

Using Crop Rotation to Improve a School Kitchen Garden

Subjects Biology, Agricultural Science

Year 11

Learning Intention

Students will investigate how crop rotation improves soil health and increases food production. They will explore the benefits of rotating crops, conduct soil tests and design a planting plan to improve sustainability in the school kitchen garden.

Curriculum links

Biology

Strand: BI 11.3, 12.3 Biodiversity, Change and Sustainability

Sub-strand:

BI 11.3.2 Man's Influence on the ecosystem

B1 12.3.2 Climate Change and Ecosystems

Learning Outcome

- 11.3.2.1 Investigate how human activities affect not only the ecological niche that individual species occupy, but the functioning of ecosystems at local and global levels.
- 12.3.2.1 Study that the Greenhouse effect is a natural phenomenon but currently a concern due to anthropogenic sources.

Agricultural Science

Strand: AS 11.1 Agricultural Concepts

Sub-strand: AS 11.1. 1 General Agriculture – Field Trials

Learning Outcome

- AS 11.1.1.1
- Deliberate on the importance of conducting field trials in obtaining environmentally friendly solutions in solving challenges faced by agricultural enterprises in the school.

Teaching Activity

Materials required

- Garden trowels and spades
- Soil testing kits (for pH, nutrients, and moisture)
- Garden gloves
- Rulers or measuring tapes
- Notebooks and pencils for recording observations
- Coloured markers and poster paper for mapping and presentations
- Watering cans or hoses
- Compost bins for sustainability practices
- Seed packets for different plant groups
- Plant labels for organizing crop sections
- Digital devices (tablets or computers) for research and presentations (optional)

- Video, *How to Use Crop Rotation* (4m 27s), YouTube

Activity Steps

Introduce and **lead** the following activity, explaining the steps and concepts as required.

Step 1: Explore Crop Rotation

- Research crop rotation and its benefits.
- Optional: View video, *How to Use Crop Rotation* (4m 27s), YouTube
- Classify common garden crops into four groups that can be rotated:
 - Leafy greens (e.g. lettuce, spinach)
 - Root vegetables (e.g. carrots, potatoes)
 - Fruiting crops (e.g. tomatoes, beans)
 - Soil builders (e.g. legumes like peas).

Step 2: Investigate the Garden

- **Map the current garden:** Identify what plants are growing and where.
- **Test the soil:** Check pH, texture, and moisture in different areas.
- **Identify any concerns:** Are some areas depleted of nutrients? Are certain plants struggling?

Step 3: Design a Crop Rotation Plan

- **Plan a 4-season cycle:** Rotate crops so each section gets different plants each season.
- **Think sustainably:** Add composting, companion planting or natural pest control methods.
- **Create a garden layout:** Draw a new map showing how the garden will change over time.

Step 4: Present and Reflect

- **Create a poster or slideshow:** Explain how your plan will improve soil health and food production.
- **Class discussion:** Share ideas and decide if any can be implemented in the real school garden.
- **Reflect:** Write a short paragraph on how crop rotation can help global food security.