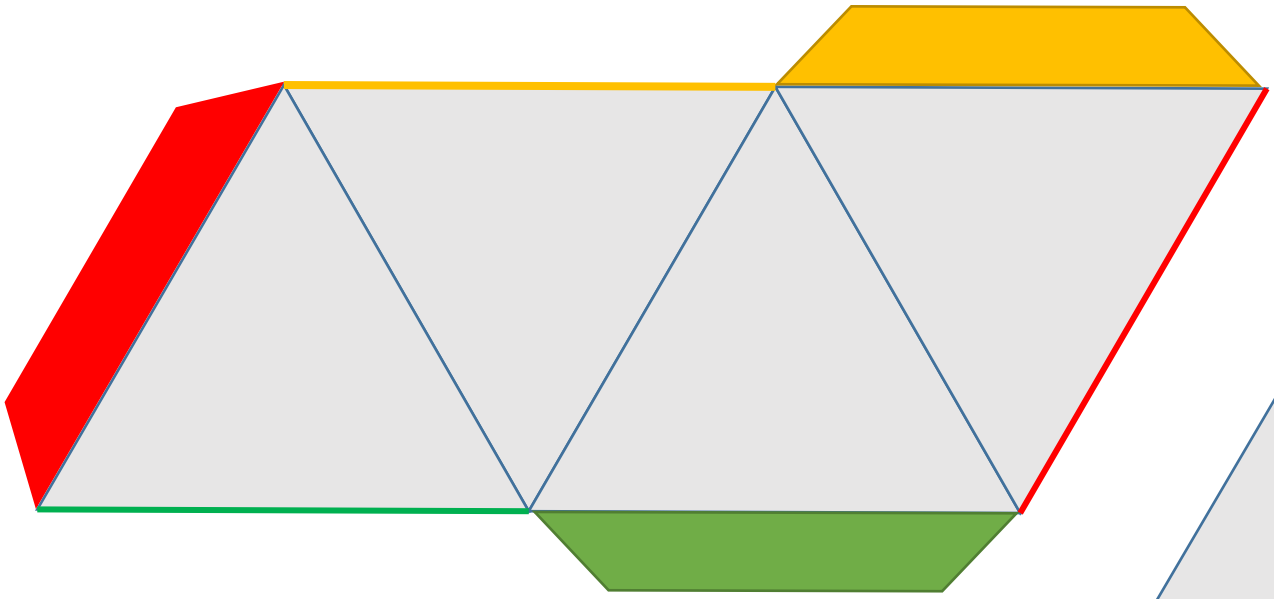
4 sided dice

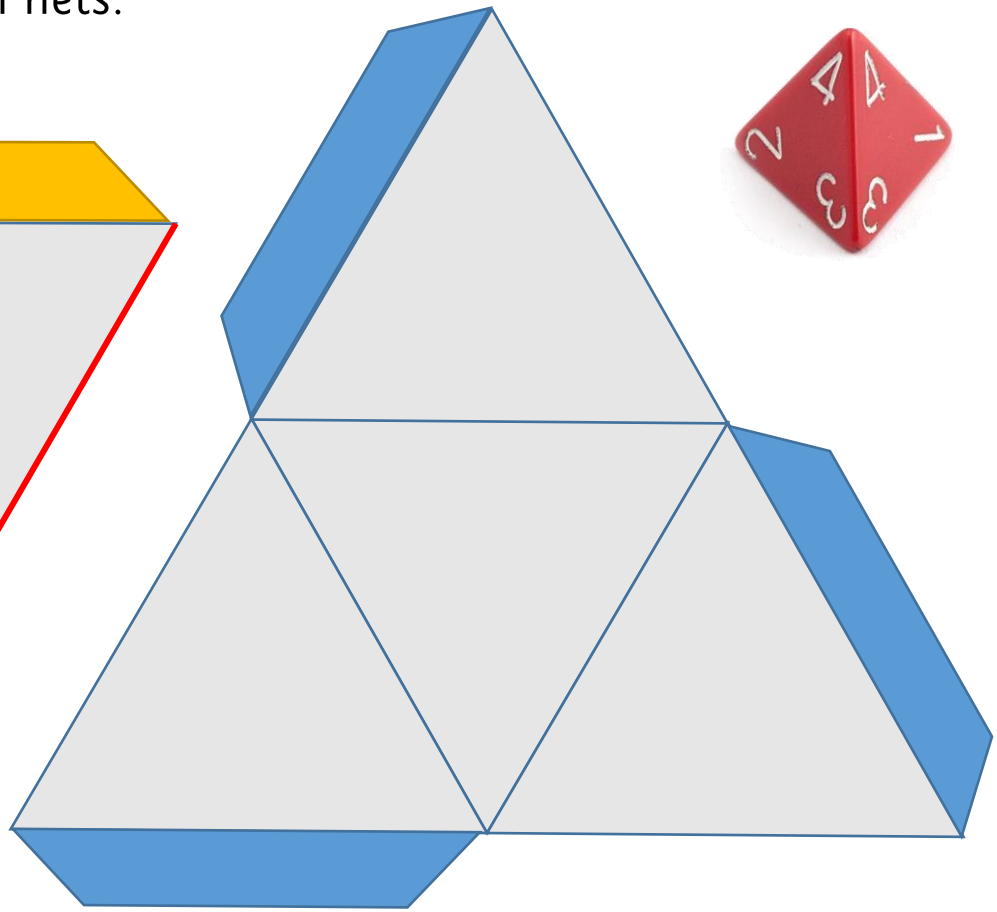
KS1 KS2

Dice come in lots of shapes and sizes. In Mongolia, they traditionally used sheep bones as a kind of dice that had 4 possible outcomes (sheep, goat, camel, horse) depending on which side it landed on.

We tend to use platonic solids as dice to make the eventual outcome as fair as possible. Try making 4 sided dice with one of these tetrahedron nets.

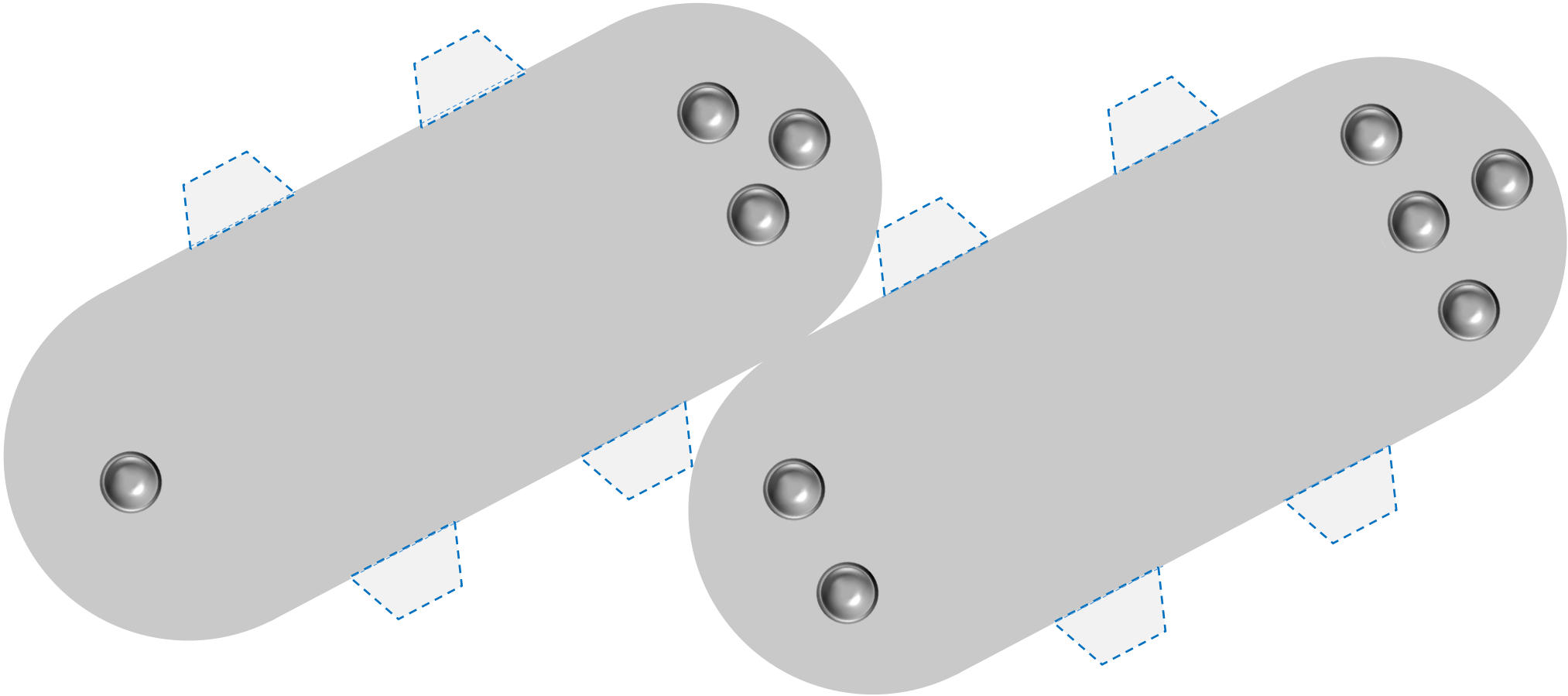
Where would you need to put the numbers?





4 sided roundish dice?

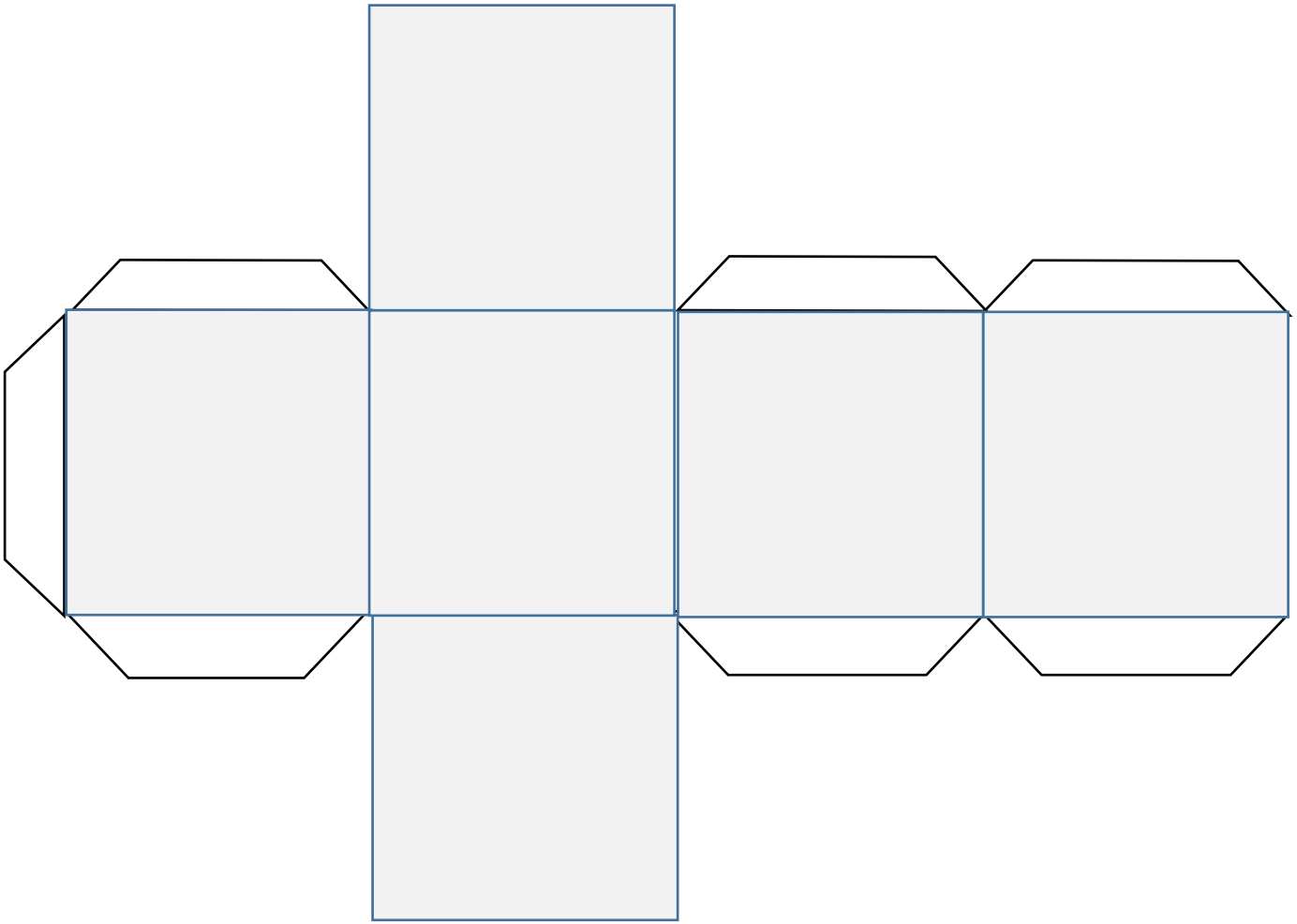
How would you make this 4 sided dice?
What do you think the finished 3D shape would look like?



A Cube die

This is the type of dice that we are most familiar with. See if you can put it together and add the numbers in. Or you could design different arrangements of dice pips for then numbers.

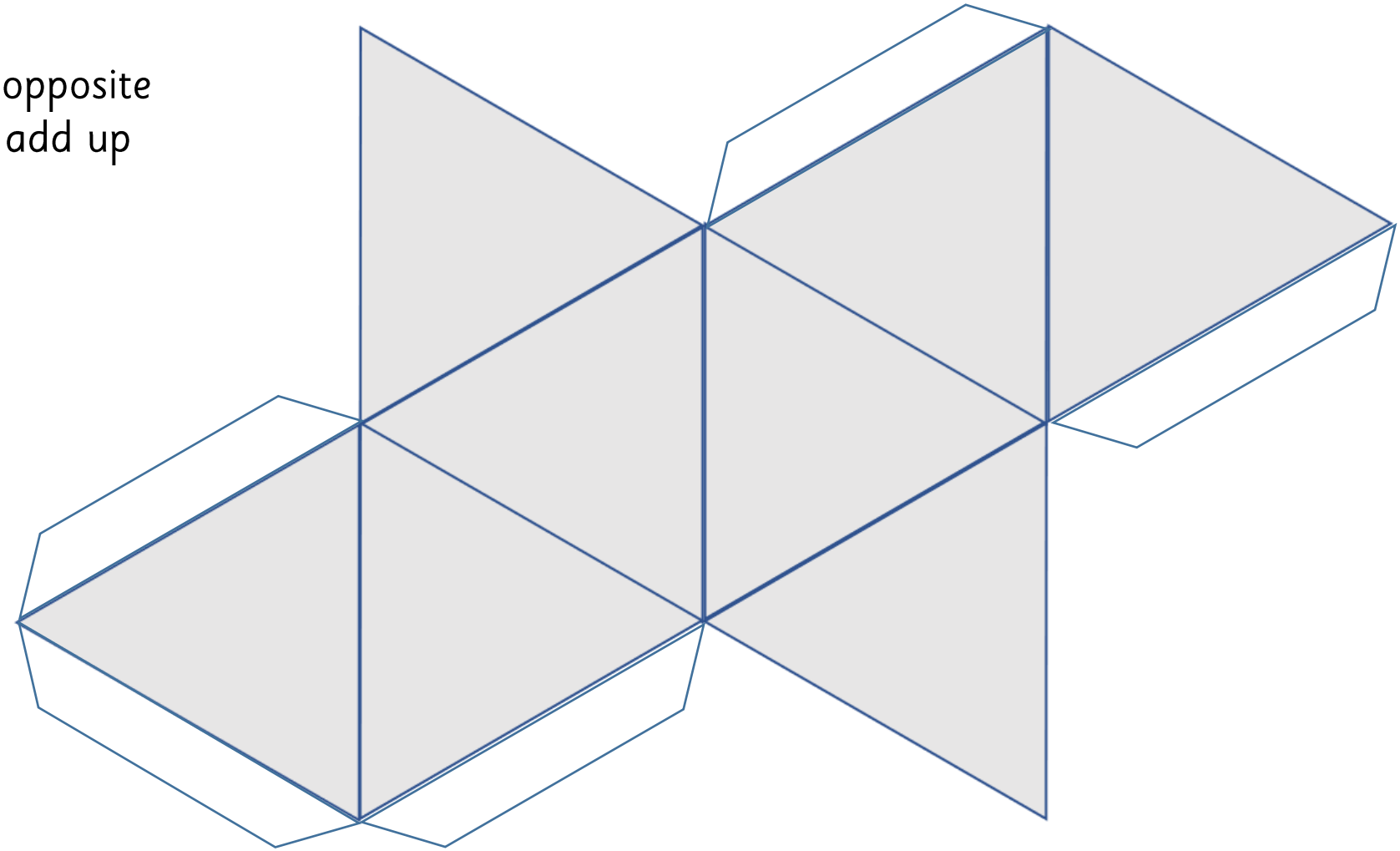
Numbers on opposite faces should add up to 7



Octahedron Die

An octahedron is made out of 8 triangles. It looks like two pyramids stuck together. Cut these shapes up and see if you can put them together to make an octahedron. See if you can add the numbers that would be on the die.

Numbers on opposite faces should add up to 9

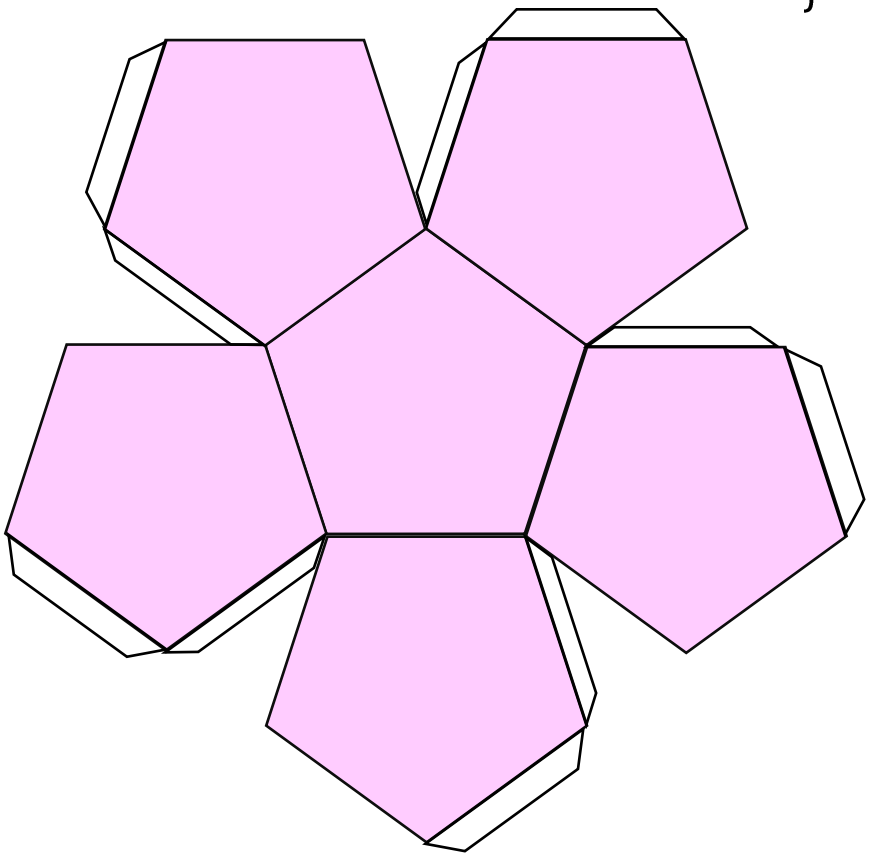


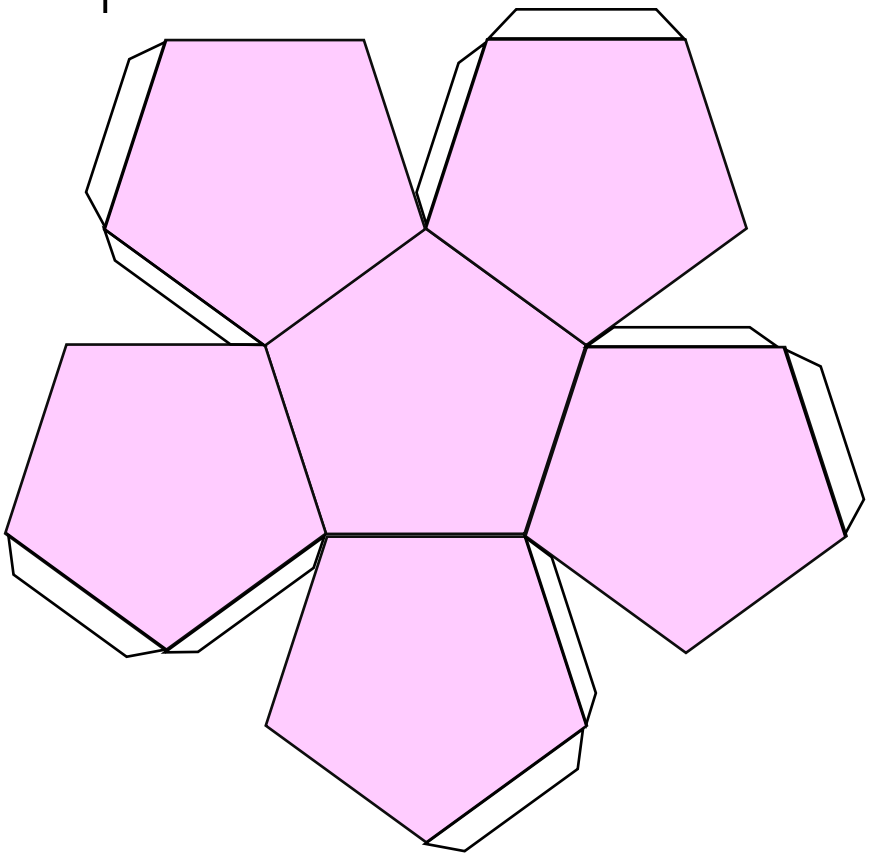
Dodecahedron Die

KS1 KS2 KS3

A dodecahedron is made out of 12 pentagons. Cut these shapes up and see if you can put them together to make a dodecahedron. See if you can add the numbers that would be on the die.

Numbers on opposite faces should add up to 13

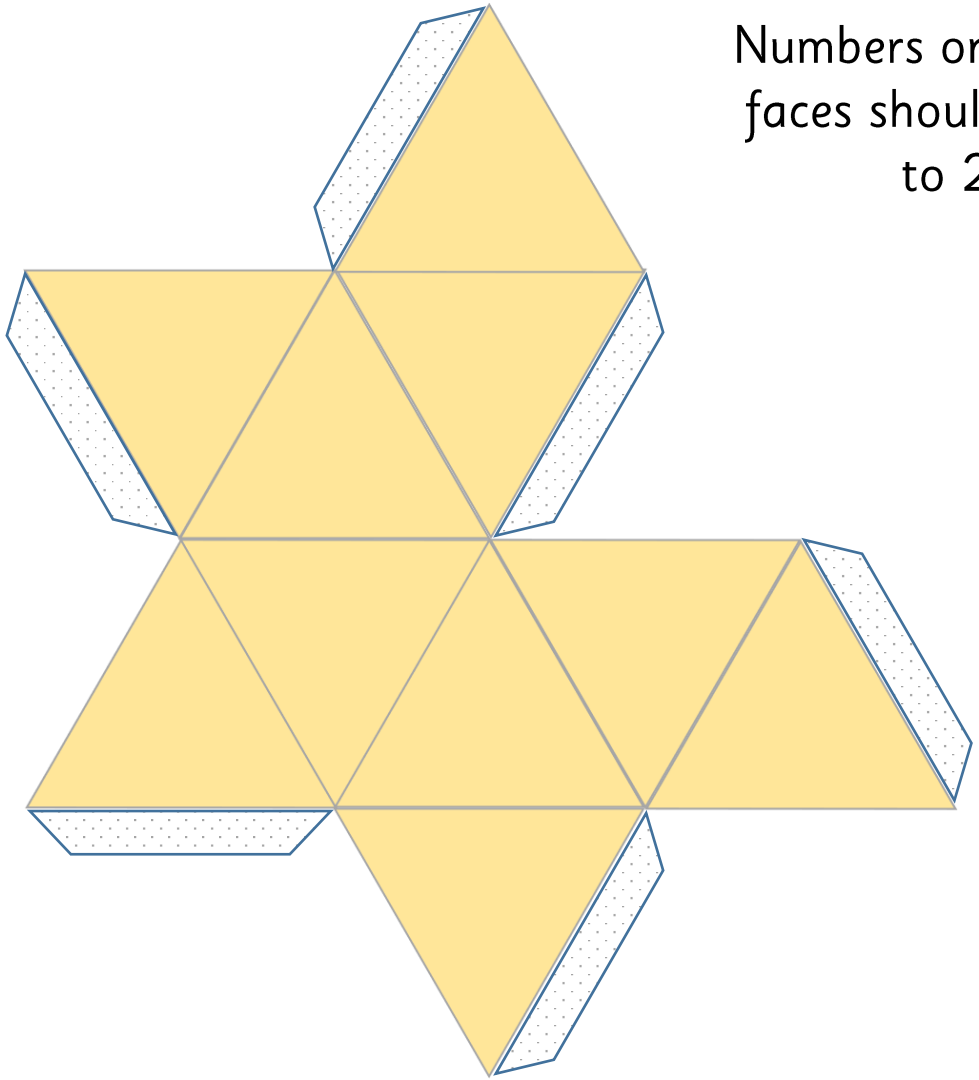


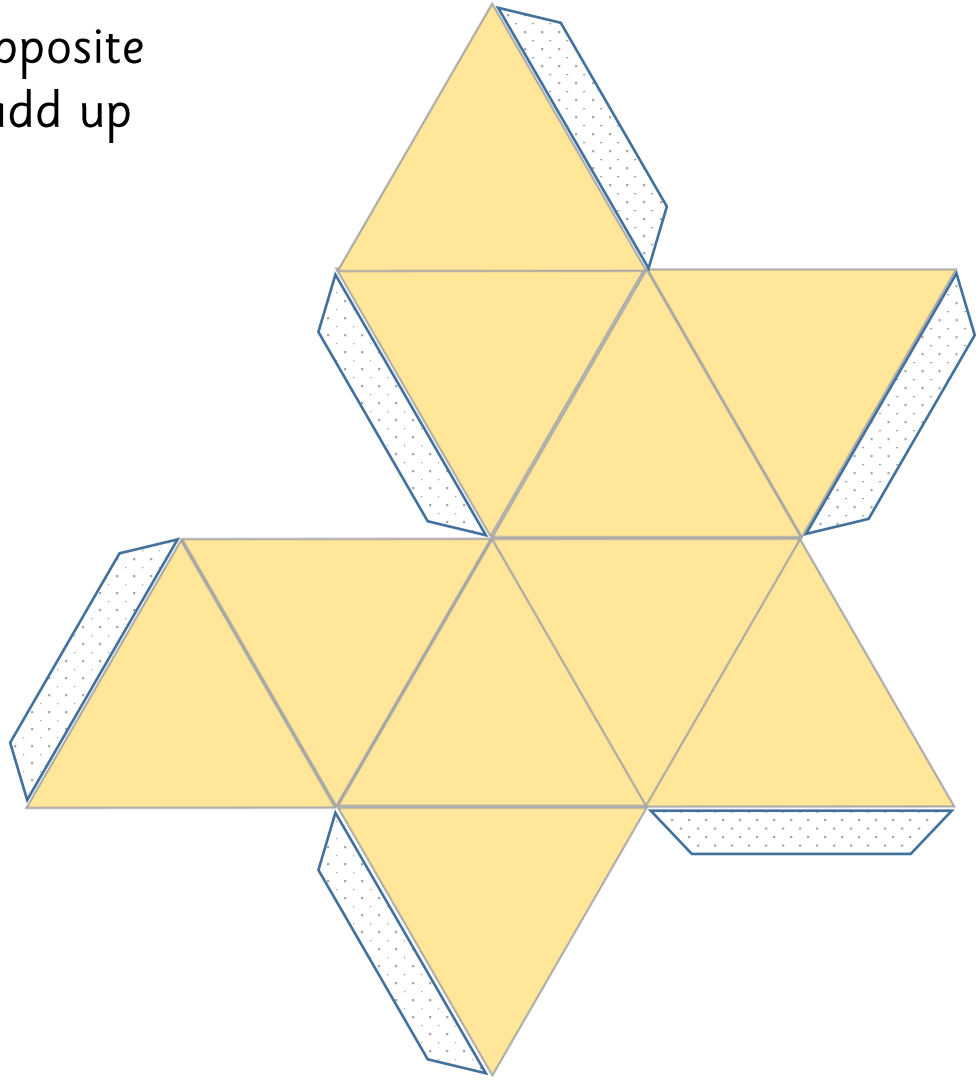


20 sided dice

An Icosahedron is made out of 20 triangles. Cut these shapes up and see if you can put them together to make an icosahedron. See if you can add the numbers that would be on the die.

Numbers on opposite faces should add up to 21





The Platonic Solids

The dice below are a group known as the Platonic Solids. Each face, edge and vertex is the same as the others on the shape. We can work out how many of each by investigating the component shapes that make them up.

	1 Triangle	4 Triangles	1 Tetrahedron
Edges			
Vertices			

	1 Square	6 Squares	1 Cube
Edges			
Vertices			

	1 Triangle	8 Triangles	1 Octahedron
Edges			
Vertices			

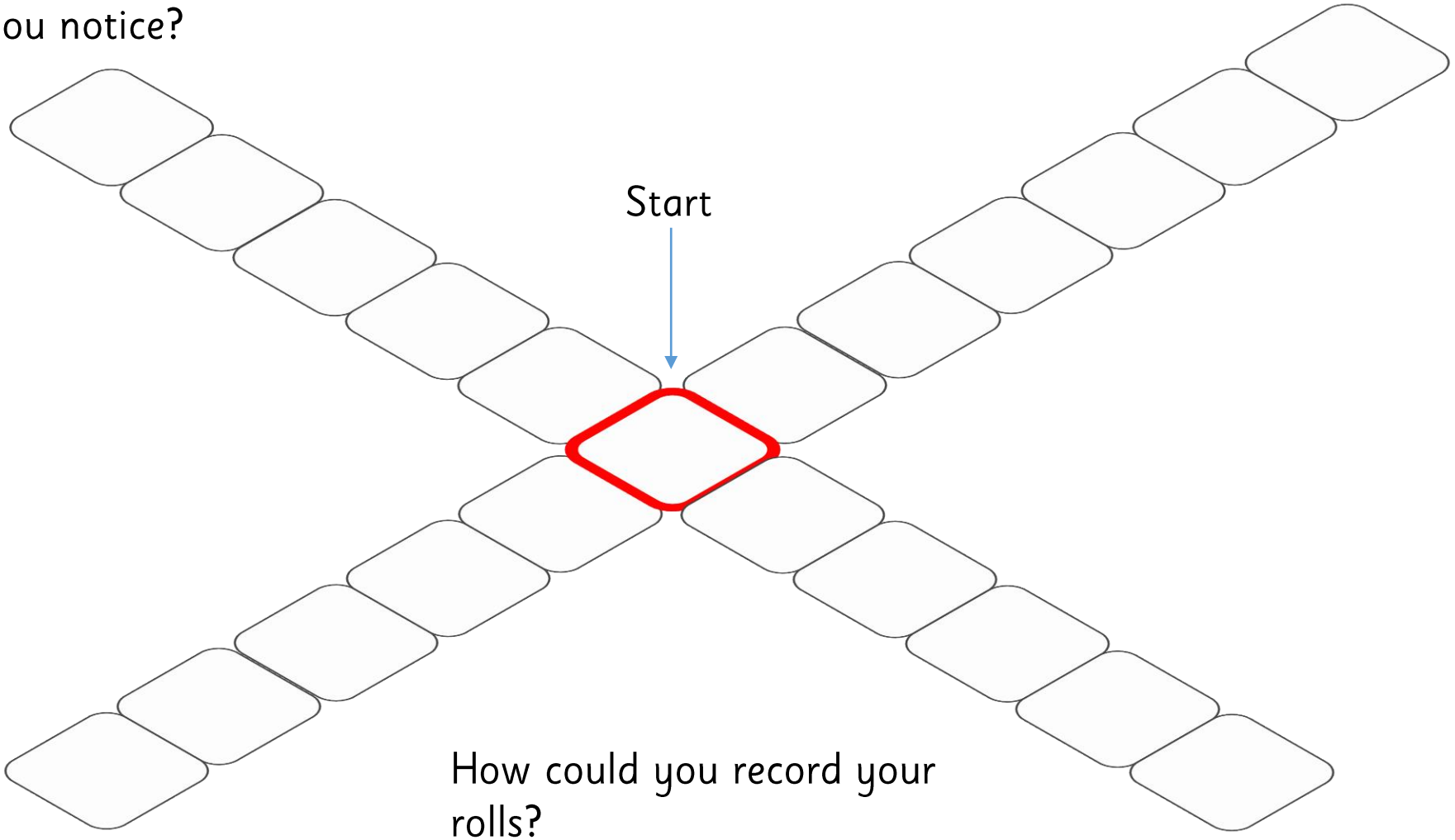
	1 Pentagon	12 Pentagons	1 Dodecahedron
Edges			
Vertices			

	1 Triangle	20 Triangles	1 Icosahedron
Edges			
Vertices			

Example: A square has 4 sides. Each side combines with one other to make an edge. So 6 x 4 sides is 24 sides. 24 sides ÷ 2 is 12 edges.

Dice Mazes

The die starts in the centre of this cross with a 6 at the top. Imagine rolling the die from square to square. What number will end up on top in each square? What patterns do you notice?

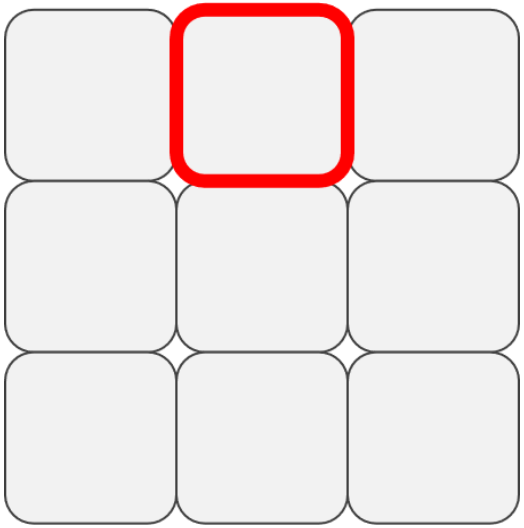


How could you record your rolls?

Dice Mazes

In these mazes, you need to roll a die from square to square and see what numbers appear.

Start on the square with the red border with a 6 at the top. Try to roll it to the centre with a 1 at the top.



How could you record your rolls?

If you start with a six showing at the start, what numbers do you end with? Does the route make a difference?