A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a solid that is bounded by polygons, called \_\_\_\_\_\_\_\_\_\_\_\_ that enclose a single region of space. An\_\_\_\_\_\_\_\_\_\_ of a polyhedron is a line segment formed by the intersection of two faces. A \_\_\_\_\_\_\_\_\_\_\_\_ of a polyhedron is a point where three or more edges meet.

Illuminations Activity Webiste:

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=70>

1. Go the website listed above.
2. Go to the “tetrahedron” option from the “select a shape” menu.
3. Select a color from the black box
4. Click on each face of the polyhedron, dragging the shape around until all faces are covered. \*Be sure not to select any edges or vertices
5. Record the number of faces in the table below
6. Select a new color and select all the edges of the polyhedron
7. Record the number of edges in the table below
8. Select a new color and select all the vertices of the polyhedron
9. Record the number of vertices in the table below
10. To check if everything is colored, you can click “net”
11. Repeat steps 4-10 for the remaining polyhedrons

|  |  |  |  |
| --- | --- | --- | --- |
| **Polyhedron** | **# of Faces** | **# of Edges** | **# of Vertices** |
| **Tetrahedron** |  |  |  |
| **Cube** |  |  |  |
| **Octahedron** |  |  |  |
| **Dodecahedron** |  |  |  |
| **Icosahedron** |  |  |  |

1. Explore the numbers of faces, edges, and vertices of each polyhedron. Is there a relationship between the three? (\*Hint- They will not be equal to each other right away, you may have to *add* something)
2. Write a formula to represent the relationship between a polyhedron’s faces, edges, and

vertices.

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