



Measuring Lichen abundance

Aim: To investigate the effect of aspect on lichen abundance in native deciduous woodland.

Reference: [PathFinder Science | Lichens and SO2 | Creating the Context | Research Methodology](#)

Lichen can be found on a variety of substrates, including trees and shrubs, absorbing nutrients from the atmosphere. They are highly sensitive to atmospheric pollution, particularly sulfur dioxide, fluoride, and ammonia, and thus their abundance provides an indicator of pollution and forest health. A lichen is two different organisms – either a fungus and an alga, or a fungus and a cyanobacterium – living in a symbiotic relationship. The fungus provides protection and moisture, while the alga or cyanobacterium provides food through photosynthesis.

Deciduous forests are primarily composed of broad-leaved trees that shed all their leaves during a season. According to research, mixed deciduous forests contain the richest diversity of lichens.

Materials required:

String	OS Locate app
Flexible tape measure	100-circle grid transparency
Trundle wheel	Tape to cordon off area

Method – *Sampling Site*

1. Mark out an area of 200 m² (20 m by 10 m). Place two transect lines diagonally across the site's area (now visually divided into four areas).
2. For the 1st diagonal transect line, the four trees closest to the transect line on both sides should be sampled. This should be repeated for the 2nd diagonal. This should give a total of 16 trees.
3. Identify the tree sampled, e.g. using an app such as PlantLife or PictureThis, or using an identification guide.



Method – *Sampling Procedures*

4. Place the 100-circle grid 1.4 m high up on the trunk from the ground. Use a compass to determine the aspect of the tree. The lower edge of the grid should touch the 1.4 m mark. This can be marked with chalk.
5. Count how many of the circles (out of 100) contain lichen. Record this as a number in the results table.
6. Repeat this process at each aspect of the tree.
7. Move onto the second tree in your sample site.

Bark pH can affect lichen growth. Typically, more alkaline bark will favour lichen growth, including ash, elm or sycamore.

https://www.pathfinderscience.net/so2/media/100_circles.pdf



Results:

Tree	Tree ID	Number of circles containing lichen on each trunk aspect			
		North	East	South	West
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Processed data:

Aspect of tree trunk	Abundance of lichen (%)
N	
E	
S	
W	

Conclusion:

Lichen is most abundant on the _____ -facing side of a tree, followed by _____, then _____. There is least lichen present on the _____-facing side of a tree.