Our team is excited to partner with you to get your students outside. We are providing this packet for you to utilize however you wish. It is intended to help introduce key concepts of our tree hike.

Students should plan to come ready for a hike in the woods. Wear layers, clothes appropriate to current weather conditions. Comfortable shoes for hiking. We will provide a water bottle and hydration stations. Students should stay on the trails and with their group. Be sure to pack a good lunch and come ready to explore the outdoors.

1. **Introduction**
    a. Classroom Discussion
        i. We live with trees every day. They are all around us. From medicines to food to shelter, trees help us.
        ii. Children may know trees as a source of apples, nuts, or a place to escape during a game of hide and seek. Take some time to discuss how trees improve our lives.
        iii. Ask your students what comes into their minds when you think of a tree?
            1. What kind of tree do you see? (pine, maple, tall, small)
            2. Name some kinds of trees.
            3. What are trees good for? (shade, treehouses, lumber, paper)
        iv. Ask students to identify some of the things in the classroom made from trees. How about in their homes? From paper to houses we use a lot of things made from trees.

    b. What do we call a person who specializes in trees?
        i. An **Arborist** is a specialist in the care and maintenance of trees
        ii. arborists work on the planting, maintenance, and care of trees.
        iii. Arborists duties include
            1. evaluating the health of trees
            2. providing a tree care plan
            3. providing services like pruning, fertilization, planting, and insect and disease control.

2. **Know a Tree, (Tree worksheet)**
   a. Vocabulary

branch
A woody limb growing from a trunk or another secondary limb of a tree.

crown
The upper part of a tree, which includes the branches and leaves.

deciduous
A tree that sheds its foliage at the end of the growing season.

evergreen
A tree or plant having leaves that remain green throughout the year.

foliage
The leaves or needle of a tree.

lateral roots
Roots which extend horizontally from the primary root and serve to anchor the tree securely into the soil. These roots also contribute to water uptake and facilitate the extraction of nutrients from the soil.

leaf
Any flattened, green outgrowth from the stem of a vascular plant. Or an above ground plant organ specialized for photosynthesis.

root hair
Root hairs are hair-like extensions of the other roots. Root hairs increase the capacity of a tree to absorb water and nutrients.

tap root
A straight tapering root that grows vertically down. It forms a center from which other roots sprout.

trunk
The main stem of a tree, usually covered with bark.

   b. Discuss the vocabulary. Point out the difference between Evergreen and Deciduous trees.

   c. Pass out the **Know a Tree handout** ask students to take notes while you describe the various parts of a tree. Read the descriptions below while students take notes

1. A crown is the upper part of a tree, including the branches and leaves.
2. A leaf is any flattened, green outgrowth from the stem of a vascular plant.
3. Foliage is the leaves or needles of a tree.
4. A trunk is the main stem of a tree, usually covered with bark.
5. A branch is a woody limb growing from a trunk or another secondary limb of a tree.
6. Lateral roots are roots which extend horizontally from the primary root and serve to anchor the plant securely into the soil. This branching of roots also contributes to water uptake, and facilitates the extraction of nutrients from the soil required for the growth and development of the plant.
7. Tap roots are straight tapering roots that grow vertically down. They form a center from which other roots sprout.
8. Root hair zones are hair-like extensions of the other roots. Root hairs increase the capacity of a tree to absorb water and nutrients.

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d. Next, instruct students to use their notes to label the tree parts on the tree diagram worksheet.

3. Tree Word Search

a. Pass out the tree word search and give students time to complete the activity. Discuss the answers after they complete the sheet.

4. Tree Ring Worksheet Notes

Read Through the following information and synthesis it for your students. Have students discuss the concepts and fill out the "How old is that tree" worksheet.

Do Tree Rings Really Indicate Age?

Have you ever come across an old tree stump and started counting the rings? The adage says the tree rings indicate how old a tree is, but is that really true?

Those tree rings tell you how old a tree is, and more.

Trees are nature's environment log books. They can live hundreds or thousands of years. Every year brings on new circumstances and experiences. And as a tree survives all that nature throws at it for the year, it records in the growth rings of the tree.

These growth rings indicate the age of the tree, plus they leave clues to help you understand the climate conditions the tree lived through.

What is a Tree Ring?

When you look at a tree stump, you may see that the top of a trunk has a series of rings. It starts with one small ring in the middle followed by a continuum of circles with each circle encompassing the one before it.

The center circle indicates the first year of growth. Each ring afterward indicates another year as well as the climate condition of that time. These growth rings grow under the bark, and the bark is pushed out while the tree grows.

Tree rings are created because trees manufacture new cells every year. These growth layers act as a timeline of a detailed report on its growth throughout its time. Trees learn to survive with the different climate conditions, and the tree rings help us understand how.

Tree Rings Indicate Age of the Tree

In the United States, the tree-growing season starts in the spring. When you look at a tree sample, this season is shown by light-colored, pale wood. Growth slows down at the end of summer, which creates smaller walls and darker colored wood.

A one-year cycle is comprised of a light pale wood that grew at the start of the year and a dark wood that grew at the end of the year. When a tree is cut, you will notice alternating light and dark wood rings. Count the dark rings, and you will get the tree's age.

Count the tree rings, and you will find some trees have up to thousands of rings. Examine more closely, and you will see different shapes, sizes, consistencies and gaps which indicate the conditions the tree lived through.

Tree Rings Indicate Environmental History

A typical tree will have tree rings with different variations that signify its life story. The layered growth indicates the climate conditions such as drought, fire, insect attack, flood and many more natural disasters that we wouldn't have been able to trace by ourselves.

Variation of tree rings occurs because of the different conditions each tree faces. Trees are sensitive to climate, which is why they help indicate the environmental condition at a certain time. That's why it's always a good idea to take samples from more than one tree to compare and eliminate individual variations.

If it's a difficult year, a tree produces a thin ring signaling slow growth. This indicates a cold and dry year. When it has positive-growth conditions, a thick ring is produced because of the added

tissue the tree produces for fast growth. A thick ring indicates a warmer wet year with abundant rainfall. Consistent tree rings signify a consistent climate throughout those years.

Thin rings may also occur because of overcrowding of trees, which limit the tree's growth. Trees that have plenty of space to grow straight at a rapid pace will have wide, evenly spaced rings.

Narrow rings for several seasons can also indicate drought because of the lack of water over a long period of time.

Insect defoliation also creates narrow rings. Each kind of insect will leave different traces of its presence, and this can help understand insect productivity and infestation.

Narrow rings also indicate forest fire damage. When trees are injured they develop boundaries around the tissue to prevent infestation. If the tree lives on, the tissue becomes the new layers of wood around a tree trunk. A damaged bark and exterior is a forest scar. While forest scars vary based on species, they all result in narrow rings due to the discouragement of growth.

Tree rings that are wider on one side mean that something was pushed against the tree while it was growing. The tree starts to lean because it produces wood to react to the other subjects.

Since trees can live thousands of years, scientists use trees to determine the events of the past. While there are new trees constantly being planted, scientists can focus on old trees to get a clue of what the climate was like even before the measurement was being recorded.