Linking SNAP 2006 to the Curriculum
Numeracy is the ability to effectively use the mathematics required to meet the general demands of life at home and at work, and for participation in community and civic life. Numeracy is a fundamental component of learning across all areas of the curriculum. The key role that teachers of geography play in the development of numeracy includes teaching students specific skills and providing them with opportunities to select, use, evaluate and communicate mathematical ideas in a range of situations.

The Geography Stages 4–5 Syllabus identifies the numeracy skills required of students of geography and includes the analysis of statistical data, the construction and interpretation of graphs and maps, and the ability to use latitude and longitude. Geography enables the students to develop these skills in a concrete manner via the use of inquiry and testing. This enhances the development of the student’s understanding of the skills which are constantly reinforced through the syllabus.

**Numeracy skills required in geography and assessed in SNAP**

**Number**
- Relative size of numbers
- Calculating with whole numbers
- Calculating with decimals and fractions
- Describing the likelihood of events
- Using samples to make predictions about larger populations

**Data**
- Identifying data in tables, charts and graphs
- Organising data in tables, charts and graphs
- Interpreting data in tables, charts and graphs

**Measurement**
- Estimating, measuring, comparing and drawing areas
- Estimating, measuring, comparing and drawing lengths

**Space and Geometry**
- Drawing three-dimensional objects
- Drawing lines and angles
- Drawing two-dimensional shapes
- Recognising and developing patterns and designs
- Using compass directions
- Using precise terminology to give position
- Using scale to measure distance on maps

**Working Mathematically**
- Using strategies to solve problems
- Communicating with appropriate numeracy terminology
- Checking solutions to problems
- Providing reasons for solutions
- Relating numeracy skills in one situation to the numeracy skills needed in another situation
- Using appropriate instruments

Syllabus referred to is *Geography Years 7–10 Syllabus*, Board of Studies, June 2003.
Tour de France (Part A)

In these questions students are required to identify data shown on a map of France by using the key, calculate a correct total by adding distances given, use a linear scale to calculate a correct distance and calculate a difference in distance travelled.

In geography, students use various types of maps. The map is one of the most important tools for students to gather data to help them evaluate and communicate geographical information.

Teaching strategies

When teaching about maps it is important that teachers stress to the students the importance of maps as an essential tool for geographers to gather and analyse data. In Stage 4 Geography, the mapping skills required for the student to answer the questions in this task are:

- identify and use elements of maps: legend, north point, title, scale and border
- identify scale as written, linear or representative fraction
- measure distances on a map using a linear scale.

Identify and use elements of maps: legend, north point, title, scale and border

1. Use atlases to investigate the different types of maps that are produced and discuss the purpose for different maps. Identify the various features on a map, eg scale.

2. Introduce the mnemonic BOLTS (Border, Orientation, Legend, Title, Scale) as a way to remember the important elements of a map. Explain the importance of each element and show how students might use each to gain information that may help them.
   - border: separates this map from others
   - orientation: helps give direction
   - legend (key): explains the symbols used on a map so that data may be obtained
   - title: gives the reason why the map was drawn
   - scale: helps determine the actual size of areas shown on the map.

3. Select a country that fits within your topic of world heritage area or global environments, eg China.

4. Provide blank paper so that students can draw or trace an outline of the country. On the map the students mark on all the World Heritage Sites found in the country, then draw a holiday route which connects many of the main heritage sites, eg Great Wall of China, Yungang Grottos, Lushan National Park.

5. Ensure all of the important elements of a map are included on their map, especially scale.

6. Calculate the total distance to be travelled on the holiday, using the scale.

7. Discuss the distances of each segment, the type of environment being traversed (eg mountains, rivers) and the modes of transport available. Which form of transport would be most appropriate for each segment? Give reasons why the mode has been selected for the segment.

8. Estimate the length of the holiday (in days), given the distances to be travelled, the modes of transport being used and time required to visit the heritage sites.

Syllabus reference

Outcome 4.1 identifies and gathers geographical information
Outcome 4.2 organises and interprets geographical information
Outcome 4.4 uses a range of geographical tools

Students learn about: the use of geographical tools in investigating the physical and human environment
Question 10

In this question students are required to interpret information represented on a bar graph.

In geography students are often required to observe and interpret geographical relationships in tables and graphs and to make and record observations about environments in written and graphical form.

Teaching strategies

Graphs are an important tool used by geographers to make it easier for the reader to determine trends and patterns and to make comparisons at a glance. Graphs are visual representations of statistics. In Stage 4 Geography the graphing skill required for the student to answer this question is to construct and interpret bar, column, line, climatic and proportional graphs.

When teaching graph work, it is important that the students are able to identify the key features of any graph such as the title of the graph, the information being represented by both vertical and horizontal axes, information supplied by the key and the date the graph was drawn. A website that shows how different graphs can be used for different purposes is http://webgis.wr.usgs.gov/globalgis/chart_types.htm. Students must know how to draw a graph so that they can accurately interpret the information it represents.

Demonstrate the construction of a divided bar graph by using Some food favourites of the koala in NSW, adapted from Geoactive 1, Sue Bliss and John Paine, Jacaranda, 1998, p 177.

Using overheads or drawing on the board, follow these steps:

1. Draw a horizontal rectangle measuring 100 mm, where 1 mm represents 1%.
2. Divide the rectangle into sections according to values from the table.
3. Show the class how to devise a key for each group.
4. Test for understanding by asking questions such as:
   - What does this graph show?
   - What is a suitable title?
   - What does the key show?
   - How many sections has the rectangle (bar) been divided into? Why?
   - What information does this graph compare?
   - Why is there such a large percentage in ‘Other eucalyptus’?
   - What colour in the key represents the smallest percentage?
   - What colour in the key represents the largest percentage?
   - What is the total number of species that are food for koalas in NSW?
   - What fraction of the total does each section represent?

5. Select data on other topics for students to work with and construct their own graphs.

This activity is enhanced if data can be provided for two different time periods on the same items. This allows students to work in pairs completing one graph each. Each pair could then write a short report to compare their set of graphs and describe the changes evident over the given time period.

Syllabus reference

Outcome 4.3 uses a range of written, oral and graphic forms to communicate geographical information
Students learn to: present geographical information in the form of both oral and written reports accompanied by maps and graphs
Question 1a

In this question students are required to find a place on a map using its coordinates.

In geography students are often required to observe and interpret geographical relationships in maps. To be able to locate places and features on a map is essential as the student develops knowledge and understanding about the characteristics and spatial distribution of environments.

Teaching strategies

A map is the reproduction of part of the earth’s surface on paper. The skill of locating features and places on a map is very important for the geography student so that they can draw conclusions and make generalisations by using the map as one of their tools for analysis. In Stage 4 Geography, the skill required for the student to answer this question is to locate features using latitude and longitude, area and grid references.

Using a simple grid with letter and number combinations for coordinates is the first step in teaching students how to use area and grid references on maps.

1. Show students a complex topographic map and ask them to find specific features (set a time limit).
2. Select a simple map similar to the one above and ask students to find specific features on the map.
3. Discuss the difference in the time taken to find the features.
   Ask questions such as:
   • How could you make finding places easier all the time?
     Suggest the use of the technique of dividing the map up into quadrants.
   • How would you write down the location of these features so that someone else could find them?
     Brainstorm ways location is shown on maps (latitude and longitude, area and grid references).
4. Explain to students the importance of being able to find specific features on a map when analysing for a specific purpose.
5. Demonstrate how coordinates are helpful, using the web site http://www.whereis.com.au. Type in the school address.
6. Construct your own map by printing the map of the school’s location and drawing a grid over the map.
7. Label the sides with letters and the top and bottom with corresponding numbers.
8. Ask questions about the map for students to locate features of their school.
9. Ask students to generate their own map using the process just demonstrated.
10. Have students compile ten “where is” questions using letter and number coordinates.
11. Students can then swap maps and questions and test another student in the class.
   This activity can be taken further by students making a thermal copy overhead of their maps and, using an overhead projector, enlarging their map onto larger sheets of paper.

Syllabus reference

Outcome 4.4 uses a range of geographical tools
Outcome 4.5 demonstrates a sense of place about global environments
Students learn to: process geographical information
Students learn about: global representation using maps