# Math / Grade 3

# Unit 1

| Course/Subject: | Grade: | Unit 1: | Suggested Timeline: |
|---|---|---|---|
| Math | 3 | Place Value | 4 weeks |

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| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | **Unit 1: Place Value**<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

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| **Unit Title** | Place Value |
| **Unit Summary** | Students will be able to understand basic place value concepts, compare numbers, order numbers, and round numbers to the nearest thousand. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How do you read numbers through the thousands?<br>2. How do you write numbers through the thousands?<br>3. How do you identify the place and value of digits through the thousands?<br>4. How do you compare numbers through the thousands?<br>5. How do you order numbers through the thousands?<br>6. How do you round numbers to the nearest ten and hundred? | 1. Values of numbers can be identified, read, and written through the thousands.<br>2. Numbers can be compared through thousands.<br>3. Whole numbers can be ordered.<br>4. Numbers can be rounded to help with estimation. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.1.3.B.1** | Apply place value understanding and properties of operations to perform multi-digit arithmetic. |

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|---|---|
| **M03. A-T.1.1.4** | Order a set of whole numbers from least to greatest or greatest to least (up through 9,999 and limit sets to no more than four numbers). |
| **M03.A-T.1.1.1** | Round two- and three-digit whole numbers to the nearest ten or hundred, respectively. |
| **3.NBT.A.1** | Use place value understanding to round whole numbers to the nearest 10 or 100. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **CC.1.5.2.G** | Demonstrate a command of the conventions of standard English when speaking, based on Grade 3 level and content. |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Not knowing place value columns<br>● (Not knowing the nearest ten when looking at numbers in the hundreds or greater)<br>● Not knowing or reading symbol names (>, <) | ● Understand place value columns<br>● (Understanding the nearest ten when looking at larger numbers)<br>● Knowing and being able to read the symbol names (>, <) |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Read numbers through the thousands<br>● Write numbers through the thousands<br>● Identify the place and value of digits through the thousands<br>● Compare numbers through the thousands<br>● Order numbers through the thousands<br>● Round numbers to the nearest ten and hundred | ● Students will be able to read numbers to the thousands using the correct vocabulary.<br>● Students will be able to write numbers to the thousands in standard form, expanded form and word form.<br>● Students will be able to differentiate between a digit's place and value when working with numbers up to the thousands.<br>● Students will be able to correctly compare numbers by reading and writing an expression using the correct vocabulary.<br>● Students will be able to order numbers up to the thousands place in ascending and descending order.<br>● Students will be able to understand what it means to round a number.<br>● Students will be able to round two digit numbers to the nearest ten.<br>● Students will be able to round three digit numbers to the nearest hundred.<br>● (Students will be able to round three digit numbers to the nearest ten.) | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 2: Reason Abstractly and Quantitatively<br>● SMP 3: Justify and Critique<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br><br>NYCSD Profile of a Graduate<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical Thinking by evaluating values of numbers in real life situations. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Place<br>● Value | ● Expanded form<br>● Word form | ● Greater than<br>● Lesser than |

| | | |
|---|---|---|
| ● Place Value<br>● Standard form | ● Round<br>● Compare | ● Equal to<br>● Symbol |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance task and/or assessment, including multiple choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Understanding numbers in context
- Written Responses

**Additional Resources:**

- Online Resources
- Math in Practice, Module 5

Math in Practice Literature Connections
***Coyotes All Around* (Stuart J. Murphy)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

O'Connell, S. (2016). *Math in practice: A guide for teachers.* Portsmouth, NH: Heinemann

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|---|---|---|---|
| | | | **Math / Grade 3**<br>**Unit 2** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 2:**<br>Addition and Subtraction | **Suggested Timeline:**<br>3 weeks |

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|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>**Unit 2: Addition and Subtraction**<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

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|---|---|
| **Unit Title** | Addition and Subtraction |
| **Unit Summary** | Students will be able to use place value strategies to add and subtract two- and three-digit whole numbers. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How do you apply place value to add numbers?<br>2. How do you solve two- and three-digit addition problems using a variety of strategies?<br>3. How do you use the properties of addition to help you solve addition problems?<br>4. How do you apply place value to subtract numbers?<br>5. How do you solve two- and three-digit subtraction problems using a variety of strategies? | 1. Place value can be used to add numbers<br>2. Different strategies can help to add two and three digit numbers.<br>3. Addition and subtraction are inverse operations. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.1.3.B.1** | Apply place value understanding and properties of operations to perform multi-digit arithmetic |

| | |
|---|---|
| **M03.A-T.1.1.2** | Add two- and three-digit whole numbers (limit sums from 100 through 1,000) and/or subtract two- and three-digit numbers from three-digit whole numbers. |
| **3.NBT.A.2** | Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. |
| **M03.B-O.3.1.1** | Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers. |
| **3.OA.D.8** | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. |
| **M03.B-O.3.1.2** | Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.3** | Assess reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.4** | Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols). |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Not considering a digit's value within its place<br>● Being aware of the operation when solving mixed operation problems. | ● Identify and applying a digit's place in order to solve a given addition and/or subtraction problem<br>● Identifying the accurate operation in a given mixed task/ problems that require addition vs. subtraction (i.e. referring to directions, symbols, key words, etc.).<br>● Using inverse operations to solve and check arithmetic |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Apply place value to add numbers<br>● Solve two- and three-digit addition problems using a variety of strategies<br>● Use the properties of addition to help you solve addition problems<br>● Apply place value to subtract numbers<br>● Solve two- and three-digit subtraction problems using a variety of strategies<br>● Addition and subtraction are related to each other<br>● Solve two-step word problems using the four operations | ● Students will be able to apply place value to add two- and three-digit numbers.<br>● Students will be able to use a variety of strategies (partial sums, regrouping, number line, compensation, mental math, base-ten, etc.) to solve two- and three- digit problems.<br>● Students will be able to use the addition properties (commutative, associative, and identity property) to solve an addition problem.<br>● Students will be able to apply place value to subtract two- and three-digit numbers.<br>● Students will be able to use a variety of strategies (decomposing, counting up, counting back, number lines, concrete objects, regrouping, compensation, etc.) to solve two- and three- digit problems. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision.<br>● SMP 7: Utilize Structure<br><br>NYCSD Profile of a Graduate<br>● Creativity through the ability to sue inquiry to solve problems.<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

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| | ● Students will be able to use inverse operations to check work and relate them as fact families.<br>● *Focusing only on addition and subtraction. Students will be able to solve two-step word problems using addition and subtraction. | |

**Academic Vocabulary:**

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|---|---|---|
| ● Addition | ● Partial Sum | ● Minuend |
| ● Subtraction | ● Regrouping | ● Subtrahend |
| ● Addend | ● Expanded form | ● Associative Property of Addition |
| ● Sum | ● Difference | ● Commutative Property of Addition |
| ● Inverse operations | ● Fact Family | ● Identity Property of Addition |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided ( Performance tasks and/or assessments including multiple choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Online Resources
- Math in Practice, Module 6 (addition) , 7 (subtraction), 4 (solving one- and two-step problems)

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann
O'Connell, S., SanGiovanni, J. (2011). *Mastering the basic math facts in addition and subtraction..* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

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| | | | **Math / Grade 3**<br><br>**Unit 3** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 3:**<br>Money | **Suggested Timeline:**<br>2 weeks |

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|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>**Unit 3: Money**<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

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|---|---|
| **Unit Title** | Money |
| **Unit Summary** | Students will be able to compare, round and solve problems to make change. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. What are the names and values of coins and dollars?<br>2. How do you count combinations of coins and/or dollars?<br>3. How do you compare the values of combinations of coins and/or dollars?<br>4. How do you round amounts of money to the nearest dollar?<br>5. How do you make change for an amount up to $5.00?<br>6. How do you solve problems and make change? | 1. Coins and dollar bills can be counted and added to find total amounts.<br>2. Coins and dollar bills can be compared<br>3. Money values can be estimated<br>4. The difference between amounts of money can be used to determine change. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **M03.D-M.1.3.1** | Compare total values of combinations of coins (penny, nickel, dime, and quarter) and/or dollar bills less than $5.00. |
| **M03.D-M.1.3.3** | Round amounts of money to the nearest dollar. |

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| **CC.2.4.3.A.3** | Solve problems and make change involving money using a combination of coins and bills. |
| **M03.D-M.1.3.2** | Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, and dollar). |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **6.1.5.A-D** | Reference Economics |
| **15.6.5.B** | Identify steps taken when making a rational decision about money. |
| **15.6.5.H** | Explain various payment methods. |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Using a dollar and a cent sign when writing money values<br>● Placing the dollar and/or cent sign at the wrong place when writing money values<br>● Not knowing that one hundred cents is equivalent to one dollar<br>● Not knowing coin attributes (value, appearance, color, etc.) | ● Understand that only one symbol can be used.<br>● Understand that dollar signs go on the left and cent sign goes on the right<br>● Understand that one hundred cents is equivalent to one dollar<br>● Know and understand coin attributes |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Names and values of coins and dollars<br>● Count combinations of coins and/or dollars<br>● Compare the values of combinations of coins and/or dollars<br>● Round amounts of money to the nearest dollar<br>● Make change for an amount up to $5.00<br>● Solve problems and make change | ● Students will be able to identify the coins and dollars and relate their values.<br>● Students will be able to add coin and/or dollar combinations to their total.<br>● Students will be able to correctly compare values of combinations of coins and/or dollars up to $5.00.<br>● Students will be able to round money value to the nearest dollar.<br>● Students will be able to make change for an amount up to $5.00 with no more than $2.00 given in change.<br>● Students will be able to solve problems and make change with a variety of coins and bills. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision.<br>● SMP 7: Utilize Structure<br><br>NYCSD Profile of a Graduate<br>● Competency by displaying mastery of core content including literacy in mathematics and financial awareness.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

| **Academic Vocabulary:** | | |
|---|---|---|
| ● Dollar<br>● Cents<br>● Decimal | ● Combination<br>● Change<br>● Difference | ● Round<br>● Value |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance task and/or assessment including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values of money in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Online Resources

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

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| | | | **Math / Grade 3**<br>**Unit 4** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 4:**<br>Time | **Suggested Timeline:**<br>3 weeks |

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| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>**Unit 4: Time**<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

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|---|---|
| **Unit Title** | Time |
| **Unit Summary** | Students will be able to tell and write time and calculate elapsed time. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How do you tell time to the nearest minute using an analog clock?<br>2. How do you show time to the nearest minute using an analog clock?<br>3. How do you write time to the nearest minute using an analog clock?<br>4. How do you calculate elapsed time to the minute?<br>5. How do you tell, write, and calculate elapsed time to the nearest minute to solve a problem? | 1. An analog clock can be used to tell time to the nearest minute.<br>2. Students can use the difference between times to find elapsed time. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **M03.D-M.1.1.1** | Tell, show, and/or write time (analog) to the nearest minute. |

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|---|---|
| **CC.2.4.3A.2** | Tell and write time to the nearest minute and solve problems by calculating time intervals. |
| **3.MD.1** | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g. by representing the problem on a number line diagram. |
| **M03.D-M.1.1.2** | Calculate elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less). |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Confusing the difference between the minute and hour hand<br>● Not knowing that you count by fives when counting the minutes on the clock<br>● Not knowing that a new hour begins when the minute hand is on the twelve (60 minutes starts a new hour)<br>● Using a base-ten number system when calculating elapsed time | ● Knowing that the minute hand is the longer hand and the hour hand is the shorter hand<br>● Knowing that you can by fives when counting minutes<br>● Knowing that a new hour begins when the minute hand is on the twelve (o'clock)<br>● Understanding that time is a base-sixty system |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Tell time to the nearest minute using an analog clock<br>● Show time to the nearest minute using an analog clock<br>● Write time to the nearest minute using an analog clock<br>● Calculate elapsed time to the minute<br>● Tell, write, and calculate elapsed time to the nearest minute to solve a problem | ● Students will be able to tell time to the nearest minute using an analog clock.<br>● Students will be able to show time to the nearest minute using an analog clock.<br>● Students will be able to write time to the nearest minute using an analog clock.<br>● Students will be able to tell elapsed time to the minute limited to sixty minutes or less.<br>● Students will be able to tell, write, and calculate elapsed time to the nearest minute to solve a problem? | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br>● SMP 7: Utilize Patterns<br><br>NYCSD Profile of a Graduate<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Analog clock<br>● Digital clock<br>● Elapsed time/time interval | ● Minute hand<br>● Hour hand<br>● Half hour | ● Quarter of an hour<br>● AM and PM |

**Evidence: Assessments and Performance Task(s)**

● Multiple forms of assessments will be provided (Performance tasks and/or assessments including multiple choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Online Resources
- Math in Practice, Module 11 (exploring time)

Math in Practice Literature Connections
***Pigs on a Blanket* (Amy Axelrod)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

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|---|---|---|---|
| | | | **Math / Grade 3**<br>**Unit 5** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 5:**<br>Understanding Multiplication and Division | **Suggested Timeline:**<br>2 weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>**Unit 5: Understanding Multiplication and Division**<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

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|---|---|
| **Unit Title** | Understanding Multiplication and Division |
| **Unit Summary** | Students will understand the concepts of multiplication and division. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How can you use concrete objects and drawings to represent multiplication?<br>2. How can you create and interpret multiplication equations?<br>3. How do you use the properties of multiplication to help you solve multiplication problems?<br>4. How can you use concrete objects and drawings to represent division?<br>5. How can you create and interpret division equations?<br>6. How are multiplication and division related to each other?<br>7. How can you solve two-step word problems using the four operations? | 1. Concrete objects and drawings help to model multiplication and division.<br>2. Multiplication and division equations can be created and interpreted to model situations.<br>3. Division is the inverse of multiplication.<br>4. Two-step problems can be solved using multiplication and division. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| *Standard Number* | *Standard Description* |
|---|---|
| **M03.B-O.1.1.1** | Interpret and/or describe products of whole numbers (up to and including 10 x 10). Example 1: Interpret 35 as a total of objects in 5 groups, each containing 7 objects. Example 2: Describe a context in which a total number of objects can be expressed as 5 x 7. |
| **CC2.2.3.A.1** | Represent and solve problems involving multiplication and division. |
| **M03.B-O.1.1.2** | Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50 and limit divisors and quotients through 10). Example 1: Interpret 48 ÷ 8 as the number of objects in each share when 48 objects are partitioned equally into 8 shares, or as a number of shares when 48 objects are partitioned into equal shares of 8 objects each. Example 2: Describe a context in which a number of shares or a number of groups can be expressed as 48 ÷ 8. |
| **3.OA.A.2** | Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8. |
| **M03.B-O.1.2.1** | Use multiplication (up to and including 10 × 10) and/or division (limit dividends through 50 and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. |
| **3.OA.A.3** | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. |
| **3.OA.A.1** | Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7. |
| **CC.2.2.3.A.2** | Understand properties of multiplication and the relationship between multiplication and division. |
| **M03.B-O.2.1.1** | Apply the commutative property of multiplication (not identification or definition of the property). |
| **M03.B-O.2.1.2** | Apply the associative property of multiplication (not identifying or definition of the property). |
| **3.OA.B.5** | Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known then 4 x 6 = 24 is also known (Commutative property of multiplication). 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30 (Associative property of multiplication). Knowing that 8 x 5 = 40 and 8 x 2 = 16 one can find 8 x 7 = as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56 (Distributive property). |
| **M03.A-T.1.1.3** | Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90). |
| **3.NBT.A.3** | Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations. |

| | |
|---|---|
| **M03.B-O.3.1.1** | Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers. |
| **3.OA.D.8** | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. |
| **M03.B-O.3.1.2** | Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.3** | Assess reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.4** | Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols). |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| Misconceptions: | Proper Conceptions: |
|---|---|
| ● Students often refer factors in a multiplication problem as addends, misunderstanding the factors represent groups and quantity in each group.<br>● Students apply properties of multiplication when solving division problems. | ● Factors represent the number of groups and the quantity within each group for multiplication. Although the order of which the factors are multiplied does not matter, factors represent a multiplication problem.<br>● Students should be exposed early on the proper vocabulary terms for multiplication (factors and products) and division (divisor, dividend, and quotient) problems.<br>● Students should be able to identify the relationship between multiplication and division but apply proper of use properties when solving a problem. |

| Knowledge & Concepts | Skills & Competencies | Dispositions & Practices |
|---|---|---|
| ● Use concrete objects and drawings to represent multiplication<br>● Create and interpret multiplication equations<br>● Use the properties of multiplication to help you solve multiplication problems<br>● Use concrete objects and drawings to represent division<br>● Create and interpret division equations<br>● Multiplication and division are related to each other<br>● Solve two-step word problems using the four operations | ● Students will be able to visualize and model how to multiply using arrays, equal groups, number lines, and repeated addition.<br>● Students will be able to create and interpret multiplication equations using strategies.<br>● Students will be able to use the multiplication properties (commutative, associative, and identity property) to solve a multiplication problem.<br>● Students will be able to visualize and model how to divide using models, arrays, equal groups, and repeated subtraction.<br>● Students will be able to create and interpret division equations using strategies.<br>● Students will be able to use inverse operations to check work and relate them as fact families.<br>● Students will be able to solve two-step word problems in all four operations using order of operations. *No parenthesis. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 2: Reason Abstractly and Quantitatively<br>● SMP 3: Justify and Critique<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br>● SMP 7: Utilize Structure<br><br>NYCSD Profile of a Graduate<br>● Creativity through the ability to sue inquiry to solve problems.<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Multiplication<br>● Equal groups<br>● Repeated addition<br>● Array<br>● Skip Counting<br>● Sets<br>● Equation<br>● Expression<br>● Fact Family<br>● Factor | ● Multiple<br>● Product<br>● Zero Property of Multiplication<br>● Distributive Property of Multiplication<br>● Associative Property of Multiplication<br>● Commutative Property of Multiplication<br>● Identity Property of Multiplication | ● Groups of<br>● Division<br>● Dividend<br>● Divisor<br>● Quotient<br>● Repeated Subtraction<br>● Unknown |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance tasks and/or assessments including multiple choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be multiplied and divided
- Written Responses

**Additional Resources:**

- Math in Practice, Modules 1 & 2 (understanding) and 4 (solving one- and two-step problems)
- Online Resources

Math in Practice Literature Connections
***Each Orange Had 8 Slices* (Paul Giganti Jr.)**
***Divide and Ride* (Stuart J. Murphy)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann
O'Connell, S., SanGiovanni, J. (2011). *Mastering the basic math facts in multiplication and division.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

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| | | | |
|---|---|---|---|
| | | | **Math / Grade 3**<br>**Unit 6** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 6:**<br>Fluently Multiply and Divide | **Suggested Timeline:**<br>4 weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>**Unit 6: Fluently Multiply and Divide**<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

| | |
|---|---|
| **Unit Title** | Fluently Multiply and Divide |
| **Unit Summary** | Students will be able to develop an understanding of multiplication and division of math facts and gain fluency. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How can you understand what multiplication and division equations represent?<br>2. What patterns can you find within multiplication and division facts?<br>3. How are multiplication and division related to each other?<br>4. How can you recall multiplication and division facts fluently?<br>5. How can you solve two-step word problems using the four operations? | 1. Multiplication and division equations can be written to represent situations.<br>2. Multiplication and division math facts build from patterns.<br>3. Multiplication and division are inverse operations.<br>4. Multiplication and division facts, zero through ten, will help with other math concepts. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| | |
|---|---|
| **CC.2.1.3.B.1** | Apply place value understanding and properties of operations to perform multi-digit arithmetic. |
| **CC.2.2.3.A.3** | Demonstrate multiplication and division fluency. |

| | |
|---|---|
| **3.OA.C.7** | Fluently multiply and divide within 100, using strategies such as relationship between multiplication and division (e.q., knowing that 8 x 5 = 40, one knows 40 / 5 = 8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers. |
| **M03.B-O.1.1.1** | Interpret and/or describe products of whole numbers (up to and including 10 x 10). Example 1: Interpret 35 as a total of objects in 5 groups, each containing 7 objects. Example 2: Describe a context in which a total number of objects can be expressed as 5 x 7. |
| **M03.B-O.1.2.2** | Determine the unknown whole number in a multiplication (up to and including 10 x 10) or division (limit dividends through 50 and limit divisors and quotients through 10) equation relating three whole numbers. Example: Determine the unknown number that makes an equation true. |
| **3.OA.A.4** | Determine the unknown whole number in multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = ___ / 3, 6 x 6 = ? |
| **M03.B0O.2.2.1** | Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 / 8 = by solving 8 x ? = 32 |
| **3.OA.B.6** | Understand division as an unknown-factor problem. For example 32 / 8 by finding the number that makes 32 when multiplied by 8. |
| **CC2.2.3.A.1** | Represent and solve problems involving multiplication and division. |
| **3.OA.A.1** | Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7. |
| **M03.B-O.3.1.1** | Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers. |
| **3.OA.D.8** | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. |
| **M03.B-O.3.1.2** | Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.3** | Assess reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. |
| **M03.B-O.3.1.4** | Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols). |
| **CC.2.2.3.A.4** | Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers. |
| M03.B-O.3.1.5 | Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends. |
| M03.B-O.3.1.6 | Create or match a story to a given combination of symbols (+, –, ×, ÷, , and =) and numbers. |
| M03.B-O.3.1.7 | Identify the missing symbol (+, –, ×, ÷, , and =) that makes a number sentence true. |
| 3.OA.D.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Students often refer factors in a multiplication problem as addends, misunderstanding the factors represent groups and quantity in each group.<br><br>● Students apply properties of multiplication when solving division problems. | ● Factors represent the number of groups and the quantity within each group for multiplication. Although the order of which the factors are multiplied does not matter, factors represent a multiplication problem.<br>● Students should be exposed early on the proper vocabulary terms for multiplication (factors and products) and division (divisor, dividend, and quotient) problems. |

| | |
|---|---|
| ● Students incorrectly use the multiplication table. | ● Students should be able to identify the relationship between multiplication and division,but apply proper of use properties when solving a problem.<br>● Students should be able to correctly use the multiplication table. |

| Knowledge & Concepts | Skills & Competencies | Dispositions & Practices |
|---|---|---|
| ● Understand what multiplication and division equations represent<br>● Patterns within multiplication and division facts<br>● Multiplication and division are related to each other<br>● Recall multiplication and division facts fluently<br>● Solve two-step word problems using the four operations | ● Students will develop an understanding of multiplication and division equations through making connections, exploring patterns and properties, using manipulatives, etc.<br>● Students will explore the patterns emerged during fact investigations.<br>● Students will be able to use inverse operations to check work and relate them as fact families.<br>● Students will be able to build mental math skills by composing and decomposing numbers. Students will learn how to use a multiplication table.<br>● Students will be able to solve two-step word problems in all four operations using order of operations. *No parenthesis. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br>● SMP 7: Utilize Structure<br>● SMP 8: Utilize Patterns<br><br>NYCSD Profile of a Graduate<br>● Creativity through the ability to sue inquiry to solve problems.<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Multiplication<br>● Equal groups<br>● Repeated addition<br>● Array<br>● Skip Counting<br>● Sets<br>● Equation<br>● Expression<br>● Fact Family<br>● Factor | ● Multiple<br>● Multiplication Table/Chart<br>● Product<br>● Zero Property of Multiplication<br>● Distributive Property of Multiplication<br>● Associative Property of Multiplication<br>● Commutative Property of Multiplication<br>● Identity Property of Multiplication | ● Groups of<br>● Division<br>● Dividend<br>● Divisor<br>● Quotient<br>● Repeated Subtraction<br>● Unknown |

**Evidence: Assessments and Performance Task(s)**

● Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

● Science and Social Studies
  ● Values in context can be multiplied and divided
● Written Responses

**Additional Resources:**

● Math in Practice, Modules 3 (fluency) and 4 (solving one- and two- step problems)
● Online Resources

Math in Practice Literature Connections
***2 x 2 = Boo!* (Loreen Leedy) Chapter 2: Seeing Double**
***Underwater Counting* (Jerry Pallotta)**
***Eggs and Legs* (Michael Dahl)**
***Toasty Toes: Counting by Tens* (Michael Dahl)**
***One Hundred Hungry Ants* (Elinor Pinczes)**
***Reese's Pieces Count by Fives* (Jerry Pallotta)**
***Lilly's Purple Plastic Purse* (Kevin Henkes)**
***What Comes in 2s, 3s, and 4s?* (Suzanne Aker)**
***Six-Dinner Sid* (Inga Moore)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann
O'Connell, S., SanGiovanni, J. (2011). *Mastering the basic math facts in multiplication and division.* Portsmouth, NH: Heinemann

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| | | | |
|---|---|---|---|
| | | | **Math / Grade 3**<br><br>**Unit 7** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 7:**<br>Graphing | **Suggested Timeline:**<br>3 Weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>**Unit 7: Graphing**<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

| | |
|---|---|
| **Unit Title** | Graphing |
| **Unit Summary** | Students will be able to understand graphs and interpret information presented on them. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| ● What are the components of a tally chart, and how can you represent and interpret the data?<br>● What are the components of a table, and how can you represent and interpret the data?<br>● What are the components of a pictograph, and how can you represent and interpret the data?<br>● What are the components of a line plot, and how can you represent and interpret the data?<br>● What are the components of a bar graph, and how can you represent and interpret the data?<br>● How can you solve one- and two-step problems using data presented in scaled pictographs and scaled bar graphs?<br>● How can you translate/convert information from one type of display to another? (limit to pictographs, tally charts, bar graphs, tables) | 1. Charts and/or graphs can help to understand data.<br>2. Scaled graphs help to understand and compare data.<br>3. One- and two-step problems can be solved using information presented in graphs.<br>4. Information from one display can be translated to another. |

**Focus Standards Addressed in the Unit:**

*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.4.3.A.4** | Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs. |
| **M03.D-M.2.1.1** | Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10). |
| **3.MD.B.3** | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets). |
| **M03.D-M.2.1.2** | Solve one-and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scaled limited to 1, 2, 5, and 10). Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more are in category A than in category B?" |
| **M03.D-M.2.1.4** | Translate information from one type of display to another. Limit to pictographs, tally charts, bar graphs, and tables. Example: Convert a tally chart to a bar graph. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| | Is applicable to Records and observes data as state on the report card. |
| | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Students can have difficulty recognizing the scale. | ● Students should be aware of the scale on a graph. |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Components of a tally chart and interpret the data<br>● Represent data using tally charts<br>● Components of a table and interpret the data<br>● Represent data using tables<br>● Components of a pictograph and interpret the data<br>● Represent data using pictographs<br>● Components of a line plot and interpret the data<br>● Represent data using line plots<br>● Components of a bar graph and interpret the data<br>● Represent data using bar graphs<br>● Solve one- and two-step problems using data presented in scaled pictographs<br>● Solve one- and two-step problems using data presented in scaled bar graphs<br>● Translate/convert information from one type of display to another? (limit | ● Students will be able to read a tally chart.<br>● Students will be able to gather information in order to create a tally chart and represent data.<br>● Students will be able to read a table.<br>● Students will be able to gather information in order to create a table and represent data.<br>● Students will be able to read a pictograph.<br>● Students will be able to gather information in order to create a pictograph and represent data.<br>● Students will be able to read a line plot.<br>● Students will be able to gather information in order to create a line plot and represent data.<br>● Students will be able to read a bar graph. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 2: Reason Abstractly and Quantitatively<br>● SMP 3: Justify and Critique<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br><br>NYCSD Profile of a Graduate<br>● Creativity through the ability to sue inquiry to solve problems.<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

| | | |
|---|---|---|
| to pictographs, tally charts, bar graphs, tables) | ● Students will be able to gather information in order to create a bar graph and represent data.<br>● Students will be able to solve one-and two-step problems using date presents in scaled pictographs.<br>● Students will be able to solve one-and two-step problems using date presents in scaled bar graphs.<br>● Students will be able to translate/convert information from one type of display to another, limited to pictographs, tally charts, bar graphs, and tables. | |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Tally Charts<br>● Tables<br>● Pictographs<br>● Line Plots<br>● Horizontal | ● Vertical<br>● Scaled Bar Graph<br>● Data<br>● Interpret<br>● Bar Graphs | ● Analyze<br>● Scale<br>● Scaled Pictograph<br>● Survey |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Data in context can be represented and interpreted using graphs and charts.
- Written Responses

**Additional Resources:**

- Math in Practice, Module 13
- Online Resources

Math in Practice Literature Connections
***Lemonade for Sale* (Stuart J. Murphy)~also 2nd grade**
-*Tiger Math* (Ann Whitehead Nagda and Cindy Bickel)
-*Graphs* (Bonnie Bader and Mernie Cole)
-*The Great Graph Contest* (Loreen Leedy)

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers.

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# Math / Grade 3

# Unit 8

| Course/Subject: | Grade: | Unit 8: | Suggested Timeline: |
|---|---|---|---|
| Math | 3 | Understanding Fractions | 3 Weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>**Unit 8: Fractions**<br>Unit 9: Geometry<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

| | |
|---|---|
| **Unit Title** | Understanding Fractions |
| **Unit Summary** | Students will be able to understand and write fractions. Students will understand fraction equivalence and compare fractions with the same denominator or the same numerator. |

**Unit Essential Questions:**

1. How can you explore and partition fractions?
2. How can you represent fractions using a variety of math models and tools?
3. What are the numerator and denominator?
4. How can you write a fraction for a fraction model?
5. How can models show fractions that are equivalent?
6. How can whole numbers be expressed as fractions?
7. How can you compare fractions with like denominators?
8. How can you compare fractions with like numerators?
9. Why do you have to compare fractions from the same whole?

**Key Understandings:**

1. Fractions represent a part of a whole.
2. Fractions can be represented using different tools and models.
3. Fractions have numerators and denominators.
4. Fractions models can be used to write fractions.
5. Fraction equivalence can be visualized using area models, number lines, and other models.
6. Whole numbers can be expressed as fractions.
7. Fractions can be compared using like denominators.
8. Fractions can be compared using like numerators.
9. When comparing fractions, the whole must be the same.

**Focus Standards Addressed in the Unit:**

*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.1.3.C.1** | Explore and develop an understanding of fractions as numbers. |
| **M03.A-F.1.1.1** | Demonstrate that when a whole or set is partitioned into *y* equal parts, the fraction 1/*y* represents 1 part of the whole and/or the fraction *x/y* represent x equal parts of the whole (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary). |
| **3.NF.A.1** | Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by *a* parts of the size *1/b.* |
| **CC.2.3.3.A.2** | Use the understanding of fractions to partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole. |
| **M03.C-G.1.1.3** | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. Example 1: Partition a shape into 4 parts with equal areas. Example 2: Describe the area of each of ⅛ of the area of the shape. |
| **3.G.A.2** | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as ¼ of the area of the shape. |
| **M03.A-F.1.1.2** | Represent fractions on a numberline (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplicatio necessary). |
| **3.NF.A.2** | Understand a fraction as a number one the number line; represent fractions on a number line diagram. |
| **3.NF.A.2.A** | Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. |
| **3.NF.A.2.B** | Represent a fraction a/b one a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoints locates the number a/b on the number line. |
| **M03.A-F.1.1.3** | Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8 and limit numerators to whole numbers less than the denominator). Example 1: 1/2 = 2/4 Example 2: 4/6 = 2/3. |
| **3.NF.A.3** | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. |
| **3.NF.A.3.A** | Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. |
| **3.NF.A.3.B** | Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model. |
| **M03.A-F.1.1.4** | Express whole numbers as fractions, and/or generate fractions that are equivalent to whole numbers (limit denominators to 1, 2, 3, 4, 6, and 8). Example 1: Express 3 in the form 3 = 3/1. Example 2: Recognize that 6/1 = 6. |
| **3.NF.A.3.C** | Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. x/y represents x equal parts of the whole (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary). |
| **M03.A-F.1.1.5** | Compare two fractions with the same denominator (limit denominators to 1, 2, 3, 4, 6, and 8), using the symbols >, =, or <m and/or justify the conclusions. |
| **3.NF.A.3.D** | Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| Misconceptions: | Proper Conceptions: |
|---|---|
| ● Students often mistake fractions with greater denominators as being larger. (⅙ > ½ )<br>● Students often are confused about the denominator being the total number of items in a group when dealing with fractions of a set. | ● Students should understand the meaning of the denominator.<br>● Students should understand that the denominator is the total number of items in the group. |

| Knowledge & Concepts | Skills & Competencies | Dispositions & Practices |
|---|---|---|
| ● Explore and partition fractions<br>● Represent fractions using a variety of math models and tools<br>● Numerator and denominator<br>● Write a fraction for a fraction model<br>● Models represent equivalent fractions<br>● Models represent whole numbers as fractions<br>● Fractions with the same denominator can be compared<br>● Fractions with the same numerator can be compared<br>● Fractions can not be compared if the wholes are different | ● Students will be able to demonstrate that when a whole number is partitioned into equal parts the fraction represents one part of the whole. *Denominators limited to 2, 3, 4, 6, and 8.<br>● Students will represent fractions using area models, length models, and set models using the following tools, number lines, fractions kits, pattern blocks, and geoboards.<br>● Students will differentiate between the numerator and denominator.<br>● Students will be able to write a fraction for a fraction model.<br>● Students will use models and number lines to show equivalent fractions.<br>● Students will use models and number lines to show whole numbers as fractions.<br>● Students will compare fractions when they have like denominators.<br>● Students will compare fractions when they have like numerators.<br>● Students will compare fractions when they have the same whole. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 2: Reason Abstractly and Quantitatively<br>● SMP 3: Justify and Critique<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically use Tools<br>● SMP 6: Attend to Precision<br>● SMP 7: Utilize Structure<br>● SMP 8: Utilize Patterns<br><br>NYCSD Profile of a Graduate<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem.<br>● Creativity by modeling and representing fractions in different ways. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Benchmark<br>● Fraction<br>● Numerator<br>● Denominator<br>● Partition | ● Equal Parts<br>● Equivalent<br>● Inequality<br>● Number Line<br>● Set<br>● Unit Fraction | ● Whole<br>● Area Model<br>● Length Model<br>● Set Model<br>● Greater than<br>● Less than |

**Evidence: Assessments and Performance Task(s)**

● Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Math in Practice, Module 8, 9, and 10
- Online Resources

Math in Practice Literature Connection
***Full House* (Dayle Ann Dodds)**
***Ed Emberley's Picture Pie* (Ed Emberley)**
***Jump, Kangaroo, Jump!* (Stuart Murphy)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers

**Created By:**
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| | | | |
|---|---|---|---|
| | | | **Math / Grade 3**<br><br>**Unit 9** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 9:**<br>Geometry | **Suggested Timeline:**<br>2 Weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>**Unit 9: Geometry**<br>Unit 10: Measurement<br>Unit 11: Measurement of Area and Perimeter |

| | |
|---|---|
| **Unit Title** | Geometry |
| **Unit Summary** | Students will recognize that shapes can belong to groups, and that shapes can have different names. Students will describe, analyze, and compare properties of two-dimensional shapes. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. What are the attributes of different shapes?<br>2. How are different shapes alike and different?<br>3. How can I recognize and compare different quadrilaterals? | 1. Attributes of different shapes can be identified.<br>2. Attributes of different shapes can be compared.<br>3. Different shapes can be categorized as quadrilaterals based on attributes. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.3.3.A.1** | Identify, compare, and classify shapes and their attributes. |
| **M03.C-G.1.1.1** | Explain that shapes in different categories may share attributes and that the shared attributes can define a larger category. Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures. |

| | |
|---|---|
| **M03.C-G.1.1.2** | Recognize rhombi, rectangles, and squares as examples of quadrilaterals and/or draw examples of quadrilaterals that do not belong to any of these subcategories. |
| **3.G.A.1** | Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. |
| **M03.C-G.1.1.3** | |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Students often confuse different quadrilaterals<br>● Students misuse inaccurate terms to describe shapes, such as calling a diamond a rhombus.<br>● Students often consider a square and a rectangle two completely different shapes. | ● Students understand similarities and differences between quadrilaterals.<br>● Students use precise language when describing shapes. |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Shapes have defining attributes<br>● Some shapes have right angles<br>● Shapes can be compared by attributes<br>● Attributes that identify shapes as quadrilaterals | ● Students will be able to name the attributes of different shapes.<br>● Students will find right angles.<br>● Students will compare similarities and differences between different shapes.<br>● Students will identify and describe shapes that are quadrilaterals. | Standards of Mathematical Practice<br>SMP # 1 Understand and Persevere<br>SMP # 3 Justify and Critique<br>SMP # 4 Model with Mathematics<br>SMP # 6 Attend to Precision<br>SMP # 7 Utilize Structure<br><br>NYCSD Profile of a Graduate<br><br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Angle<br>● Categories<br>● Circle<br>● Decagon<br>● Hexagon | ● Octagon<br>● Parallel sides<br>● Parallelogram<br>● Pentagon<br>● Quadrilateral<br>● Rectangle | ● Rhombus<br>● Right angle<br>● Square<br>● Trapezoid<br>● Triangle<br>● Vertices (Vertex) |

**Evidence: Assessments and Performance Task(s)**

● Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Math in Practice, Module 16
- Online Resources

Math in Practice Literature Connection
***The Greedy Triangle* (Marilyn Burns)**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers

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# Math / Grade 3

# Unit 10

| Course/Subject: | Grade: | Unit 10: | Suggested Timeline: |
|---|---|---|---|
| Math | 3 | Measurement | 3 Weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>**Unit 10: Measurement**<br>Unit 11: Measurement of Area and Perimeter |

| | |
|---|---|
| **Unit Title** | Understanding Measurement of Length, Mass, and Volume |
| **Unit Summary** | Students will be able to understand that mass is how much matter is in an object and volume is how much a container will hold. Students will measure lengths of objects to the nearest inch, half inch, and fourth of an inch. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. Why do you use different units of measure?<br>2. How can you estimate mass or volume?<br>3. How can you measure mass or volume?<br>4. How can you measure length to the nearest half or fourth of an inch? | 1. There are different units of measure for mass and volume.<br>2. Mass and volume can be measured precisely.<br>3. Length can be measured precisely to the nearest half or quarter inch.<br>4. Measurement can be estimated. |

**Focus Standards Addressed in the Unit:**

*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.4.3.A.1** | Solve problems involving measurement and estimation of temperature, liquid volume, mass or length. |
| **M03.D-M.1.2.1** | Measure and estimate liquid volumes and masses of objects using standard units (cups [c], pints [pt], quarts [qt], gallons [gal], ounces [oz.], and pounds [lb]) and metric units (liters [l], grams [g], and kilograms [kg]). |

| | |
|---|---|
| **M03.D-M.1.2.2** | Add, subtract, multiply, and divide to solve one step word problems involving masses or liquid volumes that are given in the same units. |
| **M03.D-M.1.2.3** | Use a ruler to measure lengths to the nearest quarter inch or centimeter. |
| **3.MD.A.2** | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. |
| **M03.D-M.2.1.3** | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters. |
| **3.MD.4** | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Students often misread the scale of a measuring tool, looking at the next number on the scale.<br>● Students often confuse the different units of measure such as the difference between a pint and a quart. | ● Students should measure with precision, and know that the last number represents the whole that was measured.<br>● Students should understand the difference between units of measure. |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Specific units measure mass, and how they are used in context.<br>● Specific units measure volume, and how they are used in context.<br>● Objects have a mass that can be estimated and measured.<br>● Objects have a volume that can be estimated and measured.<br>● Objects have a length that can be measured to the nearest half or quarter inch. | ● Students will be able to demonstrate which units measure mass, and use them in real-life applications.<br>● Students will be able to demonstrate which units measure mass, and use them in real-life applications.<br>● Students will accurately estimate and measure mass.<br>● Students will accurately estimate and measure volume.<br>● Students will solve one-step problems involving mass or volume.<br>● Students will accurately measure length to the nearest half or quarter inch. | Standards of Mathematical Practice<br>● SMP 1: Understand and Persevere<br>● SMP 2: Reason Abstractly and Quantitatively<br>● SMP 3: Justify and Critique<br>● SMP 4: Model with Mathematics<br>● SMP 5: Strategically Use Tools<br>● SMP 6: Attend to Precision<br>● SMP 7: Utilize Structure<br><br>NYCSD Profile of a Graduate<br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem.<br>● Conscientious by attending to precision in measurement |

| **Academic Vocabulary:** | | |
|---|---|---|
| ● Benchmark<br>● Capacity<br>● Gram | ● Mass<br>● Ounce<br>● Pound | ● Volume<br>● Inch<br>● Ruler |

| | | |
|---|---|---|
| ● Kilogram<br>● Liter | ● Scale<br>● Standard units | |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Math in Practice, Module 12 and 13
- Online Resources

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers

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| | | | |
|---|---|---|---|
| | | | **Math / Grade 3**<br>**Unit 11** |
| **Course/Subject:**<br>Math | **Grade:**<br>3 | **Unit 11:**<br>Measurement of Area and Perimeter | **Suggested Timeline:**<br>3 Weeks |

| | |
|---|---|
| **Grade Level Summary** | In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. |
| **Grade Level Units** | Unit 1: Place Value<br>Unit 2: Addition and Subtraction<br>Unit 3: Money<br>Unit 4: Time<br>Unit 5: Understanding Multiplication and Division<br>Unit 6: Fluently Multiply and Divide<br>Unit 7: Graphing<br>Unit 8: Fractions<br>Unit 9: Geometry<br>Unit 10: Measurement<br>**Unit 11: Measurement of Area and Perimeter** |

| | |
|---|---|
| **Unit Title** | Understanding Fractions |
| **Unit Summary** | Students will be able to understand area and perimeter of plane figures by using manipulatives and models. |

| **Unit Essential Questions:** | **Key Understandings:** |
|---|---|
| 1. How do you use models to determine area?<br>2. How do you find area using multiplication?<br>3. How do you find area of complex figures?<br>4. How do you find a missing length when you know the perimeter?<br>5. How are area and perimeter related? | 1. Area can be determined by counting square units.<br>2. Multiplication can be used to determine area.<br>3. Complex figures can be decomposed to determine area.<br>4. Perimeter can be determined by using addition.<br>5. A missing side length can be found when the perimeter is known.<br>6. A relationship exists between area and perimeter. |

**Focus Standards Addressed in the Unit:**
*Standards with prefix "CC" and "M03" denote PA Core Standards and eligible content, and standards beginning with "3" denote Common Core Standards.

| ***Standard Number*** | *Standard Description* |
|---|---|
| **CC.2.4.3.A.5** | Determine the area of a rectangle and apply the concept to multiplication and to addition. |

| | |
|---|---|
| **M03.D-M.3.1.1** | Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units). |
| **3.MD.5** | Recognize area as an attribute of plane figures and understand concepts of area measurement. |
| **3.MD.5.A** | A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. |
| **.MD.5.B** | A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. |
| **3.MD.6** | Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units). |
| **M03.D-M.3.1.2** | Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning |
| **3.MD.7** | Relate area to the operations of multiplication and addition. |
| **3.MD.7.A** | Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. |
| **3.MD.7.B** | Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. |
| **3.MD.7.C** | Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a× c . Use area models to represent the distributive property in mathematical reasoning. |
| **3.MD.7.D** | Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. |
| **CC.2.4.3.A.6** | Solve problems involving perimeters of polygons and distinguish between linear and area measures. |
| **M03.D-M.4.1.1** | Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem. |
| **3.MD.8** | Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. |

| **Important Standards Addressed in the Unit:** | |
|---|---|
| **N/A** | |

| **Misconceptions:** | **Proper Conceptions:** |
|---|---|
| ● Students often confuse area and perimeter.<br>● Students often add or multiply all numbers referencing a shape without understanding the concept of area and perimeter. | ● Students should fully understand the concepts of area and perimeter.<br>● Students should be able to explain the concept of area and perimeter when using operations to solve. |

| **Knowledge & Concepts** | **Skills & Competencies** | **Dispositions & Practices** |
|---|---|---|
| ● Area can be determined by counting square units.<br>● Area can be determined by multiplying. | ● Students will be able to determine area by counting square units.<br>● Students will use multiplication to determine area. | Standards of Mathematical Practice<br>● SMP # 1 Understand and Persevere<br>● SMP # 2 Reason Abstractly and Quantitatively<br>● SMP # 3 Justify and Critique |

| | | |
|---|---|---|
| ● Decomposing a complex figures can help to determine the area.<br>● Perimeter can be determined by counting.<br>● Perimeter can be determined by addition.<br>● A missing side length can be determined when the perimeter is known.<br>● Figures can have the same area, but different perimeters.<br>● The shape of a figure will affect its perimeter. | ● Students will break figures apart to determine area.<br>● Students will determine perimeter by counting and by using addition.<br>● Students will determine the missing side length of a figure given the overall area.<br>● Students will compare and relate the area and perimeter of figures. | ● SMP # 4 Model with Mathematics<br>● SMP # 5 Strategically use Tools<br>● SMP # 6 Attend to Precision<br>● SMP # 7 Utilize Structure<br><br>NYCSD Profile of a Graduate<br><br>● Competency by displaying mastery of core content including literacy in mathematics.<br>● Critical thinking by problem solving, identifying a problem, and brainstorm a solution for solving the problem. |

**Academic Vocabulary:**

| | | |
|---|---|---|
| ● Area<br>● Decompose<br>● Plane figure<br>● Square centimeters<br>● Square inches | ● Square feet<br>● Square meters<br>● Square units<br>● Length<br>● Perimeter | ● Polygon<br>● Regular polygon<br>● Units<br>● Unknown<br>● Width |

**Evidence: Assessments and Performance Task(s)**

- Multiple forms of assessments will be provided (Performance tasks and assessments including multiple-choice)

**Interdisciplinary Connections:**

- Science and Social Studies
  - Values in context can be added and subtracted
- Written Responses

**Additional Resources:**

- Math in Practice, Modules 14 and 15
- Online Resources

Math in Practice Literature Connections
***Sam's Sneaker Squares* (Nat Gabriel)**
***Chickens on the Move* (Pam Pollack and Meg Belviso)**
***Spaghetti and Meatballs for All* (Marilyn Burns)~also 4th grade**

Akers, C. O'Connell, S., SanGiovanni, J. (2016). *Math in practice: Teaching third-grade math.* Portsmouth, NH: Heinemann

National Governors Association Center for Best Practices, Council of Chief State of School Officers (2010). *Common core state standards initiative: Mathematics standards.* Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief of State school Officers

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