

Soil

Don't treat soil like dirt! Soil allows plants to grow, which in turn provide wildlife habitat, food and oxygen. Soil is the foundation of all ecosystems. Understanding soil is vital to understanding environmental health.

What do you need to know for the competition?

Here is a list of all the skills you will need to master the soil section.

Knowledge Base

Some of the knowledge you will have after you master the soils section include:

- Identify the soil orders;
- Identify the factors affecting soil formation and describe processes involved;
- Describe soil structure in terms of its three components: form, stability, and strength;
- Describe how different amounts of organic matter affect and are affected by soil structure and texture;
- Identify factors that influence soil temperature;
- Describe how soil pH affects plant growth;
- Describe the cation exchange process and relate it to soil fertility;
- Identify benefits of soil organic matter to soil chemistry;
- Identify the six essential nutrient elements in soil and describe how they affect soil fertility;
- Identify types of soil organisms and their functions within a soil ecosystem;
- Describe the carbon cycle and the nitrogen cycle;
- Describe the effects of each type of erosion on the landscape and capability for various kinds of plant growth;
- Identify erosion control methods (windbreaks, crop rotation, drainage, etc.);
- Explain how soil composition and fertility can be altered in an ecosystem and identify the possible consequences of such changes.

Hands on Application

After mastering the knowledge base, some of the skills you will have include:

- Identify soil horizons in a soil pit or photograph;
- Name and map the soil orders of Canada and identify them on a map;
- Identify soil types according to textural characteristics;
- Use a soil triangle to determine soil class;
- Use munzell soil colour chart/other soil charts;
- Classify soil structure according to aggregate characteristics (i.e., granular, blocky, columnar, platy, massive);
- Measure and interpret soil pH using test kits or pH meter;
- Use soil test kits to determine preferred conditions for growth of plants(nitrogen, phosphorus, potassium, pH);
- Use a soil probe;
- Relate stream velocity to sediment sorting (grade 12 biology);
- Identify and measure soil horizons;
- Describe and classify a soil profile.

Putting it All Together

Now you can:

- Relate how soil, water and air are interrelated. (grade 12 biology);
- Use data, observations on soils to explain vegetation in an area (grade 12 biology);
- Predict the types of soil organisms that would be found within a given soil type
- Assess a site for the erosion (grade 12 biology);
- Make recommendations on how to implement erosion control;
- Make recommendations on site on how to improve soil quality.

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Module Study Material Download

- 1 Ecozones and What is Soil?
- 2 Soil Texture, Horizons, Formation and Structure
- 3 Erosion
- 4 Degradation