

Antarctica Maths - Geometry Term 3 2019

Antarctica Maths -

Specific Learning Outcomes

- Make shapes with tessellations.
- Investigate shapes that tessellate.
- Make geometric patterns by translating, reflecting and rotating.

Achievement Objectives:

Predict and communicate the results of translations, reflections, and rotations on plane shapes.

Activity 1: Antarctica - Tessellation

In this session students will explore shapes that tessellate or repeat to cover the plane without gaps or overlaps. Students will tessellate the hexagons and put them together to make the landmass of Antarctica.



1. Explain to the students that they have the task of building a landmass that roughly represent Antarctica.
2. Give them the white ice hexagon pattern blocks and ask them to build the shape using the hexagons. Talk about how all the hexagons must fit together without any gaps. How will we make the outline look similar to the map above?
3. Assemble the blocks of ice on the blue water and glue them in place.

Activity 2: Penguin Reflection / Symmetry

In this session students will be investigating line symmetry by making draw the second half of a penguin.

1. Show pictures of Penguins. Look at the two sides.

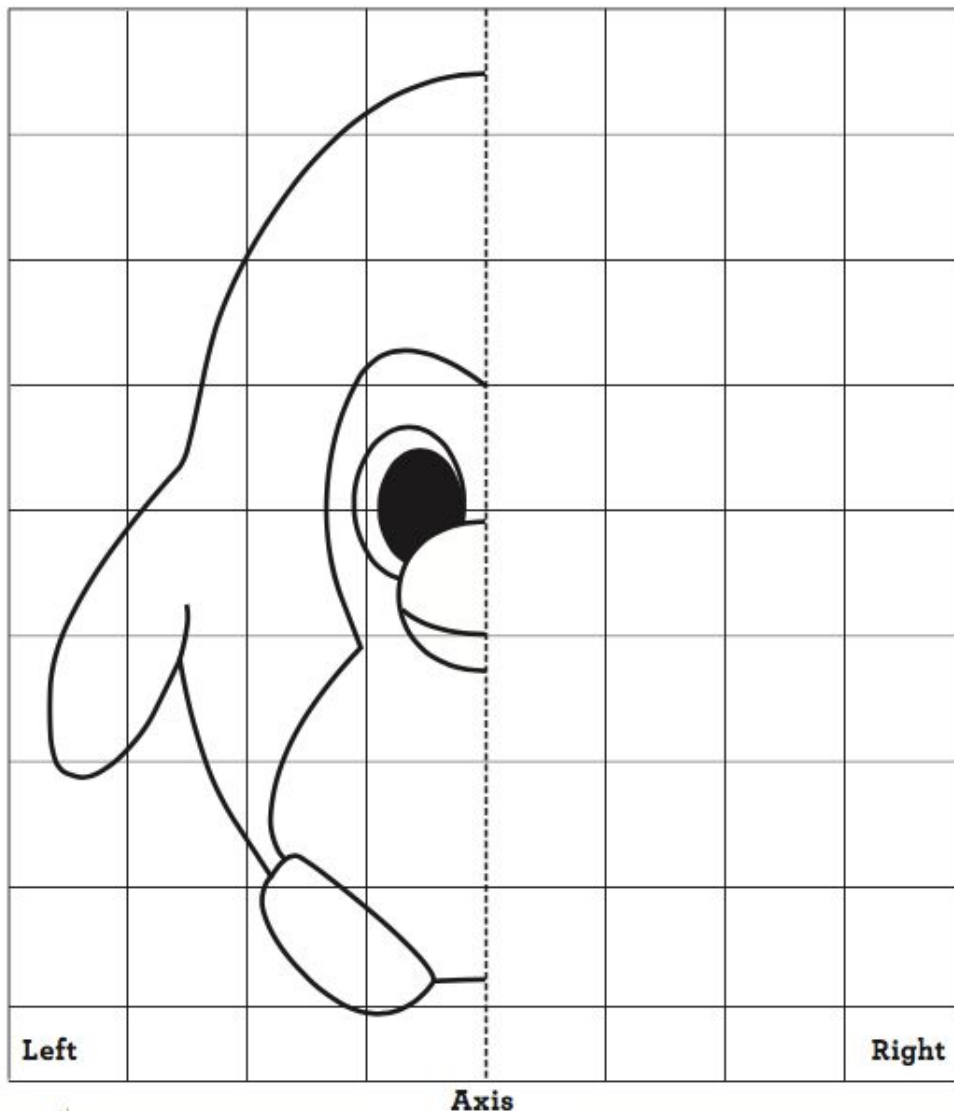


2. Have the students complete their own [penguins by drawing the matching half](#)

Name _____

Date _____

Practice in Symmetry: Use the grid below to draw the right side of the penguin.

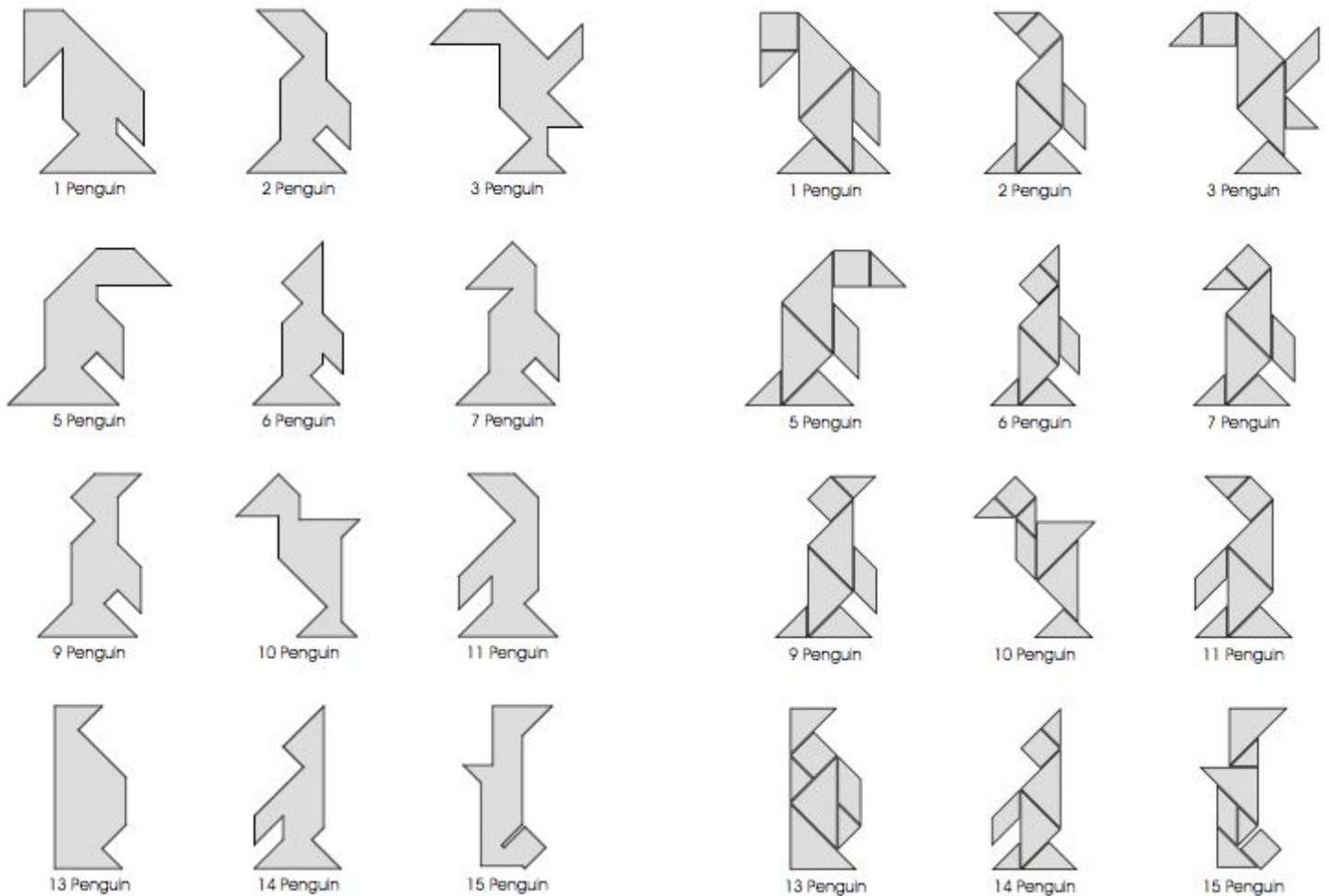


Activity 3: Tangram Penguins

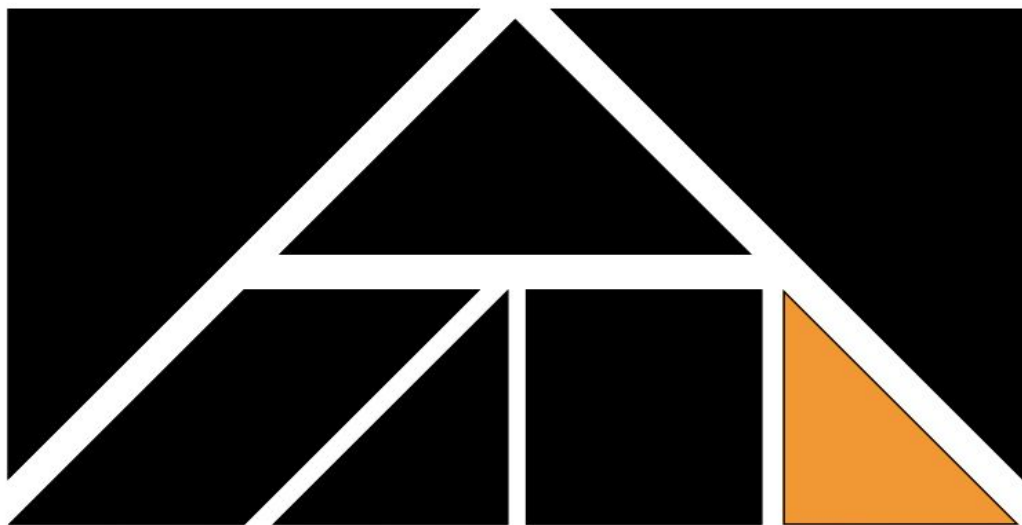
Use the tangram template page to cut out the pieces to make a penguin. Construct the penguin and then glue it onto a piece of black paper. Cut out around the shape and colour the penguin. Glue penguins on to the tessellated ice from activity 1 above.

Penguin Parade

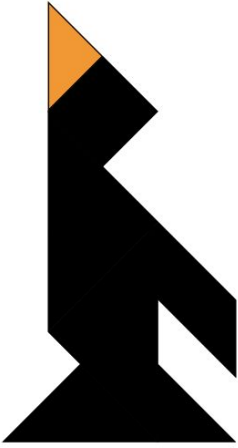
Penguin Parade



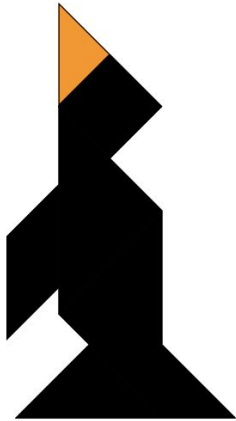
Penguin



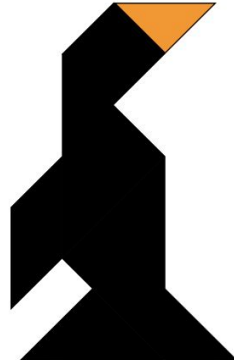
Frisky



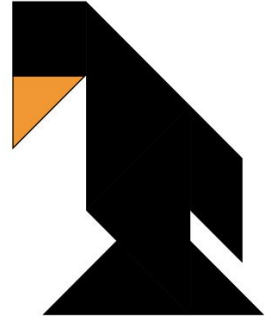
Chilly



Splash



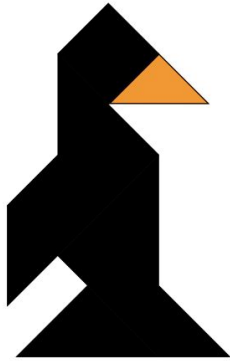
Wobble



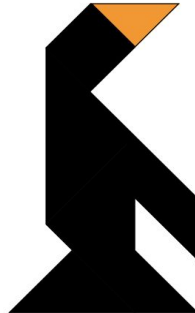
Flipper



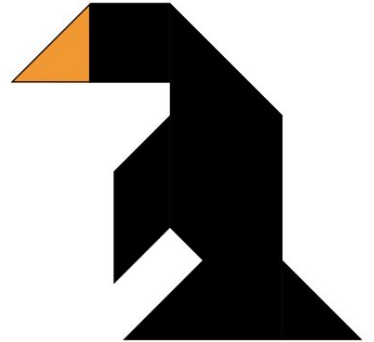
Wiggle



Nosey



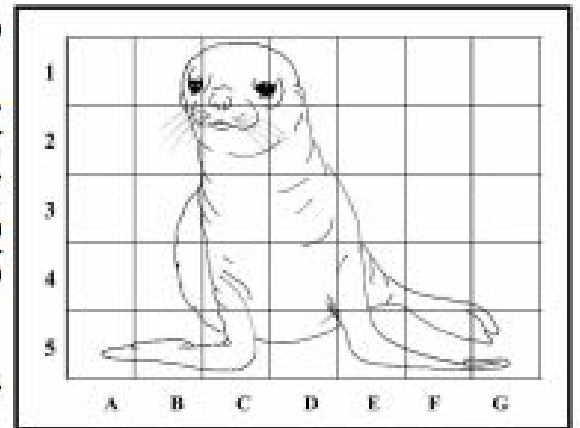
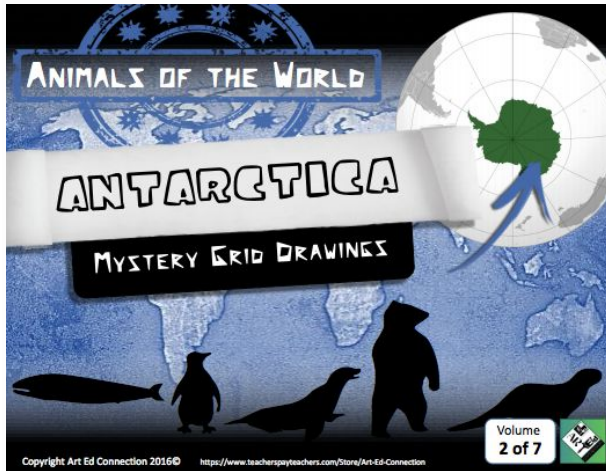
Speedy



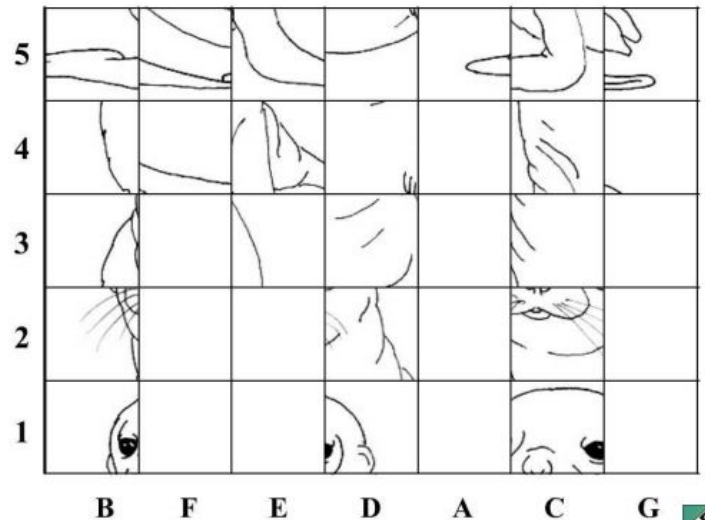
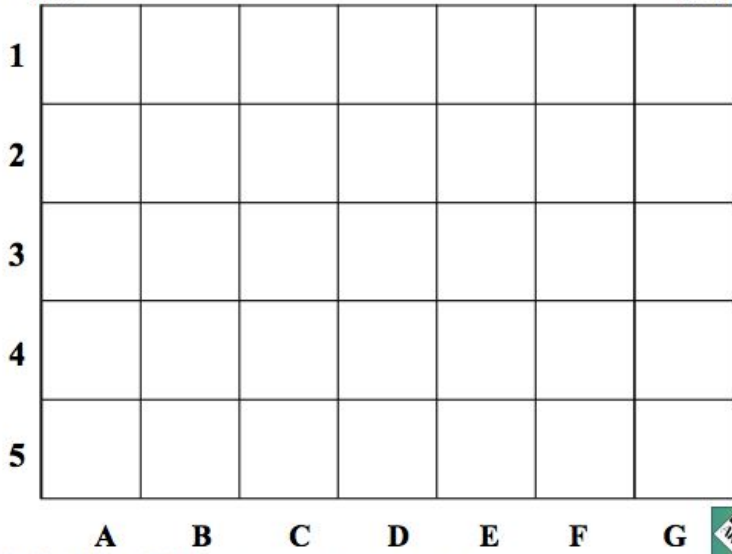
Activity 4: Transposing Seal

Talk about the grid and how we read the grid coordinates. Remind students about the x and y axis.

1. Using the template from the Antarctica Mystery Animals Pack cut out one square at a time and transpose the pieces to the blank grid paper.
2. Continue until all the squares are transferred to the sheet and the seal is complete.
3. Colour the seal and the water around it.



NAME: _____ 5x7 GRID



Activity 5: Enlargement

Why Fish Look Bigger Underwater. One of the attributes of water is that when viewed through a prism of air, objects appear to be larger than they really are. ... Fish and anything else viewed underwater are only $\frac{3}{4}$ of their apparent size.

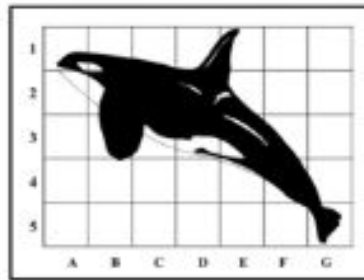
Look at objects in and out of water . Discuss the term enlarge.

Show small whale and have students draw an enlarged version of the whale

WALT.. enlarge a picture

Make a picture of a larger whale by copying the squares from the small picture to the large grid.

(Remember to follow the numbers and letters on the grid.)



NAME: _____ 5x7 GRID

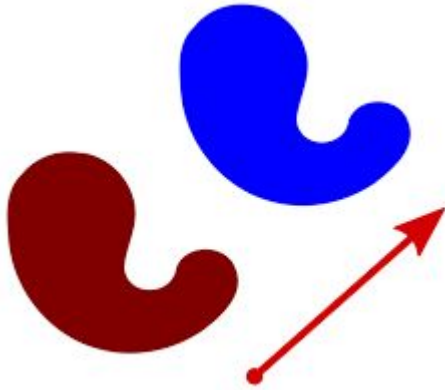
1							
2							
3							
4							
5							
	A	B	C	D	E	F	G



Activity 6: Translation

Moving something left, right, up or down is called translation.

Move the sea lion to the ice shelf and then to the water using translation.
The sea lion will stay the same but move positions on the page.



WALT Move objects using translation

In maths translation is when you move something up, down, left or right.

Move the sea lion from the water onto the ice shelf and then into the water. Describe in writing how you have moved the sea lion in your picture. Use words like left, right, up, down, across.

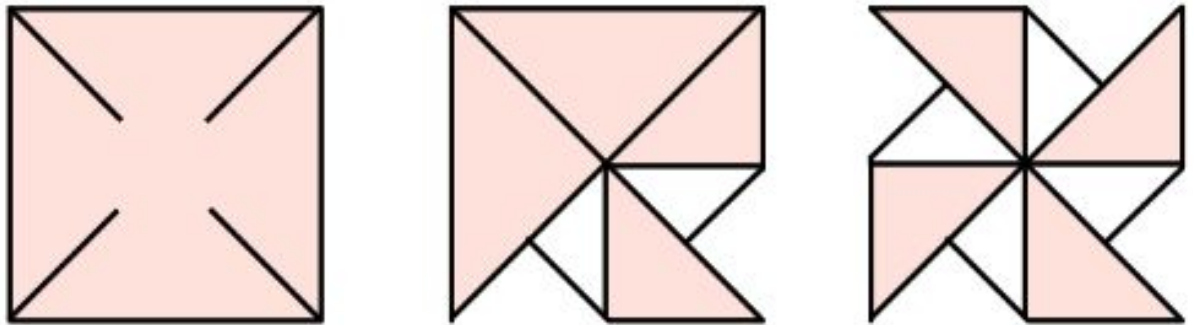
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Activity 7: Rotation - Wind Turbines in Antarctica

Environmentally friendly way to make electricity. Doesn't cause pollution. Lots of wind in an Antarctica to drive the turbines. They follow the wind around so they are always facing the right way to make the most of the wind.

1. Give each student a square piece of paper.
2. Fold the square along its diagonals.
3. Make cuts along the diagonals leaving about 1 cm uncut at the centre of the square.
4. Take one of the cut ends at each corner and fold into the centre.
5. Repeat this at each corner.
6. Pin the folded pieces together with a split pin.
7. Put a little piece of blue tack onto the back of the pin to hold the pieces in place.
8. Attach the pin to a stick.
9. Blow to watch it rotate.



Cut along lines in first image

Teaching Notes:

The wind turbines have rotational symmetry but not reflective symmetry. This is because it can be rotated round onto itself but it doesn't have a line of symmetry in the plane.

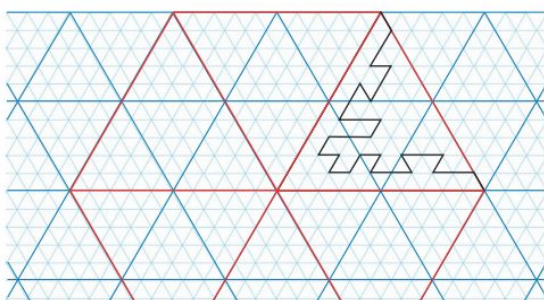
Activity 8: Snowflake Symmetry

1. Give each student a snowflake with the first triangle filled in
2. Continue on with the pattern
3. If time colour in or leave white?
4. Fold and cut out to make a snowflake

Snowflake Symmetry

Snowflakes are usually based on a hexagon.

Continue the symmetrical pattern into each part of the snowflake. Fold and cut out.



Activity 9 Tessellating

Tessellation Task

Create tessellations using the shapes below.



Week 2 Activity 1 Tessellating Scott Base

WALT: Tessellate different types of shapes to redesign Scott Base.

Play Introduction to [Scott Base video](#) (Play video)

Discuss:

What shapes they saw?

Why do the buildings need to be interlinked?

Explain that these current buildings are quite old and Antarctic NZ are going to redesign Scott Base and they need your help!

This is Antarctica NZ's [current plan](#) (play video) but they are looking for other suggestions. Can you help redesign Scott Base using your knowledge of tessellating shapes?

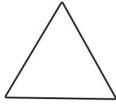
1. Introduce first activity Name the 2D Shape (See below)

Date _____

Name _____



Name the 2D Shape



Number of sides _____
Name _____



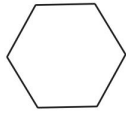
Number of sides _____
Name _____



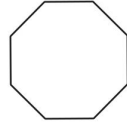
Number of sides _____
Name _____



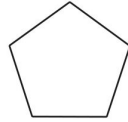
Number of sides _____
Name _____



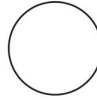
Number of sides _____
Name _____



Number of sides _____
Name _____



Number of sides _____
Name _____



Number of sides _____
Name _____

2. Design a 2D version of their Scott Base on squared paper using various shapes. Make a series of buildings for the scientists and other staff to live and work in Antarctica.

3. The buildings must all be joined together in some way. You will need to include the following areas

- Sleeping areas
- Living areas
- Kitchen
- Bathrooms
- Work areas
- Storage rooms
- Laundry

4. Move onto making 3D model of Scott Base?

Maths Games

[Save the Whale](#)

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Redesigning Scott Base


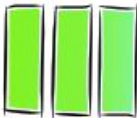
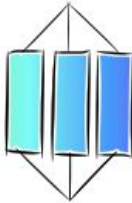
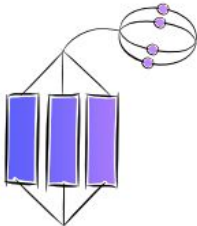
Achievement Objectives:

- Understand the range of different shapes and the number of sides shapes have
- Learn to tessellate shapes to redesign Scott Base.

WALT... increase our knowledge of 2D shapes and then tessellate these shapes to redesign Scott Base.

Success Criteria:

- I can name a range of 2D shapes and know the number of sides of each of these shapes.
- Tessellate different shapes to redesign Scott Base.
- Organised these shapes to show each of these areas:
 - **Living areas**
 - **Sleeping areas**
 - **Kitchen**
 - **Bathrooms**
 - **Work areas**
 - **Storage rooms**
 - **Laundry**
- We are precise and accurate when drawing these shapes and have clearly labelled each of the above areas.

Scott Base - Buddy SOLO Assessment Rubric			
			
With support my buddy is able to draw one or two 2D shapes.	My buddy can independently draw a range of 2D Shapes to redesign Scott Base.	My buddy is able to tessellate a range of 2D shapes so all the living and work areas are connected.	My buddy can identify all the 2D shapes on the worksheet, they can tessellate them to redesign Scott Base to include all of the buildings needed. They have clearly labelled the building and made a list of the shapes they have used.

