

DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES

Geometry – Shape and Space

Level 2 (Year 3/4)

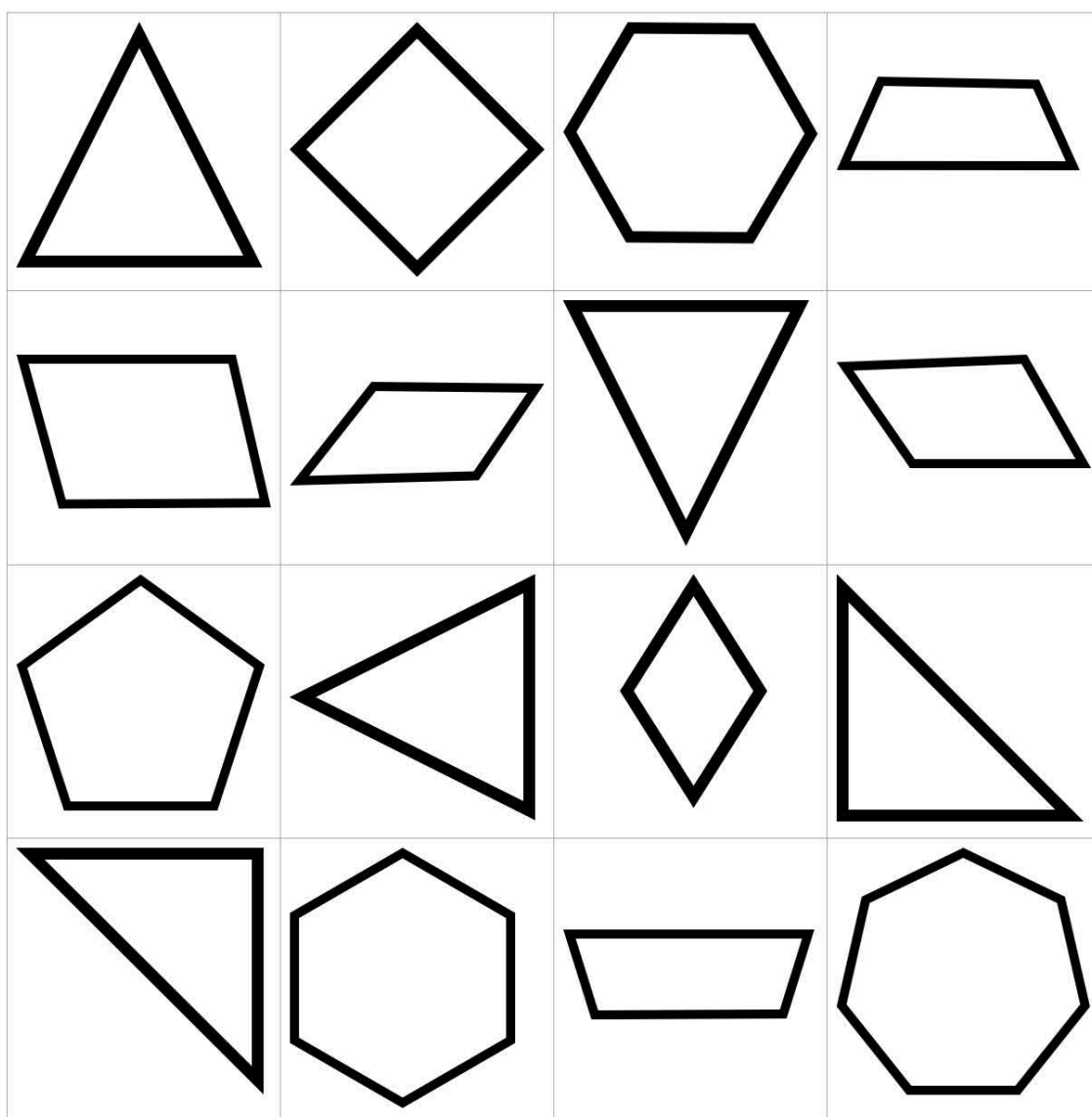
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Level 2 Year 3/4: Geometry – Space and Shape

Task 1

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.

*Level 2 Year 3/4: Geometry – Space and Shape***Task 1 Resource**

Task 1 (independent)

1. 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.
2. Make 2 squares with your sticks. How many sticks did you need?
3. Make a rectangle with the sticks which is made up of 2 squares joined together.
4. Make 4 squares with your sticks. How many sticks did you need?
5. 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?
6. On your paper draw without looking at the picture a rectangle made of 2 squares.
7. On your paper draw without looking at the picture a 2 by 2 large square made up of the 4 smaller squares. On your paper draw without looking at the picture a 2 by 2 large square made up of the 4 smaller squares.

Level 2 Year 3/4: Geometry – Space and Shape

Task 2

Mary is playing a game with her sister Anne. She says “I drew a shape with 4 sides. You draw what my shape might look like.”

Draw the shape you think Anne drew and compare it with other children in your group. What do you notice about what is the same? What is different?

Now Mary says, “I used two smaller shapes both the same to cover my larger shape.”

If her shape looks like this what might the smaller shapes look like?



Compare your two shapes with other children in your group. What do you notice about what is the same? What is different?

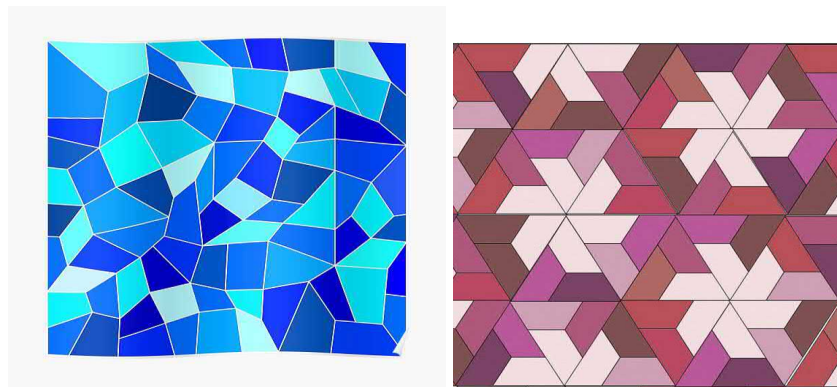
Task 2 (independent)

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 4 by 1 shape, the 4 by 2 shape and the 4 by 3 shape. Can you make these larger and smaller?
3. 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.

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Task 3

Georgia is looking at the geometric patterns on some wrapping paper her mother is using.



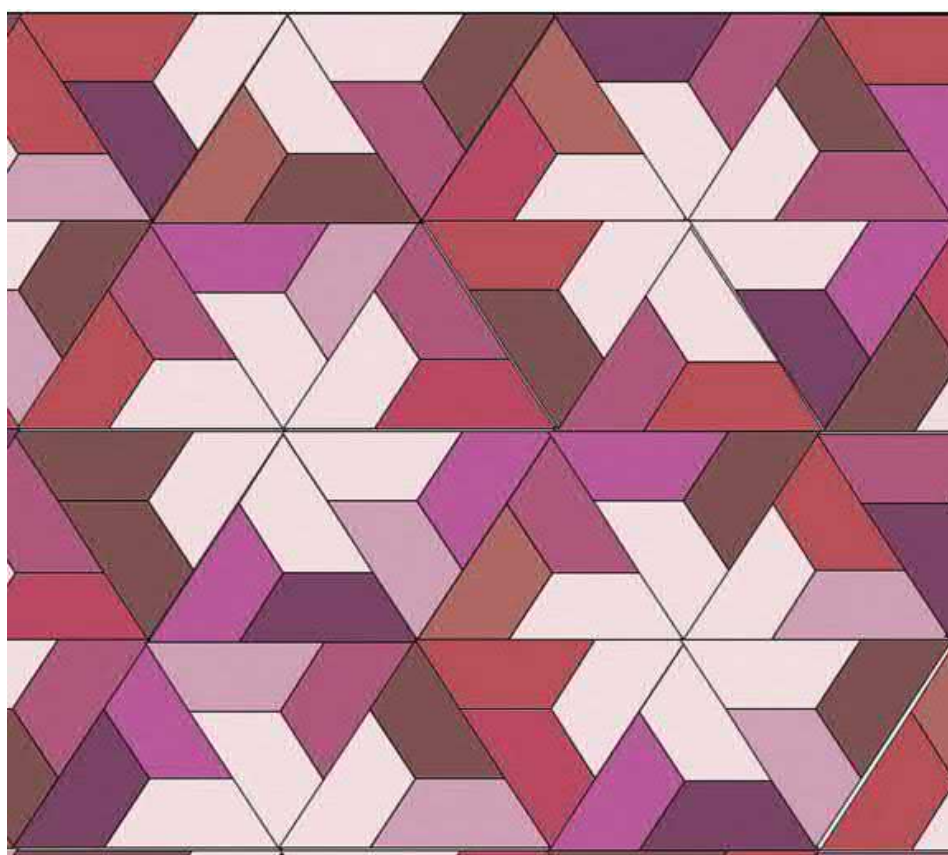
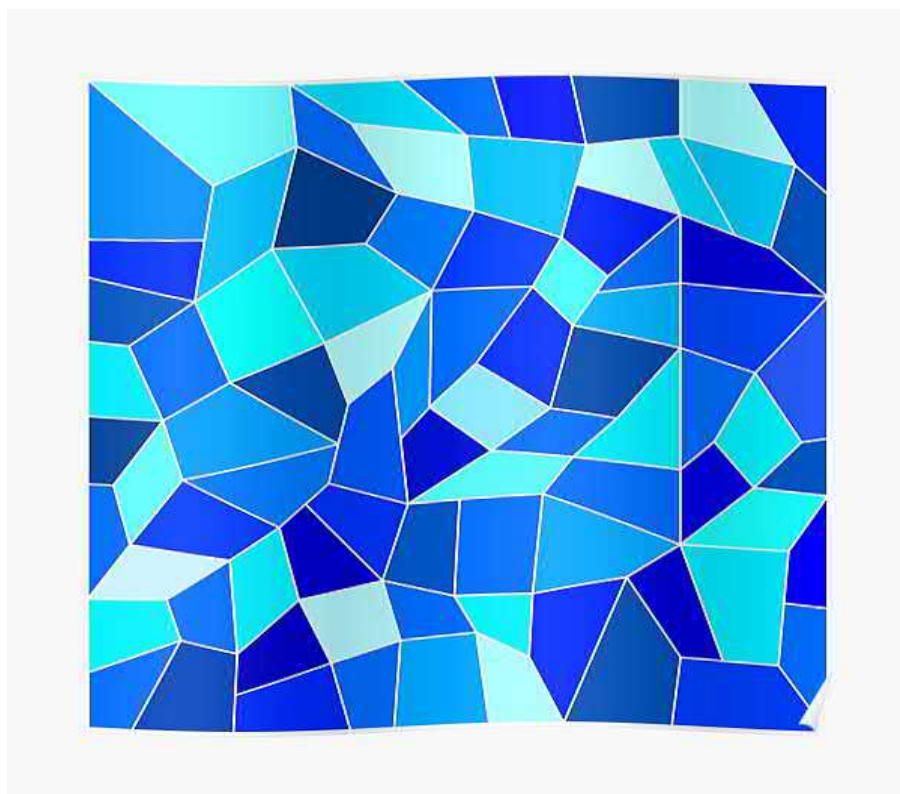
What do you think she notices about all the shapes on the wrapping paper that are the same? That are different?

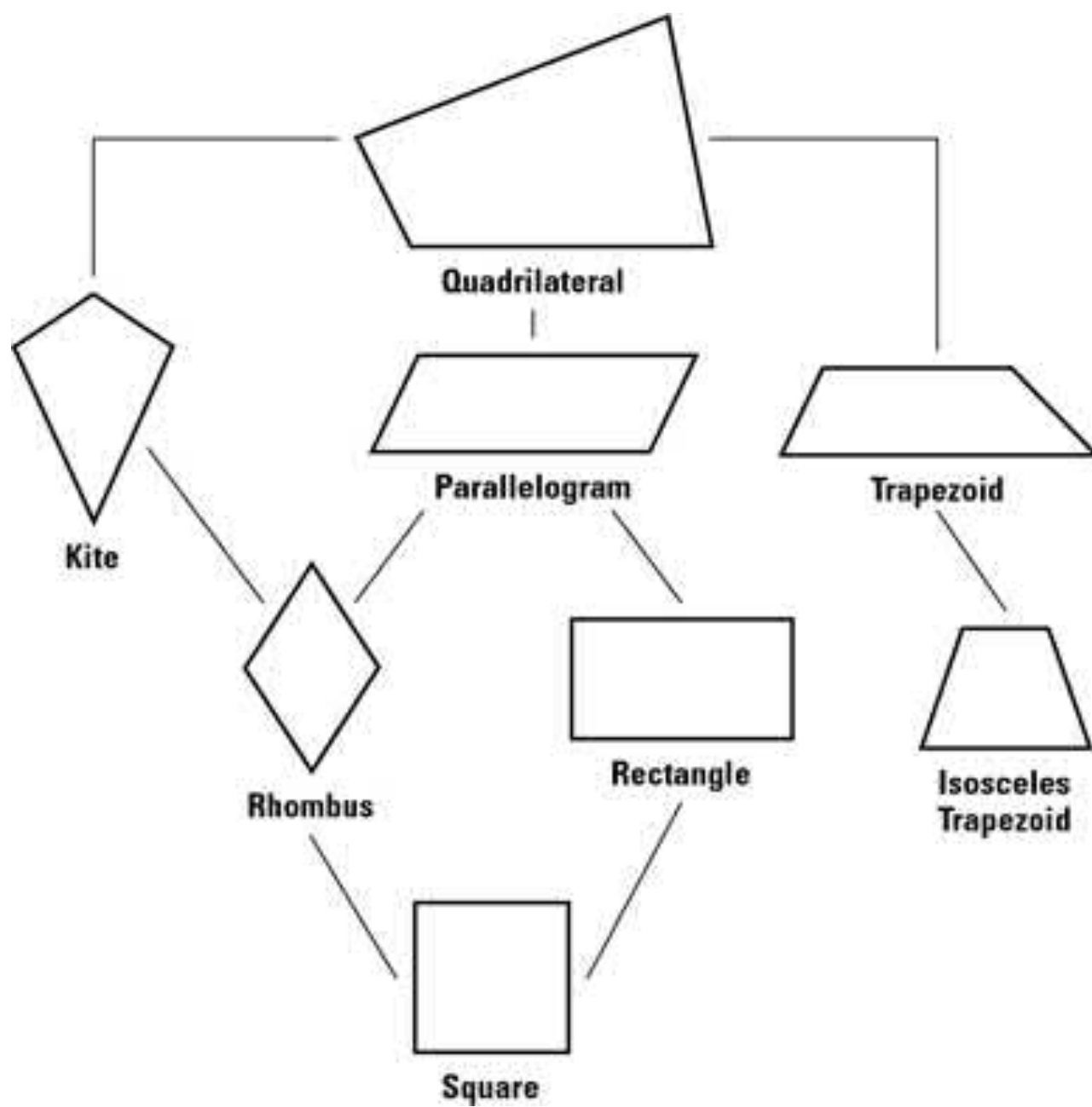
Georgia tells her mother that the artist who designed both pieces of wrapping paper used only quadrilaterals. Her mother says that she can see lots of different shapes and they all have different names, but they are also all called quadrilaterals. Can you explain why her mother said that?

Can you find the different sorts of quadrilaterals her mother named? How are they the same? How are they different from other quadrilaterals?

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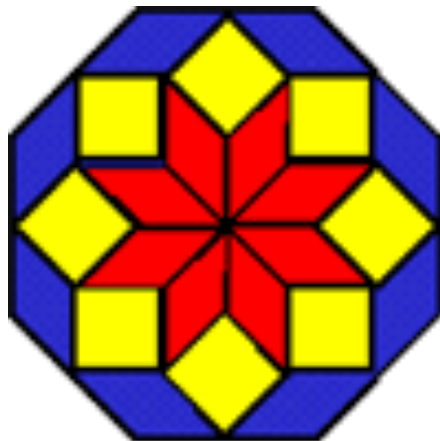
Task 3 Resource



Quadrilaterals Chart

Task 3 (independent)

Zahra is looking closely at the clever geometric patterns in the tile at the mosque she goes to with her family.



Zahra tells her mother that the artist who designed the tile used only quadrilaterals. Her mother says that she can see squares, rectangles, rhombus but they are all quadrilaterals.

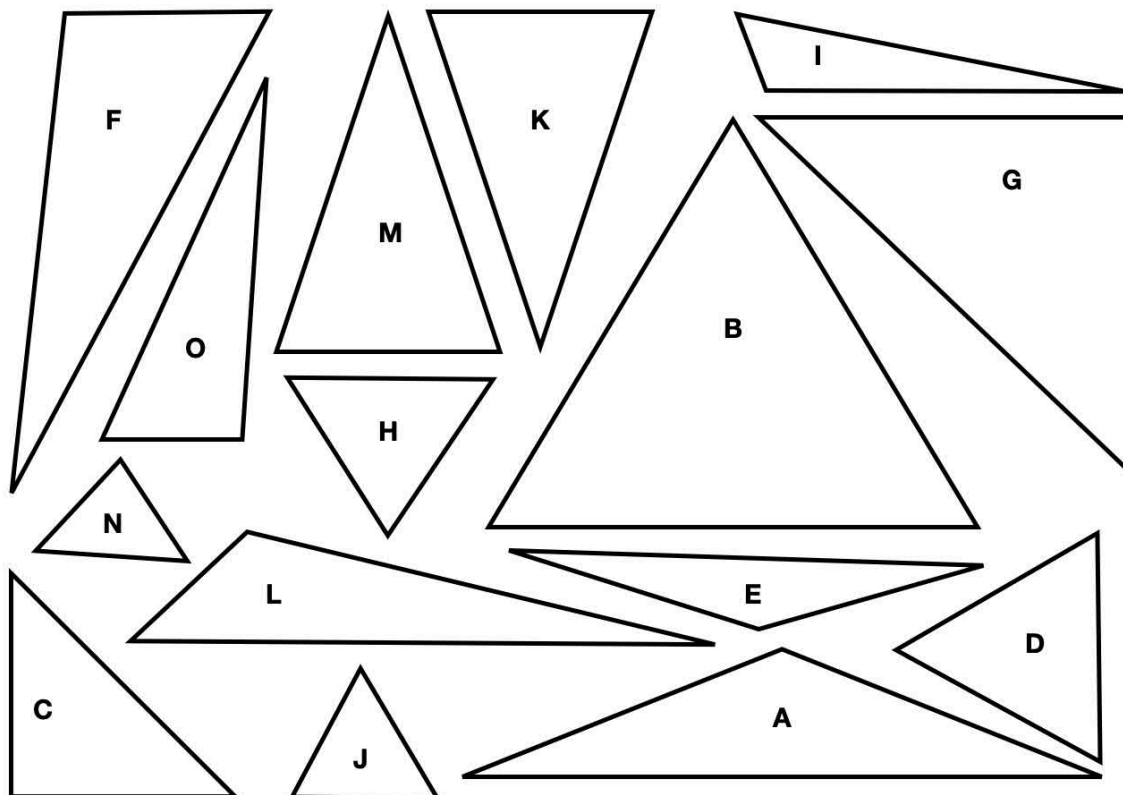
1. Can you write why her mother said that? Make sure that you write everything you know about quadrilaterals.
2. Can you find the different sorts of quadrilaterals her mother named? Write how they are the same? Write how they are different.
3. Draw pictures of the quadrilaterals she did not see. Write how they are the same? Write how they are different.

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Task 4

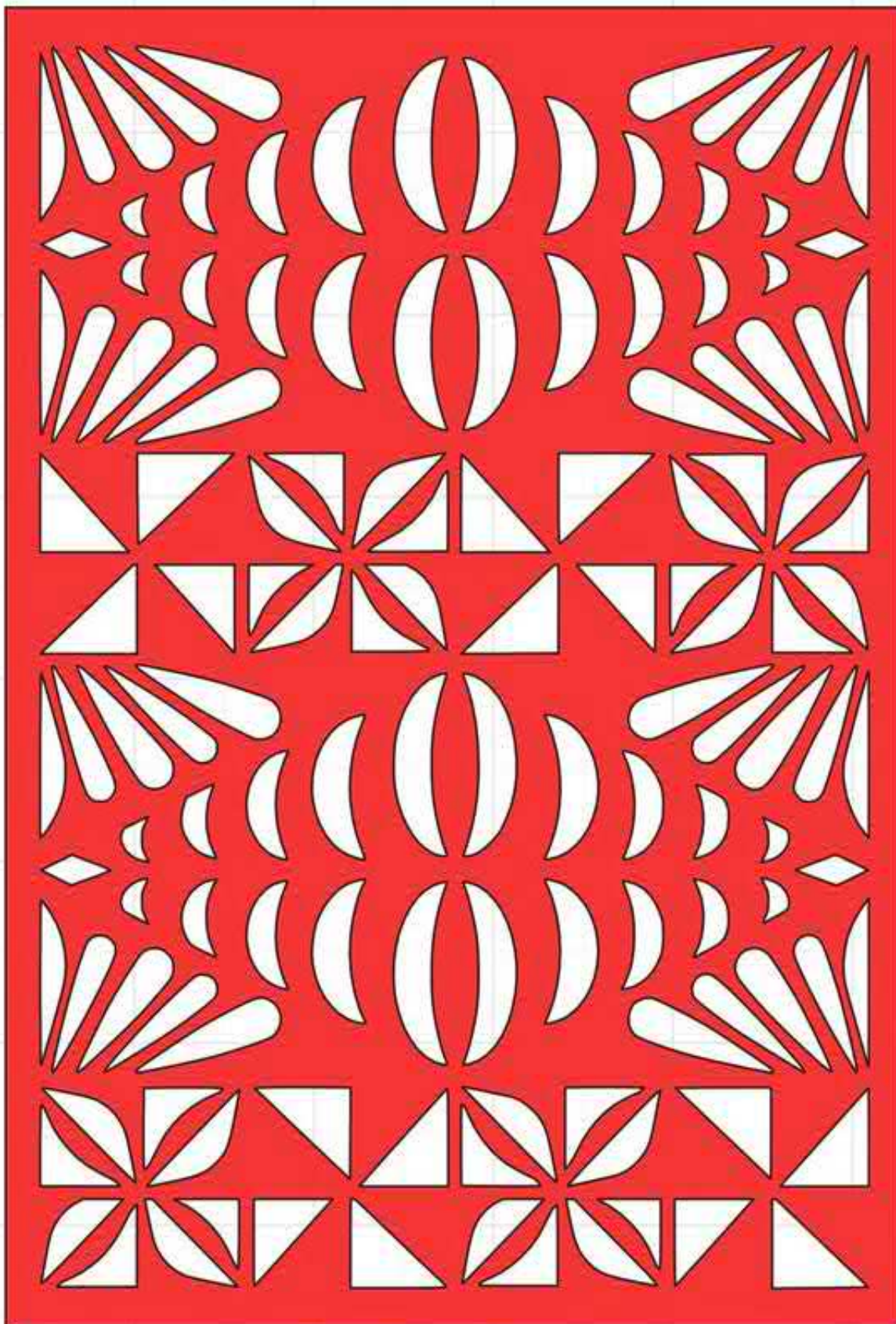
Can you sort these shapes into different groups?

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.

*Level 2 Year 3/4: Geometry – Space and Shape***Task 4**

Level 2 Year 3/4: Geometry – Space and Shape

Task 4 Connect



Level 2 Year 3/4: Geometry – Space and Shape

Task 4 (independent)

Sort your objects into cuboids, cylinders, and spheres.

Talk with a partner about why they are cuboids, cylinders, and spheres.

Play a game with your partner of “guess what I have behind my back”.

Hide one of your shapes behind your back.

Describe it to your partner. They have to draw it and say whether it is a cuboid, cylinder or sphere.

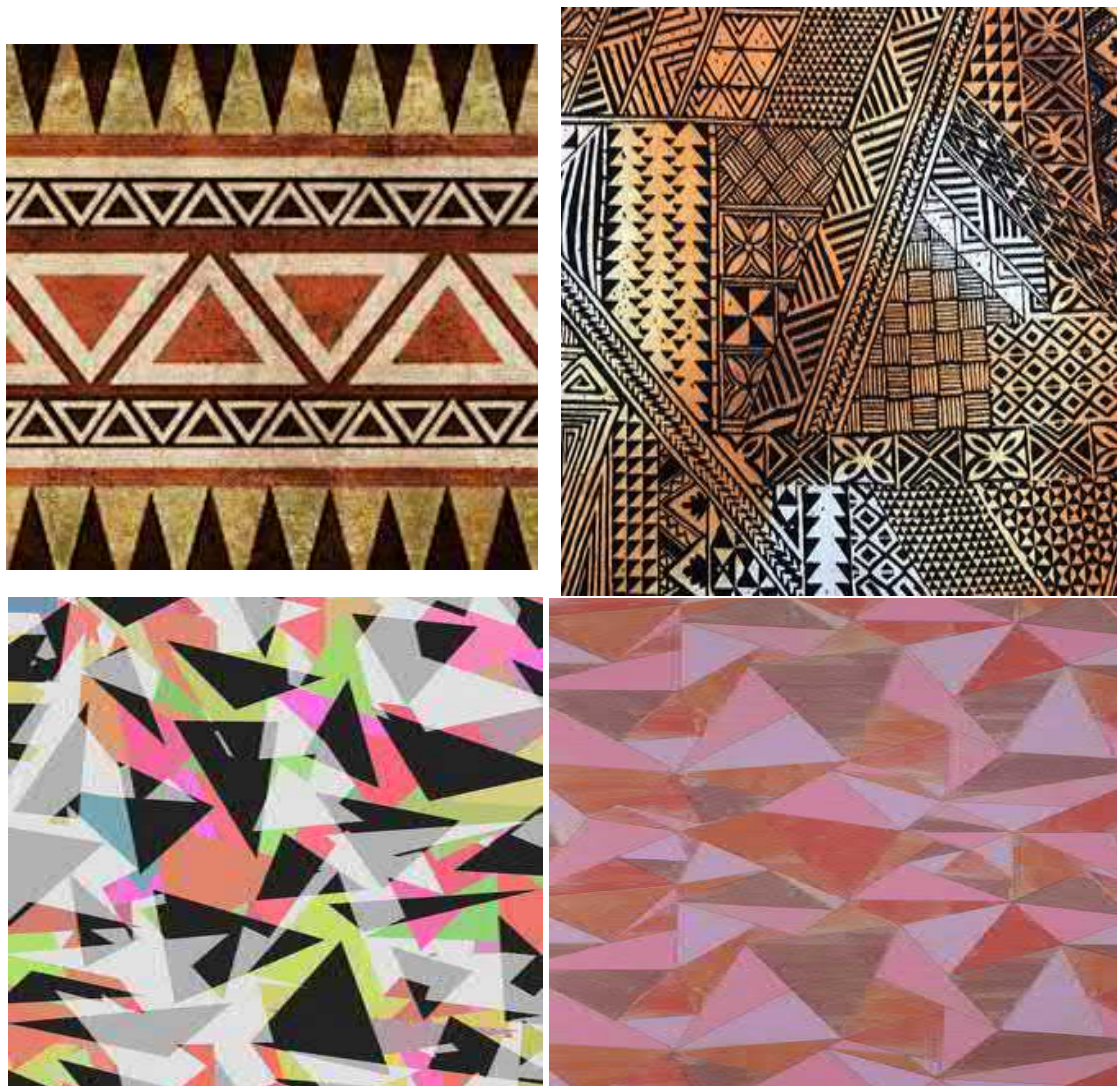
Take turns doing this. What do you notice?

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Task 5

Designers who make patterns for material sometimes use different geometric shapes.

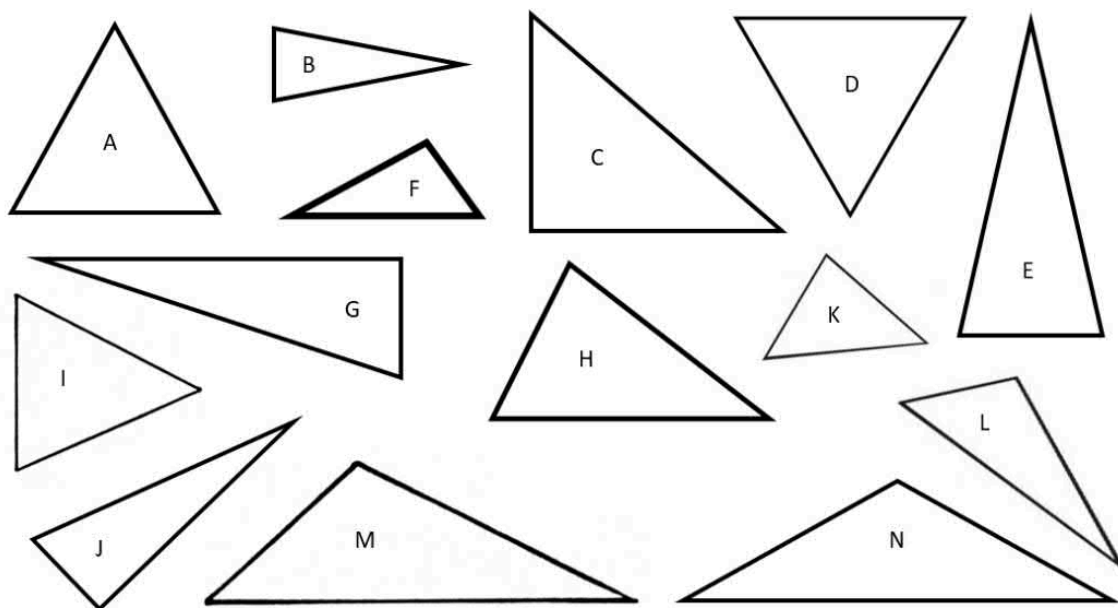
In these different samples of material, the designers have used different types of triangles.



Can you identify the different triangles they have used in their design?

In your group discuss the attributes of each triangle you identify.

What attributes are the same? What attributes are different? Have some triangles only got one attribute the same? Have some triangles only more than one attribute the same?

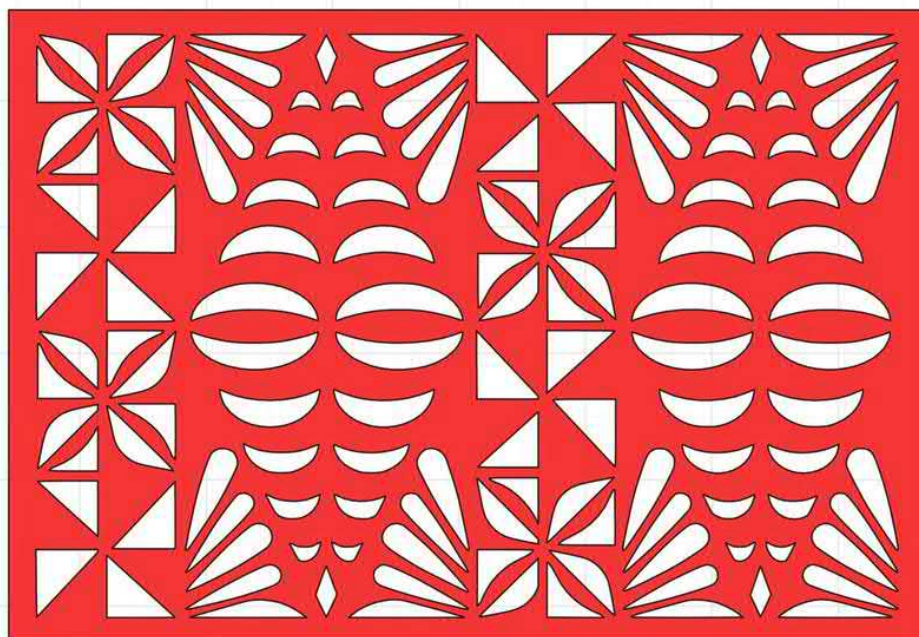
*Level 2 Year 3/4: Geometry – Space and Shape***Task 5 Triangles**

Level 2 Year 3/4: Geometry – Space and Shape

Task 5 (independent)

The design of pattern on this Polynesian material uses three sided shapes.

Are they all triangles? Why or why not?



What makes a triangle a triangle?

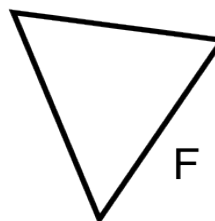
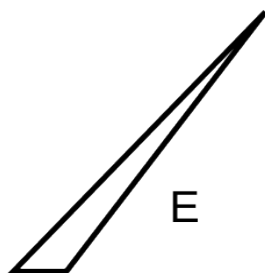
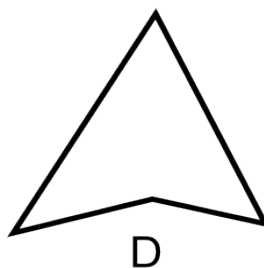
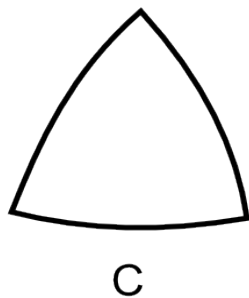
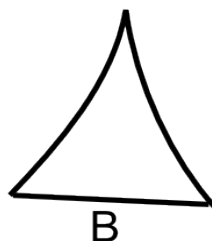
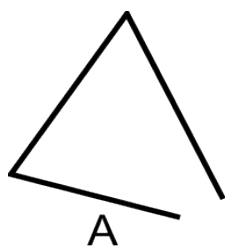
Write down everything else you know about the other shapes on this material.

Task 6

Another task for you great shape sorters.

Here is a set of shapes. In your group can you decide which shapes are triangles? Be ready to explain and justify why they are triangles.

Use your clever thinking to come up with a list of attributes that is shared by all triangles.



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Task 6 (independent)

Choose two different shape objects and explain the relationships between them.

Record the similarities and differences between the shapes.

Choose another two different shape objects and explain the relationships between them.

Record the similarities and differences between the shapes.

Level 2 Year 3/4: Geometry – Space and Shape

Task 7

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?

Be ready to explain and justify why you sorted them into the different groups.

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Task 7 (independent)

Look at these three-dimensional objects.

Draw each of the objects until they are exact.

Write down everything you know about each object you have drawn.

Write down what makes the object three-dimensional.

Task 8

Make up a chart to describe each of these 3D shapes. Record on your chart the name of the solid and a 3D drawing of it, the number of faces it has, the number of edges it has, the number of corners it has.

*Level 2 Year 3/4: Geometry – Space and Shape***Task 8 Chart [or students can make own chart in book]**

Name	Drawing	Faces	Edges	Corners

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Task 8 (independent)

Anshuma is looking at this beautiful piece of siapo.

She notices that the artists have used congruent triangles to make the pattern.



Can you explain why she says they are congruent triangles?

Record your thinking.

Task 9

When the box makers were designing these cuboids, they drew a 2D representation of their net.

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 9 (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 10

Your turn to be a designer.

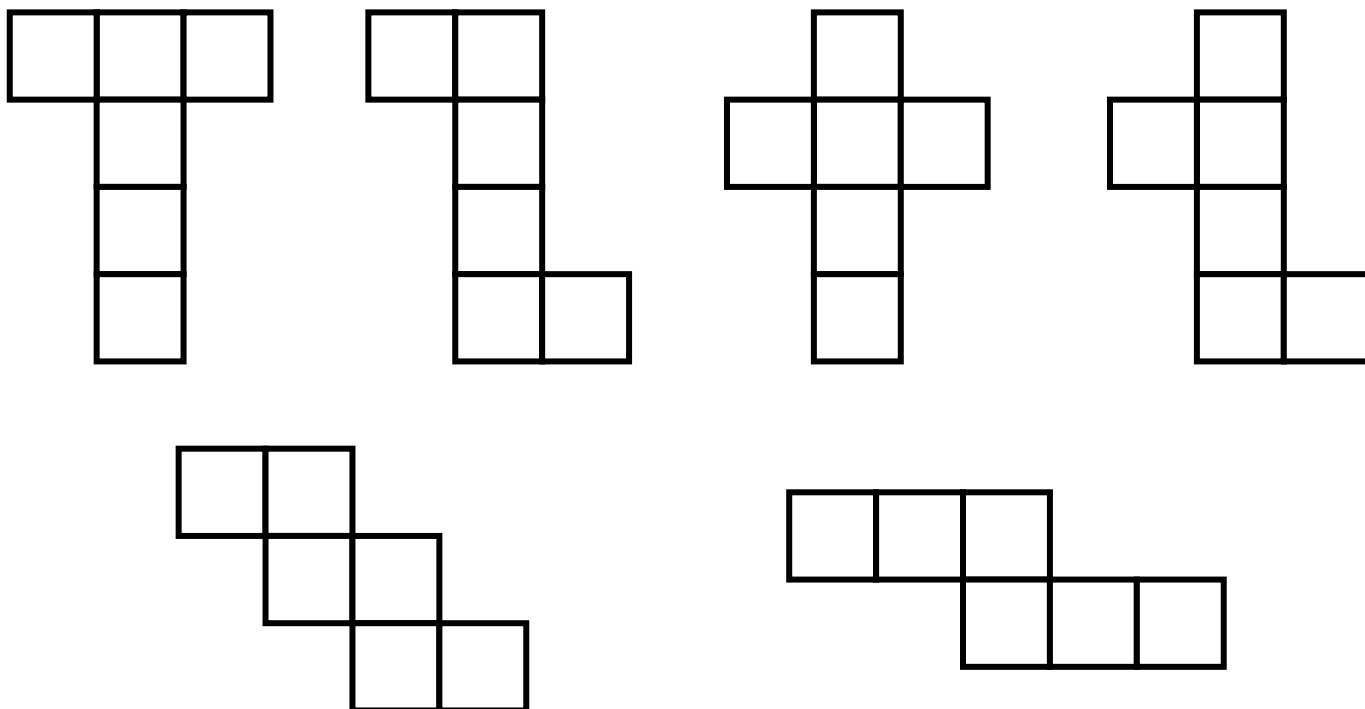
Your first task on your new job as a designer is to draw the net for a cube. Do not put flaps or anything else just draw the net you think can be folded to make a cube.

When you have finished cut the net out and test it. Does it fold to make a cube?

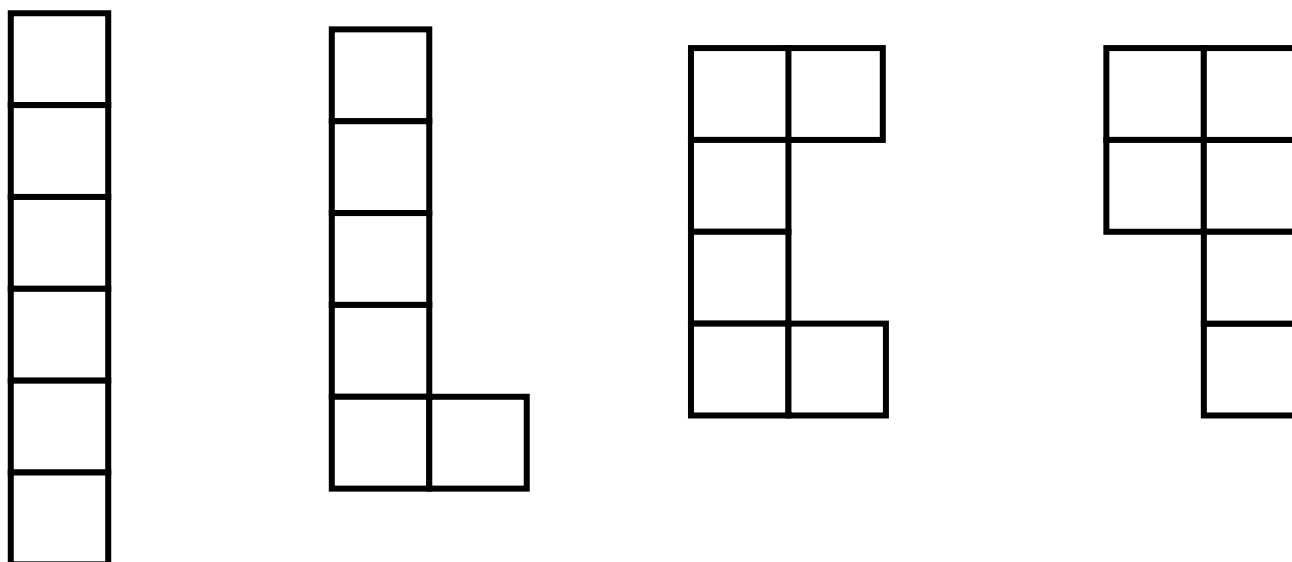
When you have completed one net act like the true designer you are and test out whether there is more than one way to draw the net for a cube.

*Level 2 Year 3/4: Geometry – Space and Shape***Task 10 Resource**

Examples of nets that work:



Examples of nets that will not work:



Level 2 Year 3/4: Geometry – Space and Shape

Task 10 (independent)

Choose a 3-D object.

Draw the object and label its attributes.

Design the net for the object.

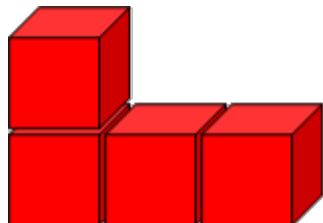
Use the net to make the model.

Test the model to see if it is exactly the same as the object you have selected.

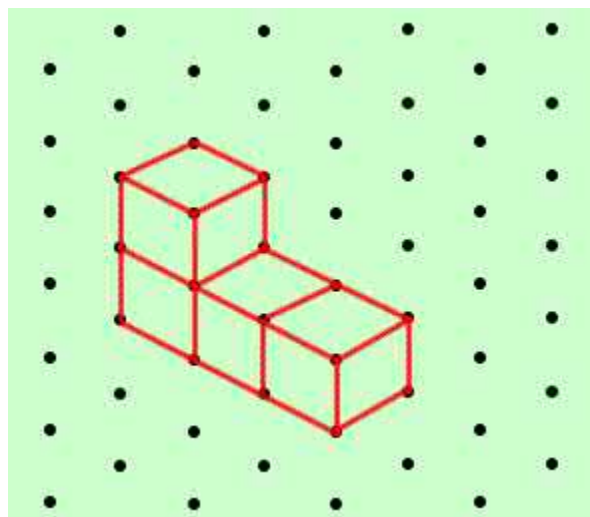
*Level 2 Year 3/4: Geometry – Space and Shape***Task 11 (Optional)**

Let's work in the Third Dimension.

Here are four cubes joined together.

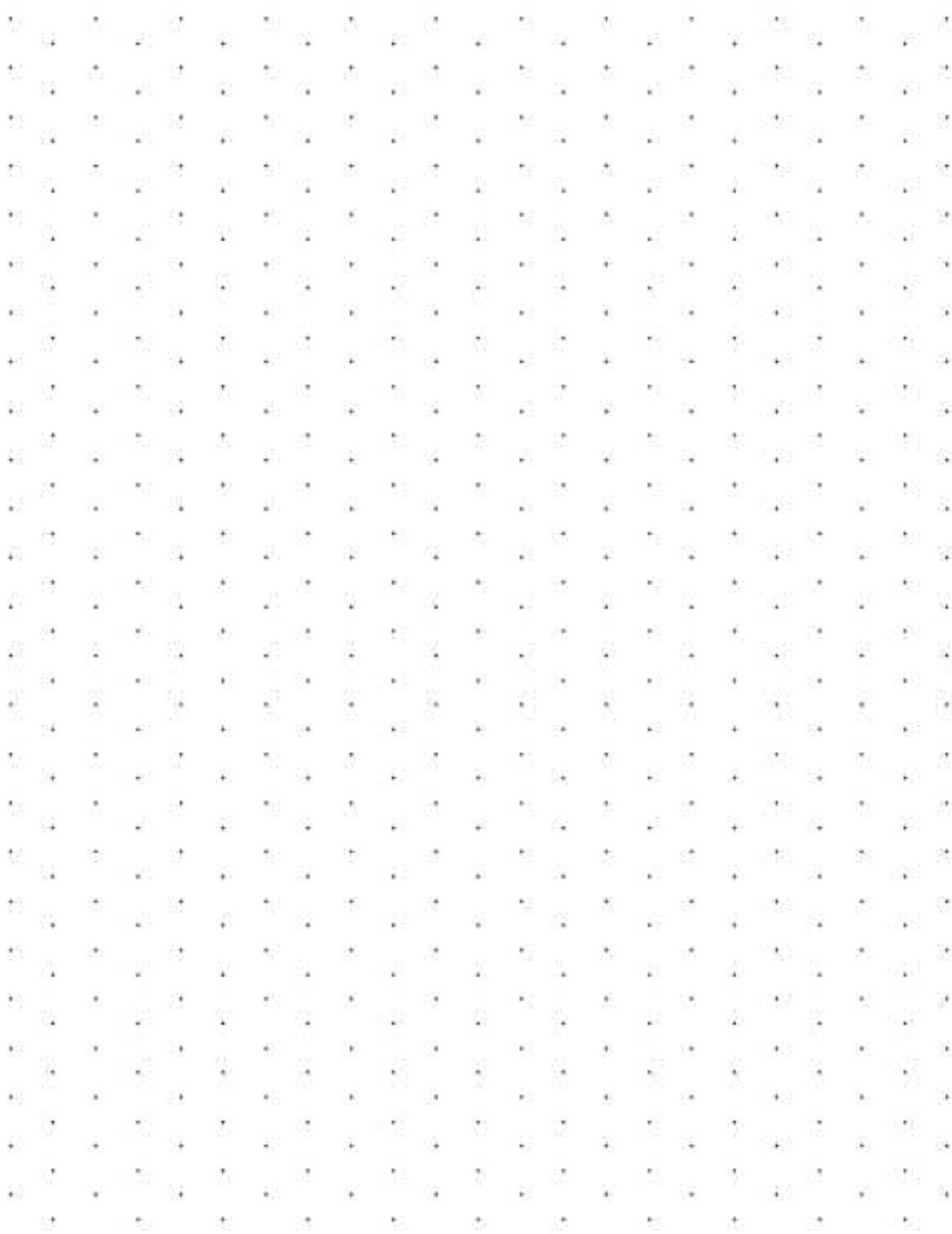


Here is what they look like drawn on dotty paper



How many other ways can you arrange the cubes? When you complete the arrangement draw what they look like on dotty paper.

Task 11 Isometric Dotty Paper



Task 11 (Optional Independent Task)

Today you are going to be a designer again for a building. But this time you must use your imagination first.

Imagine that you have five cubes. The cubes are blue, red, yellow, black, and white.

Now imagine making the building.

Start with the yellow cube and put the black cube just behind it. Put the white cube on top of the black cube. Put the yellow cube on the left of the black cube. Put the blue cube on the right of the black cube.

What does your building look like? Use some cubes to check whether you imagined it correctly.

When you are sure that you did, draw a picture of what it looks like.

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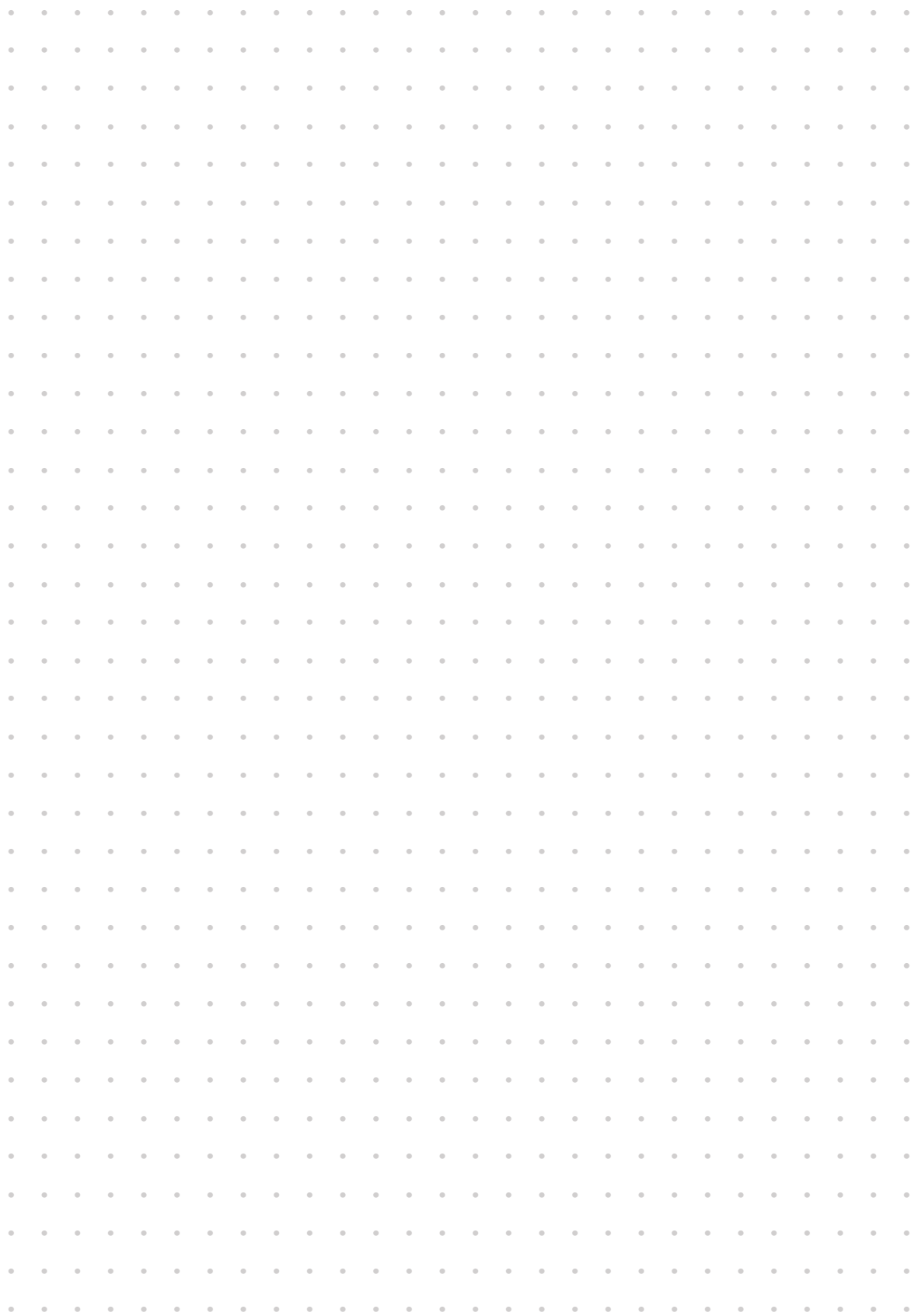
Task 12 (Optional Task)

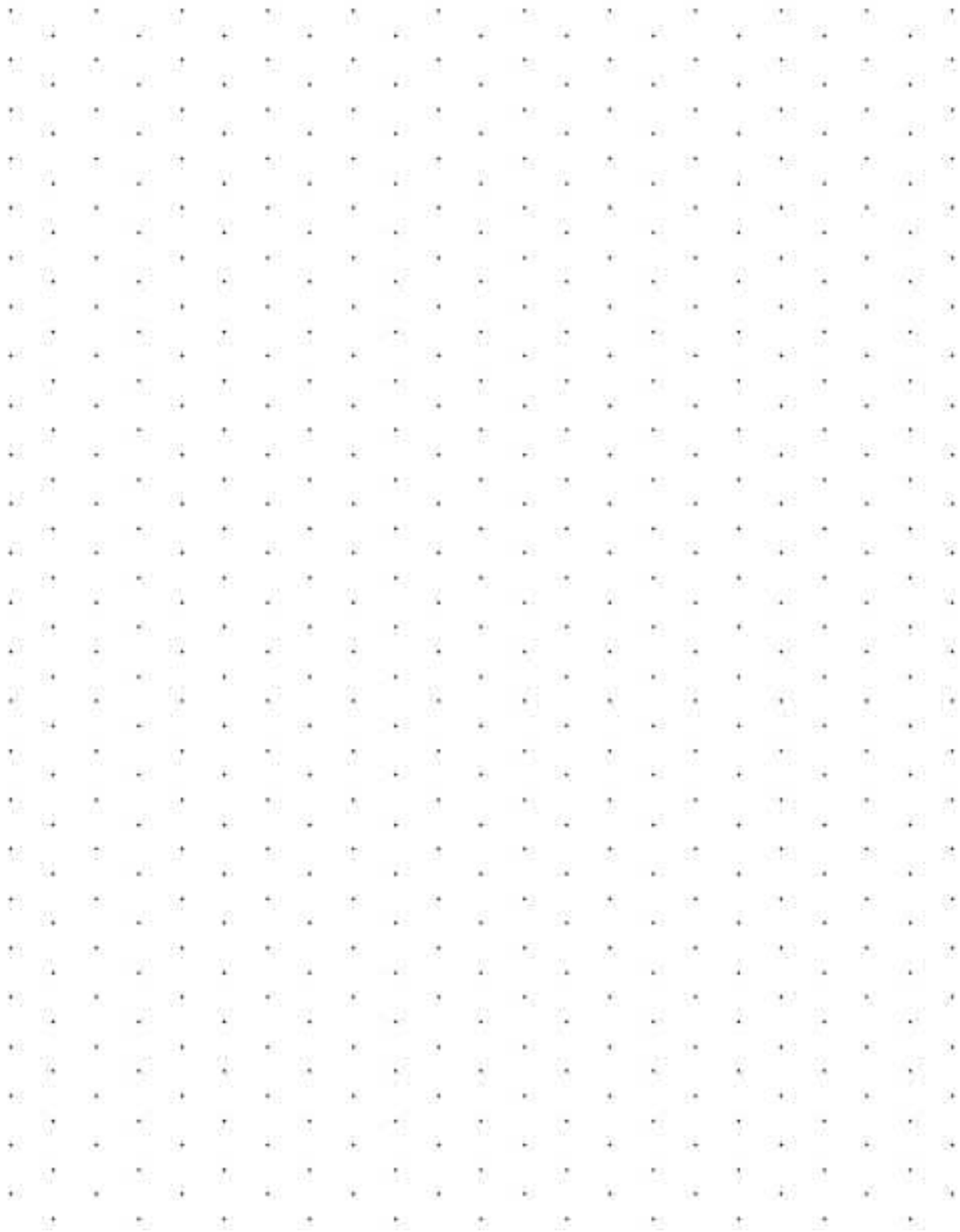
Mahine has bought this beautiful piece of siapo to school today to show her class. Her teacher asks the children to describe all the attributes of the different geometric shapes they can see.

Can you write all the different things they described?



Dotty Paper



Isometric Dotty Paper

Squared Paper