Project – Coloring Platonic Solids:

Problem Set 3: Exploring Other Platonic Solids and Euler Number

Name:

How do we make Platonic Solids??

- You only can pick one kind of regular polygon.
- All faces must be made up with the polygon you chose.
- Each vertex has the same number of faces.

1. Make three more platonic solids other than tetrahedron and hexahedron with toothpicks and gumdrops. (Hint: there are platonic solids made with origami in this classroom…)
2. In tetrahedron, 4, 3 stands for 4 faces, each face has 3 sides. Also 3, 3, 3 shows that around each vertex, we have 3 figures with 3 sides. Use this notation to describe other platonic solids. (**)
3. Make a table with the number of vertices, edges, and faces of all polygons up to decagon.
4. According to Euler, there is a special formula relating the number of vertices, edges, and faces that can be applied to any polygon. What is that? (**) Show more examples.
5. Make a table with the number of vertices, edges, and faces of all platonic solids including the tetrahedron and hexahedron.
6. According to Euler, there is a special formula relating the number of vertices, edges, and faces that can be applied to any polyhedron. What is that? Show more examples.
7. If you make a hole on a triangle or square, how many vertices, edges, and faces does it have? Is there any special relationship like P4?
8. What if you have two holes side-by-side? (*)
9. If you make a square tunnel through the center from top to bottom of hexahedron, how many vertices, edges, and faces does it have? Is there any special relationship like P6?
10. How many vertices, edges, and solids does it have if you make two tunnels side-by-side? Is there any special relationship? (*)
11. How many vertices, edges, and solids does it have if you make two tunnels that meet at right angles through the center of a hexahedron? Is there any special relationship? (*)