



CROSS CURRICULUM ACTIVITY

> CROSS-CURRICULUM ACTIVITY

Each of the Mathematics, Geography and Science Curricula identify inquiry and analysis skills that are complementary and which could be covered by a significant project which includes the volunteer sector. Two examples illustrating how this could occur are provided below.

Content descriptors:

- + Mathematics: *Data Representation and Interpretation*
- + Science: *Scientific Enquiry*
- + Geography: *Geographical Inquiry and Skills*

Target Group: Year 4

Cross Cultural Priority: Sustainability

PROJECT DESCRIPTION

Students help volunteers collect seeds and pot them for future planting or for sale at a future school fundraising event. This can occur with students going into the field, or the volunteer coming to the school and using the school's natural resources for the project.

Students pose scientific and geographical questions to investigate through the activity.

Students construct different graphical representations of their data, evaluate the effectiveness of each style, and draw conclusions by analysing their data.

Students can be allocated to groups to consider one scientific and one geographical question.

Questions might include the following.

- + Where are the seeds located across the site? (Mapping).
- + Which trees produce the most seeds? (Predict, graph).
- + Why do we think some trees produce more seeds than others? (Predict).
- + How can these seeds be used to ensure sustainability of the landscape? (Interpret).
- + What type of soil grows the best plants?
- + What is the rate of growth of the plants over a given period?
- + What happens to plant growth when the soil they are planted in is enhanced?
- + How many species of weeds are there in the same environment as the trees where the seeds were collected?
- + What has to occur for the seeds to germinate?

Students plan for the sale of their product, calculating pricing to return a profit and answer number problems related to the calculation of change to the nearest five cents for individual plant sales.

The volunteer's role is to guide students through the processes that are used in the activities they perform in the real world for the organisation they are attached to, and describe what being a volunteer in that field entails.

GEOGRAPHY

GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING

- + The types of natural vegetation and the significance of vegetation to the environment and to people (ACHGK021).
- + The natural resources provided by the environment, and different views on how they could be used sustainably (ACHGK024).

GEOGRAPHICAL INQUIRY AND SKILLS

Observing, questioning and planning

Develop geographical questions to investigate (ACHGS026).

Collecting, recording, evaluating and representing

- + Collect and record relevant geographical data and information, for example by observing, interviewing, conducting surveys and measuring, or from sources such as maps, photographs, satellite images, the media and the internet (ACHGS027).
- + Represent data by constructing tables and graphs (ACHGS028).
- + Represent the location of places and their features by constructing large-scale maps that conform to cartographic conventions including scale, legend, title and north point, and describe their simple grid references, compass direction and distance (ACHGS029).

Interpreting, analysing and concluding

Interpret geographical data to identify distributions and patterns and draw conclusions (ACHGS030).

Communicating

Present findings in a range of communication forms, for example, written, oral, digital, graphic, tabular and visual, and use geographical terminology (ACHGS031).

Reflecting and responding

Reflect on their learning to propose individual action in response to a contemporary geographical challenge and identify the expected effects of the proposal (ACHGS032).

MATHEMATICS

DATA REPRESENTATION AND INTERPRETATION

- + Select and trial methods for data collection, including survey questions and recording sheets (ACMSP095).
- + Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096).
- + Evaluate the effectiveness of different displays in illustrating data features including variability (ACMSP097).

MONEY AND FINANCIAL MATHEMATICS

Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies (ACMNA080)

SCIENCE

QUESTIONING AND PREDICTING

With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge (ACSIS064).

PLANNING AND CONDUCTING

- + Suggest ways to plan and conduct investigations to find answers to questions (ACSIS065).
- + Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate (ACSIS066).

PROCESSING AND ANALYSING DATA AND INFORMATION

Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends (ACSIS068).

Compare results with predictions, suggesting possible reasons for findings (ACSIS216).

EVALUATING

Reflect on the investigation; including whether a test was fair or not (ACSIS069).

COMMUNICATING

Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports (ACSIS071).

Target Group: **Year 9**

Cross Cultural Priority: **Sustainability**

PROJECT DESCRIPTION

Collaborate on a garden project with a local not for profit organisation.

Students research, plan design, construct and maintain the project for a 12 month period, developing strategies to transfer maintenance responsibility after that time.

GEOGRAPHY

GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING

Unit 1: Biomes and food security (background research)

- + The distribution and characteristics of biomes as regions with distinctive climates, soils, vegetation and productivity (ACHGK060).
- + The human alteration of biomes to produce food, industrial materials and fibres, and the environmental effects of these alterations (ACHGK061).
- + The environmental, economic and technological factors that influence crop yields in Australia and across the world (ACHGK062).
- + The challenges to food production, including land and water degradation, shortage of fresh water, competing land uses, and climate change, for Australia and other areas of the world (ACHGK063).
- + The capacity of the world's environments to sustainably feed the projected future population to achieve food security for Australia and the world (ACHGK064).

Interpreting, analysing and concluding (planning for planting)

Apply geographical concepts to synthesise information from various sources and draw conclusions based on the analysis of data and information, taking into account alternative points of view (ACHGS068).

Geographies of interconnections (market gardening in Northern Asia)

The effects of the production and consumption of goods on places and environments throughout the world and including a country from North-East Asia (ACHGK068).

Collecting, recording, evaluating and representing (use this data to plan the garden content).

- + Collect, select, record and organise relevant geographical data and information, using ethical protocols, from a range of appropriate primary and secondary sources (ACHGS064).
- + Evaluate sources for their reliability, bias and usefulness, and represent multi-variable data in a range of appropriate forms, for example, scatter plots, tables, field sketches and annotated diagrams, with and without the use of digital and spatial technologies (ACHGS065).

MATHEMATICS

MEASUREMENT AND GEOMETRY

Using units of measurement

Calculate the areas of composite shapes (for example to determine fertiliser ratios) (ACMMG216).

Pythagoras and trigonometry

Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles (ACMMG222).

Patterns and algebra

Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations (ACMNA296).

Suggested activities:

- + graph growth rates for selected plants, calculate the volume of soil needed for specific garden beds.
- + design triangular-shaped garden beds and calculate the angles and sizes of the triangles to ensure the most efficient use of the space available.

SCIENCE

SCIENCE UNDERSTANDING

Biological sciences (companion planting)

Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems (ACSSU176).

Chemical sciences

Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer (ACSSU179).

Suggested activities include soil testing, researching nutrient difference for different plants, exploring companion planting options and designing sustainable watering systems.