F/G. The secrets of the soil

Previous Step: The mystery of growth

By the end of this month, pupils will have:

1. **Understood the structure of soil;**
2. **Learned about chemical processes in the soil;**
3. **Discussed the different factors affecting soil quality (erosion; vegetation; carbon matter; climate);**
4. **Familiarised with different types of soil;**
5. **Made connections between soil types and nutritional qualities of different vegetables.**
6. **Reflected on how soil is used.**

What is soil?

1. **Soil** is a generic term referring to the land on which we walk, build roads and houses and grow our food. However, soil is more than just a 'flat surface'… there are different types of soil and a lot more happens under the ground than we may suspect.

Activity 1a: in class, children may be encouraged to give their ideas of 'soil'. They may be referring to a one- dimensional idea (e.g. surface), or they may use common words to talk about the ground (land; floor; ground; earth).

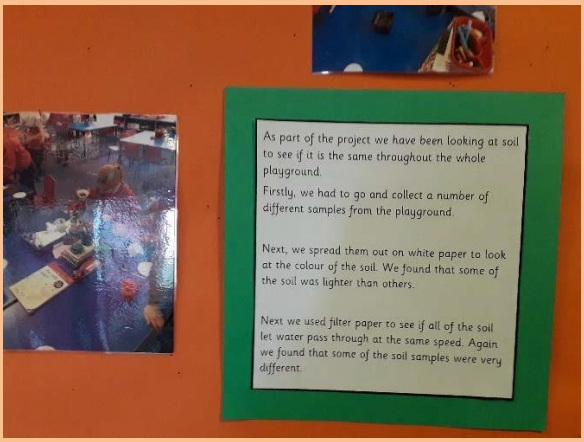
Activity 1b: different soil samples can be made available for children to manipulate.

2. **Core ideas** include **variety** of terminology used for **soil:** why do we have so many words to talk about it?

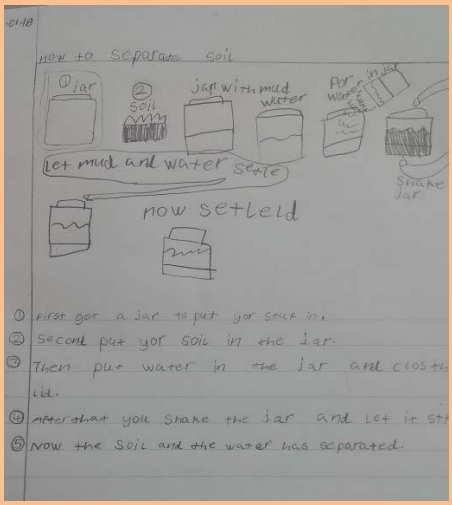
Activity 2a: Teachers may help children to reflect on the different uses of soil (for growing; building houses; transport; for standing up or lying flat) and the importance for human beings and other living things. What would happen if there was no soil?

3. **The word 'soil'** is used specifically to describe a section of the earth with particular qualities. **Key ideas** include **types of soil** which are different from each other depending on what they contain, how they are laid out (structure) and where they are found (climate and location). Soils can **change over time** depending on all these factors.

Activity 3a: outside, children can continue mapping the school grounds by taking samples of soil from different locations. Each location needs to be labelled clearly and marked on the map; all soil samples will be labelled and stored in small containers (*equipment:* selection of small plastic containers; shovel; map of the school grounds).
Indoors, children can compare their different samples and organise them by colour, wetness, and texture.



4. Soil types are affected by many factors. Core ideas include the ability of the soil to retain **water**
Activity 4a: different types of soil retain or release soil, depending on the ration between solid rock content (which provides drainage) and clay/organic matter content (which retains water). *The jar experiment* can help to visualize how the different materials react to water and what the soil looks like under the ground



Activity 4b: question time! What happens if all plants are taken away from the soil? What happens if too many plants are planted and harvested too often? Answering these questions leads to a discussion about **soil erosion** due to deforestation; **salty soil** due to water being pumped out of the ground in excessive quantities (e.g. for large-scale irrigation elsewhere), and **soil exhaustion**, when the soil is overused

5. Healthy soil/exhausted soil: farmers sometimes add calcium carbonate (e.g. fishbone meal) to the soil to raise the Ph to a suitable level. Airy soil can help the roots to breathe and provide energy to the plants to grow. Worms help with turning soil around and let air into the ground.

6. When the soil is at rest… in winter produce is available through preserves, stored in jars, under vinegar or oil.
Activity 6a: research what winter foods are available in different countries. Research the content: rich in… sugars? Butter? Oil? Vinegar?

The secrets of the soil across the Curriculum for Excellence

Health and Wellbeing

• encourages children and young people to act as **positive role models** for others within the educational community

• leads to a lasting commitment in children and young people to follow a **healthy lifestyle** by participation in experiences which are **varied, relevant, realistic, and enjoyable**

Sciences

- develop **curiosity** and understanding of the environment and **my place in the living, material and physical** world
- demonstrate a secure knowledge and understanding of the **big ideas** and concepts of the sciences
- develop the skills of **scientific inquiry** and investigation using **practical techniques**

Literacy and English

- explore the richness and diversity of language and how it can affect me, and the wide range of ways in which I and others can be creative

Religious and moral education

- investigate and understand the responses which religious and non-religious views can offer to questions about the nature and meaning of life
- develop the skills of reflection, discernment, critical thinking make a positive difference to the world by putting my beliefs and values into action

Numeracy and Mathematics

- develop a secure understanding of the concepts, principles and processes of mathematics and apply these in different contexts, including the world of work
- interpret numerical information appropriately and use it to draw conclusions, assess risk, and make reasoned evaluations and informed decisions
- apply skills and understanding creatively and logically to solve problems, within a variety of contexts