

# MATHEMATICS COMMON CORE CURRICULUM UNIT #3, Grade 3\*

## North Smithfield School Department

**TITLE OF UNIT:** Foundations of Measurement and Fractions **GRADE :** 3

**DATE PRESENTED:** \_\_\_\_\_ **DATE DUE:** \_\_\_\_\_ **LENGTH OF TIME:** Several weeks

**OVERVIEW OF UNIT:**

Students will solve problems using addition, subtraction, multiplication, division. Students will build a foundation of understanding fractions as numbers. Students will sort and classify shapes according to their attributes and measure volume of liquid, intervals of time, and masses of objects.

**ESSENTIAL QUESTIONS PROMPT, PROBLEM/UNIT**

- How can multiplication strategies help you solve other facts
- What strategies help you determine the reasonableness of an answer?
- How can you locate and compare fractions on a number line?
- How do you tell time to the nearest minute?
- How can you find elapsed time in intervals of minutes?
- How can we describe how much a container holds?
- How can you describe the mass of an object?
- How can shapes be portioned into equal parts with equal areas?
- What numeric patterns do you see?
- What numeric patterns do you see?

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

Counting and Cardinality <b>CC</b>	Operations and Algebraic Thinking <b>OA</b>	Number and Operations in Base Ten <b>NBT</b>	Number and Operations – Fractions <b>NF</b>	Measurement and Data <b>MD</b>	Geometry <b>G</b>
<input type="checkbox"/>	<input type="checkbox"/> <b>3.OA.8</b>	<input type="checkbox"/>	<input type="checkbox"/> <b>3.NF.1,2</b>	<input type="checkbox"/> <b>MD.1,2</b>	<input type="checkbox"/> <b>G.2</b>
<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"/>
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**STANDARDS: Mathematical Practices grades K-12**

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

**FOCUS MATHEMATICS STANDARDS:**

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. **3.MD.1,2**
- Develop understanding of fractions as numbers. **3.NF.1,2**
- Reason with shapes and their attributes. **3.G.2**
- Solve problems involving the four operations, and identify and explain patterns in arithmetic. **3.OA.8,9**
- 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 solve problems using four operations, understand fractions as numbers, solve problems involving measurement, and reason with shapes.

**PRIOR KNOWLEDGE:**

- Students need to understand the part/whole relationships in order to understand the connection between multiplication and division.
- In Grade 2, students found the total number of objects using rectangular arrays, such as a 5 x 5, and wrote equations to represent the sum.
- Students have experience in telling and writing time from analog and digital clocks to the hour and half hour in Grade 1 and to the nearest five minutes, using a.m. and p.m. in Grade 2.

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- In Grade 2, students partitioned rectangles into two, three or four equal shares, recognizing that the equal shares need not have the same shape. They described the shares using words such as, halves, thirds, half of, a third of, etc., and described the whole as two halves, three thirds or four fourths.

#### STUDENT OBJECTIVES, SKILLS and/or NEW KNOWLEDGE:

- Know from memory all products and quotients of one digit numbers.
- Students will study patterns and relationships of multiplication facts and relate it to division.
- Students use multiplication steps to solve two step word problems.
- Students observe addition and multiplication tables to find patterns and explain how those patterns exist

#### SUGGESTED PROBLEMS:

STANDARD	WEBSITE	ADDITIONAL INFO (B, A)
3.OA.7	<a href="http://www.k-5mathteachingresources.com/support-files/x2-to-x5-arrays.pdf">http://www.k-5mathteachingresources.com/support-files/x2-to-x5-arrays.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/multiplicationnumberwheel.pdf">http://www.k-5mathteachingresources.com/support-files/multiplicationnumberwheel.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/divisionriddlesdoc.pdf">http://www.k-5mathteachingresources.com/support-files/divisionriddlesdoc.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/division-spin.pdf">http://www.k-5mathteachingresources.com/support-files/division-spin.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/theproductis3oa7.pdf">http://www.k-5mathteachingresources.com/support-files/theproductis3oa7.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/theansweris3oa7.pdf">http://www.k-5mathteachingresources.com/support-files/theansweris3oa7.pdf</a>	Basic Basic Advanced Basic Advanced Advanced
3.OA.8	<a href="http://www.illustrativemathematics.org/illustrations/13">http://www.illustrativemathematics.org/illustrations/13</a> <a href="http://www.illustrativemathematics.org/illustrations/1301">http://www.illustrativemathematics.org/illustrations/1301</a> <a href="http://www.k-5mathteachingresources.com/support-files/3rdgrademultistepproblems.pdf">http://www.k-5mathteachingresources.com/support-files/3rdgrademultistepproblems.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/twostepwordproblemsset2.pdf">http://www.k-5mathteachingresources.com/support-files/twostepwordproblemsset2.pdf</a>	Basic Advanced Basic Advanced
3.OA.9	<a href="http://www.illustrativemathematics.org/illustrations/954">http://www.illustrativemathematics.org/illustrations/954</a> <a href="http://www.illustrativemathematics.org/illustrations/953">http://www.illustrativemathematics.org/illustrations/953</a> <a href="http://www.k-5mathteachingresources.com/support-files/oddandevensums.pdf">http://www.k-5mathteachingresources.com/support-files/oddandevensums.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/oddandevenproducts.pdf">http://www.k-5mathteachingresources.com/support-files/oddandevenproducts.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/rollarule.pdf">http://www.k-5mathteachingresources.com/support-files/rollarule.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/roll-a-rule-two-step.pdf">http://www.k-5mathteachingresources.com/support-files/roll-a-rule-two-step.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/twostepnumberpatterns3.oa9.pdf">http://www.k-5mathteachingresources.com/support-files/twostepnumberpatterns3.oa9.pdf</a>	Advanced Basic Basic Basic Basic Advanced Basic
3.NF.1	<a href="http://www.illustrativemathematics.org/illustrations/833">http://www.illustrativemathematics.org/illustrations/833</a>  <a href="http://www.k-5mathteachingresources.com/support-files/findonehalfofagroup.pdf">http://www.k-5mathteachingresources.com/support-files/findonehalfofagroup.pdf</a>	Part A Basic, Part B Advanced, Part C SKIP Basic
3.NF.2	<a href="http://www.illustrativemathematics.org/illustrations/172">http://www.illustrativemathematics.org/illustrations/172</a> <a href="http://www.illustrativemathematics.org/illustrations/170">http://www.illustrativemathematics.org/illustrations/170</a> <a href="http://www.illustrativemathematics.org/illustrations/168">http://www.illustrativemathematics.org/illustrations/168</a> <a href="http://www.illustrativemathematics.org/illustrations/169">http://www.illustrativemathematics.org/illustrations/169</a> <a href="http://www.illustrativemathematics.org/illustrations/171">http://www.illustrativemathematics.org/illustrations/171</a> <a href="http://www.k-5mathteachingresources.com/support-files/fraction-strips.pdf">http://www.k-5mathteachingresources.com/support-files/fraction-strips.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/number-line-roll.pdf">http://www.k-5mathteachingresources.com/support-files/number-line-roll.pdf</a>	Advanced Advanced Basic Basic Basic Basic Advanced
3.MD.1	<a href="http://www.k-5mathteachingresources.com/support-files/elapsetimewordproblems.pdf">http://www.k-5mathteachingresources.com/support-files/elapsetimewordproblems.pdf</a>	Basic/Advanced
3.MD.2	<a href="http://www.k-5mathteachingresources.com/support-files/measuring-one-liter.pdf">http://www.k-5mathteachingresources.com/support-files/measuring-one-liter.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/weigh-it-twice.pdf">http://www.k-5mathteachingresources.com/support-files/weigh-it-twice.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/capacity-mass-word-problems.pdf">http://www.k-5mathteachingresources.com/support-files/capacity-mass-word-problems.pdf</a>	Advanced Advanced Basic
3.G.2	<a href="http://www.illustrativemathematics.org/illustrations/1014">http://www.illustrativemathematics.org/illustrations/1014</a> <a href="http://www.illustrativemathematics.org/illustrations/1061">http://www.illustrativemathematics.org/illustrations/1061</a> <a href="http://www.k-5mathteachingresources.com/support-files/comparingquadrilaterals.pdf">http://www.k-5mathteachingresources.com/support-files/comparingquadrilaterals.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/congruenteighths.pdf">http://www.k-5mathteachingresources.com/support-files/congruenteighths.pdf</a> <a href="http://www.k-5mathteachingresources.com/support-files/fractionswithcolortiles.pdf">http://www.k-5mathteachingresources.com/support-files/fractionswithcolortiles.pdf</a>	Advanced Advanced Basic Advanced Basic

## MATHEMATICS COMMON CORE CURRICULUM UNIT #3, Grade 3\*

### North Smithfield School Department

#### ACTIVITIES, PRODUCTS, PERFORMANCE, and ASSESSMENTS:

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|---|--|--|---|
| <ol style="list-style-type: none"> <li>1. Application to real world problems</li> <li>2. Creating charts/collecting data</li> <li>3. Collaboration - interpersonal</li> <li>4. Conferencing</li> <li>5. Exhibits</li> </ol> | <ol style="list-style-type: none"> <li>6. Graphic organizers</li> <li>7. Graphing</li> <li>8. Interviews</li> <li>9. Journals</li> <li>10. KWL charts</li> <li>11. Mathematical Practices</li> <li>12. Modeling ★</li> <li>13. Oral presentations</li> </ol> | <ol style="list-style-type: none"> <li>14. Problem/Performance based/common tasks</li> <li>15. Real-life applications involving graphing</li> <li>16. Represent numbers</li> <li>17. Rubrics/checklists (mathematical practice, modeling)</li> </ol> | <ol style="list-style-type: none"> <li>18. Technology</li> <li>19. Summarizing and note-taking</li> <li>20. Tests and quizzes</li> <li>21. Writing genres<br/>Arguments/ opinion<br/>Informative</li> </ol> |
|---|--|--|---|
- OA.7 use the relationship of multiplication and division to solve problems fluently
  - OA.8 solve and explain 2 step word problems
  - OA.9 look for and explain patterns in arithmetic
  - NF.1 identify parts of a whole
  - NF.2 represent fractions on a number line
  - MD.1 solve problems involving elapsed time
  - MD.2 measure liquid volume and masses of objects
  - G.2 partition shapes into equal parts and areas

#### 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

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• <i>enVisionMath</i>,             <ul style="list-style-type: none"> <li>○ Topic 8 (3.OA.7)</li> <li>○ Topics embedded throughout</li> <li>○ Topics 2-1,2-2,5,and 6 (3.OA.9)</li> <li>○ Topic 12-1,12-2,12-3 (3.NF.1)</li> <li>○ Topics 12-7 (3.NF.2)</li> <li>○ Topics 17-1, 17-2, 17-3, 17-4 (3.MD.1)</li> <li>○ Topics 15-3,15-4 (3.MD.2)</li> <li>○ Topics 12-1 (3.G.2)</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <i>Newmark Learning Common Core Math Grade 3</i>,             <ul style="list-style-type: none"> <li>○ p.p. 55-60 (3.OA.7)</li> <li>○ p.p. 26-30 (3.OA.8)</li> <li>○ p.p. 41-45 (3.OA.9)</li> <li>○ p.p. 71-75 (3.NF.1)</li> <li>○ p.p. 12-17 (3.NF.2)</li> <li>○ p.p. 91-95 (3.MD.1)</li> <li>○ p.p. 96-100 (3.MD.2)</li> <li>○ p.p. 136-140 (3.G.2)</li> </ul> </li> </ul> |
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#### VOCABULARY

OA	NF	MD	G
• Addend	• Denominator	• Analog	• Area
• Diagonal	• Denominator	• Balance scale	• Denominator
• Doubles	• Eights	• Clock	• Eighths
• Doubling	• Equivalent	• Digital	• Equal
• Estimate	• Fourths	• Elapsed time	• Fifths
• Even	• Fraction	• Half-hour	• Fourths
• Factor	• Halves	• Hour	• Fraction
• Horizontal	• Mixed numbers	• Hour hand	• Halves
• Multiple	• Number line	• Kilograms	• Numerator
• Multiple step	• Numerator	• Liquid	• Portion
• Multiples	• Numerator	• Liters	• Sixths
• Number sentence	• Part	• Mass	• Thirds
• Odd	• Partition	• Milliliters	• whole
• Part-part-total	• Sixths	• Minute hand	
• Patterns	• Tenths	• Minutes	
• Patterns	• Thirds	• Quarter-hour	
• Product	• Twelfths	• Rams	
• Reasonableness	• Whole	• Seconds	
• Rounding	• Whole number	• Unit	
• Skip counting		• Volume	
• Square numbers			
• Sum			
• Vertical			

MATHEMATICS COMMON CORE CURRICULUM UNIT #3, Grade 3\*  
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LESSON PLAN for UNIT \_\_\_\_\_

LESSONS

- Lesson # 1 Summary:
  
- Lesson #2 Summary:
  
- Lesson #3 Summary:

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OBJECTIVES for LESSON # \_\_\_\_\_

- Materials/Resources:**
  
- Procedures:**
  - Lead -in
  
  - Step by step
  
  - Closure
  
- Instructional strategies:** see curriculum introduction
  
- Assessments:** see curriculum introduction
  - **Formative**
  
  
  - **Summative**