New or Recently Introduced Terms

- **Altitude and Base of a Triangle** (An altitude of a triangle is a perpendicular segment from a vertex of a triangle to the line containing the opposite side. The opposite side is called the base. For every triangle, there are three choices for the altitude, and hence there are three base-altitude pairs. The height of a triangle is the length of the altitude. The length of the base is called either the base length or, more commonly, the base. Usually, context makes it clear whether the base refers to a number or a segment. These terms can mislead students: base suggests the bottom, while height usually refers to vertical distances. Do not reinforce these impressions by consistently displaying all triangles with horizontal bases.)

- **Cube** (A cube is a right rectangular prism all of whose edges are of equal length.)

- **Hexagon** (Given 6 different points $A, B, C, D, E,$ and $F$ in the plane, a 6-sided polygon, or hexagon, is the union of 6 segments $AB, BC, CD, DE, EF,$ and $FA$ such that (1) the segments intersect only at their endpoints, and (2) no two adjacent segments are collinear. For both pentagons and hexagons, the segments are called the sides, and their endpoints are called the vertices. Like quadrilaterals, pentagons and hexagons can be denoted by the order of vertices defining the segments. For example, the pentagon $ABCDE$ has vertices $A, B, C, D,$ and $E$ that define the 5 segments in the definition above. Similar to quadrilaterals, pentagons and hexagons also have interiors, which can be described using pictures in elementary school.)

- **Line Perpendicular to a Plane** (A line $L$ intersecting a plane $E$ at a point $P$ is said to be perpendicular to the plane $E$ if $L$ is perpendicular to every line that (1) lies in $E$ and (2) passes through the point $P$. A segment is said to be perpendicular to a plane if the line that contains the segment is perpendicular to the plane. In Grade 6, a line perpendicular to a plane can be described using a picture.)

- **Parallel Planes** (Two planes are parallel if they do not intersect. In Euclidean geometry, a useful test for checking whether two planes are parallel is if the planes are different and if there is a line that is perpendicular to both planes.)

- **Pentagon** (Given 5 different points $A, B, C, D,$ and $E$ in the plane, a 5-sided polygon, or pentagon, is the union of 5 segments $AB, BC, CD, DE,$ and $EA$ such that (1) the segments intersect only at their endpoints, and (2) no two adjacent segments are collinear.)

- **Right Rectangular Prism** (Let $E$ and $E'$ be two parallel planes. Let $B$ be a rectangular region in the plane $E$. At each point $P$ of $B$, consider the segment $PP'$ perpendicular to $E$, joining $P$ to a point $P'$ of the plane $E'$. The union of all these segments is called a right rectangular prism. It can be shown that the region $B'$ in $E'$ corresponding to the region $B$ is also a rectangular region whose sides are equal in length to the corresponding sides of $B$. The regions $B$ and $B'$ are called the base faces (or just bases) of the prism. It can also be shown that the planar region between two corresponding sides of the bases is also a rectangular region called the lateral face of the prism. In all, the boundary of a right rectangular prism has 6 faces: the 2 base faces and 4 lateral faces. All adjacent faces intersect along segments called edges—base edges and lateral edges.)

- **Surface of a Prism** (The surface of a prism is the union of all of its faces—the base faces and lateral faces.)

- **Triangular Region** (A triangular region is the union of the triangle and its interior.)

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1 A rectangular region is the union of a rectangle and its interior.