Richmond Public Schools

Curriculum Framework

Grade 6

Strand: Measurement and Geometry	
6.7 The student will **a) derive π (pi);** **b) solve problems, including practical problems, involving circumference and area of a circle; and** **c) solve problems, including practical problems, involving area and perimeter of triangles and rectangles.**	
Suggested Pacing	
Third Nine Weeks-6 instructional days	
Related Standards	
5.8 The student will a) solve practical problems that involve perimeter, area, and volume in standard units of measure; and b) differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation. **5.10** The student will identify and describe the diameter, radius, chord, and circumference of a circle.	**7.4** The student will a) describe and determine the volume and surface area of rectangular prisms and cylinders; and b) solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders. **8.6** The student will a) solve problems, including practical problems, involving volume and surface area of cones and square-based pyramids; and b) describe how changing one measured attribute of a rectangular prism affects the volume and surface area. **8.10** The student will solve area and perimeter problems, including practical problems, involving composite plane figures. **A.4** The student will solve c) literal equations for a specified variable. **G.13** The student will use surface area and volume of three-dimensional objects to solve practical problems **G.14** The student will apply the concepts of similarity to two- or three-dimensional geometric figures. This will include; b) determining how changes in one or more dimensions of a figure affect area and/or volume of the figure; c) determining how changes in area and/or volume of a

	figure affect one or more dimensions of the figure; and d) solving problems, including practical problems, about similar geometric figures.
Essential Questions	**Common Misconceptions**
6.7a ● What relationships exist among the radius, diameter, and circumference of a circle? **6.7b** ● How does the circumference of a circle relate to the distance it rotates? (i.e. tire, ferris wheel, gears) ● In what type of situations would you need to find the area of a circle? **6.7c** ● How can patterns be used to determine formulas for area and perimeter? ● How could you find the area of a square if you knew the perimeter? ● How is the area formula for a triangle similar to the area formula of a rectangle?	Students often use the wrong formula or no formula at all when calculating. Students often confuse the ideas of area and circumference. Students do not know the difference between radius and diameter.
Understanding the Standard	**Essential Knowledge and Skills**
● The value of pi (π) is the ratio of the circumference of a circle to its diameter. Thus, the circumference of a circle is proportional to its diameter. ● The calculation of determining area and circumference may vary depending upon the approximation for pi. Common approximations for π include 3.14, $\frac{22}{7}$, or the pi (π) button on a calculator. ● Experiences in deriving the formulas for area, perimeter, and volume using manipulatives such as tiles, one-inch cubes, graph paper, geoboards, or tracing paper, promote an understanding of the formulas and their use. ● Perimeter is the path or distance around any plane figure. The	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Derive an approximation for pi (3.14 or $\frac{22}{7}$) by gathering data and comparing the circumference to the diameter of various circles, using concrete materials or computer models. (a) ● Solve problems, including practical problems, involving circumference and area of a circle when given the length of the diameter or radius. (b) ● Solve problems, including practical problems, involving area and perimeter of triangles and rectangles.(c)

perimeter of a circle is called the circumference.

- The circumference of a circle is about three times the measure of its diameter.
- The circumference of a circle is computed using $C = \pi d$ or $C = 2\pi r$, where d is the diameter and r is the radius of the circle.
- The area of a closed curve is the number of nonoverlapping square units required to fill the region enclosed by the curve.
- The area of a circle is computed using the formula $A = \pi r^2$, where r is the radius of the circle.
- The perimeter of a square whose side measures s can be determined by multiplying 4 by s ($P = 4s$), and its area can be determined by squaring the length of one side ($A = s^2$).
- The perimeter of a rectangle can be determined by computing the sum of twice the length and twice the width ($P = 2l + 2w$, or $P = 2(l + w)$), and its area can be determined by computing the product of the length and the width ($A = lw$).
- The perimeter of a triangle can be determined by computing the sum of the side lengths
- ($P = a + b + c$), and its area can be determined by computing the product of base and the height $(A = \frac{1}{2}bh)$. .

Vocabulary	Instructional Activities Organized by Learning Objective
circle pi approximation radius circumference diameter area triangle rectangle base height	**Textbook:** Eureka Eureka Grade | Module | Topic | Lesson(s) 6 | 5 | A | 1-4 7 | 3 | C | 16-17 Virginia Math Connects, Course 1, ©2012, Glencoe/McGraw-Hill Circumference – page(s) 507 - 512 Area - page(s) 495 – 500 (triangles) 513 – 518 (circles)

length width perimeter	Perimeter – page(s) 520 – 524 Volume – page(s) 534 – 540 Extra Practice page –EP 24 -27 Lessons 9-1, 9-2, 9-3, and 9-4
Assessment	Coach book, 6th Grade Virginia Gold Edition 6.10a - page(s) 121 – 126 6.10b - page(s) 127 – 131 6.10c – page(s) 132 – 138
	Notes SOL 6.7 Interactive Notebook (INB) Notes
	Resources ● Print ● Technology-based Circumference [SMART Notebook lesson] The Area of Circles [SMART Notebook lesson] Volume of Rectangular Prisms [SMART Notebook lesson] Gizmos – Circumference and Area of Circles - interactive instructional resource Gizmos – Balancing Blocks - interactive instructional resource Gizmos – Finding Fido's Flower Bed - interactive instructional resource Brain Pop – Pi – interactive skills practice
	Station Activities
Cross-Curricular Connections	**Tiered Differentiations**
Area and perimeter scenarios can be embedded in many real world example including sports, architecture, and design. For example, students can design their own dream home. Students can be asked to find the	Bubble Circumference – Students will blow bubbles onto construction paper, trace the outline, and then find the circumference, diameter, radius, and area of each circle.

fencing (perimeter) needed for the backyard, the carpet (area) to cover each bedroom floor, and a variety of other real world connections.	Snowmen – Use a variety of circle sizes to make a snowman. Glue the circles on construction paper and then have students find diameter, radius, circumference, and/or area. Geoboards or Grid paper – Make different shapes and find the area and perimeter of each. Volume – Use linking cubes or empty boxes, have students find the volume of a variety of different rectangular prisms. Surface Area – Collect empty cardboard boxes and label with a letter or number. Have the students find the measurements of length, width, and height. They can then chart the surface area of each box.