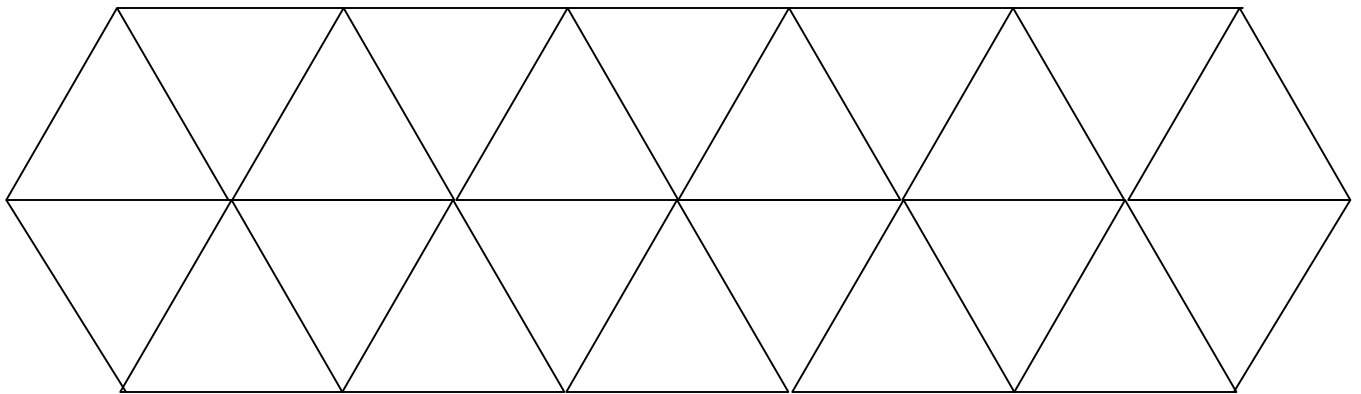


Math Circles

Polyhedra

We have learned about polygons, regular polygons and about filling up the plane with regular polygons (tessellations).



You also learned about nets of squares used to build cubes.

Question: What 3-dimensional objects can we build with nets of regular polygons?

Example: Equilateral triangles

How many do we need to fold a 3D object with triangles as faces?

1 triangle

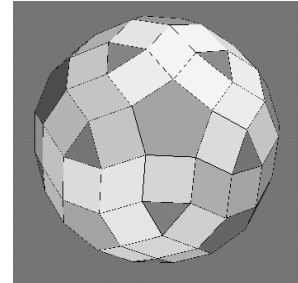
2 triangles

3 triangles

4 triangles

Polyhedra

A polyhedron is a figure in 3-dimensions with flat faces and straight sides. The **faces** of a polyhedron are polygons.

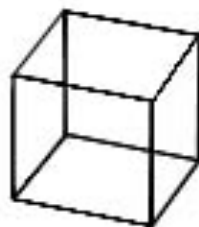


A polyhedron is **regular** if all its faces are the same, and the same number of faces meet at each corner.

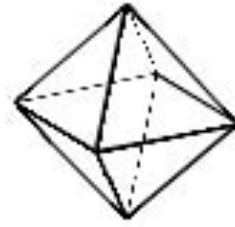
The **Platonic solids** are regular polyhedra whose faces are regular polygons.



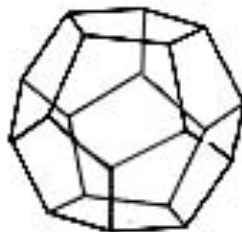
tetrahedron



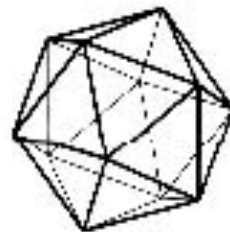
cube



octahedron

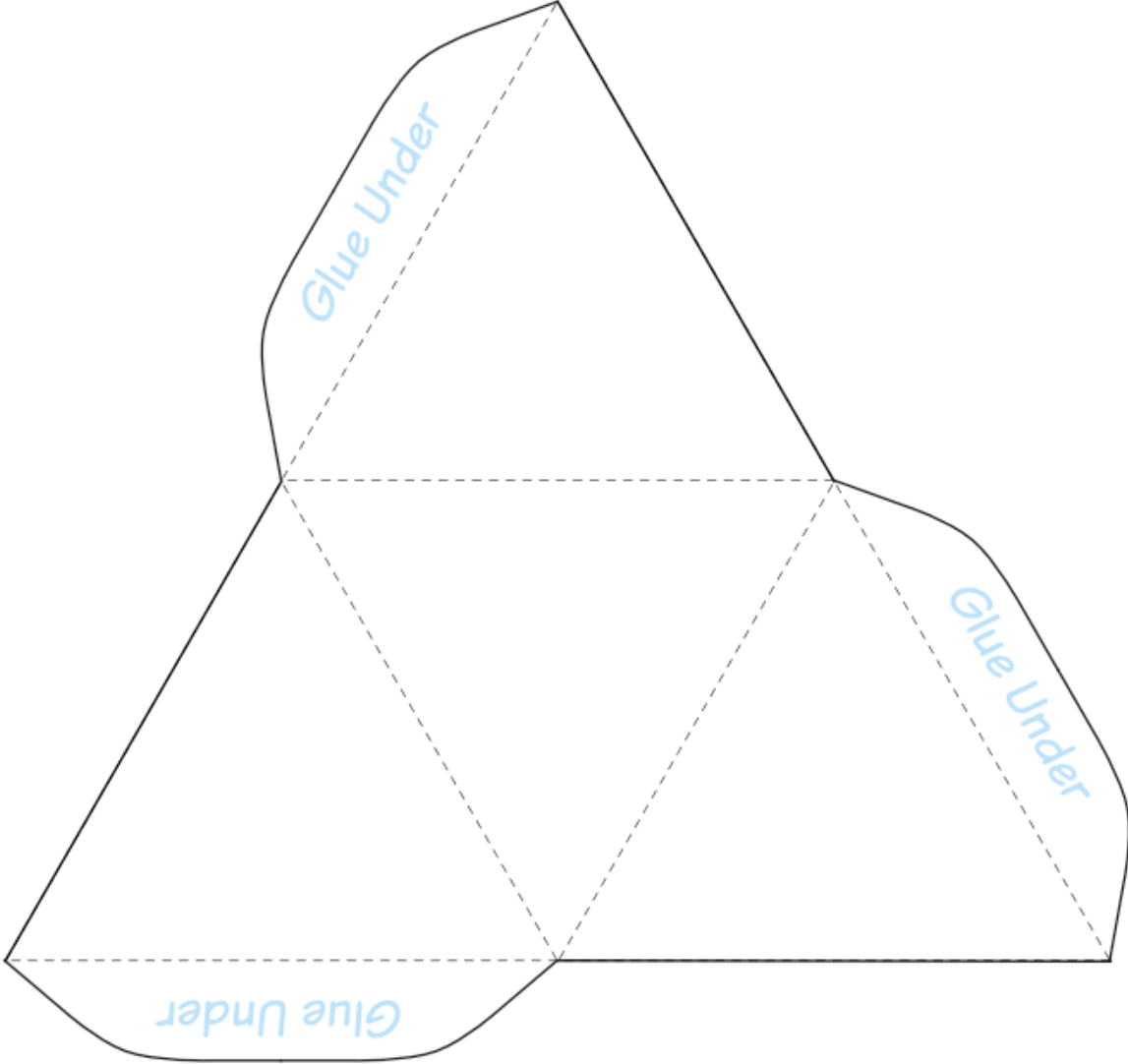
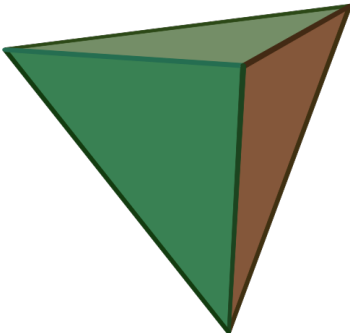


dodecahedron

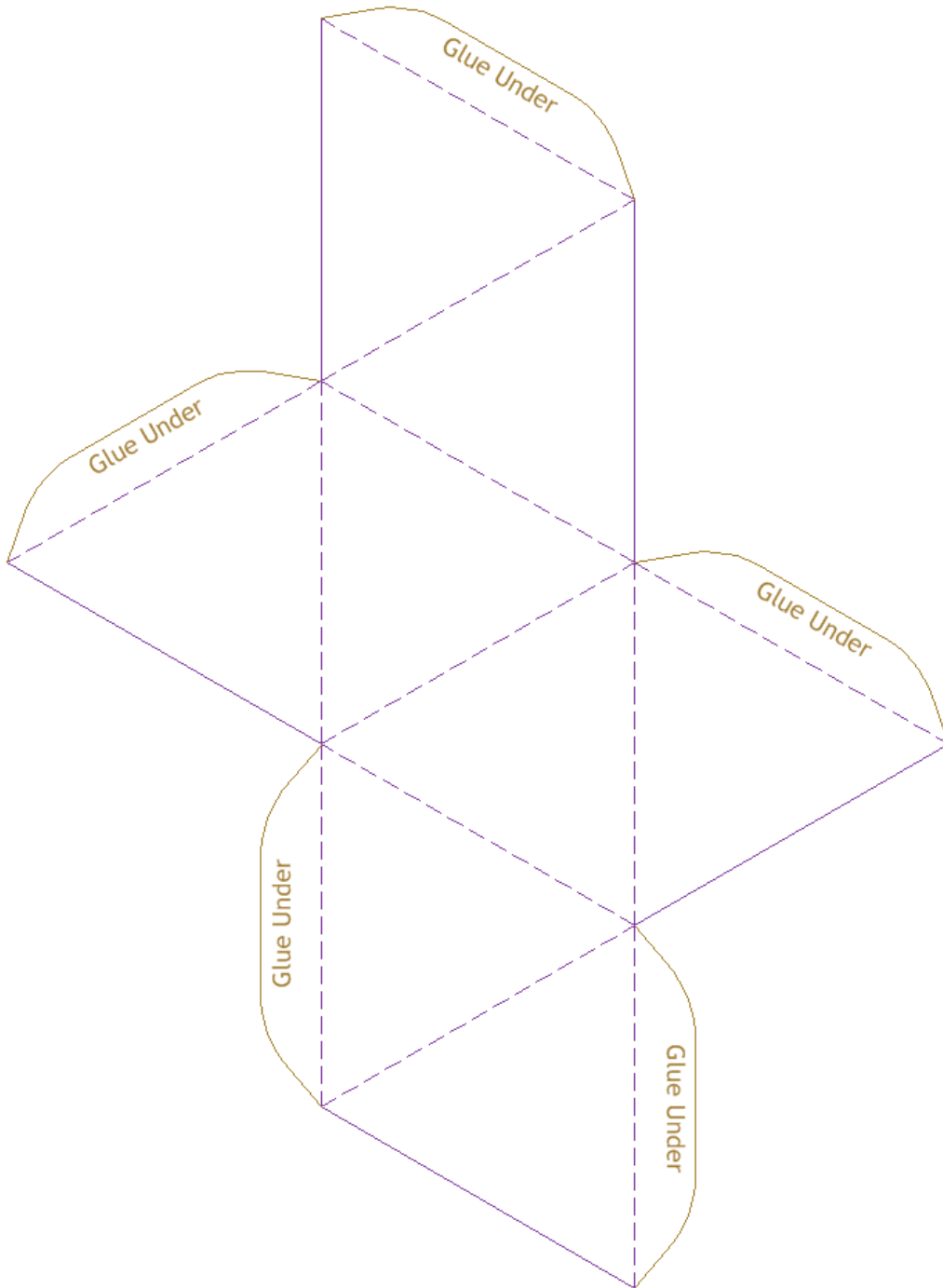
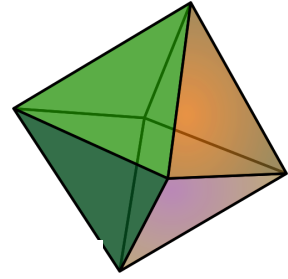


icosahedron

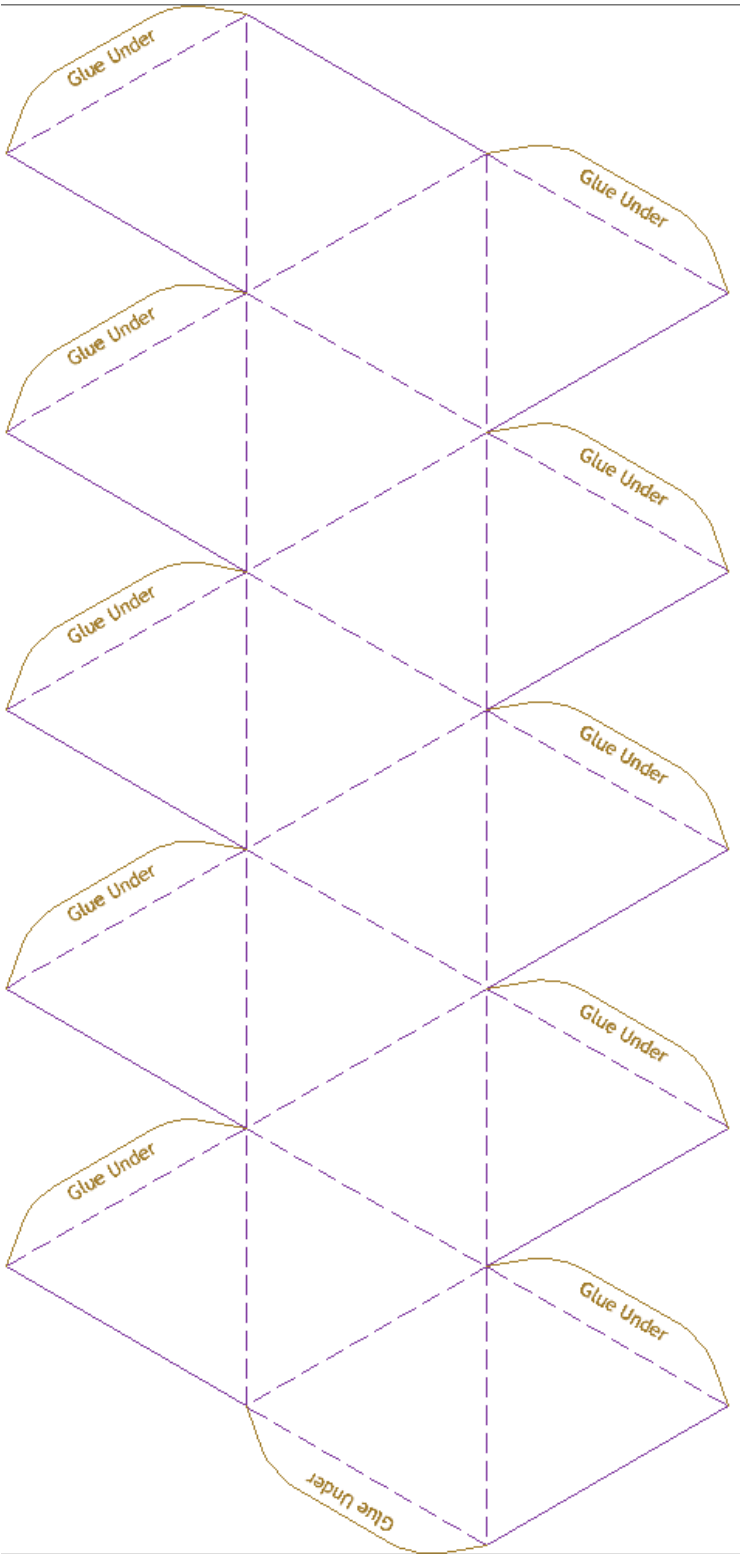
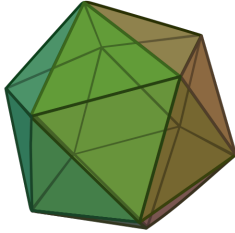
Tetrahedron (4 triangles)



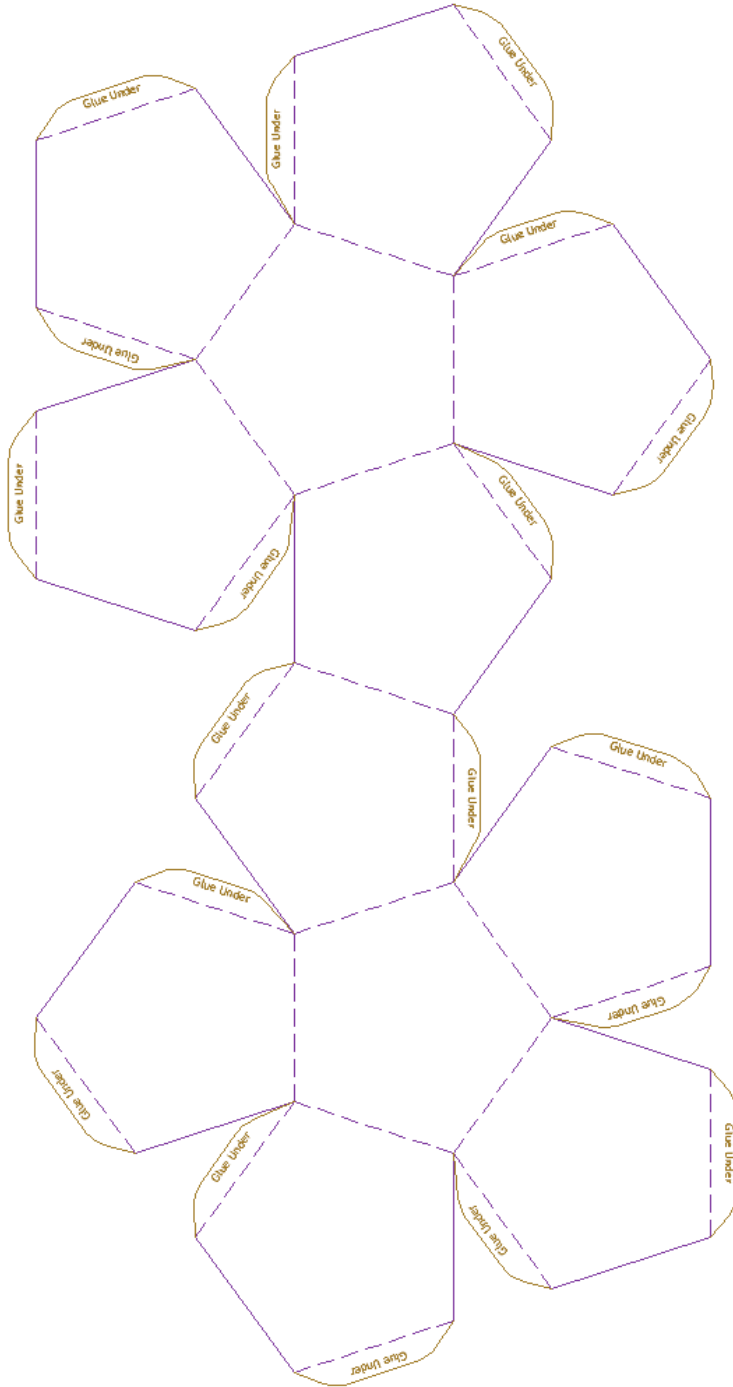
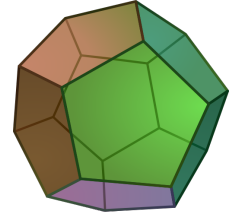
Octahedron (8 triangles)



Icosahedron (20 triangles)



The last platonic solid, the **dodecahedron**, is built with 12 pentagons!



HOMEWORK

Build different nets of equilateral triangles to construct one or two of the platonic solids. Turn in your drawings.