Grade 6
Math Unit 1
Canterbury Public Schools

Subject	Math
Grade Level	6
Unit Title	Area and Surface Areas/ Volume
Unit Goals	Area and Surface Area Section Reasoning to Find Area Compare areas of the shapes that make up a geometric pattern Comprehend that the work area refers to how much of the plane a shape covers Calculate the area of a region by decomposing it and rearranging the pieces, and explain the solution method Parallelograms Compare and contrast different strategies for calculating the area of a polygon Find the area of a polygon by decomposing rearranging, subtracting, or enclosing shapes and explain the solution method Include appropriate units when stating the area of a polygon Triangles Polygons Surface Area Squares and Cubes Volume: determine the surface area and volume of shapes made out of cubes Explain how it is possible for two polyhedra to have the same surface area but different volumes, or to have different surface areas but the same volume.
Pacing (# of weeks)	6 -8 weeks
Standards	6.G.A Reason with shapes and their attributes, solve real world and mathematical problems involving area, surface area, and volume 6.G.A.1 find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and their shapes 6.G.A.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing or decomposing them. 6.G.A.2: Find the volume of a right rectangular prism.

	6.G.A.4: Represent three-dimensional figures using nets and use the nets to find surface area. 6.EE.A.2: Write, read, and evaluate expressions in which letters stand for numbers (supporting work in this unit).
Students will know:	Area is amount of a plane a shape covers The relationship between shapes The meaning for two figures to have the same If a figure is decomposed and rearranged to compose another figure, they its area is the same as the area of the original figure If two figures can be placed one on top of another so that they match exactly, then they have the same area If a square is divided in half using two small triangles, then the area of each small triangle is have the area of the unit square A square can be decomposed into exactly two small (medium, large) triangles, so the area of each small (medium, large) triangle must be have of that squareDefinitions and properties of polygons, right triangles, rectangles, parallelograms, and trapezoids.How to use area formulas for different 2D shapes. That a net is a two-dimensional representation of a 3D figure.The difference between surface area and volumeThe process for calculating surface area Exponents and their role
Skills (be able to do)	Explain the meaning of area Show that the area of a figure is additive by composing polygons with a given area Explain how to find the area of a figure that is composed of other shapes Find the area of a figure by decomposing it and rearranging its parts Use different reasoning strategies to find the area of shapes Decompose a figure into shapes whose areas can be calculated Decompose and rearrange a shape into areas that can be calculated A figure is a shape with one or more missing pieces, calculate the area of the shape, then subtract the areas of the missing pieces Use a dot to represent multiplication Construct logical arguments X = is a variable Decompose complex shapes to find area. Represent three-dimensional figures using nets. Calculate surface area from a net or a 3D drawing. Apply numerical expressions to represent and solve geometric problems. Describe and name polyhedra by their attributes and functions

	Calculate volume Use squaring to find an amount Write an equation
Essential Questions	How is the area of a trapezoid compared to the area of a triangle? (shape to shape) How can you describe “area”? What is “area”? How can I find the area of a complex shape? What strategies help me visualize and calculate the surface area of a solid? How do different representations (diagrams, expressions, models) help solve geometric problems? How do you determine volume?
Enduring Understandings	If two figures can be placed one on top of the other so they match up exactly, then they have the same area A region can be decomposed and rearranged without changing its area The sum of the area of the pieces is equal to to area of the original figure If a figure is composed of non-overlapping pieces, its area is equal to the sum of the areas of the pieces- area is additive The area of a figure can be found by adding the area of its parts. The sum of the areas of the pieces is the area of a figure. If we decompose a given figure into pieces, then the area of the given figure is the sum of the areas of the pieces.Even when rearranged, the overall area does not change. Area can be determined by decomposing figures into familiar shapes. Surface area is the sum of areas of all the faces of a three-dimensional figure. Nets help visualize the surface area of three-dimensional shapes. Area of complex figures can be found by breaking them into familiar shapes. Surface area is the total area covering a 3D object and can be calculated from nets. Mathematical expressions can represent and solve geometric problems.
Vocabulary	Area, region, plane, gap, compose, decompose, rearrange two-dimensional, shaded, strategy, parallelogram, base, corresponding, expression, represent, horizontal, vertical, identical, opposite vertex, edge, polygon,face, surface face, polyhedron, net, prism, pyramid, volume, appropriate, quantity, squared, cubed, exponent, edge length, value, estimate, description, congruent Square, squaring, cube
Common Learning	Analyze patterns,the amount of the plane is covered b each shape in a pattern

Experiences	Partner discussions Create a tiling pattern with criteria Practice problems Use shapes to create new shapes Compose a single large square/ what is the area? Creating with tangrams **Common Learning Experiences** 1. **Hands-On Investigation**: Students use grid paper to compose and decompose composite shapes to find area. 2. **Real-World Exploration**: Measuring classroom objects (e.g., binder, box, door) and calculating surface area. 3. **Gallery Walk of Nets**: Groups create nets for 3D shapes and post them; students rotate, calculate, and comment. 4. **Interactive Tools**: Use of virtual manipulatives and digital apps (e.g., GeoGebra, Desmos) to unfold nets. 5. **Collaborative Learning**: Partner tasks to solve area and surface area problems, discuss strategies, and reflect. 6. **Error Analysis**: Students analyze incorrect student work (provided by teacher or IM resources) and correct it. Cool Downs and Warm ups
Assessments	**Performance Tasks** ● **Design a Sculpture (Project)**: Students design a sculpture made of boxes and prisms. They calculate the surface area for materials and compare costs. ● **Create a Net**: Students receive a 3D object and create a labeled net to calculate its surface area. **Other Evidence** ● Quizzes on area of 2D figures

	● Exit tickets demonstrating understanding of surface area ● Homework practice problems from IM curriculum ● Reflection journal: “What surprised me about surface area?” MId unit assessments End of Unit assessments
Resources	Glue sticks, index cards, nets of polyhedra, models of polyhedra, rulers, scissors, snap cubes, sticky notes, tape Geometry tool kits- tracing paper, graph paper, colored pencils, index cards, protractors, compases, tangrams
Strategies	Think, Pair, Share Which One Doesn’t Belong? Anticipate, monitor, select, connect Hands on experimentation Math talks