DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES

Geometry – Shape and Space

Level 1 (Year 0/NE)

Teacher Booklet

Level 1 Year 0/NE: Geometry – Space and Shape

Task 1	Can you use your square tiles to make the same shape? First check that they are the same size. Now can you use them to make the same shape as this one? What about if I turn it like this? Can you use your squares to make this shape? Talk with you buddy about how this new shape you have made is the same as the first one you made. How is it different?
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Describe shapes according to shape, size, colour. • Describe two dimensional shapes using non-geometrical language. • Use geometrical language to describe shapes and objects.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than.
Sharing back/Connect	After the first activity select students to share who have tested that the squares are the same by placing one on top of the other and then have laid them horizontally with edges touching to construct a rectangle. After the second activity select students to share who have reconstructed the rectangle vertically and can describe the similarities and differences. **Connect:** Your turn to draw this shape. When you are finished check with your buddy that it is the same.
Teacher Notes	• During the launch, use square and rectangular 2D shapes and have the students discuss their attributes as well as naming them as squares and rectangles. Then present them with a template of a rectangular shape made of two squares and have the students discuss and describe it.(See Task 1 Template in Copy Masters).

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	• Use the first template cut out for Task 1, to have the students construct the same shape using their squares to complete the first activity. Use the second template cut out to have the students complete the second activity (See Copy Master booklet). • Have 2D squares and rectangles. These could be wooden blocks, carpet squares, floor tiles, foam tiles or cardboard or paper squares (See Copy Master booklet). Give each child 3 or 4 identical square shapes. • Facilitate the students to notice that the template of a rectangular shape made of two squares is made from two equal-sized squares and that they make a rectangle (See Copy Master booklet). Ensure that they notice that the shapes are same although the direction has changed. • Notice how students use their squares to make the rectangle. Discuss with them how they place the squares to make the shape (from what direction, right to left or left to right, turn, or flip them). • For the connect remove the materials and provide each student with a drawing of the rectangle you used to have them make a representation with their materials. Have them re-represent the rectangle as a drawing. Repeat until the drawings are more accurate. Draw student attention to the fact that there is only one line between the two squares which make the rectangle. • For the independent task, have available paper copies of rectangles made from two squares for students to re-represent from memory a rectangle.
Independent Tasks	Have a look at the rectangle made of two squares. Now hide the rectangle and draw the shape from memory. Check if your drawing was the same. Keep repeating this activity until your drawing is close to the rectangle on the sheet.
Anticipations	

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Task 2	Look at this shape. I wonder what it reminds you of. Can you use your shapes to make this shape? As you make the shape talk with your buddy about how you are making it and what you notice about it.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Describe shapes according to shape, size, colour. • Describe two dimensional shapes using non-geometrical language. • Use geometrical language to describe shapes and objects.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array.
Sharing back/Connect	Select students to share who can explain in different ways how they made the larger square. **Connect:** Your turn to draw this shape. When you are finished check with your buddy that it is the same.
Teacher Notes	• During the launch, provide the students with the pictures of the rectangle both horizontally and vertically positioned and discuss and record their conjectures (See Copy Master booklet). • Present the students with a square made of four smaller squares (See Copy Master booklet). Discuss with them what it makes them think of (e.g., windows, lego blocks, ceiling, or floor tiles). Lead into how it might be called a 2 by 2 block in Lego and ask them why. Use this as an opportunity to count, subitise and see it as an array. • Following immediately after this large group discussion and before the connect have the students place counters on the corners of their 2 by 2 square. Discuss how this has made a 3 by 3 array [see example below]

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	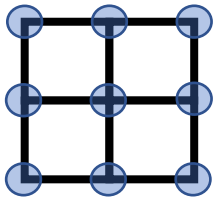 • In the connect provide each child with a drawing of the larger square made of 4 smaller squares and have them draw it as many times as needed until they are able to get a close representation of it. • Have available 2-D squares. • Facilitate the students to notice that all four squares are touching. Ensure that students can see that the larger square has 2 rows of 2 squares as well as 2 columns of 2 squares and that the vertical and horizontal lines divide it into 2 halves and that together they divide it into quarters. • Monitor for students using everyday vocabulary when discussing the rectangle during the launch. These might include the following generalised ideas; the lines as straight; the 2 squares are congruent, that is the same size and shape; the squares are beside each other and touching; they are collinear because their sides match and their top and bottom edges are in line; a square has 4 equal corners and 4 equal sides; some lines are vertical and some are horizontal, the 2 squares which make the rectangle are symmetrical, the rectangle is the same size whether horizontal or vertical. • For the independent task, have available short sticks of the same length.
Independent Tasks	1. Make 2 squares with your sticks. How many sticks did you need? 2. Make a rectangle with the sticks which is made up of 2 squares joined together. 3. Make 4 squares with your sticks. How many sticks did you need? 4. Make a 2 by 2 large square with the sticks which is made of 4 squares joined together to make one large square. How many sticks did you need this time? Why do you need less? 5. On your paper draw without looking at the picture a rectangle made of 2 squares. 6. On your paper draw without looking at the picture a 2 by 2 large square made up of the 4 smaller squares.
Anticipations	

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Task 3	Look at this picture. Talk with your buddy about how it is made and what you notice about it? Can you use your shapes to make this? Make sure you are talking with your buddy about what you are doing when you are making it. What about if we turn it this way? Talk with your buddy about how many squares you can see. How is this shape the same or different from the first one?
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2**: Sort objects by their appearance. **GM2-3**: Sort objects by their spatial features, with justification. **GM3-4**: Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Describe shapes according to their attributes. • Describe two dimensional shapes using non-geometrical language. • Use geometrical language to describe shapes and objects.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array.
Sharing back/Connect	Select students to share who can explain in different ways how they constructed the rectangle and can describe the attributes they notice. **Connect:** In the connect provide each child with a drawing of the 2 by 3 shape and have them draw it as many times as needed until they are able to get a close representation of it.
Teacher Notes	• During the launch, show students pictures of 2 by 2 squares found in their environment (take photos to use) and have them discuss the attributes of the shapes. Have students fold the shape and explore symmetry. • Present the students with a picture of a 2 x 3 drawing of a 2 by 3 rectangle made of 6 smaller squares (as seen in Task 3, Copy Masters booklet). Have students count by twos horizontally and then by 3s vertically and express as

	2 threes are 6 and 3 twos are 6. Use this as an opportunity to count, subitise and see it as an array. Discuss why the shapes could be called a 2 by 3 array or a 3 by 2 array. In the connect provide each child with a drawing of the larger square made of 6 smaller squares in rectangular shape and have them draw it as many times as needed until they are able to get a close representation of it. • Have the 2 by 3 shape cut out to use to explore it vertically and horizontally. • Facilitate the students to notice that the shape is called a rectangle and it is composed of 6 congruent squares and that there are 3 rows of 2 columns. Emphasise that both rectangles are made of lines and that the various lines are equally spaced both horizontally and vertically. • For the independent task, have available large pieces of paper and drawing materials. Sandboxes, dotty paper (See teacher masters) and grid paper could also be available. Hide all other materials (pictures and other objects) and only make them available after they have drawn their representation.
Independent Tasks	1. Draw what you think a 2 by 3 shape looks like which is made of 6 squares which are all the same. Check whether you are right. If you need to, keep drawing it until you are right. 2. Use the grid and/or dotty paper to draw the 2 by 1 shape, the 2 by 2 shape and the 2 by 3 shape. Can you make these larger and smaller?
Anticipations	

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Task 4	With your buddy you are going to explore all the different shapes you can make with your squares. After you have finished making a shape talk with your buddy about what you notice. Now both you and your buddy need to draw it. Keep checking that your drawing looks like the shape you have made.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Group similar shapes together and explain why they are similar using non-geometrical and geometrical language. • Group different shapes together and explain why they are different using non-geometrical and geometrical language. • Describe shapes according to their attributes. • Describe two dimensional shapes using non-geometrical language. • Use geometrical language to describe shapes and objects.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array.
Sharing back/Connect	Select students to share who have made various size shapes and are able to describe what they have made using every day and the language of geometry. **Connect:** Use the sticks to make different size shapes using congruent squares. Have students count how many squares they have used using structured counting (by twos or threes etc) and then describe them as 3 by 3 etc. Have them place counters on the corners of each shape and redescribe them as arrays.
Teacher Notes	• During the launch, have students explore every day and contextual pictures of shapes in their environment which are made of congruent squares. Have them draw around the shape so that it is annotated and make a wall display.

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	• Have materials, dotty paper, and squared paper available (See Copy Master booklet). • Facilitate the students to notice how the horizontal and vertical lines form the smaller squares and larger square or rectangle. • Monitor for students using the vocabulary of geometry • Notice students who are able to draw a close approximation of their shapes and those who need more support and repetition to achieve this. • For the independent task, have available dotty and squared paper (See Copy Master booklet).
Independent Tasks	Use the dotty and/or squared paper to draw squares and rectangles which are made up of many different smaller squares. Keep talking with a buddy about what you notice about the lines.
Anticipations	

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Task 5	Talk with your buddy about what you notice about the shape of these different things. Can you sort them into groups which you think are the same? Can you sort them into groups which you think are different?
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Group similar shapes together and explain why they are similar using non-geometrical and geometrical language. • Group different shapes together and explain why they are different using non-geometrical and geometrical language. • Describe two-and-three-dimensional shapes according to their attributes. • Describe two-and three-dimensional shapes using non-geometrical language. • Use geometrical language to describe shapes and objects.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid.
Sharing back/Connect	Select students to share who can explain and justify using everyday language and the language of geometry how the different objects are the same and/or different. **Connect:** Explore with the students the properties of the different objects through asking questions which explore for example, large and small, solid and hollow, roll, sharp edges etc.
Teacher Notes	• During the launch, use structured counting, to count objects which they see every day, which are represented as arrays (e.g., eggs in an egg carton, chocolates in a box (See Copy Master booklet).

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	• Provide students in pairs with a collection of common objects from their environment and have them talk with each other about what they notice about them. Then have the students sort the objects into groups that are the same and have them justify why they are the same. Repeat with how they are different. • Have available a large collection of common objects including some that are similar to cubes, cuboids, cylinders and spheres (e.g., boxes, dice, cans, balls, glad wrap roll, building blocks, Lego). • Facilitate the students to notice 3D aspects of the shapes including flat faces, curved faces, faces form an edge, corner, vertices when they come together, horizontal and vertical lines etc. • Monitor for students using vocabulary related to 3D shapes. • For the independent task, have available a wide collection of different 3D shapes.
Independent Tasks	Work with a buddy to sort your objects. Make sure that you are talking about why they are the same or why they are different. After you have finished sorting them into their groups count how many objects you have in each group.
Anticipations	

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Task 6	With your buddy can you find some shapes that are the same as this? Talk about what you notice about this shape. Now with your buddy can you find some shapes that are the same as this? Talk about what you notice about this shape. With your buddy can you find some shapes that are the same as this? Talk about what you notice about this shape.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
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Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid.
Sharing back/Connect	Select students to share who can explain and justify their groupings of objects according to the criteria set. **Connect:** Explore different cuboids and discuss how many faces they have, their shape, size of the faces, edges, and their length in comparison to the other edges.
Teacher Notes	• During the launch, have students examine selected objects more closely and identify whether they have rectangles, squares, or circles on their surface (or face). • In the first section of the lesson hold up a ball and use that as the first prompt, then a can as the second prompt and

	then a box as the last exploration. At the end of each iteration ask the students; What do you notice is the same about all the objects you have put together? In the connect have students identify 6 rectangular faces, and the congruency of the faces and the edges. • Facilitate the students to notice that objects which are shaped like balls have a single curved surface. They are called a sphere; objects shaped like a can or glass jar have two circular ends and a curved surface between them and are called cylinders; objects shaped like bricks and dice have 6 rectangular faces and are called cuboids. • For the independent task, have a collection of cuboids, cylinders and spheres.
Independent Tasks	• Sort your objects into cuboids, cylinders, and spheres. Talk with a buddy about why they are cuboids, cylinders, and spheres. • Now count how many cuboids there are, how many cylinders there are, and how many spheres there are. • Now play a game with your buddy of "guess what I have behind my back". Hide one of your shapes behind your back and ask your buddy to guess whether it is a cuboid, cylinder or sphere.
Anticipations	

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Task 7	Can you sort these shapes into different groups? As you sort them, talk with your buddy about what you notice about them. Be ready to explain and justify how the shapes in each group are the same and how they are different from the shapes in the other groups.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
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Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners.
Sharing back/Connect	Select students to share who are able to explain and justify their groupings of the shapes. **Connect:** Show the students a triangle which has a sharp corner and ask them to find other sharp corners on their shapes. Then show them a shape (like a rhombus) which has a blunt corner and ask them to find shapes with a blunt corner.
Teacher Notes	• During the launch, provide the students with cuboids and ask them to draw them. Repeat as often as needed to allow them to develop close 3D representations. • Have available for each pair of students a variety of triangle, quadrilateral, and hexagon shapes. These can be either as 2D wooden blocks or card representations (See Copy Master booklet).

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	• Have the students sort and re-sort until they are sorting the shapes by number of sides. Introduce the correct terms of triangle, quadrilateral and hexagon as 3-sided, 4-sided and 6-sided shapes. • Facilitate the students to notice that shapes can have a different number of sides and that their shapes have either 3, 4 or 6 sides. They also have different sized corners and that these can be sharp or blunt corners. • Monitor for students using vocabulary which is everyday maths language and revoice using the language of geometry. • For the independent task, provide students with solid shapes of a sphere, cuboid and a cylinder (maths material blocks are preferable to home type objects so there is no distraction from the shapes).
Independent Tasks	Draw each of these shapes. You might need to make a lot of drawings of them until your picture really looks like the shape.
Anticipations	

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Task 8	Can you sort these shapes into different groups? As you sort them, talk with your buddy about what you notice about them. Be ready to explain and justify how the shapes in each group are the same and how they are different from the shapes in the other groups.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
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Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner.
Sharing back/Connect	Select students to share who are able to explain and justify the groupings they have used. **Connect:** Show the students a set of triangles which are all different. Ask them what they notice about them all that is the same. Have them explain to each other why all the shapes are called triangles.
Teacher Notes	• During the launch, have a set of pictures of artifacts including tapa (See Copy Master booklet) and have the students identify the different shapes (squares, rectangles, triangles, etc) • Have sets of different triangles available for the students to sort and group (See Copy Master booklet). • In the lesson have the students sort and re-sort the different triangles while discussing what is the same and what is different about them. When they have finished sorting them into groups ask them to count how many

	triangles are in each group. How many more? How many less? • Facilitate the students to notice that some triangles have same length sides, others have 2 sides the same, or none the same length. Use the term equilateral and have students notice that these have 3 sharp corners that are all the same. Another group of triangles have a square corner, and they might notice that they can find square corners around the classroom. • For the independent task, have available play dough, sand, and 2D triangles.
Independent Tasks	Make a triangle with play dough or in the sand then draw it on your paper. Now make a different triangle with play dough or sand and draw it. Keep doing this making all sorts of different triangles in the sand or with dough and drawing them until your paper is full of triangles.
Anticipations	

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Task 9	Can you sort these shapes into different groups? As you sort them, talk with your buddy about what you notice about them. Be ready to explain and justify how the shapes in each group are the same and how they are different from the shapes in the other groups.
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Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner, rhombus.
Sharing back/Connect	Select students to share who are able to explain and justify their groupings. **Connect:** Show the students a set of quadrilaterals which are all different. Ask them what they notice about them all that is the same. Have them explain to each other why all the shapes are called quadrilaterals.
Teacher Notes	• During the launch, explore the orientation of a triangle by showing them triangles upside down etc. Discuss with them whether they are still triangles. • Have a set of quadrilaterals available for sorting and re-sorting (See Copy Master booklet). • Facilitate the students to notice that some quadrilaterals have 4 sides all the same length, use term rhombus for shape with 4 sides the same length, some quadrilaterals

	have 1 or more square corners and squares and rectangles all have square corners. • For the independent task, have available a range of big books, picture books, picture of everyday places and objects.
Independent Tasks	With your buddy can you find some shapes that are the same? Talk about what you notice about this shape. Draw these shapes and record everything you know about them. Now with your buddy can you find some shapes that are different? Talk about what you notice about these shapes. Draw these shapes and record everything you know about them.
Anticipations	

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Task 10	Let us use all our 2D shapes to make a train. Each person is going to get a turn to add a carriage. Listen to what the person before you say about their shape. Then choose another shape to add which has all the attributes the same and only one attribute which is different.
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Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner, rhombus.
Sharing back/Connect	**Connect:** Choose a shape which has two attributes which are different from this shape. Be ready to explain and justify why they are different.
Teacher Notes	• Have 2D shapes available to use and put them in the middle of the circle of students. Build the train across the floor each student taking a turn by naming the attributes of the shape and how their shape differs and is the same. • Facilitate the students to notice that they can name the attributes of different shapes and that shapes can differ by one attribute or more. • For the independent task, have available large pieces of paper and drawing materials. Sandboxes, dotty paper and grid paper could also be available (See Copy Master booklet).

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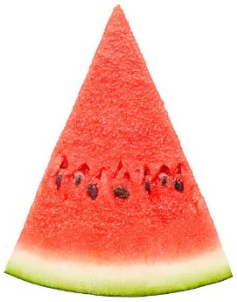
Independent Tasks	1. Draw what you think a 4 by 3 shape looks like which is made of 12 squares which are all the same. Check whether you are right. If you need to, keep drawing it until you are right. 2. Use the grid and/or dotty paper to draw the 2 by 1 shape, the 2 by 2 shape, and the 2 by 3 shape. Can you make these larger and smaller?
Anticipations	

Task 11 (optional)	Some children are talking about their food in their lunchbox. Sam says that they are all triangles, but Matthew argues that only some of them are triangles.     Do you think they are all triangles? Why or why not? Be ready to explain and justify your reasoning.
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Group similar shapes together and explain and justify why they are similar using non-geometrical and geometrical language. • Group different shapes together and explain why they are different using non-geometrical and geometrical language. • Use geometrical language to describe two-and-three-dimensional shapes according to their attributes.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column, row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner, rhombus.

Level 1 Year 0/NE: Geometry – Space and Shape

Sharing back/Connect	Select students to share who are able to explain and justify their reasoning. **Connect:** Can you explain to a buddy what makes a triangle.
Teacher Notes	• Facilitate the students to notice that all triangles have three angles and three straight sides. • Notice students who identify the shapes which are not triangles because their sides are not straight. • For the independent task, have sets of cut-out squares and rectangles ready for students to use, or use sets of tangram shapes and modify task to include making a picture from the tangram shapes or cut-out shapes.
Independent Tasks	With your buddy you are going to explore all the different shapes you can make with your squares. After you have finished making a shape talk with your buddy about what you notice. Now both you and your buddy need to draw it. Keep checking that your drawing looks like the shape you have made.
Anticipations	

Level 1 Year 0/NE: Geometry – Space and Shape

Task 12 (optional)	Ravi has bought this piece of tapa to school to show all his friends the geometric patterns he can see.  What are some of the geometric shapes he shows them? What do you notice about them? Can you make some drawings of the geometric shapes you can see on this piece of tapa?
Big ideas	Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes. Shapes have sides that are parallel, perpendicular, or neither. Shapes have line symmetry, rotational symmetry, or neither. Shapes are similar, congruent, or neither.
Curriculum links	**GM1-2:** Sort objects by their appearance. **GM2-3:** Sort objects by their spatial features, with justification. **GM3-4:** Represent objects with drawings and models.
Learning Outcomes: Students will be able to:	• Recognise shapes in their environment. • Sort objects in a variety of ways. • Explain and justify how shapes are similar using non-geometrical and geometrical language. • Explain and justify how shapes are different using non-geometrical and geometrical language. • Use geometrical language to describe two-dimensional shapes according to their attributes.
Mathematical language	Square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, sort, describe, side, equal, size, colour, big, small, bigger than, smaller than, straight, congruent, half, collinear, corners, angles, sides, vertical, horizontal, symmetrical, halves, quarters, column,

Level 1 Year 0/NE: Geometry – Space and Shape

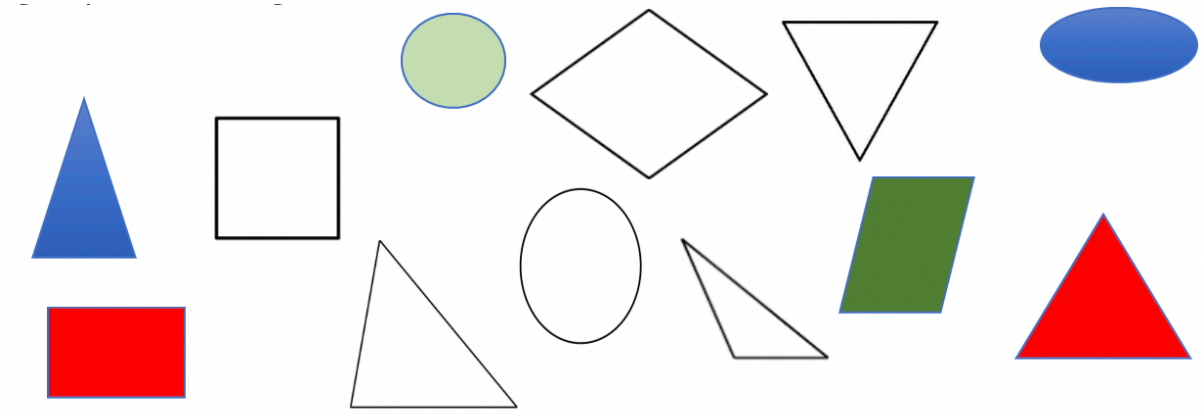
	row, array, face, curved, edge, corner, sphere, cylinder, cube, cuboid, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner, rhombus.
Sharing back/Connect	Select students to share who are able to identify and annotate the different shapes on the tapa. **Connect:** Use the 2D shapes to make a repeating pattern which could be used on a piece of tapa.
Teacher Notes	• For the independent task, students complete the assessment task.
Independent Tasks	Complete the following assessment tasks (attached at the end of the document) as the independent activity: • GS2 : Geometry - Shape
Anticipations	

DMIC

DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES
ASSESSMENT TASK

GEOMETRY: SHAPE: LEVEL 1 Task GS2

Here is a set of shapes. Sort them into groups and explain why you have grouped them together



Teacher note: Could use attribute shapes or randomly coloured, laminated pre-cut shapes.