life. Feel free to let your imagination run wild!"

- Emphasize the contest timeline and submission process.

"Remember, the deadline for submissions is (insert date here). Once you've finished your masterpiece, we'll collect all the posters and send them to our local participating district for the contest. There's a chance your artwork could be recognized and shared with people from all over the country!"

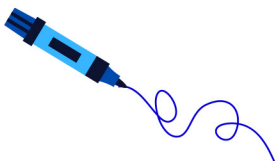
- Conclude with encouragement and motivation.

"I'm so excited to see what incredible posters you'll create. Let's work together to spread the word about conservation and make a positive impact on our community through art. Now, who's ready to unleash their creativity and make a difference in the NACD Poster Contest?"

What is Stewardship Week?
NACD Stewardship Week is one of the largest national programs to promote natural resource conservation. Celebrated annually since 1955 between the last Sunday in April and the first Sunday in May, NACD Stewardship Week reminds us of our individual responsibilities to care for natural resources.



Why Stewardship Week?
Each spring, NACD and thousands of dedicated conservationists organize a multitude of outreach events and educational learning experiences for students and adults in order to increase awareness about the importance of natural resource conservation. During Stewardship Week, local conservation districts and their state associations educate the public on the importance of soil health, water quality, pollinator habitat and other conservation topics. Different classroom activities, field visits and community events are hosted to honor and recognize efforts in conservation at the local level.





FOREST CONSERVATION: EMPOWERING ACTIONS

Forest conservation matters to your local community, even if you do not live in a forest!

Conservation District Educators that include students with additional needs in education and outreach events foster a more inclusive and diverse learning environment, promoting empathy, understanding, and improved social skills among all participants.

Create a **POSITIVE**
and **INCLUSIVE**
Learning
ENVIRONMENT

Conservation education is for everyone!



2024 NACD HAND DRAWN POSTER CONTEST

The National Conservation Poster Contest is open to K-12th grade students.

Artwork entered in the national competition must first have been judged in a local or area conservation district sponsored poster contest and a state conservation association or state auxiliary sponsored contest.

- The 2024 Stewardship theme "May the Forest be with You, Always" must be included on the front side of each poster submission to qualify for the contest.
- To find your state/territory's NACD poster contest coordinator, visit the NACD Conservation District Directory and reach out to your state/territory's conservation association.
- Remember, each state chooses one poster to enter in each grade division (K-1, 2-3, 4-6, 7-9, 10-12).
- When submitting traditional painted or drawn posters, ensure they are scanned and uploaded as a PDF, meeting the required size specifications of your state contest.
- Get creative with any media you like!
- The poster must be solely the work of one student and not traced from photographs or other artworks.
- While younger students might receive planning assistance from parents or teachers, it's encouraged for each student to do their best to complete the work independently.
- Entries showcasing student handwriting and coloring tend to score better than those heavily assisted by adults.
- Only official state poster contest sponsors are eligible to submit entries for the national contest.
- State must submit entries by December 1, 2024.
- Make sure your poster meets your state's requirements for a chance to shine at the national level!

Recap the previous lesson on forest conservation, and engage in a discussion about why it is essential to have an action plan to conserve forests.

Action Plan Brainstorming:

- Explain to students that they will be creating a forest conservation action poster.
- Instruct them to brainstorm and write down at least three actions they can take to protect and conserve forests using their UpCycled Scratch Pad.
- Sharing and Grouping: Allow students to share their ideas with the class. As a class, group similar actions together on the whiteboard. Discuss the distinct categories of actions, such as recycling, planting trees, recycling paper, spreading awareness, etc.

POSTER CONTEST ART ACTIVITY

Materials:

Poster Paper 14" x 22" . Use landscape of portrait

UpCycled Scratch Pad

Art supplies

Books or online resources on forest conservation



Creating Forest Conservation Action Posters:

- Provide art supplies to the students.
- Instruct them to create posters illustrating one or more of the actions they brainstormed to protect and conserve forests following the contest guidelines.
- Remind students the 2024 Stewardship theme "May the Forest be with You, Always" must be included on the front side of each poster submission to qualify.

Presentation and Explanation:

- Allow students to present their posters to the class.
- Ask them to explain the action(s) depicted in their poster and why it is important for forest conservation.

Conclusion: Summarize the key actions discussed during the activity, emphasizing the importance of taking personal responsibility for forest conservation.

Assessment: Observe students' engagement during activities and presentations to determine their understanding of and ability to generate meaningful actions. Evaluate the clarity and effectiveness of their posters in communicating their chosen actions for forest conservation.



FOREST CONSERVATION: EMPOWERING ACTIONS

Forest conservation matters to your local community, even if you do not live in a forest!

Did You Know?

Conservation technicians use math daily for measuring and surveying conservation areas, analyzing data, budgeting projects, and planning restoration efforts, enabling effective environmental management and protection. Math is essential for their decision-making, resource allocation, and sustainable conservation practices.



Forest Conservation Word Problems Worksheet

Introduce simple addition and subtraction word problems related to forest conservation. Print and give each student a worksheet or use it as an oral quiz. Provide students with manipulatives or visual aids to help solve the word problems.

Choose the problems that are academically appropriate for your students.

1. Sara recycled 5 pieces of paper. Then she recycled 3 more. How many pieces of paper did she recycle in total?
2. Liam planted 4 new trees in a forest. There were already 6 trees there. How many trees are there now?
3. Emma collected 10 acorns from the forest. She gave 3 to Ana. How many acorns does Emma have now?
4. There were 7 birds sitting on a tree in the forest. 2 birds flew away. How many birds are left on the tree?
5. Ethan picked 9 flowers in the forest. Then he gave 5 flowers to his sister. How many flowers does Ethan have?
6. There were 12 butterflies in the forest. 4 butterflies flew away. How many butterflies are still in the forest?
7. Jacob found 15 pinecones in the forest. He kept 8 pinecones and gave the rest to his friends. How many pinecones did Jacob give to his friends?
8. There were 9 mushrooms in the forest on Monday. 6 more mushrooms grew on Tuesday and Wednesday night. Last night, 3 new mushrooms grew. Today is Friday, how many mushrooms are there now?
9. A conservation group cleaned up a forest trail and collected 32 bags of litter. If they recycle 18 of those bags, how many bags of litter will they dispose of in a landfill?
10. In a protected forest area, there are 25 endangered species of animals. If 10 more animals of each species are discovered, how many endangered animals will there be in total?
11. A group of volunteers planted 50 saplings in a forest. However, 12 of them did not survive due to lack of water. How many saplings are left?
12. The forest ranger discovered that 28% of the trees in a specific area were infested with pests. If there are 240 trees in that area, how many trees are affected by the infestation?
13. A forest covers an area of 350 acres. If 75 acres are designated as a wildlife sanctuary, how many acres are left for human activities and sustainable logging?
14. A conservation team cleared an invasive plant species from an area in the forest, covering an area of 50,000 square feet. They replanted native plants in 320 square feet of the cleared area. How much area remains to be reforested? a) 48,680 square feet b) 50,320 square feet c) 320 square feet d) 50,640 square feet
15. There were 80 squirrels living in a forest. During the winter, 25 squirrels migrated to a warmer region. How many squirrels remained in the forest?
16. A forest trail is 3.5 miles long. If a hiker covers 1.2 miles in the morning and 2.1 miles in the afternoon, how much of the trail is left to complete? a) 0.2 miles b) 1.2 miles c) 2.2 miles d) 1.3 miles
17. Question: In a forest, it rained 21 inches. If 16 inches of the rain disappeared as water vapor, how much water is left for the plants and animals to use? a) 5 inches b) 37 inches c) 16 inches d) 37 feet

Bonus: If a forest conservation group plants 50 trees per day, how many trees will they have planted in 7 days?



FOREST CONSERVATION: EMPOWERING ACTIONS

Forest conservation matters to your local community, even if you do not live in a forest!

UPCYCLED SCRATCH PAD

Materials:

- Scrap paper without print or old notebooks
- Scissors or paper trimmer
- Ruler
- Hole punch
- Yarn

Cut the Paper:

- Use scissors or a paper trimmer to cut 20 pieces of paper and two cardboard or card stock covers using the template.
- Use a ruler to measure and make straight cuts.

Punch Holes:

- Using the template provided punch 8 holes. Keep this page as a guide for the rest.
- Use the first paper's holes as a guide to punch holes in the other papers. This will make sure all the papers have the same holes. You can punch 3 to 4 pages at a time.
- Stack pages together.

Add Cardboard Covers:

- Take two pieces of cardstock or cardboard and trim them to the same size as the papers for the front and back covers of your scratch pad.

Bind the Scratch Pad:

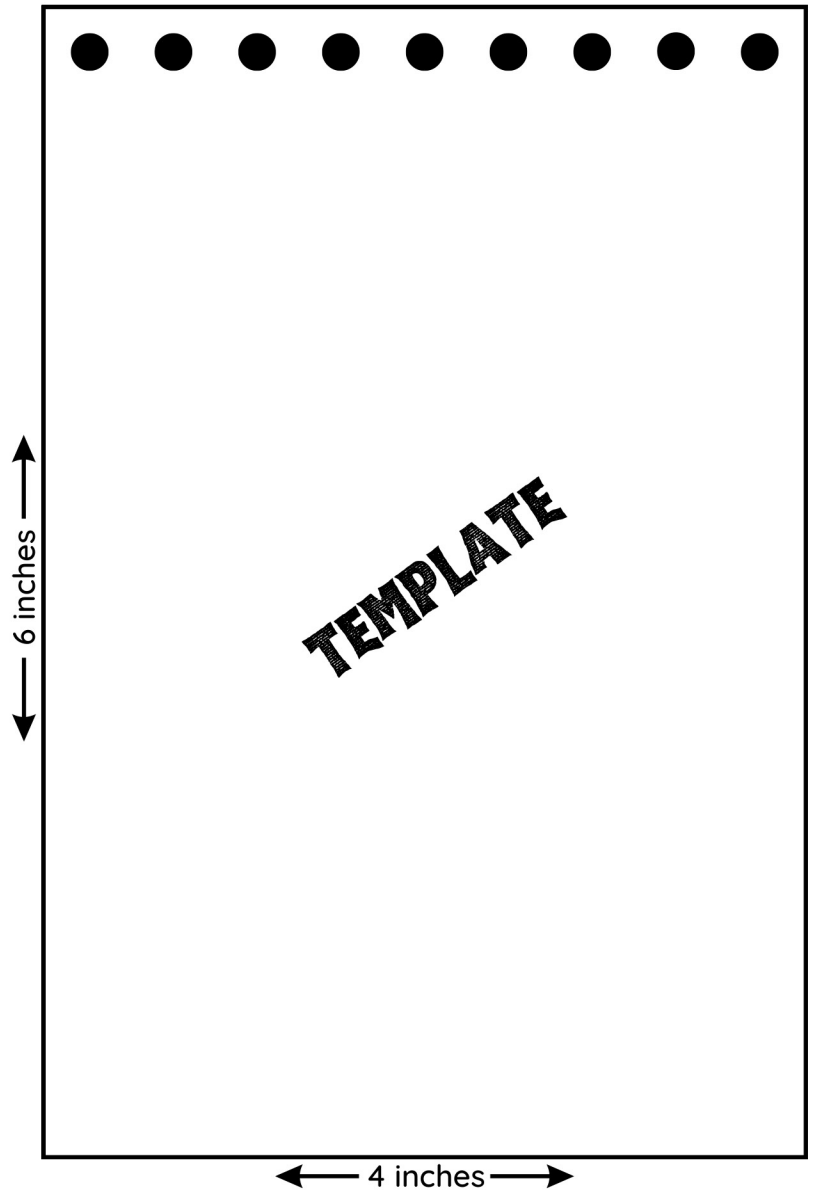
- Stack all the papers together with the cardboard covers on top and bottom.
- Use yarn and loop it thread it through the holes and tie it securely. Not too tight, so pages flip pages easily, and not too loose either!

Decorate the Scratch Pad:

- Use stickers, cutouts from magazines, or crayons to decorate the front and back covers.
- Get creative and make your scratch pad look unique and colorful!

Start Using the Scratch Pad!

- Once the paper is secured or decorated, students can use the scratch pad just like sticky notes. Students can write notes, reminders, or doodle on individual sheets of paper, tearing off each sheet as needed.



An upcycled scratch pad is fun for kids to make because they get to use their creativity while repurposing materials, giving a sense of accomplishment and environmental awareness. Using the scratch pad when making notes for a poster contest allows them to jot down ideas, make quick sketches, and experiment freely, fostering brainstorming and refining their artistic concepts before creating the final poster.





COMMUNITY TREE AND ME

Trees play an integral role in urban environments by providing shade, improving air quality, and reducing the heat island effect. They offer habitat for wildlife, reduce stormwater runoff, and enhance the overall aesthetics of the cityscape, contributing to the well-being and quality of life for urban residents.

PRIMARY Kindergarten - 2nd

DURATION: 60 MINUTES
PER ACTIVITY

OBJECTIVES:

- Students will understand the importance of trees in their local community and explore ways to contribute to tree conservation efforts.
- Promote kindness and positivity while fostering a sense of community in the classroom

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals (including trees) and the places they live.
- K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- 2-LS2-3: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Common Core State Standards (CCSS)

- CCSS.ELA-LITERACY.SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.K.2: Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- CCSS.ELA-LITERACY.SL.1.1: Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

Introduction:

Begin the lesson by discussing the type of region you live in. Are you in a rural, suburban or urban community? Maybe you live in a region where these communities are all a part of your community? Ask students if they know what role forests play in their community, ask them what the benefits of trees are in their yards, community parks, or forests near their home or school. Show pictures or videos of trees in different community settings, such as parks, streets, and neighborhoods.

Engage students in a discussion about the importance of trees for clean air, shade, beauty, and providing habitat for animals. Reviewing discussions from earlier units if needed.

Urban Forest Exploration:

- Explain the concept of an urban forest and how trees are an integral part of urban environments.
- Discuss examples of urban forests, such as community parks, school campuses, and streets lined with trees. Explaining an urban forest refers to the collection of trees and vegetation in urban areas.

"Good morning/afternoon, class! Today, we're going to dive into a fascinating topic called urban forests. Can anyone guess what an urban forest might be? (Allow students to share their thoughts.) An urban forest is the collection of trees and vegetation that we can find right in the middle of our busy cities and towns. It's like a little piece of nature nestled within our urban environments. These trees and plants bring a touch of green, fresh air, and a sense of calm to our surroundings. Now, let's explore together and learn more about these incredible urban forests, and how they contribute to our communities."

Discuss how trees are an integral part of urban environments, providing numerous benefits:

- Trees play an integral role in urban environments by providing shade, improving air quality, and reducing the heat island effect.
- Trees offer habitat for wildlife, reduce stormwater runoff, and enhance the overall aesthetics of the cityscape, contributing to the well-being and quality of life for urban residents.

In a city forest, squirrels dart among the trees, contributing to the ecosystem's biodiversity and adding charm to the urban green spaces.





COMMUNITY TREE AND ME

Trees play an integral role in urban environments by providing shade, improving air quality, and reducing the heat island effect. They offer habitat for wildlife, reduce stormwater runoff, and enhance the overall aesthetics of the cityscape, contributing to the well-being and quality of life for urban residents.

Define examples of urban forests, such as:

- Community parks and green spaces: Mention local parks in the community where trees are abundant and provide recreational spaces for people.
- School campuses: Explain how school grounds often have trees that offer shade, beauty, and a natural learning environment.
- Streets lined with trees: Discuss how trees planted along the sidewalks and streets can create a green canopy and enhance the aesthetics of urban areas.
- Ask students to share their experiences with trees in their community. (to lead students into conservation, ask them if they see any in the fall that may be red, or yellow? Maybe they have a favorite tree to sit under, or one that they see a squirrel climbing a lot? Maybe there is one that is kind of “spooky”? Have they ever planted a tree?)

Tree conservation discussion:

- Lead a class discussion on the importance of preserving and caring for trees in shared spaces. Discuss the threats to trees, such as pollution, improper pruning, and disease, and the impact of their loss on the community. Brainstorm ideas on how students can contribute to urban tree conservation efforts, focusing on actions they can take in and around their classroom and school.

Project 1: Kindness Tree

(Indoor Bulletin Board or Wall Project)

Begin the project by discussing the importance of kindness and how it can positively impact individuals and the community.

Materials:

- Construction paper or poster board
- Brown construction paper for the tree trunk
- Assorted colored paper for the leaves
- Scissors
- Markers or crayons
- Glue or tape

“Today, we are going to embark on a special project that combines two beautiful things: kindness and the enchanting world of forests. But before we dive in, let’s take a moment to think about the power of kindness and how it can create a ripple effect of positivity. Just like the trees in a forest, kindness has the remarkable ability to grow and spread. When we are kind to others, it not only brightens their day but also inspires them to be kind to others.”

“Forests, too, play a significant role in our world. They are not only home to a diverse range of plants and animals but also act as havens of tranquility and natural beauty. They offer shelter, oxygen, and countless resources that sustain life on Earth. Just as forests thrive when nurtured and protected, so does kindness when cultivated and shared.”

“Today, we are going to create something magical called a ‘Kindness Tree.’ Just like the majestic trees in a forest, our classroom will have a special tree adorned with leaves of kindness. Each leaf will be a reminder of the kind acts we do for one another and our beloved trees, showcasing how our collective efforts can make our classroom community and the forest of kindness blossom and grow.”

Squirrels play a crucial role in urban forest seed dispersal, helping to plant new trees and vegetation as they bury and forget some of the nuts they collect, contributing to the forest’s regeneration and diversity. They also serve as a food source for various predators, supporting the local wildlife food web.



COMMUNITY TREE AND ME

Trees play an integral role in urban environments by providing shade, improving air quality, and reducing the heat island effect. They offer habitat for wildlife, reduce stormwater runoff, and enhance the overall aesthetics of the cityscape, contributing to the well-being and quality of life for urban residents.

Explain to the students that they will be creating a "Kindness Tree" on the bulletin board where they can share kind words with trees.

Tree Trunk:

- Cut out a large tree trunk from brown construction paper and attach it to a wall or bulletin board in the classroom, making sure it is easily accessible to the students.

Leaf Cut-outs: (template included)

- Provide each student with colored paper and scissors. Instruct them to cut out leaf shapes from the paper. When necessary pre-cut leaves for students.
- Making a fall tree? Add Samaras to your kindness tree! Known often by the nickname "Helicopters," Samaras is the proper term for maple tree seed!
- Not in a maple region? Use a tree leaf cutout that is local to your area.
- For added texture on pine needles, use an almond shape, glue yarn strands to it, and add a matching color on top with the kind words.
- Instruct students to write their kind words on the leaf cut-outs using markers or crayons.

Writing Kind Words: Encourage students to think of kind words, compliments, or positive messages they would like to share with a tree. Prompts can include:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Gently hug a tree. • Listen to tree stories. • Softly sing to a tree. • Thank trees for clean air • Plant tiny tree seeds | <ul style="list-style-type: none"> • Water saplings during dry spells • Give trees space to grow • Pick up litter • Reduce paper use • Never breaking branches |
|---|---|

- Assist students as needed with writing difficult words.
- Remind students to write with consideration of space or consider adding lettering lines to the leaves to assist with spacing.

Adding Leaves to the Kindness Tree:

- Students use glue or tape to attach leaf cut-outs to the tree trunk, creating a colorful display of kind words and compliments.
- Guide, but don't direct, fostering student independent thinking, pride and ownership

Reflection and Discussion: Once the Kindness Tree is complete, gather the students for a reflection and discussion. Ask the students how it feels to receive kind words and compliments, and how they can continue to spread kindness in their daily lives.



DID YOU KNOW? Raccoons are highly adaptable and resourceful creatures that thrive in city forests and urban areas, using their keen intelligence to find food, water, and shelter amidst human surroundings.

Raccoons' dexterous front paws, with thumb-like adaptations, enable them to skillfully forage for food in urban areas, displaying remarkable problem-solving abilities.





COMMUNITY TREE AND ME

Trees play an integral role in urban environments by providing shade, improving air quality, and reducing the heat island effect. They offer habitat for wildlife, reduce stormwater runoff, and enhance the overall aesthetics of the cityscape, contributing to the well-being and quality of life for urban residents.

Project 2: Outdoor Kindness Tree Tags

Students will create tags for outdoor trees to raise awareness about their importance and promote tree care. This project works very well for community service projects, summer camps, 4-H, or Scout projects.

Begin by discussing the importance of trees in the environment and their role in providing shade, oxygen, and habitat for wildlife.

Here's a presentation to get you started:

"Friends, let's talk about the amazing trees in our city! Trees are like big helpers, providing us with fantastic benefits. First, they give us shade on hot and sunny days, so we can play outside and feel cool. Just like how we put on a hat to protect ourselves from the sun, trees use their leaves to make us a natural shade. But that's not all! Trees also help us breathe fresh air. They take in the air we breathe out, and in return, they make clean oxygen for us to inhale. It's like they're magic air cleaners! And guess what? Our trees are not just good to us, they're good to animals too! Birds, squirrels, and many other creatures love living in trees. Trees are like a big apartment building for them, providing a safe home and yummy food to eat. So, let's remember to take care of our tree friends, give them water, and say thanks for all the wonderful things they do for us and our city!"

Print and provide each student with a **Kindness Tree Tag** from this unit:

- Instruct them to design and decorate the tag with messages or symbols related to tree care, conservation, or appreciation. Encourage creativity and the use of bright colors to attract attention.

Writing on the tags:

- Assist students by writing their message for them using permanent markers. Prompts for students could be "Protect Trees," "Trees are Important," or "Take Care of Our Trees".

Laminate, hole punch, and attach:

- Use a laminator and lamination sheets.
- Use a hole punch to create a hole at the top of each tag.
- Provide string for the students to attach the tags securely to tree branches or trunks in an outdoor area, such as a schoolyard or community park.

Tree tagging:

- Take the students outdoors and guide them to choose trees where they can hang their tags.
- Encourage them to find trees that may benefit from additional care or attention, such as young or recently planted trees.
- Ensure tags are secure without causing damage to trees.

Reflection and Discussion: After the tags are hung on the trees, gather the students for a reflection and discussion. Ask them how they think the tags can raise awareness about tree care and inspire others to appreciate and protect trees in the community.

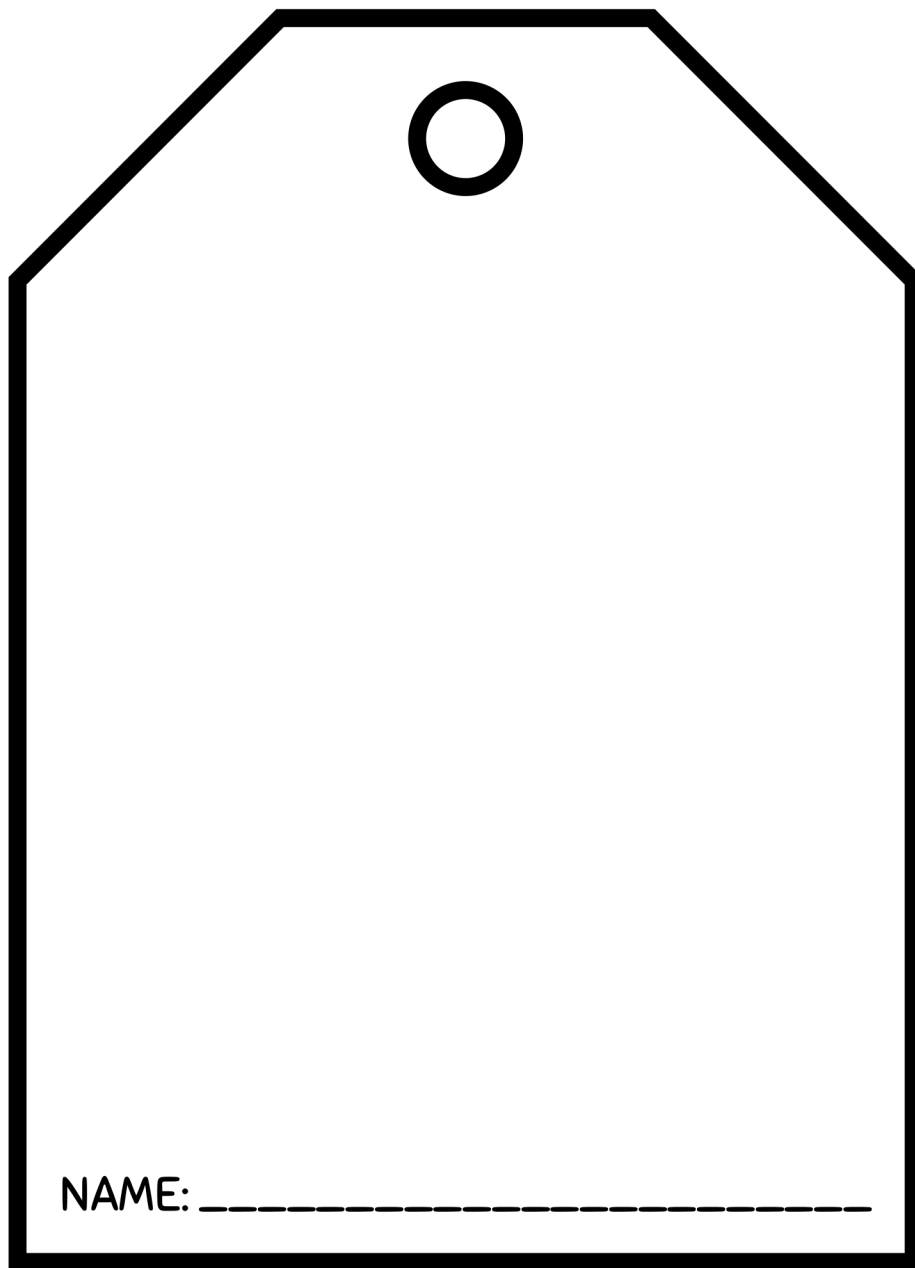
Note: Ensure that the materials used for the outdoor project are eco-friendly and safe for the trees, considering factors such as the type of ink used and the attachment method.

Materials

- Laminator and lamination sheets
- White paper (card stock for best results)
- Permanent marker (Teacher use only)
- Crayons or colored pencils
- Hole punch
- String or yarn

These tree tags are provided in your guide.

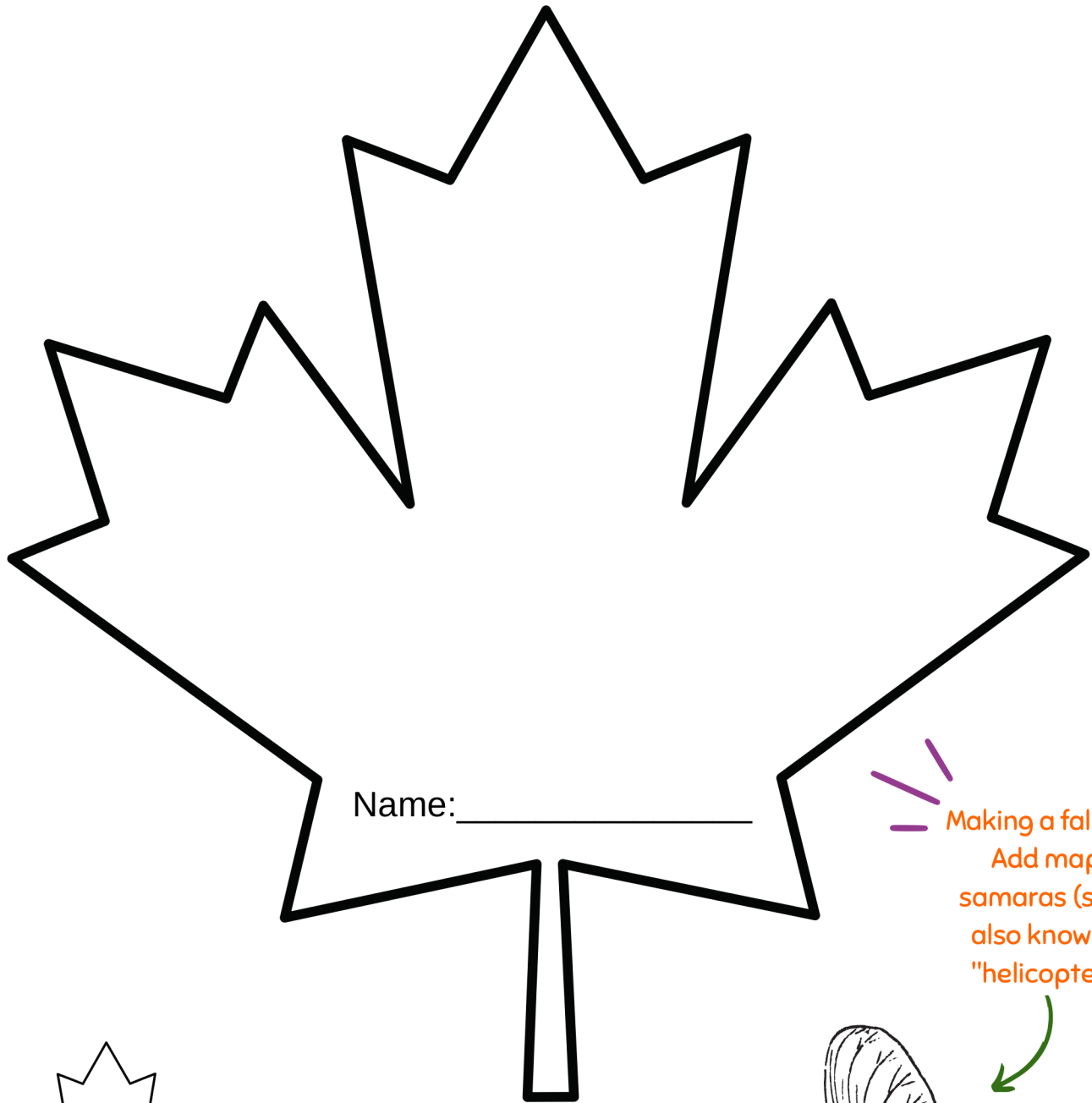




KINDNESS TREE TAG

Write your kind message and laminate, Tie message to a tree limb gently, ensuring tag is secure but not too tight!

Check your tag often or remove it after two weeks so it does not fly away or you might become a litterbug!



Making a fall tree?
Add maple
samaras (seed),
also known as
"helicopters"!



KINDNESS TREE

Copy on white paper to color or use fall color construction paper!



NATURAL RESOURCE PARTNERSHIPS FOR CONSERVATION

This lesson plan is designed for use by conservation district educators help students explore the importance of partnerships in conservation, understanding how different groups work together to protect natural resources and address forest conservation challenges.

PRIMARY Kindergarten - 2nd

DURATION: 60 MINUTES

OBJECTIVES:

- Identify and describe the partnerships between conservation districts and natural resource agencies.
- Understand the role of teamwork and collaboration in solving problems related to forest conservation.
- Develop critical thinking and problem-solving skills through brainstorming and action planning.
- Demonstrate effective communication and cooperation within their groups.

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals (including trees) and the places they live.
- K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- 2-LS2-3: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Common Core State Standards (CCSS)

- CCSS.ELA-LITERACY.SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.1.1: Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.1: Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

Introduction:

Begin the lesson by asking students if they know what a partnership is and why it is important. Explain that a partnership is when different people or groups work together to achieve a common goal.

Key term: Board (noun) Unlike the wood plank "board", this board is a group of people who are chosen or elected to make decisions and oversee the activities of an organization, institution, or group. They work together to provide leadership, set policies, and guide the direction of the organization.

Begin the lesson by asking students if they know what a partnership is and why it is important.

- Explain that a partnership is when different people or groups work together to achieve a common goal.
- Introduce the concept of forest conservation and explain that it requires partnerships between conservation districts and other stakeholders.
- Mention four actual conservation partners across the United States, such as USDA (NRCS), and state conservation agencies.

Collaborative Discussion:

- Divide students into small groups and assign each group a role to represent, a conservation district board, conservation district staff, USDA/NRCS and a state conservation agency.
- Allow students to use age-appropriate online resources, brochures, or other information available for research. Or, invite a local conservation board member or staff to your classroom!
- Facilitate a discussion asking each group to share what they learned their role entails in protecting natural resources. Encourage students to discuss and exchange ideas within their groups.



Conservation districts were created after the Dust Bowl, a challenging time with big dust storms that harmed the land and farms. It made people realize how important it is to protect our natural resources. A man named Hugh Hammond Bennett worked with the US Government to form conservation districts. These districts act like a team of nature helpers, working together to care for our land, water, plants, and animals. Their important goal is to keep our world safe for us and for the generations that come after us.



NATURAL RESOURCES PARTNERSHIPS FOR CONSERVATION

PROBLEM IDENTIFICATION:

- Provide each group with a problem-solving worksheet.
- Instruct students to brainstorm and identify a specific forest conservation challenge they want to address.
- Encourage creativity and emphasize the importance of choosing a problem they can realistically solve within their classroom context.
- Remind students to consider the roles and responsibilities of their assigned entities when selecting a problem.
- Remember to adapt these problems to the local context and ensure they are age-appropriate for primary students.
- Encourage students to come up with practical solutions that they can implement within their school or community.

Here are some suggestions:

- **Wildlife Habitat Loss:** Students can explore the issue of habitat loss for animals, such as birds or squirrels, in their local forests. They can brainstorm ways to create artificial habitats or provide food and shelter to support wildlife in their school or community.
- **Tree Preservation:** Students can focus on the importance of trees and the need to protect them from being cut down. They can come up with ideas to prevent tree removal, such as promoting tree planting initiatives or organizing tree care campaigns in their neighborhood.
- **Pollution in Water Sources:** Students can learn about the impact of pollution on rivers, lakes, or streams near their community. They can brainstorm ways to reduce pollution, like organizing clean-up events, promoting recycling, or educating others about the importance of keeping water sources clean.
- **Invasive Species:** Students can explore the problem of invasive species that harm native plants and animals in forests. They can research and suggest strategies to identify and control invasive species, such as organizing invasive species removal days or creating awareness campaigns to prevent their spread.
- **Conservation of Endangered Species:** Students can focus on a specific endangered species in their region and learn about its habitat requirements and conservation efforts. They can brainstorm ways to raise awareness and support conservation initiatives for that particular species.
- **Creating an Education Program for Conservation Outreach:** Students can take on the challenge of developing an education program to raise awareness about forest conservation in their school or community. They can identify key topics related to forest conservation, such as the importance of trees, wildlife protection, or sustainable practices. Students can design informative posters, pamphlets, or presentations to educate others about these topics.

ACTION PLANNING:

- Guide students in developing an action plan to address the identified problem.
- Have students discuss and record their ideas on chart paper or sticky notes.
- Encourage collaboration and remind students to consider the strengths and resources of their assigned entities.
- Assist groups in organizing their action plans and prioritizing steps to achieve their goals.

GROUP PRESENTATIONS:

- Provide each group with an opportunity to present their problem, action plan, and how their assigned entity contributes to solving the problem.
- Encourage other groups to ask questions and provide feedback on the presented solutions.
- Emphasize the importance of teamwork and collaboration in finding innovative ways to protect our forests.

CONCLUSION:

- Summarize the lesson by highlighting the significance of partnerships in natural resource conservation. Reinforce the idea that everyone can contribute to protecting forests and become friends of our natural resources.
- Discuss the importance of working together and appreciating the diverse roles of different entities. Encourage students to continue exploring and learning about forest conservation in their daily lives.

ASSESSMENT:

- Observe students' participation and engagement during discussions and group activities.
- Evaluate the quality and creativity of students' problem identification and action planning.
- Assess students' ability to communicate their ideas effectively during group presentations.



Remember, as a guest in public or private schools, always request the teacher's permission before taking photographs of or with students. Never post photos of students on social media without proper consent!



NATURAL RESOURCES PARTNERSHIPS FOR CONSERVATION

Forest Conservation Challenge Worksheet

Choose a problem from the list below and work with your group to find a solution.

Remember, together we can make a difference!

PROBLEM CHOICES

- | | |
|--|--|
| <input type="radio"/> Wildlife Habitat Loss | <input type="radio"/> Assigned Entity: I represent the |
| <input type="radio"/> Tree Preservation | <input type="radio"/> Conservation District as a _____ |
| <input type="radio"/> Pollution in Water Sources | <input type="radio"/> NRCS |
| <input type="radio"/> Invasive Species | <input type="radio"/> Farmers |
| <input type="radio"/> Conservation of Endangered Species | <input type="radio"/> Landowners |
| <input type="radio"/> Creating an Education Program | <input type="radio"/> Others _____ |

Brainstorming: Write or draw your ideas here:

Solutions: Write or draw your solution here:

Practical Implementation: Write or draw how you can make your solution happen:

Collaboration: Group Members:

- 1:
- 2:
- 3:
- 4:
- 5:



FOREST FOODS: EXPLORING NATURE'S EDIBLE TREASURES

PRIMARY Kindergarten - 2nd

DURATION: 2-3 CLASS PERIODS

OBJECTIVES:

- Students will develop an understanding and appreciation for forest foods by exploring their diversity, cultural significance, and sustainable harvesting practices. They will also engage in hands-on activities to learn how to prepare forest foods in simple and creative ways.

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

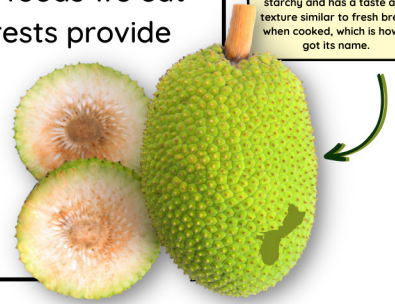
Common Core State Standards (CCSS)

- CCSS.ELA-LITERACY.W.K.2: Use a combination of drawing, dictating, and writing to compose informative/explanatory texts.
- CCSS.ELA-LITERACY.W.1.2: Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
- CCSS.ELA-LITERACY.SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.1: Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

Introduction:

Engage students by asking questions such as: "Have you ever wondered where some of the foods we eat come from?" or "Did you know that forests provide us with delicious and nutritious foods?"

Share the lesson objective: Today, we will explore forest foods, learn about their importance, and discover how we can enjoy them in sustainable ways.



In Guam, one tree food that is commonly found and enjoyed is the "Breadfruit" (*Artocarpus altilis*). Breadfruit is a versatile and nutritious fruit that grows on tall, leafy trees. The fruit is starchy and has a taste and texture similar to fresh bread when cooked, which is how it got its name.

PPT Presentation:

Exploring Forest Foods and Taking Care of Nature

- Forest foods, highlighting different edible plants, fruits, and mushrooms found in the forest.
- Show samples of edible forest foods, discussing their characteristics, flavors, and nutritional benefits.
- Discuss the concept of sustainable harvesting and why it is important to take care of our forests while gathering forest foods.

PPT Presentation:

The Cultural Significance of Forest Foods

- Outline for presentation provided in this lesson plan.
- Introduce the cultural significance of forest foods in different communities
- Share stories or examples of how forest foods have been traditionally used for culinary purposes.
- Encourage students to discuss their own experiences or knowledge of forest foods.

Activity 1: Forest Food Collage

- Provide art supplies and ask students to create a collage showcasing different forest foods they have learned about. Instruct them to draw and label forest foods, incorporating elements of nature and cultural diversity into their artwork.
- After completion, allow students to share their collages and explain their choices.



Guam is an island in the Pacific Ocean. Many people visit Guam to enjoy its natural beauty and learn about its unique culture. People who live on the island are called Guamanians, and they have their own language called Chamorro. Guam is a United States Territory and has its own government. Their government has special laws to protect its soil and water, which are essential for the land and plants to grow properly. They made these laws to keep the soil from washing away during heavy rain and to prevent flooding in some areas. Guam created two Soil and Water Conservation Districts' - one for the northern part of Guam and one for the southern part. These districts are members of the National Association of Conservation Districts!

Can you find the island of Guam hidden on this page?



FOREST FOODS: EXPLORING NATURE'S EDIBLE TREASURES

Presentation: Exploring Forest Foods and Taking Care of Nature

Slide 1: Title: Exploring Forest Foods and Taking Care of Nature

[Suggested Photo: A beautiful forest scene with green trees and colorful plants.]

Slide 2:

Hello, friends! Get ready to dive into the exciting world of forest foods and learn how to take care of nature. Today, we will discover yummy plants, fruits, and mushrooms found in the forest and why it's important to protect our forests.

[Suggested Photo: Group of children with curious expressions, looking at nature.]

Slide 3: Forest Foods

• Yummy Plants, Fruits, and Mushrooms • Forests are like treasure chests full of delicious and nutritious foods! Let's explore some of them together!

[Suggested Photo: Assortment of forest foods like berries, mushrooms, and leaves.]

Slide 4: Edible Plants

• These are some yummy plants you can find in the forest, like wild strawberries or blackberries.
• They have a sweet taste and fun colors, and you can enjoy them as healthy snacks.

[Suggested Photo: Kids holding wild strawberries or blackberries.]


Slide 5: Edible Fruits

• Forests have fruits too, like blueberries or raspberries.
• These fruits are like nature's candies, bursting with flavors and colors, perfect for eating fresh or in yummy treats.

[Suggested Photo: Kids holding blueberries or raspberries.]

Slide 6: Edible Mushrooms

• Some mushrooms are yummy, but remember to forage only when an adult who knows about mushrooms is with you. It is best to never try mushrooms in the wild, as they can be poisonous.

[Suggested Photo: Show a NO sign over a red-and-white-spotted toadstools (non-edible).] 

Slide 7: Sustainable Harvesting

• It's essential to take care of nature while gathering forest foods.

[Suggested Photo: Children with a friendly forest ranger or guide.]

Slide 8: Nature's Helpers: Sustainable Harvesting

• We want to help nature when we gather food from the forest.

• We can pick only a few fruits or leaves from a plant, so it can keep growing and be healthy.

[Suggested Photo: Kids gently picking fruits from a tree or plant.]

Slide 9: Why is it Important?

• It's important to take care of nature when gathering forest foods:

• We want to make sure there is enough food for animals and other plants.

[Suggested Photo: Smiling kids with a healthy forest background.]

Slide 10: How Can We Help?

• Picking only what we need, so others can enjoy forest foods too.

• Being gentle with the plants and leaving some behind to keep growing.

• Not littering or damaging the forest when we explore.

[Suggested Photo: Kids picking fruits and leaves with care and respect for the environment.]

Slide 11: Nature and Us: Friends Forever

• Nature is our friend, and by taking care of it, we can continue to enjoy its tasty gifts.

• Remember these tips and practice sustainable harvesting whenever you explore the forest.

[Suggested Photo: Kids planting trees or flowers to give back to nature.]

Slide 12:

• We've learned about forest foods and how to take care of nature.

• Thank you for being responsible and caring friends of the forest.

[Suggested Photo: Group of kids smiling, showing they care for nature.]

And folks, here's the secret recipe for success: never forage in the same area as our furry friends. Bears might have a big appetite for berries, but they won't appreciate us barging in on their feast! Let's give them some space to enjoy their fruity delights, shall we?

So, berry hunters, don't forget your forager's toolkit - a keen eye, a nose for adventure, and a sprinkling of humor to keep things light. Happy foraging and bon appétit...minus the bear chasing! Stay safe out there!





FOREST FOODS: EXPLORING NATURE'S EDIBLE TREASURES

Presentation: Cultural Significance of Forest Foods

SLIDE 1: TITLE CULTURAL SIGNIFICANCE OF FOREST FOODS

SLIDE 2:

- Introduction
- Hello, friends! Today, we will learn about forest foods and how they are important in different cultures. Are you ready to explore the world of yummy forest foods?

SLIDE 3:

- Cultural Significance
- Forest foods are very special in many cultures around the world.
- They are foods that come from the forest and have been part of people's traditions, celebrations, and everyday life for a long time.

SLIDE 4:

- Examples of Forest Food Traditions
- Let's look at some examples of how forest foods are used in different cultures.

SLIDE 5:

- Example 1: Tribal communities have a strong connection with forest foods.
- **Tribal foodways** know about tasty plants, fruits, and nuts in their forests.
- One example is the piñon tree nut. Piñon pine nuts, also known as piñones, are slightly smaller than typical pine nuts. However, they offer a more indulgent, buttery taste and contain a higher fat content compared to other varieties.
- Tribal communities use these foods to make special dishes like pemmican, which is made from dried meat and berries. It's yummy and helped them survive!

SLIDE 6:

- Example 2: Nordic Countries
- In countries like Sweden and Finland, people love forest foods too.
- They use berries like lingonberries and cloudberry to make tasty jams, sauces, and desserts. These berries are part of their special cultural recipes.

SLIDE 7:

- Example 3: Indigenous Communities in the Amazon Rainforest
- In the Amazon Rainforest, indigenous communities have a deep relationship with the forest and its foods.
- They rely on plants, fruits, and nuts for their food and medicine. They make special dishes like manioc bread and fish stew that are part of their cultural heritage.

SLIDE 8:

- Sharing Time
- Do you have any experiences or stories about forest foods?
- Have you tasted any forest foods or seen them in recipes?
- Let's take turns sharing what we know or have experienced with forest foods!

SLIDE 9:

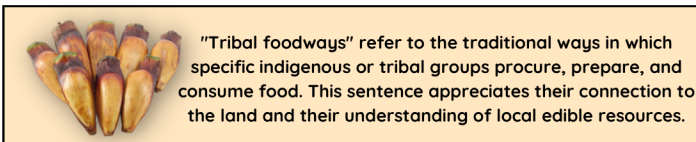
- Student Sharing
- Give students the opportunity to share their experiences, stories, or family traditions related to forest foods.
- Encourage them to talk about their favorite forest foods and any special recipes they know.

SLIDE 10:

- Conclusion
- Forest foods have a special place in different cultures. They have been enjoyed by people for a very long time!
- By learning about forest foods, we can appreciate different cultures and the yummy foods that come from nature.

SLIDE 11:

- Thank You!
- Thank you for joining our adventure into the world of forest foods and their cultural significance.
- Let's remember to respect and enjoy nature's gifts as we continue to explore and learn together.



"Tribal foodways" refer to the traditional ways in which specific indigenous or tribal groups procure, prepare, and consume food. This sentence appreciates their connection to the land and their understanding of local edible resources.



FOREST FOODS: EXPLORING NATURE'S EDIBLE TREASURES

Presentation: Cultural Significance of Forest Foods

Instructors' PPT Presentation: PROVIDED FOR DOWNLOAD ON NACD EDUCATION HUB

“Hello, everyone. Today, I'm going to talk about how the three Rs of reduce, reuse, and recycle can be applied to forestry conservation. Forests are important for many reasons. They provide us with oxygen, clean water, and a place to live. They also help to regulate the climate and prevent erosion. Unfortunately, forests are being destroyed at an alarming rate. This is due to a number of factors, including deforestation, wildfires, and climate change. We can all do our part to help conserve forests. One way to do this is by following the THREE R's”

- “**Reduce.** The first R, reduce, means to cut back on the amount of trash we generate. This can be done by making small changes in our daily lives, such as: Printing on both sides of the paper, reusing paper bags, bringing reusable water bottles and coffee cups with us. This can also include buying products with less packaging, or composting food scraps at home.”
- “**Reuse.** The second R, reuse, means to find new ways to use things that otherwise would have been thrown out. This can be done by reusing plastic containers for storage, turning old clothes into new projects, such as quilts or stuffed animals. Donating used furniture or appliances to charity or upcycling old materials into new creations.”
- “**Recycle.** The third R, recycle, means to turn something old and useless into something new and useful. You can practice this by recycling paper, plastic, metal, and glass. Or donating electronics to recycling centers.”
- “**All three Rs are important for forestry conservation.** By reducing, reusing, and recycling, we can help to reduce the demand for new paper and wood products, which in turn helps to protect our forests.”

DOWNLOAD THE THREE R'S PRESENTATION SHOWN ON THE LEFT ON THE NACD EDUCATION HUB.

Tips for discussion: Here are some examples of how the three Rs can be applied to forestry conservation:

- **Reduce:** We can reduce our footprint and the use of newly harvested wood by opting for sustainable alternatives such as reclaimed wood. An alternative is the use of products made from trees harvested in responsibly managed forests.
- **Reuse:** We can reuse old lumber to build new projects, such as birdhouses or garden beds.
- **Recycle:** We can recycle wood products, such as pallets and shipping containers, to create new products, such as furniture or flooring.
- **By following the three Rs, we can all help to conserve our forests and protect the environment.**



The Three R's: Reduce, Reuse, Recycle and Forestry Conservation

PRIMARY Kindergarten - 2nd

Duration: 45 Minutes

OBJECTIVES:

- Students will be able to define the three Rs of reduce, reuse, and recycle.
- Students will be able to identify examples of how to reduce, reuse, and recycle in the context of forestry conservation.

CORRELATION TO STANDARDS:

Next Generation Science Standards (NGSS)

- LS1.A: Ask questions about the natural world.
- LS1.C: Obtain, evaluate, and communicate information about the natural world.

Common Core State Standards (CCSS)

- CCSS.ELA-LITERACY.K.ARTS.1.a Describe how different materials, tools, and techniques can be used to create works of art.

Introduction:

Use the Three R's Presentation provided to explain that these are three ways to help conserve our natural resources. Discuss how the three Rs can be applied to forestry conservation.

Instructors' PPT Presentation:

“Hello, everyone. Today, I'm going to talk about how the three Rs of reduce, reuse, and recycle can be applied to forestry conservation.

- Forests are important for many reasons. They provide us with oxygen, clean water, and a place to live. They also help to regulate the climate and prevent erosion. Unfortunately, forests are being destroyed at an alarming rate.
- This is due to a number of factors, including deforestation, wildfires, and climate change.
- We can all do our part to help conserve forests.
- One way to do this is by following the THREE R's”

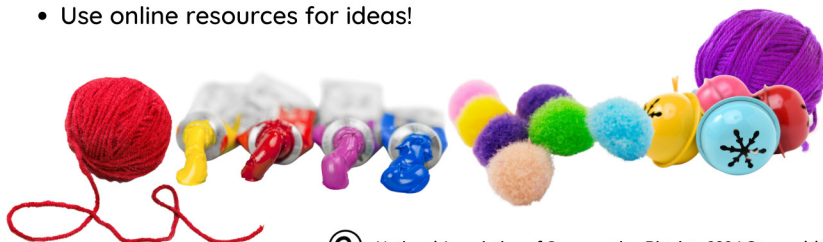
PROJECT: UPCYCLED WALKING OR HIKING STICK

Find the pieces of wood that you want to use for walking sticks.

- Look for fallen branches. This is the most common way to find wood for a walking stick. Fallen branches are often already dry and seasoned, making them perfect for making a walking stick. You can find fallen branches in parks, forests, or even your own backyard.
- Check with your local arborist. Many arborists have wood that they need to dispose of, and they may be willing to give you some for free. You can also ask your local parks department if they have any wood that they are willing to donate.
- Upcycle broken broom sticks or tool handles.
- An alternative is to purchase an inexpensive broom handle.

Creating the Stick:

- Cut the wood to the desired length. The length should be just above the shoulder.
- Sand the wood smooth to ensure there are no sharp edges.
- Students can also put scraps of fabric on the ends and tie them onto the top end of the stick to avoid sharp edges.
- Wrap colorful yarn around the wood and secure using knots or glue.
- Decorate the walking sticks with recycled or upcycled materials.
- Add a cat toy with bells or a rattle toy.
- Use online resources for ideas!





ELEMENTS OF A FOREST KEY TERMS

The elements of a forest vary depending on the specific forest ecosystem and geographical region. Encourage students to observe and explore forests to discover the unique elements present in their local environments.

Common elements you can include when discussing forests with K-2 students:

- **Trees:** The most prominent feature of a forest. They provide shade, habitat, food, and oxygen through photosynthesis.
- **Plants:** Forests are filled with various plants, including flowers, shrubs, ferns, mosses, and grasses. They contribute to the diversity and overall health of the ecosystem.
- **Animals:** Forests support a wide range of animal life, including mammals (such as deer, bears, squirrels), birds, insects, reptiles, and amphibians. These animals depend on the forest for food, shelter, and protection.
- **Soil:** Forests have rich and diverse soil that supports the growth of plants. The soil contains organic matter, nutrients, and microorganisms important for the health of the forest ecosystem.
- **Understory:** The vegetation layer beneath the main canopy of trees. It consists of smaller trees, bushes, and plants that grow in the shade of the taller trees.
- **Canopy:** Formed by the uppermost layer of the forest, consisting of the crowns of the tallest trees. It provides shade and forms a protective cover for the layers below.
- **Wildlife Habitats:** Forests provide essential habitats for a variety of wildlife. This includes nesting sites for birds, dens and burrows for mammals, and hiding places for insects and reptiles.
- **Streams and Rivers:** Some forests have flowing water bodies like streams and rivers, which contribute to the overall biodiversity of the forest and provide water for plants and animals.
- **Rocks and Boulders:** Forests often have rocks and boulders scattered throughout the landscape. These provide hiding places for small animals and create microhabitats.
- **Fungi:** Forests are home to a wide variety of fungi, including mushrooms, molds, and mildews. Fungi play important roles in decomposing organic matter and forming beneficial relationships with plants.



INTERMEDIATE

SUGGESTED FOR GRADES 3-5





UNDERSTANDING FOREST ECOSYSTEMS

DIVERSE ECOSYSTEMS TEEMING WITH LIFE: FORESTS.

INTERMEDIATE GRADES 3-5

Duration: 2-3 Class Periods

OBJECTIVES:

- Identify and describe the different layers of a forest ecosystem.
- Explain the roles and interactions of organisms within each layer.
- Understand the importance of forests in regulating climate, supporting biodiversity, and providing ecosystem services.
- Recognize the significance of conservation and identify ways they can help protect and preserve forest ecosystems.

STANDARDS:

Next Generation Science Standards (NGSS):

- NGSS 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- NGSS 3-LS2-1: Construct an argument that some animals form groups that help members survive.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.W.3.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- CCSS.ELA-LITERACY.SL.3.1: Engage effectively in a range of collaborative discussions.

INTRODUCTION:

Understanding forest ecosystems is crucial for appreciating their value, preserving their biodiversity, and ensuring their sustainable management. In this lesson, we will explore the layers of a forest ecosystem, discover the organisms that call them home, and learn how we can protect and conserve these precious habitats for future generations.

Engage students in a class discussion about the different components of a forest ecosystem. Here's a good starting oral presentation: "Forests are remarkable ecosystems that play a vital role in our lives and the health of our planet. They provide us with clean air, fresh water, food, medicine, and countless other resources. Forests also serve as habitats for a wide variety of plant and animal species, fostering biodiversity and contributing to the balance of our natural world. Let's review what organisms make up a forest ecosystem."

FOREST LAYERS AND ORGANISMS

- Explain the different layers of a forest ecosystem, including the forest floor, understory, canopy, and emergent layer.
- Show examples of organisms that inhabit each layer and discuss their roles in the ecosystem.
- Encourage students to ask questions and share their observations or experiences related to forests.

Hands-on Activity: Miniature Forest Ecosystem

- Divide students into small groups and provide each group with a glass container or terrarium.
- Instruct students to layer soil, moss, rocks, and small plant cuttings in their containers to represent the different forest layers.
- Ask students to place toy animals or figurines in the appropriate layers to represent the organisms found in each layer.
- Allow students time to observe and discuss the interdependence of the organisms within their miniature ecosystems.
- Emphasize the importance of maintaining a balanced ecosystem.

Reflection and Discussion

- Bring the class back together and facilitate a group discussion.
- Ask students to share their observations and discuss the connections they made between the miniature ecosystems and real forest ecosystems.
- Guide the discussion to highlight the role of forests in regulating climate and supporting biodiversity. Encourage students to think about ways they can help protect and preserve forest ecosystems.

Wrap-up and Conclusion

- Summarize the key points discussed during the lesson.
- Provide students with an opportunity to ask any remaining questions.
- Reinforce the importance of understanding and valuing forest ecosystems.

Materials Needed:

- Pictures or illustrations of forest ecosystems
- PPT Presentation
- Glass containers or terrariums
- Soil, moss, rocks, and small plant cuttings
- Toy animals or figurines
- Journals or notebooks to record observations.





UNDERSTANDING FOREST ECOSYSTEMS

POWERPOINT PRESENTATION OUTLINE:

TITLE: EXPLORING FOREST ECOSYSTEMS: UNDERSTANDING THE LAYERS AND ORGANISMS

Slide 1: Title Slide - "Exploring Forest Ecosystems: Understanding the Layers and Organisms"

Slide 2: Importance of Forest Ecosystems

- Display pictures or illustrations of diverse forest ecosystems. Emphasize the significance of forests for biodiversity, climate regulation, and ecosystem services.

Slide 3: Components of a Forest Ecosystem.

- Prompt students to think about the different elements they associate with forest ecosystems.
- Encourage participation and share ideas.
- Forest Layers and Organisms

Slide 4: Overview of Forest Layers

- Define the four layers of a forest ecosystem: forest floor, understory, canopy, and emergent layer.
- Include brief descriptions and images to visually represent each layer.

Slide 5: Forest Floor

- Emphasize the significance of the forest floor layer.
- Present a range of examples of organisms found on the forest floor, such as decomposers (e.g., fungi, bacteria), insects (e.g., ants, beetles), and small mammals (e.g., rodents, reptiles).
- Explain the vital role of the forest floor in nutrient cycling, as decomposers break down organic matter, releasing nutrients back into the soil.
- Highlight how the forest floor provides essential habitat for numerous organisms, including shelter, nesting sites, and food sources.

Slide 6: Understory

- Discuss the importance of the understory layer within the forest ecosystem.
- Showcase examples of diverse plants, shrubs, and small trees that characterize the understory.
- Explain how the understory serves as a critical habitat, providing shelter and protection for various organisms, such as birds, small mammals, and insects.
- Highlight the role of the understory in offering food sources, including berries, seeds, and insects, which support the survival and reproduction of different species.

Break: Student Engagement and Questions

Slide 7: Canopy

- Explore the canopy layer.
- Display images of tall trees forming the canopy.
- Highlight the presence of birds, insects, and epiphytes (plants growing on other plants) in this layer.
- Emphasize the canopy's role in light interception and creating a microclimate.

Slide 8: Emergent Layer

- Introduce the emergent layer.
- Showcase the presence of tall, individual trees rising above the canopy.
- Discuss the unique species that inhabit this layer, such as birds of prey and arboreal mammals.

Slide 9: Interactive Discussion

- Encourage students to ask questions about the different forest layers and organisms.

Why did the mushroom always get picked first for games?

Because he was a "cap"-tain!

Fungi grow on the forest floor to decompose organic matter, recycling nutrients and supporting the ecosystem.

When these spores land in suitable environments with the right conditions (e.g., moisture, temperature, and organic matter), they germinate and produce hyphae.



Fungi grow through a process of spore germination and hyphal growth. Spores, which are tiny reproductive cells, are released by mature fungi and can be carried by wind, water, or other means to new locations.

Why did the mushroom get invited to all the parties?

Because he was such a fungi!



DEFORESTATION AND THREATS TO FOREST BIODIVERSITY

RAISING AWARENESS, PROMOTING RESPONSIBLE CHOICES, AND INSPIRING POSITIVE ACTIONS TOWARDS PROTECTING AND PRESERVING FORESTS

INTERMEDIATE GRADES 3-5

Duration: 2-3 Class Periods

OBJECTIVES:

- Students will understand the concept of deforestation and its impact on forest biodiversity.
- Students will identify and describe common threats to forest biodiversity.
- Students will collaborate on a hands-on project to raise awareness about deforestation and its effects.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

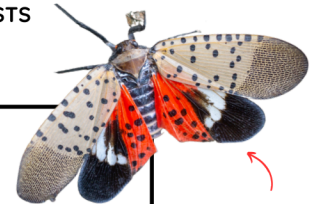
- ELA-LITERACY.RI.3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- ELA-LITERACY.W.4.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

INTRODUCTION:

Engage students by asking the following questions:

What do you know about deforestation? (Prompt: Invasive species damage such as Spotted Lantern Fly.) Why do you think forests are important? Show a captivating image related to deforestation to grab students' attention.

Explain the purpose of the lesson: to understand deforestation and its impact on forest biodiversity.



The spotted lanternfly is an invasive insect known for its striking appearance with red, black, and white spotted wings. It poses a significant threat to agricultural crops and trees due to its rapid spread and feeding habits.



PowerPoint Presentation: Deforestation and Threats to Forest Biodiversity

Slide 1: Title Slide - "Deforestation and Threats to Forest Biodiversity"

Good [morning/afternoon] everyone! Today, we will explore the topic of "Deforestation and Threats to Forest Biodiversity." We'll discuss the impact of human activities on forests and the importance of conserving our natural resources. Let's get started!

Slide 2: Definition of Deforestation: Deforestation is the permanent removal of trees and vegetation from an area. It is a process that has been occurring for various reasons throughout history. As responsible citizens, it is crucial for us to understand the implications of deforestation and work towards sustainable practices.

Slide 3: Causes of Deforestation: One of the factors contributing to deforestation is agriculture, a vital industry that feeds our nation and the world. Farmers work tirelessly to produce food and other agricultural products that we depend on every day. While it is true that agriculture can lead to deforestation, we are making positive changes as a nation to balance the need for these industries with the conservation of natural resources.

Slide 4: Impact on Forest Biodiversity: Deforestation has significant impacts on forest biodiversity, including habitat loss, species extinction, and disruption of ecosystem services. It is important to recognize that these changes affect not only the flora and fauna but also the communities and ecosystems that depend on forests for their livelihoods.

Slide 5: Common Threats to Forest Biodiversity: Now, let's explore some common threats to forest biodiversity. These threats include habitat destruction, climate change, invasive species, and overexploitation. By understanding these challenges, we can work towards finding sustainable solutions that support both our industries and the conservation of our natural environment.

Slide 6: Interactive Activity - Threat Identification: To deepen our understanding, let's engage in a class discussion to identify examples of threats to forest biodiversity. By recognizing these threats, we can collectively brainstorm and work towards positive change.



Another invasive caterpillar of concern is the "fall armyworm" (*Spodoptera frugiperda*), which primarily targets crops but can also impact vegetation in natural areas. Fall armyworms consume a wide range of plants, including corn, grasses, and other crops.



DEFORESTATION AND THREATS TO FOREST BIODIVERSITY

Presentation outline and suggested photos:

Slide 1: Title Slide - "Deforestation and Threats to Forest Biodiversity"

- [Image: A lush green forest with diverse trees and wildlife]

Slide 2: Definition of Deforestation

- [Image: An illustration showing a forested area turning into a cleared land due to forest fires]

Slide 3: Causes of Deforestation

- [Image: An image showing invasive plants taking over a forest area]

Slide 4: Impact on Forest Biodiversity

- [Image: A photo highlighting the effects of deforestation caused by forest fires on wildlife habitat loss]

Slide 5: Common Threats to Forest Biodiversity

- [Image: A collage of images representing threats like invasive animals, plants, and forest fires]

Slide 6: Interactive Activity - Threat Identification

- [Image: A group of students participating in a class discussion, identifying examples of invasive species and forest fires as threats to forest biodiversity]

Research and Analysis:

Problem-Solution Flow Chart

Divide students into groups and assign each group a specific threat to forest biodiversity.

Here are four prompts:

- Habitat Destruction: Forest fires, whether natural or human-caused, can have severe impacts on ecosystems and biodiversity.
- Invasive Species: Non-native species introduced into forest ecosystems can outcompete native species for resources, disrupt natural ecological processes, and negatively impact the diversity and balance of the ecosystem. (Plants and Insect/Animals)
- Climate Change: Altered temperature and precipitation patterns associated with climate change can affect forest ecosystems. Changes in temperature and rainfall can disrupt the life cycles of plants and animals, leading to shifts in species distribution and potentially increasing the risk of species extinction.
- Overpopulation of Herbivores: In some cases, overpopulation of herbivores can pose a significant threat to forest biodiversity. Instruct students to conduct research using provided resources or internet access.
- Students will gather information about their assigned threat, its causes, and the specific impact it has on forest biodiversity. Each group will create a poster or presentation summarizing their findings.

PROBLEM & SOLUTION CHART PROTECTING FOREST DIVERSITY		
Problem	Description	Solution



DEFORESTATION AND THREATS TO FOREST BIODIVERSITY

Problem-Solution Flow Chart: Protecting Forest Biodiversity Educator Examples

STEP 1: IDENTIFY THREATS TO FOREST BIODIVERSITY

Cause:

- Habitat Destruction
- Invasive Species
- Climate Change
- Overexploitation

Effect:

- Loss of habitat and species
- Disruption of ecosystems
- Decreased biodiversity

STEP 2: PREVENTION STRATEGIES

Cause: Habitat Destruction

Prevention Strategies:

- Sustainable land use practices
- Reforestation and habitat restoration
- Conservation and protected areas

Cause: Invasive Species

Prevention Strategies:

- Early detection and rapid response programs
- Quarantine and control measures
- Public education and awareness

Cause: Climate Change

Prevention Strategies:

- Reduce greenhouse gas emissions
- Promote renewable energy sources
- Adaptation and resilience planning

Cause: Overexploitation

Prevention Strategies:

- Sustainable harvesting practices
- Enforce regulations and quotas
- Promote responsible consumption

STEP 3: IDEAS TO FIX THE ISSUES

Cause: Habitat Destruction

Ideas:

- Community involvement in reforestation projects
- Promote responsible land development practices
- Advocate for protected areas and wildlife corridors

Cause: Invasive Species

Ideas:

- Support native species restoration initiatives
- Educate the public on invasive species identification and reporting
- Establish partnerships with local organizations for invasive species removal

Cause: Climate Change

Ideas:

- Implement energy conservation practices in schools and communities
- Advocate for climate action policies and initiatives
- Promote sustainable transportation options

Cause: Overexploitation

Ideas:

- Organize campaigns to raise awareness about sustainable consumption
- Support local and sustainable businesses and products
- Engage in community clean-up and restoration projects

STEP 4: EVALUATE AND TAKE ACTION

- Discuss the importance of evaluating the effectiveness of prevention strategies and implementing the proposed ideas.
- Encourage students to actively participate in conservation efforts, raise





CONSERVATION DISTRICTS: RESTORING AND PROTECTING FOREST BIODIVERSITY

COMMUNITY-BASED INITIATIVES AND SUSTAINABLE PRACTICE

INTERMEDIATE GRADES 3-5

Duration: 1 Hour

OBJECTIVES:

- Students will understand the role of conservation districts in restoring and protecting forest biodiversity.
- Students will learn about various efforts and projects led by conservation districts across the United States.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.RI.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text.
- CCSS.ELA-LITERACY.W.4.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

INTRODUCTION:

This lesson focuses on the restoration and protection work being carried out by conservation districts across the United States. The presentation and class activity provide opportunities for students to learn about specific projects and engage in discussions.

PowerPoint Presentation:

Restoration and Protection by Conservation Districts

Slide 1: Title Slide "Restoration and Protection of Forest Biodiversity by Conservation Districts"

Slide 2: What are Conservation Districts?

- Briefly explain the purpose and role of conservation districts in promoting conservation and sustainable land management practices.

Slide 3: Conservation District Efforts in Forest Restoration

- Highlight various projects and initiatives led by conservation districts across the United States.
- Include examples such as reforestation programs, stream and wetland restoration, and invasive species management.

Slide 4: Case Study 1: Reforestation Project by a Local Conservation District

- Use your own, or another local conservation district reforestation project information. Keep it as local as possible!
- Provide details about a specific reforestation project led by a conservation district.
- Mention the goals, methods, and positive outcomes of the project.

Slide 5: Case Study 2: Wetland Restoration in a SWCD (educators choice)

- Share information about a wetland restoration initiative conducted by your local conservation district.
- Explain the importance of wetland ecosystems and the benefits of restoration efforts.

Slide 6: Case Study 3: Invasive Species Management in a Local Conservation District

- Discuss a specific project focused on invasive species management, highlighting the impact on native species and ecosystem health.

Slide 7: Class Discussion - Impacts and Benefits

- Engage students in a discussion about the impacts and benefits of the projects presented.
- Encourage students to share their thoughts on the importance of restoration and protection efforts for forest biodiversity.

Slide 8: Student Reflection - How Can We Contribute?

- Prompt students to reflect on how they can contribute to the restoration and protection of forest biodiversity in their own communities.
- Encourage students to think about simple actions they can take, such as recycling, conserving water, or participating in community clean-up events.





CONSERVATION DISTRICTS: RESTORING AND PROTECTING FOREST BIODIVERSITY

Class Activity: Conservation District Research

- Divide students into pairs or small groups.
- Assign each group a conservation district from a different region of the United States.
- Instruct students to conduct research on their assigned conservation district and find information about a specific project or initiative related to forest biodiversity restoration or protection.
- Students will gather information about the project's goals, methods, and positive outcomes.
- Each group will share their findings with the class in a brief presentation.

Example Districts:

King Conservation District (Washington): The King Conservation District, located in Washington state, is recognized for its robust forestry programs. They provide assistance and resources to landowners for sustainable forest management, wildfire prevention, and reforestation efforts. The district offers workshops, technical guidance, and financial incentives to promote forest health and conservation.

Lane County Soil and Water Conservation District (Oregon): The Lane County Soil and Water Conservation District in Oregon is known for its active forestry programs. They work closely with landowners to develop forest management plans, implement best management practices, and promote sustainable forestry practices. The district also offers educational programs and workshops on topics like forest ecology, wildfire management, and tree planting.

El Dorado County Resource Conservation District (California): The El Dorado County Resource Conservation District in California has a strong focus on forest management and conservation. They collaborate with landowners, government agencies, and other stakeholders to promote sustainable forest practices, reduce wildfire risk, and enhance forest health. The district offers technical assistance, educational workshops, and financial support for forest restoration projects.

Alachua Conservation Trust (Florida): The Alachua Conservation Trust in Florida has a notable forestry program that focuses on land conservation and restoration efforts. They work to protect and manage forested lands, including longleaf pine ecosystems, by engaging in land acquisition, habitat restoration, and prescribed burning. The trust also offers educational programs to raise awareness about the importance of forests and their conservation.

The Guam Conservation District conducts educational programs and outreach initiatives to raise awareness about the importance of forests and promote sustainable forestry practices. This includes organizing workshops, training sessions, and community events to engage the public and provide information on forest conservation, reforestation techniques, and the role of forests in supporting Guam's ecosystems.

Conclusion

- Recap the main points discussed during the presentation.
- Emphasize the importance of conservation districts in restoration and protection efforts.
- Encourage students to continue learning about and supporting initiatives led by conservation districts.



**There are over 3,000 conservation districts
across the United States and its territories!**



SUSTAINABLE FORESTRY AND FOREST ECOSYSTEMS

SUSTAINING FOREST ECOSYSTEMS FOR A THRIVING FUTURE.

INTERMEDIATE GRADES 3-5

Duration: 1 Hour

OBJECTIVES:

- To introduce students to the concept of sustainable forestry, explore its importance for forest ecosystems.
- Engage students in an interactive project to understand the interconnections within a forest environment.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3 - Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-LS1-1 - Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 5-ESS3-1 - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

- Reading Informational Text - Grade 3: RI.3.1 - Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- Writing - Grade 4: W.4.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- Speaking & Listening - Grade 5: SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes.

INTRODUCTION:

This lesson focuses on the restoration and protection work being carried out by conservation districts across the United States. The presentation and class activity provide opportunities for students to learn about specific projects and engage in discussions.

Title: Sustainable Forestry and Forest Ecosystems

Slide 1: Title and Introduction

- Title slide with the lesson title and teacher's name.
- Briefly introduce the topic of sustainable forestry and its importance for forest ecosystems.

Slide 2: What is Sustainable Forestry?

Good morning/afternoon, everyone! Today, we're going to learn about a very important topic: sustainable forestry. Are you ready to explore the world of forests and discover why sustainable forestry is so crucial? So, what is sustainable forestry? Well, sustainable forestry is a responsible approach to managing forests for long-term health, biodiversity, and economic benefits. It's all about taking care of our forests so they can continue to provide us with the things we need, like clean air, clean water, and homes for animals and plants.

You might be wondering, why do we need to manage forests? Forests are amazing ecosystems that are home to many plants and animals. They also help to keep our planet healthy by capturing carbon dioxide, a greenhouse gas that contributes to climate change. Sustainable forestry is important because it helps us balance the needs of the environment, society, and the economy.

When we manage forests sustainably, we make sure that we don't harm the environment. We also consider the needs of people who depend on forests for their livelihoods, like loggers and local communities. Sustainable forestry helps us keep a healthy balance between using the forest resources we need and preserving the forest for future generations.

So, let's remember that sustainable forestry is all about taking care of our forests and finding a balance. By managing forests responsibly, we can protect the environment, support local communities, and ensure that we have healthy forests for years to come. Get ready for an exciting journey as we explore more about sustainable forestry and the wonders of our forests!





SUSTAINABLE FORESTRY AND FOREST ECOSYSTEMS

Slide 3: Examples of Sustainable Forestry Practices

These practices are like special ways people take care of forests to make sure they stay healthy and strong.

The first example is called selective logging. This means that when people need to cut down trees, they choose only specific ones and leave others to keep growing. It's like picking out only the ripest fruits from a tree while making sure the rest can keep growing.

The second example is reforestation. When trees are cut down, we plant new trees in their place. This helps the forest stay full of trees and ensures that animals and plants have homes to live in. The third example is forest certification. It's like getting a special stamp of approval for the way forests are managed. Forests that are certified meet strict rules to protect the environment and take care of wildlife. This way, we can be sure that the products we use, like wood, come from forests that are managed responsibly.



Volunteers or workers planting tree saplings.



Toys have been made from wood throughout all of history.



Friends enjoy forest recreation.



Peaceful forest, with sunlight filtering through the trees.

Slide 4: Importance of Forest Ecosystems

Forests are not just a collection of trees; they are vibrant ecosystems that support a wide variety of plants, animals, and insects. These forests provide habitats for countless species, creating homes for them to thrive and survive. From the tiniest insects to the mighty bears and deer, forests are like bustling cities full of life.

But the significance of forests doesn't stop there. They play a crucial role in purifying the air we breathe and the water we drink. Just like our lungs, forests absorb carbon dioxide, a gas that contributes to climate change, and release oxygen, giving us clean, fresh air. Forests act as natural filters, ensuring that our rivers, lakes, and streams remain pure and unpolluted.

Forests are like the Earth's natural air conditioners too. They provide shade, cool the temperature, and regulate the climate. They help maintain balance, preventing extreme heat or cold, and create a pleasant and comfortable environment for all living creatures. Let's not forget the incredible recreational opportunities that forests offer. They invite us to explore and connect with nature. We can hike through the trails, listen to the melodic songs of birds, and witness the wonders of the forest firsthand.

Now, more than ever, it's crucial to protect and sustainably manage our forests for the sake of future generations. By doing so, we ensure that the diverse plant and animal species continue to thrive, that our air and water remain clean, and that future generations can experience the awe and wonder of the forest just as we do today.

Slide 5: Interactive Project - Forest Exploration: Indoor Hands-On Forest Exploration Lesson Plan

Today, we are going to become forest explorers! I will divide you into small groups, and each group will receive special project materials including magnifying glasses, field guides or ecosystem identification charts, clipboards, paper, and pencils.



SUSTAINABLE FORESTRY AND FOREST ECOSYSTEMS

Slide 6: Sharing and Discussion

It's time to come together and share the findings and observations from our forest exploration project. Each group will have the opportunity to present their discoveries and share what they found during their exploration of the forest ecosystem. Tell us about the plants, insects, animal tracks, and fungi you discovered using your magnifying glasses and field guides.

As each group presents, let's pay attention to the interconnections within the forest ecosystem. Please hold your questions to the end of all presentations.

As you present, don't forget to discuss how different elements rely on each other for survival and how changes to one part of the ecosystem can impact the others. This will help us understand the delicate balance that exists within forests.

-ALLOW ALL GROUPS TO SHARE EXPLORATION NOTES NOW -

Slide 7: Reflection and Action

Now, let's engage in a class discussion about the importance of maintaining this balance in the forest ecosystem. How do sustainable forestry practices help us achieve this balance? What can we do to ensure the long-term health and well-being of our forests? Share your thoughts, ideas, and insights about the role of sustainable forestry in protecting and preserving our precious forests.

Remember, we are all responsible for taking care of our environment, and our forests play a crucial role. So let's have an open and engaging discussion as we deepen our understanding of the importance of maintaining a balanced forest ecosystem and the significant role that sustainable forestry practices play in achieving this goal.

Slide 8: Conclusion

Let's review. We learned about sustainable forestry, which is a responsible approach to managing forests for their long-term health, biodiversity, and economic benefits.

We discussed the importance of sustainable forestry in maintaining healthy forests and preserving biodiversity. By practicing sustainable forestry, we can ensure that forests continue to provide habitats for plants and animals, purify air and water, regulate climate, and offer recreational opportunities.

I want to extend my gratitude to all of you for your active participation and interest in learning about forest ecosystems and sustainable practices. By understanding the significance of forests and the role of sustainable forestry, you have taken an important step towards becoming stewards of our environment.

Remember, each one of us has a part to play in protecting and conserving our forests. Let's continue to explore and appreciate the wonders of nature, while also advocating for sustainable practices in our daily lives.

Teachers tips:

- Ask students to reflect on what they have learned about sustainable forestry and forest ecosystems.
- Prompt them to think about actions they can take to contribute to the sustainability and conservation of forests.
- Encourage ideas such as reducing paper waste, supporting sustainable forestry products, participating in community tree planting events, or learning more about local forests.





SUSTAINABLE FORESTRY AND FOREST ECOSYSTEMS

Indoor Hands-On Forest Exploration Project

Materials to Bring Into the Classroom:

- **Leaves:** Gather a variety of leaves from different tree species found in local forests. Make sure to have leaves of various sizes, shapes, and colors.
- **Insects:** If possible, bring in preserved or plastic models of common forest insects, such as butterflies, ladybugs, ants, and beetles.
- **Animal Tracks:** Use rubber stamps or printed images of animal tracks from animals that are typically found in forests, like deer, raccoons, squirrels, and birds.
- **Fungi:** Collect different types of fungi samples (non-poisonous) found in forests, such as mushrooms and bracket fungi.
- **Magnifying Glasses:** Provide magnifying glasses for each student or group to use for close-up observations.
- **Field Guides:** Offer field guides on forest ecosystems and wildlife, containing information and images to help students identify the items they discover.
- **Clipboards and Paper:** Each student or group should have clipboards and paper for taking notes and making sketches of their findings.



Begin by introducing the project, emphasizing that students will become forest explorers using their observation skills and curiosity. Briefly explain the items available for exploration, such as leaves, insects, animal tracks, and fungi, and how these elements are interconnected in a forest ecosystem.

Exploring the Items:

- Assign or let students choose their groups for the exploration activity.
- Distribute the materials (leaves, insects, animal tracks, and fungi) to each group.
- Instruct students to use the magnifying glasses to closely examine each item and record their observations.
- Encourage students to look for specific details, such as leaf venation patterns, insect body segments, track shapes, and fungus growth patterns.

Observations and Sketches:

- As students explore, have them take notes on their observations. They can describe the features, colors, textures, and any unique characteristics they notice.
- Ask students to create sketches of the items they are examining, capturing important details.

Group Discussions:

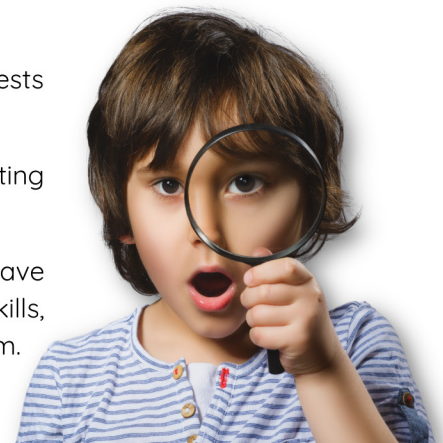
- After the exploration period, bring the students back together for group discussions.
- Each group should share their findings and observations with the rest of the class.
- Encourage students to discuss the interconnections they observed within the forest ecosystem. For example, how insects play a role in pollination, how animal tracks indicate wildlife activity, or how fungi contribute to the forest's nutrient cycling.

Presentations:

- Allow each group to present their discoveries and tell the class about the fascinating things they found during the exploration.
- Encourage questions and interactions between groups to foster a deeper understanding of the forest ecosystem.

Reflection and Conclusion:

- Conclude the project with a class reflection on the importance of forests and the significance of observing and understanding their elements.
- Emphasize the role of sustainable forestry in preserving and protecting these ecosystems for future generations.
- By engaging in this hands-on forest exploration project, students will have the opportunity to connect with nature, develop their observation skills, and gain a deeper appreciation for the wonders of the forest ecosystem.





FOREST CERTIFICATION AND ECO-LABELING

SUSTAINABLE AND RESPONSIBLE PRACTICES, VERIFYING THAT PRODUCTS MEET ENVIRONMENTAL STANDARDS

INTERMEDIATE GRADES 3-5

Duration: 1-2 class periods

OBJECTIVES:

- Students will understand the concept of forest certification and eco-labeling.
- Students will explore different forest certification systems and their criteria for sustainable forest management.
- Students will evaluate the role of eco-labeling in promoting consumer awareness and responsible choices.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 5-ESS3-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Common Core State Standards (CCSS):

- ELA-LITERACY.RI.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- CCSS.ELA-LITERACY.RI.4.7: Interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the text in which it appears.
- ELA-LITERACY.W.5.7: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

INTRODUCTION:

Begin the lesson by asking students the following questions:

- Have you heard about forest certification or eco-labeling?
- What do you think these terms mean?

Sustainable Forestry and Forest Ecosystems

Show examples of forest certification logos and eco-labels to pique students' curiosity and interest.



Explain the purpose of the lesson:

"In this lesson, we will explore the concept of forest certification and eco-labeling as essential tools for promoting sustainable forestry practices. We will learn how these systems are used to ensure responsible forest management, protect wildlife, and preserve the environment. By understanding how eco-labeling works, we can gain insights into how products can be labeled to inform consumers about their sustainable sourcing. Through this exploration, we will develop a better understanding of the importance of preserving forests and supporting eco-friendly practices to protect our natural resources."

Presentation: Forest Certification and Eco-labeling:

- Definition and objectives of forest certification
- Overview of prominent forest certification systems (e.g., Forest Stewardship Council, Sustainable Forestry Initiative)
- Criteria and standards for sustainable forest management certification
- Explanation of eco-labels and their role in informing consumers about sustainably sourced products
- Use visual aids and real-life examples to enhance understanding.

Group Activity: Eco-label Evaluation

- Divide students into groups and provide each group with various eco-label examples.
- Instruct students to research and evaluate the credibility and criteria of the assigned eco-label.
- Alternatively, allow students to create their own eco-label.
- Ask students to prepare a short presentation sharing their findings with the class. Facilitate a discussion where each group presents their eco-label evaluation, and encourage critical thinking about the effectiveness and impact of eco-labeling.

Conclusion and Reflection

- Summarize key points, emphasizing the role of forest certification and eco-labeling in promoting sustainable forestry practices.
- Remind students to consider the role they play as informed consumers.



FOREST CERTIFICATION AND ECO-LABELING

Outline for Presentation: Forest Certification and Eco-labeling

Slide 1: Introduction

- Title: Forest Certification and Eco-labeling
- Briefly introduce the topic and its importance in promoting sustainable forestry practices.
- Include an engaging image of a lush forest or a sustainable forest management scene.

Slide 2: Definition and Objectives of Forest Certification

- Define forest certification and its purpose in ensuring responsible forest management.
- Explain the objectives of forest certification, such as biodiversity conservation and environmental protection.
- Include image representing a forest certification logo or label.

Slide 3: Overview of Prominent Forest Certification Systems

- Provide an overview of well-known forest certification systems, such as Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI).
- Mention the key features and principles of each system.
- Display logos of FSC and SFI, or images representing their certification processes.

Slide 4: Criteria and Standards for Sustainable Forest Management Certification

- Describe the criteria and standards that forests must meet to receive sustainable forest management certification.
- Highlight factors such as wildlife habitat preservation, responsible harvesting, and community engagement.
- Include images showcasing sustainable forest management practices, such as selective logging or reforestation efforts.

Slide 5: Eco-labels and Their Role in Informing Consumers

- Explain the concept of eco-labels and how they inform consumers about sustainably sourced products.
- Showcase examples of eco-labels found on forest products to illustrate their importance in making responsible choices.
- Showcase images of real products featuring eco-labels to visually illustrate the positive effect of such labeling on increasing consumer awareness and encouraging environmentally responsible decisions.

Group Activity: Eco-label Evaluation

In this group activity, students will work together to explore and evaluate various eco-label examples, gaining insights into the credibility and criteria of each label.

The purpose of this activity is to encourage critical thinking about the effectiveness and impact of eco-labeling in promoting sustainable practices.

Divide the students into small groups and provide each group with different eco-label examples found on forest products. Examples may include labels from Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), or other relevant eco-labeling organizations.

Instruct the groups to conduct research on the assigned eco-labels, using available resources such as books, articles, and credible websites. They should investigate the criteria and standards used by each eco-label to certify products as sustainably sourced.

With their research findings, students will prepare short presentations to share their eco-label evaluations with the class. During the presentations, students should explain the credibility of the eco-label, the specific criteria it assesses for sustainable forest management, and how it informs consumers about responsible choices.

As each group presents their eco-label evaluation, facilitate a class discussion. Encourage students to share their thoughts and engage in critical thinking about the effectiveness and impact of eco-labeling on consumer awareness and responsible decision-making.

To further enrich the activity, allow students to engage in a creative element. After evaluating the existing eco-labels, each group can design their own eco-label logo that represents sustainable forest practices. This will encourage students to think creatively about how eco-labels can visually communicate environmental responsibility to consumers.





BALANCING TIMBER HARVESTING AND CONSERVATION

EXAMINING THE COEXISTENCE OF LOGGING AND FOREST CONSERVATION

INTERMEDIATE GRADES 3-5

Duration: 1-2 class periods

OBJECTIVES:

- Students will understand the concept of forest certification and eco-labeling.
- Students will explore different forest certification systems and their criteria for sustainable forest management.
- Students will evaluate the role of eco-labeling in promoting consumer awareness and responsible choices.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.W.3.7: Conduct short research projects that build knowledge about a topic.
- CCSS.ELA-LITERACY.RI.4.7: Interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the text in which it appears.
- CCSS.ELA-LITERACY.W.5.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

INTRODUCTION:

Engage students by asking the following questions:

- What are your thoughts on balancing timber harvesting and conservation in forestry?
- Do you think it is possible to have sustainable timber harvesting practices while conserving natural resources?
- Show visual images representing forests and timber harvesting activities to stimulate discussion.
- Explain the purpose of the lesson: to explore the concept of balancing timber harvesting and conservation in sustainable forestry.

Presentation: Balancing Timber Harvesting and Conservation

- Definition and objectives of multiple-use forestry
- Principles of multiple-use forestry, including sustainable timber harvesting, biodiversity conservation, and ecosystem protection
- Strategies for integrating timber harvesting with conservation, such as buffer zones, sustainable logging techniques, and habitat restoration
- Use visual aids and real-life examples to enhance understanding.

Case Studies and Discussion

- Divide students into small groups and provide each group with a case study example of balancing timber harvesting and conservation.
- Instruct students to read and analyze the case study, considering the strategies employed and the outcomes achieved in terms of timber production and conservation goals.
- Facilitate a group discussion where each group presents their case study findings and encourages critical thinking and reflection on the challenges and benefits of balancing timber harvesting and conservation.
- Engage students in a dialogue about possible solutions and approaches for achieving a balance between timber harvesting and conservation.

Hands-On Project: Eco-Friendly Forest Diorama

- In this hands-on project, students will work in small groups to create eco-friendly forest dioramas. These dioramas will showcase the principles of multiple-use forestry, including sustainable timber harvesting, biodiversity conservation, and ecosystem protection. Using construction paper and visual aids, groups will design a balanced forest landscape, incorporating strategies for integrating timber harvesting with conservation.

Conclusion and Reflection

- Summarize the key points discussed during the lesson, emphasizing the importance of balancing timber harvesting and conservation in sustainable forestry practices.
- Engage in a class discussion to reflect on the challenges and opportunities of implementing strategies for sustainable timber harvesting while conserving natural resources.



BALANCING TIMBER HARVESTING AND CONSERVATION

PRESENTATION OUTLINE: BALANCING TIMBER HARVESTING AND CONSERVATION

Slide 1: Definition and Objectives of Multiple-Use Forestry

- Briefly explain what multiple-use forestry means: a concept that aims to balance timber harvesting with other important objectives like biodiversity conservation and ecosystem protection.
- Highlight the main objectives of multiple-use forestry, such as sustainable timber production, promoting biodiversity, and maintaining ecological balance.
- Photo suggestion: Show an image of a diverse forest ecosystem with various plant and animal species to represent the concept of multiple-use forestry.

Slide 2: Principles of Multiple-Use Forestry

- Present the key principles of multiple-use forestry, including sustainable timber harvesting practices that ensure long-term forest health.
- Emphasize the importance of biodiversity conservation to support various wildlife and plant species within the forest.
- Mention ecosystem protection measures to maintain the overall health and functioning of the forest environment.
- Photo suggestion: Include pictures depicting sustainable logging practices, protected forest areas, and thriving wildlife to illustrate the principles of multiple-use forestry.

Slide 3: Strategies for Integrating Timber Harvesting with Conservation

- Introduce specific strategies that facilitate the balance between timber harvesting and conservation, such as implementing buffer zones around water bodies to protect aquatic habitats.
- Discuss sustainable logging techniques, like selective cutting, that promote forest regeneration and reduce environmental impacts.
- Highlight the significance of habitat restoration projects to enhance biodiversity and ecological functions.
- Photo suggestion: Showcase images of buffer zones near rivers, sustainable logging operations, and successful habitat restoration projects.

Slide 4: Real-Life Examples of Balanced Forest Management

- Provide real-life examples of forests where timber harvesting and conservation practices have been successfully integrated.
- Discuss the positive outcomes achieved in terms of timber production, biodiversity conservation, and overall ecosystem health.
- Photo suggestion: Present before-and-after images of forests that have undergone successful balanced management, illustrating the improvements in forest health and conservation efforts.

Slide 5: Enhancing Understanding through Visual Aids

- Emphasize the use of visual aids and real-life examples throughout the presentation to enhance understanding.
- Reiterate the importance of considering both economic benefits and environmental conservation in sustainable forestry practices.
- Encourage questions and discussions from the audience to further engage their understanding of balancing timber harvesting and conservation.
- Photo suggestion: Show a collage of various visual aids used in the presentation, such as diagrams, charts, and photos, to reinforce the key concepts explored in the lesson.

Hands-On Project: Eco-Friendly Forest Diorama

Materials Needed:

- Shoebox or small cardboard box (per group)
- Construction paper (green, brown, blue)
- Scissors
- Glue
- Small toy trees and animals (optional)
- Markers or colored pencils

Divide the students into small groups.

Provide each group with a shoebox or small cardboard box to serve as the base for their diorama.

Instruct the students to use construction paper to create the forest landscape inside the box. They can cut and glue green paper to represent trees and foliage, brown paper for the forest floor, and blue paper for rivers or lakes.

Encourage the students to incorporate visual aids and real-life examples of sustainable timber harvesting, biodiversity conservation, and ecosystem protection. They can use small toy trees and animals to represent the forest ecosystem.

Inside the diorama, students should depict strategies for integrating timber harvesting with conservation, such as buffer zones around water bodies, sustainable logging techniques, and areas dedicated to habitat restoration.

Each group should add labels or markers to explain the different elements they included in their diorama, highlighting the principles and strategies they have depicted.

Once the dioramas are complete, facilitate a group discussion where each group presents their diorama and shares the reasoning behind their choices. Encourage critical thinking and reflection on how their diorama represents the balance between timber harvesting and conservation.

Engage the students in a dialogue about possible solutions and approaches for achieving a sustainable balance in real-world forest management, considering the challenges and benefits of both.



FOREST CONSERVATION PROJECTS AND COMMUNITY ENGAGEMENT

THE COMMUNITY ROLE IN FOREST CONSERVATION SUCCESS

INTERMEDIATE GRADES 3-5

Duration: 80 MINUTES

OBJECTIVES:

- Students will learn about real-world forest conservation projects and how communities play a crucial role in their success.
- They will explore examples of community engagement, volunteerism, and partnerships with organizations to protect and conserve forests.
- Students will discuss the benefits of active involvement in conservation efforts.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.SL.3.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.W.4.1.B: Provide reasons that are supported by facts and details.
- CCSS.ELA-LITERACY.W.5.7: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

INTRODUCTION:

Engage students by asking:

- Why do you think forests are essential for our planet and communities?
- How do you think communities can play a role in protecting forests?

Define Forest Conservation:

- Forest conservation refers to the responsible and sustainable management of forest ecosystems to protect and preserve their ecological, social, and economic values. It involves the wise use of forest resources while ensuring the long-term health and biodiversity of the forests.
- Forests are vital for biodiversity, climate regulation, and providing valuable resources. They support diverse habitats, absorb carbon dioxide, and offer essential products for human well-being.

Explore methods such as buffer zones, sustainable logging techniques, and habitat restoration.

- Buffer zones are areas of land around important places like forests, rivers, or wildlife habitats that are protected to keep them safe from harm.
- Sustainable logging involves the responsible harvesting of trees, ensuring that new trees can grow, and the forest can maintain its health and vitality over the long term.
- Habitat restoration is the process of helping damaged or destroyed habitats in nature become healthy again so that plants and animals can live there.

Discuss how these strategies promote harmonious coexistence between timber harvesting and conservation.

- Buffer zones act as protective areas around crucial habitats and water bodies, ensuring their conservation while still allowing for sustainable timber harvesting in other parts of the forest.
- Habitat restoration efforts create healthier and more diverse environments, fostering a harmonious coexistence between timber harvesting and conservation by enhancing the overall ecological balance and supporting various plant and animal species.

Benefits of Community Engagement in Forest Conservation

- Community members can actively participate in conservation efforts by collaborating with conservation districts and local organizations. Their positive impact lies in fostering a sense of stewardship, safeguarding the environment, and ensuring the preservation of these valuable natural resources for future generations.



FOREST CONSERVATION PROJECTS AND COMMUNITY ENGAGEMENT

PRESENTATION OUTLINE: FOREST CONSERVATION PROJECTS AND COMMUNITY ENGAGEMENT

Slide 1: Introduction

- Title: Forest Conservation Projects and Community Engagement
- Photo suggestion: A vibrant forest landscape symbolizing the beauty and significance of forests.
- "Today, we will learn about Forest Conservation Projects and Community Engagement. We'll explore the importance of preserving our forests and how communities can play a vital role in this effort."

Slide 2: Real-World Forest Conservation Projects

- Photo suggestion: Images of conservationists working in the field, planting trees, or restoring habitats.
- Discuss examples of real-world forest conservation projects
- Highlight the goals and strategies employed in these projects
- "Let's look at some inspiring real-world forest conservation projects happening around the globe. What goals do you think these projects aim to achieve? How are they using different strategies to protect and restore forests?"

Slide 3: Community Engagement and Volunteerism

- Photo suggestion: Pictures of community members participating in conservation activities and events.
- Explain the role of communities in forest conservation
- Discuss benefits volunteerism in conservation efforts
- "How can communities actively participate in forest conservation? Can you think of any ways you or your family could get involved? Share your thoughts on the benefits of community engagement and volunteerism in preserving local forests."
- Photo suggestion: Pictures of community members participating in conservation activities and events.

Slide 4: Partnerships with Organizations

- Photo suggestion: Logos or visuals representing conservation districts and collaborating organizations.
- Explore partnerships between communities and organizations in forest conservation.
- Showcase examples of successful partnerships and their positive outcomes.
- "Partnerships between communities and organizations are powerful in conservation. Can you name some organizations that work to protect forests? How do you think collaborations can help achieve bigger and better outcomes?"

Slide 5: Benefits of Active Involvement

- Photo suggestion: Smiling faces of students engaged in conservation-related projects or actions.
- Summarize the benefits of active involvement in forest conservation efforts.
- Encourage students to discuss the ways they can actively contribute to conservation in their community.
- Photo suggestion: Smiling faces of students engaged in conservation-related projects or actions.

Hands-on Project: Conservation Action Plan

Materials Needed:

- Paper
- Markers
- Research materials (books, articles, websites)

Introduction

- Engage students in a discussion about the importance of forest conservation and the role of communities in protecting forests.
- Present the objectives of the lesson and explain that students will be developing a conservation action plan.

Research and Planning

- Divide students into small groups.
- Assign each group a specific forest conservation issue (e.g., habitat loss, invasive species, pollution).
- Provide research materials and guide students to gather information about the assigned issue, including its causes, impacts, and potential solutions.
- In their groups, students should brainstorm and plan a conservation action plan to address the assigned issue.

Action Plan Development

- In their groups, students should create a conservation action plan that includes:
 - Identifying the specific issue and its causes.
 - Outlining steps and strategies to address the issue.
 - Determining roles and responsibilities for each group member.
 - Designing a timeline for implementation.

Presentation and Discussion

- Each group presents their conservation action plan to the class, explaining the identified issue, proposed strategies, and expected outcomes.
- Encourage students to provide reasons supported by facts and details for their chosen approaches.
- Facilitate a class discussion about the benefits of active involvement and community engagement in conservation efforts

Reflection and Conclusion

- Ask students to reflect on the lesson and their understanding of the importance of community engagement in forest conservation.
- Summarize the key points covered in the lesson and emphasize the potential impact of their conservation action plans.



FOREST FIRE PREVENTION AND MANAGEMENT

SAFEGUARD OUR FORESTS: LEARN AND PREVENT WILDFIRES

INTERMEDIATE GRADES 3-5

Duration: 80 MINUTES

OBJECTIVES:

- This lesson focuses on the prevention and management of forest fires. Students will learn about the causes and impacts of wildfires and examine strategies for preventing and controlling them. They will explore the role of fire management agencies, emergency response, and community preparedness in minimizing fire risks.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.SL.3.3: Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.W.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- CCSS.ELA-LITERACY.W.5.2.A: Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.



INTRODUCTION:

- Engage students in a discussion about the importance of preventing and managing forest fires.
- Present the objectives of the lesson and explain that students will be developing a fire safety and preparedness plan.

Research and Planning

- Create and present the PowerPoint on forest fire prevention and management using the outline provided.
- Utilize localized forest fire management resources, as well as online resources, to enhance our understanding strategies for preventing and managing forest fires in our local area.

Divide students into small groups

- Assign each group a specific community affected by forest fires (real or hypothetical).
- Guide students to gather information about the community's geographical features, climate, and history of forest fires.
- In their groups, students should brainstorm and plan a fire safety and preparedness plan for the assigned community.

Plan Development*

- In their groups, students should create a fire safety and preparedness plan that includes:
 - Identifying high-risk areas and vulnerable community assets.
 - Outlining strategies for vegetation management and creating fire-resistant zones.
 - Developing an emergency response plan, including evacuation routes and communication protocols.

Plan Presentation and Discussion

- Each group presents their fire safety and preparedness plan to the class, explaining the chosen community, proposed strategies, and expected outcomes.
- Encourage students to provide reasons supported by facts and details for their chosen approaches.
- Facilitate a class discussion about the importance of community preparedness and the role of individuals in preventing and managing forest fires.

Reflection and Conclusion

- Ask students to reflect on the lesson and their understanding of the importance of fire prevention and management.
- Summarize the key points covered in the lesson and emphasize the role of community involvement in minimizing fire risks.

* The hands-on project focuses on developing a fire safety and preparedness plan for a specific community,



FOREST FIRE PREVENTION AND MANAGEMENT

PRESENTATION OUTLINE: PREVENTING AND MANAGING FOREST FIRES

Slide 1: Introduction

- Title: Forest Fire Prevention and Management
- Objectives: Explain the importance of preventing and managing forest fires.
- Visual Suggestions:
 - A forest landscape with signs of fire prevention and safety measures.
 - Firefighters conducting a training exercise on forest fire prevention.
- Verbal Prompt: "In this presentation, we will learn about the critical topic of forest fire prevention and management. Let's explore why it's crucial to protect our forests from the devastating effects of wildfires."

Slide 2: Causes and Impacts of Forest Fires

- Discuss the causes of forest fires, including natural and human factors.
- Highlight the environmental and social impacts of forest fires.
- Visual Suggestions:
 - Consequences of forest fires, including burnt landscapes and wildlife habitat destruction.
 - Natural causes of forest fires, such as lightning strikes or drought conditions. Visual representation of natural causes of forest fires, such as lightning strikes or drought conditions.
- Verbal Prompt: "Now, let's look into the causes of forest fires and understand how they can have far-reaching impacts on our environment and communities."

Slide 3: Prevention Strategies

- Explore strategies for preventing forest fires, such as creating fire breaks and implementing fire-resistant vegetation management.
- Discuss the importance of public education and awareness campaigns.
- Visual suggestions:
 - Firebreaks and controlled burns being conducted to prevent the spread of forest fires and another showcasing a community education event on fire-resistant vegetation and safety measures.
 - Photo showcasing a community education event.
- Verbal Prompt: "Here, we will explore various prevention strategies, including firebreaks and education programs, that can help reduce the risk of forest fires and protect our natural resources."

Slide 4: Fire Management Agencies and Emergency Response

- Explain the role of fire management agencies in preventing and managing forest fires.
- Discuss emergency response procedures and available resources for fire suppression.
- Visual suggestion:
 - Photo of firefighters in action, battling a forest fire.
 - Fire management agency personnel conducting fire monitoring and assessment.
- Verbal Prompt: "Discover the vital role of fire management agencies in responding to forest fires and the resources available to tackle these challenging situations."

Slide 5: Community Preparedness

- Highlight the importance of community involvement in fire prevention and management.
- Discuss the development of emergency plans and evacuation procedures.
- Visual suggestion:
 - Picture of a community evacuation drill to prepare for potential forest fire emergencies.
 - Community members participating in fire prevention and preparedness workshops.
- Verbal Prompt: "Lastly, let's explore how community involvement and preparedness play a critical role in mitigating forest fire risks and ensuring the safety of our neighborhoods and natural spaces."

Hands-on Project: Fire Safety and Preparedness Plan

Materials Needed:

- Paper
- Markers
- Research materials (books, articles, websites)

Introduction

- Engage students in a discussion about the importance of preventing and managing forest fires.
- Present the objectives of the lesson and explain that students will be developing a fire safety and preparedness plan.

Research and Planning

- Divide students into small groups.
- Assign each group a specific community affected by forest fires (real or hypothetical).
- Provide research materials and guide students to gather information about the community's geographical features, climate, and history of forest fires.
- In their groups, students should brainstorm and plan a fire safety and preparedness plan for the assigned community.

Action Plan Development

In their groups, students should create a fire safety and preparedness plan that includes:

- Identifying high-risk areas and vulnerable community assets.
- Outlining strategies for vegetation management and creating fire-resistant zones.
- Developing an emergency response plan, including evacuation routes and communication protocols.

Presentation and Discussion

- Each group presents their fire safety and preparedness plan to the class, explaining the chosen community, proposed strategies, and expected outcomes.
- Encourage students to provide reasons supported by facts and details for their chosen approaches.
- Facilitate a class discussion about the importance of community preparedness and the role of individuals in preventing and managing forest fires.

Reflection and Conclusion

- Ask students to reflect on the lesson and their understanding of the importance of fire prevention and management.
- Summarize the key points covered in the lesson and emphasize the role of community involvement in minimizing fire risks.



MAPPING AND MONITORING FORESTS

TRACKING CHANGES IN FOREST ECOSYSTEMS



INTERMEDIATE GRADES 3-5

Duration: 80 MINUTES

OBJECTIVES:

- Students will explore the importance of mapping and monitoring forests in this lesson. They will learn about remote sensing technologies, such as satellite imagery and drones, used for forest monitoring. Students will understand how these tools help assess forest health, identify changes over time, and inform conservation efforts. They will also create their own forest maps using available data.

STANDARDS:

Next Generation Science Standards (NGSS):

- 3-LS4-3: Construct an argument with evidence that in a particular habitat, some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.SL.3.3: Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.W.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- CCSS.ELA-LITERACY.W.5.2.A: Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

INTRODUCTION:

Mapping involves creating visual representations of forest areas, illustrating their boundaries, and identifying different features within them.

Monitoring involves regularly observing and recording changes in these forest areas over time, helping to assess their health, track deforestation, habitat loss, and inform conservation efforts.

Introduce the topic of forest monitoring and mapping:

"Good morning, students! Today, we will learn about forest monitoring and mapping. These tools help us understand how forests are doing and what changes happen over time. By using special technologies like satellite imagery and drones, we can gather important information to protect our forests and the environment. Let's dive into this exciting topic and discover how we can take care of our forests better. How is this done? With the use of satellite imagery and sometimes drones!

Satellite imagery is a sophisticated technology that involves using advanced cameras and sensors on satellites and drones positioned high above the Earth's surface to capture detailed images and collect valuable information. These images offer important insights into various aspects of the Earth, including forests, mountains, oceans, and cities. Scientists and researchers use this data to study forest sizes, types of vegetation, and animal habitats. Moreover, satellite imagery helps track changes over time, such as deforestation or forest regrowth. With this precise and up-to-date information, experts can make well-informed decisions for environmental conservation, land use planning, and resource management to protect and sustain our planet's natural resources and ecosystems.

In addition to satellite imagery, drones serve as another valuable tool for monitoring forests. Drones are highly versatile devices that can fly at lower altitudes and cover more localized areas with precision. They are like flying robots equipped with cameras and sensors, making them ideal for observing forests up close. One of the significant advantages of using drones is their ability to access hard-to-reach areas, such as dense forests or steep terrains, which might be challenging for satellites to capture. By flying over these areas, drones can gather detailed and specific data, helping researchers and conservationists understand the finer details of the forest ecosystem and identify any potential issues that need attention. With satellite imagery and drones working together, we can get a comprehensive view of our forests, both from a wide perspective and from up close, empowering us to make informed decisions for their protection and preservation."



MAPPING AND MONITORING FORESTS

PRESENTATION OUTLINE: TRACKING CHANGES IN FOREST ECOSYSTEMS

Slide 1: Introduction

- Title: Mapping and Monitoring Forests
- Objectives: Explain the importance of mapping and monitoring forests for conservation efforts.
- Verbal Prompt: "Welcome, students! Today, we are diving into the fascinating world of mapping and monitoring forests. We will discover why these tools are important for protecting our natural resources."
- Visual Suggestion: Display an image of a lush green forest with vibrant trees and diverse wildlife to capture attention and spark curiosity about the topic.

Slide 2: Remote Sensing Technologies

- Introduce remote sensing technologies used for mapping and monitoring forests, such as satellite imagery and drones.
- Explain how these tools provide valuable data about forest health and changes over time.
- Verbal Prompt: "Now, let's explore the incredible remote sensing technologies that allow us to study forests from above. These include satellites and drones, equipped with special cameras and sensors. They help us gather important information about forest health and track changes occurring over the years."
- Visual Suggestion: Show images of satellites and drones in action, capturing forest images, to give students a visual representation of how these technologies work.

Slide 3: Assessing Forest Health

- Discuss how remote sensing technologies help assess forest health, including indicators of biodiversity, vegetation density, and habitat quality.
- Highlight the importance of understanding forest health for conservation purposes.
- Verbal Prompt: "Now, let's delve deeper into how remote sensing technologies help us check the well-being of forests. We will explore indicators like biodiversity, vegetation density, and habitat quality, which give us vital clues about the overall health of the forest ecosystem. Understanding forest health is essential in making informed decisions for conservation and protection."
- Visual Suggestion: Display charts or infographics illustrating different indicators of forest health and how they are assessed using remote sensing technologies.

Slide 4: Identifying Changes Over Time

- Explore how remote sensing technologies can identify changes in forests over time, such as deforestation, habitat loss, or the spread of invasive species.
- Discuss the significance of monitoring these changes to inform conservation efforts.
- Verbal Prompt: "Let's shift our focus to the past and present. We will discover how remote sensing technologies help us identify changes in forests over time, such as deforestation, habitat loss, or the presence of invasive species. Understanding these changes is critical as it guides us in making important decisions to protect our precious forests."
- Visual Suggestion: Showcase side-by-side images or maps showing a forest area before and after significant changes, highlighting the impact of human activities on the environment.

Slide 5: Hands-on Forest Mapping

- Explain the hands-on project where students will create their own forest maps using available data.
- Provide guidance on accessing and interpreting forest data, such as topographic maps, vegetation maps, or satellite imagery.
- Verbal Prompt: "Now, it's your turn to become forest cartographers! Get ready for our hands-on project, where you will create your own forest maps. We will guide you in accessing data like topographic maps and satellite imagery to observe and document the fascinating features of our local forests."
- Visual Suggestion: Display a picture of students working with maps, satellite imagery, and markers, engaging in the forest mapping project, to excite students about the practical aspect of the lesson.

Hands-on Project: Forest Mapping

Materials Needed:

- Computers or tablets with internet access
- Printed topographic maps or satellite imagery of the local area
- Markers or colored pencils

Introduction

- Engage students in a discussion about the importance of mapping and monitoring forests for conservation efforts.
- Present the objectives of the lesson and explain the hands-on forest mapping project.

Research and Planning

- Divide students into small groups.
- Provide each group with a printed topographic map or satellite imagery of the local area. Use this link for the US Forest Service National Overview Maps: <https://www.fs.usda.gov/visit/maps>
- Guide students to access online resources to gather additional data about the forests in their area, such as vegetation types, protected areas, or biodiversity hotspots.

Forest Mapping Activity

In their groups, students should study the printed maps and online data to identify and map the forests in their local area.

- Encourage students to mark different types of forests, important features (e.g., rivers, trails), and any observed changes or human impacts.

Data Interpretation and Presentation

- Each group presents their forest maps to the class, explaining the identified forests, notable features, and any observed changes or impacts.
- Encourage students to use appropriate headings and illustrations to organize their maps and explain their findings.

Reflection and Conclusion

- Ask students to reflect on the lesson and their understanding of the importance of mapping and monitoring forests.
- Summarize the key points covered in the lesson and emphasize the role of data in informing conservation efforts.

Note: The hands-on project for this lesson focuses on creating forest maps using available data, allowing students to apply their knowledge of mapping and monitoring forests.



ADVANCED

SUGGESTED FOR GRADES 6-8





INVASIVE SPECIES AND FOREST HEALTH



STRATEGIES TO CONTROL AND PREVENT THE SPREAD OF INVASIVE SPECIES

ADVANCED GRADES 6-8

Duration: Varies

OBJECTIVES:

- Students will study the impacts of invasive species on forest ecosystems.
- Students will explore management strategies to control and prevent the spread of invasive species and discuss the challenges associated with their management.

STANDARDS:

Next Generation Science Standards (NGSS):

- MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.RST.6-8.4: Cite specific textual evidence to support analysis of science and technical texts.
- CCSS.ELA-LITERACY.WHST.6-8.1: Write arguments focused on discipline-specific content.

INTRODUCTION:

Students will learn about common invasive species, management strategies, and develop an action plan while observing these species in a local forest area for a deeper understanding.

Introduce the impact of invasive species on forest ecosystems

- Present the lesson's objectives.
- Use the "Invasive Species and Forest Health" presentation.

Understanding Invasive Species

- Define invasive species and discuss their characteristics.
- Highlight the effects of invasive species on native flora and fauna in forest ecosystems.

Impacts and Challenges

- Explore the ecological and economic consequences of invasive species in forests.
- Discuss the challenges faced in controlling and eradicating invasive species.

Management Strategies

- Introduce different management strategies to control and prevent the spread of invasive species.
- Emphasize the importance of early detection, monitoring, and public awareness.

Hands-on Project: Invasive Species Action Plan

- Divide students into small groups.
- Assign each group a specific invasive species found in their local area. Guide students in developing an action plan for prevention, control, and public awareness.

Invasive species are non-native organisms, such as plants, animals, or microorganisms, that enter and establish themselves in a new environment outside their natural range. These species have the potential to cause harm to the ecosystem, economy, or human health by outcompeting native species, disrupting natural processes, and altering habitats. Invasive species often lack natural predators or controls in their new environment, allowing them to multiply rapidly and spread aggressively, leading to ecological imbalances and posing significant challenges for conservation and management efforts. Understanding invasive species is crucial for middle school students as it helps raise awareness about the importance of protecting native biodiversity and the environment.



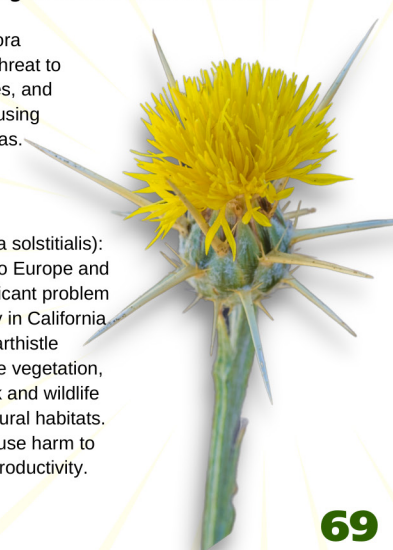
Garlic Mustard (*Alliaria petiolata*): A highly aggressive invasive plant that outcompetes native vegetation in forested areas, disrupting natural ecosystems.



The Asian Longhorned Beetle (*Anoplophora glabripennis*) is an invasive pest that poses a threat to several tree species, including maples, birches, and willows, by tunneling into their wood and causing severe damage to urban and forested areas.



Brown Marmorated Stink Bug (*Halyomorpha halys*). Originally from Asia, it has become a widespread pest in the United States. These stink bugs feed on a wide range of crops, fruits, and ornamental plants, causing significant damage to agricultural industries and disrupting ecosystems.



Yellow Starthistle (*Centaurea solstitialis*): This noxious weed is native to Europe and Asia but has become a significant problem in western states, particularly in California and Oregon. Yellow starthistle aggressively displaces native vegetation, reducing forage for livestock and wildlife and negatively impacting natural habitats. Its spiny seeds can also cause harm to animals and reduce land productivity.

The USDA National Invasive Species Information Center offers a wealth of invasive species educational resources at: www.invasivespeciesinfo.gov





INVASIVE SPECIES AND FOREST HEALTH

PRESENTATION OUTLINE: INVASIVE SPECIES AND FOREST HEALTH

Slide 1: Title: Invasive Species and Forest Health

- Introduce the concept of invasive species and their impact on forest ecosystems.
- Verbal Prompt: "Welcome to our presentation on 'Invasive Species and Forest Health.' Today, we will explore the hidden dangers that invasive species pose to our precious forests. Join us as we uncover the impacts of these intruders and discuss strategies to protect our valuable ecosystems."
- Photo Suggestions: Show a vibrant forest landscape with native trees and wildlife to emphasize the beauty and importance of healthy forest ecosystems.



Feral Swine: These invasive creatures cause significant ecological destruction, threatening native habitats and species. Learn more about their impact on the environment at the USDA APHIS webpage: <https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/operational-activities/feral-swine>

Slide 2: Understanding Invasive Species

- Define invasive species and explain their characteristics.
- Verbal Prompt: "Let's start by understanding what invasive species are and how they disrupt the delicate balance of our forests. We'll dive into their characteristics and learn about some of the most common invaders that threaten our native flora and fauna."
- Photo Suggestions: Include images of various invasive species, such as Japanese Knotweed or zebra mussels, to visually represent the diversity and potential threat they pose to the environment.

Slide 3: Impacts and Challenges

- Discuss the ecological and economic impacts of invasive species on forest ecosystems.
- Verbal Prompt: "As we delve deeper, we'll uncover the far-reaching impacts of invasive species on forest ecosystems. From ecological disruptions to economic challenges, we'll grasp the severity of the situation and explore the hurdles faced in managing these invaders."
- Photo Suggestions: Use pictures that showcase the negative consequences of invasive species, such as damaged habitats, reduced biodiversity, and the economic toll on industries like agriculture and forestry.

Slide 4: Management Strategies

- Explore different management strategies to control and prevent the spread of invasive species.
- Verbal Prompt: "To combat the invasion, we need effective management strategies. In this slide, we'll explore a range of tactics used to control and prevent the spread of invasive species. We'll also highlight the significance of early detection, monitoring, and the crucial role of public awareness in our conservation efforts."
- Photo Suggestions: Show images of professionals and volunteers engaging in various management activities, such as removing invasive plants, setting traps for invasive insects, or conducting surveys to monitor invasive species' populations.



Feral hogs in Florida cause destruction in sensitive wetland areas, causing severe damage to the delicate ecosystem and negatively impacting the biodiversity of the region.

Slide 5: Reflection and Discussion

- Facilitate a class discussion about the importance of addressing invasive species and their impact on forest health.
- Allow students to share their thoughts on potential solutions and their role in preventing the spread of invasive species.
- Verbal Prompt: "Now, it's time for a thoughtful discussion. We invite you to share your insights on the importance of addressing invasive species and safeguarding our forest health. Let's brainstorm potential solutions and explore how each one of us can contribute to preventing the spread of invasive species and preserving our forests for future generations."
- Photo Suggestions: Include pictures of students or community members engaging in conservation activities, such as planting native trees or participating in local clean-up events, to inspire a sense of responsibility and active involvement in forest protection.



INVASIVE SPECIES AND FOREST HEALTH

HANDS-ON PROJECT: INVASIVE SPECIES ACTION PLAN

Materials

- Research materials (books, articles, websites)
- Paper and pencils for note-taking and planning

Procedure

- Engage students in a discussion about the impact of invasive species on forest ecosystems.
- Present the objectives of the lesson and explain the hands-on invasive species action plan project.

Research and Planning

- Divide students into small groups. Encourage students to give their group a fun name, such as "Hog Busters"!
- Give each group an Invasive Species Action Plan Worksheet
- Provide research materials and guide students to gather information about the selected invasive species, their impacts, and management strategies.

Invasive Species Action Plan Development

In their groups, students should develop an action plan that includes:

- Identifying prevention strategies to stop the introduction and spread of invasive species.
- Outlining control methods to manage and reduce the population of invasive species.
- Planning public awareness initiatives to educate the community about the impacts and prevention of invasive species.

Presentation and Discussion

- Each group presents their invasive species action plan to the class, explaining the selected invasive species and the proposed prevention, control, and public awareness strategies.
- Encourage students to provide reasons supported by facts and details for their chosen approaches.
- Facilitate a class discussion about the challenges of managing invasive species and the importance of public awareness

Reflection and Conclusion

- Ask students to reflect on the lesson and their understanding of invasive species and their impact on forest health.
- Summarize the key points covered in the lesson.
- Emphasize the potential impact of their invasive species action plans.

OUTDOOR OPTIONAL PROJECT

Field Trip Planning and Preparation

- Use this project when attending education events at camps and other outdoor events.
- Invite your local conservation technician to participate in the field trip with your class!
- Provide students with a checklist of items they may need during the field trip, such as appropriate clothing, water bottles, notepads, field guides, and cameras.
- Review safety guidelines and expectations for behavior during the trip.

Invasive Species Field Observation

- Take the students to the selected forest area and guide them in observing and identifying invasive species.
- Encourage students to document their findings by taking photographs, drawing sketches, or recording detailed descriptions.

Data Analysis and Reflection

- Back in the classroom, guide students in analyzing the data collected during the field trip.
- Discuss the observed invasive species, their impacts on native flora and fauna, and the potential consequences for the forest ecosystem.
- Facilitate a class discussion where students reflect on the importance of addressing invasive species and their role in preventing their spread.

Reflection and Conclusion

- Ask students to reflect on the outdoor experience and their observations of invasive species in the forest.
- Summarize the key findings and emphasize the significance of firsthand observation in understanding the impact of invasive species on forest ecosystems.





INVASIVE SPECIES AND FOREST HEALTH

INVASIVE SPECIES ACTION PLAN WORKSHEET

Group Name: _____

Selected Invasive Species: Choose One Plant and One Animal:

Invasive Plants:

- Autumn Olive (*Elaeagnus umbellata*)
- Kudzu (*Pueraria montana* var. *lobata*)
- Japanese Knotweed (*Fallopia japonica*)
- Purple Loosestrife (*Lythrum salicaria*)
- Giant Hogweed (*Heracleum mantegazzianum*)

Invasive Animals, Insects and Reptiles

- Feral Swine (*Sus scrofa*)
- Emerald Ash Borer (*Agrilus planipennis*)
- Spotted Lanternfly (*Lycorma delicatula*)
- Asian Longhorned Beetle (*Anoplophora glabripennis*)
- European Starling (*Sturnus vulgaris*)

European Starlings - Due to their adaptability, aggressive behavior, and ability to outcompete native birds for food and nesting sites, European starlings have been known to displace native bird species. This can have negative impacts on the local biodiversity and ecosystem balance.



Goats are excellent for biological invasive eradication due to their voracious appetite and ability to consume a wide range of vegetation, including invasive plants. Additionally, their browsing behavior helps reduce the spread of invasive species by preventing these plants from reproducing and outcompeting native vegetation.



Write a brief description of the selected invasive species and its impact on forest ecosystems.

Online Sources: List the websites or online resources used for research on the selected invasive species.

Source 1:

Source 2:

Source 3:

Insert Drawing/Photo of Invasive Species

Invasive Species Action Plan Development:

Strategy 1:

Strategy 2:

Identify and describe your prevention strategies to stop the introduction and spread of the selected invasive species.

Control Methods: Outline control methods to manage and reduce the population of the selected invasive species.

Method 1:

Method 2:

Public Awareness Initiatives: Plan public awareness initiatives to educate the community about the impacts and prevention of the selected invasive species.

Initiative 1:

Initiative 2:



The Asian longhorn beetle (*Anoplophora glabripennis*) is an invasive species of wood-boring beetle native to Asia. It poses a significant threat to hardwood trees in North America, Europe, and other regions where it has been introduced, as the larvae bore into tree trunks and branches, potentially causing severe damage and death to a wide variety of tree species.

The emerald ash borer (*Agrilus planipennis*) is an invasive beetle species native to Asia that has become a serious threat to ash trees in North America and parts of Europe. The adult beetles lay eggs on the bark of ash trees, and their larvae tunnel under the bark, disrupting the tree's nutrient and water transport, ultimately leading to the decline and death of infested ash trees.



Remember to cite your sources and have fun with your action plan development!



National Association of Conservation Districts 2024 Stewardship and Education Lesson Plan Guide



CONSERVATION STRATEGIES FOR FORESTS

HABITAT PRESERVATION, ENDANGERED SPECIES PROTECTION, AND THE ROLE OF CONSERVATION ORGANIZATIONS.

ADVANCED GRADES 6-8

Duration: Varies

OBJECTIVES:

- Students will explore a variety of conservation strategies for forests in this lesson. They will learn about protected areas, conservation easements, and corridors that help maintain connectivity between forest habitats.
- Students will discuss the importance of habitat preservation, endangered species protection, and the role of conservation organizations.

STANDARDS:

Next Generation Science Standards (NGSS):

- MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.
- CCSS.ELA-LITERACY.WHST.6-8.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

- Invasive Species Control: Addressing the threat of invasive plants and animals that can disrupt forest ecosystems and outcompete native species, often through monitoring and targeted removal efforts.
- Forest Health Monitoring: Regularly assessing forest health and identifying potential threats such as disease, pests, and climate-related stressors to take timely corrective actions.
- Forest Fire Prevention and Management: Implementing strategies to prevent wildfires and managing controlled burns to maintain healthy forest ecosystems and reduce the risk of catastrophic fires.
- Protected Areas and Conservation Easements: Collaborating with landowners and partners to establish protected areas and conservation easements that safeguard ecologically important forest landscapes from development.
- Habitat Restoration and Connectivity: Restoring degraded habitats and establishing forest corridors to enhance wildlife movement and biodiversity connectivity within the landscape.

INTRODUCTION:

- Engage students in a discussion about the importance of forest ecosystems and their role in supporting diverse life forms.
- Introduce the objectives of the lesson: to explore conservation strategies for forests and understand their role in maintaining ecological balance.

Introduce Conservation Districts

- The role of a conservation district is to serve as a local entity that works directly with farmers, landowners, and community members to promote responsible land and resource management. Conservation districts collaborate with various partners, such as government agencies, non-profit organizations, and educational institutions, to implement conservation programs and practices that protect soil, water, and wildlife habitats. They play a vital role in educating the community about sustainable land use and environmental stewardship, working towards the common goal of preserving natural resources for future generations.

Conservation Strategies for Forests

Conservation districts' conservation strategies for forests encompass a range of initiatives and best management practices aimed at sustainably managing and protecting forest ecosystems across the nation.

Landowner participation is strictly voluntary. Strategies can include:

- Reforestation and Afforestation: Planting new trees and promoting natural regeneration in areas where forests have been depleted or degraded, enhancing carbon sequestration and biodiversity.
- Forest Management Plans: Developing and implementing comprehensive forest management plans that consider ecological, economic, and social factors to ensure responsible and long-term forest stewardship.

Community Outreach AHEAD

Conservation districts actively engage with the community through educational programs, workshops, and outreach activities to promote awareness about the significance of forests and the importance of conservation strategies. They also foster collaboration with diverse stakeholders, such as government agencies, NGOs, local communities, and private landowners, to combine resources and expertise in advancing forest conservation efforts effectively.



CONSERVATION STRATEGIES FOR FORESTS

PRESENTATION OUTLINE: CONSERVATION STRATEGIES FOR FORESTS

Slide 1: Introduction

- Title: Conservation Strategies for Forests
- Objectives: Introduce the concept of conservation strategies for forests.
- Visual Recommendation: An image of a lush forest with diverse plant and animal life, symbolizing the beauty and richness of forests.
- Verbal Prompt: "Welcome to the world of forests, where nature's treasures thrive! Today, we embark on a journey to uncover the strategies that safeguard these ecosystems."



Preserving Nature's Sanctuary: Habitat Conservation Area - No Trespassing.

Slide 2: Protected Areas and Conservation Easements

- Define protected areas and conservation easements.
- Explain how these strategies contribute to habitat preservation and species protection.
- Visual Recommendation: An illustration depicting a protected forest area with a sign representing the sanctuary for flora and fauna.
- Verbal Prompt: "Let's delve into protected areas and conservation easements. Discover how these watchful zones shield habitats and species."

Slide 3: Forest Corridors and Connectivity

- Discuss the importance of forest corridors and maintaining connectivity between forest habitats.
- Highlight examples of corridors and their role in enhancing biodiversity.
- Visual Recommendation: An infographic presenting interconnected forest habitats, showcasing the importance of corridors for wildlife movement.
- Verbal Prompt: "Venture into the lifelines of the forest—its corridors! Witness the role they play in uniting habitats and fostering biodiversity among the wild inhabitants."

Slide 4: Endangered Species Protection

- Explore the concept of endangered species and their significance in forest conservation.
- Provide examples of endangered species and the conservation efforts dedicated to their protection.
- Visual Recommendation: A montage featuring images of endangered species and conservation efforts, evoking compassion for these vulnerable creatures.
- Verbal Prompt: "Meet the rare and endangered stars of the forest. Explore their significance in forest conservation and the dedicated efforts to secure their future."



Bipartisan conservation district board members are elected by the community to oversee local conservation efforts, ensuring a collaborative approach to environmental stewardship. They represent a diverse range of perspectives and work together towards a shared goal of sustainability.

Slide 5: Role of Conservation Organizations

- Discuss the role of conservation organizations in implementing and promoting forest conservation strategies.
- Highlight the contributions and initiatives of renowned conservation organizations.
- Visual Recommendation: Logo of your conservation district or of National Association of Conservation Districts, showcasing their commitment and influence in protecting forests.
- Verbal Prompt: "Now, discover the groups working tirelessly behind the scenes—the conservation districts! Learn about their role in forest conservation strategies."



WATERSHED PROTECTION AND FOREST MANAGEMENT

SAFEGUARDING WATERSHEDS THROUGH EFFECTIVE FOREST MANAGEMENT

ADVANCED GRADES 6-8

Duration: 2.5 Hours

OBJECTIVES:

- This lesson focuses on exploring the relationship between forests and watersheds, the importance of forests in maintaining water quality and regulating water flow, and exploring management practices promoted by conservation districts that protect and restore watershed health.

STANDARDS:

Next Generation Science Standards (NGSS):

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.
- CCSS.ELA-LITERACY.WHST.6-8.7: Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

INTRODUCTION:

- Explain to students that they will explore the relationship between forest management and watershed protection. Throughout this exploration, we will witness how conservation districts tailor their programs to address the unique environmental challenges and opportunities in their local areas.

Conservation Districts

Watershed Protection and Forestry Management

Conservation districts play a crucial role in forest management for watershed protection, working closely with landowners and stakeholders to promote sustainable practices that safeguard water quality and quantity within watersheds. They provide technical assistance and educational outreach to encourage forest landowners to implement best management practices (BMPs) that minimize soil erosion, reduce sedimentation, and maintain healthy riparian zones. Collaboratively, they coordinate reforestation projects and establish forested buffers along streams to stabilize streambanks, filter pollutants, and mitigate the impacts of floods and droughts. Through active engagement in watershed planning, conservation districts contribute to the preservation and restoration of healthy forests, supporting the overall well-being of the entire watershed ecosystem.

As local entities, conservation districts have the flexibility to customize their programs to address specific environmental challenges and opportunities in their respective areas. They adapt their initiatives to suit the distinct characteristics and demands of the local landscape, whether it's implementing forest management strategies, restoring degraded watersheds, or protecting critical habitats. By tailoring their programs, conservation districts can effectively engage stakeholders, collaborate with partners, and deliver targeted solutions that yield meaningful and sustainable impacts for the environment and the communities they serve.

Through the NACD Education Hub, district educators, volunteers, public and private school teachers, or anyone interested in sharing the message of conservation can access our free educational materials, all correlated to standards and designed to promote environmental stewardship and sustainable practices. Interested? Just scan the code!



The National Association of Conservation Districts (NACD) effectively assists conservation districts in watershed protection and forestry management through technical assistance, resource sharing, advocacy, and funding opportunities.

By promoting conservation stewardship, fostering partnerships, supporting research, and conducting outreach, NACD empowers districts to implement sustainable practices and protect natural resources for the benefit of current and future generations.

Conservation District Education and Outreach Programs

With a focus on education and professional outreach, conservation districts provide valuable resources and support to educators in their efforts to integrate watershed protection and forest management concepts into their teaching curriculum, fostering a deeper understanding and appreciation for environmental conservation among students.



WATERSHED PROTECTION AND FOREST MANAGEMENT

PRESENTATION OUTLINE: CONSERVATION STRATEGIES FOR FORESTS

Slide 1: Introduction

- Title: Watershed Protection and Forest Management
- Objectives: Introduce the concept of watersheds, the role of forest management in maintaining watershed protection and water quality.
- Visual Recommendation: An image of a pristine forest surrounding a clean and flowing river, illustrating the vital connection between forests and water resources.
- Verbal Prompt: "Take a moment to observe this image. Today, we will explore the important relationship between forests and watersheds, and how forest management plays a role in protecting our water sources."



Vegetation along natural waterways in forests help filter pollutants, excess nutrients, and sediments from surface runoff before it reaches the stream, improving water quality and protecting aquatic habitats. The vegetation also provides shade, helping to regulate water temperature and create a suitable environment for various aquatic species.

Slide 2: Forests and Watersheds

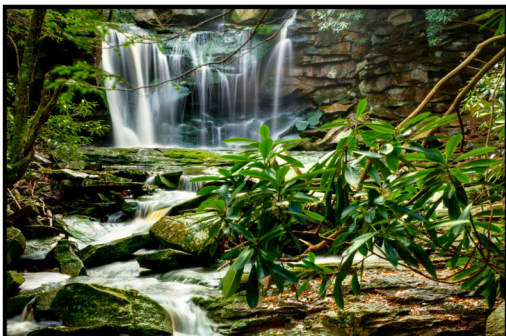
- Explain the concept of a watershed and its components, including the land, water bodies, and their relationship.
- Discuss the importance of forests in maintaining water quality and regulating water flow within watersheds.
- Visual Recommendation: A clear and concise diagram illustrating the concept of a watershed, with arrows indicating the flow of water from the land to the water bodies.
- Verbal Prompt: "Observe this diagram, which explains the components of a watershed and the interaction between land and water. Let's discuss the significance of forests in maintaining water quality within these systems."

Slide 3: Impacts of Deforestation on Watersheds

- Present the impacts of deforestation on watersheds, such as soil erosion, increased sedimentation in water bodies, and altered water flow patterns.
- Explain the consequences of these impacts on water quality, aquatic ecosystems, and downstream communities.
- Visual Recommendation: A before-and-after image showcasing the negative consequences of deforestation on a watershed, including soil erosion, sedimentation, and altered water flow.
- Verbal Prompt: "This image portrays the effects of deforestation on watersheds. Take note of the changes caused by deforestation and how it can impact water quality and aquatic life."

Slide 4: Forest Management Practices for Watershed Protection

- Explore management practices that protect and restore watershed health, such as:
- Reforestation and afforestation to prevent soil erosion.
- Riparian zone protection to filter and regulate water flow.
- Best management practices for sustainable logging to minimize impacts on water quality.
- Visual Recommendation: A series of images displaying forest management practices, such as reforestation, protected riparian zones, and sustainable logging techniques.
- Verbal Prompt: "Explore these images illustrating various forest management strategies for watershed protection. Let's discuss how each practice contributes to safeguarding our water resources."



Forest canopies provides shade and protection for the stream. Plants like shrubs, grasses, and ferns along streambanks help stabilize the soil, preventing erosion caused by the force of flowing water.

Slide 5: Reflection and Discussion

- Facilitate a class discussion about the importance of watershed protection and the role of forest management in maintaining water quality.
- Allow students to share their thoughts on the challenges and benefits of implementing management practices for watershed protection.
- Visual Recommendation: A picture of students engaged in a lively discussion, exchanging ideas and insights on watershed protection and forest management.
- Verbal Prompt: "As we conclude, I encourage you to participate in a meaningful discussion about the importance of preserving watersheds and the role of forest management. Share your thoughts on the challenges and benefits of implementing these strategies in our communities."



WATERSHED PROTECTION AND FOREST MANAGEMENT

ADDITIONAL PRESENTATION OUTLINE FOR DISTRICT EDUCATORS: CONSERVATION DISTRICTS AND WATERSHED PROTECTION THROUGH FOREST MANAGEMENT

Presentation Outline: The Role of Conservation Districts in Watershed Protection and Forest Management

Note: Customize the presentation outline by adding relevant visuals, data, and examples specific to the local conservation district and audience.

Introduction

- Briefly introduce the topic of the presentation: "Today, we will explore the role of Conservation Districts in protecting our watersheds and managing our forests for a sustainable future."
- Engage the audience with a compelling environmental fact or statistic related to watersheds and forests.

District's Approach to Addressing Challenges

- Conservation Districts' proactive and comprehensive approach to watershed protection and forest management.
- Collaborative strategies to address challenges and ensure the health of natural resources. Visual Recommendation: Display a flowchart or infographic illustrating the district's multi-faceted approach to watershed protection and forest management.

Collaborative Efforts with Landowners and Stakeholders

- Districts engagement with landowners, stakeholders, and partners to promote sustainable practices.
- The importance of cooperation and shared responsibility in safeguarding water resources. Visual Recommendation: Include images of district representatives working with landowners and partners in the field, emphasizing teamwork and collaboration.

Technical Assistance and Educational Outreach

- District role in providing technical support and educational resources to forest landowners.
- The impact of educational outreach in encouraging the adoption of best management practices (BMPs). Visual Recommendation: Showcase photos of district-led workshops and educational events, highlighting active participation and learning.

Reforestation Projects and Forested Buffers

- How districts coordinate reforestation efforts to restore forests and enhance watershed health.
- The significance of forested buffers along streams in improving water quality. Visual Recommendation: Include before-and-after images of reforestation projects and forested buffers, illustrating positive environmental changes.

Adaptive Programs for Local Challenges

- District programs are tailored to address specific local environmental challenges and opportunities.
- The flexibility and adaptability of initiatives in response to changing conditions. Visual Recommendation: Present a map showing the diverse landscapes and environmental challenges in the local area.

Examples of Successful Initiatives

- Inspiring examples of district-led projects that have positively impacted watershed protection and forest management.
- Testimonials from community members or landowners on the positive outcomes of district initiatives. Visual Recommendation: Include a slideshow with images and descriptions of successful projects, showcasing the district's meaningful contributions.

Conclusion

- Recap the key points discussed in the presentation, emphasizing the essential role of districts in protecting watersheds and forests.
- Deliver the closing message: "As we conclude, let us recognize the critical role of Conservation Districts in fostering a harmonious relationship between our watersheds and forests, ensuring a sustainable environment for the benefit of all."

Q&A Session (Optional)

- Offer a brief question-and-answer session to engage the audience and address any queries or comments related to the presentation.



WATERSHED PROTECTION AND FOREST MANAGEMENT

HANDS-ON PROJECT: WATERSHED MODEL AND MANAGEMENT PLAN

INTRODUCTION (10 MINUTES)

- Engage students in a discussion about watersheds, their importance, and the potential impacts of human activities on watershed health.
- Present the objectives of the lesson and explain the hands-on watershed model and management plan project.

Objective: Students will work individually or in small groups to create a watershed model and develop a management plan that incorporates forest management practices for watershed protection.

Materials:

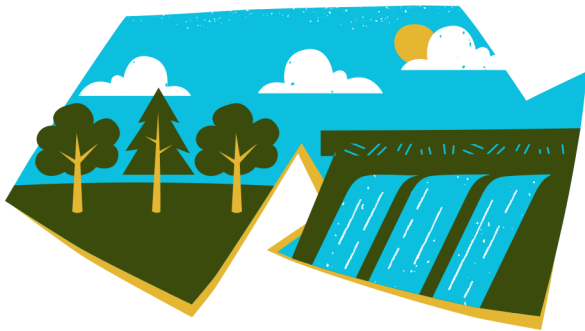
- Large plastic tray or container
- Sand, soil, and pebbles
- Plastic cups, straws, and clay (optional)
- Water source (sink or bucket)
- Art supplies (paper, markers, colored pencils, etc.) for creating the management plan

WATERSHED MODEL CONSTRUCTION (40 MINUTES)

- In small groups or individually, provide students with the necessary materials to construct a watershed model in a large plastic tray or container.
- Guide students to create different land features, such as hills, valleys, and forests, using sand, soil, pebbles, and other materials.
- Optional: Use plastic cups, straws, and clay to represent human activities, such as buildings, agriculture, or logging.

WATERSHED SIMULATION (30 MINUTES)

- Introduce water into the watershed model by pouring it from a water source (sink or bucket) at a controlled rate.
- Observe and discuss the movement of water, erosion patterns, and the accumulation of sediment in different parts of the watershed model.
- Facilitate a class discussion about the impacts of human activities on watershed health based on the observations.



MANAGEMENT PLAN DEVELOPMENT (40 MINUTES)

- In their individual or group work, students should develop a management plan for the watershed model, incorporating forest management practices for watershed protection.
- Encourage students to consider strategies like reforestation, riparian zone protection, and sustainable logging practices to minimize erosion and protect water quality.

PRESENTATION AND DISCUSSION (20 MINUTES)

- Each student/group presents their watershed model and management plan to the class, explaining the selected forest management practices and their rationale.
- Facilitate a class discussion about the effectiveness of the management plans in protecting the watershed and maintaining water quality.
- Discuss the challenges and benefits of implementing forest management practices for watershed protection.

REFLECTION AND CONCLUSION (10 MINUTES)

- Ask students to reflect on the lesson and their understanding of watershed protection and the role of forest management in maintaining water quality.
- Summarize the key points covered in the lesson and emphasize the potential impact of implementing sustainable forest management practices for watershed health.



FOREST RESEARCH AND DATA ANALYSIS

THE REAL-WORLD RELEVANCE OF FOREST INVENTORIES

ADVANCED GRADES 6-8

Duration: 45 minutes per lesson
(5 lessons)

OBJECTIVES:

- Students will understand the importance of forest research and data analysis in informing sustainable forest management decisions and conservation strategies.
- Students will learn various methods of forest data collection, including field observations, plot sampling, and remote sensing, to analyze forest ecosystems effectively.
- Students will develop data analysis skills to interpret and draw meaningful insights from collected forest data, enabling them to contribute to evidence-based forest conservation and management practices.

STANDARDS:

Next Generation Science Standards (NGSS):

- NGSS: MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- NGSS: MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Common Core State Standards (CCSS):

- CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- CCSS.ELA-LITERACY.WHST.6-8.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

INTRODUCTION:

Forest research involves studying various aspects of forests to gain insights into their ecology and health, while data analysis helps in interpreting collected information to make informed decisions for sustainable forest management and conservation.

FOREST INVENTORIES

Forest inventories involve the comprehensive and structured assessment of a forest's characteristics and resources. This process includes collecting data on various elements within the forest, such as the types and abundance of tree species, their age distribution, size classes, health conditions, and the presence of other vegetation and wildlife. In addition to tree-related data, forest inventories may also record information on soil properties, water features, and environmental factors that influence the forest's overall health and ecological dynamics.

DATA ANALYSIS

Data analysis in the context of forest inventories involves processing and interpreting the collected information using various analytical techniques. After data is gathered through methods like field observations, plot sampling, and remote sensing, it undergoes thorough examination to reveal meaningful patterns, relationships, and trends within the forest ecosystem.

Forestry experts and scientists scrutinize the data to identify the distribution of tree species, assess forest health, and understand the ecological dynamics. They analyze the age structure of trees, assess biodiversity, and determine the extent of environmental impacts on the forest. This data analysis plays a pivotal role in formulating forest management strategies, setting conservation priorities, and addressing potential challenges, such as deforestation or habitat loss.

By extracting valuable insights from the gathered data, forest managers, ecologists, and policymakers can make well-informed decisions to support sustainable forest practices, protect biodiversity, and ensure the long-term health and resilience of forest ecosystems. Data analysis in forest inventories provides a scientific basis for promoting responsible stewardship and safeguarding these critical natural resources for future generations.

SUMMARY:

This lesson provides educators with a detailed plan to teach students about forest inventories and the significance of accurate data collection for informed forest management decisions. Students will explore various forest inventory techniques and engage in hands-on data collection activities in their local environment.



FOREST RESEARCH AND DATA ANALYSIS

PRESENTATION OUTLINE: FOREST RESEARCH AND DATA ANALYSIS LESSON 1

Introduction (5 minutes)

- Start by explaining the learning objectives of the lesson: "Today, we will explore the fascinating world of forest research and data analysis, discovering how they shape sustainable forest management and conservation practices."
- Engage students with a real-world example: "Imagine a forest ranger using data to understand the health of a nearby forest and making informed decisions to protect it from potential threats."
- Visual Suggestion: Display images of diverse forest ecosystems and forest researchers collecting data in the field.
- Verbal Prompt: "Why do you think it's essential to study forests and collect data? How might this information help protect forests and the creatures that call them home?"

Forest Inventory Techniques (15 minutes)

- Discuss various forest inventory methods: "Today, we'll explore three key techniques: field observations, where scientists closely study forest components on-site, plot sampling, which involves systematically measuring areas to represent the whole forest, and remote sensing, using aerial imagery to study large forested regions."
- Provide examples and visuals: "Let's see how researchers use binoculars for bird counts during field observations, place sample plots to measure trees in plot sampling, and use satellite images for remote sensing."
- Visual Suggestion: Present images or short videos of researchers conducting each inventory technique.
- Verbal Prompt: "Can you think of any advantages or challenges associated with each inventory technique? How might these methods complement one another in understanding the forest's bigger picture?"

Data Collection Activity (20 minutes)

- Divide students into small groups: "Now, we'll put our knowledge into action! You'll work in teams to conduct a mini forest inventory in designated areas."
- Assign specific areas for data collection: "Each group will explore a different section of the school grounds or a nearby park, observing trees, plants, and any signs of wildlife."
- Instruct data collection using field guides and data sheets: "You'll record your observations, collect samples, and carefully document relevant data for analysis."
- Visual Suggestion: Share sample field guides and data sheets for students to reference during the activity.
- Verbal Prompt: "What data would you consider essential to collect during the mini forest inventory? How might this data help us understand the health of our local forest?"

Data Analysis and Discussion (5 minutes)

- Regroup to discuss data collected by each group: "Let's now review the data you collected during the inventory activity."
- Encourage analysis and observations: "Take a moment to identify any patterns, common tree species, or signs of environmental health you noticed in your data."
- Visual Suggestion: Display a simple chart or graph showcasing the data collected by each group for comparison.
- Verbal Prompt: "What insights did your group gain from analyzing the data? Can you draw any connections between the data and the forest's well-being?"

Conclusion and Reflection (5 minutes)

- Summarize the main points: "Today, we explored the significance of forest research and data analysis, learning valuable techniques for understanding and protecting forests."
- Engage students in a reflection: "How might the data you collected and analyzed contribute to making informed decisions for managing and conserving our forests?"
- Visual Suggestion: Present before-and-after images of forests to demonstrate the impact of data-driven decisions on forest conservation.

"STEM education plays a pivotal role in building a well-informed and environmentally-conscious society, where individuals can make evidence-based decisions, advocate for sustainable practices, and actively contribute to preserving the health of our soils and water bodies."



FOREST RESEARCH AND DATA ANALYSIS

PRESENTATION OUTLINE: FOREST RESEARCH AND DATA ANALYSIS LESSON 2

In this lesson, we will delve into data analysis techniques to interpret forest data sets and make informed decisions. We'll explore statistical analysis and visualization tools used to analyze factors like biodiversity, tree health, and ecosystem services.

Review and Discussion (10 minutes)

- Recap concepts from the previous lesson on forest inventories and data collection.
- Engage in a discussion on the significance of data analysis in drawing conclusions and making informed decisions for forest management.
- Visual Suggestion: Present a summary slide with key points from the previous lesson.
- Verbal Prompt: "Why is data analysis important when studying forests? How can it help us understand the forest ecosystem better?"

Data Analysis Techniques (20 minutes)

- Introduce statistical analysis and visualization tools commonly used in forest data analysis.
- Demonstrate how to interpret data sets, calculate basic statistics, and create visual representations.
- Visual Suggestion: Display examples of statistical analysis and visualizations used in forest research.
- Verbal Prompt: "How can statistical analysis and visualizations help us explore complex forest data? What insights might we gain from these techniques?"

Statistical Analysis:

- **Mean and Standard Deviation:** Calculating the average tree height or diameter in a forest stand and determining how much individual measurements vary from the average.
- **Frequency Distribution:** Analyzing the distribution of tree diameters or species abundance to understand the forest's composition and diversity.
- **Regression Analysis:** Assessing the relationship between two variables, such as tree age and growth rate, to identify correlations and make predictions.
- **T-tests and ANOVA:** Comparing the means of different forest plots or areas to determine if there are significant differences in tree characteristics or biodiversity.

Analyzing Forest Data Exercise (10 minutes)

- Provide students with a set of forest data, such as tree measurements, species distribution, or biodiversity indices.
- Instruct students to analyze the data using appropriate statistical analysis techniques and visualization tools.
- Visual Suggestion: Show a forest data set to be analyzed.
- Verbal Prompt: "What data do you have, and how would you analyze it to understand specific aspects of the forest ecosystem?"

Visualizations:

- **Bar Charts and Histograms:** Illustrating the distribution of tree species or diameter classes, providing a visual overview of the forest's composition.
- **Scatter Plots:** Displaying the relationship between two variables, such as tree height and diameter, to visualize patterns and associations.
- **Pie Charts:** Representing the percentage distribution of different tree species or forest components to visualize their relative abundance.
- **Geographic Information Systems (GIS) Mapping:** Creating maps with spatial data, such as tree density or forest cover, to identify spatial patterns and hotspots.
- **Heatmaps:** Using color gradients to visualize changes in forest attributes, like tree density or carbon sequestration, across different areas.
- **Box-and-Whisker Plots:** Displaying the spread and distribution of tree measurements, such as height or volume, to understand their variability.
- **Radar Charts:** Comparing multiple forest stands based on various attributes, such as tree species composition, allowing for a quick visual comparison.

Group Discussion (5 minutes)

- Encourage students to share their findings, interpretations, and any trends or patterns observed in the data.
- Visual Suggestion: Present a slide with discussion points to guide the group discussion.
- Verbal Prompt: "What patterns or insights did you discover from analyzing the forest data? How might this information be valuable for forest management decisions?"

Conclusion and Reflection (5 minutes)

- Summarize key concepts from the lesson.
- Discuss the significance of data analysis in making informed decisions for forest management.
- Visual Suggestion: Display a concluding slide summarizing the main points.
- Verbal Prompt: "What have you learned today about analyzing forest data? How might data analysis help us make responsible decisions to protect and preserve forests?"

"STEM education in soil and water conservation is vital as it equips students with the scientific knowledge and skills needed to tackle the complex environmental challenges our planet faces, ensuring the sustainable management of precious natural resources."



FOREST RESEARCH AND DATA ANALYSIS

PRESENTATION OUTLINE: FOREST RESEARCH AND DATA ANALYSIS LESSON 3

In this lesson, we will develop skills in effectively communicating our research findings and recommendations. We'll explore various communication methods, such as oral presentations, written reports, and visual presentations, emphasizing the importance of clear and persuasive communication.

Introduction and Discussion (10 minutes)

- Review the importance of effective communication in scientific research and decision-making: "Communication is key in conveying our discoveries and influencing positive changes in forest management."
- Engage in a discussion about communication methods: "Let's explore different ways scientists share their findings, from speaking in front of an audience to writing detailed reports."
- Visual Suggestion: Display images of scientists presenting their research findings and engaging with the audience.
- Verbal Prompt: "Why is it crucial for scientists to communicate their findings accurately and convincingly? How might the chosen communication method impact the audience's understanding?"

Communication Methods Exploration (10 minutes)

- Introduce different communication methods: "Today, we'll examine oral presentations, written reports, and visual presentations as powerful tools for sharing research insights."
- Discuss the target audience, purpose, and structure of each method: "Each method has its strengths, depending on who we want to reach and the information we want to convey."
- Visual Suggestion: Present a table comparing the characteristics of each communication method.
- Verbal Prompt: "When might you choose an oral presentation over a written report, or vice versa? How can visual presentations complement other communication methods?"

Presentation Skills Workshop (15 minutes)

- Provide guidance on effective presentation skills: "Let's practice delivering engaging presentations with confident body language, clear voice projection, and compelling visual aids."
- Offer tips on organizing content and engaging the audience: "We'll explore ways to structure our presentations, use appropriate language, and keep our listeners attentive."
- Visual Suggestion: Show short video clips of exemplary presenters and their techniques.
- Verbal Prompt: "What are some essential tips for delivering an impactful presentation? How can we ensure our message comes across clearly and convincingly?"

Presentations and Peer Feedback (10 minutes)

- Divide students into small groups. Instruct each group to prepare a presentation based on their forest data analysis from the previous lessons.
- Students will present their findings and recommendations to their peers, followed by constructive feedback and discussion.
- Visual Suggestion: Create a presentation slide template for students to use during their presentations.
- Verbal Prompt: "How will you organize your presentation to effectively convey your forest data analysis? What elements will you include to engage your audience?"

Conclusion and Reflection (5 minutes)

- Summarize the key points discussed in the lesson: "Today, we explored different communication methods and presentation skills for sharing our forest research findings."
- Encourage reflection on the importance of clear and persuasive communication: "Effective communication is essential in making a positive impact on forest management decisions."
- Visual Suggestion: Show a slide with key takeaways from the lesson.
- Verbal Prompt: "What did you learn about effective communication today? How might these skills be valuable beyond the field of forest research?"

"Incorporating STEM education in soil and water conservation fosters critical thinking, problem-solving, and innovative approaches, empowering the next generation of conservationists to develop cutting-edge technologies and practices that safeguard our ecosystems for future generations."



FOREST RESEARCH AND DATA ANALYSIS

STEM FAIR PROJECT WORKSHEET

PROJECT TITLE: INVESTIGATING BIODIVERSITY IN FOREST ECOSYSTEMS

DAY 1: FOREST INVENTORIES AND DATA COLLECTION.

Choose three different forest locations for your study:

Location 1: _____

Location 2: _____

Location 3: _____

Divide each forest location into smaller sampling areas or quadrats:

Quadrats in Location 1: _____

Quadrats in Location 2: _____

Quadrats in Location 3: _____

Use the following forest inventory techniques to collect data on plant species diversity in each quadrat:

Field Observations: _____

Plot Sampling: _____

Remote Sensing: _____

Record the names and abundance of plant species using field guides or smartphone apps.

Plant Species in Location 1: _____

Plant Species in Location 2: _____

Plant Species in Location 3: _____

Take photos of representative plant species to aid in identification and documentation.

DAY 2: ANALYZING FOREST DATA AND MAKING INFORMED DECISIONS.

Organize and compile the data collected from each quadrat in the three forest locations.

Use the following statistical analysis techniques to analyze the data:

Species Richness: _____

Evenness: _____

Diversity Indices: _____

Create visual representations of the data using graphs or charts to compare biodiversity among the forest locations.

Analyze the data to identify any patterns, trends, or differences in biodiversity between the forest areas.

Draw conclusions based on your analysis and discuss the implications for forest management and conservation.

"Through STEM, we harness the power of science, technology, engineering, and math to address environmental challenges and preserve Earth's biodiversity, creating a brighter and greener future."



FOREST RESEARCH AND DATA ANALYSIS

STEM FAIR PROJECT WORKSHEET

PROJECT TITLE: INVESTIGATING BIODIVERSITY IN FOREST ECOSYSTEMS

DAY 3: COMMUNICATING FINDINGS AND RECOMMENDATIONS

TITLE AND INTRODUCTION:

PROJECT TITLE: _____

INTRODUCTION: _____

RESEARCH QUESTION AND HYPOTHESIS:

RESEARCH QUESTION: _____

HYPOTHESIS: _____

METHODOLOGY AND DATA COLLECTION:

METHODS USED: _____

SAMPLING AREAS: _____

DATA COLLECTION TOOLS: _____

DATA ANALYSIS AND FINDINGS:

DATA ANALYSIS RESULTS: _____

KEY FINDINGS: _____

PHOTOGRAPHS AND SPECIES DOCUMENTATION:

REPRESENTATIVE PLANT SPECIES: _____

LABELS AND CAPTIONS: _____

CONCLUSION AND IMPLICATIONS:

CONCLUSIONS: _____

IMPLICATIONS FOR FOREST MANAGEMENT: _____

DISPLAY ENHANCEMENTS:

BORDERS, COLORS, AND BACKGROUND: _____

FOREST ELEMENTS ILLUSTRATIONS: _____

QUOTES OR FACTS: _____

CAPTIONS AND LABELS:

CAPTIONS FOR VISUAL ELEMENTS: _____

LABELS FOR GRAPHS AND PHOTOGRAPHS: _____

"STEM in conservation empowers us to explore, innovate, and develop sustainable solutions, bridging science and technology to protect our environment for generations to come."



FOREST RESEARCH AND DATA ANALYSIS

TIPS FOR A SUCCESSFUL STEM FAIR CONSERVATION-BASED PRESENTATION

Day 1: Forest Inventories and Data Collection

Objective: To conduct a forest inventory and collect data on plant species diversity in different forest areas.

- Choose three different forest locations for your study, such as a local park, nearby woodland, or school grounds.
- Divide each forest location into smaller sampling areas or quadrats.
- Use the forest inventory techniques discussed in Lesson 1 to collect data on plant species present in each quadrat.
- Record the names and abundance of plant species using field guides or smartphone apps.
- Take photos of representative plant species to aid in identification and documentation.

Day 2: Analyzing Forest Data and Making Informed Decisions

Objective: To analyze the collected data and explore patterns of biodiversity in the studied forest areas.

- Procedure: Organize and compile the data collected from each quadrat in the three forest locations.
- Use appropriate statistical analysis techniques, such as calculating species richness, evenness, and diversity indices.
- Create visual representations of the data using graphs or charts to compare biodiversity among the forest locations.
- Analyze the data to identify any patterns, trends, or differences in biodiversity between the forest areas.
- Draw conclusions based on your analysis and discuss the implications for forest management and conservation.

Day 3: Communicating Findings and Recommendations

Objective: To effectively communicate your research findings and recommendations to a wider audience.

Procedure: Title and Introduction:

- Use a catchy and descriptive title that grabs the attention of viewers.
- Include an introductory section that briefly explains the purpose and significance of your project.

Research Question and Hypothesis:

- Clearly state your research question and the hypothesis you formulated before conducting the project.
- Use visually appealing fonts and colors to highlight these sections.

Methodology and Data Collection:

- Provide a concise overview of the methods you used to collect data on plant species diversity.
- Include photographs or illustrations of the sampling areas or quadrats you used in the forests.
- Display any data collection tools or equipment you utilized, such as field guides or measuring instruments.

Data Analysis and Findings:

- Present your data analysis results using visually appealing graphs, charts, or tables.
- Highlight key findings related to biodiversity patterns among the different forest locations.
- Use color-coded graphs or icons to represent different plant species or diversity indices.

Photographs and Species Documentation:

- Include high-quality photographs of representative plant species you encountered during your forest inventories.
- Add labels or captions with the common and scientific names of the species.
- Consider creating a collage or arrangement of photographs to showcase the plant diversity you observed.



Conclusion and Implications:

- Summarize your conclusions based on the data analysis and discuss the implications for forest management and conservation.
- Use bullet points or visually distinct sections to highlight key takeaways from your project.

Display Enhancements:

- Use borders, color schemes, and visually appealing backgrounds to make your display board visually appealing and cohesive.
- Consider adding icons or illustrations of forest elements, such as trees or animals, to enhance the overall theme.
- Incorporate relevant quotes or facts about forest ecosystems to engage viewers and spark their curiosity.

Captions and Labels:

- Provide clear captions and labels for all visual elements on your display board.
- Use concise, informative captions that help viewers understand the purpose and significance of each graph or photograph.

Day 4: STEM Fair Set-Up and Interaction

Objective: To set up your project display and engage with the science fair audience.

- Procedure: Set up your display board and arrange your project materials in an organized and visually appealing manner.
- Stand near your project display, ready to engage with visitors, judges, and other participants.
- Deliver your presentation confidently, explaining your research question, methods, and key findings.
- Answer questions from the audience and engage in discussions about your project and its implications.
- Use the opportunity to learn from other science fair projects and network with fellow participants.

Day 5: Reflection and Evaluation

Objective: To reflect on your project experience and evaluate the outcomes of your research.

Procedure:

- Reflect on the process of conducting the project, including the challenges, successes, and lessons learned.
- Evaluate the effectiveness of your data collection methods, data analysis techniques, and presentation skills.
- Consider the implications of your findings for forest management and conservation.
- Identify areas for improvement and future research directions.
- Share your project experience with classmates, teachers, or family members, highlighting the value of scientific inquiry and data-driven decision-making in forest research.