Lichen Bio-Indicator Observation

Duration of activity: 1–1.5 hours

What is lichen?

A lichen is made up of two organisms living together: a fungus and an alga. Lichens usually attach themselves to trees but you can also find them on other surfaces, such as park benches.

What's so special about lichen?

There are lots of different types of lichen – they come in all sorts of shapes, sizes, and colours – and different types of lichen like different types of air!

- Nitrogen-sensitive lichens only live in clean air
- Nitrogen-loving lichens can live in dirty air
- Some lichens are not affected by air quality and can live anywhere

Which means that you can work out if the air around you is polluted by looking at the types of lichen you can see growing.

What you'll need for your observation:

- Your survey sheet
- A pencil

You could also take a map and a camera, so that you can mark the areas you've studied and take photos of the lichen you find.

Instructions:

1. Some lichens change colour in the rain, which could make it more difficult for you to work out what type they are, so try to do the survey when the weather is dry.
2. Look for a site with deciduous trees, such as oak and ash, and lots of light.
3. Choose four trees to study. Ones with a single trunk are best.
4. On your survey sheet, record the total amount of each type of lichen you can see on the side of the tree trunk you've chosen.

   If there's none of that lichen type, tick the red light.

   If you see a small to medium amount (less than 1 sheet of A4 in total), tick the amber light.

   If you find a large amount overall (more than one A4 sheet in total), tick the green light.

   If you'd like to record the amount of lichen you spot in more detail, you could use a scale from 0 to 5, with 3 representing roughly half an A4-page of lichen.

5. Look at the results you've collected (you can do this back in your classroom) and decide what you think it's telling you about the amount of pollution in the air around you. Remember, the more pollution-loving lichen you saw, the more polluted the air is likely to be.
6. If your study shows that the air around you is probably polluted, can you think what might be causing the pollution?

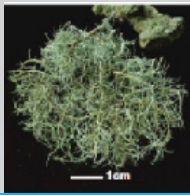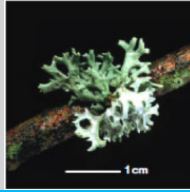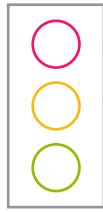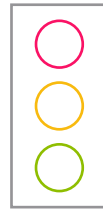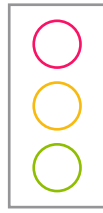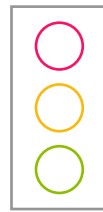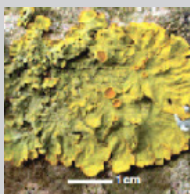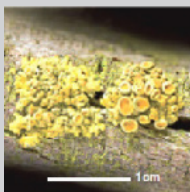|	How much of the tree was covered by each lichen type?				
	Example	Tree 1	Tree 2	Tree 3	Tree 4
	The Pollution Haters				
Usnea	🔴 🟡 🟢 ✓	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢
Evernia	🔴 🟡 🟢 ✓	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢
Hypogymnia	🔴 🟡 🟢 ✓	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢
	The Pollution Lovers				
Leafy Xanthoria	🔴 🟡 ✓ 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢
Cushion Xanthoria	🔴 ✓ 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢
Physcia	🔴 ✓ 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢	🔴 🟡 🟢