

LEVEL: Year 2	CONTENT: Geometry	FOCUS: Introduction to 2D & 3D shapes
In the Classroom		
<b>PURPOSE</b>	<ul style="list-style-type: none"> <li>• Recognise and draw two-dimensional shapes</li> <li>• Describe two-dimensional shapes using key features and describe what is meant by these features, e.g. a side is a straight line that joins two corners</li> <li>• Recognise three-dimensional shapes</li> <li>• Describe the properties of 3D objects and what is meant by these terms</li> <li>• Identify the 2D shapes that make up 3D objects</li> <li>• Sort shapes into categories and provide reasons for these categories</li> <li>• Recognise that changing the orientation of the shape (turning it) does not change the shape</li> <li>• Write definitions for two-dimensional shapes, three-dimensional objects and their properties</li> </ul>	
<b>INTRODUCTION</b>	<p>Show students the collection of 2D shapes and 3D objects in the classroom. Ask them to tell you what they see? How can they describe what they see? Try to bring out the terms two dimensional and three dimensional (not just 2D and 3D).</p>	
<b>EXPLICIT TEACHING &amp; LEARNING</b>	<p><b>Investigating Shapes</b> Provide students with a range of 2D shapes and 3D objects. Ask students to collect 3 different shapes each and then work with a partner to sort their shapes into categories. Students must then explain how they have categorised their shapes and what they mean by these categories. Provide students with additional shapes and have them re-categorise their shapes.</p> <p><b>Challenge</b> Students must choose one of their shapes and write a who am I? Each student will be given an A4 piece of paper that is folded in half to make a booklet. Students will write 3 clues to describe their shape, one on the front, and two in the middle, the back page is used to record the name of the shape and draw a simple diagram of the shape.</p>	
<b>DISCUSSION/KEY QUESTIONS</b>	<ul style="list-style-type: none"> <li>• Tell me about the shapes you see</li> <li>• What is the difference between 2D shapes and 3D objects?</li> <li>• What are the features and properties of 2D shapes?</li> <li>• What is meant by these terms, e.g. side?</li> <li>• What are the features and properties of 3D objects?</li> <li>• What is meant by these terms, e.g. face?</li> <li>• Can you use what you know about shapes to place them into categories?</li> <li>• Can you use your knowledge of the properties of shapes to explain your categories?</li> <li>• If I turn the shape (change the orientation) does the shape change?</li> <li>• Can you write a what am I (who am I?) for a 2D shape and 3D object?</li> </ul>	
<b>DELIBERATIVE PRACTICE</b>	<p>The focus of this activity is to discover the language that students are using to describe the shapes, particularly the language students are using to describe the features of the shapes. Although students may know the names of many of the shapes, and may know the difference between say a square and a circle, the description of why these shapes are different may not be mathematically accurate. Listen to student suggestions first, before having other students clarify or build upon these descriptions.</p>	
<b>REFLECTION</b>	<p>During the lesson, after sorting the shapes into categories, have students stand up and swap groups. Students then need to identify the reasons why a different group may have sorted their shapes into these categories. After listening to the new justifications, the first group can choose to agree or share their reasoning.</p>	
<b>RESOURCES</b>	<p>A range of 2D shapes and 3D objects</p>	

Curriculum Connections	
<b>CONTENT</b>	<p><b>VICTORIAN CURRICULUM F-10 LEVEL 2</b></p> <p><b>Shape</b> Describe and draw two-dimensional shapes, with and without digital technologies (<a href="#">VCMMG120</a>) <b>Elaborations:</b> identify key features of squares, rectangles, triangles, kites, rhombuses and circles, such as straight lines or curved lines, and counting the edges and corners Describe the features of three-dimensional objects(<a href="#">VCMMG121</a>) <b>Elaborations:</b> identify geometric features such as the number of faces, corners or edges</p>
<b>WHAT CAME BEFORE</b>	<p>Many students will come to school with the ability to identify a number of shapes and describe these using a basic knowledge of their properties. It is important to ask students what they mean when they use different terms, such as side. Sometimes students are just quoting a fact, “triangles have 3 sides” but do not have a clear definition of the term The same student may describe a circle as having 1 side, where in fact a circle is made of a curve or curved line.</p>
<b>WHAT COMES NEXT</b>	<p>A deeper investigation into polyhedra can identify the relationship between the number of edges, faces and vertices of a shape. This becomes a number and equation task.</p>
<b>VOCABULARY</b>	<p>Two-dimensional shape, 2D, three-dimensional object, 3D, features, properties, side, corner, edge, face, angle, vertices, square, rectangle, rhombus, diamond, triangle, kite, curved line, curved surface, pyramid, prism, polygon, polyhedral, orientation etc.</p>
<b>MISCONCEPTIONS</b>	<p>As a number of common language words, like side, already have a meaning for students it is important to talk to students about the mathematical term. Also, many students, having been exposed to prototype shapes, such as an equilateral triangle with a point facing up, think the name of the shape changes as it is turned (orientated) a different way. Many students will describe 2D shapes as flat, in fact, once you can physical pick up a shape it is in fact a 3D object. So only a picture of a 2D shapes is actually a true 2D representation.</p>
<p><b>WHAT PROFICIENCIES ARE TO BE UTILISED?</b></p> <p>Understanding Fluency Problem Solving Reasoning Communicating (NSW) Justifying (NSW)</p>	<p><b>Year 2 (Australian Curriculum)</b> <b>Understanding</b> includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly and identifying and describing the relationship between addition and subtraction and between multiplication and division <b>Fluency</b> includes readily counting numbers in sequences, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations <b>Problem-solving</b> includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape <b>Reasoning</b> includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations and creating and interpreting simple representations of data.</p>
<b>ASSESSMENT</b>	<p>Create at least one 2D shape and 3D object who am I? This will allow the teacher to see if the student really has a clear understanding of the properties of their chosen shapes. In the next lesson, the teacher may use these to highlight some general misconceptions.</p>