



# Teacher's Corner Lesson Plans

*Helping Teachers and Students Make the Most of  
their Outdoor Classroom*

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## Leaf Magic\*†

Ontario Forestry Association

**Grade level:** Grade 3.

**Provincial curriculum links:** Ontario.

**Subject:** Science and Technology - Life Systems.

**Subject:** The Arts - Visual Arts.

**Keywords:** leaf, colour.

### Description

Students adopt a deciduous tree in September, and begin regular observations of their tree. In October, one leaf is chosen daily to illustrate leaf colour. Students create a timeline to show how leaves change colour. Students also conduct a science experiment to illustrate colour change.

### Curriculum Framework

Topic: Growth and Change in Plants

Strand: Life Systems 3s7

Specific Lesson Goals:

- Students will describe, using their observations, the effects of the seasons on plants (e.g. leaves turn colour in the fall).

### Preparation

**Preparation time:** 30 minutes

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\*This exercise is adapted from Ontario Forestry Association. *Hidden Colours of Leaves* in Focus On Forests. The Ontario Forestry Association, 1990, 76 pages.

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**Length of lesson:**

- 45 minutes initial time for adopting a tree
- 5 minutes daily in October for gathering leaves and recording data
- two 30 minute lessons for the experiment

**Resources required:**

- maple tree(s) in schoolyard area or within walking distance of the class
- measuring tapes or 2-3m length of string or yarn (one for each group)
- metre stick for each group
- dark coloured crayons
- writing paper and pencils

For the experiment:

- nine green maple leaves (three each from three different trees)
- rubbing alcohol
- three small glass baby food jars
- coffee filter paper (cut into three strips)
- metal spoon
- 3 pencils

## Procedure

### Part 1

1. Early in the fall, take a walk in the schoolyard and identify the deciduous trees in the area. Assign groups of students to each hardwood tree. The groups “adopt” the tree for the year.
2. Provide each group with a measuring tape, metre stick, dark coloured crayon and several sheets of paper(blank and lined) and pencils.
3. The students visit their tree - measure the circumference using the measuring tape and the metre stick - the tape should be placed one meter above the ground. If the trees are too large, use a piece of string and then measure the string later.

4. Students use the crayon to make a bark rubbing of their tree - place a sheet of paper against the tree bark and rub the length of the crayon gently over the paper, creating a rubbing of the bark underneath.
5. Students gather a sample of green leaves from their tree. The samples may be preserved by ironing them between sheets of waxed paper. Each student will need a sample of the tree leaves.
6. Students sit beneath their tree and write a letter to the tree, introducing themselves. They will also thank the tree for the gifts which the tree gives them - oxygen, shade, etc.

## **Part 2**

Experiment - What Colours are Hiding in the Leaves?

1. Collect three green leaves from three different trees. Tear the leaves from each tree separately and place them into a glass baby food jar. Label each jar with the type of leaf which has been collected.
2. Add enough rubbing alcohol to just cover the leaves. Stir up the mixture with a metal spoon.
3. Wait 10 minutes. Cut a coffee filter into three strips. Dangle each strip into a jar so that it just touches the liquid. The liquid will begin to be absorbed by the filter paper.
4. When the liquid has moved half way up the strips, remove the strips and let them dry. Record your observations.
5. Students should see one or more bands of green (chlorophyll) and yellow or orange bands of colour (leaf pigments). Explain to the class that yellow or orange colours are always present in the leaf but that they are usually hidden under the green chlorophyll. In autumn, the chlorophyll is drawn back into the tree, and the true colours appear.

## **Part 3**

1. In October, each group of students gathers one leaf from their tree every day. The leaf should represent the colours visible on the tree on that day. The leaf is pressed or preserved in wax paper, and the date recorded.
2. Students continue to collect one leaf per day, recording the date, for as long as the leaves keep falling from the tree.

3. Students examine the leaves carefully to see how they have changed in colour. Students make a colour timeline to show how the colours have changed.
4. Students may summarize the changes in a written or artistic form.

## **Discussion and Questions**

These questions may be posed to the tree groups, or provided as a worksheet for individual student response.

- What kind of tree have you adopted for the year?
- When do you predict all the leaves will have turned colour?
- What factors might be involved in how quickly the leaves turn?
- Whose tree lost all of its leaves first? What species of tree was it?
- Whose tree lost all of its leaves last? What species of tree was it?
- What advantage might a tree have if its leaves fall quickly?
- What advantage might a tree have if its leaves open quickly in the spring?

## **Student Evaluation**

Develop a rating scale for students to determine how well they have completed the goals of the lesson.

## **Enrichment and Extension Activities**

- Try the experiment with leaves that have already turned colour. Are the results the same? What is missing from the coffee filter paper? Why?
- Use the internet to find out more information about Ontario's tree species.

## References

Tree Canada Foundation. <http://www.treecanada.ca/treefacts/>.

Greengrounds. <http://www.greengrounds.org/guide.html>.

University of Minnesota. <http://www.ncfes.umn.edu>.