Date: _____ Name: _____

LICHENS ON TREE TRUNKS

In this exercise you will:

- learn to recognise moss and lichens
- identify different trees
- record observations accurately by a mapping technique
- learn to use a compass and measure accurately
- think about the conditions mosses and lichens like
- suggest explanations for what you find

You will need:

- a clipboard and these worksheets: you need 3 recording sheets with circles (page 2)
- a compass
- a meter ruler or tape measure
- a piece of string at least 3 meters in length
- books with pictures showing examples of moss and tree lichens
- a book or pictures to help you to identify your tree

Estimated time:

- preparation in the classroom: 20 minutes
- fieldwork 40 minutes
- working on results in the classroom: 40 minutes

With one or more partners:

- select a tree for your study, preferably one which is large and mature. Your tree may be in a garden, park, graveyard or woods. The trunk should have something growing upon it. If possible, select a tree which sheds its leaves for the winter (deciduous tree) rather than an evergreen (coniferous tree).
- using pictures and a book (and your teacher's help), identify the tree which you have selected. You may need to look at pictures of leaves in summer (buds and leaf scars in winter) and make a good match.
- now take the piece of string and tie it around the circumference of the tree trunk at the level of your eye.
- use your compass to locate the north side of your tree. Mark on your circle at north the position of any lichens and moss you see which are touched by the string. Use M for moss and L for lichens.
- go around the tree mapping out on your circle the position of moss and lichens all around the tree.
- use the meter ruler to measure the height from the ground of the string you put around the trunk.
- remove the string, taking care to keep the length that went around the tree trunk. Use the meter rule to measure the length of the string which gives you the circumference of the trunk.

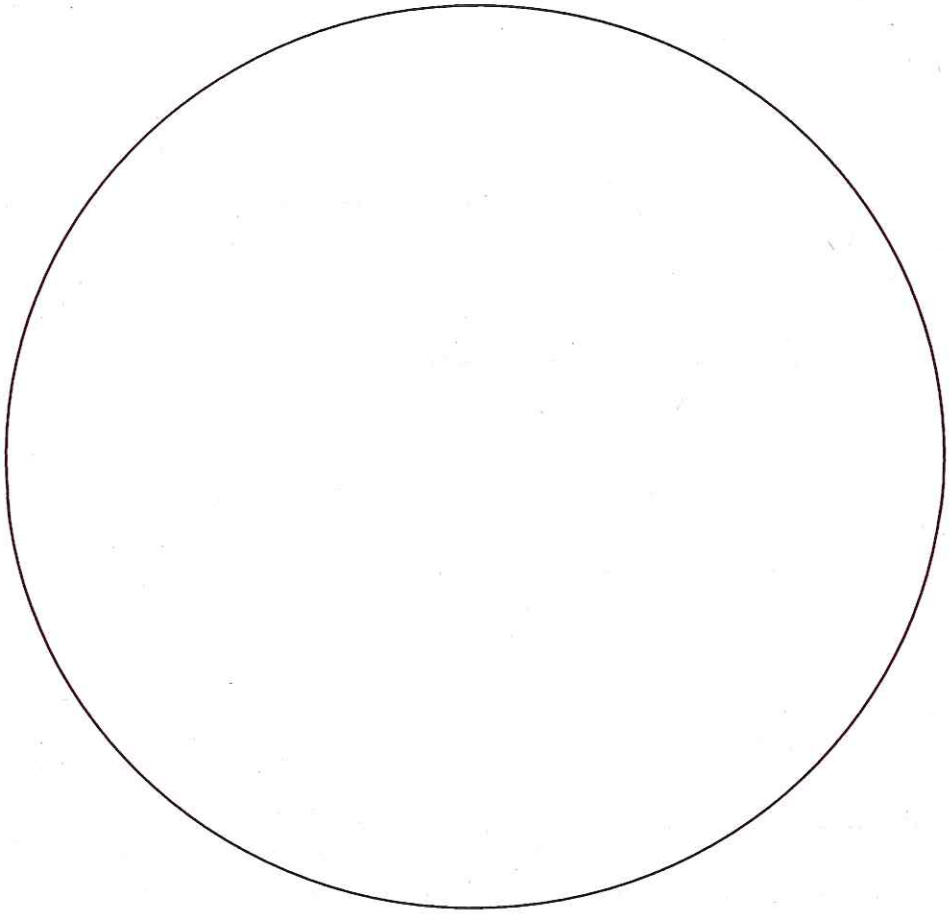
Date: _____ Name: _____

The height of the string around the trunk at eye-level is _____m

The circumference of the trunk at this height is _____m

Tree Map

North



West **East**

South

Name of tree = _____

Best direction for moss: _____

Best direction for lichens: _____

- look at the bark. Is it smooth, rough, flaky? Find words of your own to describe it below:

- Date: _____ Name: _____

Focus task:

- look at your map taken at eye-height and decide which direction is best for moss - write this down beneath your circle map
- look at your map taken at eye-height and decide which direction is best for lichens - write this down beneath your circle map
- you can repeat this study and make other maps by tying the string around the tree trunk at a) waist-level and then b) knee-level

Moving on:

- which side of the tree has most light? _____
- which side of the tree is warmest? _____
- which side of the tree is likely to have most rain and wind and be dampest? _____
- explain why lichens or moss prefer growing on one side of a tree rather than another? _____

  _____
- suggest ways in which you could measure light, temperature or dampness (= humidity)?

  _____

  _____
- do you find the same mosses and lichens - and the same amounts - on the trunk at waist-level?

  _____

  at knee-level? _____

  suggest why: _____
- using pictures of lichens distinguish between crusty, leafy and shrubby lichens: do shrubby

  lichens prefer growing on one side of a tree rather than another? _____

  suggest why: _____
- you may wish to study another kind of tree or compare your results with others in your class.

  Is there a similar pattern? _____
- do you think the kind of bark makes any difference to lichens and mosses? _____

  suggest why: _____

Date: _____ Name: _____

Background information

Lichens are colonizers: they will grow on rock, trees and roofs, for example, where other organisms cannot. Having established themselves, conditions often develop so that other organisms - such as mosses and flowering plants - can develop.

Structurally, lichens are simple. They are a partnership between a fungus, which gives the lichen its shape, and an alga, which produces food or energy by photosynthesis. (Some lichens contain cyanobacteria, in place of algae
Keys are a great help in identifying lichens. Important characteristics used in their identification are form and fruiting bodies. Lichens come in three forms: crustose, leafy (foliose) and shrubby (fruticose). The last type is not frequently found in polluted areas (like cities), but you will find shrubby lichens in the country, near the sea and in high rainfall areas.

Many lichens reproduce by forming fruits (discs or apothecia) which are more or less round and grow on the main body (thallus) of the lichen. The fruits often look like disks (the margin of the fruit is the same colour as the thallus; these are known as lecanorine fruits). Sometimes the fruits look like buns (the margin of the fruit is the same as the centre; these are known as lecideine fruits).

Some lichens reproduce vegetatively (asexually) - either by forming small powdery patches (soredia) on the surface of the thallus which fall or rub off to form a new lichen, or finger-like outgrowths of thallus (isidia), which likewise break off to start a new lichen.

Lichens are very sensitive to air pollution and are good indicators of air quality. They are sometimes used to monitor the effects of pollution in towns and around industrial development sites. They are also indicators of airborne fertilizer, high in ammonia.

[This lesson has been adapted from the British Lichen Society, www.thebls.org.uk]

Common Lichens on the Red Oaks on Tower Road:

Amandinea punctata (Tiny Button lichen) - grey crustose w/dots
Candelaria concolor (Candleflame lichen) - orange foliose w/soredia
Candelariella efflorescens (Powdery Goldspeck lichen) - orange crustose w/soredia
Flavoparmelia caperata (Common Greenshield lichen) - yellow/green foliose w/soredia
Ochrolechia arborea (Powdery Saucer lichen) - white crustose w/soredia
Parmelia sulcata (Hammered Shield lichen) - large gray foliose w/soredia
Phaeophyscia pusilloides (Pompom-tipped Shadow lichen) dark gray foliose w/soredia
Physcia millegrana (Mealy Rosette lichen) - small gray foliose w/soredia
Punctelia rudecta (Rough Speckled Shield lichen) - large gray foliose w/isidia