



RICH MATHEMATICAL TASK BOOKLET

GEOMETRY

YEAR 7-8
EVEN YEARS

Teacher Booklet

Task 1

Sort these shapes into three groups.

Rule: No shape is allowed to belong to two groups.

When you have sorted them into three groups record the properties of each group.

Now start again. Re-sort the set into another three groups which are different from your first set. Record the properties of this new group.

Write some "if" statements.

Teacher Notes

As a starter, begin by asking students to develop a mathematical argument based on the following statement:

A hexagon has six equal length sides.

Students have to decide if the statement could be described as:

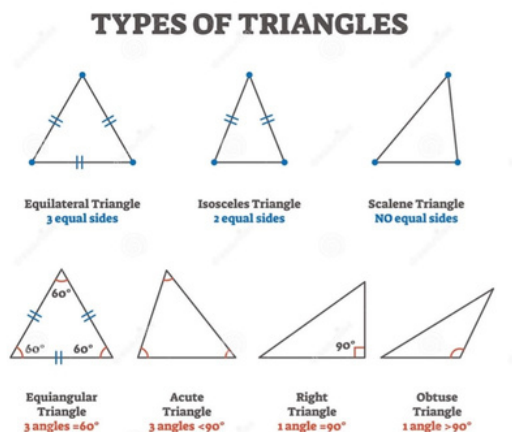
Always true. Sometimes true. Never true.

Encourage students to justify their reasoning for each decision they make.

Have the sets of the different triangles cut out and available for the students to sort (copy masters).

Facilitate the students to notice that triangles are classified by their sides and/or their angles.

Notice students who use the term triangles rather than the singular triangle. The use of the plural denotes that they are able to generalise what makes all triangles, triangles.



For the independent task, have the following sheet prepared (copy masters).

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

End of Year Seven

Classifying triangles by both their angle and side properties.

End of Year Eight

Identifying and describing the parts of a circle: the radius, diameter, and circumference.

Shareback

Select students to share who can explain and justify their groupings of triangles according to their properties.

Connect

How could you give a description that covers all the properties of triangles?
Make an if statement that covers all the properties of triangles?

What about making an if statement that concerns isosceles triangles?

Suggested Learning Outcomes

Identify and sort classes and sub classes of plane shapes in a range of different ways using geometrical language to explain and justify grouping.

Use commonly shared rules to communicate ideas about defining shapes.

Identify and explain relationships between shapes, including similarities and differences

Independent Tasks

Are all the three-sided shapes on this piece of ngatu triangles?
Explain and justify your answer using all the three-sided figures on this piece of ngatu.



Mathematical Language

*circle, diameter,
radius, pi,
circumference.*

Anticipations

Solutions, Misconceptions

Task 2

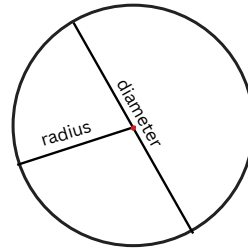
Frankie thinks there is a relationship between the radius of a circle and the diameter.

Using the different sized circles, fill in the table below.
What do you notice?

Teacher Notes

As you launch the task, unpack the definitions for radius and diameter.

- Radius - the distance from the centre to the circumference.
- Diameter - a straight line that goes through the centre joining two points on the circumference.



Groups will need rulers to measure the circles.

Monitor for students who are able to use sophisticated explanations of the relationships between the radius and diameter.

Have string available for the connect.

Shareback

As students begin to recognise that the diameter is twice the radius, select groups who can accurately explain their thinking.

Introduce the formula. $2r = d$.

Connect

There is also a connection between the circumference and the diameter of a circle.

Have the students measure the circumference of the circles objects using a piece of string that is the length of the diameter of the circle being measured.

Students will find that they can wrap the string, (which is the length of the diameter) just over three times around the circle.

Introduce the concept of pi and the symbol.

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

End of Year Seven
Classifying triangles by both their angle and side properties.

End of Year Eight
Identifying and describing the parts of a circle: the radius, diameter, and circumference.

Suggested Learning Outcomes

Identify parts of a circle.

Define different parts of a circle.

Independent Tasks

Match the words with their definition.

Word	Definition
1. Polygon	A. A triangle with all three sides the same length
2. Irregular Polygon	B. A four-sided polygon
3. Radius	C. A line segment from the center of a circle to its edge
4. Diameter	D. A line segment that passes through the center of a circle and connects two points on the circle
5. Circumference	E. A polygon whose sides and/or angles are not all equal
6. Pi (π)	F. An angle that measures exactly 90°
7. Quadrilateral	G. A mathematical constant approximately equal to 3.14
8. Scalene Triangle	H. A 2D shape made of 3 or more straight sides
9. Equilateral Triangle	I. A triangle with no equal sides
10. Isosceles Triangle	J. The distance all the way around a circle
11. Right Angle	K. A triangle with at least two sides of equal length

Mathematical Language

Properties, square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, side, equal, size, smaller than, straight, parallel, congruent, collinear, angles, vertices, vertex, sides, vertical, horizontal, diagonal, symmetrical, face, curved, edge, corner, sphere, cylinder, cube, cuboid, rectangular prism, triangle, quadrilateral, hexagon, equilateral triangle, square corner, right angle, rhombus, parallelogram, kite, trapezoid, isosceles trapezoid, polygon, regular, irregular, pentagon, hexagon, heptagon, octagon, equilateral, scalene, acute angle, obtuse angle

Anticipations

Solutions, Misconceptions

Task 3

What do you notice about the shape of these different items?

Sort them into groups which you think are the same.

Sort them into groups which you think are different.

Use a table or Venn diagram to record your observations.

Explain and justify your reasoning.

Teacher Notes

As a starter, begin by asking students to develop a mathematical argument based on the following statement:

Triangles have a line of symmetry.

Students have to decide if the statement could be described as:

Always true. Sometimes true. Never true.

Encourage students to justify their reasoning for each decision they make.

For the task, provide students in groups with a collection of structured 3D shapes and a collection of common objects from their environment and have them talk with each other about what they notice about them. Have them sort by special categories including edges and vertices; faces and surfaces; cylinders; cones.

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)

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. Students could create tables or Venn diagrams to record how they are classifying the various shapes.

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. Also 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. Have students sort by properties including edges and vertices, faces and surfaces as well as 2D features.

Facilitate the students to group and sort the shapes based on the cross section shape. Cross section is the shape that you see when you slice through a 3D object. The shape of the cross-section depends on the shape of the 3D object and the angle at which it's sliced.

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

End of Year Seven

Classify and name shapes based on their attributes

End of Year Eight

Describe triangles, quadrilaterals, and other polygons in relation to their sides, diagonals, and angles

Shareback

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

Someone said that all 3D shapes are made from 2D shapes. How would you respond to that? Think about the attributes of a square and the attributes of a cube. How are these related? Could any other 2D shape be used to construct a cube? Why or why not?

What is the cross section of a cube? What about a sphere? What do you notice?

Suggested Learning Outcomes

Use geometrical language to explain and justify classification and properties of shapes.

Explain how solid shapes have fixed-cross sections and can be classified by their cross-section.

Independent Tasks

Draw the horizontal and vertical cross sections for these different shapes.

Mathematical Language

Properties, square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, side, equal, size, smaller than, straight, parallel, congruent, collinear, angles, vertices, vertex, sides, vertical, horizontal, diagonal, symmetrical, face, curved, edge, corner, sphere, cylinder, cube, cuboid, rectangular prism, triangle, quadrilateral, hexagon, equilateral triangle, square corner, right angle, rhombus, parallelogram, kite, trapezoid, isosceles trapezoid, polygon, regular, irregular, pentagon, hexagon, heptagon, octagon, equilateral, scalene, acute angle, obtuse angle

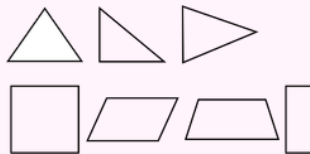
Anticipations

Solutions, Misconceptions

Task 4

Use a protractor to investigate the interior angles of these triangles and quadrilaterals.

Are these statements true or false? Prove it.




1. All interior angles of a triangle add to 180°
2. Congruent angles (opposite angles) are always the same.
3. Quadrilateral interior angles always add to 360° as a quadrilateral can be divided into two triangles.

What other statements can you make about internal angles of triangles or quadrilaterals.

Teacher Notes

As a starter, have the students stand with an arm out and rotate 180° and 360° .

Represent this on the board to demonstrate $180^\circ =$ 

Emphasise the use of the $^\circ$ symbol to represent degrees. Show a full circle to represent 360° .

Ask students to hold one arm straight up and then rotate 180° and then 360° . Start in different positions to emphasise that the starting point can be anywhere within the full circle.

During the task, support students to correctly use a protractor. Notice who is turning the protractor to fit within the angle, who is reading the protractor in the correct direction etc.

Expect students to make conjectures and generalisations about what they are noticing about the interior and opposite angles as they measure. Have they noticed which quadrilaterals have equal opposite angles and why?

Shareback

Select students to share that can explain how the angles in their shapes equal 180° or 360° , and who has noticed that opposite angles can be equal in some quadrilaterals.

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

End of Year Seven

Identify and describe angles at a point, angles on a straight line, and vertically opposite angles

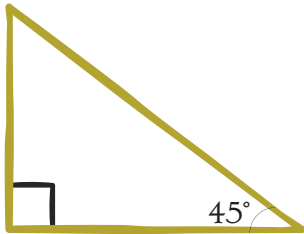
End of Year Eight

Reason about unknown angles at a point, angles on a straight line, vertically opposite angles and interior angles of triangles and quadrilaterals

Connect

Show the image of the triangle.

Ask the students: if we know that the internal angles add together to be 180 degrees, what is the size of the unknown angle?



Suggested Learning Outcomes

Make conjectures about interior angles of quadrilaterals.

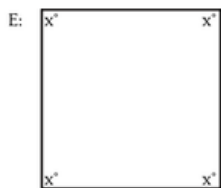
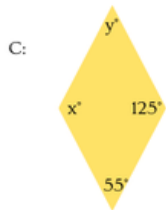
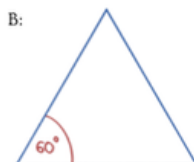
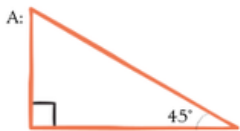
Make conjectures about interior angles of triangles.

Find unknown angles in quadrilaterals.

Find unknown angles in triangles.

Independent Tasks

Calculate the missing internal angles of these shapes.



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, face, curved, edge, corner, sphere, cylinder, cube, cuboid, rectangular prism, triangle, quadrilateral, hexagon, sharp corners, blunt corners, equilateral triangle, square corner, rhombus, parallelogram, kite, trapezoid, isosceles trapezoid.

Anticipations

Solutions, Misconceptions

Task 5

George believes there are more than five different ways to draw a net for a cube.

Is he correct?

How many different nets can you create?

Teacher Notes

During the launch, have available a few cuboid shaped boxes collected from home.

Before students start to draw the net prompt the students: Think about what the cuboid would look like flattened out as a net. Discuss how many faces the cuboid would have.

Tell the students not to draw the flaps just the faces.

Provide the students with isometric grid paper to support their nets. Encourage the students to cut out and check that their nets work.

Facilitate the students to notice that despite the different dimensions of the boxes they all have six rectangular faces, and the opposite faces are congruent (the same). Note also that all corners are square (right angles).

Notice the students who are able to draw six faces and approximate a net for a cuboid. These students will often be different from those who are able to compute. Also notice the students who use gesturing for the number of faces needed.

If needed prompt the students: Remember that when you fold the net up it needs to make a 3D cuboid and so you need to draw all the faces.

Big Ideas

Two-and-three dimensional objects with or without curved surfaces can be described, classified, and analysed by their attributes.

Curriculum Links

During Year Seven

Visualise, construct and draw plan views for front, back, left, right, and top views of 3D shapes

Transform 2D shapes, including composite shapes, by resizing by a whole number or unit fraction

During Year Eight

Visualise, construct and draw nets for prisms with a fixed cross section

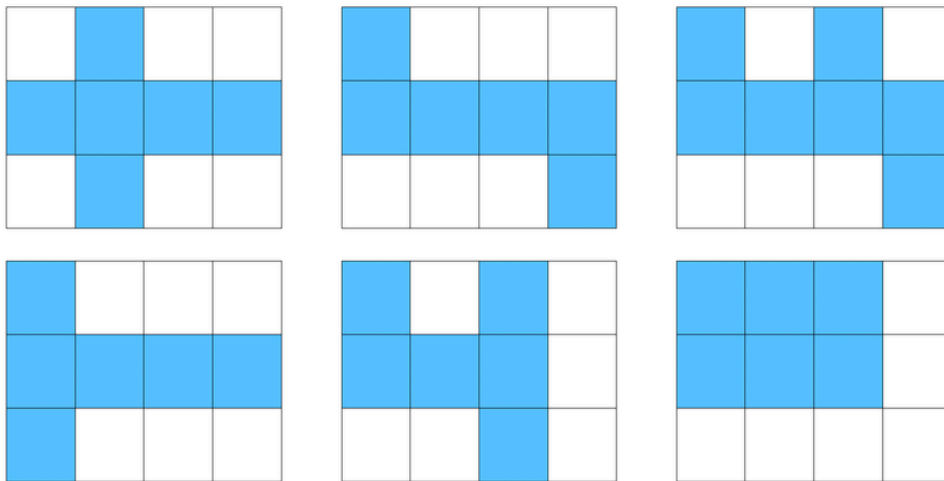
Recognise the invariant properties of 2D and 3D shapes under different transformations

Shareback

Select students to share who are able to explain their different nets to make a cube.

Connect

Discuss what nets will successfully fold into a cube. Encourage the students to justify why or why not.



Suggested Learning Outcomes

Create 2-dimensional drawings of 3-dimensional models.

Draw objects which can take the form of plane views of nets.

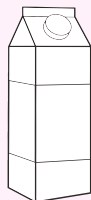
Use commonly shared rules to communicate ideas about defining shapes.

Independent Tasks

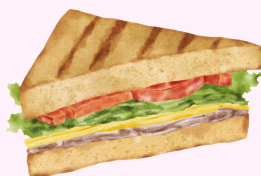
Draw a net for this can.



Draw a net for this juice carton.



Draw a net for a carton that would hold this sandwich.



Mathematical Language

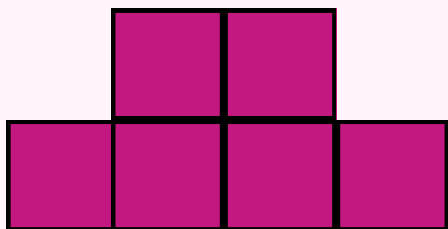
3D, 3 dimensional, cube, box, sides, flaps, net, plane view, 2 dimensional.

Anticipations

Solutions, Misconceptions

Task 6

Here is a shape made with linking cubes. When you look at it from one side, it looks like this.



What does the whole structure look like?

Visualise what you think it looks like. Draw this structure on isometric paper and then build it with the cubes.

Look at your construction from a different view. Draw this view on isometric paper.

Draw different views of the construction onto the isometric paper.

Teacher Notes

Have linking cubes or other cubes available.

Provide isometric paper (copy masters) for students to draw their representations of the 3D model.

Facilitate the students to notice the multiple perspectives of structures. Some students will assume that the structure has only the six obvious cubes in it whereas others will realise that there are more possibilities with additional cubes which cannot be seen from this view.

Monitor for students using vocabulary which identifies relationships between the different perspectives.

Facilitate discussion about what the cross section of the shape would look like, depending on what side of the shape you are looking at.

For the independent activity provide the students with grid paper.

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

During Year Seven

Visualise, construct and draw plan views for front, back, left, right, and top views of 3D shapes

Transform 2D shapes, including composite shapes, by resizing by a whole number or unit fraction

During Year Eight

Visualise, construct and draw nets for prisms with a fixed cross section

Recognise the invariant properties of 2D and 3D shapes under different transformations

Shareback

Select students to share who have realised that there can be more than six cubes and have drawn and built structures to match.

Connect

What would our classroom look like from a birds eye view?

Suggested Learning Outcomes

Draw objects that can take the form of plane views.

Use commonly shared rules to communicate ideas about defining shapes.

Create 2-dimensional drawings of 3-dimensional models.

Draw objects which can take the form of plane views of nets.

Independent Tasks

Imagine you are a bird. What would your school look like from above.

Use the grid paper to draw out this perspective.

Mathematical Language

Properties, square, rectangle, attribute, 2-dimensional, 3-dimensional, shape, side, equal, size, smaller than, straight, parallel, congruent, collinear, angles, vertices, vertex, sides, vertical, horizontal, diagonal, symmetrical, face, curved, edge, corner, sphere, cylinder, cube, cuboid, rectangular prism, triangle, quadrilateral, hexagon, equilateral triangle, square corner, right angle, rhombus, parallelogram, kite, trapezoid, isosceles trapezoid, polygon, regular, irregular, pentagon, hexagon, heptagon, octagon, equilateral, scalene, acute angle, obtuse angle

Anticipations

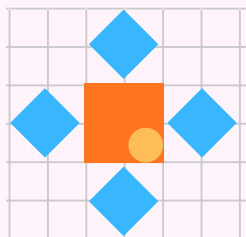
Solutions, Misconceptions

Task 7

Draw this image on your grid paper

Now enlarge the image by scale factor 2.

Repeat again enlarging the image by scale factor 3.



Teacher Notes

Have available grid paper (see copy masters)

Facilitate students to notice that when you resize a shape it gets bigger or smaller, but it still looks similar (not congruent). All angles stay the same, relative sizes are the same (in proportion)

Notice students who recognise that enlarging and reducing uses specific factors (factor of 2 as an example).

Shareback

Select to share students who are able to explain and justify their enlargement and reduction using correct factors.

Connect

What stays the same when you enlarge the pattern?

What changes?

Do the angles change?

Does the shape remain similar?

Suggested Learning Outcomes

Describe an enlargement on a simple shape.

Recognise how to reduce a shape keeping to scale.

Big Ideas

Transformations provide a significant way to think about the ways properties change or do not change when a shape is moved on a plane.

Curriculum Links

During Year Seven

Transform 2D shapes, including composite shapes, by resizing by a whole number or unit fraction

During Year Eight

Recognise the invariant properties of 2D and 3D shapes under different transformations

Independent Tasks

Use three or four shapes to design an image. This is the start of a wallpaper design. Make the design 4 cm wide and 6 cm high

The wallpaper company enlarges a pattern by a scale factor of 5.

1. What will the new width be?
2. What will the new height be?
3. How many times larger is the area?

Explain your thinking using diagrams and measurements.

Mathematical Language

*enlarge, factor,
reduce, scale grid.*

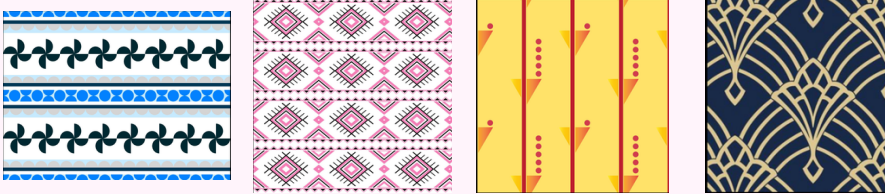
Anticipations

Solutions, Misconceptions

Task 8

Many wallpaper designs in homes, hotels, and public buildings use repeating patterns. From a distance, the wallpaper may look the same all the way across the wall, but a closer look often reveals different shapes and arrangements.

- What do you notice in these wall papers.
What wallpapers have mirror symmetry?
What wallpapers has translation?
What wallpapers have rotation?



Teacher Notes

Facilitate the students to notice that in mirror symmetry a shape matches itself when it is reflected in a specific mirror line but in slide symmetry the shape matches itself when it is slid in a particular direction by a particular distance thus making it translational symmetry.

Translation is sliding a figure in any direction without changing its size, shape or orientation.

Notice students who can describe rotation and reflection elements within their pattern.

Shareback

Select students to share who can explain and justify the similarities and differences in the way the repeating patterns are a process of slide symmetry.

Select students who can identify different rotations or reflections within the patterns.

Connect

Using the images above discuss angles. Are there any right angles (90°)? Can you find any acute angles (less than 90°)? Can you find any obtuse angles (greater than 90°)? Which shapes contain these angles? Explain how the angles help create the overall design.

Big Ideas

A transformation is a way of moving a shape, and a shape that remains unchanged under a transformation is said to have symmetry.

Transformations provide a significant way to think about the ways properties change or do not change when a shape is moved on a plane.

Line symmetry is a component of the transformation called a reflection.

Curriculum Links

During Year Seven

Transforming 2D shapes in the coordinate plane by a single translation, reflection across a given mirror line, or a rotation about a given point by a multiple of 90 degrees

During Year Eight

Transforming 2D shapes on the coordinate plane, including composite shapes, by a combination of translations, reflections, rotations, and scaling by any factor

Suggested Learning Outcomes

Explain transformation as a way of moving a shape

Describe how a shape that stays the same under transformation has symmetry.

Recognise that turns around a point can be described and recorded as a quarter, half, full turn or rotation or an angle.

Explain that angles are linked with slides (translations) to create paths.

Independent Tasks

Design your own wallpaper border using at least:

- 2 different shapes
- 1 repeating pattern
- 1 line of symmetry
- Acute, right, and obtuse angles

Draw enough repeats to show how your wallpaper could continue across an entire wall.

Mathematical Language

Reflection, mirror line, mirror symmetry, reflectional symmetry, line of symmetry, flipping, congruent, translation, sliding, rotation, turning, revolution, transformation, forward, backwards, right, left, front, back, clockwise, anticlockwise, full turn, half turn, quarter turn, 4-turn symmetry, congruence, path, angle, perspectives, bird's eye view, reverse, invert, obtuse, acute.

Anticipations

Solutions, Misconceptions

Task 9

Design a pattern for a large rug.
Your challenge is to use simple shapes to make a complex pattern using rotation, translation and flipping.

Teacher Notes

For this task, have available grid paper for students to construct their pattern on. Remind the students of the tiles from the prior task - that one design was translated and repeated throughout the entrance way. The same idea is to be applied to their rugs. Have one complex pattern that is rotated, translated, or flipped within the large one. Encourage the use of colours to support their design.

Remind the students that in mirror symmetry a shape matches itself when it is reflected in a specific mirror line but in slide symmetry the shape matches itself when it is slid in a particular direction by a particular distance thus making it translational symmetry.

Translation is sliding a figure in any direction without changing its size, shape or orientation.

Encourage students to use rotation and reflection elements within their pattern.

This is a task that could be done whole class over two lessons.

Students may use technology for the independent activity.

Shareback

Select students to share who can explain and justify the rotation, translations, and flipping in their patterns.

Connect

If we enlarged a pattern what would that now look like. Take an aspect of your patten and enlarge it. What do you notice?

Big Ideas

Shapes can be described in terms of their location in a plane or space.

Coordinate systems can be used to describe these locations precisely.

The coordinate view of shape offers another way to understand certain properties of shapes.

Curriculum Links

During Year Seven

Transforming 2D shapes in the coordinate plane by a single translation, reflection across a given mirror line, or a rotation about a given point by a multiple of 90 degrees.

During Year Eight

Transforming 2D shapes on the coordinate plane, including composite shapes, by a combination of translations, reflections, rotations, and scaling by any factor.

Suggested Learning Outcomes

Explain transformation as a way of moving a shape

Describe how a shape that stays the same under transformation has symmetry.

Recognise that turns around a point can be described and recorded as a quarter, half, full turn or rotation or an angle.

Explain that angles are linked with slides (translations) to create paths.

Independent Tasks

Design your own rug, wall paper or tile design by creating a complex pattern and using rotation, translation and flipping.

Mathematical Language

Reflection, mirror line, mirror symmetry, reflectional symmetry, line of symmetry, flipping, congruent, translation, sliding, rotation, turning, revolution, transformation, forward, backwards, right, left, front, back, clockwise, anticlockwise, full turn, half turn, quarter turn, 4-turn symmetry, congruence, path, angle, perspectives, bird's eye view, reverse, invert, obtuse, acute.

Anticipations

Solutions, Misconceptions

Task 10

Aroha lives in Wellington and flies a small plane.
In which compass direction does she fly to get from:

1. Wellington to Palmerston North?
2. Palmerston North to Napier?
3. Wellington to Nelson?
4. Nelson to Blenheim?
5. Wellington to New Plymouth?
6. New Plymouth to Hamilton?
7. Wellington to Christchurch?
8. Christchurch to Timaru?
9. Nelson to Westport?
10. Napier to Gisborne?

Teacher Notes

During the launch introduce the use of compasses. Have students develop benchmarks for where each direction is in relation to parts of their classroom and beyond. Link to the face of a clock and the angles of the hands on the face of the clock.

Facilitate students to understand that they need to place the compass on the floor before getting a reading and that North is always North and that compass points are 90 degree turns.

For the independent task, provide the students with or allow them to choose an area of New Zealand to explore.

Shareback

Select students to share who are able to describe the angles and compass points used to travel from one point to another.

Connect

What did you notice about the angles between one compass point and another?

Suggested Learning Outcomes

Use a map to describe directions or map out a path on a map.

Use a compass to precisely explain the direction heading.

Big Ideas

Coordinate systems can be used to describe these locations precisely.

The coordinate view of shape offers another way to understand certain properties of shapes.

Curriculum Links

During Year Seven

Interpret and communicate the location of positions and pathways using coordinates, angle measures, and the 8 main and halfway compass points

During Year Eight

Use map scales, compass points, distance, and turn to interpret and communicate systems and grid reference systems.

Independent Tasks

Use a map of your area of New Zealand.

Write a set of 10 directions using compass points to navigate an explorer around that area.

You can choose their mode of transport e.g car or helicopter.

You can choose if they are going to travel all over New Zealand or stay local

There must be ten sets of directions.

Mathematical Language

*north, south, east,
west, forward, rotate,
turn, start, end,
degrees*

Anticipations

Solutions, Misconceptions

Task 11

Make your own computer game map that involves finding objects. You can choose your own setting, but you need to use coordinates.

Mark where the hunt begins on your map.

Provide 10 coordinates or clues for another group to find the objects.

Teacher Notes

Provide students with grid paper to create their computer game map.

Notice students who are able to correctly use co-ordinates correctly – going along the horizontal and then up the vertical. You may need to pause the class and get one group to share back how they are reading the co-ordinates before continuing further.

Introduce the students to the language of longitude and latitude and encourage use of this alongside directional language when writing their clues. Encourage the use of angles also.

For the independent task, provide students with grid paper.

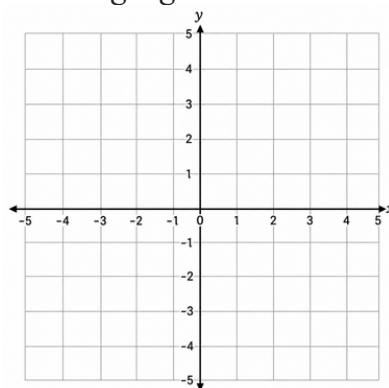
Shareback

Select students to share who are able to explain and justify the objects and different grid references they used.

Select students who have used scale and directional language in their clues.

Connect

Using this grid, plot a variety of dots and ask the students to explain the co-ordinates. Be sure to go into the negatives.



Suggested Learning Outcomes

Identify and describe a location using coordinates, directions and distances.

Big Ideas

Shapes can be described in terms of their location in a plane or space.

Coordinate systems can be used to describe these locations precisely. The coordinate view of shape offers another way to understand certain properties of shapes.

Curriculum Links

During Year Seven

During Year Seven Interpreting and communicating the location of positions and pathways using coordinates, angle measures, and the eight main and halfway compass points (e.g. NE, which is 45° E from N).

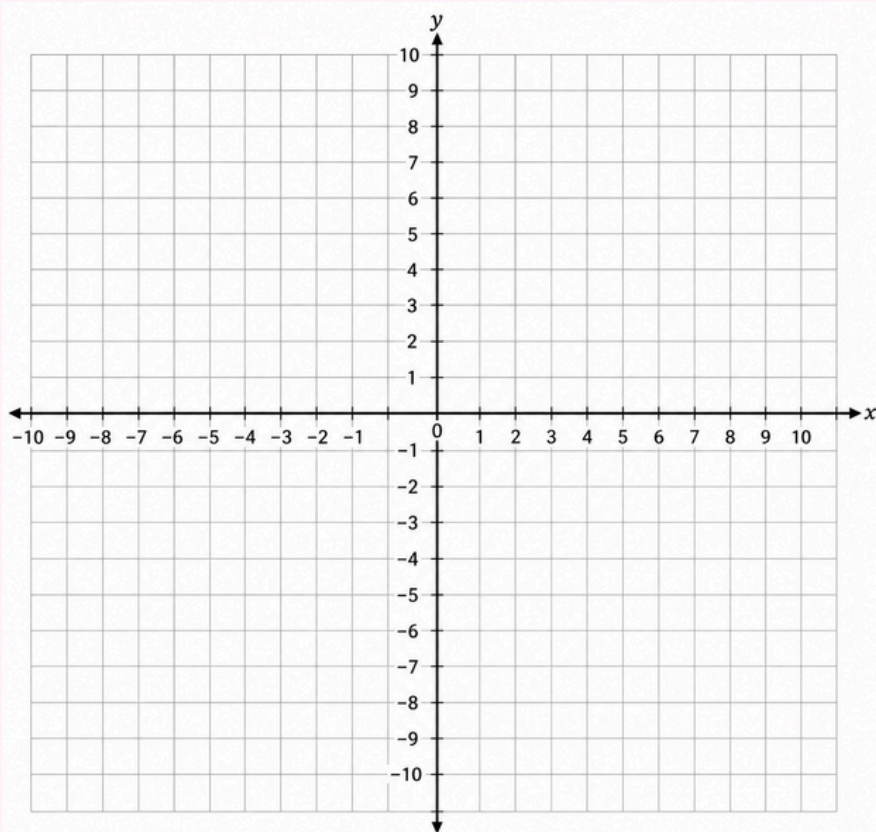
During Year Eight

Using map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems.

north, south, east, west, longitude, latitude, co-ordinations

Independent Tasks

Plot ten points on this grid and record their co-ordinates.



Anticipations

Solutions, Misconceptions

Task 12

Create your own tourist map for somewhere in your local area.

This could be natural attractions such as bush or river walks or a local attraction map such as a town map showing shopping malls, indoor playgrounds or other places of interest.

You can use a geographic online map as your base (such as a screen shot from google maps) or draw your own map.

You need to use a grid with the sides numbered and the top lettered, decide on a scale and have a legend.

Mark where the tourist trail begins on your map.

Provide 10 instructions for a tourist to follow so that they can see the sights on your map.

Teacher Notes

Before launching the task, ask students to provide an explanation for scale, legend and grid labels. Reinforce their prior learning from previous tasks.

Remind students of their co-ordination work the task prior.

Facilitate the students to notice the importance of clear instructions.

Once maps are created, swap between groups to allow students to trial each others clues.

Shareback

Select students to share who are able to explain their maps or how they followed others directions.

Connect

Write a question for someone else to answer using the map.

What was important about how you wrote your instructions? Why?

Big Ideas

Shapes can be described in terms of their location in a plane or space.

Coordinate systems can be used to describe these locations precisely. The coordinate view of shape offers another way to understand certain properties of shapes.

Curriculum Links

During Year Seven

Interpreting and communicating the location of positions and pathways using coordinates, angle measures, and the eight main and halfway compass points (e.g. NE, which is 45° E from N)

During Year Eight

Using map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems

Suggested Learning Outcomes

Identify and describe a location using coordinates, directions and distances.

Mathematical Language

north, south, east, west, longitude, latitude, co-ordinations

Independent Tasks

Assessment Tasks:

One: Shape Sorting

Two: Creating Nets

Three: Translations

Four: Maps

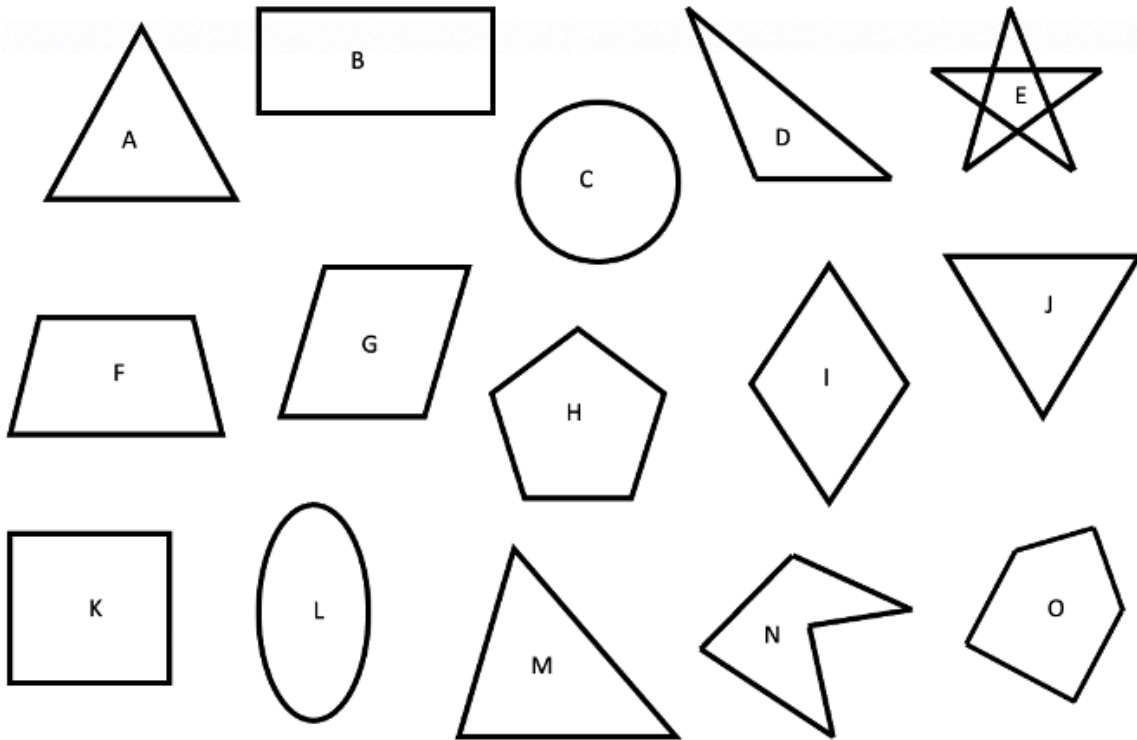
Anticipations

Solutions, Misconceptions

Assessment Task 1 - Shape - Year 7-8

GEOMETRY: SHAPE:

Here is a set of shapes. Sort them into groups and provide a description of the properties of the groups using geometrical language. This could include types of lines, angles, and sides.



Assessment Task - Shape - Year 7-8

GEOMETRY: SHAPE:

At school prize-giving all the students will receive a gift presented in a square or rectangle box.

Draw as many different nets as you can for the boxes.

Assessment Task 3 - Spatial Reasoning - Year 7 - 8

GEOMETRY: Spatial Reasoning:

Use the language of geometry to describe the picture below. Use words like reflection, rotation, translation, and symmetry. You may draw or label the picture to highlight parts of your description.

