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|  | **Baldwin-Whitehall School District**  ***UNIT OF INSTRUCTION OVERVIEW*** |

**General Course Information**

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| **Course Title:** | **3rd Grade Mathematics** | | **Course Code:** | |  |
| **Pre-requisites:** | **2nd Grade Mathematics** | **Time Allocated Per Unit:**  ***(Based on 165 days of instruction)*** | | | **Approx. 8-13 days** |
| **Authors:** | **Dianna Wispolis, Rebecca Wolf, Liz Murray** | | | **Last Updated:** | **6-29-2015** |
| **Reviewed by:** | **Andrea Huffman** | | | **Date Entered:** |  |

**Course Description**

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| * *What information would accurately and articulately describe what students will know and be able to do as a result of this course?*   + Is the description worded in such a way that it is engaging and interesting to both students and parents?   + Does the description provide the essential skills and competencies that students will be able to demonstrate upon successful completion of the course?   + Does the description mention the duration of the course?   + Does the description use the title of the course within it?   + Does the description specifically communicate expectations of students? |
| 3rd Grade Mathematics will focus on the 5 domains outlined in the PA Core Standards.   * Operations and Algebraic Thinking * Number and Operations in Base Ten * Number and Operations Fractions * Measurement and Data * Geometry |

| **Unit Title 1** | **Topic 1: Understand Multiplication and Division of Whole Numbers** | **Instructional Days Needed** | **10** |
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| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |



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| CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property).   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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 the reasonableness of answers. Limit problems posed 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. Example 2: Explain why 6 times a number can be decomposed into three equal addends. |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. |



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| * Real-world problems that involve joining or separating equal groups or making comparisons can be solved using multiplication. * Repeated addition that involves joining equal groups is one way to think about multiplication. * Multiplication on the number line can involve joining equal groups and is one way to think about multiplication. * An array involves displaying objects in equal rows and columns, and is one way to think about multiplication. * Two numbers can be multiplied in any order and the product remains the same. * Sharing involves separating equal groups and is one way to think about division. * Repeated subtract involves separating equal groups and is one way to think about division. * Good math thinkers know how to pick the right tools to solve math problems. |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. |



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| * What are the mathematical properties that govern addition and multiplication? How would you use them? * How do you know if a number is divisible by 2,5, and 10? * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? * How can multiples be used to solve problems? * How can I use the array model to explain multiplication? * How can I relate what I know about skip counting to help me learn the multiples of 2,5,10? * How are repeated addition and multiplication related? * How can I use what I know about repeated subtraction, equal sharing, and forming equal groups to solve division problems? * How does my knowledge about multiplication facts help me to solve problems? |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. |
| * Write multiplication problems as repeated addition. * Use number lines to join equal groups. * Draw and interpret arrays to match given multiplication facts. * Draw and interpret pictures to match given multiplication facts. * Understand and use the Communitive Property of Multiplication. * Use sharing to separate equal groups and think about division. * Write division problems as repeated subtraction. * Identify the key words which symbolize when to use multiplication to solve a problem. |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. |
| * Interpret and/or describe products of whole numbers (up to and including 10 × 10). * 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. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) or division (limit dividends through 50 and limit divisors and quotients through 10) equation relating three whole numbers. * Use 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. * Apply the commutative property of multiplication (not identification or definition of the property). * Apply the associative property of multiplication (not identification or definition of the property). * Represent two-step word problems using equations with a symbol standing for the unknown quantity. * Assess the reasonableness of answers. |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). |
| * Pretest * Study guide * Topic One Test |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. |
| * **Factors** - Numbers that are multiplied together to give a product. * **Product -** The answer to a multiplication problem. * **Array** - A way of displaying objects in rows and columns. * **Multiplication** – Repeated addition * **Associative Property of Multiplication** - The grouping of factors can be changed and the product will be the same. * **Commutative Property of Multiplication** Numbers can be multiplied in any order and the product will be the same. * **Division-** An operation that tells how many equal groups there are or how many are in each group * **Quotient-** The answer to a division problem * **Fact Family-**A group of related facts using the same numbers. * **Equal Groups –** Having the same number in each group * **Number Line** – A line divided into equal units and numbered in order. |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com |

| **Unit Title 2** | **Topic 2: Multiplication Facts: Use Patterns** | **Instructional Days Needed** | **10** |
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| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property).   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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 the reasonableness of answers. Limit problems posed 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. 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * There are patterns in the products for multiplication with factors of 2 or 5. * There are patterns in the products for multiplication with a factor of 9. * There are patterns in the products for multiplication facts with a factor of 0 or 1. The product of 0 and any number is 0. The product of 1 and any number is that same number. * Patterns can be used to solve multiplication problems with a factor of 10. * Basic multiplication facts can be found by identifying patterns. * Good math thinkers choose and apply math they know to show and solve problems from everyday life. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * What are the mathematical properties that govern addition and multiplication? How would you use them? * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? How can I use the array model to explain multiplication? * How can I relate what I know about skip counting to help me learn the multiples of 2,5,10? * How are repeated addition and multiplication related? * How does my knowledge about multiplication facts help me to solve problems? What strategies can be used to solve for unknowns in algebraic equations? * How are the four basic operations related to one another? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Write multiplication problems as repeated addition. * Draw and interpret arrays to match given multiplication facts. * Draw and interpret pictures to match given multiplication facts. * Fluently solve one-digit multiplication problems with a factor of 0, 1, 2, 5, 9, and 10. * Identify, explain, and use patterns on the multiplication chart to solve other problems. * Describe the patterns related to numbers on the addition chart. * Identify the key words which symbolize when to use multiplication to solve a problem. * Solve one-step word problems using multiplication. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation. * Apply the associative property to multiplication problems with 3 factors. * Use multiplication to compare. * Solve multi-step word problems involving +, -, and/or x. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90). * Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * Use multiplication (up to and including 10 × 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) equation relating three whole numbers. Example: Determine the unknown number that makes an equation true. * Apply the commutative property of multiplication (not identification or definition of the property). * Apply the associative property of multiplication (not identification or definition of the property). * Demonstrate multiplication and division fluency. * 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. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, ×, <, >, and =) and numbers. * Identify the missing symbol (+, –, ×, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study guide * Topic Two Test | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Multiples** – Products of a number and another whole number. * **Identity (One) Property of Multiplication** –The product of 1 and any number is that number. * **Zero Property of Multiplication** – The product of any number and zero is zero. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 3** | **Topic 3: Apply Properties: Multiplication Facts for 3, 4, 6, 7, and 8** | **Instructional Days Needed** | **10** |
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| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| CC.2.1.3.B.1: Apply place value understanding and propertied of operations to perform multi-digit arithmetic.   * **M03.A-T.1.1.3:** Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).   CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property). * **M03.B-O.2.2.1:** Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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. * **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 the reasonableness of answers. Limit problems posed 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. 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * The Distributive Property can be used to break a large array into smaller arrays. * Basic multiplication facts with 3, 4, 6, 7, 8 as a factor can be found by breaking apart the unknown fact into known facts. The answers to the known facts are added to get the final product. * Strategies such as bar diagrams and arrays with known facts can be used to solve multiplication problems. * Three or more numbers can be grouped and multiplied in any order. * Good math thinkers look for things that repeat, and they make generalizations. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? * How can numbers be broken down into its smallest factors? * How can I relate what I know about skip counting to help me learn the multiples of 3,4,6,7,8? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Write multiplication problems as repeated addition. * Draw and interpret arrays to match given multiplication facts. * Draw and interpret pictures to match given multiplication facts. * Draw and interpret pictures to match given division facts. * Fluently solve one-digit multiplication problems with a factor of 3, 4, 6, 7, & 8. * Fluently solve division problems with a dividend less than 50. * Identify, explain, and use patterns on the multiplication chart to solve other problems. * Describe the patterns related to numbers on the addition chart. * Identify the key words which symbolize when to use multiplication to solve a problem. * Solve one-step word problems using multiplication. * Solve one-step word problems using division. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation. * Apply the associative property to multiplication problems with 3 factors. * Use multiplication to compare. * Solve multi-step word problems involving +, -, x and/or ÷. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90). * Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * Use multiplication (up to and including 10 × 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. * Use 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. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) and/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. * Apply the commutative property of multiplication (not identification or definition of the property). * Apply the associative property of multiplication (not identification or definition of the property). * Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32 * Demonstrate multiplication and division fluency. * 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. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, ×, ÷, <, >, and =) and numbers. * Identify the missing symbol (+, –, ×, ÷, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study guide * Topic Three Test | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Distributive Property** – A rule which says you can change the grouping of the factors and the product will remain the same. * **Associative (Grouping) Property of Multiplication** – A rule which says a multiplication fact can be broken apart into the sum of two other multiplication facts | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 4** | **Topic 4: Use Multiplication to Divide: Division Facts** | **Instructional Days Needed** | **13** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property). * **M03.B-O.2.2.1:** Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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. * **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 the reasonableness of answers. Limit problems posed 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. 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * The inverse relationship between multiplication and division can be used to find division facts; every division fact has a related multiplication fact. * Factors and products can be identified by patterns as well as other characteristics, such as even or odd. * Any number (except 0) divided by itself is equal to 1. Any number divided by 1 is that number 0 divided by any number (except 0) is 0. 0 cannot be a divisor. * Patterns and known facts can be used to find unknown multiplication facts. Division facts can be found by thinking of a related multiplication fact. * You can use a multiplication or division fact to find the unknown value in an equation. * Good math thinkers make sense of problems and think of ways to solve them. If they get stuck they don’t give up. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * What are the mathematical properties that govern addition and multiplication? How would you use them? * How do you know if a number is divisible by 2, 3, 5, and 10? * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? * What are fact families? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Fluently solve division problems with a dividend less than 50. * Identify, explain, and use patterns on the multiplication chart to solve other problems. * Identify the key words which symbolize when to use multiplication or division to solve a problem. * Solve one-step word problems using multiplication. * Solve one-step word problems using division. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation. * Solve multi-step word problems involving +, -, x and/or ÷. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * Use multiplication (up to and including 10 × 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. * Use 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. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) and/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. * Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32 * Demonstrate multiplication and division fluency. * 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. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, ×, ÷, <, >, and =) and numbers. * Identify the missing symbol (+, –, ×, ÷, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study guide * Topic Four Posttest | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Dividend** – The answer to a division problem. * **Divisor** – The number in a division problem that is divided into equal groups. * **Division-** An operation that tells how many equal groups there are or how many are in each group * **Quotient-** The answer to a division problem * **Fact Family-**A group of related facts using the same numbers. * **Even –** A number which is divisible by 2; It has 0, 2, 4, 6, or 8 in the ones place. * **Odd** - A number which is not divisible by 2; It has 1, 3, 5, 7, or 9 in the ones place. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 5** | **Topic 5: Fluently Multiply and Divide within 100.** | **Instructional Days Needed** | **Built into other topics** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| CC.2.1.3.B.1: Apply place value understanding and propertied of operations to perform multi-digit arithmetic.   * **M03.A-T.1.1.3:** Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).   CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property). * **M03.B-O.2.2.1:** Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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. * **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 the reasonableness of answers. Limit problems posed 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. 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * There are patterns in the factors and the products for multiplication facts. * Any division problem can be thought of as a missing factor multiplication problem. * Strategies and reasoning can be used to recall multiplication and division basic facts. * Strategies such as using properties of operations drawings and skip counting can be used to multiply. * Some real-world problems can be represented and solved using different multiplication and division strategies. * Some real-world problems that involve equal groups can be solved using multiplication. * Some real world problems that involve equal group can be solved using division. * Good math thinkers look for relationships in math to help solve problems. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * What are the mathematical properties that govern addition and multiplication? How would you use them? * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? * How does my knowledge about multiplication facts help me to solve problems? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Fluently solve one-digit multiplication problems. * Fluently solve division problems with a dividend less than 50. * Identify, explain, and use patterns on the multiplication chart to solve other problems. * Identify the key words which symbolize when to use multiplication or division to solve a problem. * Solve one-step word problems using multiplication. * Solve one-step word problems using division. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation. * Apply the associative property to multiplication problems with 3 factors. * Use multiplication to compare. * Solve multi-step word problems involving +, -, x and/or ÷. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90). * Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * Use multiplication (up to and including 10 × 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. * Use 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. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) and/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. * Apply the commutative property of multiplication (not identification or definition of the property). * Apply the associative property of multiplication (not identification or definition of the property). * Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32 * Demonstrate multiplication and division fluency. * 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. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, ×, ÷, <, >, and =) and numbers. * Identify the missing symbol (+, –, ×, ÷, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * None | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * All vocabulary for Topic 5 has been covered in Topics 1 – 4. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com)   Commoncoresheets.com | | | |

| **Unit Title 6** | **Topic 6: Connect Area to Multiplication and Addition** | **Instructional Days Needed** | **8** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| 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). * **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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * The amount of space inside a shape is its area, and area can be found or estimated using unit squares. * Area can be measured using nonstandard units including unit squares of different sizes. * Standard measurement units are used for consistency in finding and communicating measurements. * The amount of space inside a region is its area, and area can be found by counting unit squares or by multiplying the side lengths. * The area of rectangles can be used to model the Distributive Property. * The area of some irregular shapes can be found by dividing the original shape into rectangles, finding the area of each rectangle, and adding all of the areas. * Good math thinkers look for relationships in math to help solve problems. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How do you decide which unit of measurement to use? * How can I measure length, mass and capacity by using non-standard units | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Measure area by counting unit squares * Multiply side lengths to find the area of polygons. * Create regions with given areas. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units). * 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. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study Guide * Topic Six Posttest | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Area** – The number of unit squares needed to cover an area. * **Unit Square** – A square with sides one unit long, used to measure area. * **Square Unit** – The area of one unit square. * **Estimate** – To give an approximate number or answer to. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 7** | **Topic 7: Represent and Interpret Data** | **Instructional Days Needed** | **8** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| 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). * **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 (scales 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.2.1.3:** 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. * **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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * Certain types of graphs are appropriate for certain kinds of data. Picture graphs and bar graphs make it easy to compare data. * The type of graph used is based on the data being presented. The key for a picture graph determines the number of pictures needed to represent the data. * In a scaled bar graph, the scale determines how long each bar needs to be to represent every number in the data set. * Some problems can be4 solved by making, reading, and analyzing a graph. * Good math thinkers are careful about what they write and say, so their ideas about math are clear. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How do you collect data? * How can you collect, organize, and display data? * How do you interpret the data you have collected? * What information does a chart or table give?  How do charts, tables, and graphs help you interpret data? * How does the type of data influence the choice of graph? * What kinds of questions can be answered using different data displays? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Create and interpret tally charts. * Create and interpret bar graphs, pictographs, and line plots. * Connect and transfer information between tables, tally charts, and various graphs. * Solve one and two step word problems using data presented in bar graphs and pictographs. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * 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). * Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales 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?” * Generate measurement data by displaying the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters. * 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. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study Guide * Topic Seven Posttest | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Scaled Picture Graph** – A graph using pictures or symbols to show data * **Key** – Explains what each symbol on a picture graph represents * **Scaled Bar Graph** – A graph using bars to show data. * **Scale** – The numbers that show the units used on a graph. * **Frequency Table** – A table used to show the number of times something occurs. * **Data** – Pieces of information * **Survey** – Collecting information by asking a number of people the same question and recording their answers. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 8** | **Topic 8: Use Strategies and Properties to Add and Subtract** | **Instructional Days Needed** | **11** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| 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.   CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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 the reasonableness of answers. Limit problems posed 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * [The same number sentence (e.g., 12 - 4 = 8) can be associated with different concrete or real world situations, AND different number sentences can be associated with the same concrete or real world situation](javascript:__doPostBack('ctl00$_PageContent$rptBigIdeas$ctl05$lnkBigIdea','')). * [Numerical quantities and calculations can be estimated by using numbers that are close to the actual values, but easier to compute.](javascript:__doPostBack('ctl00$_PageContent$rptBigIdeas$ctl06$lnkBigIdea','')) | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How can addition and subtraction facts help me? * What strategies do I use to find the sum or differences of two whole numbers up to two digits long? * How can using number relationships help me solve addition and subtraction problems for two digit and three-digit numbers? * How can I estimate the answers for operations involving two and three digit numbers? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Demonstrate the relationship and properties between addition and subtraction facts by using fact families. * Solve 2 and 3 digit addition and subtraction problems with and without regrouping. * Round 2 digit numbers to the nearest 10. * Round 3 digit numbers to the nearest 100. * Round a money amount to the nearest dollar. * Estimate sums and differences. * Determine if an answer to a problem is reasonable. * Represent the value of digits in numbers up to 9,999 using place-value blocks, written form, standard form, and expanded form. * Describe the patterns related to numbers on the addition chart. * Identify the key words which symbolize when to use addition or subtraction to solve a problem. * Solve one-step word problems using addition or subtraction. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Round two- and three-digit whole numbers to the nearest ten or hundred, respectively. * 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. * Represent one-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the addition table) and/or explain them using properties of operations. Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, <, >, and =) and numbers. * Identify the missing symbol (+, –, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study Guide * Topic Eight Posttest | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Identity (Zero) Property of Addition** - The sum of any number and zero is that same number * **Round** - Use the multiple of ten or hundred that is nearest to a number. * **Inverse Operations** - Two operations that undo each other. * **Commutative (Order)Property of Addition** - Numbers that can be added in any order and the sum will be the same. * **Associative (Grouping) Property of Addition** - Addends can be regrouped and the sum will be the same. * **Compatible Numbers** - Numbers that are easy to add, subtract, multiply, or divide mentally. * **Place Value** - The value given to the place a digit has in a number. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 9** | **Topic 9: Fluently Add and Subtract within 1000** | **Instructional Days Needed** | **9** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| 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.   CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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 the reasonableness of answers. Limit problems posed 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * The same number sentence (e.g., 12 - 4 = 8) can be associated with different concrete or real world situations, AND different number sentences can be associated with the same concrete or real world situation. * Numerical quantities and calculations can be estimated by using numbers that are close to the actual values, but easier to compute. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How can addition and subtraction facts help me? * What strategies do I use to find the sum or differences of two whole numbers up to two digits long? * How can using number relationships help me solve addition and subtraction problems for two digit and three-digit numbers? * How can I estimate the answers for operations involving two and three digit numbers? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Demonstrate the relationship and properties between addition and subtraction facts by using fact families. * Solve 2 and 3 digit addition and subtraction problems with and without regrouping. * Determine if an answer to a problem is reasonable. * Describe the patterns related to numbers on the addition chart. * Identify the key words which symbolize when to use addition or subtraction to solve a problem. * Solve one-step word problems using addition or subtraction. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Round two- and three-digit whole numbers to the nearest ten or hundred, respectively. * 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. * Represent one-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the addition table) and/or explain them using properties of operations. Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, <, >, and =) and numbers. * Identify the missing symbol (+, –, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * Pretest * Study Guide * Topic Nine Posttest | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Conjecture** - A statement that is believed to be true, but has not been proved. * **Regroup** - Naming whole numbers in a different way using place value. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |

| **Unit Title 10** | **Topic 10: Multiply of Multiples of 10** | **Instructional Days Needed** | **Built into other topics** |
| --- | --- | --- | --- |
| **Competencies/Academic Standards**   * *What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?*   + Select specific standards or assessment anchors that address the core of instruction.   + Use Common Core, PA Academic Standards, Keystone Assessment Anchors, etc., as appropriate. | | | |
| CC.2.1.3.B.1: Apply place value understanding and propertied of operations to perform multi-digit arithmetic.   * **M03.A-T.1.1.3:** Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).   CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.   * **M03.B-O.1.1.1:** Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * **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. * **M03.B-O.1.2.2:** Determine the unknown whole number in a multiplication (up to and including 10 × 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.   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 identification or definition of the property). * **M03.B-O.2.2.1:** Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find 32 ÷ 8 by solving 8 × ? = 32   CC.2.2.3.A.3: Demonstrate multiplication and division fluency.  CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.   * **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. * **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 the reasonableness of answers. Limit problems posed 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. 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. | | | |
| **Big Ideas:**  Students will understand that:   * *What are the big ideas?* * *What specific understandings about them are desired?* * *What misunderstandings are predictable?*   + Big ideas help students make sense of confusing experiences and seemingly isolated facts.   + Write big ideas in statement form, each with a new bullet point. | | | |
| * Students use open number lines to find products when one factor is a multiple of 10. * Recognize patterns in the products of a one-digit number and a multiple of 10. * Understand that if one factor is a multiple of 10, the product will have a zero in the ones place. | | | |
| **Essential Questions:**   * *What provocative questions will foster inquiry, understanding, and transfer of learning?*   + Essential questions are always written in question format.   + Essential questions should be overarching in nature and written in language that is readily understandable.   + Please list only 2-3 essential questions in a unit of instruction.   + Use SAS to help identify the standards, anchors and eligible content that are aligned to the unit’s essential questions.   + List each question in bulleted form. | | | |
| * How can multiples be used to solve problems? * What strategies aid in mastering multiplication and division facts? * How can numbers be broken down into its smallest factors? * How can I relate what I know about skip counting to help me learn the multiples of 3,4,6,7,8? | | | |
| **Essential Skills/Objectives:**  Students will be skilled at:   * *What should students eventually be able to do as a result of such knowledge?*    + Essential skills/objectives should be written in statement form.   + Essential skills/objectives should contain verbs from Webb’s Depth of Knowledge and lead to higher order thinking.   + List each skill on a new line with a bullet point. | | | |
| * Write multiplication problems as repeated addition. * Draw and interpret arrays to match given multiplication facts. * Draw and interpret pictures to match given multiplication facts. * Fluently solve one-digit multiplication problems with multiples of 10. * Identify, explain, and use patterns on the multiplication chart to solve other problems. * Describe the patterns related to numbers on the addition chart. * Identify the key words which symbolize when to use multiplication to solve a problem. * Solve one-step word problems using multiplication. * Solve one-step word problems using division. * Create number sentences (with one element represented as a letter) after reading a word problem or looking at a picture. * Match a given story to the appropriate number sentence. * Identify the missing symbols needed to solve a given equation. * Apply the associative property to multiplication problems with 3 factors. * Use multiplication to compare. * Solve multi-step word problems involving +, -, x and/or ÷. | | | |
| **Knowledge:**  Students will know:   * *What key knowledge will students acquire as a result of this unit?*   + Knowledge statements should be written in sentence form.   + Knowledge statements should contain nouns and key information from the unit.   + List each concept on a new line with a bullet point. | | | |
| * Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90). * Interpret and/or describe products of whole numbers (up to and including 10 × 10). Example 1: Interpret 35 as the total number 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 × 7. * Use multiplication (up to and including 10 × 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities. * Determine the unknown whole number in a multiplication (up to and including 10 × 10) and/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. * Apply the commutative property of multiplication (not identification or definition of the property). * Apply the associative property of multiplication (not identification or definition of the property). * Demonstrate multiplication and division fluency. * 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. * Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers. * Identify arithmetic patterns (including patterns in the multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. * Create or match a story to a given combination of symbols (+, –, ×, ÷, <, >, and =) and numbers. * Identify the missing symbol (+, –, ×, ÷, <, >, and =) that makes a number sentence true. | | | |
| **Learning Activities**  Students will work toward mastery of the desired outcomes by participating in:   * *Through what activities (academic prompts, observations, Socratic seminars, research, homework, journals, etc.) will students be able work toward achievement of the desired results?*   + Select the types of activities that would best enable students to work toward achievement of the desired results throughout the unit.   + List each activity on a separate line as a bullet point. | | | |
| * Whole group instruction * Small group instruction * Homework * Learning games * Math notebooks/dictionary * Academic prompts | | | |
| **Performance Tasks/Major Assessments:**  Students will demonstrate understanding:   * *Through what authentic performance tasks will students demonstrate the desired understandings?* * *What type of assessment would best measure knowledge (i.e. Summative, Formative etc.)?* * *By what criteria will performances of understanding be judged?*   + Select the type of assessment that would best measure student knowledge and skills.   + Write a brief description of the assessment.   + Attach/upload a copy of the common major assessments for the unit of instruction.   + Attach/upload a copy of the tool that would be used to evaluate student performance (rubric, etc.). | | | |
| * None | | | |
| **Essential Vocabulary & Definitions:**   * *Which essential vocabulary words should every student be able to use?*    + Limit Essential Vocabulary to a maximum of 10 words per unit.   + Use primarily Tier 3 Vocabulary in your list.   + List each Essential Vocabulary term on a separate line as a bullet point. | | | |
| * **Open Number Line** – Only displays the numbers being computed. | | | |
| **Instructional Materials, Equipment, and Technologies**   * *What resources (textbooks, supplemental materials, shared resources, software, technology, etc.) best support learning in this unit?* * *What items or strategies will be used for differentiation?*   + List any instructional materials and resources that will be used to support learning in this unit.   + For print works, audio and video materials, software, etc., list the item in MLA format.   + List each resource on a separate line as a bullet point. | | | |
| * Envisions 2.0 * Investigations * - Websites ( * [http://studyjams.scholastic.com/studyjams/jams/math/index.htm](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher) * [superteacher](http://studyjams.scholastic.com/studyjams/jams/math/index.htmsuperteacher)worksheets.com * <http://www.mathfactcafe.com/> * Youtube * sharemylesson.com * <http://www.ixl.com/standards/pennsylvania/math/grade-3> * [www.mathworksheets4kids.com](http://www.mathworksheets4kids.com) * Commoncoresheets.com | | | |