

# MATHEMATICS COMMON CORE CURRICULUM UNIT #3 Grade 2\*

## North Smithfield Public Schools

**TITLE OF UNIT:** Equal groups of objects and measures in standard units-foundations for multiplication. **GRADE :** 2

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

### OVERVIEW OF UNIT:

In this unit students will gain foundations for Multiplications by using addition and subtraction. They will also measure in standard units and use place value to add and subtract.

### ESSENTIAL QUESTIONS

- *What equation(s) expresses the array?*
- *How can you use a model to decide if a number is even or odd?*
- *Which mathematical property(ies) helped you solve this problem? Explain your thinking.*
- *How might you use place value to explain why addition and subtraction strategies work?*
- *How might you represent the number with a model?*
- *Why does “what” we measure influence “how” we measure?*
- *How do we use different units of measurement (centimeter, inches, feet yard) to measure the same object?*
- *How do you compare/contrast two different units of measurement when measuring the same object?*
- *How can you compare the objects being measured?*

### 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>2.OA.2,4</b>	<input type="checkbox"/> <b>2.NBT. 2, 5</b>	<input type="checkbox"/>	<input type="checkbox"/> <b>2.MD.1,2,3,4</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"/>	<input type="checkbox"/>

### STANDARDS: Mathematical Practices grades K-12

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

### FOCUS MATHEMATICS STANDARDS:

- Add and subtract within 20 **2.OA.2**
- Work with equal groups of objects to gain foundations for multiplication **2.OA.4**
- Measure and estimate lengths in standard units **2.MD.1,2,3,4**
- Understand place value. **2.NBT. 2**
- Use place value understanding and properties of operations to add and subtract **2.NBT.5**

### Applied Learning Standards:

problem solving                      communication                      critical thinking                      research                      reflection/ evaluation

### ENDURING UNDERSTANDING:

At the end of this unit students will be able to gain a foundation for multiplication by using addition, subtraction and place value. They will be able estimate and measure lengths in standard units.

### PRIOR KNOWLEDGE:

- Solve addition and subtraction problems less than 20.
- Understand that a two digit number represents tens and ones.
- Compare, contrast and measure lengths of objects visually.

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

- Doing mathematics involves a variety of processes including problem solving, reasoning, communicating, connecting, and representing.
- Decomposing and recomposing numbers to solve addition and subtraction problems helps students make sense of number relationships.
- Fluency in addition and subtraction within 20 (using various strategies) is critical to understanding addition and subtraction of larger numbers. TUSD
- Addition and subtraction have an inverse relationship. This inverse relationship can be used to find subtraction and/or addition facts. Every subtraction fact has a related addition fact.

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- Adding multiple groups of equal size is the foundation for multiplication.
- Sets of objects can be arranged in a rectangular array.
- Even numbers can be divided into two equal sets, arranged into pairs or counted by twos; odd numbers cannot.
- The position of digits in numbers determines their value.
- Numbers can be used to tell how many.
- Composing and decomposing numbers by place value allows for efficiency for addition and subtraction computation.
- Sometimes it is necessary to compose a unit of the next higher value when adding multi-digit numbers.
- Flexible methods for computation require a strong understanding of the operations of addition and subtraction and their properties.
- Adding and subtracting hundreds or tens is similar to adding or subtracting single digit numbers.
- Standard units of measurement are necessary to measure an object accurately.
- Rulers and other measurement tools can be used for quantifying measurement.
- Measurement is a process of comparing a unit to the object being measured.
- Different tools are used to measure different objects.
- Objects have different attributes and some attributes are measurable.
- Linear measurement involves units of equal size repeated over and over. The smaller the unit, the more of it you will need to measure the length of an object.
- Some measurements can be approximated using known measurement units (feet, inches, yards)
- The better we understand the size of a unit, the better we can estimate a length.
- When measuring students need to have an understanding of greater than, less than, equal to, in order to compare objects.
- The length of an object or shape can be measured using standard or non-standard units of measure.

### SUGGESTED PROBLEMS:

- 2. OA.2** Fluently add and subtract within 20 using mental strategies. By end of Grade 2; know from memory all sums of two one-digit numbers. Use strategies such as (from grade 1):
- counting on;
  - making ten (e.g.,  $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$ );
  - decomposing a number leading to a ten (e.g.,  $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$ );
  - using the relationship between addition and subtraction (e.g., knowing that  $8 + 4 = 12$ , one knows  $12 - 8 = 4$ );
  - creating equivalent but easier or known sums (e.g., adding  $6 + 7$  by creating the known equivalent  $6 + 6 + 1 = 12 + 1 = 13$ ).
- 2. OA.4 Basic**
- <http://www.illustrativemathematics.org/standards/k8> (Counting Dots in Arrays)
- 2. NBT.2 Advanced**
- <http://www.illustrativemathematics.org/standards/k8> (Saving Money)
- 2. NBT.5 Basic**
- <http://www.illustrativemathematics.org/standards/k8> (Jamir's Penny Saving Jar)
- 2. NBT.5 Advanced**
- <http://www.illustrativemathematics.org/standards/k8> (Saving Money 1 and Saving Money 2)

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**ACTIVITIES, PRODUCTS, PERFORMANCE, and ASSESSMENTS:** see curriculum introduction

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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> |
|---|--|--|---|

**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

- 2.OA.2 SE/TE: Lessons 2-1, 2-2, 2-3, 2-6, 3-1, 3-2, 3-3, 3-4, 3-5
- 2.OA.4 SE/TE: Lessons 4-1, 4-2, 4-3, 4-4
- 2.NBT.2 SE/TE: Lessons 5-4, 6-6, 10-1, 10-5, 10-6, 10-9
- 2.NBT.5 SE/TE: Lessons 1-6, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 3-1, 3-2, 3-3, 3-4, 3-5, 5-5, 5-7, 6-1, 6-2, 6-3, 6-4, 6-5, 7-1, 7-2, 7-3, 7-4, 7-5, 8-1, 8-2, 8-3, 8-4, 8-5, 8-7, 8-8, 8-9, 9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-8, 9-9, 14-1, 14-2, 14-3
- 2.MD.1 SE/TE: Lessons 15-1, 15-2, 15-3, 15-4, 15-5, 15-9
- 2.MD.2 SE/TE: Lessons 15-6
- 2.MD.3 SE/TE: Lessons 15-2, 15-3, 15-4, 15-5, 15-9
- 2.MD.4 SE/TE: Lesson 15-8

### VOCABULARY

#### OA

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>• Addend</li> <li>• Addition sentence</li> <li>• Area model</li> <li>• Array</li> <li>• Composing</li> <li>• Decomposing</li> <li>• Difference</li> <li>• Doubles</li> <li>• Equals</li> </ul> | <ul style="list-style-type: none"> <li>• Even</li> <li>• Fact families</li> <li>• Factor</li> <li>• Fewer</li> <li>• Mental math</li> <li>• Minuend</li> <li>• Minus</li> <li>• More</li> <li>• Multiplication</li> </ul> | <ul style="list-style-type: none"> <li>• Odd</li> <li>• Part</li> <li>• Product</li> <li>• Regroup</li> <li>• Strategy</li> <li>• Subtraction sentence</li> <li>• Sum</li> </ul> |
|---|---|--|

#### NBT

- |  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li>• After</li> <li>• Before</li> <li>• Between</li> <li>• Equal to</li> </ul> | <ul style="list-style-type: none"> <li>• Greater than</li> <li>• Greatest</li> <li>• Least</li> <li>• Less than</li> </ul> | <ul style="list-style-type: none"> <li>• Number word</li> <li>• Pattern</li> </ul> |
|--|--|--|

#### MD

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>• Bar graph</li> <li>• Categories</li> <li>• Centimeter, meter</li> <li>• Clock (analog and digital)</li> <li>• Coin</li> <li>• Data</li> <li>• Dime</li> <li>• Dollar</li> </ul> | <ul style="list-style-type: none"> <li>• Estimate</li> <li>• Graph</li> <li>• Hour</li> <li>• Inch, Feet, yard</li> <li>• Length</li> <li>• Line plot</li> <li>• Linear</li> <li>• Measure, measurement</li> </ul> | <ul style="list-style-type: none"> <li>• Minute</li> <li>• Nickel</li> <li>• Penny Pictograph</li> <li>• Quarter</li> <li>• Represent</li> <li>• Ruler</li> <li>• Variable/symbol</li> <li>• Width</li> </ul> |
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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**