Getting to Know a Tree, Springtime Lesson (Grades 3-4)

Introduction:

Q: What is happening outside right now?
A: Hibernating animals are awake, looking for food, spring flowers are coming up, and tree buds are sprouting

Read, *The Busy Tree*

Take a deep breath. Thank a tree.

What is a tree?

• A tree is a long-lived perennial plant with a single woody stem (trunk) and secondary branches that reaches a height of at least 12 to 15 feet.
• Trees are made of wood and have branches, leaves, roots, flowers or cones, and seeds.
• Roots grow deep into the ground. They anchor the tree in the soil, and absorb water, minerals, and nutrients.
• Wood is made of cells with strong cell walls that provide the structural support of the tree. The same cells are also the vascular system that transports water and sap up and down from the roots to the leaves.
• Trees grow by adding a new layer of wood every year. In a slice of a tree, these layers are called growth rings.

- **Heartwood**: As a tree grows, older xylem cells in the center of the tree become inactive and die, forming heartwood. Because it is filled with stored sugar, dyes and oils, the heartwood is usually darker than the sapwood. The main function of the heartwood is to support the tree.
- The **xylem**, or sapwood, comprises the youngest layers of wood. Its network of thick-walled cells brings water and nutrients up from the roots through tubes inside of the trunk to the leaves and other parts of the tree. As the tree grows, xylem cells in the central portion of the tree become inactive and die. These dead xylem cells form the tree's heartwood.
- The **cambium** is a very thin layer of growing tissue that produces new cells that become either xylem, phloem or more cambium. Every growing season, a tree's cambium adds a new layer of xylem to its trunk, producing a visible growth ring in most trees. The cambium is what makes the trunk, branches and roots grow larger in diameter.
- The **phloem** or inner bark, which is found between the cambium and the outer bark, acts as a food supply line by carrying sap (sugar and nutrients dissolved in water) from the leaves to the rest of the tree.

• Branches grow out from the trunk and support the leaves. Leaves are arranged for maximum sunlight exposure.

- The crown, which consists of the leaves and branches at the top of a tree, plays an important role in filtering dust and other particles from the air. It also helps cool the air by providing shade and reduces the impact of raindrops on the soil below.
- They contain chlorophyll, which facilitates photosynthesis and gives leaves their green color. Through a process called photosynthesis, leaves use the sun's energy to convert carbon dioxide from the atmosphere and water from the soil into sugar and oxygen. The sugar, which is the tree's food, is either used or stored in the branches, trunk and roots. The oxygen is released into the atmosphere.

• Trees are covered in bark that protects the wood underneath. The bark expands and cracks as the tree grows.
• Trees reproduce by making seeds. The seed can be single or contained within a cone or fruit. Some examples of tree seeds are acorns, maple helicopters, pine nuts, walnuts, apples, and peaches.
• Like all photosynthesizing plants, trees take in carbon dioxide (CO_2 – what humans breathe out and release oxygen (O_2 – what humans breathe in).

Types of Trees

- There are 2 basic types of trees – coniferous (evergreen) and deciduous.
- Evergreens keep their leaves and stay green all year. Most evergreen trees have needles and produce seeds in cones.
    - Evergreen species – pines, firs, spruces
- Deciduous trees shed their leaves at the end of the growing season. Most deciduous trees have leaves that turn color and fall off in autumn.
    - Deciduous species – maples, oaks, ashes, birches
- Identify trees via leaves or needles, bark, branch pattern, buds

Why are trees so important?

- Trees absorb carbon dioxide. They also absorb other gases and pollutants and remove them from the atmosphere.
- Because of their large size and longevity, trees store large amounts of carbon.
- Trees release oxygen into the atmosphere that humans and wildlife need to breathe.
- Trees moderate temperature by providing shade and releasing water vapor.
- Trees anchor the soil and help to prevent erosion.
- Trees provide habitat for many different kinds of wildlife.
- Dead leaves from trees provide habitat for important decomposing and recycling organisms in soil ecosystems.
- Old-growth forests are among the most diverse ecosystems in the world.
- Trees provide wood, paper, food, and medicine. Every day we use or eat many items that come from trees.
- Trees have a calming effect on most people.

Fun Tree Facts

- About one-third of the world is covered by forests. The United States has 8 percent of the world's forests (750 million acres).
- The tallest living tree (And the tallest tree ever recorded) is a 379-foot tall Coast Redwood in Northern California.
- The largest living single tree is a giant sequoia in California with an estimated weight of 3.6 million pounds. This is more than 10 times the weight of the largest blue whale.
- Trees are among the longest lived and largest organisms in the world.
- The oldest living single tree is a bristlecone pine in California that is 5,066 years old.
- There is a grove of quaking aspen in Utah that is both larger (12 million pounds) and older (the root system is 80,000 years old) than the 2 trees listed above, but this is a colony of many stems and not a single tree.