# **Geometric Measurement Discussion Guide (for use during or after reading)**

1. How can one determine the perimeter of an irregular polygon? How can one determine the perimeter of a regular polygon? (Polygons and Perimeter, p. 6-9)
   1. Perimeter measures the distance around a figure. In order to determine the perimeter of a figure, like an irregular polygon, we can add the lengths of all the sides together. In order to determine the perimeter of a regular polygon, we can multiply the length of one side by the total number of sides.
2. What formula is used to find the area of a triangle? Use it to determine the area of a triangle with a base of 3 in and a height of 4 in. (Area of Triangles, p. 10-13)
   1. The formula used to find the area of a triangle is , where *A* represents the area of the triangle, *b* represents the length of the base, and *h* represents the height.
   2. If we use that formula, we can determine that a triangle with a base of 3 in and a height of 4 in has an area of 12 square inches.
3. How does the formula for the area of squares and rectangles relate to the formula for the area of triangles? (Area of Triangles and Area of Squares and Rectangles, p. 10-15)
   1. The formula for the area of squares and rectangles is . This relates to the formula for the area of a triangle () because a triangle covers half the space of a square or rectangle, so it makes sense that its formula includes multiplying by the fraction .
4. What is a composite figure? How can one find the area of a composite figure? (Area of Composite Figures, p. 16-19)
   1. A composite figure is one that can be broken down into a combination of smaller figures. For example, a composite figure may combine two rectangles together to form an irregular polygon. Likewise, a composite figure may “take away” a smaller figure, such as a square from the middle of a circular shape. In order to find the area of composite figures, we can first find the area of their individual pieces and then combine them (or subtract, depending on the situation).
5. What is the formula for the area of a parallelogram? Use it to determine the height of a parallelogram if its base is 7 cm and its area is 42 sq. cm. (Area of Parallelograms with No Right Angles, p. 20-21)
   1. The formula for the area of a parallelogram is the same as those of rectangles and squares, . In this example, 42 = *b* x7. If we apply our knowledge of expressions and equations, we can divide 42 by 7 to determine that *b*, the base, is equal to 6 cm.
6. What is the formula for the area of a trapezoid? Use it to determine the area of a trapezoid with a height of 3 cm and bases of 6 cm and 8 cm. (Area of Trapezoids, p. 22-23)
   1. The formula for the area of a trapezoid is . If we use our algebraic thinking, we can solve that expression to find the area as 21 square cm.
7. What is a coordinate plane? How can it be used in geometry? (Measurements on the Coordinate Plane, p. 24-25).
   1. In geometry, a coordinate plane can be used to place figures on a grid. This can be helpful when trying to visualize figures. In addition, coordinate grids can help us count to determine the area and perimeter of figures, especially those with perpendicular corners.
8. Define and describe the following circle measurement vocabulary terms: diameter, radius, and circumference. (Circle Measurements, p. 26-29)
   1. The diameter is the distance across a circle through its center.
   2. The radius is the distance from the center of a circle to any point on its edge. Because of this, the radius is one half of the diameter.
   3. The circumference is the measure of the distance around a circle.
   4. When you compare the circumference and the diameter of any circle, you will notice they form a specific ratio: .
9. What is the formula for the circumference of a circle? What is the formula for the area of a circle? If the diameter of a circle is 6 mm, what is its circumference and area? (Circle Measurements, p. 26-29)
   1. The formula for the circumference of a circle is , or . The formula for the area of a circle is .
   2. If the diameter of a circle is 6mm, its circumference is 6π mm and its area is 36π square cm.
10. How do you determine the volume of a rectangular prism? What is the volume of a rectangular prisms with a length of 3 inches, a width of 9 inches, and a height of 4 inches? (Volume of Rectangular Prisms, p. 30-33)
    1. In order to determine the volume of a rectangular prism, you can multiply the length, width, and height together. For example, a prism with a length of 3 inches, a width of 9 inches, and a height of 4 inches has an area of 4 in x 9 in x 3 in, or 108 cubic inches.