

TAKE IT TO THE MAT

A NEWSLETTER ADDRESSING THE FINER POINTS OF MATHEMATICS INSTRUCTION

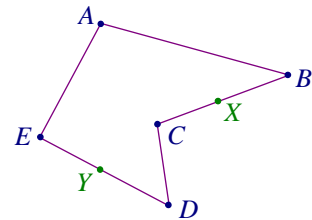


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It's an understatement to say that vocabulary is important in mathematics. Precise use of mathematical terminology is critical to communicating effectively in math. Furthermore, the most often cited reason for students performing poorly on standardized tests is that they do not understand mathematical language. In this issue of *Take It to the MAT*, we'll look at some geometric vocabulary that often gets mixed up or overlooked.

First, we'll look at various aspects of two-dimensional figures, specifically polygons. Consider the polygon shown at right. Identify the following parts of the figure: *points*, *sides*, and *vertices*.



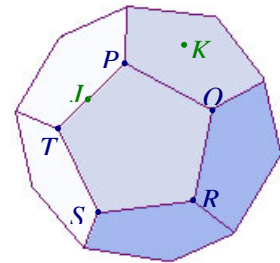
Points. $A, B, C, D, E, X,$ and Y are all *points*. There are an infinite number of *points* on the polygon, but here only seven of them are labeled.

Sides. This polygon has five *sides* which are the segments \overline{AB} , \overline{BC} , \overline{CD} , \overline{DE} , and \overline{EA} .

Vertices: $A, B, C, D,$ and E are the *vertices* of the polygon. *Vertices* (singular: *vertex*) are the endpoints where two sides of the polygon intersect. X and Y are not *vertices*.

At times, students, teachers, and even textbooks refer to “edges” or “corners” in polygons. There are no edges in this figure. It is incorrect to refer to *sides* as edges. *Vertices* as sometimes identified as “corners,” but that a descriptive term, not a mathematical one. If corner is used, the correct vocabulary words *vertices* and *vertex* should also be used.

Now, we'll look at parts of the three-dimensional figures known as polyhedra (singular: polyhedron). Consider the polyhedron shown at right. Identify the following parts of the figure: *points*, *faces*, *edges*, and *vertices*.



Points. $J, K, P, Q, R, S,$ and T are all labeled *points*. There are an infinite number of *points* on the polyhedron, but here only seven of them are labeled.

Faces. *Faces* are the plane surfaces that define a polyhedron. As *sides* are line segments that make up a polygon, *faces* are polygons that make up a polyhedron. The pentagon $PQRST$ is one of the many faces of this polyhedron.

Edges. The edges of a polyhedron are the line segments where two faces intersect. Three of the many edges in this polyhedron are \overline{PQ} , \overline{QR} , and \overline{TP} .

Vertices. $P, Q, R, S,$ and T are *vertices* on the polyhedron. There are several more. *Vertices* are points where three faces of the polyhedron intersect. J is a point on an edge, and K is a point on a face, but neither is a *vertex*.

As with polygons, students, teachers, and sometimes refer to “sides” or “corners” in polyhedra. Polyhedra do not have sides; they have *faces*. It is incorrect to refer to either the *edges* or *faces* as sides. And again, *vertices* may be called corners, but corner is incorrect terminology and should be avoided.