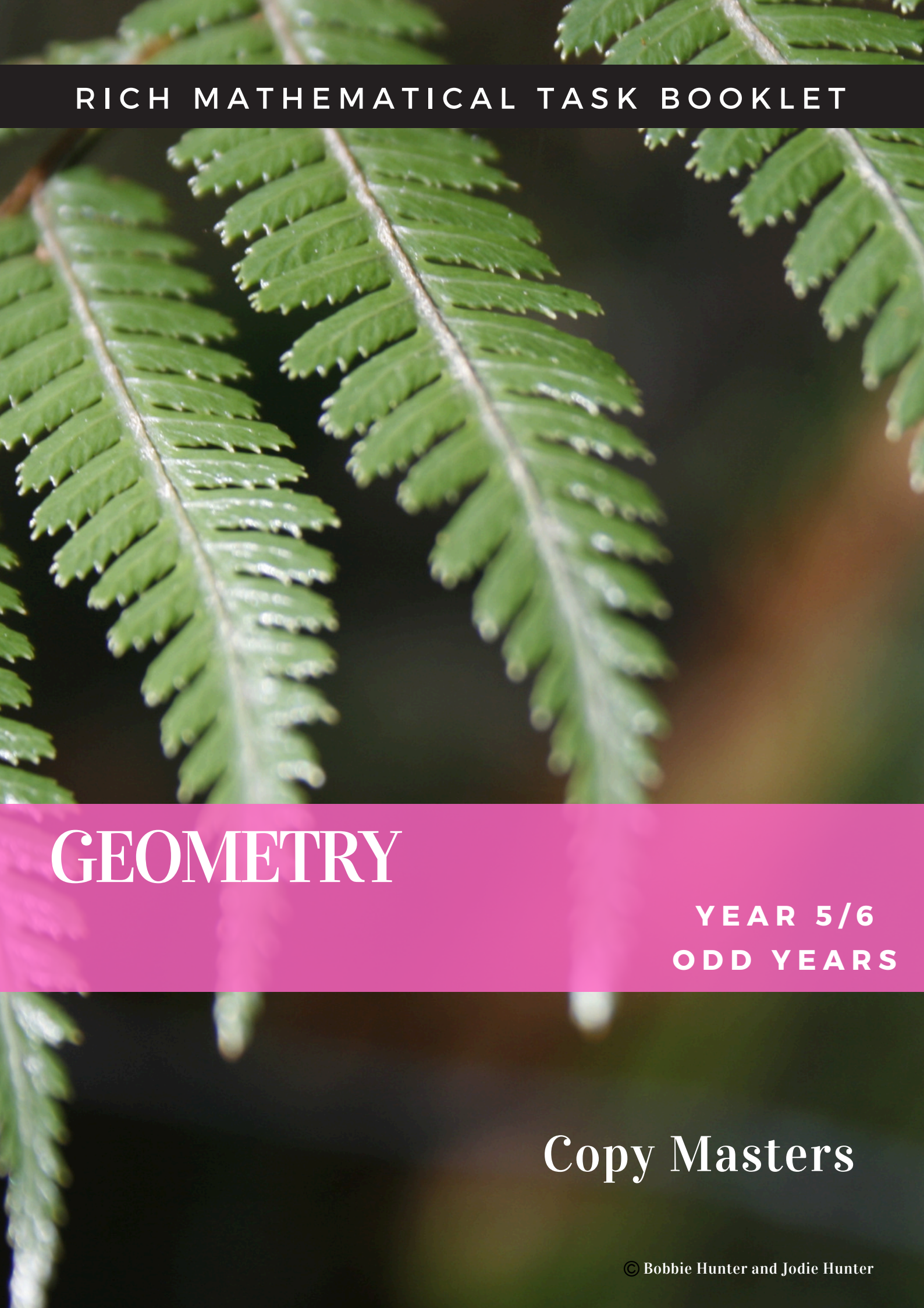


RICH MATHEMATICAL TASK BOOKLET

# GEOMETRY

YEAR 5/6
ODD YEARS

## Copy Masters

## Task 1

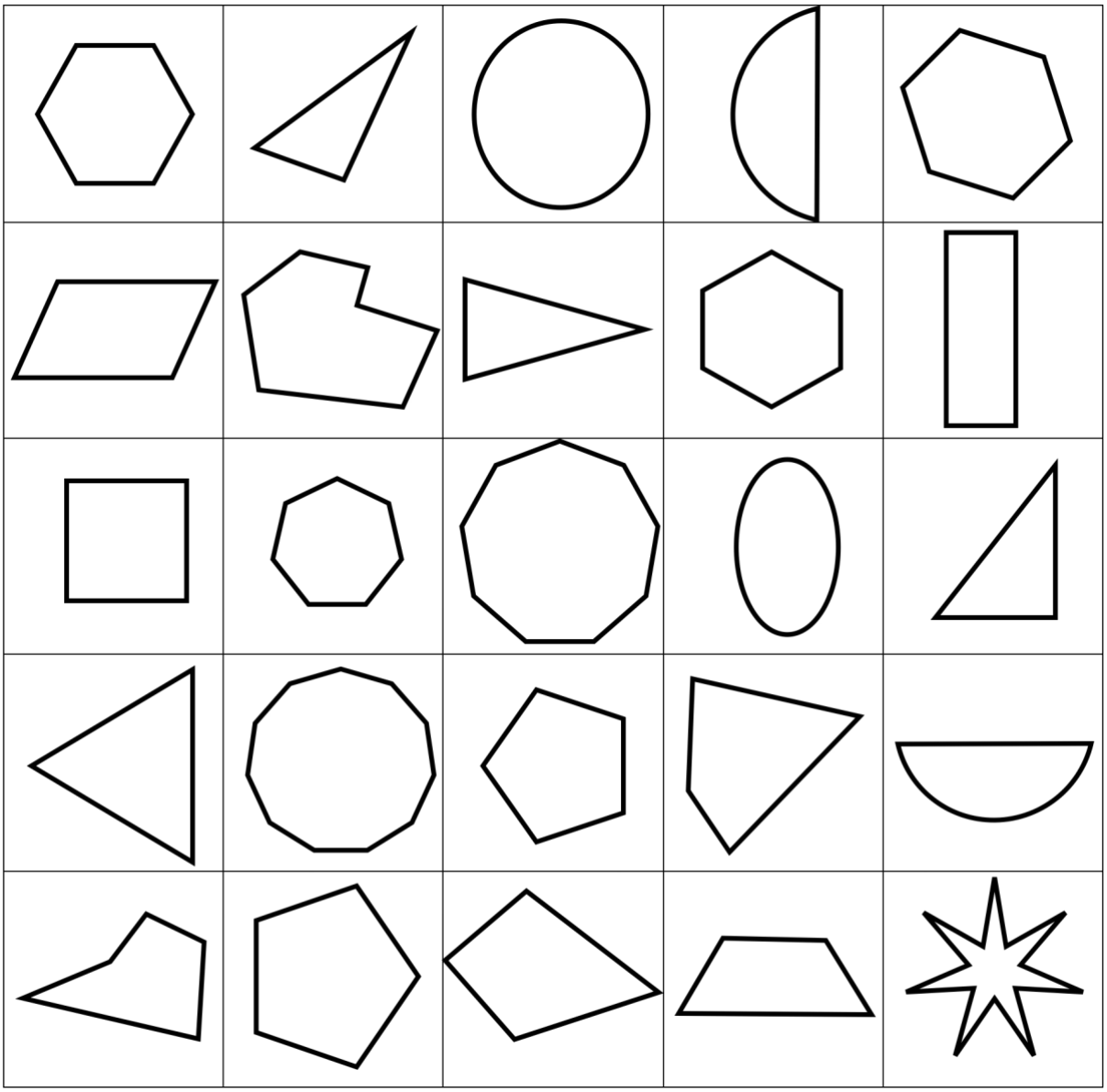
Decide on a criteria to sort these shapes.

| | Regular Polygons | Irregular Polygons |
|---|---|---|
| | | |
| | | |

What other criteria could you use to sort the shapes?

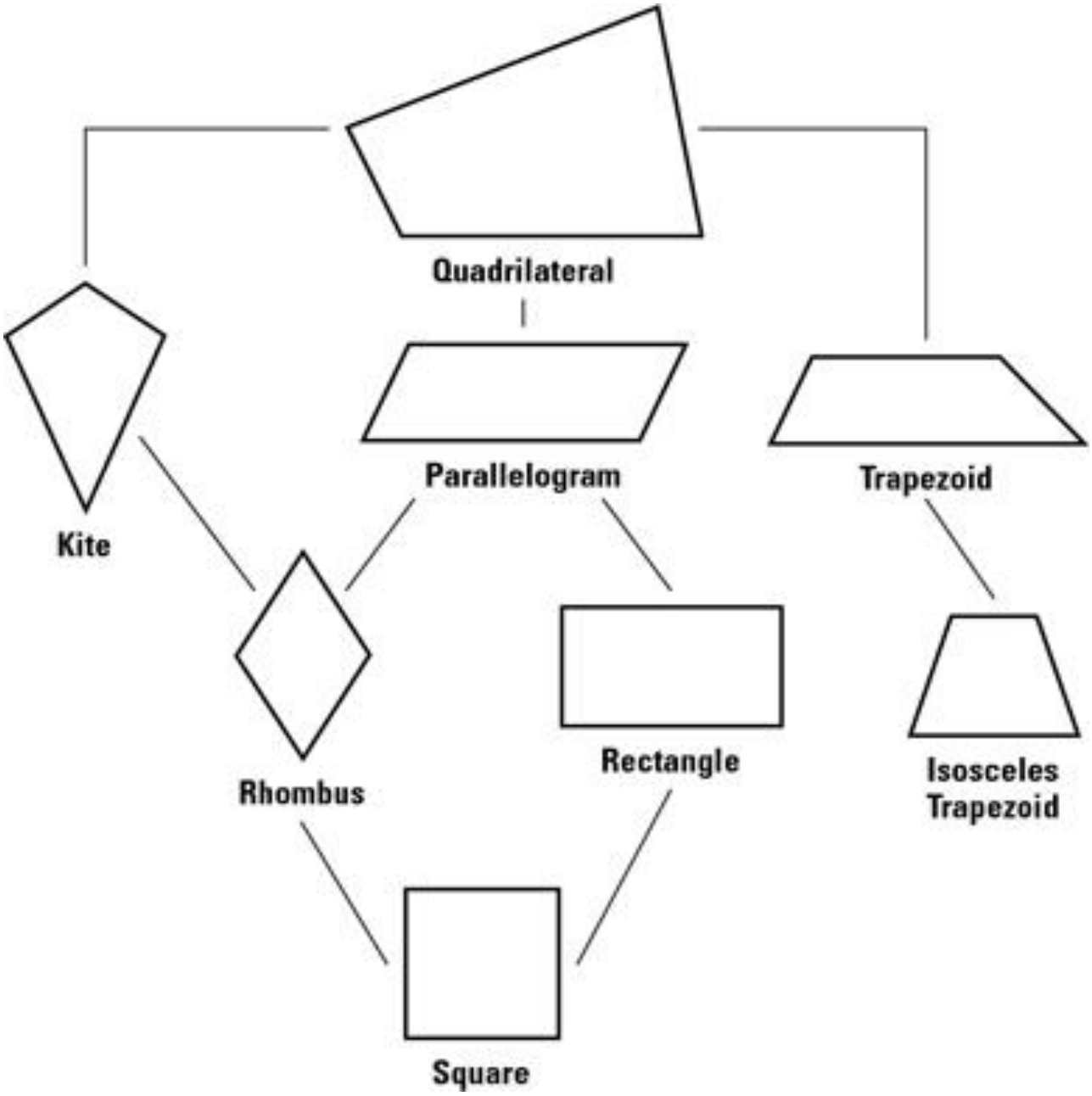
| | | |
|---|---|---|
| | | |
| | | |

# Task 1 Resource



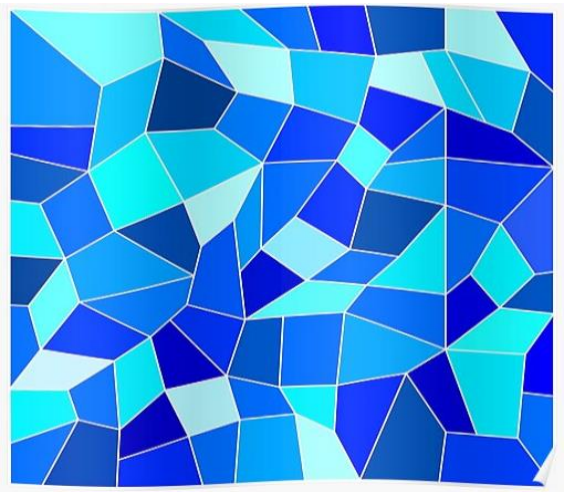
*Year 5-6 Geometry Copy Masters*

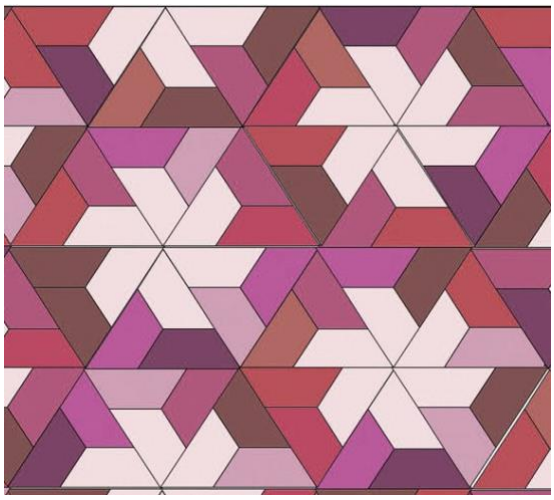
# Quadrilaterals Chart



## Task 1 (independent)

Look at the geometric patterns on some wrapping paper.





What do you notice about all the shapes on the wrapping paper that are the same? That are different?

Mason says that he can see lots of different shapes and they all have different names, but they are also all called quadrilaterals. Can you explain why Mason said that?

Can you find the different sorts of quadrilaterals in the design? How are they the same? How are they different from other quadrilaterals?

## Task 2

Ready to be a shape sorter? You will need to be because the word polygon is from Greek and poly means many!

Here you have a set of polygons all mixed up. With your group can you sort these polygons into different groups by their properties.

What do you notice about their properties? Can you come up with a list of attributes you have decided are shared by all the polygons each set?

As a shape sorter be ready to explain and justify your list of attributes shared by the polygons in each set.

What are the common properties across the whole set of polygons?

What differences are there in the properties across the whole set of polygons?

## Task 2 (independent)

Regular polyhedrons are shapes that have all sides equal in length and all inside angles are equal.

Irregular polyhedrons are 2-D shapes that have straight sides that are not equal to each other and angles that are not equal to each other.

Fill in the missing details. Draw examples of what the following might look like.

| Number of sides & angles | Name | Draw an example of regular polygon | Draw an example of irregular polygon |
|---|---|---|---|
| 3 | Triangle | | |
| 3 | Triangle | | |
| | Kite | | |
| 4 | Quadrilateral | | |
| 5 | Pentagon | | |
| | Hexagon | | |
| | Square | | |
| 7 | | | |
| | Octagon | | |
| | Nonagon | | |
| 10 | | | |

## Task 3

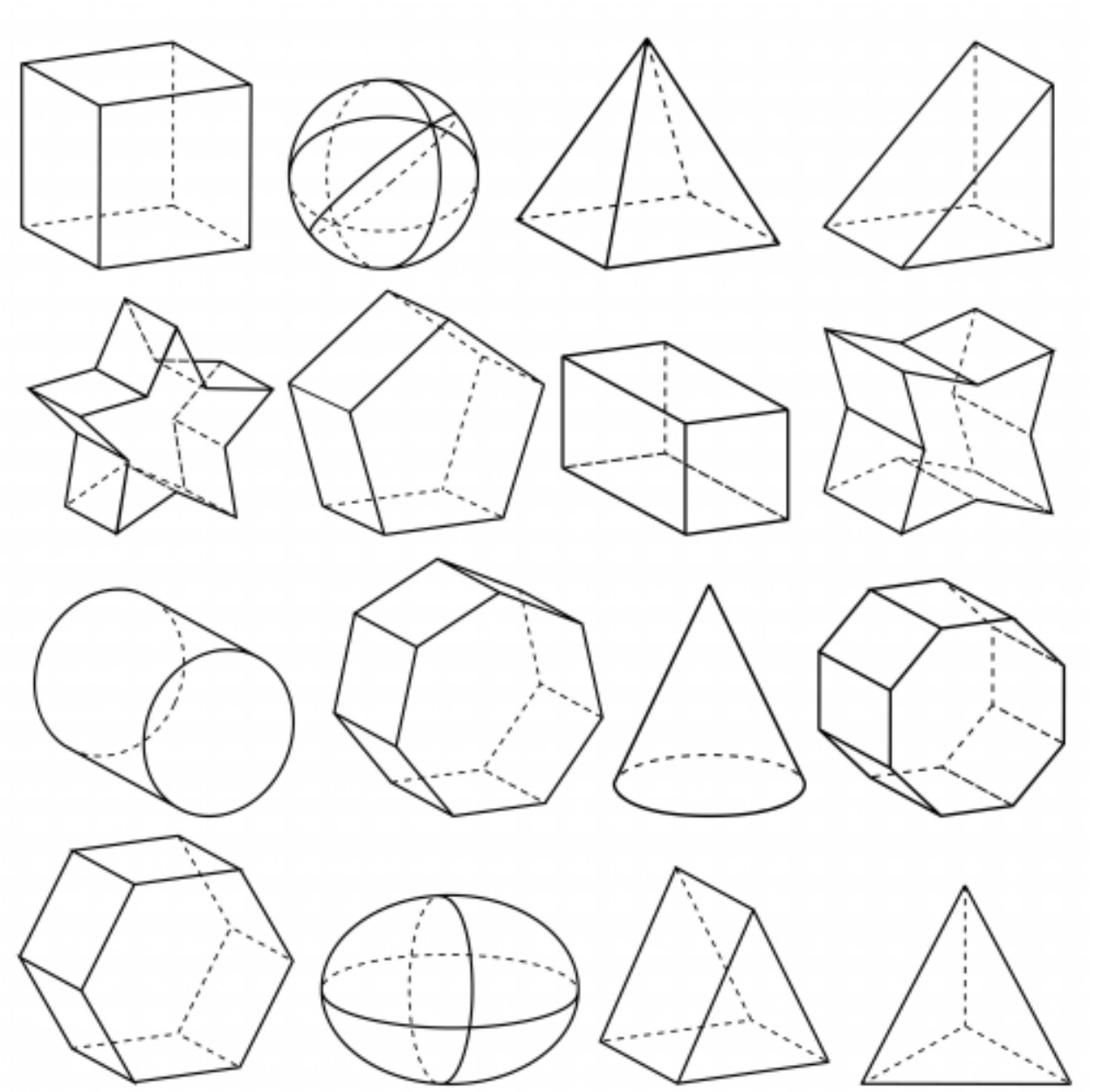
What do you notice about the shape of these different things?

Sort the things into groups which are the same.

Sort the things into groups which are different.

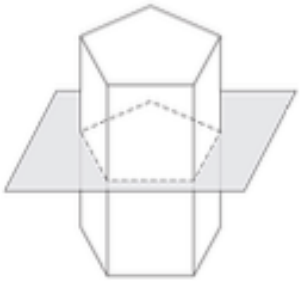
Explain and justify how you have sorted the things into different groups.

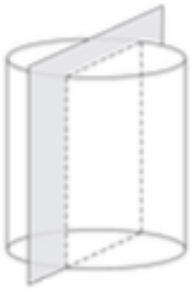
# Task 3 - 3D Shapes

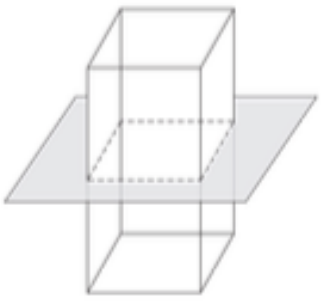


## Task 3 (independent)

Draw the cross section of these different shapes.







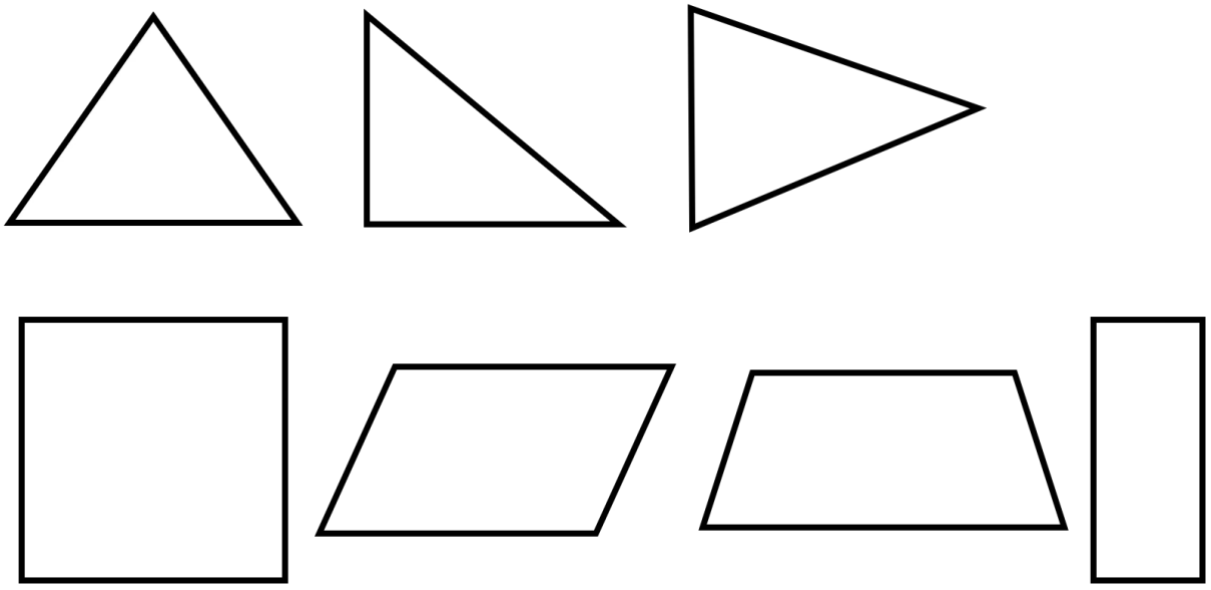
## Task 4

Poppy noticed that “the interior (inside) angles in a triangle adds up to 180 degrees and the angles in a quadrilateral adds up to 360 degrees”

She said she could prove this by cutting the angles within the shapes and gluing them in a line to show 180 degrees and 360 degrees.

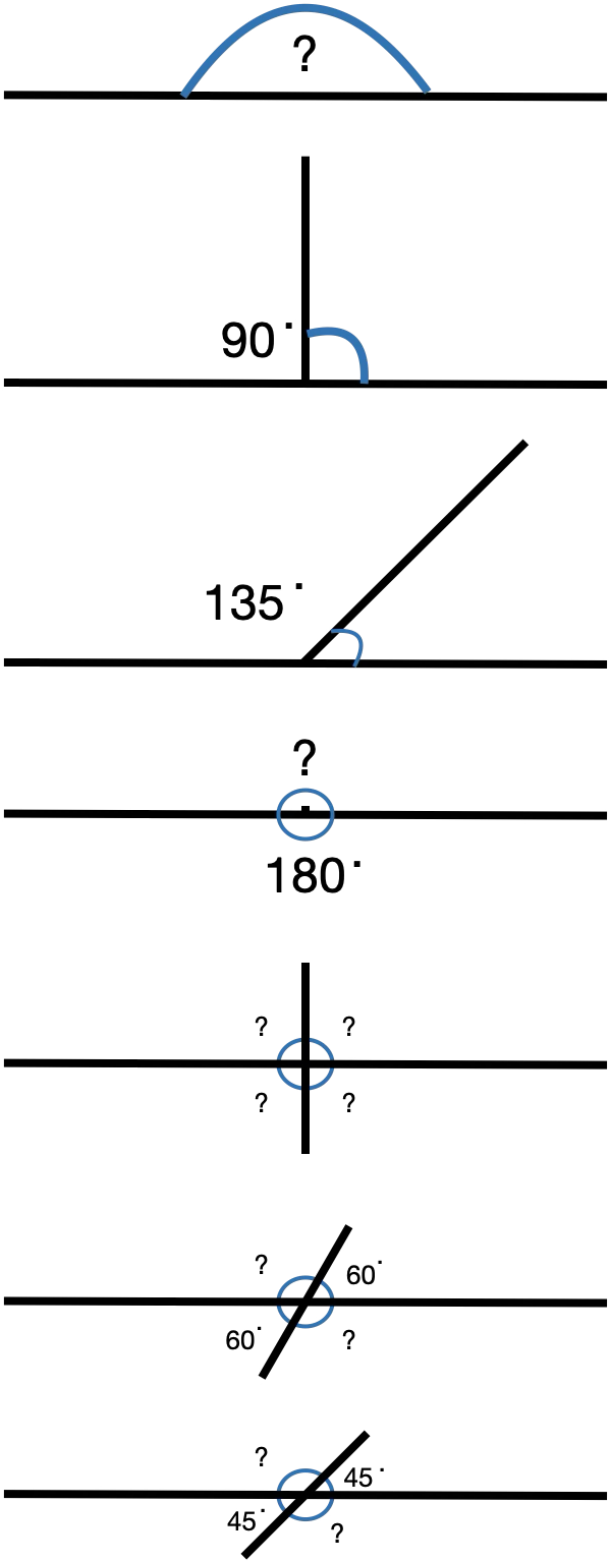
Using all of the triangles and quadrilaterals below, test this theory.

What do you notice?



## Task 4 (independent)

Calculate the missing angles.
Remember that angles on a straight line add up to 180 degrees and angles around a point add up to 360 degrees.



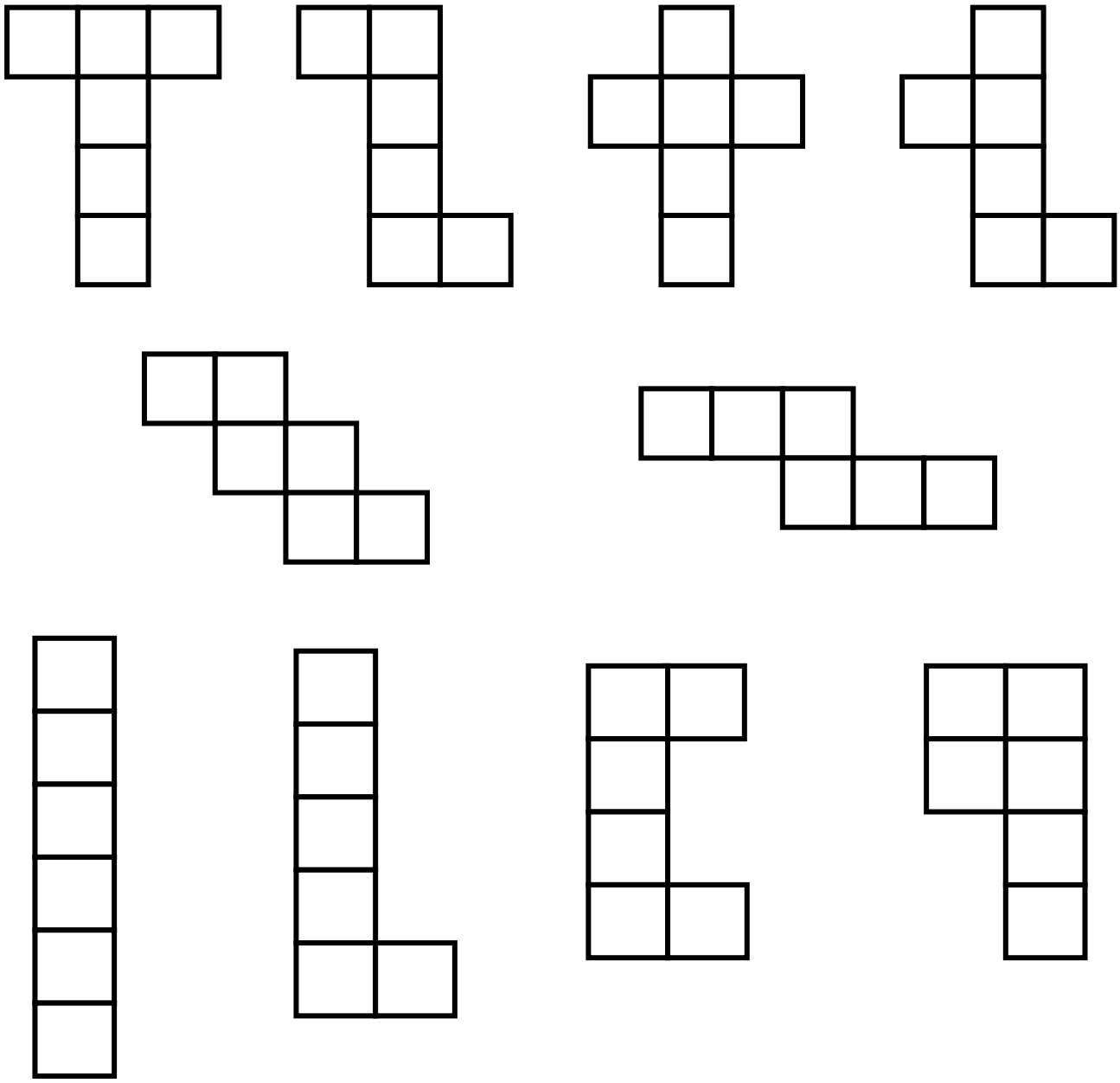
## Task 5

When the box makers were designing these cuboids, they drew a 2D representation of their net. What 2D shapes did they draw?

Look carefully at one of the cuboids and imagine what it would look like flattened out as a net. Talk to your buddy about how many faces it will have and how many will be congruent.

Draw what you think it will look like as a net. Remember that when you fold the net up it needs to make a 3D cuboid and so you need to draw all the faces.

# Task 5 Net Resource - Connect



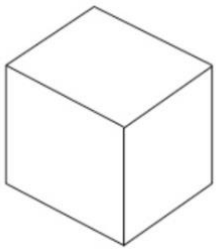
## Task 5 (independent)

Make up a chart to describe each of these 3D shapes.
Record on your chart:

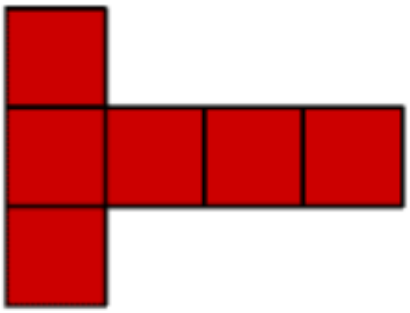
1. the name of the solid and a 3D drawing of it
2. the number of faces it has
3. the number of edges it has
4. the number of corners it has.
5. the 2D shapes that make the 3D shape

## Task 6

Your class has an opportunity to sell lucky dip prizes at the local Night Market for a fundraiser. The prizes will be put in a box that looks like this and children will lift the flap and choose a parcel:



In your group discuss and justify whether the net drawing below would make the box.



Can you draw at least 3 different nets which will also make the box. Be ready to prove that they all work.

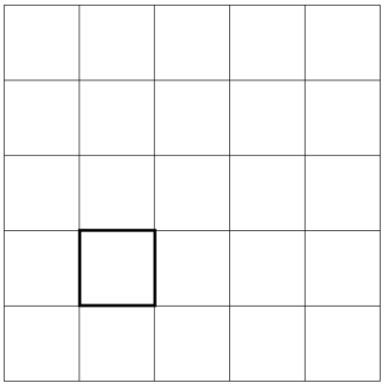
## Task 6 (independent)

Look closely at the box you have chosen. Draw what you think it will look like as a net. Do not draw the flaps just the faces. Remember that when you fold the net up it needs to make a 3D cuboid and so you need to draw all the faces.

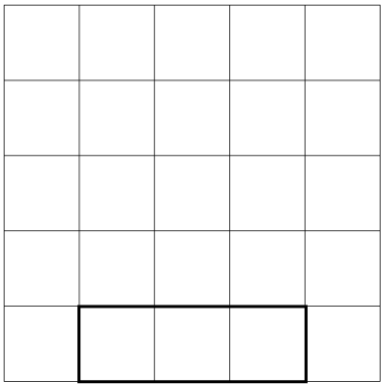
When you have finished drawing the net undo your box and compare its net with the net you drew. Keep redrawing the net until you have got it correct.

## Task 7

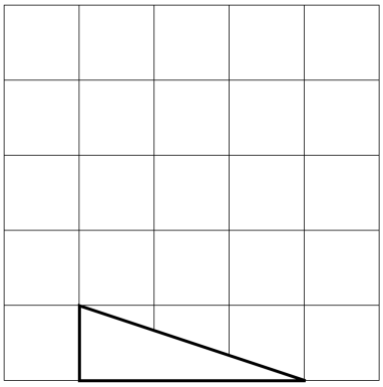
How can the square be enlarged but remain as a square?



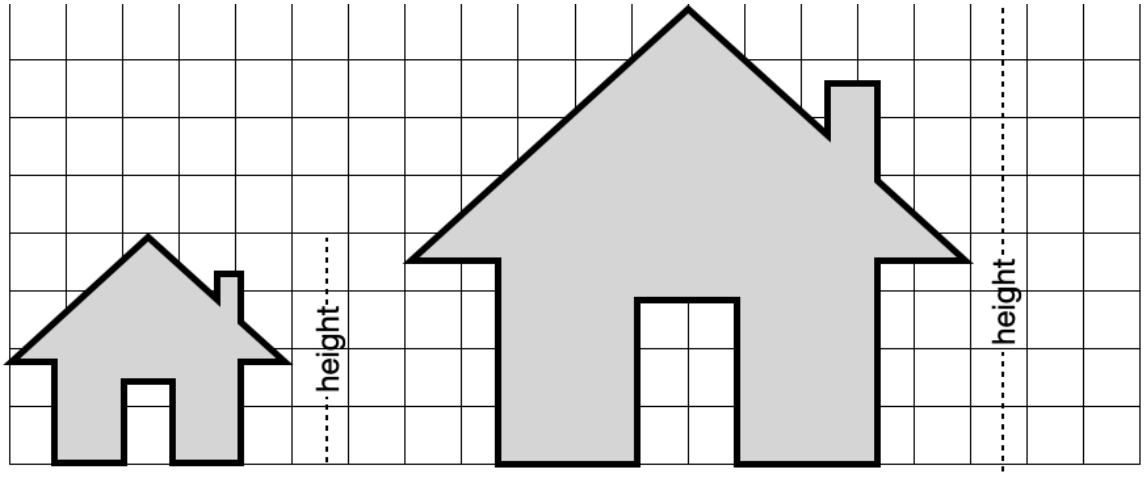
How can the rectangle be enlarged but remain as a rectangle?



How can the triangle be enlarged but remain as a triangle?



## Task 7 (Independent)




The house on the right is an enlargement of the house on the left.

Complete the questions.

**Small house:**

Length: 5 units

Height:

**Big house:**

Length:

Height:

Draw an enlargement of the house the next size.

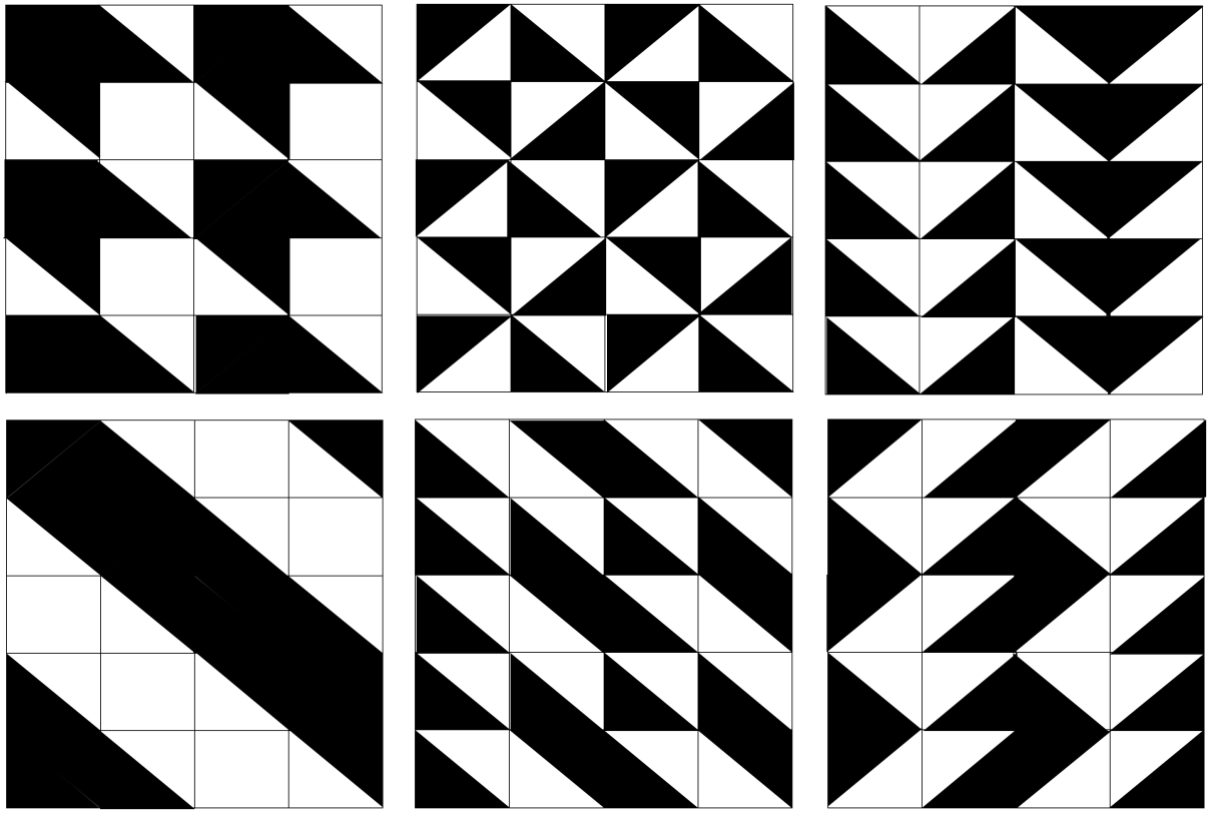
## Task 8

Repeating patterns are used in many different ways as part of designs.

Identify the repeating patterns on the wrapping paper.

Identify and discuss where each repeating patterns starts.

Choose a repeating pattern and explain whether it shows rotation or reflection.



## Task 8 (independent)

Make your own wrapping paper design using a combination of mirror, slide, and rotational symmetry.

Draft different designs and ensure you are using all of the types of symmetry.

Leave a space for a border on the edge of the paper around your pattern design.

## Task 9

You are playing a computer game and need to collect the most gems and bring them to your home base.

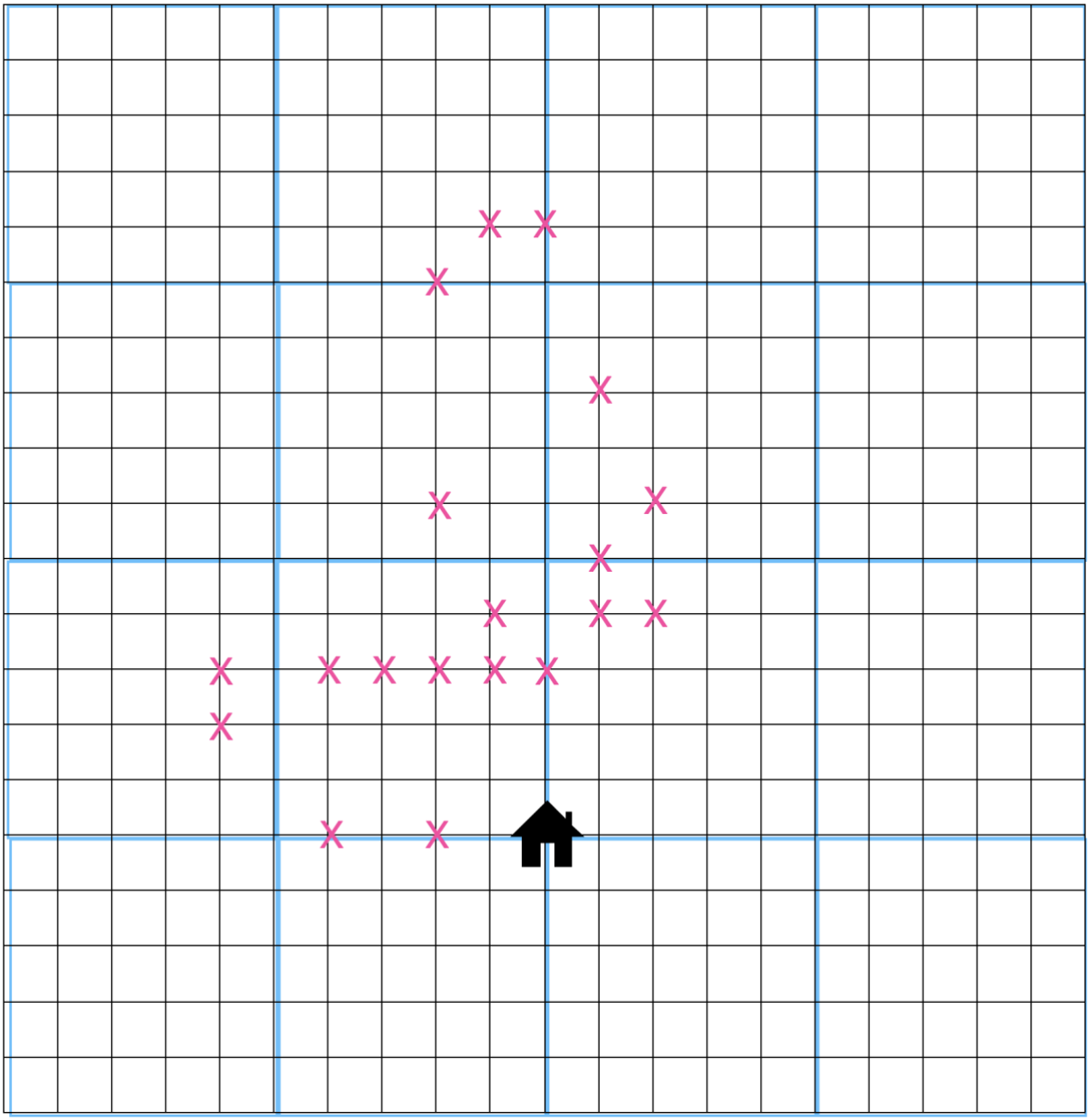
Draw straight lines through the gems using the four points of the compass (North, South, East, West). You can only use up to ten lines to create your route from the home base and back again.

Try and improve your route to collect more gems.

Can you collect all the gems?

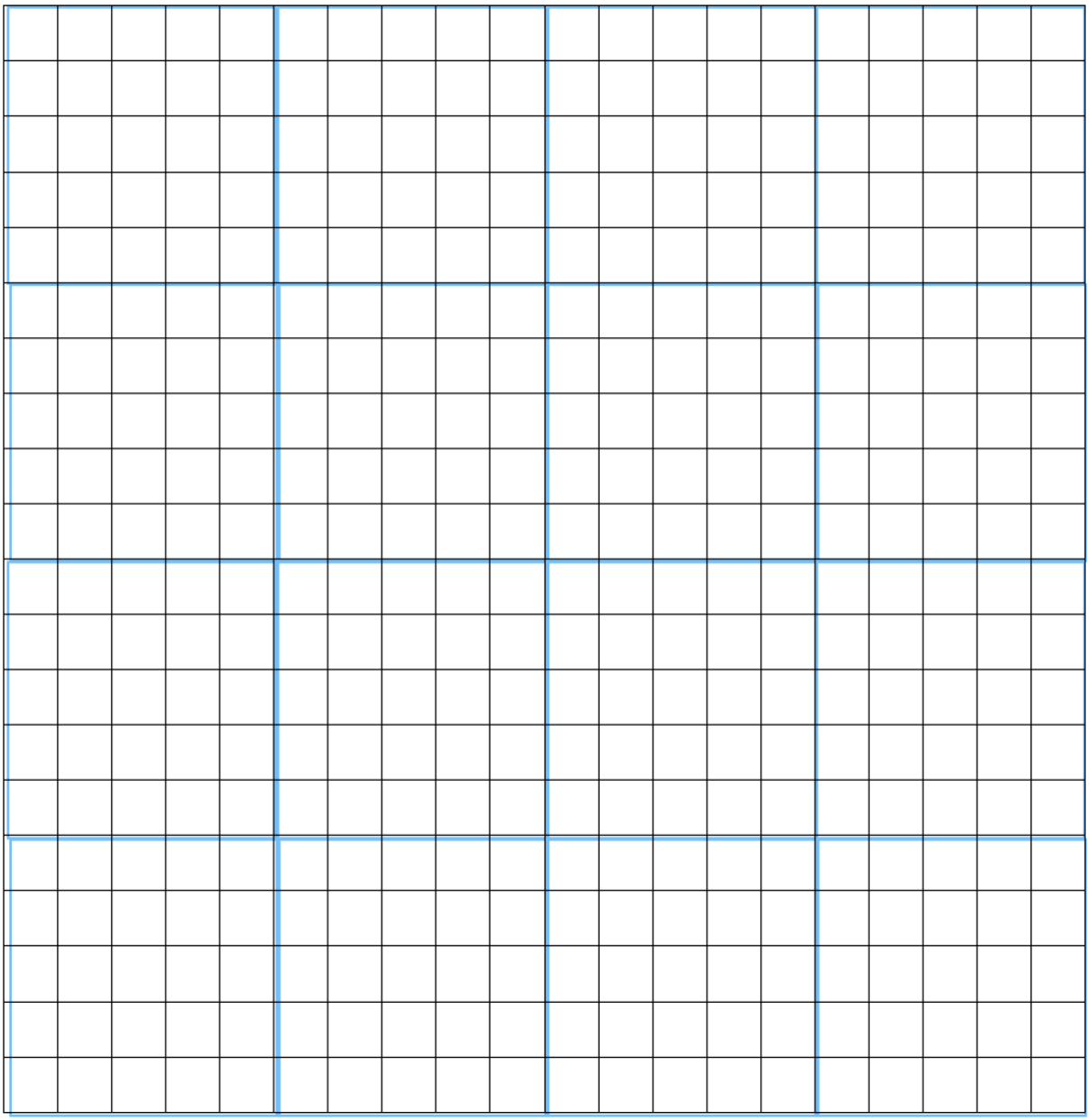
Keep a record of the directions to explain the best route to collect the gems.

# Task 9 – Map



## Task 9 (independent)

Make your own grid map of home and gems which you need to gather. Make sure that it is solvable and then give it to your buddy to complete.



## Task 10

Using grid paper draw a map of an area you know well. Make sure that you have numbers down the side of your grid and use alphabet letters across the top. Put the names of all your group members in different places.

Mark on your map key points of interest. To the side of your map put a key (or legend) using simple symbols, signs, and colours to give others information about your map in a small space. Don't forget to put in where the compass directions are. These could include more specific compass points (for example, North-West).

Write a set of 10 statements about your map using the grid references, and compass points or angles and turns to indicate paths each person might take to go from one point of interest to another.

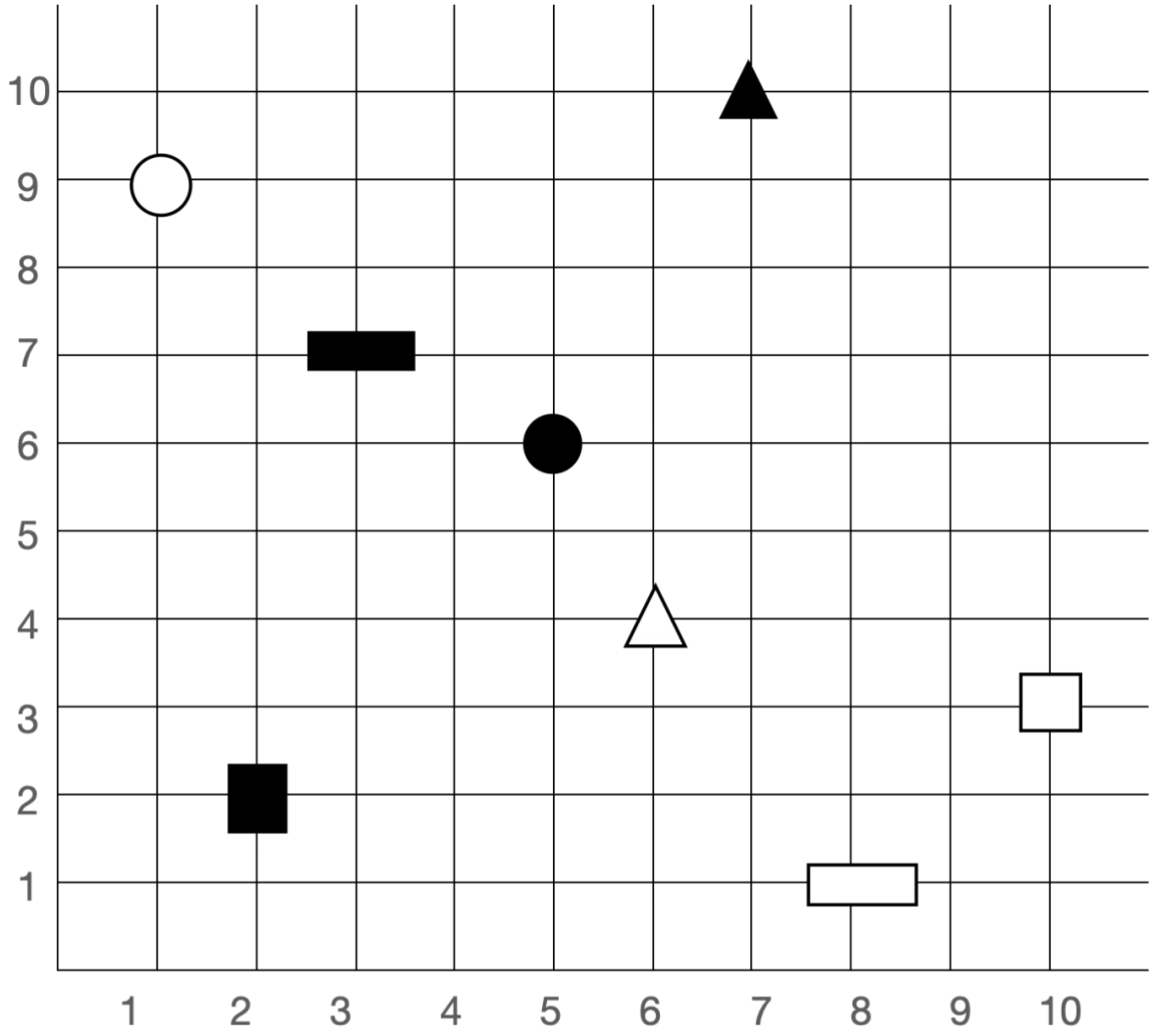
## Task 10 (independent)

Explore as many different types of maps as you can. With a buddy talk about their legend and scale.

Make a list of all the different symbols in the different legends and the different scales.

## Task 11

Complete the challenge sheet.



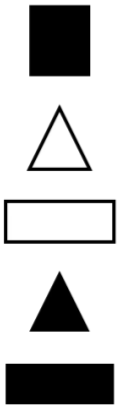

Draw the objects found at:

A: (1,9)

B: (10, 3)

C: (5,6)

Give the Grid Reference for:



Add your own shapes and provide the co-ordinates to share with a group/the class.

## Task 11 (independent)

Use grid paper to make your own grid challenge for other students.

You might place objects on the grid and ask others to provide their grid reference or ask them to name objects found at the grid references.

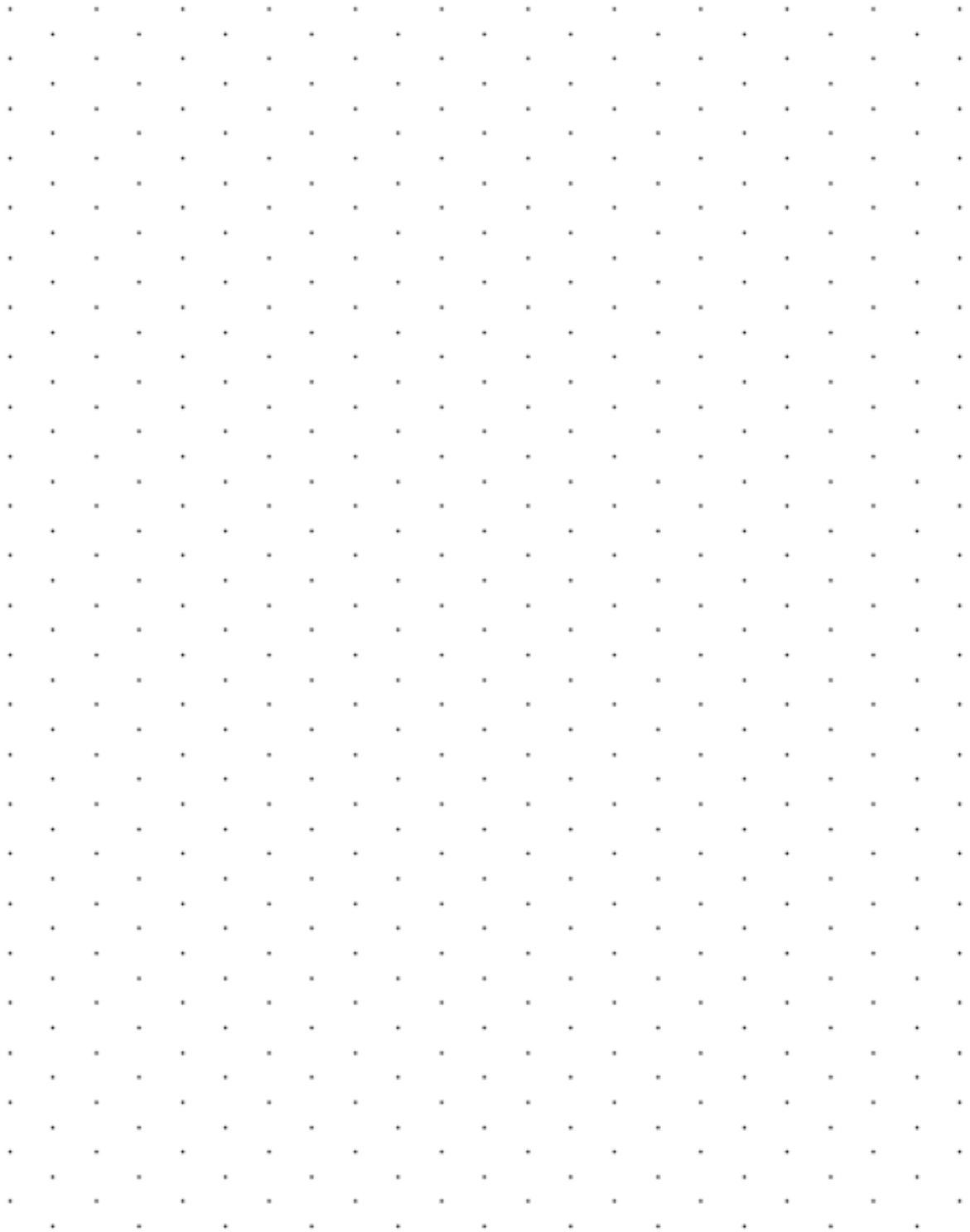
## Task 12 (independent)

Make your own Golden Egg Hunt. You can choose your own setting but 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 hunt begins on your map. Provide 10 clues to find the Golden Eggs using your scale, legend and the grid labels.

# Dotty Paper

# Isometric Dotty Paper



# Squared Paper