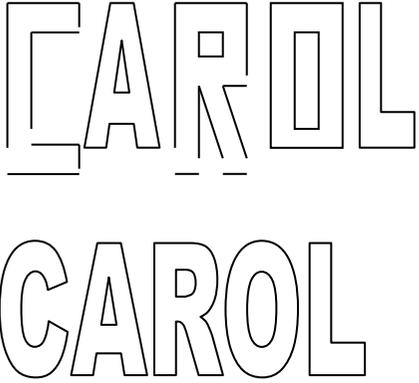


Two-dimensional Space

<p>Outcomes</p> <p>Early Stage 1</p> <ul style="list-style-type: none"> › describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM › uses objects, actions, technology and/or trial and error to explore mathematical problems MAe-2WM › manipulates, sorts and describes representations of two-dimensional shapes, including circles, triangles, squares and rectangles, using everyday language MAe-15MG 	<p>Language</p> <p>shape, circle, triangle, square, rectangle, features, side, straight line, curved line, open line, closed shape</p>	
<p>Syllabus pp63 & 64</p> <p>Experiences with shapes, even in Early Stage 1, should not be limited. It is important that students experience shapes that are represented in a variety of ways, eg 'tall skinny' triangles, 'short fat' triangles, right-angled triangles presented in different orientations and of different sizes, and shapes that are represented using a variety of materials, eg paint, images on the computer, string. Manipulation of a variety of real objects and shapes is crucial to the development of appropriate levels of language and representation.</p> <p>In Early Stage 1, it is important that teachers present students with both regular and irregular shapes (regular shapes have all sides and all angles equal). However, students are not expected to use the terms 'regular' and 'irregular' themselves. Students should be given time to explore materials in order to represent shapes by tearing, painting, drawing, writing, or cutting and pasting.</p>		
Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date
<p>Barrier Shapes</p> <p>In pairs, each student is given an identical set of two-dimensional shapes eg 1 circle, 1 square, 3 triangles, and 2 rectangles.</p> <p>Student A creates a flat design using the shapes and conceals it. They describe it to Student B who attempts to produce the same design. Students compare designs, swap roles and repeat the activity.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> - could your partner follow your instructions? - what shapes did you make and how did you do it? 		

<p>Cutting Up Triangles</p> <p>The teacher provides copies of several different drawings of large triangles. Each student selects a triangle and cuts it out. They begin cutting off triangles. As students work, they describe the kind of cuts that have been made eg 'I snipped off a corner.'</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> - do you know the name of this shape? - can you find two triangles that are the same or similar and one very different triangle? - are all of these shapes triangles? How do you know? 		
<p>Drawing and Describing Shapes</p> <p>Students are asked to draw a particular shape eg a circle. They are then asked to draw a different shape eg a rectangle.</p> <p>Possible questions include:</p> <ul style="list-style-type: none"> - how did you draw the circle? - what was different about the way you drew the rectangle? - can you draw another rectangle that looks different?How is it different? - are there other shapes that can be drawn using curved/straight lines? Can you draw some? 		
<p>Geoboards:</p> <p>Make triangle, square and rectangle shapes on Geoboards. What shape can't we make? Why? Make shapes of different sizes (area). Make shapes in different orientations.</p>		
<p>Lines</p> <p>Students are given a piece of string and are asked to make a straight line, a curved line or a closed shape. They are asked to describe their line or shape, and draw what they create.</p> <p><i>Variation:</i> Students could use computer software to draw a variety of closed shapes and open lines.</p>		

<p>Line Hunt</p> <p>The teacher prepares a chart on butcher's paper with columns labelled 'straight lines' and 'curved lines'. The students are asked to find pictures in magazines (or sort pictures given to them) that show straight and curved lines, cut them out and paste in correct column. Discuss the pictures and lines that were found</p> <p>Use WORD to draw straight lines and curved lines on a screen (AUTOSHAPES). Students are asked to make a design using colour and straight/curved lines.</p> <p>Students are given pictures of faces and they need to draw curved hair and straight hair on the different faces.</p> <p>What can we use to help us draw straight lines and curved lines (straight edge, edge of book, edges of plates/bowls etc)?</p> <p>Students draw/copy a stencil of their names in block letters – first only using straight lines, then using curved lines eg.</p> 		
<p>Line Investigations</p> <ol style="list-style-type: none"> 1. Which of these lines is closest in length to this pencil? Draw some lines on a piece of paper and provide children with a pencil. Note how they compare the pencil to the lines to find the line closest in length. 2. This string is a measure of the distance around an object in this room. What is the object? 		
<p>Making Shape Pictures</p> <p>Students make a picture using different-sized paper shapes, including circles, squares,</p>		

<p>triangles and rectangles. As students are working, the teacher asks the students to name the shapes they are using. Students glue their picture onto paper, add additional features, and describe their picture in sentences to be scribed.</p> <p><i>Variation:</i> Students could use a computer drawing program to create a shape picture.</p>		
<p>Pipe Cleaner Shapes Students investigate the shapes or figures that can be made by threading pipe cleaners through straws and bending them. Students describe their shape and use drawings to record what they have made. Alternatively, the teacher may take photos.</p>		
<p>Print It Students select an object from a collection of environmental and commercial materials such as fruit, stones, boxes and pattern blocks. They are asked to investigate the different parts of the object that can be painted and printed onto paper. Students share and discuss the printed shapes and the ways they were able to create particular shapes.</p> <p><i>Variation:</i> The teacher could cut some of the objects and ask the students to predict the shape/s that could be made if the cut surface was printed. Students test their predictions by painting and printing.</p>		
<p>Shape and Hunt The teacher prepares a chart on butchers' paper with columns labelled 'circles', 'squares', 'triangles' and 'rectangles'. The students are asked to find pictures in magazines that are similar to the shapes, cut them out, and paste them in the correct column. Students then view the class chart and discuss the pictures and shapes that were found and comment on which shapes were more difficult to find.</p>		
<p>Shape Walk Students walk around the school and describe the various shapes they see eg 'These leaves look round.' Students are asked to use drawings to show what they found.</p>		

<p>These are collated and placed in a class book for others to share.</p>		
<p>Sorting and Classifying The teacher prepares a variety of regular and irregular paper shapes and collects a variety of objects (some with similar features).</p> <p>Part A Students are asked to sort the shapes and objects into groups eg rough or smooth, colour, size, shape. Students are asked to explain their grouping. Students then sort the shapes and objects in a different way. For example, if the students sort them according to their colour the teacher could ask 'If these shapes and objects were all red, how would you sort them?'</p> <p>Part B In small groups, students take turns to sort the shapes and objects for others to determine and explain how they have been sorted. Possible questions include:</p> <ul style="list-style-type: none"> - how many different ways can you sort the shapes? - is this shape a square, a rectangle or a triangle? How do we know? - how are these shapes (two rectangles) the same or different? - can you name each shape? 		
<p>Sorting Attribute Blocks</p> <p>Part A Students are shown a set of attribute blocks and, in turn, are asked to select two of the blocks and state how they are alike and how they are different eg 'These two shapes are both triangles but one is thick and one is thin.'</p> <p>Part B The teacher then sorts the attribute blocks into two groups and the students determine how the shapes were sorted.</p> <p>Part C In small groups, a student randomly selects one of three cards and displays the card for the others to see.</p>		



The group then sorts the attribute blocks according to the feature indicated on the card.

Tracing Shapes

In pairs, students make a design or picture by tracing around the faces of various shapes eg make a picture of a robot by tracing a variety of objects. Students share and describe their pictures and are asked to:

- explain the position of particular shapes
- discuss the ways different students used a particular shape, and
- identify any shape used in different orientations.

Unit One: Shapes All Around– from ‘Teaching Space and Geometry’ CD ROM

Lesson One :Finding Shapes In The Environment- *Identifying, drawing and discussing different shapes found in the environment*

Lesson Two : Body Shapes- *Creating two-dimensional shapes using the students’ bodies*

Unit: Discovering Shapes

Lesson One :Sorting Two Dimensional Shapes-*Sorting and naming two-dimensional shapes according to given features*

Lesson Two : Make It Like Mine-suitable also for assessment-*Using two-dimensional shapes to create pictures*

Lesson Three: Find A Face-*Investigating the shapes of faces of three-dimensional objects.*

Unit Four: Investigating Triangles– from ‘Teaching Space and Geometry’ CD ROM

Lesson One :Dynamic Triangles- *Cutting a large triangle into smaller triangles*

Lesson Two :Radiating Triangles- *Creating triangles by joining lines that radiate from a point*

Lesson Three: Finding Triangles In Squares- *Creating triangles by cutting a square*

Lesson Four: Triangles On The Geoboard- *Making triangles on the geoboard and*

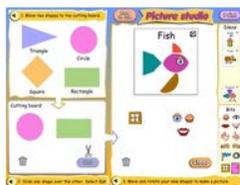
describing them

Using Technology to Teach Mathematics

Computer Learning Objects

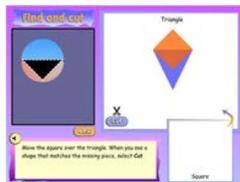
Shape overlays: picture studio TaLe - L1071 – Years P–4

Students create a picture from a range of shapes made by the intersecting shapes of overlaid shapes. Students select from four regular shapes then slide the shapes over each other to create another intersecting shape. Students cut, rotate and arrange the shape to create their own picture. Additional fun elements are available to add to pictures if required. A number of starter ideas are provided. Students can print their picture.



Shape overlays: find and cut TaLe - L752 – Years P–2

The student is presented with a missing shape in a partially covered picture. To find the missing shape and see the final picture, the student slides a given 2D shape over a fixed 2D shape. They cut the shape to check that they are correct. When they have matched the missing piece the picture is revealed.



Mathletics:

- Sort It
- Collect the Shapes 1

Ideal Resources:

-

Story Books

- Milestones in maths
- I spy shapes in art by Lucy Micklethwait

Other Activities

