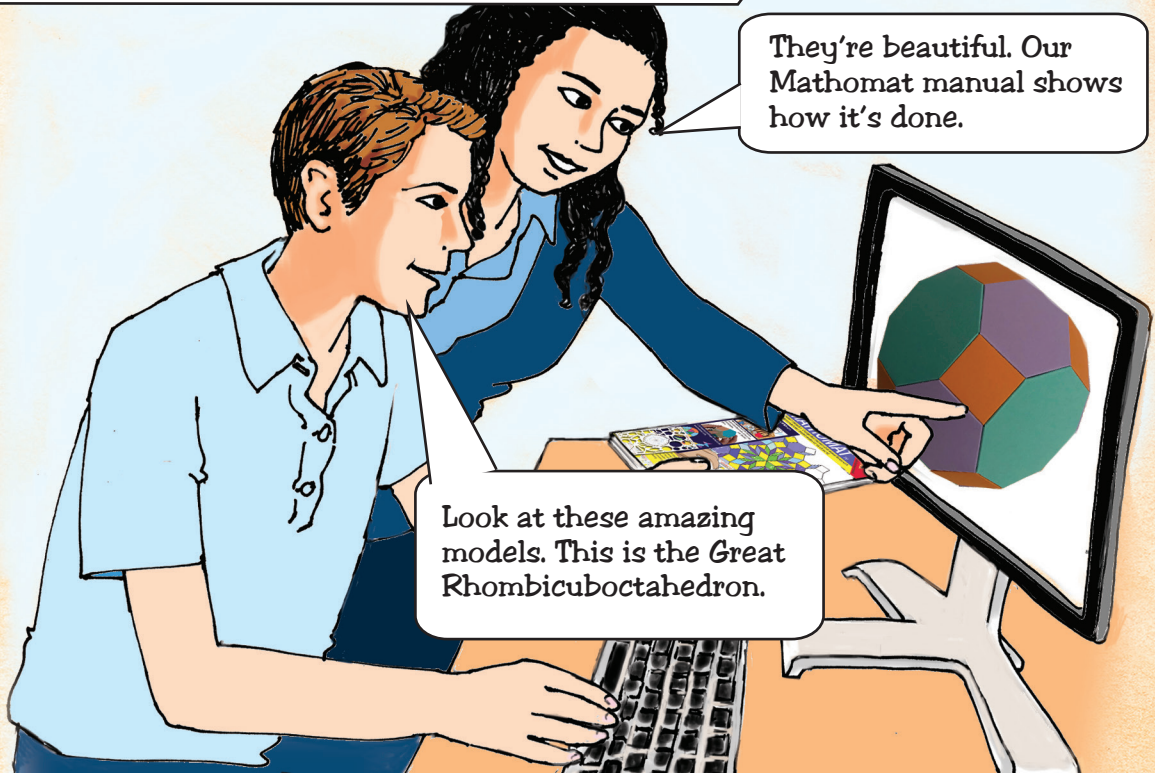


# Constructing the Archimedean solids with Mathomat I

Jack and Livvy are looking at MAC, on the Mathomat website.

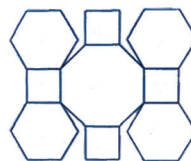


They're beautiful. Our Mathomat manual shows how it's done.

Look at these amazing models. This is the Great Rhombicuboctahedron.

The Mathomat V7 and V5 templates have the shapes needed to make these models. Start by spending time on the Mathomat website to find one that really interests you. Consider its design, the way it has been made, and the colour and type of cardboard used. Making some of these models physically is essential for understanding their geometry (you don't have to make them all!).

The next screen shows the net, or plan, to make each model. The Great Rhombicuboctahedron is one of 13 Archimedean solids. They have 2 or more regular polygons at each vertex. Each model type has only one unique vertex pattern.



We can use the special **REGULAR POLYGON** expansion scale on our Mathomat V7.

Let's make ours a giant model with 50mm side lengths.



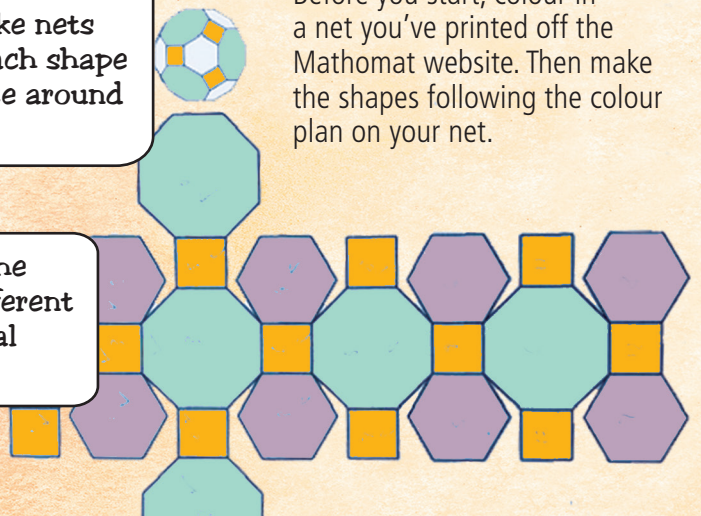
Here are some tips:

For large models like this I found it better to make nets from templates for each shape individually. You trace around the shape...

Before you start, colour in a net you've printed off the Mathomat website. Then make the shapes following the colour plan on your net.

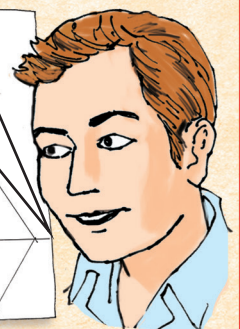
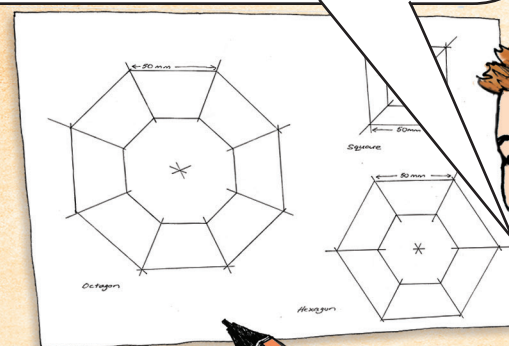
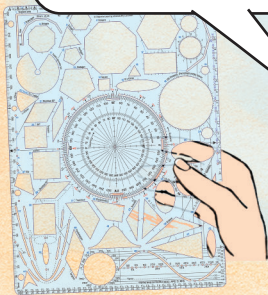


...that way you can use the colours you want for different shapes and be economical with the card.



To make a large Great Rhombicuboctahedron I have increased the side lengths of the faces drawn with my V7 template from 20mm to 50mm. Here is how I did it:

I can see from the net that I will need squares, hexagons and octagons for faces. I've used shapes 21, 6 and 7 on my Mathomat V7.

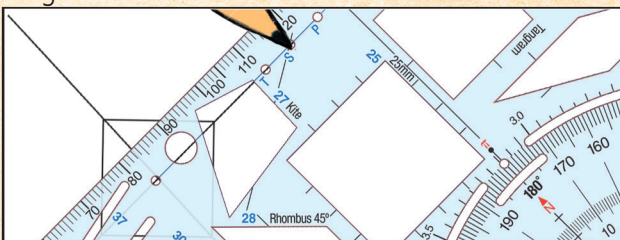


## Face making method 2

**Step 1:** Draw in the face using Mathomat.

**Step 2:** To scale the shape up draw lines through the vertices.

**Step 3:** Position the zero point of the Mathomat regular polygon expansion scale in the centre of the face and mark the extension lines at correct length for 50mm sides.



**Step 4:** Join up the end points of the lines to create your enlarged face.



We have started scaling up the square face. Use your Mathomat scale to finish it.

You can make faces for the Archimedean solids by simply drawing them using the 20mm sided regular polygons in Mathomat V7. We call this **Face making method 1**. Find more useful methods in **MAC** (activities 6.4 and 6.5).

