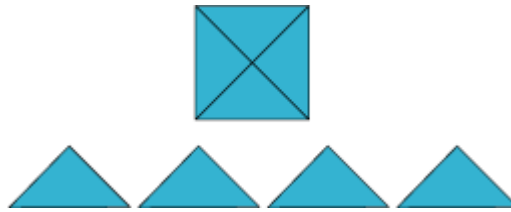


Workshop B 2D Shapes, Patterns and Symmetry

Task 1

Four Triangles Puzzle: <http://nrich.maths.org/141>

If you cut a square diagonally from corner to corner you get **four right-angled isosceles triangles**.



How many different shapes can you make by fitting the four triangles back together?

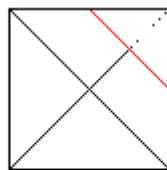
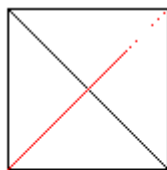
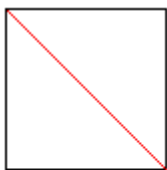
You may only fit **long sides to long sides** and **short sides to short sides**.
The **whole length** of the side must be joined.

How can you be sure that you have found **all** different possibilities?

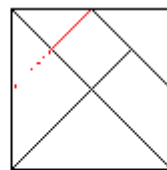
Task 2

Making tangrams: <http://nrich.maths.org/2595>

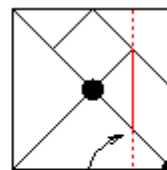
Here's a simple way to make a Tangram without any measuring or ruling lines. All you need is a square of paper and some scissors to cut out the shapes when you've finished folding. Follow the steps shown in each diagram and remember that every fold you make is finding half of a shape or line.



Fold corner to centre



Fold other corner to centre



Halfway between centre and corner.

Now you can play around and make lots of pictures and puzzles - like a dog, boat, house, duck, rocket or rabbit.



Task 3

Napkin Origami

Follow the instructions below to create a napkin origami of a pyramid.

 <p>1</p> <p>Lay the square napkin face down in front of you.</p>	 <p>2</p> <p>Fold the napkin in half bringing the top left corner onto the bottom right corner.</p>	 <p>We have folded the napkin across its _____.</p>
 <p>We now have a triangle. What kind of triangle is it? _____.</p>	 <p>3</p> <p>Turn your triangle one and a half right angles anticlockwise.</p>	 <p>4</p> <p>Fold the right corner to meet the top corner.</p>
 <p>5</p> <p>Fold the left corner to meet the top corner.</p>	 <p>We now have a shape of a _____. What can you say about the line in the middle?</p>	 <p>6</p> <p>Turn the napkin over keeping the open end facing away from you.</p>
 <p>7</p> <p>Fold the napkin in half again, bringing the top corner down onto the bottom corner.</p>	 <p>8</p> <p>Fold the napkin along its line of symmetry and make it stand as a pyramid.</p>	 <p>What are the properties of such a pyramid? Think: faces, vertices, edges? What is missing here?</p>

Can you create another pattern or shape using **more than one** similar napkin origami?

What **mathematical language/ vocabulary** is used during such an activity?

Which **mathematical skills** and **concepts** do children need to know?

Think of new instructions to create a **different** origami.

Task 4

Exploring Tile Patterns

Use the laminated tile cards given to your group to create a **pattern**.

How many different **tiling patterns** can you come up with?

Look at one individual tile. What smaller shapes are used to make the pattern on it?

