Linking SNAP 2006 to the Curriculum
Linking SNAP to Technology (mandatory)

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 technology teachers play in the development of numeracy includes teaching students specific skills and providing students with opportunities to select, use, evaluate and communicate mathematical ideas in a range of situations.

The Technology (Mandatory) Years 7–8 Syllabus involves students in designing, producing and evaluating quality design solutions that respond to identified needs and opportunities. During the development of a design solution, students are involved in researching, experimenting, generating and communicating creative design ideas and managing quality solutions to successful completion.

Students work with a variety of technologies across three areas of study (Built Environments, Products, Information and Communication). For each design project, students will develop a design folio to communicate the application of a design process and the specific technologies used in this process. Each project provides regular opportunities to develop students’ numeracy skills through the manipulation of data, shapes and spaces.

Numeracy skills required in technology and assessed in SNAP

**Working Mathematically**
- Asking appropriate numeracy questions
- 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 numeracy skills in another situation

**Number**
- Using place value and using number facts
- Representing and comparing fractions
- Calculating with whole numbers
- Calculating with decimals and fractions
- Using chance words, percentages and fractions to describe events
- Describing the likelihood of events
- Using samples to make predictions about larger populations

**Patterns and Algebra**
- Building and describing simple geometric patterns using words
- Completing a table of values for a number pattern involving one operation

**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 lengths and areas
- Measuring and comparing volumes
- Estimating, measuring and comparing capacity
- Measuring and comparing mass
- Understanding time
- Calculating speed

**Space and Geometry**
- Recognising and drawing three-dimensional objects
- Drawing lines and angles
- Recognising and drawing two-dimensional shapes
- Locating position using grids
- Using scale

The syllabus referred to is the Technology (Mandatory) Years 7–8 Syllabus, Board of Studies, June 2003
Question 25

In this question students are provided with a drawing of a model. They are required to visualise what the model would look like when viewed from the front and to match this to the correct drawing of the front view.

In technology, students are often required to draw a two-dimensional view (a top view, a front view or a side view) of a three-dimensional object. Sometimes they are required to interpret workshop drawings that consist of a number of related two-dimensional views of an object. This is a common type of representation used to communicate design solutions for products and built environments. These drawings can be used when working out the details of a design solution or when the designer needs to communicate sizes and shapes to others involved in production.

The capacity to sketch an object for a design that has not yet taken form or to draw a two-dimensional view is closely connected to the student’s skill in imagining what the object looks like, picturing the object in the ‘mind’s eye’.

Teaching strategies

Teaching students the skills of preparing workshop drawings should be an explicit focus in some design projects. Lessons should be sequenced to support students as they refine and communicate their design ideas. When teaching students to draw two-dimensional views of three-dimensional objects, it is best to use products that are familiar and meaningful to students. This assists students to understand the form of the product and it provides a familiar language to describe its parts and features during learning experiences.

• Have students use a digital camera to photograph a familiar object, eg a toy train.

• Instruct students to look at the train from the side and freehand draw a side view. Use the camera to photograph a view from the side. Compare the photograph and the drawing.

• Students should be made aware that a two-dimensional view is not exactly as the eye would see the object. We see objects from a single vantage point. Similarly, students should be made aware that a photo is not a true top view. A two-dimensional view assumes that we can look at all parts of the object at a true angle of 90°.

• Have students look at the train from above and freehand draw a top view. Use the camera to photograph a view from the top. Compare the photograph and the drawing.
Teaching strategies (cont'd)

- Have students identify differences between their drawings and the photograph of the same view. Review the terms used to describe the various parts of the toy train. Discuss with students the shapes of the various parts when viewed from the top, the front and the side. Questions might include:
  - What type of geometrical solid is the funnel?
  - What shape will the funnel appear to be when viewed from above?
  - What shape will it appear to be when viewed from the front?
  - How can we tell where the edge of the boiler is in the top view?

- Repeat using products that have simpler or more complex forms. If students experience difficulty visualising objects, provide them with construction blocks and have them construct a basic form such as a set of steps. Ask students to draw the steps when viewing them from the front, the top and the side.

Projecting between views

To understand the form of a product, it is often necessary for students to view its features from more than one direction, i.e. to understand the cylindrical nature of the funnel, it is important to see the circular end in top view and the apparently rectangular shape in the front view.

In many design projects students will need to make a workshop drawing that consists of more than one view. When making a workshop drawing it is important to align the views so the same features correspond when viewed from different directions.

- Provide students with graph paper or a grid to draw on. This will allow them to ‘project between views’ or match sizes from one view to another. By aligning views, students save time re-measuring the same dimension on a different view. Graph paper also helps students draw to scale.

- To complete a workshop drawing, students should add dimensions. Dimensions are typically shown in millimetres (mm) and should be outside each view to avoid confusion between dimension lines and outlines. Features that are not visible in a view can be shown as ‘hidden details’ and indicated by a dashed line.

- When arranging views it is important to place the view to the same side as that being viewed, i.e. the top view is placed or projected to the top, a right-hand side view is projected to the right. This convention (third angle projection) assists the reader to interpret the form.

Syllabus reference

Outcome 4.2.1 generates and communicates creative design ideas and solutions
Students learn about: communication methods including – drawings, sketches and models
Students learn to: sketch, draw and model to aid design development – drawings, sketches and models
Questions 4a, 4b, 4c, 4d

In these questions students interpret data from a table. In technology, students are often required to conduct surveys, collect data and interpret results. They provide explanations of data collected as part of investigating needs and evaluate responses to design ideas and design solutions.

**Teaching strategies**

Video making can be a very engaging technology for students. A class might design and produce a video based on a novel they studied in English. As part of the design process students develop a set of criteria to be used to gauge the success of their production. The criteria may require that the video has believable characters, a realistic setting, an understandable plot and an interesting graphic style.

As part of the final editing, the class prepares a survey based on the criteria for gauging success, conducts a screening and surveys the audience. The test audience are asked to nominate one aspect of the video they liked and one aspect that they disliked.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Number of students who liked</th>
<th>Number of students who disliked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believable characters</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Realistic setting</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Understandable plot</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Interesting style</td>
<td>4</td>
<td>12</td>
</tr>
</tbody>
</table>

- Have the class identify changes that are possible to make in the final editing, eg reduce the length of scenes, cut scenes with poor characters, reconsider material already cut, re-edit transitions, modify the graphic style of titles and credits.
- Divide the class into groups to prepare a report based on the data collected with recommendations for final editing.
- As a whole class model an analysis of one aspect of the production, eg As many people understood the plot as had difficulty understanding it. We could make some minor adjustments such as including subtitles when Teen Wolf is mumbling.
- Have each group prepare a report and present recommendations to the class with relevant justifications.

**Syllabus reference**

**Outcome 4.2.2** selects, analyses, presents and applies research and experimentation from a variety of sources

**Students learn about:**
- research methods
  - needs analysis
  - surveys and interviews

**Students learn to:** use effective research methods to identify needs and opportunities and locate information relevant to the development of each design project.