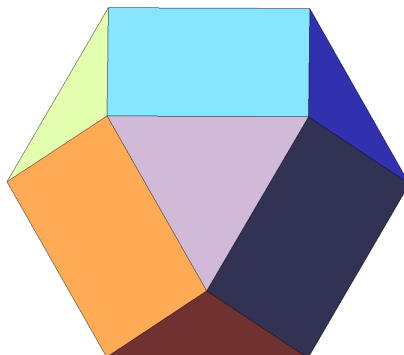# Space Chips

The picture below shows a cuboctahedron (thanks to Wikimedia foundation):

Every corner looks the same: as you go around it, you see a triangle, a square, a triangle, and a square. By counting the number of sides of each of these shapes that meet at any corner, we can call it a (3,4,3,4) polyhedron. Or we can say "The recipe for a cuboctahedron is (3,4,3,4)."

1. Make a model of a cuboctahedron.

2. How many triangles and how many squares are needed to make a cuboctahedron?

3. By building the shapes, fill in the chart on the next page. Warning: some of those recipes are impossible!

4. Which recipes are impossible? How can you tell? Is there a way to predict, just by looking at the recipe, whether it's going to work?

5. Think up some more recipes of your own and try them out!

6. Is there a way to predict how many triangles, squares, and pentagons you'll need, just by looking at the recipe and doing some calculations, without actually building the shape?

Recipe	Triangles	Squares	Pentagons	Name
(3,4,3,4)				**Cuboctahedron**
(4,4,4)				
(3,3,3)				
(5,5,5)				
(3,3,3,3)				
(3,5,3,5)				
(4,5,4,5)				
(3,3,3,3,3)				
(3,4,5)				
(3,4,3,5)				
(3,3,5)				
(3,3,3,5)				