




















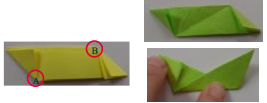








Slide 1	 <p>Advanced Mathematics Support Programme®</p>	
Slide 2	  <p>Origami paper</p> <ul style="list-style-type: none"> You need square paper for all origami Square post-its were used for this construction. They work well for this, however you can use standard square origami paper. If you need to make square paper, instructions are available at this link https://bit.ly/squarefrom4 	
Slide 3	  <p>Dodecahedron origami</p> <ul style="list-style-type: none"> We will construct a dodecahedron The dodecahedron has been made from 3 colours, with the 3 different colours meeting at each vertex. You don't have to use this colouring. 	You can do all one colour, or another challenge is to have 5 colours, with each pentagonal face made out of one of each colour. This is definitely worth planning out first!
Slide 4	  <p>Polyhedrons</p> <ul style="list-style-type: none"> The platonic solids are 3D shapes that have congruent faces. How many can you name? A dodecahedron is a platonic solid. How many edges and faces does it have? Use Euler's polyhedron formula to calculate how many vertices a dodecahedron has. 	Students could also spend some time exploring polyhedral and discovering Euler's polyhedron formula if they haven't come across it before.
Slide 5	  <p>Making each module</p> <ul style="list-style-type: none"> The dodecahedron is made from 30 separate edge pieces. To use the 3 colour strategy, you need to make 3 sets of 10 pieces. 	
Slide 6	  <p>Step 1</p> <ul style="list-style-type: none"> Take your post – it or origami paper Fold it in half, then unfold it If using postits, you need to fold the sticky edge up to meet the other edge (then unstick it) 	

Slide 7	  <p style="text-align: center;">Step 2</p> <ul style="list-style-type: none"> • Fold both halves in to the central line. • If you are using post it notes, one of these will be stuck together. This is fine (it actually makes the next steps a bit easier) • Fold back in the middle crease so you have an zig zag (you will have an N shape with a post-it or an MW shape with standard origami paper) 	
Slide 8	  <p style="text-align: center;">Step 3</p> <ul style="list-style-type: none"> • Fold along the zig zag edges to make a rectangle with ¼ width of the original paper • Fold the bottom left corner up to meet the top line. • Rotate 180 degrees and do the same 	
Slide 9	  <p style="text-align: center;">Step 4</p> <ul style="list-style-type: none"> • Crease along the middle diagonal, between the position A and B. • Make sure your creases are sharp as this makes the next stage easier and more stable. 	
Slide 10	  <p style="text-align: center;">Step 5</p> <ul style="list-style-type: none"> • Get folding! • You need 30 of these pieces in total, preferably in 3 different colours, 10 of each. 	
Slide 11	  <p style="text-align: center;">Answers</p>	
Slide 12	  <p style="text-align: center;">Polyhedrons</p> <ul style="list-style-type: none"> • The platonic solids are 3D shapes that have congruent faces. How many can you name? <p>There are 5 platonic solids – cube, tetrahedron, octahedron, dodecahedron and icosahedron.</p> <ul style="list-style-type: none"> • A dodecahedron is a platonic solid. How many edges and faces does it have? <p>30 edges, 12 faces</p> <ul style="list-style-type: none"> • Use Euler's polyhedron formula to calculate how many vertices a dodecahedron has. $V + f - e = 2, \text{ so } V = 2e - f$ $V = 2 + 30 - 12 = 20 \text{ vertices}$	