MATHEMATICS COMMON CORE CURRICULUM UNIT #4 Grade 2*
North Smithfield Public Schools

TITLE OF UNIT: Place value and measurement of lengths indirectly and by Iterating lengths of units. **GRADE : 2**

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

OVERVIEW OF UNIT:

In this unit students will add and subtract numbers to 1,000 using mental math, concrete models and computation. Students will use addition and subtraction to solve problems involving length, time, and money.

ESSENTIAL QUESTIONS

- *How might different strategies be helpful when solving a problem?*
- *Will the end result be more or less than the amount you started with?*
- *How could you use mental math to estimate and solve the sum or difference?*
- *How can I compose or decompose this number using place value to help me add or subtract?*
- *How might you use place value to explain why addition and subtraction strategies work?*
- *How do I know when to regroup?*
- *Why do I need to align my numbers in correct place when adding or subtracting?*
- *How can you use mental math to add multiples of 100's, 10's?*
- *How might you use addition or subtraction to solve a measurement problem?*
- *How might you use a letter in an equation to represent a missing part or a missing whole?*
- *How is a ruler like a number line?*
- *How do you determine which hand measures hours vs. minutes?*
- *How are analog and digital clocks similar to and different from each other?*
- *What is the value of each coin or bill?*

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
☐	☐ 2.OA.1,2	☐ 2.NBT. 5,8,9	☐	☐ 2.MD.5,6,7,8	☐
☐	☐	☐	☐	☐ **Modeling with Geometry G-MG**	☐

STANDARDS: Mathematical Practices grades K-12

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
2.	Reason abstractly and quantitatively	4.	Model with mathematics ★	6.	Attend to precision	8.	Look for and express regularity in repeated reasoning

FOCUS MATHEMATICS STANDARDS:

- Represent and solve problems involving addition and subtraction. 2.OA.1
- Add and subtract within 20 2.OA.2
- Relate addition and subtraction to length.2.MD.5,6
- Work with time and money. 2.MD.7,8
- Use place value understanding and properties of operations to add and subtract 2.NBT.5
- Use place value understanding and properties of operations to add and subtract.2.NBT.8,9

Applied Learning Standards:

problem solving communication critical thinking research reflection/ evaluation

ENDURING UNDERSTANDING:

At the end of this unit students will be able to use their knowledge of place value to the thousands to add and subtract a variety of problems. Students will add and subtract problems involving length, time, and money.

PRIOR KNOWLEDGE:

- Solve addition and subtraction problems and word problems less than 20.
- Relate addition and subtraction to measurement problems.
- Tell and write time in hours and half hours using digital and analog clocks.

STUDENT OBJECTIVES, SKILLS and/or NEW KNOWLEDGE:

- Some addition and subtraction problems may require two-steps to solve. Sometimes the answer to one problem is needed to find the answer to another problem or question.
- The unknown can be represented algebraically with a symbol (a box, a blank, or a question mark, NOT a letter at this grade level) and pictorially to solve all types of addition and subtraction situations.

*Referenced templates from *Common Core Curriculum Maps, English Language Arts* and *The Understanding By Design Guide to Creating High Quality Units*

- Students' modeling of story problems helps them figure out what operation is involved in a problem, regardless of the size of the numbers.
- Estimating is an important tool to determine the reasonableness of an answer.
- Two digit numbers can be broken apart using tens and ones and added and subtracted in different ways.
- 10 ones can be regrouped for 1 ten.
- 10 tens can be regrouped for one 100
- 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.
- 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.
- 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.
- Students need to be able to justify their answers orally, in writing and/or using models to explain.
- Flexible methods for computation require a strong understanding of the operations of addition and subtraction and their properties.
- Addition and subtraction are routinely applied in situations that require measurement.
- Variables or symbols can be used to express an unknown quantity in an equation.
- A number line measures distances from zero as a ruler does.
- An unmarked number line (an open number line) can be used to add and subtract. (Note: This standard supports NBT: Addition and subtraction.)
- Time can be measured in units of time.
- One day includes two cycles of 12 hours or one cycle of 24 hours; the 12 hours from midnight to noon can be indicated by "a.m.", while the 12 hours from noon to midnight can be indicated by "p.m.".
- Units of time include hours (60 minutes), half-hours (30 minutes), minutes (60 seconds), and seconds.
- The symbols ¢ and $ represent cents and dollars in United States currency.
- U.S. currency includes coins worth 1, 5, 10, 25, 50, and 100 cents and paper money worth 1, 2, 5, 10, 20, 50, and 100 dollars; amounts of money can be configured in multiple ways.

SUGGESTED PROBLEMS:

ASSESSMENT PROBLEMS
2. OA.1 Basic
- http://www.illustrativemathematics.org/standards/k8 (Pencil & Sticker)

2. OA.1 Advanced
- http://www.illustrativemathematics.org/standards/k8 (Saving Money 1)

*Referenced templates from *Common Core Curriculum Maps, English Language Arts* and *The Understanding By Design Guide to Creating High Quality Units*

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. 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)

2. MD.6 Basic
- http://www.illustrativemathematics.org/standards/k8 (Frog and Toad on the Number Line)

2. MD.8 Basic
- http://www.illustrativemathematics.org/standards/k8 (Jamir's Penny Jar, Visiting the Arcade)

2. MD.8 Advanced
- http://www.illustrativemathematics.org/standards/k8 (Delayed Gratification)

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

1. Application to real world problems
2. Creating charts/collecting data
3. Collaboration - interpersonal
4. Conferencing
5. Exhibits
6. Graphic organizers
7. Graphing
8. Interviews
9. Journals
10. KWL charts
11. Mathematical Practices
12. Modeling ★
13. Oral presentations
14. Problem/Performance based/common tasks
15. Real-life applications involving graphing
16. Represent numbers
17. Rubrics/checklists (mathematical practice, modeling)
18. Technology
19. Summarizing and note-taking
20. Tests and quizzes
21. Writing genres
    Arguments/ opinion
    Informative

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.1 SE/TE: Lessons 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 2-1, 2-2, 2-3, 2-4, 2-5, 2-7, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 4-4, 8-9, 9-9
- 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.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.NBT.8 SE/TE: Lessons 6-1, 6-2, 6-3, 6-5, 7-1, 7-4,10-4, 10-5, 11-1, 11-2,11-6
- 2.NBT.9 SE/TE: Lessons 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 3-1, 3-2, 3-3, 3-4, 5-6, 6-1, 6-2, 6-3, 6-4, 6-5, 7-1, 7-2, 7-3, 7-4, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8, 9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-8,11-1, 11-2, 11-3, 11-4,11-6, 11-7, 11-8, 14-1,14-2, 14-3
- 2.MD.5 SE/TE: Lessons 15-7,15-9
- 2.MD.6 SE/TE: Lessons 8-6, 9-6
- 2.MD.7 SE/TE: Lessons 16-1,16-2
- 2.MD.8 SE/TE: Lessons 13-1, 13-2, 13-3, 13-4, 13-5,14-1, 14-2, 14-3, 14-4

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VOCABULARY

OA

- Addend
- Addition sentence
- Area model
- Array
- Composing
- Decomposing
- Difference
- Doubles
- Equals
- Even
- Fact families
- Factor
- Fewer
- Mental math
- Minuend
- Minus
- More
- Multiplication
- Odd
- Part
- Product
- Regroup
- Strategy
- Subtraction sentence
- Sum

NBT

- After
- Before
- Between
- Equal to
- Greater than
- Greatest
- Least
- Less than
- Number word
- Pattern

MD

- Bar graph
- Categories
- Centimeter, meter
- Clock (analog and digital)
- Coin
- Data
- Dime
- Dollar
- Estimate
- Graph
- Hour
- Inch, Feet, yard
- Length
- Line plot
- Linear
- Measure, measurement
- Minute
- Nickel
- Penny
- Pictograph
- Quarter
- Represent
- Ruler
- Variable/symbol
- Width

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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**

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