Experiment 1: Testing the air in the soil

50% of soil is made up of air! The air in soil comprises a range of gases, with oxygen being essential because it enables plant roots and animals that live in the soil to breathe. However, soil can get compacted or filled with water, meaning there can be less space for air and less oxygen for plants and animals living in the soil. This experiment will test which of your soil types might be compacted.

Materials required:

- different soil types from different areas in your yard. You will need to ensure soil types are labelled throughout the experiment - it would be useful to have trays that you label, and you keep all the materials relating to that soil type (soil clods and jars/beakers of water) in that tray
- spray bottle
- jars/beakers of water - you will need 2 jars/beakers for each soil type you collect
- water.

Instructions:

1. Moisten each soil sample lightly and create two similarly-sized clods of soil with your hands from each sample, making sure to keep them labelled.
2. Spray each clod and wait 2 minutes.
3. Drip each clod into jars/beakers filled with water and labelled with the soil collection site. Watch the bubbles.
4. Which of your soil samples appears to produce the most amount of air bubbles? Which produces the least? What does this tell you about which soil type and site has been most compacted? What might this mean for plants and animals living in the soil at that site? (The soil types with the most bubbles are those that are least compacted and, therefore, the ones that the plants would most enjoy growing in.)

Notes: Ensure that students understand which soil types were the most compacted and that they understand that less compacted soil is better suited to growing plants because the organisms in the soil will be able to move around, the roots of plants will have spaces to grow in, and the water will be absorbed into the soil more easily.

Experiment adapted from: https://www.fao.org/3/i7957e/i7957e.pdf