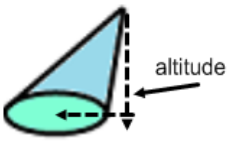
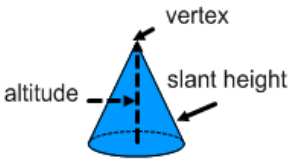
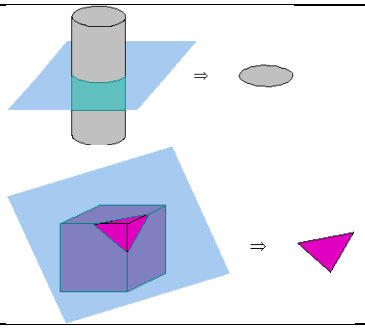
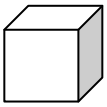
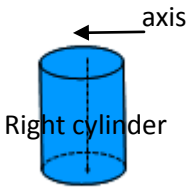
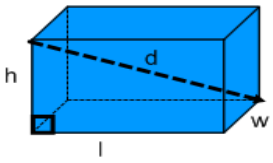
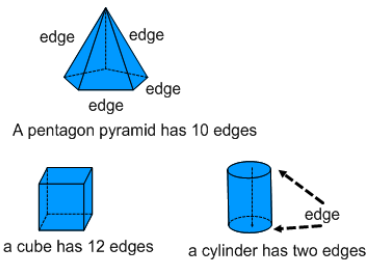
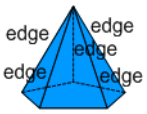
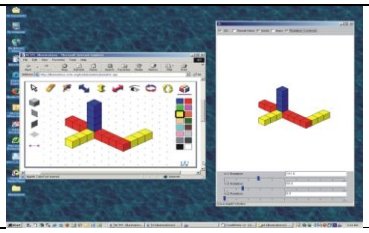
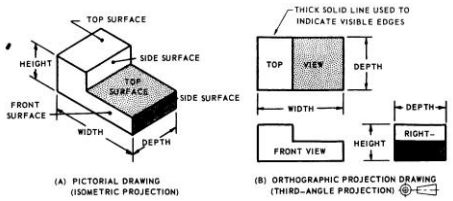
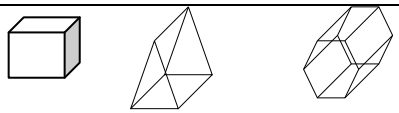
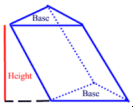
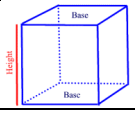
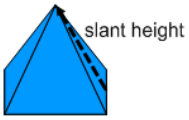
Unit 10 Notes

Vocabulary

Vocabulary Term	Definition	Example
altitude	in a geometrical figure, the perpendicular distance from the vertex to the plane of the base	See illustrations of each three-dimensional figure
Cone	an object or shape that has a circular base and tapers to a point at the top, or has a circular top and tapers to a point at the bottom	See oblique and right cone
*Altitude of a cone	The perpendicular distance from the vertex of the cone to the circular base	
*Axis of a cone	the line containing the vertex of a conic solid and the center of the base	
*Oblique cone	A non-right cone • Is there a slant height for an oblique cone? • Explain. • Does it have an axis? • Explain.	
*Right cone	a cone whose axis is perpendicular to the plane containing its base	
*Slant height of a right cone	The distance from the edge of the base to the vertex	
*Vertex of a cone	The point that marks the thinnest part of a cone. It is opposite the base of the cone.	

Cross-section of a polygon	A cross-section of a space figure is the shape of a particular two-dimensional "slice" of a space figure.	
Cube	A six sided polyhedron whose faces are all squares. It has 6 faces, 12 vertices, and 18 edges.	
Cylinder	A three-dimensionl figures with two circular or oval bases whose net contains a rectangle.	
• Axis of a Cylinder	A line connecting the centers of the bases of a cylinder	
• Right Cylinder	A cylinder whose axis is perpendicular to both bases.	
Diagonal of a Right Prism	A segment whose endpoints are vertices of two different faces	
Distance formula for 3-D figures	The length of a diagonal of a prism is	d =$\sqrt{l^2 + w^2 + h^2}$
Edge of a 3-D figure	The segment that intersects two faces of a polyhedron.	

*Lateral Edge of a polyhedron	The segment that connects the vertices of the bases to form the sides	
Euler's Formula	For any polyhedron with V vertices, F faces and E edges,	V – E + F = 2.
Face of a polyhedron	The polygons that form the sides and bases of a polyhedron	
*Lateral face of a polyhedron	The polygons that form the sides of a polyhedron	
Isometric Drawing	A way to show three sides of a figure from a corner view.	
Orthographic Drawing	A drawing that shows a three-dimensional object in which the sight for each view is perpendicular to the plane of the picture. It shows 6 different views of the object: front, back, top, bottom, left side, and right side	
Midpoint Formula for 3-D figures	$\left(\frac{\Delta x}{2}, \frac{\Delta y}{2} \frac{\Delta z}{2}\right)$	
Perspective Drawing	Non-vertical parallel lines are drawn so that the meet at the vanishing point	
Polyhedron	A closed three-dimensional figure formed by 4 or more polygons that intersect only at their edges	
Prism	A polyhedron with rectangular sides and two congruent bases.	
• Oblique Prism	A prism that has at least one nonrectangular lateral face	
• Right Prism	A prism whose lateral faces are all rectangles.	
Pyramid	A polyhedron with one polygonal base and triangular sides that meet at a common vertex.	

*Regular pyramid	A pyramid whose base is a regular polygon and whose lateral faces are isosceles triangles	
*Slant height of a regular pyramid	The distance from the vertex of a regular pyramid to a midpoint of an edge of the base	
*Vertex of a pyramid	The point of intersection of the lateral faces of a pyramid. It is opposite be base of the pyramid.	
Sphere		
*Surface Area of a sphere	The formula for finding the surface area of a sphere is	S = $4\pi r^2$
*Volume of a sphere	The formula is	V = $\frac{4}{3}\pi r^3$
*Lateral Surface Area	The sum of the areas of the sides of a polyhedron. Formulas are at the right, P is the perimeter, C is the circumference, height is the height and l is the slant height.	Lateral Surface area of a prism = Ph Lateral Surface area of a pyramid = ½ Pl Lateral Surface area of a cylinder = Ch Lateral surface area of a cone = ½ Pl
Vanishing Point	A point where lines meet on the horizontal line called the horizon	vanishing point
Vertices of a polyhedron	The point where three faces meet.	

Volume	The number of non-overlapping unit cubes that will exactly fill the interior of a three-dimensional figure	V = Bh, where B is the area of the base and h is the altitude of the figure. $V_{cube} = s^3$ because the area of the base is s^2 and the height is s. $V_{cylinder} = \pi r^2 h$ because the area of a circle is $A = \pi r^2$ $V_{cone} = 1/3\ \pi r^2 h$ because a cone is 1/3 of a cylinder. • The volume of any prism is found by multiplying the area of its base by its height. • The volume of a pyramid is found by taking 1/3 the area of the base times its height.

Resources:

http://www.mathleague.com/help/geometry/3space.htm#cone

http://islamiclanguage.net/DIY53d.swf Click on the shapes, the circle marked “cross-sections”, and nets”. They are at the base of the illustration. Click on the side bar icons and check your understanding.