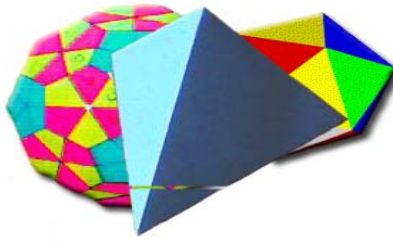


Polyhedra Patterns



Crystals and their structure (crystallography) involve the study of polyhedra. For examples and photos of some common crystals, go online to the website <http://mathforum.org/alejandre/workshops/chart.html>. Here you will see the crystals halite and spinel described as cubic with squares for their six faces.

Viruses that cause colds and meningitis and their structure are also connected to the study of polyhedra. An important discovery in medicine (1985) found that these viruses were shaped like icosahedrons enabling scientists to better understand their structure with new avenues for research.

The structure of polyhedra has many real-world applications from nature to medicine. You will be investigating the structure of some common polyhedra and finding a relationship among the vertices, edges, and faces.

1. Use coffee stirrers and play doh to make the following polyhedra: tetrahedron, hexahedron, octahedron, pentagonal prism, triangular prism, pentagonal pyramid.
2. Record the number of vertices, faces, and edges in table 1 and look for patterns.
3. Write a generalization that relates the vertices, faces, and edges.
4. Study each different face of the polyhedra and complete table 2. Write a generalization for the relationship among the vertices, face(s), and edges of these two-dimensional figures.
5. Compare the generalizations from table 1 and table 2. What do you observe?

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Complete the tables below using the data from your investigations of polyhedra built with coffee stirrers and play doh.

Table 1

Polyhedron	Number of Faces	Number of Vertices	Number of Edges
Tetrahedron			
Hexahedron			
Octahedron			
Pentagonal Prism			
Pentagonal Pyramid			
Triangular Prism			

Table 2

Shape of Polyhedron Face(s)	Number of Face(s)	Number of Vertices	Number of Edges
Triangle			
Square/Rectangle			
Pentagon			
Hexagon			