

Maximise Crop Production in a School Garden

Subject(s): Agriculture, Mathematics, Design Technology

Year: 8-9

Learning Intention

Students will investigate, design and implement strategies to maximise crop production within a given garden plot by applying principles of sustainable agriculture, efficient resource use and innovative gardening techniques. They will develop problem-solving, critical thinking and teamwork skills while exploring real-world applications of food production and environmental sustainability.

Links to Curriculum

Strands:

Agriculture – Food security, Soil Physical Properties, Introduction to Farm Management

Mathematics – Numbers

Design Technology – Information and Communications

Sub strands

Agriculture

- 8.1 What is food security?
- 8.4 Soil Physical Properties
- 9.2 Farm planning
- 9.4 Why sustainable land management?

Mathematics

- 8.2 Length and Perimeter
- 8.5 Rates and Ratio
- 8.13 Area and Volume
- 9.2 Measurement

Design Technology

- 8.1 and 9.1: The Design process

Learning outcomes

Agriculture

- 8.2.4 Understand the factors that affect food supply
- 8.5.3.1 Explain soil nutrients and the nutrient cycle
- 9.2.1 Understand farm planning
- 9.4.3 Understand different sustainable land management practices

Mathematics

- 8.2.12.2 Calculate the perimeters of composite shapes
- 8.5.1 Understand what ratio is and how it is used to compare quantities and look at the relationships between quantities
- 9.5.8.1 Convert units of various rates from one unit to another

Design Technology

- 9.1.2 apply the design process to solve a real-life situation

Teaching Activity

Materials/Resources

- Access to the Library or Internet for research purposes (optional)

Activity Overview

Your school has a designated garden plot, and your mission is to design and implement a system to maximise crop production within the given space. You will need to research, plan and test different strategies to improve yield while considering factors like soil health, water usage, plant selection and sustainability.

Key Considerations

- How can you optimise space to grow more crops?
- What methods can improve soil health and fertility?
- How can you ensure efficient watering and drainage?
- Which crops are best suited for the climate and soil conditions?
- What role do companion planting and crop rotation play?
- How can natural pest control methods be integrated?

Student Questioning

To guide your thinking and design process, consider these questions:

- What do plants need to grow successfully?
- How can we measure the success of our garden (e.g. yield, plant health, sustainability)?
- What innovative gardening techniques (e.g. vertical gardening, hydroponics) could help increase production?
- How do environmental factors like sunlight, temperature, and rainfall affect crop growth?
- What real-world farming practices could be adapted for a small school garden?
- How can we make the garden sustainable and environmentally friendly?
- What unexpected challenges might arise, and how can we adapt our design to overcome them?

Design and Experimentation Process

- **Research:** Investigate gardening techniques, plant needs and soil improvement strategies.
- **Plan:** Sketch a layout of your garden and select appropriate crops.
- **Prototype and Implement:** Set up small test plots with different techniques and compare results.
- **Evaluate and Improve:** Measure crop yield, analyse what worked best, and refine your design.



Credit: CC0

Outcome

Present your findings in a report or presentation, showcasing your garden plan and results, and offering recommendations for improvements.