



# Tree Rangers

(Observing Alaskan Plants)

Dear 3rd Grade Teacher,

Welcome to the Chugach National Forest's Forest Ranger Academy– Tree Ranger Unit! We are very excited to have your class participate in our Conservation Education program!

In an effort to more effectively meet your needs as a teacher, we have developed a set of curricula specifically designed to meet the Anchorage School District 3rd grade Science Standards. In addition, the classroom visit and the Portage Valley field trip will be a fun and memorable experience for your students!

Enclosed you will find copies of a pre-visit test which we ask you administer to your students. This same test will be used after the Forest Ranger Academy. Your commitment to administering the pre and post-visit tests will help us assess the impact of our instruction on your students, and know to implement changes when necessary. Also included are suggested pre-visit activities. Conducting the quick and easy pre-visit activities will prepare your students for the classroom visit and field trip.

We are working hard to develop a program that will enhance your existing science program. As this program is only in its second year, we welcome and strongly encourage your feedback at any time during the program! If you have any questions or comments, please do not hesitate to call or write to the contact information provided at the bottom of the page. We greatly appreciate your participation and assistance with our Conservation Education program!

Many Thanks,

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**US Forest Service**  
**Chugach National Forest**  
**Conservation Education**





## T e a c h e r I n s t r u c t i o n s

### This kit should include:

- Sufficient copies of pre-tests
- **Tree cookies**  
**SHARE BETWEEN CLASSES, PLEASE**
- 1 copy of The Lorax, by Dr. Seuss

Before the Forest Rangers come to your class.....

#### 1. Administer the pre-test (15 minutes)

The purpose of this test is to evaluate the impact of the Forest Ranger Academy on your students' knowledge. How well the students do is NOT important, only that they do their best! Because this is an evaluation tool, *we ask that you provide minimal assistance to the students once they begin.* It will be used again as the post test, the final phase of the Forest Ranger Academy.

#### 2. Study Seasonal Change in "Tree Cookies" (5-10 minutes)

(Refer to *EXPLORATION 7: Reading the Rings* in your "Observing Alaskan Plants" Binder for more information.) Hand out one tree cookie to each student. Have students observe their "tree cookie" and make observations in their Science Notebooks: How old is the tree? \* Does it grow more in the summer (light rings) or winter (dark rings)? Why might this be? Are there other markings or oddities in their tree cookie? Have students brainstorm what these marks are on their "tree cookie", i.e. leaf/branch scars, insect/ fire scars, human scars, drought, growth on a slope, etc.

\*One full year of growth is represented by one dark ring and one light ring (winter + summer). When figuring the age of the tree, count EITHER the number of dark rings OR light rings. Counting both will double the actual age of the tree!

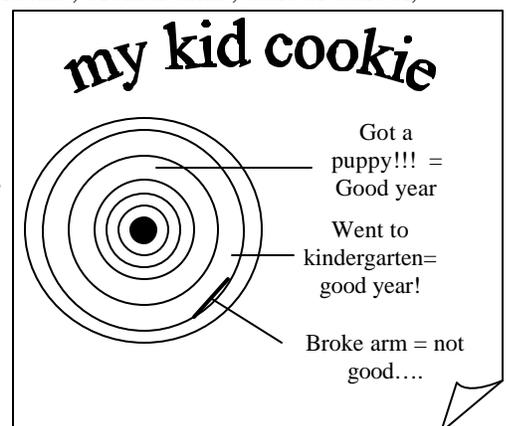
#### 3. Have students create "KID cookies"! (10-15 minutes)

Using paper and pencil, have students start by making a small dot to represent the start of their life. Have them recall some good times (i.e. vacations, baby brothers/ sisters being born, start of school, making new friends, etc.) and not-so-good times (stitches, bike accidents, broken arms, start of school, etc.) in their life. The first 2 years are often difficult to recall, so have them do their best. However, by the time they turned 3 or 4, they should start remember some significant events in their life.

*Example:* Between age 3 and 4, I got a new puppy! When I was five I started school, which was good....but broke my arm at recess which was bad. This "kid cookie" may look something like:

#### 4. Read The Lorax, by Dr. Seuss (optional)

One copy of the Lorax has been provided for participating 3rd grade classes in your school. Coordinate with the other teacher(s) to share if needed. This is a great book to introduce students to the products we get from our forests!





## In-Class Ranger Visit

### This kit should include:

- Tree model
- Role cards
- Oak chunk
- Dish soap
- Slide projector
- Tree cookie

#### **Introduction:**

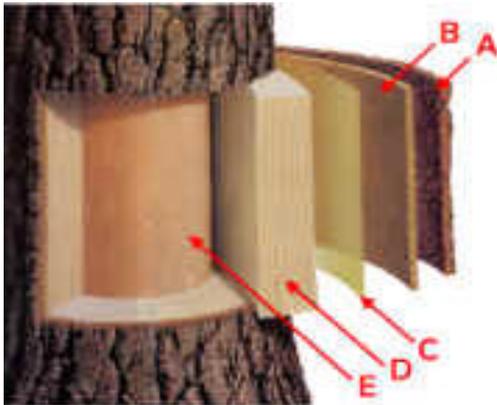
Give brief introduction to Forest Service and Chugach National Forest.

Topics to address:

- National Forests are managed by the Forest Service, but all citizens of the US share ownership
- Basic principles of multiple use
- Resources available from the Forest, many products used in our lives come from National Forests

#### **Opener:**

Have the students recall the activities from the pre-visit packet. What did they learn about their tree cookie? How did they do with their “kid cookies”? Etc... They should be able to make the connection that trees are alive, like humans, and they go through changes year after year! (More growth in summer, etc.) Did they notice any strange markings? Gauge their knowledge about trees. How do trees change from winter to summer? Ask them to name things that trees have to deal with all year, standing in the same place, never moving. When the weather is cold- they can't put on coats and mittens and warm up inside—so how would that effect their growth season to season?



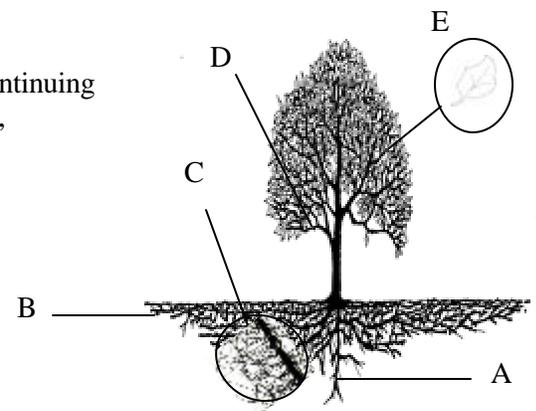
#### **Tree Factory:**

*Explanation:* In the forest, trees may seem to be still, quiet, simple structures– but in fact they are complex systems, inside and out! Transition to tree-model. Trees have many different layers and parts, each with a special job to do. Discuss different layers of the trees and the function of each. Associate each layer to more recognizable items, such as armor for the bark, etc.

- A. Outer bark (Armor, protector, etc.)
- B. Phloem/ Inner Bark (food maker, feeder, fork, etc.)
- C. Cambium (blow bubbles to simulate new cell growth)
- D. Xylem/ Sapwood (Pipes)
- E. Heartwood

Review layers and their function before continuing discussion of external tree parts, (i.e. roots, branches/ twigs, leaves)

- A. Taproot (Anchor)
- B. Lateral roots (Straws)
- C. Root hairs (Straws)
- D. Branches/ Twigs (Arms)
- E. Leaves (Hands)



*Activity:* Assign each student a role as one of the layers/ parts of a tree. In an open area of the classroom, have students act out motions and/ or sounds that represent the various functions of each part of the tree. (Role cards can be used at instructor's discretion) When the class has successfully made their tree function as a whole, have students return to their seats and begin discussion about different types of trees.

Explain that while all trees use each layer and part to survive, not all trees are alike. Discuss the concept of *species*. Humans are a type of species. Use guided imagery to help the students relate trees to humans. How do we differ from one another? How might trees differ from one another? Transition to slide show.

***Slide Show (soon to be PowerPoint)***

\*CAUTION: Familiarize yourself with slide order before attempting to teach this lesson!

Explain that our friend Joey is just like any other kid, except that he put together a slide show to share his knowledge of trees with other students. In working through the slide show—5 different species of trees will be discovered by Joey and his friend, Bucky Beaver:

- Alder (deciduous tree w/ cones, catkins “chicken feet”)
- Willow (deciduous tree w/ catkins, pussy willow)
- Mountain Ash (deciduous, compound leaf, cluster of red berries)
- Birch (bark is papery)
- Cottonwood (bark is chunkier)
- Hemlock (evergreen or coniferous tree with smoother bark, bent top)
- Spruce (coniferous tree with straight top and chunky bark)

***Conclusion: (10 minutes)***

Prepare students for their field trip to Portage Valley where they will learn more about trees and how many trees together make up a forest! They will also have the opportunity to explore the Chugach National Forest and identify some of the trees they learned about today on a fun snowshoe hike!

Tell students what to expect on their field trip, items to bring, clothes to wear, etc. Leave class with a pair of snowshoes to practice putting on before their trip to the Portage.



## PVLC Field Trip

### ***Introduction:***

Welcome students to the Chugach National Forest and the Portage Valley Learning Center. For review, ask the students what they can know about trees as systems.

### ***Opener:***

Begin by opening discussion with students about the significance of trees. Why are trees important to humans? The environment? We understand that trees as individuals are complex systems, made of many different parts each with a special job to do in order for the tree to survive. But what happens when we look at a forest of trees? Are all the trees the same? No. Trees may rely on the same basic needs (sunlight, soil, water, and air) to survive, but trees, like humans, all have different needs. Some may require sunlight to thrive, and grow fast. Others may be more tolerant to shade, growing strong and tall with minimal light.

Tree identification is an important aspect of resource and forest management. As a renewable resource, managers must value and understand the role trees play in their ecosystem and daily human life. In the heart of the Chugach, Portage Valley will serve as a place to learn some basic skills necessary for identifying trees.

When trying to identify the species of a tree, there are three main components we will study: leaves/ needles, branches, and bark. While we know there is more going on inside the tree, observation of the visible structures are used in identification.

Leaves: ***Simple v. compound***, Shape (broad, narrow, oblong, etc.), Margins (***smooth, toothed, lobed***), Veins (***palmate, pinnate, parallel***)

Needles: Number of needles per bundle, Texture (prickly v. soft)

Branches: ***Whorled, opposite, alternate***

Bark: Color, Texture (Chunky, smooth, papery, rough, etc.)

Re-visit the dichotomous key. hand out dichotomous keys and key out a tree together as a class before breaking into two groups.

**BREAK INTO GROUPS:**

### ***Inside:***

Students participate in a lesson exploring tree lifecycles and forest succession. Engage students in a discussion relating the life cycle of a tree to the life cycle of a hu-



man. Trees begin as seeds that have very basic simple needs: Sun, soil, water, and air. As trees continue to grow up and out, the forest as a whole changes with them. Smaller, shorter, younger trees play a different role in the forest than mature trees. Have students express some of the differences between the layers of the forest: Herb, Shrub, Young Forest, Mature Forest, Old-Growth Forest. What type of forest is the Chugach?



After brief discussion, have students play the “Plant Succession Relay” adapted from the *Role of Fire in Alaska Curriculum*. All students begin as herbs in the herb stage. The object is to overcome the natural and man-made obstacles in each stage/ layer of the forest in order to reach the Old-Growth Forest. Students select over-turned scenario cards from each stage of the forest...Herb, Shrub, Young Forest, Mature Forest, and Old-Growth Forest. If a student manages to successfully choose cards that allow them to advance from each stage to the next, eventually “remaining in the Old-Growth” stage—everyone should then “FREEZE!!!”

As the race is over, use the students’ positions on the playing field (the front of the theatre) as an extension discussion to why so many students are still in the herb/ shrub/ young forest stage. There are many obstacles to overcome that make mature and especially old-growth forests unique.

Wrap up inside discussion by talking about students as Tree Rangers/ forest managers. There are many things to consider when deciding what to do with land. Humans need trees for many products, while animals need trees for other reasons. Resource managers must understand the forest as a whole, and a large part of that is being able to identify the species of tree.

If time permits, allow students time to explore the exhibit area of the visitor center. If not...time to switch groups!

#### ***Outside:***

Rangers and chaperones will assist student in donning their snowshoes for a short hike to and through the Gary Williams Moraine Trail. Students will work in group of 2 or 3 to successfully key out marked tree along the trail using their dichotomous key. Group goes to Moraine trail on snowshoes if needed, to identifying trees with their dichotomous key. Rangers assist and check on groups as they work through identifying the marked trees.

Bring the groups together as a whole to discuss the observed differences between tree species. Have students share the species name of their tree and what makes it unique to the whole group. If time and weather permits, have students participate in a “quiet-sit” and listen to the sounds of the forest.

#### ***Switch groups:***

Conduct activities with 2nd group.

#### ***Conclusion:***

Bring students back together as a whole group for review, and lunch!



(Observing Alaskan Plants)

## Teacher Instructions

### This kit should include:

- Sufficient copies of post-tests
- 1 stamped envelope for returning student post-tests
- Junior Ranger badges, 1 per student

### 1. Administer the post-test (15 minutes)

Thank you for taking the time to administer this test to your students. The purpose of this test is to evaluate the impact of the Forest Ranger Academy on the students' knowledge. How well the students do is NOT important, only that they do their best! Because this is an evaluation tool, we ask that you provide minimal assistance to the students once they begin.

#### **PLEASE REMAIN CONSISTENT WITH YOUR INSTRUCTIONS FROM THE PRE-TEST.**

1. Have students fill in: Teacher's Name, Date, Age, Gender, Student Name, and check all activities they participated in.— i.e. if they did not go on the field trip, they should not mark that box!
2. Allow students 10-15 minutes to complete the post-test.
3. Collect tests and return using the provided stamped envelope.

### 2. Distribute Junior Ranger badges to students

Explain to the students they have successfully completed their Aqua Ranger training, and are now official Junior Rangers for the Chugach National Forest! We would like to reward our new rangers with their official badges. *By presenting their badge at the Begich, Boggs Visitor Center in Portage Valley, students and their family will be granted FREE movie access to our award-winning film, "Voices from the Ice"!* This 20-minute long film runs every half-hour in our theater. So bring the family and come on back and visit your Chugach National Forest next summer!

### 3. Please give us your feedback!

We welcome and strongly encourage your feedback! If you would like to share any comments, or advice on how the program could be improved with our staff directly, please send us an email! We would love to hear from principals and parent chaperones as well, so please feel free to share our email addresses. Thank you so much for your support of conservation education! We look forward to hearing from you!

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Also, keep an eye out for an additional form coming in the mail from our Region's Forest Service Office in Juneau. Thank you again for your participation.