

Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 1: Word Problems Using Addition and Subtraction

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Writing

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

- W.2.5. With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

- W.2.8. Recall information from experiences or gather information from provided sources to answer a question.

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Speaking and Listening
Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 1. Make sense of problems and persevere in solving them.
- 2. Reason abstractly and quantitatively.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Operations & Algebraic Thinking

2.OA Represent and solve problems involving addition and subtraction.

- 2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the

unknown number to represent the problem.

DOC: Mathematics, DOC: Grade 2, Numbers, Number Sense and Operations

C. Computation and Estimation

- 5. Develop and solve word problems by using various strategies; e.g., recognizing "clue" words.

Essential Questions

- How do the four steps in solving problems help me?
- Why is it important for me to know how to solve math problems?
- In what ways will knowing how to solve math problems help me in everyday life?

Content

The students will know

1. Addition within 100 to solve one and two-step word problems with the unknown in all positions.
2. Subtraction within 100 to solve one and two-step word problems with the unknown in all positions.
3. "Clue" words.
4. Four-step problem solving process.
read
think
solve
check

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Apply the four-step process in solving word problems within 100 involving "adding to" and "putting together."
2. Apply the four-step process in solving word problems within 100 involving "taking apart."
3. Apply the four-step process in solving word problems within 100 involving "comparing."
4. Identify and explain the importance of "clue" words when solving addition and subtraction word problems.
5. Manipulate objects, produce drawings, and use equations with a symbol for the unknown to solve addition and subtraction word problems within 100.
6. Describe and illustrate the steps taken to solve addition and subtraction word problems within 100

Reading/Writing Skills

1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems.
2. Justify solutions, either verbally or in written form.
 - a. Explain step-by-step process.
 - b. Summarize results using specific and appropriate vocabulary.
 - c. Use proper sentence structure for written answers.
3. Work in cooperative groups to practice listening and speaking skills.

Common Core Vocabulary

1. Word problems
2. Unknowns
3. Adding to
4. Putting together
5. Taking apart
6. Comparing
7. Positions
8. Equations
9. "Clue" Words

Additional Vocabulary

Learning Experiences (Suggested)

Assessment (Suggested)

<ol style="list-style-type: none"> Working with a partner, students will look at sample word problems and make a list of words they consider "clue" words in solving the problems. In conclusion, they will come together as a whole class to discuss the "clue" words they found for solving addition and subtraction problems and create a chart of these words. Have students engage in class activities to review and reinforce the solving of one-step word problems. As a class have students model and solve word problems for all the situations shown in Table 1 on page 88 in the Common Core State Standards and represent their solutions with equations. (See Link for the Common Core Standards.) Following the class activity using the material from the Common Core Standards described above, have students work with a partner to create and solve similar two-step word problems with sums and differences less than or equal to 100 using the numbers 0 to 100. Students need to be reminded to check their answers to determine if it makes sense for the situation and the questions being asked. Have students work with a partner to create and solve similar two-step word problems with sums and differences less than or equal to 100 using the numbers 0 to 100. Students need to be reminded to check their answers to determine if it makes sense for the situation and the questions being asked. Engage students in various classroom enrichment activities to practice and reinforce the addition and subtraction facts and solving word problems with games, manipulatives (e.g., dice, playing cards, flashcard games, relay races to write the correct answer on whiteboard, hopscotch type games), or Web 2.0 tools. 	<p>"Clue" Words Formative: Cooperative Group Work</p> <p>Working with a partner, students will look at sample word problems and make a list of words they consider "clue" words in solving the problems. In conclusion, they will come together as a whole class to discuss the "clue" words they found for solving addition and subtraction problems and create a chart of these words.</p> <p>Model and Solve Word Problems Formative: Observation</p> <p>As a class have students model and solve word problems for all the situations shown in Table 1 on page 88 in the Common Core State Standards and represent their solutions with equations. (See Link for the Common Core Standards.)</p> <p>Solving Two-Step Problems Formative: Written Assessment</p> <p>Students will work with a partner to create and solve two-step word problems with sums and differences less than or equal to 100 using the numbers 0 to 100. They should check their answers to determine if it makes sense for the situation and the questions being asked.</p> <p>Practice and Reinforce Addition and Subtraction Formative: Observation</p> <p>Students will engage in various classroom enrichment activities to practice and reinforce addition and subtraction facts and solving word problems with games, manipulatives (e.g., dice, playing cards, flashcard games, relay races to write the correct answer on whiteboard, hopscotch type games), or Web 2.0 tools.</p> <p>Evaluating word problems Summative: Writing Assignment</p> <p>Students will create own word problems and evaluate reasonableness.</p>
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<p>Resources (Suggested)</p> <ol style="list-style-type: none"> iPad Resources Literature Connections: <i>Centipede's 100 Shoes</i> by Tony Ross <i>Night Noises</i> by Mem Fox <i>One Duck Stuck</i> by Phyllis Root <i>One Gorilla</i> by Atsuko Morozumi <i>P. Bear's New Year's Party</i> by Paul Owen Lewis <i>Six-Dinner Sid</i> by Inga Moore <i>Stay in Line</i> by Teddy Slater <i>A Collection for Kate</i> by Barbara deRubertis and Gioia Fiammenghi <i>Mission: Addition</i> by Loreen Leedy <i>The Action of Subtraction</i> by Brian P. Cleary and Brian Gable <i>Smart Pads!: Addition & Subtraction Grades 2-3</i> by Joan Novelli Internet Resources

<p>Catholic Identity</p> <p>Social Justice Teachings</p> <ul style="list-style-type: none"> ✚ Life And Dignity Of The Human Person ✚ Call To Family, Community, And Participation ✚ Rights And Responsibilities ✚ Solidarity ✚ Care For God's Creation <p>Rights of Children</p> <ul style="list-style-type: none"> ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security. ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity. ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents. ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and



[Addition and Subtraction Word Problems](#)



[National Library of Virtual Manipulatives](#)



[The Math Worksheet Site](#)



[The Khan Academy](#)

reflective thinking in their search for truth.

- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
- ✚ THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.

Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 2: Add and Subtract Within 20

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Speaking and Listening
Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Operations & Algebraic Thinking

2.OA Add and subtract within 20.

- 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.

DOC: Mathematics, DOC: Grade 2, Numbers, Number Sense and Operations

B. Meaning of Operations

- 1. Mastery of addition and subtraction facts to 20.

Essential Questions

- Why is it important for me to know the addition and subtraction facts?
- To what degree am I able to use mental strategies to add and subtract numbers?
- How do good problem solvers use mental strategies to help them solve problems?

Content

The students will know

1. Mental strategies to add and subtract
2. Addition facts to 20
3. Subtraction facts to 20






Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Develop, use and explain mental strategies used to add fluently within 20.
2. Develop, use and explain mental strategies used to subtract fluently within 20.
3. Recite from memory the addition facts within 20.
4. Recite from memory the subtraction facts within 20.

	<p>Reading/Writing Skills</p> <ol style="list-style-type: none"> 1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Addition 2. Subtraction 3. Mental strategies 4. Sums 5. One-digit numbers 	<p>Additional Vocabulary</p>
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Have students engaged in a variety of activities that will help them develop a strong understanding of number relationships, addition and subtraction so they can develop, share, and use efficient strategies for mental computation. 2. Working with a partner, have students explain how they apply the commutative and associative properties to their mental strategies for sums less or equal to 20 using the numbers 0 to 20. 3. As a class, discuss the mental strategies students use to add and subtract within 20; give the strategy a name that makes sense to the students and include examples of the strategies. Create a poster listing the strategies. 4. Working in cooperative groups, have students take turns rolling a number cube and subtracting the number they roll each time from 20. The first person to reach 0 wins the round. 5. As a class, have students study how numbers are related to 5 and 10 so they can apply the relationships to their strategies for knowing $5 + 4$ or $8 + 3$ and so on. Ask them to do sample problems using a mental strategy. 	<p>Assessment (Suggested)</p> <p>Commutative and Associative Properties & Mental Strategies Formative: Observation</p> <p>Working with a partner, students will explain how they apply the commutative and associative properties to their mental strategies for sums less or equal to 20 using the numbers 0 to 20.</p> <p>Practicing Subtraction Formative: Cooperative Group Work</p> <p>Working in cooperative groups, students will take turns rolling a number cube and subtracting the number they roll each time from 20. The first person to reach 0 wins the round.</p> <p>Addition and Subtraction Games Formative: Cooperative Group Work</p> <p>Working in small groups, students will follow rules of games (e.g., flashcards, playing cards, websites, iPad applications) while practicing basic addition and subtraction facts within 20.</p> <p>Fluency of addition and subtraction facts within 20 Summative: Test</p> <p>Students will demonstrate their knowledge of math facts within 20 (timed tests).</p>
<p>Resources (Suggested)</p> <ol style="list-style-type: none"> 1. iPad Resources 2. Literature Connections: <i>Centipede's 100 Shoes</i> by Tony Ross <i>Night Noises</i> by Mem Fox <i>One Duck Stuck</i> by Phyllis Root <i>One Gorilla</i> by Atsuko Morozumi <i>P. Bear's New Year's Party</i> by Paul Owen Lewis 	<p>Catholic Identity</p> <p>Social Justice Teachings</p> <ul style="list-style-type: none">  Life And Dignity Of The Human Person  Call To Family, Community, And Participation  Rights And Responsibilities  Solidarity  Care For God's Creation

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Stay in Line by Teddy Slater
A Collection for Kate by Barbara deRubertis and Gioia Fiammenghi
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The Action of Subtraction by Brian P. Cleary and Brian Gable
Smart Pads!: Addition & Subtraction Grades 2-3 by Joan Novelli

3. Internet Resources



[Addition and Subtraction Activities and Games](#)



[The National Library of Virtual Manipulatives](#)



[The Math Worksheet Site](#)



[The Brain Pop](#)

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
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Unit 3: Conceptual Multiplication

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

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- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
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- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Operations & Algebraic Thinking

2.OA Work with equal groups of objects to gain foundations for multiplication.

- 2.OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
- 2.OA.4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Essential Questions

- Why is knowing how to work with numbers important?
- How do good problem solvers solve problems?
- Why is it important to recognize patterns in problems?

Content

The students will know

1. Odd or even numbers.
2. The sum of two equal addends equals an even number (e.g., doubles facts).
3. Addition is used to find the total number of objects arranged in rectangular arrays with up to 5 rows and 5 columns.

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Investigate groups objects (up to 20) and determine whether the number is odd or even (e.g., pairing objects or counting by 2's).
2. Formulate an equation to express an even number as a sum of two equal addends.
3. Construct an equation to express the total number of objects in rectangular arrays with up to 5 rows and 5 columns.

	<p>4. Formulate an equation to express the total as a sum of equal addends (e.g., $5+5+5+5=20$).</p> <p>Reading/Writing Skills</p> <ol style="list-style-type: none"> 1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Even number 2. Odd number 3. Pairing 4. Rectangular arrays 5. Equal addends 6. Sum 7. Rows 8. Columns 9. Counting by 2's 10. Equations 	<p>Additional Vocabulary</p> <ol style="list-style-type: none"> 1. Grid paper
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Working in cooperative groups, have students investigate separating no more than 20 objects into two equal groups to find that the numbers will have some objects remaining and some will have no objects remaining after separating the collections into two equal groups. Odd numbers will have some objects remaining while even numbers will not. For an even number of objects in a collection, show the total as the sum of equal addends (repeated addition). 2. Working with a partner, have students create all the rectangular arrays possible with square pattern blocks or linking cubes with no more than 25 objects. Then, using grid paper have the partners draw the arrays and write two different equations under the arrays: one showing the total as a sum by rows and the other showing the total as a sum by columns. <p> ○○○○ Equation by rows: $20 = 5 + 5 + 5 + 5$ ○○○○ Equation by columns: $20 = 4 + 4 + 4 + 4 + 4$ </p> <p>Have students discuss the two arrays are different and yet the same.</p> 3. Build on this activity by having the students investigate arrays with up to 5 rows and up to 5 columns in different orientations. (For example, an array with 3 rows and 4 objects in each row and then 4 rows and 3 objects in each row. Explain how the arrays are different and yet the same.) 	<p>Assessment (Suggested)</p> <p>Modeling Multiplication Formative: Teacher Observation</p> <p>Students will model and illustrate repeated addition equations by grouping objects (up to 20) into equal groups and arranging in columns and rows.</p> <p>Even or Odd Formative: Teacher Observation</p> <p>Working in cooperative groups, have students investigate separating no more than 20 objects into two equal groups to find that the numbers will have some objects remaining and some will have no objects remaining after separating the collections into two equal groups. Odd numbers will have some objects remaining while even numbers will not. For an even number of objects in a collection, show the total as the sum of equal addends (repeated addition).</p> <p>Writing Equations Formative: Cooperative Group Work</p> <p>Working with a partner, students will create all the rectangular arrays possible with square pattern blocks or linking cubes with no more than 25 objects. Then, using grid paper have the partners draw the arrays and write two different equations under the arrays: one showing the total as a sum by rows and the other showing the total as a sum by columns.</p> <p>Investigating Many Arrays Summative: Writing Assignment</p>

Students will investigate arrays with up to 5 rows and up to 5 columns in different orientations. (For example, an array with 3 rows and 4 objects in each row and then 4 rows and 3 objects in each row. Explain how the arrays are different and yet the same.)

Resources (Suggested)

1. iPad Apps and Resources
2. Literature Connections
Centipede's 100 Shoes by Tony Ross
One Hundred Hungry Ants by Elinor J. Pinczes
P. Bear's New Year's Party by Paul Owen Lewis
Six-Dinner Sid by Inga Moore
Two Ways to Count to Ten: A Liberian Folktale by Ruby Dee
Amanda Bean's Amazing Dream by Cindy Neuschwander
How Many Ants? by Larry D. Brimmer
Melisande by Edith Nesbit and P. J. Lynch
Noah's Ark Song by June Epstein and Alison Lester
Under the Sun and Over the Moon by Kevin Crossley-Holland and Ian Penney
3. Internet Resources



[Multiplication Tables Up To 5](#)



[Illustrates Groups](#)



[The National Library of Virtual Manipulatives](#)



[Understanding Multiplication](#)



[Free Printable Multiplication Worksheets](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Option For The Poor And Vulnerable
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
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Mathematics Curriculum ~ Grade Two

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Unit 4: Place Value

Standards Assessed

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Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

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Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

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- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Number & Operations in Base Ten

2.NBT Understand place value.

- 2.NBT.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
 - 2.NBT.1a. 100 can be thought of as a bundle of ten tens — called a "hundred."
 - 2.NBT.1b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
- 2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s.
- 2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- 2.NBT.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

DOC: Mathematics, DOC: Grade 2, Numbers, Number Sense and Operations

A. Numbers and Number Systems

- 3. Count money and make change using coins and a dollar bill.
- 4. Represent and write the value of money using the ¢ sign and in decimal form when using the \$ sign.

Essential Questions

- How does the position of a digit in a number affect its value?
- How are place value patterns repeated in numbers?
- Why is it important for me to understand place value?

Content

Skills

<p>The students will know</p> <ol style="list-style-type: none"> 1. Three-digit numbers represent amounts of hundreds, tens, and ones. 2. A bundle of ten tens is called a "hundred." 3. Three-digit numbers with zeroes in tens and ones place (100, 200, 300...) 4. Skip counting by 5's, 10's and 100's within 1,000. 5. Numbers, number names and expanded form within 1,000. 6. Symbols $<$, $=$, $>$ to compare two three-digit. 7. Place value of quarter, half-dollars, and dollars. 8. Different combinations of coins and dollar bills that have the same value. 9. Appropriate symbols for dollars (\$) and cents (¢). 	<p><u>Bloom's Taxonomy</u> <u>DOK Links</u></p> <p>The students will be able to</p> <ol style="list-style-type: none"> 1. Explain how a three-digit number represents amount of hundreds, tens, and ones. 2. Show ten tens as a bundle called a hundred. 3. Explain place value of numbers in units of hundred, from 100-900. 4. Compare two three-digit numbers based on the meaning of hundreds, tens, and ones using $<$, $=$, $>$. 5. Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form. 6. Count by 5's, 10's, and 100's within 1,000. 7. Determine the value of a small collection of coins and dollar bills (less than ten dollars) using quarters, half-dollars and dollar bills. 8. Compare values of two small collections of coins and dollar bills (less than ten dollars) using $<$, $=$, $>$. 9. Write value of money using the appropriate symbols. <p>Reading/Writing Skills</p> <ol style="list-style-type: none"> 1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Expanded form 2. Three-digits 3. Hundreds 4. Tens 5. Ones 6. Skip count 7. 1,000 8. Number names 9. Symbols for less than ($<$), equal to ($=$), greater than ($>$) 10. Quarters 11. Half-dollars 12. Dollars 13. Symbols for dollars and cents 	<p>Additional Vocabulary</p>
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Engage students in class activities focusing on developing an understanding of the following: <ol style="list-style-type: none"> a. There are ten digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9). b. Some numbers have one digit, some numbers have two digits, and some have three digits. c. The ones place is always farthest to the right. The tens place is to the left of the ones place. The hundreds place is to the left of the tens place. 	<p>Assessment (Suggested)</p> <p>Modeling Place Value Formative: Class Work</p> <p>Students will use base ten blocks, a place value mat, or other manipulatives to illustrate place value concepts for numbers within 1,000.</p> <p>Place Value and Comparing Numbers</p>

- d. A number written as numerals is in **standard form**.
 e. A number written as a sum of its place value is in **expanded form**.
- Working with a partner and using a list of three-digit numbers, have students write different representations for each of the numbers. (For example, $236 = 236$ ones, or 23 tens and 6 ones, or 2 hundreds, 3 tens and 6 ones.)
 - On a number line, have students use a magnet or a marker to identify the number that is ten more than a given number or five more than a given number.
 - Working in cooperative groups, have students create and compare all the three-digit numbers that can be made using numbers from 0 to 9 and determine which number is greater than or less than another number.
 - Have students practice using money (naming the value of different forms of money, writing money value correctly using ¢ and \$ signs) by having a bake sale, toy sale, or classroom "garage sale." Have students total up the purchases and make change. Donate the proceeds to the missions or another charity.

Summative: Technology Project

Students will use Link (Number Line and Place Value, see resources) to compare two three-digit numbers.

Understanding Place Value
Summative: Cooperative Group Work

Working with a partner and using a list of three-digit numbers, students will write different representations for each of the numbers. (For example, $236 = 236$ ones, or 23 tens and 6 ones, or 2 hundreds, 3 tens and 6 ones.)

Skip Counting
Summative: Written Assessment

On a number line, students will use a marker to identify the number that is ten more than a given number or five more than a given number.

Classroom "Garage Sale"
Formative: Performance

Students will demonstrate their knowledge of coins, creating coin combinations, and creating change while setting up and conducting a classroom "garage sale."

Great Than or Less Than
Summative: Written Assessment

Working in cooperative groups, students will create and compare all the three-digit numbers that can be made using numbers from 0 to 9 and determine which number is greater than or less than another number.

Resources (Suggested)

- iPad Apps and Resources
- Literature Connections:
Can You Count to a Googol? by Robert E. Wells
The Coin Counting Book by Rozanne Lanczak Williams
The King's Commissioners by Aileen Friedman
More Than One by Miriam Schlein
Pigs Will Be Pigs: Fun with Math and Money by Amy Axelrod
Stay in Line by Teddy Slater
One in a Million by Moira Andrew
- Internet Resources



[Place Value](#)



[Place Value](#)



[The National Library of Virtual Manipulatives](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
- ✚ THE RIGHT TO LEARN RESPONSIBILITY for themselves and

	their actions.
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Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 5: Place Value and Addition

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 1. Make sense of problems and persevere in solving them.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Number & Operations in Base Ten

2.NBT Use place value understanding and properties of operations to add and subtract.

- 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 2.NBT.7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
- 2.NBT.8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
- 2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations.

Essential Questions

- In what ways can numbers be composed and decomposed?
- How are place value patterns repeated in numbers?
- How can place value properties aid computation?

Content

The students will know

1. Addition within 100 using strategies based on place value, properties of operations and relationships between addition and subtraction.
2. Addition up to four two-digit numbers using strategies using place value and properties of operations.

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Fluently add within 100 using strategies based on (a) place value, (b) properties of operations, and (c) relationship between addition and subtraction.
2. Add up to four two-digit numbers using strategies based on

<ol style="list-style-type: none"> 3. Strategies to write and explain the reasoning used in addition to 1,000. 4. Addition of three-digit numbers sometimes requires composing a hundred. 5. Addition by 10 or 100 to a given number 100-900 by memory. 6. Why addition strategies work. 	<p>place value and properties of operations.</p> <ol style="list-style-type: none"> 3. Add within 1,000 using (a) concrete models or drawings, (b) strategies based on place value, (c) properties of operations, (c) relationship between addition and subtraction and (d) relating these strategies to a written method. 4. Explain and model that in adding three-digit numbers, ones are added to ones, tens are added to tens, and hundreds are added to hundreds. Sometimes it is necessary to compose a hundred. 5. Mentally add 10 or 100 to a given number 100-900. 6. Relate an addition strategy to a written method and explain the reasoning used. <p>Reading/Writing Skills</p> <ol style="list-style-type: none"> 1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Place value 2. Properties of operations 3. Two-digit numbers 4. Three-digit numbers 5. Concrete models 6. Written method 7. Compose numbers 8. Ones 9. Tens 10. Hundreds 11. Mental math 12. Addition 	<p>Additional Vocabulary</p>
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. On a number line, have students use a clothespin or marker to identify the number that is ten more than a given number or five more than a given number. 2. Using place value mats, the students will demonstrate their understanding of a ten and provide more experiences modeling addition with grouped and pre-grouped base-ten materials. 3. Working with a partner, have students use direct modeling with physical objects or drawings to find different ways to solve addition problems. Then, challenge them to "invent" strategies that do not involve physical materials or counting by ones to solve problems. Ask them to share and explain their strategies with the class and have other students try their strategies. 4. Give students a number of problems and have them compose tens and hundreds using their own strategies for solving the problems where regrouping is necessary. 5. Challenge students to analyze and "think-through" a problem before they solve it. Ask them to explain the strategy they use to solve a problem. 	<p>Assessment (Suggested)</p> <p>Modeling Addition Formative: Performance</p> <p>Ask students to explain and demonstrate how to solve addition problems within 1,000 by using manipulatives on place value board.</p> <p>Mentally add 10 and 100 Summative: Test</p> <p>Give a number (up to 1,000) and have students add 10 more or 100 more to the number mentally.</p> <p>Have students self-correct by checking answer on a number line.</p> <p>"Inventing" Strategies Formative: Class Work</p> <p>Working with a partner, have students use direct modeling with physical</p>

objects or drawings to find different ways to solve addition problems. Then, challenge them to "invent" strategies that do not involve physical materials or counting by ones to solve problems. Ask them to share and explain their strategies with the class and have other students try their strategies.

Composing Tens and Hundreds
Formative: Homework

Give students a number of problems and have them compose tens and hundreds using their own strategies for solving the problems where regrouping is necessary.

The "WHY" in Problem Solving
Summative: Oral Assessment

Challenge students to analyze and "think-through" a problem before they solve it. Ask them to explain the strategy they use to solve a problem.

Resources (Suggested)

1. iPad Resources
2. Literature Connections
Can You Count to a Googol? by Robert E. Wells
Cats Add Up! by Dianne Ochiltree
Centipede's 100 Shoes by Tony Ross
The King's Commissioners by Aileen Friedman
More Than One by Miriam Schlein
Night Noises by Mem Fox
One Duck Stuck by Phyllis Root
One Gorilla by Atsuko Morozumi
Only One by Marc Harshman
P. Bear's New Year's Party by Paul Owen Lewis
Six-Dinner Sid by Inga Moore
Stay in Line by Teddy Slater
Ten Friends by Bruce Goldstone
Two of Everything by Lily Toy Hong
The 329th Friend by Marjorie Weinman Sharmat and Cyndy Szekeeres
Six Dogs, Twenty-Three Cats, Forty-Five Mice, and One Hundred Sixteen Spiders by Mary Chalmers
3. Internet Resources



[Adding using place value tens and ones!](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
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- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
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Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 6: Place Value and Subtraction

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

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

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Number & Operations in Base Ten

2.NBT Use place value understanding and properties of operations to add and subtract.

- 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 2.NBT.7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
- 2.NBT.8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
- 2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations.

Essential Questions

- In what ways can numbers be composed and decomposed?
- How are place value patterns repeated in numbers?
- How can place value properties aid computation?

Content

The students will know

1. Subtraction within 100 using strategies based on place value, properties of operations and relationships between addition and subtraction.
2. Strategies to write and explain the reasoning used in subtraction

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Fluently subtract within 100 using strategies based on (a) place value, (b) properties of operations, and (c) relationship between

<p>within 1,000.</p> <ol style="list-style-type: none"> Subtraction of three digit numbers sometimes requires decomposing a ten or a hundred. Subtraction by 10 or 100 from a given number 100-900 by memory. 	<p>addition and subtraction.</p> <ol style="list-style-type: none"> Subtract within 1,000 using concrete models or drawings, strategies based on place value, properties of operations, and relationship between addition and subtraction and relating these strategies to a written method. Explain and model that in subtracting three-digit numbers ones are subtracted from ones, tens are subtracted from tens, and hundreds are subtracted from hundreds; and sometimes it is necessary to decompose a ten or a hundred. Mentally subtract 10 or 100 from a given number 100-900. Relate the strategy to a written method and explain the reasoning used. <p>Reading/Writing Skills</p> <ol style="list-style-type: none"> Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> Explain step-by-step process. Summarize results using specific and appropriate vocabulary. Use proper sentence structure for written answers. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> Place value Properties of operations Two-digit numbers Three-digit numbers Concrete models Written method Decompose numbers Ones Tens Hundreds Mental math Subtraction 	<p>Additional Vocabulary</p>
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> On a number line, have students use a clothespin or marker to identify the number that is ten less than a given number or five less than a given number. Using place value mats, the students will demonstrate their understanding of a ten and provide more experiences modeling subtraction with grouped and pre-grouped base-ten materials. Working with a partner, have students use direct modeling with physical objects or drawings to find different ways to solve subtraction problems. Then, challenge them to "invent" strategies that do not involve physical materials or counting by ones to solve problems. Ask them to share and explain their strategies with the class and have other students try their strategies. Give students a number of problems and have them decompose tens and hundreds using their own strategies for solving the problems where regrouping is necessary. Challenge students to analyze and "think-through" a problem before they solve it. Ask them to explain the strategy they use to 	<p>Assessment (Suggested)</p> <p>Modeling Subtraction Formative: Performance</p> <p>Have students solve subtraction problems by using manipulatives and a place value board.</p> <p>Mentally Subtract 10 and 100 Formative: Performance</p> <p>Give a number within 1,000 and have students mentally subtract 10 and 100. Give students a number line to self-correct their answers.</p> <p>"Inventing" Strategies for Subtraction Formative: Class Work</p> <p>Working with a partner, have students use direct modeling with physical</p>

solve a problem.

objects or drawings to find different ways to solve subtraction problems. Then, challenge them to "invent" strategies that do not involve physical materials or counting by ones to solve problems. Ask them to share and explain their strategies with the class and have other students try their strategies.

Solving by Decomposing
Formative: Homework

Give students a number of problems and have them decompose tens and hundreds using their own strategies for solving the problems where regrouping is necessary.

The "WHY" Behind Subtraction
Summative: Oral Assessment

Challenge students to analyze and "think-through" a problem before they solve it. Ask them to explain the strategy they use to solve a problem.

Resources (Suggested)

1. iPad Resources
2. Literature Connections
Cats Add Up! by Dianne Ochiltree
The King's Commissioners by Aileen Friedman
Night Noises by Mem Fox
Ten Sly Piranhas: A Counting Story in Reverse by William Wise
Counting Caterpillars and Other Math Poems by Betsy Franco
A Fair Bear Share by Stuart J. Murphy and John Speirs
Arithme-Tickle: An Even Number of Odd Riddle-Rhymes by J. Patrick Lewis and Frank Remkiewicz
Elevator Magic by Stuart J. Murphy and G. Brian Karas
How Will We Get to the Beach? by Brigitte Luciani and Eve Tharlet
The Shark Swimathon by Stuart J. Murphy and Lynne W. Cravath
3. Internet Resources



[Subtraction Using Place Value!](#)



[National Library of Virtual Manipulatives!](#)



[Khan Academy!](#)



[The Math Worksheet Site!](#)



[IXL Math Site!](#)



[Subtraction by Regrouping!](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
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Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 7: Measurement in Standard Units

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Speaking and Listening
Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
- SL.2.1a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

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

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Measurement & Data

2.MD Measure and estimate lengths in standard units.

- 2.MD.1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- 2.MD.2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
- 2.MD.3. Estimate lengths using units of inches, feet, centimeters, and meters.
- 2.MD.4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

DOC: Mathematics, DOC: Grade 2, Measurement
A. Measurement Units

- 1. Identify and select appropriate units of measure for:
 - a. Length -- centimeters, decimeters, meters, inches, feet or yards;
 - b. Volume – liters, cups, pints, quarts, and gallons;
 - c. Weight-grams, kilograms, ounces or pounds;
 - f. Temperature -- Fahrenheit.
- 3. Describe, compare and order the relationships among standard and non-standard units of measure, such as centimeters and meters; inches, feet and yards; cups, pints and quarts; ounces and pounds, hours, half-hours and quarter-hours.

B. Measurement Techniques and Tools

- 1. Estimate and measure the length and weight of common objects, using metric, U.S. customary units, and non-standard units accurate to the nearest unit.
- 3. Select and use appropriate measurement tools.

Essential Questions

- Why do I measure?
- Why do I need standardized units of measurement?
- How do I use measurement everyday?
- How does what I measure influence how I measure?

Content

The students will know

1. Tools can be used to measure length.
2. Rulers, yardsticks, meter sticks, and measuring tapes show the length an object can be measured.
3. Length units of different lengths can be used to measure an object.
4. Inches, feet, centimeters, and meters are units of length.
5. Standard length unit of objects.
6. Appropriate unit of measure for volume (e.g., cups, pints, quarts, gallons), weight (e.g., ounces and pounds), temperature (e.g., degrees Fahrenheit).
7. Personal and common reference points for units of measure.
8. Relationships among standard units of measure.

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Measure objects by length using the appropriate tools.
2. Compare and describe the measurement of length using different length units and how the measurements relate to the size of the unit chosen.
3. Estimate the length of an object using units of inches, feet, centimeters, and meters.
4. Measure and compare difference between objects using standard length units.
5. Identify and select appropriate units of measure for volume, weight, and temperature.
6. Estimate and measure the length and height of objects using nonstandard units.
7. Describe, compare, and order the relationships among standard units of measure: cups, pints, and quarts and ounces and pounds.
8. Compare and contrast length and height of objects without measuring.
9. Estimate and measure length and height using inches, feet, yards, centimeters, meters.
10. Explain length and height, volume, weight, and temperature.
11. Identify and select appropriate units of measure for temperature.

Reading/Writing Skills

1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems.
2. Justify solutions, either verbally or in written form.
 - a. Explain step-by-step process.
 - b. Summarize results using specific and appropriate vocabulary.

- c. Use proper sentence structure for written answers.
- 3. Work in cooperative groups to practice listening and speaking skills.

Common Core Vocabulary

1. Length
2. Tools
3. Rulers
4. Yardsticks
5. Meter sticks
6. Measuring tapes
7. Length unit
8. Inches
9. Feet
10. Centimeters
11. Meters
12. Estimate
13. Standard length unit
14. Longer
15. Difference

Additional Vocabulary

1. Volume
2. Cups
3. Pints
4. Quarts
5. Gallons
6. Weight
7. Ounces
8. Pounds
9. Temperature
10. Degrees Fahrenheit
11. Standard units of measure
12. Thermometer

Learning Experiences (Suggested)

1. Introduce the study of measurement by reading *Mr. Tall & Mr. Small* by Barbara Brenner. Discuss the height of the giraffe and the length of its neck. Have students compare a giraffe's neck to a mouse's neck. What other comparisons can they make about objects around the classroom?
2. Working with a partner and using connecting cubes, have students guess (estimate) how many cubes long their arms are from their wrist to their elbow. Use the cubes to measure the lengths and then compare the actual measurement with their guess.
3. Working with a partner, have students estimate and then measure the length of several objects of the same size using connecting cubes (pencil, crayon, eraser) and the height of a notebook or textbook. Record their measurements and share results with the rest of the class. Have students explain why there may be differences in their measurements. Repeat this activity using paper clips instead of cubes and then compare the clip measurements with their cube measurements.
4. Using a book such as *Millions to Measure* by David M. Schwartz, explain the need for standard units and tools of measurement and show students some of these standard units and tools.
5. Working with a partner and using a paper clip, a ruler, or a yardstick, have students measure objects in the classroom. Have them record their measurements and reflect on why they used each "tool" to measure the object.
6. Using a discussion of the Olympics, introduce students to the metric system of measure and show them a meter stick. Using rulers that also have centimeter markings, have students compare centimeters and inches. Compare meter stick to yard stick. Which stick is longer? What types of objects would you measure with a meter stick?
7. Using different types and sizes of containers, e.g., cup, pint, liter, quart, have students compare the different volumes using rice or another small object. Share their results.

Assessment (Suggested)

Measuring Classroom Objects
Formative: Teacher Observation

Have students estimate then measure classroom objects to the nearest inch.
 Have students estimate then measure classroom objects to the nearest centimeter.
 Have students (in small groups) compare estimations with actual measurements.
 Teachers record observations as students complete task.

Estimating a Measure
Formative: Class Work

Working with a partner and using connecting cubes, have students guess (estimate) how many cubes long their arms are from their wrist to their elbow. Use the cubes to measure the lengths and then compare the actual measurement with their guess.

How Long Is It?
Formative: Cooperative Group Work

Working with a partner, have students estimate and then measure the length of several objects of the same size using connecting cubes (pencil, crayon, eraser) and the height of a notebook or textbook. Record their measurements and share results with the rest of the class. Have students explain why there may be differences in their measurements. Repeat this activity using paper clips instead of cubes and then compare the clip measurements with their cube measurements.

Estimating volumes
Formative: Project

Children will bring in containers from snacks that come in different size

<p>8. Working with a partner, have students examine the weight of different objects. Explain that weight is measured in units of pounds and ounces.</p> <p>9. As an introduction to "temperature" as a unit of measure, read Robert Munsch's <i>50 Below Zero</i> to the class. Follow the reading with a discussion of the many ways in which we measure temperature. Have students keep a temperature chart showing the high and low temperatures of the weather for several days. Explain their charts to the class.</p>	<p>containers, e.g. cup, pint, liter, quart. They can use sand or rice to compare the different volumes.</p> <p>In cooperative groups students will compare and order volume containers based on the amount of rice or sand it holds.</p> <p>Measuring weight Formative: Technology Project</p> <p>Students will use iPad link to practice measuring weight.</p> <p>Temperature Formative: Observation</p> <p>Students will use the weather report and temperature listing to demonstrate on a thermometer the high and low during a given day.</p> <p>Watching the Temperature Formative: Homework</p> <p>Following the reading of Robert Munsch's <i>50 Below Zero</i> and a discussion of the many ways in which we measure temperature, have students keep a temperature chart showing the high and low temperatures of the weather for several days. Ask them to explain their charts to the class.</p>
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Resources (Suggested)

1. iPad Resources
2. Literature Connection
 - Big and Little* by Steve Jenkins
 - Biggest, Strongest, Fastest* by Steve Jenkins
 - Can You Count to a Googol?* by Robert E. Wells
 - How Big Is a Foot?* by Rolf Myller
 - How Tall, How Short, How Faraway* by David A. Adler
 - Inch by Inch* by Leo Lionni
 - My Map Book* by Sara Fanelli
 - Telling Time: How to Tell Time on Digital and Analog Clocks* by Jules Older
 - A House for Hermit Crab* by Eric Carle
 - Carrie Measures Up* by Linda Aber and Joy Allen
 - Counting on Frank* by Rod Clement
 - The 100-Pound Problem* by Jennifer Dussling and Rebecca McKillip Thornburgh
 - Wilma Unlimited: How Wilma Rudolph Became the World's Fastest Woman* by Kathleen Krull and David Diaz
3. Internet Resources



[Measurement Quiz](#)



[Temperature Resources and Worksheets](#)



[Super Teacher Worksheets](#)



[Teaching Measurement](#)

Catholic Identity

Social Justice Teachings

- + Life And Dignity Of The Human Person
- + Call To Family, Community, And Participation
- + Rights And Responsibilities
- + Solidarity
- + Care For God's Creation

Rights of Children

- + THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- + THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- + THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPowerMENT through the development of their gifts and talents.
- + THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- + THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- + THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
- + THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.



[National Library of Virtual Manipulatives!](#)

Mathematics Curriculum ~ Grade Two Diocese of Cleveland



Unit 8: Relate Addition and Subtraction to Length

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 1. Make sense of problems and persevere in solving them.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Measurement & Data

2.MD Relate addition and subtraction to length.

- 2.MD.5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
- 2.MD.6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2... and represent whole-number sums and differences within 100 on a number line diagram.

Essential Questions

- Why do I need standardized units of measurement?
- How do I use measurement everyday?
- How can I relate length to addition and subtraction?

Content

The students will know

1. Addition and subtraction within 100 to solve word problems involving length.
2. Equations with a symbol for the unknown number to represent the problem.
3. Number line diagram represents whole numbers.
4. Addition or subtraction using a number line within 100.

Skills

Bloom's Taxonomy


DOK Links

The students will be able to

1. Solve word problems involving lengths given in the same units, e.g., by drawing of rulers.
2. Draw and write equations with a symbol for the unknown number to represent the problem.
3. Apply addition and subtraction concepts using a number line for problems within a 100.

Reading/Writing Skills

1. Define, using context clues, specific vocabulary from the

	<p>Common Core and apply the terms and definitions to solve problems.</p> <ol style="list-style-type: none"> 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Addition 2. Subtraction 3. Word problems 4. Equations 5. Symbol for unknown number 6. Number line diagram 7. Sums 8. Differences 9. Rulers 	<p>Additional Vocabulary</p> <ol style="list-style-type: none"> 1. Yardsticks 2. Meter Sticks 3. Measuring tapes 4. Cash Register tapes or paper strips
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Working with a partner, have students connect the whole-number units on rulers, yardsticks, meter sticks and measuring tapes to number lines showing whole-number units starting at 0. Then ask them to use these measuring tools to model different representations for whole-number sums and differences less than or equal to 100 using the numbers 0 to 100. 2. Have students use a meter stick to view units of ten (10 cm) and hundred (100 cm), and to skip count by 5's and 10's. 3. Provide one and two-step word problems that include different lengths/measurements made with the same unit (inches, feet, centimeters, and meters). Have students add or subtract within 100 to solve problems for these situations by making drawings and writing equations with a symbol for the unknown. 4. Working with a partner, have students use a whole-number line to represent addition and subtraction within 100 on the number line by using curved line segments above the number line and between the numbers marked on the number line. 	<p>Assessment (Suggested)</p> <p>Measuring Tools and the Number Line Formative: Class Work</p> <p>Working with a partner, have students connect the whole-number units on rulers, yardsticks, meter sticks and measuring tapes to number lines showing whole-number units starting at 0. Students will use these measuring tools to model different representations for whole-number sums and differences less than or equal to 100 using the numbers 0 to 100.</p> <p>Using a Number Line to Compare Lengths Formative: Observation</p> <p>Students will measure two objects using a number line. Students will compare the two measurements and write an equation to compare the measurements.</p> <p>Adding and Subtracting Formative: Homework</p> <p>Students will add or subtract within 100 to solve problems for situations by making drawings and writing equations with a symbol for the unknown.</p> <p>Using Number Line to Show Addition and Subtraction Summative: Homework</p> <p>Working with a partner, students will use a whole-number line to represent addition and subtraction within 100 on the number line by using curved line segments above the number line and between the numbers marked on the number line.</p>
<p>Resources (Suggested)</p> <ol style="list-style-type: none"> 1. iPad Resources 2. Literature Connections 	<p>Catholic Identity</p> <p>Social Justice Teachings  Life And Dignity Of The Human Person</p>

Math For All Seasons: Mind-Stretching Math Riddles by
Gregory Tang and Harry Briggs
The Water Hole by Graeme Base
Why Mosquitoes Buzz in People's Ears: A West African Tale by
Verna Aardema, Leo Dillon and Diane Dillon

3. Internet Resources



[Relating Addition and Subtraction to Length](#)



[Number Line for Subtraction](#)



[The National Library of Virtual Manipulatives](#)



[The Math Worksheet Site](#)



[Number Lines](#)

- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
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Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 9: Time and Money

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 1. Make sense of problems and persevere in solving them.
- 2. Reason abstractly and quantitatively.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Measurement & Data

2.MD Work with time and money.

- 2.MD.7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- 2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

Essential Questions

- How do we determine time and calculate elapsed time?
- How can we count money, make change, and compare amounts of money?
- How are counting money and telling time useful?

Content

The students will know

- Analog and digital times on a clock to the nearest five minutes, using a.m. or p.m.
- Word problems involving dollar bills, half-dollars, quarters, dimes, nickels, and pennies using appropriate symbols.

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

- Write and tell time from an analog and digital clock to the nearest five minutes using a.m. or p.m.
- Identify the current time to the nearest 5 minutes on both analog and digital clocks.
- Show on both analog and digital clocks the time that they perform various activities during the day, to the nearest five minutes.
- Solve word problems involving dollar bills, half-dollars, quarters, dimes, nickels, and pennies using appropriate symbols.
- Calculate money totals represented in word format.
- Use appropriate operations as described in word problems to find money totals.

Reading/Writing Skills

- Define, using context clues, specific vocabulary from the

	<p>Common Core and apply the terms and definitions to solve problems.</p> <ol style="list-style-type: none"> 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Analog 2. Digital 3. a.m. 4. p.m. 5. Dollar bills 6. Quarters 7. Half-dollars 8. Dimes 9. Nickels 10. Pennies 11. \$ and ¢ 	<p>Additional Vocabulary</p>
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Working with a partner, have students tell time from analog and digital clocks to the nearest five minutes using a.m. and p.m. 2. Working with a partner, have students manipulate the hands on a face clock to show the time given on a digital clock. Times should be given to the nearest five minutes. 3. Using play money, have students sort their money into piles of similar coins and determine the total value of each pile by counting penny pile by ones, the nickel pile by 5's, and the dime pile by 10's. 4. Write a coin amount on the chalkboard up to 99 cents. Ask students to use their play money to show that amount with their coins on their desks. Discuss the different combinations of coins the children use to show the amount. Determine who used the fewest or most coins. Point out that there can be different ways to make the same amount of money. 5. Working with a partner, have students explore the relationship between pennies, nickels, dimes, and quarters and have them count sets of mixed coins, write story problems that involve money, and use coins to make patterns. 6. Conduct a class "garage sale." Have students use play money to purchase items. 	<p>Assessment (Suggested)</p> <p>What Time Is It? Formative: Class Work</p> <p>Working with a partner, students will tell time from analog and digital clocks to the nearest five minutes using a.m. and p.m.</p> <p>Telling Time Formative: Class Work</p> <p>Working with a partner, students will manipulate the hands on a face clock to show the time given on a digital clock. Times should be given to the nearest five minutes.</p> <p>Telling Time Summative: Observation</p> <p>Given a specific time, students will write digital time and use an analog clock to demonstrate the given time.</p> <p>Coin combinations Formative: Observation</p> <p>Students will count sets of mixed coins. Students will write story problems that involve money, and use coins to make patterns.</p> <p>How Much Do You Have? Formative: Class Work</p> <p>Using play money, students will sort their money into piles of similar coins and determine the total value of each pile by counting penny pile by ones, the nickel pile by 5's, and the dime pile by 10's.</p>

How Many Coins Do I Need?

Formative: Class Work

Write a coin amount on the chalkboard up to 99 cents. Students will use their play money to show the given amount using different combinations of their coins.

Garage Sale

Summative: Teacher Observation

Conduct a class "garage sale." Students will demonstrate their understanding of money by using coins correctly to purchase items.

Resources (Suggested)

1. iPad Resources
2. Literature Connection
Before and After: A Book of Nature Timescapes by Jan Thornhill
Be Pigs: Fun with Math and Money by Amy Axelrod
Telling Time: How to Tell Time on Digital and Analog Clocks! by Jules Older
A Day on the Avenue by Robert Roennfeldt
All In A Day by Mitsumasa Anno
Clocks and More Clocks by Pat Hutchins
Game Time! by Stuart J. Murphy and Cynthia Jabar
Monster Math School Time by Grace Maccarone and Marge Hartelius
Telling Time with Big Mama Cat by Dan Harper, Barry Moser and Cara Moser
A Chair for My Mother by Vera B. Williams
Arthur's Funny Money by Lillian Hoban
Jelly Beans for Sale by Bruce McMillan
The Lunch Line by Karen Berman Nagel and Jerry Zimmerman
You Can't Buy a Dinosaur With a Dime by Harriet Ziefert and Amanda Haley

3. Internet Resources



[Count, Collect, Exchange Coins](#)



[Analog and Digital Clocks](#)



[Money and Word Problems](#)



[Money Activities](#)



[Money Games](#)



[Clocks](#)



[Analog and Digital Clocks Animation](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
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Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 10: Working with Data

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Reading: Informational Text
Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

- RI.2.1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

- RI.2.4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Writing

8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

- W.2.8. Recall information from experiences or gather information from provided sources to answer a question.

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Speaking and Listening
Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
- SL.2.1a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 4. Model with mathematics.
- 6. Attend to precision.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Measurement & Data

2.MD Represent and interpret data.

- 2.MD.9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.MD.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problem 1 using information presented in a bar graph.

DOC: Mathematics, DOC: Grade 2, Data Analysis and Probability

A. Data Collection

- 3. Read, interpret and make comparisons and predictions from data represented in charts, line plots, picture graphs, bar graphs, and tally charts.

Essential Questions

- How can information be gathered, recorded, and organized?
- How do people use data to influence others?
- How can predictions be made based on data?

Content

The students will know

1. The way that data is collected, organized and displayed influences interpretation.
2. Lengths of several objects will generate measurement data.
3. A plot line, where the horizontal scale is marked off in whole-number units.
4. Rules for classification of objects or data.
5. A picture graph and bar graph represent data.
6. Picture graphs and bar graphs with up to four categories.
7. Tally marks represent the total number of data points.

Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Organize and represent data obtained by measuring the lengths of several objects.
2. Collect, display and interpret a series of measurements on a line plot, where the horizontal scale is marked off in whole-number units and an X is placed above the corresponding value on the line that represents each piece of data.
3. Measure the lengths of several objects to the nearest whole inch, foot, centimeter or meter and create a line plot with whole-number units (0, 1, 2...) on the number line to represent the measurements.
4. Classify various objects naming the classification and stating the rule for inclusion in the category.
5. Create a picture graph and bar graph (with single-unit scale) to represent data with up to four categories.
6. Solve simple put together, take apart, and compare problems using information in a bar graph.
7. Construct a bar graph using tally mark totals.

Reading/Writing Skills

1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems.
2. Justify solutions, either verbally or in written form.
 - a. Explain step-by-step process.
 - b. Summarize results using specific and appropriate vocabulary.
 - c. Use proper sentence structure for written answers.
3. Work in cooperative groups to practice listening and speaking skills.

Common Core Vocabulary

1. Measurement data
2. Line plot
3. Horizontal scale
4. Picture graph
5. Bar graph
6. Tally mark
7. Categories
8. Single-unit scale

Additional Vocabulary

Learning Experiences (Suggested)

1. Working in cooperative groups, have students organize and classify attribute blocks stating the rule for inclusion in the classification.
2. As a class, create a chart showing how many students have a birthday in a certain month. Ask students to explain what the chart tells them.
3. Working with a partner, have students create real object and picture graphs so each row or bar consists of countable parts. Then have students make horizontal or vertical bar graphs with two to four categories and a single-unit scale. Have them use the information in the graphs to pose and solve simple put together, take-apart, and compare problems. (See samples in Table 1 of



the Common Core State Standards [page 88] at http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

4. Class activity. Collect, display and interpret a series of measurements on a line plot, where the horizontal scale is marked off in whole-number units and an X is placed above the corresponding value on the line that represents each piece of data.
5. Class activity. Using the [Bar Chart](#) manipulative make a bar chart with 1 to 20 for the vertical axis and 1-12 on the horizontal axis. Ask students to explain what the chart is showing them.
6. Working in cooperative groups, have students collect information about what kind of pet each child has and put this information into a graph. Have each group explain their results to the class.

Assessment (Suggested)

Classifying Attribute Blocks

Formative: Class Work

Working in cooperative groups, students will organize and classify attribute blocks stating the rule for inclusion in the classification.

Creating Charts and Graphs

Formative: Cooperative Group Work

Working with a partner, students will create real object and picture graphs so each row or bar consists of countable parts. Students will then make horizontal or vertical bar graphs with two to four categories and a single-unit scale and use the information in the graphs to pose and solve simple put together, take-apart, and compare problems.

Collecting, Organizing and Interpreting Data

Summative: Cooperative Group Work

Working in cooperative groups, students will collect information about what kind of pet each child has and put this information into a graph. Each group will explain their results to the class.

Measurement Data

Formative: Class Work

Following a class activity, students will collect, display and interpret a series of measurements on a line plot, where the horizontal scale is marked off in whole-number units and an X is placed above the corresponding value on the line that represents each piece of data.

Resources (Suggested)

1. iPad Resources
2. Literature Connection
 - So You Want to Be President?* by Judith St. George
 - The Camp-Out Mystery* by Gertrude Chandler Warner
 - Chrysanthemum* by Kevin Henkes
 - Cloudy With a Chance of Meatballs* by Judi Barrett and Ronald Barrett
 - Country Fair* by Gail Gibbons
 - You're a Hero, Daley B.!* by Jon Blake and Axel Scheffler
 - Lemonade for Sale* by Stuart J. Murphy and Tricia Tusa
 - The Three Pigs* by David Wiesner
 - Red is Best* by Kathy Stinson and Robin Baird Lewis
3. Internet Resources



[Manipulatives Can Be Used To Make Bar Graph!](#)



[Standards Based Math Activities!](#)



[Online Games and Activities!](#)



[Brain Pop - Data!](#)

Catholic Identity

Social Justice Teachings

- ✚ Life And Dignity Of The Human Person
- ✚ Call To Family, Community, And Participation
- ✚ Rights And Responsibilities
- ✚ Solidarity
- ✚ Care For God's Creation

Rights of Children

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- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
- ✚ THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.



[Brain Pop Junior](#)



[The Math Worksheet Site](#)

Mathematics Curriculum ~ Grade Two

Diocese of Cleveland



Unit 11: Shapes and Their Attributes

Standards Assessed

CCSS: ELA & Literacy in History/Social Studies, Science, & Technical Subjects K-5, OH: CCSS: Grade 2, Speaking and Listening
Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

- SL.2.1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
- SL.2.1a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL.2.1c. Ask for clarification and further explanation as needed about the topics and texts under discussion.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- 2. Reason abstractly and quantitatively.
- 3. Construct viable arguments and critique the reasoning of others.
- 4. Model with mathematics.
- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

CCSS: Mathematics (2011), OH: CCSS: Grade 2, Geometry

2.G Reason with shapes and their attributes.

- 2.G.2.MD.1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- 2.G.2.MD.2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- 2.G.2.MD.3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Essential Questions

- How are geometric properties used to solve problems in everyday life?
- How can plane and solid shapes be described?
- What are attributes of geometric figures?
- How can shapes be combined or separated to form new shapes?

Content

The students will know

1. Shapes have specific attributes such as a given number of angles and a given number of equal faces.
2. Rectangle can be divided into rows and columns of same size squares.
3. Circles and rectangles can be divided into two, three or four equal shares.
4. Words describing equal shares (e.g., halves, thirds, fourths).
5. Words describing a whole (e.g., two halves, three thirds, four



Skills

Bloom's Taxonomy

DOK Links

The students will be able to

1. Recognize and draw shapes having specific attributes, such as a given number of angles and a given number of equal faces.
2. Compare sizes directly or visually not by measuring.
3. Partition a rectangle into rows and columns of same size squares.
4. Count the total number of squares in a partitioned rectangle.
5. Separate circles and rectangles into two, three, or four equal

<p>fourths).</p> <p>6. Equal shares of identical wholes need not have the same shape.</p>	<p>shares.</p> <p>6. Describe the shares using appropriate vocabulary.</p> <p>7. Illustrate equal shares of identical wholes need not have the same shape.</p> <p>Reading/Writing Skills</p> <ol style="list-style-type: none"> 1. Define, using context clues, specific vocabulary from the Common Core and apply the terms and definitions to solve problems. 2. Justify solutions, either verbally or in written form. <ol style="list-style-type: none"> a. Explain step-by-step process. b. Summarize results using specific and appropriate vocabulary. c. Use proper sentence structure for written answers. 3. Work in cooperative groups to practice listening and speaking skills.
<p>Common Core Vocabulary</p> <ol style="list-style-type: none"> 1. Angles 2. Faces 3. Rows 4. Columns 5. Circles 6. Rectangles 7. Halves 8. Thirds 9. Fourths 10. Half of 11. Third of 12. Fourth of 13. Two halves 14. Three thirds 15. Four fourths 16. Identical wholes 	<p>Additional Vocabulary</p> <ol style="list-style-type: none"> 1. Grid paper
<p>Learning Experiences (Suggested)</p> <ol style="list-style-type: none"> 1. Review. Using drawings, two and three-dimensional shapes, have students name and describe various geometric shapes including triangles, quadrilaterals, pentagons, hexagons, cubes, circles, spheres, prisms, etc. 2. Working with a partner, have students model multiplication with partitioned rectangles on a piece of grid paper. Have them draw a rectangular unit each 2 units by 3 units ~ how many 1 units are inside. Have them repeat the activity with different unit totals. Finally, have them explain what they observed as they worked on the task. 3. Give students different sized circles and rectangles and have them compare the different sized circles and rectangles when they have been folded into halves, thirds and fourths. Ask them to explain the different representations for each fractional part. 	<p>Assessment (Suggested)</p> <p>Shapes Summative: Visual Arts Project</p> <p>Student will identify, explain, and draw triangles, quadrilaterals, pentagons, hexagons, and cubes based on the specific attributes of the shapes.</p> <p>Forming "Fractions" Summative: Project</p> <p>Students will compare and illustrate different sized circles, and rectangles that have been folded into halves, thirds and some into fourths.</p> <p>In pairs, they will explain the different representations for each fractional part.</p>
<p>Resources (Suggested)</p> <ol style="list-style-type: none"> 1. iPad Resources 2. Literature Connection <i>A Cloak for the Dreamer</i> by Aileen Friedman 	<p>Catholic Identity</p> <p>Social Justice Teachings</p> <ul style="list-style-type: none">  Life And Dignity Of The Human Person  Call To Family, Community, And Participation

Cubes, Cones, Cylinders, and Spheres by Tana Hoban
The Greedy Triangle by Marilyn Burns
Little House in the Big Woods by Laura Ingalls Wilder
A Star in My Orange: Looking for Nature's Shapes by Dana Meachen Rau
What Is Square? by Rebecca Kai Dotlich
The Wing on a Flea: A Book About Shapes by Ed Emberley

3. Internet Resources



[Introduction to Fractions](#)



[Brain Pop Junior](#)



[The National Library of Virtual Manipulatives](#)



[Activities with Geometric Shapes](#)

✚ Rights And Responsibilities

✚ Solidarity

✚ Care For God's Creation

Rights of Children

- ✚ THE RIGHT TO A SAFE ENVIRONMENT that promotes care, protection and security.
- ✚ THE RIGHT TO BE RESPECTED AS INDIVIDUALS with human dignity.
- ✚ THE RIGHT TO WORK ACTIVELY TOWARD THEIR OWN EMPOWERMENT through the development of their gifts and talents.
- ✚ THE RIGHT TO A LEARNING ENVIRONMENT THAT VALUES COOPERATION, and challenges its members to critical and reflective thinking in their search for truth.
- ✚ THE RIGHT TO DEVELOP POSITIVE, RESPONSIBLE AND CARING ATTITUDES AND BEHAVIORS TOWARD OTHERS and to recognize the rights of others to be safe and free from harassment and abuse.
- ✚ THE RIGHT TO LEARN THE SKILL OF SELF PROTECTION by identifying safe and unsafe situations.
- ✚ THE RIGHT TO LEARN RESPONSIBILITY for themselves and their actions.

PARENT GUIDE

GRADE TWO MATHEMATICS CURRICULUM

DIOCESE OF CLEVELAND

Below is a list of skills your child will be taught in Grade Two Mathematics.

As parents, you are encouraged to support the work of your child’s teacher in helping your child acquire each of these skills.

OPERATIONS AND ALGEBRAIC THINKING	
REPRESENT AND SOLVE PROBLEMS INVOLVING ADDITION AND SUBTRACTION	
	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
ADD AND SUBTRACT WITHIN 20.	
	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
WORK WITH EQUAL GROUPS OF OBJECTS TO GAIN INFORMATION ABOUT MULTIPLICATION.	
	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
NUMBER AND OPERATIONS IN BASE TEN	
UNDERSTAND PLACE VALUE.	
	Understand that the three digits of a three-digit number represent amounts in hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
	a. 100 can be thought of as a bundle of ten tens – called a “hundred.”
	b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
	Count within 1000; skip count by 5s, 10s, and 100s.
	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digit, using $>$, $=$, and $<$ symbols to record the results of comparison.
USE PLACE VALUE UNDERSTANDING AND PROPERTIES OF OPERATIONS TO ADD AND SUBTRACT.	
	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
	Add up to four-digit numbers using strategies based on place value and properties of operations.
	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, and ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
	Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
	Explain why addition and subtraction strategies work, using place value and the properties of operations. [Explanations may be supported by drawings or objects.]
MEASUREMENT AND DATA	
MEASURE AND ESTIMATE LENGTHS IN STANDARD UNITS.	
	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

MEASUREMENT AND DATA CONTINUED	
	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
	Estimate lengths using units of inches, feet, centimeters, and meters.
	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
RELATE ADDITION AND SUBTRACTION TO LENGTH.	
	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawing of rulers) and equations with a symbol for the unknown number to represent the problem.
	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.
WORK WITH TIME AND MONEY.	
	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
REPRESENT AND INTERPRET DATA.	
	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take apart, and compare problems using information presented in a bar graph.
GEOMETRY	
REASON WITH SHAPES AND THEIR ATTRIBUTES.	
	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. [Sizes are compared directly or visually, not compared by measuring.]
	Partition a rectangle into rows and columns of same-size and count to find the number of them.
	Partition circles and rectangles into two, three, or four equal shares, describe the shares using words <i>halves</i> , <i>thirds</i> , <i>half of</i> , <i>a third of</i> , etc. Describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
DOC: Numbers, Number Sense and Operations	
NUMBERS AND NUMBER SYSTEMS	
	Count money and make change using coins and a dollar bill.
	Represent and write the value of money using the ¢ sign and in decimal form when using the \$ sign.
MEANING OF OPERATIONS	
	Mastery of addition and subtraction facts to 20.
COMPUTATION AND ESTIMATION	
	Develop and solve word problems by using various strategies; e.g., recognizing “clue” words.
DOC: Measurement	
MEASUREMENT UNITS	
	Identify and select appropriate units of measure for:
	Length -- centimeters, decimeters, meters, inches, feet or yards;
	Volume – liters, cups, pints, quarts, and gallons;
	Weight-grams, kilograms, ounces or pounds;
	Temperature -- Fahrenheit.
	Describe, compare and order the relationships among standard and non-standard units of measure, such as centimeters and meters; inches, feet and yards; cups, pints and quarts; ounces and pounds, hours, half-hours and quarter-hours.

MEASUREMENT TECHNIQUES AND TOOLS	
	Estimate and measure the length and weight of common objects, using metric, U.S. customary units, and non-standard units accurate to the nearest unit.
	Select and use appropriate measurement tools.
DOC: Data Analysis and Probability	
DATA COLLECTION	
	Read, interpret and make comparisons and predictions from data represented in charts, line plots, picture graphs, bar graphs, and tally charts.
OH: CCSS: Literacy: Reading: Informational Text	
KEY IDEAS AND DETAILS	
	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
CRAFT AND STRUCTURE	
	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
OH: CCSS: Literacy: Writing	
PRODUCTION AND DISTRIBUTION OF WRITING	
	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.
RESEARCH TO BUILD AND PRESENT KNOWLEDGE	
	Recall information from experiences or gather information from provided sources to answer a question.
OH: CCSS: Literacy: Speaking and Listening	
COMPREHENSION AND COLLABORATION	
	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
	Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
	Ask for clarification and further explanation as needed about the topics and texts under discussion.
PRESENTATION OF KNOWLEDGE AND IDEAS	
	Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

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(Source: [1] National Governors Association Center for Best Practices, Council of Chief State School Officers. 2010. *Common Core State Standards for Mathematics*. Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.[2] Office of Catholic Education. 2007. *Mathematics Curriculum*. Cleveland, Ohio: Office of Catholic Education.)

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MATHEMATICS CURRICULUM

GRADE TWO

CHECKLIST FOR COMMON CORE STATE STANDARDS & DIOCESAN CURRICULUM

DATE TAUGHT	
OPERATIONS AND ALGEBRAIC THINKING	
REPRESENT AND SOLVE PROBLEMS INVOLVING ADDITION AND SUBTRACTION.	
	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
ADD AND SUBTRACT WITHIN 20.	
	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
WORK WITH EQUAL GROUPS OF OBJECTS TO GAIN INFORMATION ABOUT MULTIPLICATION.	
	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
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UNDERSTAND PLACE VALUE.	
	Understand that the three digits of a three-digit number represent amounts in hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
	100 can be thought of as a bundle of ten tens – called a “hundred.”
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DATE TAUGHT	
MEASUREMENT AND DATA CONTINUED	
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	Estimate lengths using units of inches, feet, centimeters, and meters.
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	Volume – liters, cups, pints, quarts, and gallons;
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	Temperature -- Fahrenheit.
	Describe, compare and order the relationships among standard and non-standard units of measure, such as centimeters and meters; inches, feet and yards; cups, pints and quarts; ounces and pounds, hours, half-hours and quarter-hours.

DATE TAUGHT	
MEASUREMENT TECHNIQUES AND TOOLS	
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	Select and use appropriate measurement tools.
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DATA COLLECTION	
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	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
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	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.
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	Recall information from experiences or gather information from provided sources to answer a question.
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