

MATHEMATICS COMMON CORE CURRICULUM UNIT #5, Grade 3

North Smithfield School Department

TITLE OF UNIT: Understanding Area and Perimeter

GRADE : 3

DATE PRESENTED: _____ **DATE DUE:** _____ **LENGTH OF TIME:** Several weeks

OVERVIEW OF UNIT:

Students will sort and classify shapes, find the area and perimeter of geometric figures, and distinguish between linear and area measurements.

ESSENTIAL QUESTIONS

- How can you use addition or subtraction to solve problems?
- How can you use grid/graph paper to find the area of a plane figure?
- How can we find the area of a rectangle using multiplications?
- How are arrays used to determine area and perimeter?
- Can two shapes with the same perimeter have the same area? If so, will this always be the case? Explain your reasoning.
- Can two shapes with the same area have the same perimeter? If so, will this always be the case? Explain your reasoning.
- How can you name quadrilaterals and sort them by attributes into different categories?

STANDARDS: Common Core Math Standards – Grade level domains K-5

Counting and Cardinality CC	Operations and Algebraic Thinking OA	Number and Operations in Base Ten NBT	Number and Operations – Fractions NF	Measurement and Data MD	Geometry G
<input type="checkbox"/>	<input type="checkbox"/> 3.OA.7	<input type="checkbox"/> NBT.2	<input type="checkbox"/>	<input type="checkbox"/> 3.MD.8	<input type="checkbox"/> G.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STANDARDS: Mathematical Practices grades K-12

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|----------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------|-----------------------------------------------------------------|
| 1. Make sense of problems and persevere in solving them | 3. Construct viable arguments and critique the reasoning of others | 5. Use appropriate tools strategically | 7. Look for and make use of structure | 8. Look for and express regularity in repeated reasoning |
| 2. Reason abstractly and quantitatively | 4. Model with mathematics ★ | 6. Attend to precision | | |

FOCUS MATHEMATICS STANDARDS:

- Reason with shapes and their attributes. **3.G.1**
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition. **3.MD.7**
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. **3.MD.8**
- Use place value understanding and the properties of operations to perform. **3.NBT.2**
- Multiply and divide within 100. **3.OA.7**

Applied Learning Standards:

problem solving communication critical thinking research reflection/ evaluation

ENDURING UNDERSTANDING:

At the end of this unit students will be able to find the perimeter and area of given shapes.

PRIOR KNOWLEDGE:

- A strong understanding of place value is essential for the developed number sense and the subsequent work that involves rounding numbers.
- Building on previous understandings of the place value of digits in multi-digit numbers, place value is used to round whole numbers.
- Strategies used to add and subtract two-digit numbers are now applied to fluently add and subtract whole numbers within 1000.
- Understanding what each number in a multiplication expression represents is important.
- Students should also make the connection of the area of a rectangle to the area model used to represent multiplication.
- Students have created rectangles before when finding the area of rectangles and connecting them to using arrays in the multiplication of whole numbers.

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- In earlier grades, students have experiences with informal reasoning about particular shapes through sorting and classifying using their geometric attributes. *Students have built and drawn shapes given the number of faces, number of angles and number of sides.*

STUDENT OBJECTIVES, SKILLS and/or NEW KNOWLEDGE:

- Know from memory all products and quotients of one digit numbers.
- Add and subtract numbers fluently within 1000 with and without regrouping.
- There is a relationship between addition and subtraction (inverse operations) .
- Students use grid/graph paper to count the area of a plane figure in square units.
- There is a relationship between area and the operations of multiplication and addition?
- Perimeter is an attribute of plane figures that can be measured.
- There is a relationship between area and perimeter; area is the space within the perimeter, perimeter is the border of an area.
- Two or more shapes with the same area do not necessarily have the same perimeter. Two or more shapes with the same perimeter do not necessarily have the same area.

SUGGESTED PROBLEMS:

STANDARD	WEBSITE	ADDITIONAL INFO (B, A)
3.OA.7	http://www.k-5mathteachingresources.com/support-files/x2-to-x5-arrays.pdf http://www.k-5mathteachingresources.com/support-files/multiplicationnumberwheel.pdf http://www.k-5mathteachingresources.com/support-files/divisionriddlesdoc.pdf http://www.k-5mathteachingresources.com/support-files/division-spin.pdf http://www.k-5mathteachingresources.com/support-files/theproductis3oa7.pdf http://www.k-5mathteachingresources.com/support-files/theansweris3oa7.pdf	Basic Basic Advanced Basic Advanced Advanced
3.NBT.2	http://www.khanacademy.org/math/arithmetic/addition-subtraction/sub_borrowing/e/subtraction_4 http://www.k-5mathteachingresources.com/support-files/3-digit-addition-split.pdf http://www.k-5mathteachingresources.com/support-files/doublingto1000.pdf	Basic Basic Basic
3.MD.6	http://www.k-5mathteachingresources.com/support-files/find-the-area.pdf http://www.k-5mathteachingresources.com/support-files/rectangles-with-color-tiles.pdf http://www.k-5mathteachingresources.com/support-files/rectangularareacards.pdf	Basic Advanced Resource-rectangle cards
3.MD.7	http://www.k-5mathteachingresources.com/support-files/developingaformulafortheareaofarectangle.pdf http://www.k-5mathteachingresources.com/support-files/area-word-problems-3md7.pdf http://www.k-5mathteachingresources.com/support-files/designingaflowerbed.pdf http://www.k-5mathteachingresources.com/support-files/rectangular-robot.pdf	Basic Basic Advanced Advanced
3.MD.8	http://www.khanacademy.org/math/geometry/basic-geometry/perimeter_area_basics/e/perimeter_1 http://www.khanacademy.org/math/geometry/basic-geometry/perimeter_area_basics/e/perimeter_of_squares_and_rectangles http://www.k-5mathteachingresources.com/support-files/measuringperimeter.pdf http://www.k-5mathteachingresources.com/support-files/perimeteronthegeoboard.pdf http://www.k-5mathteachingresources.com/support-files/designingarabbitenclosure.pdf http://www.k-5mathteachingresources.com/support-files/theareastaysthesame.pdf http://www.k-5mathteachingresources.com/support-files/perim-word-problems.pdf	Basic Advanced Basic Advanced Advanced Basic Advanced
3.G.1	http://www.k-5mathteachingresources.com/support-files/2dshapesort.pdf http://www.k-5mathteachingresources.com/support-files/comparingquadrilaterals.pdf	Basic Advanced

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ACTIVITIES, PRODUCTS, PERFORMANCE, and ASSESSMENTS:

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| <ol style="list-style-type: none"> 1. Application to real world problems 2. Creating charts/collecting data 3. Collaboration - interpersonal 4. Conferencing 5. Exhibits | <ol style="list-style-type: none"> 6. Graphic organizers 7. Graphing 8. Interviews 9. Journals 10. KWL charts 11. Mathematical Practices 12. Modeling ★ 13. Oral presentations | <ol style="list-style-type: none"> 14. Problem/Performance based/common tasks 15. Real-life applications involving graphing 16. Represent numbers 17. Rubrics/checklists (mathematical practice, modeling) | <ol style="list-style-type: none"> 18. Technology 19. Summarizing and note-taking 20. Tests and quizzes 21. Writing genres Arguments/ opinion Informative |
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- OA.7 use the relationship of multiplication and division to solve problems fluently
- NBT.2 fluently add and subtract numbers within 1000
- MD.6 find area by counting square units
- MD.7 find area using multiplication and addition
- MD 8 solve problems using perimeter and area
- G.1 sort and classify shapes

HIGHER ORDER THINKING SKILLS: Web's Depth of Knowledge 2 – 4 or Bloom's Taxonomy

Web's Depth of Knowledge

- skill/conceptual understanding
- strategic reasoning
- extended reasoning

Bloom's Taxonomy

- apply
- analyze
- synthesize/create
- evaluate

ADDITIONAL RESOURCES: see curriculum for specifics

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| <ul style="list-style-type: none"> • <i>enVisionMath</i>, <ul style="list-style-type: none"> • Topic 8 (3.OA.7) • Topics embedded throughout • Topics 2,3,4 (3.NBT.2) • Topics 16-5,16-6,16-8 (3.MD.6) • Topic 16 (3.MD.8) • Topics 10-5,10-7,10-8 (3.G.1) | <ul style="list-style-type: none"> • <i>Newmark Learning Common Core Math Grade 3</i>, <ul style="list-style-type: none"> • p.p. 55-60 (3.OA.7) • p.p. 11-25 (3.NBT.2) • p.p. 121-130 (3.MD.6) • p.p. 116-120 (3.MD.8) • p.p. 131-135 (3.G.1) |
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VOCABULARY

OA

- Doubling
- Multiples
- Square numbers
- Skip counting

NBT

- Base ten
- Difference
- Digits
- Equation
- Estimate
- Place value
- Regroup
- Rounding
- Sum
- Total
- Value

MD

- Area
- Arrays
- Chart/table
- Commutative properties
- Graph paper
- Length
- Length
- Multiplication
- Perimeter
- Polygon
- Rectangle
- Square units
- Width

G

- Acute angle
- Angles
- Attribute
- Closed figure
- Congruent
- Line segments
- Obtuse angle
- Parallel
- Parallelogram
- Right angle
- Sides
- square
- Vertices

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LESSON PLAN for UNIT _____

LESSONS

- Lesson #1** Summary:

- Lesson #2** Summary:

- Lesson #3** Summary:

OBJECTIVES for LESSON # _____

- Materials/Resources:**

- Procedures:**
 - **Lead -in**

 - **Step by step**

 - **Closure**

- Instructional strategies:** see curriculum introduction

- Assessments:** see curriculum introduction
 - **Formative**

 - **Summative**