Spruce Tree Challenge!

Take a walk in the woods with this self-guided scavenger hunt to learn more about white and black spruce trees. Developed for use in Denali National Park and Preserve, but adaptable to interior Alaska.

1. Meet a spruce tree—make a new friend!

Spruce trees are evergreen trees with needles and cones. Take a walk and choose a spruce tree to "meet"; find one with cones on it. Then make and record observations to find out what kind of spruce tree you just met. Please be kind to your new friend; touch it gently and leave all cones and branches on the tree. But, feel free to shake hands with or give your tree a hug when introducing yourself!

Find the large cones near the top of your tree. Draw or describe their shape.

What kind of spruce is your new friend? Circle one.

***Picea glauca* (white spruce)**- long cylindrical cones on branch ends and clustered near the top of the tree; has no hairs on the back of its twigs (hint: look between the needles near the end of a branch). White spruce prefers well drained, upland sites.

***Picea mariana* (black spruce)** - small oval cones often located along trunk and at the top of the tree; tiny red-brown hairs on the backs of twigs between needles (try a camera zoom or hand lens to see). Black spruce prefer low lying areas with more moisture like bogs or near wetlands.

Clipart courtesy FCIT

If you gave your friend a name, what would it be? _____

Want to share a picture of you and your new friend? Or meet other spruce friends? Post on social media with **#sprucetreechallenge**

2. Spruce are ecologically and culturally important

Many organisms rely on spruce trees for food and habitat. As you continue your walk through the spruce forest, what signs of animals, mushrooms, or lichen can you find on or around spruce trees?

Look up, down & around spruce trees

Draw or describe what you find.

Look closely at a branch for lichen

How many different kinds of lichen can you find on a tree or in the picture below?____

Spruce, People, and Culture—Traditional Spruce Uses

For over 13,000 years, Indigenous Peoples of the Denali area have been using spruce trees in ingenious ways. Look at the spruce trees around you and imagine how they could help you survive. Match tree parts with some of their uses by drawing lines between tree parts and their uses.

Spruce tips or needles	Building materials, heating, cooking
Pitch	House floors, roofs, fish cutting tables
Branches or boughs	Teas and medicines (high in vitamin C)
Tree roots	Emergency food
Bark	Glue, chewing gum, disinfectant salve
Cone seeds	Floors and roofs at summer camps
Wood	Smoke animal hides
Rotten wood	Rope, string, making baskets

Plant Connections

How do you use spruce trees?

_____

3. How healthy are the trees in the forest?

How can you tell if a spruce tree is healthy?

As you walk through the forest, take a look at the trees to see if they have any unusual bumps, damaged bark, or if any of the needles look yellow or orange. Draw or describe what you find.

Did you find any of these? Circle any you found.

Burl

Spruce Broom

Spruce Needle Rust

Spruce Bark Beetle pitch tubes (circled)

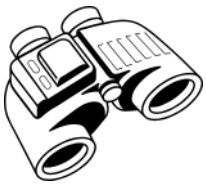
Burl – large round growth on the trunk; burls are like a non-cancerous tumor. Burls grow quickly and may weaken trees but do not kill them.

Spruce Broom – a cluster of orange or yellow growth caused by a rust fungus; does not kill a tree, but can weaken it. Also known as witches' broom.

Spruce Needle Rust– related to spruce broom rust, this fungus infects the new needles on the ends of branches turning needles orange; this is common on white spruce trees near Denali this summer.

Spruce Bark Beetles – small holes in the lower trunk or piles of "sawdust" at the tree base may indicate spruce bark beetles. Trees react to beetles by releasing pitch, which results in small white or reddish-brown pitch tubes on the bark of the trunk. These are native insects, but warming temperatures may cause more outbreaks. Widespread spruce tree death due to spruce bark beetles has occurred in the southern portions of Denali National Park and Preserve in recent summers.

4. Science of spruce trees



Counting cones

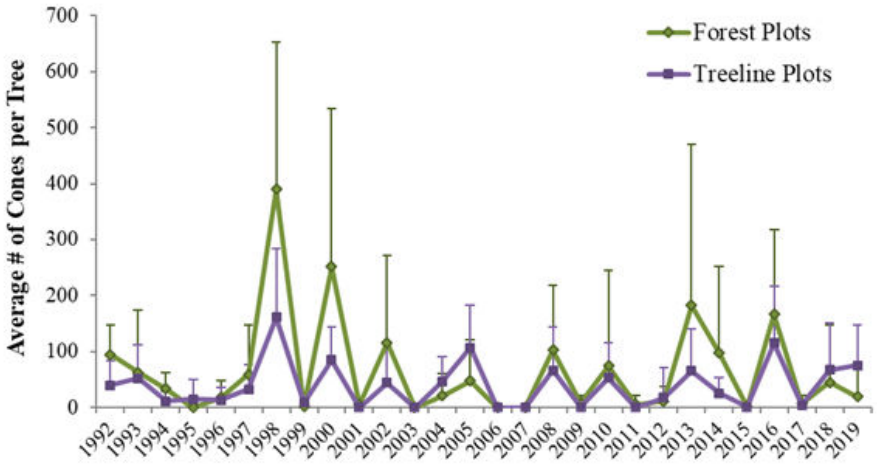
The seeds found in white spruce cones are eaten by many forest animals. Park scientists keep track of this important food source by counting the number of spruce cones on the same trees each year. This way they track changes in the number of cones a tree produces from year to year. 2020 is a masting year for white spruce trees in Denali (they are making lots of cones!). Use binoculars or the zoom on your camera to get a close up look at nearby spruce tree and try to count its cones.

About how many cones does your tree have? _____

Food security—Is there a pattern to high cone years?

Since 1992 scientists have collected data on white spruce cone production in two different locations (plots). Can you notice the pattern to high cone years?

Is it the same or different across locations?



About how many years are there between high cone cycles? _____

Patterns and Cycles

What kinds of other natural cycles occur near where you live? Can you name one and its effects?

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