

## A New Forest; The Next Generation For Teacher's Use Outdoors

### **Introduction:**

**A New Forest; The Next Generation** is based on a program offered at the Natural Resources Education Centre in Nova Scotia. It is aimed at students at the grade 3-4 level. It is designed to increase their awareness of the importance of maintaining the forest resource, and allow them to make their own discoveries. The following activities are meant to instill curiosity and knowledge in the students, and to make their experience with nature a positive one.

The lesson plan includes a Introductory lesson that will help you to instill in the children some basic concepts. As well there is a lesson plan that will guide you through your field exploration. At the end of the download you will find two worksheets that will help you with each phase of your lesson.

### **How To Select a Suitable Site:**

Selecting a site for your visit is as easy as looking around your school. If there is a nearby forest, reasonably sized park, vacant lot or managed woodlot, these would all suffice. You may want to contact your local NS Department of Natural Resources to inquire about possible sites. The most important thing is to have the children exposed to their natural environment as they learn. Some of the activities are designed for a more diverse area, but all are adaptable to an area as small as a park, with the aid of a few props.

### **Important Rules For Children:**

It is important to allow the children to have a sense of exploration, however, they must not disturb the environment. There are two important lessons that should be explored before any field excursion:

1. Children should not venture into the forest alone. It is very easy to get confused and disoriented even in an area that you think is familiar to you. Always take an adult who should be better prepared.
2. The children should be taught that for the duration of the visit to this wild space that everything should be left as found. That means no disturbances, for this is a place where wild things live, not where we live. This point can be more clearly realized by children through their participation in a short skit. Choose a volunteer to be at home playing with his/her "toys" (i.e., rocks, sticks, a blade of grass, etc.). Next, allow several other volunteers to knock on the child's door and ask to be invited in. Then tell each guest to pick their favorite toy and leave. Ask the children what just happened. Ask the original volunteer how he or she feels. Make the analogy that when the class goes into a wild space, they are guests. If they pick up things they like and leave, the wild space will be altered. Whenever a child tries to take something, remind them of this story.

## Introductory Lesson

### Discussion #1

This part of the program can take place either indoors or outdoors as an introduction to some terms and basic concepts that will form the basis of your study. It will be helpful if you had a small tree that you can use to focus the children's attention on. Using this tree you can pose the following questions:

**Q) Lets look closely at this tree, can you tell me anything about it? What kind of tree is it?**

*A) Hardwood (Deciduous, Broadleaf) or Softwood (Coniferous, Evergreen)* Softwood trees are easily identified by their green needle-like leaves. The other distinguishing factor is that they always keep their needles' year round. (One exception is the larch tree.)

The hardwood trees have leaves which drop each year in the fall.

In Nova Scotia we have approximately 40 native species of trees.

**Q) How old is the tree? Do you think it is old or young?**

*A) Show diagrams of branch whorls and Annual Rings*

Young trees can be aged by counting the whorls of branches. Starting at the top of the tree, find each group of branches that completely encircles the stem. This would be counted as one year.

In older trees you have to get a cross-section of the stem so that you can count each annual ring.

**Q) Is the tree healthy?**

Most trees will indicate whether they are healthy by displaying a deep green color. If the color is yellow-green, this usually indicates poor soil and is the result a lack of nutrients and minerals that the tree needs. Other signs of health problems could be an overabundance of old man's beard, fungus, witch's broom, scars, etc.

### Discussion #2 - Basic needs of Trees

In this part of the program, you are instilling in the children the basis of what any healthy tree or healthy forest needs. If you can collect some cones from softwood trees and seeds from hardwood trees, it will prove helpful in completing this exercise.

**Q) Can anyone tell me what a recipe is?**

*A) A recipe provides three things:*

- 1 - the ingredients you need*
- 2 - how much of each ingredient you need*
- 3 - the instructions of how to make your recipe.*

There is a recipe for a healthy tree and a healthy forest as well. Trees need:

- A) Sun (For Making Food)
- B) Soil ( To stabilize and provide nutrients and minerals)
- C) Seeds (For reproduction)
- D) Space (Room to grow)
- E) Shelter (Protection from the elements).

**Q) Is there an exact measurement for each ingredient?**

*A) No, but so that students get an idea that these five things are needed in some proportions you can complete the recipe as follows:*

Pinch of Seeds  
Heaps of Sunshine  
Buckets of Soil - Water  
                                  - Nutrients  
Lots of Shelter  
Piles of Space

**Q) What are the instructions?**

*A) Well, that is what Foresters and Forest Technicians do. These are professional people who after leaving high school, go onto further study to learn all about trees and what they need to grow better.*

## **Activity #1 - Exploration**

This portion directly relates to the actual “walk” through the wild space. It is important that the children retain the information they learned in the previous discussions so that they can apply it in the field exploration.

There will be five stops along the way. The children will be working in small groups or with partners for the various activities.

### **Stop #1 - Soil**

Break the class into five groups. You will need 5 hand trowels, 5 pencils, 5 clipboards, 5 magnifying glasses, 5 “What’s in the Soil” Activity Sheets.

Instruct the students to find a space in amongst the trees where they can dig a small hole in the ground. Ask them to look, and record all the things that they find.

When they have finished, ask them to replace the soil from the hole. Allow the children to relay the data they collected to you. Your conclusions should include:

1. Soil is made up of living and nonliving things.

2. Even the most insignificant living thing is important to the whole ecosystem.
3. Soil is made up of different layers - each having its own purpose.

- Top Green Layer (things that are alive)
- Litter Layer (decaying matter)
- Mineral Soil (where nutrients and minerals are stored)
- Parent Material (Original soil formation)

## **Stop #2 - Space**

Equipment needed - none

Space requirements: Two (2) areas will be needed for this activity. Area #1 will be a place where the trees are tightly spaced and Area #2 will be the opposite where the trees have lots of space. In area #1, have the children spread out and find their own spot. Ask them to try to do "jumping jacks" on the spot they have selected. Are they inhibited by trees being in the way? Ask them how they feel? Is it cold and damp? Can they see the sky through the crowns of the trees?

Move to Area #2 and pose the same requests and questions.

Then compare your results sharing the following conclusions:

1. Trees compete daily for their needs. Even though we cannot physically see this competition, it occurs between trees that are too close to each other.
2. Trees grow in two ways. From the outermost tips of their branches (height) and in circumference - around the outer-side of the stem (diameter). Trees that are too close together can only grow in one direction - upwards, resulting in tall, skinny trees.
3. Because the crowns (branches) are intertwined with each other, sunlight cannot get through to heat up the forest floor. Even though trees might be warm enough to produce seeds, if the soil isn't warm enough, the seeds will lie dormant and eventually decompose.
4. Trees will grow through their entire life time, but towards the end, the growth is very small. The optimum time for growth is when trees are young (10-40 years).

## **Stop #3 - Seeds**

Equipment Requirements - None

Space Requirements - Any place where seeds from trees can be collected (preferably from the ground)

Trees generally start to produce cones anywhere between twenty (20) and thirty (30) years. The cones produced are the source for the next generation of trees. Have the

children look around on the forest floor to find as many different cones as they can. Instruct the children to open the cones to locate the seeds inside. Conclusions to be drawn from this activity include:

1. Naturally regenerated trees happen in random fashion. Trees that are manually planted will be typically found in patterns usually straight lines until the same distance given all around the tree (6' - 8'). This gives each tree the space it needs from the time it is very young.
2. The seeds of trees can be used individually in the identification of the tree. Just like people have characteristics that make them individuals, so trees have specific characteristics in their shape, bark, seed, and needle/leaf arrangement.
3. Seeds will only germinate at an optimum forest floor temperature which is specific to the species of a tree. That is why you may find areas where there is seed but no seedlings.

#### **Stop #4 - Shelter and Sunlight**

Equipment needed: None

Space Requirements: an area in the forest where it is obvious that the trees are far enough apart to let the sun penetrate through to the forest floor.

Have the students find their own individual spot within the defined area. If it is dry enough have them lie on their backs so that they can look through the crowns of the trees to see the sky. If each tree has an adequate amount of sunshine reaching the branches the more the tree will be able to produce food and oxygen.

The bigger trees will provide some shelter for the smaller trees coming along in the under story, especially during extreme environmental conditions, i.e. high winds, heavy snow, ice, and/or rain.

Next, have the students stand and look at the shadows the trees create. These shadows create cooler temperatures which assist the younger trees in the extreme heat of summer.

#### **Stop #5**

**Equipment Needed:** Blindfolds (enough so that each pair of students will have a blindfold to share)

**Space Requirements:** A park-like setting where there are a suitable number of trees that individual pairs of students can examine. The following instructions should be given to the students once they have selected a partner to work with:

1. One person is blindfolded.
2. The second person is responsible for guiding them to a tree they have selected.

The student “guiding” must be careful to make sure that their partner does not trip or slip on the uneven terrain.

3. Once they have found a tree, the blindfolded student is then asked to examine the tree using some of their senses: listening, feeling, and smelling. Preferably not tasting and definitely not seeing it.

4. The blindfolded person is then carefully returned to where they originated - the blindfold removed and then asked to find the tree in question.

5. Then the partners will switch roles.

The applications that can be made from this activity are:

1. Even though the students usually have quite a bit of fun with this activity, they should realize that there are some important lessons to be learned - the most important being responsibility for the safety of another individual.

2. The bigger trees probably got all the things they needed,(food, water, shelter, space) whereas the smaller ones were probably lacking something, somewhere throughout their lifetime.

### **Additional Activity**

This activity is a great way to conclude this particular lesson. It can come in two forms depending on the resources available to you.

1) **Plant - A - Tree in your School Yard** - Solicit some of the local landscaping companies and/or nurseries in your area. Explain to them what your class has been doing and ask if they will donate a tree. Your class should then survey your school yard to find the best possible location for your tree.

2) **Plant - A - Seed** - For this activity you will need the following supplies: peat moss, tree seeds (try a local landscape nursery), water, plastic wrap and an elastic. The following instruction will guide you through this exercise:

1. Each student takes a paper cup. Punch five or six drain holes in the bottom with the point of a pencil from the outside in.

2. Dip each cup into a bin of peat moss and fill to the brim. Press down until the surface of the soil is firm.

3. Slowly wet the soil in each cup until thoroughly moistened.

4. Sow seeds; four or five seeds in each cup.

5. Cover the cups with a layer of thin plastic wrap to prevent drying out during the next two or three weeks. Secure the plastic in place with an elastic. At the first sign of germination remove the plastic and place cup on a sunny windowsill. Water lightly as needed ( daily misting is beneficial too). If water is chlorinated, let stand

overnight before using.

6. When seedlings are several centimeters tall, select the sturdiest looking one and snip off the rest at soil level (do not pull, this disturbed the roots of the one left). Best results will be noticed if this is done before the seedling is 21 days old ( from the date of germination).