**Blackwater Community School**
**Curriculum Map 2015-2016**

# Third Grade Quarter 1

## Module 1: Properties of Multiplication and Division and Solving Problems with Units of 2-5 and 10

**Approximately 25 days – Begin around July 27th**

This 23-day module begins the year by building on students' fluency with addition and knowledge of arrays.

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| **Major Clusters:** | **3.OA.A – Represent and solve problems involving multiplication and division.**<br>**3.OA.B – Understand properties of multiplication and the relationship between multiplication and division.**<br>**3.OA.C – Multiply and divide within 100.**<br>**3.OA.D – Solve problems involving the four operations, and identify and explain patterns in arithmetic.** |
| Supporting Clusters: | |
| Vocabulary | Array, column, commutative property/commutative, equal groups, equation, distribute, divide/division |

| Domain | Cluster | Standard | Arizona's College and Career Ready Standards | Explanations & Examples | Notes & Resources |
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| **3.OA** | **A** | **1** | Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.4*. Model with mathematics.<br>*3.MP.7.* Look for and make use of structure. | Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. Multiplication requires students to think in terms of groups of things rather than individual things. Students learn that the multiplication symbol 'x' means "groups of" and problems such as 5 x 7 refer to 5 groups of 7.<br><br>To further develop this understanding, students interpret a problem situation requiring multiplication using pictures, objects, words, numbers, and equations. Then, given a multiplication expression (e.g., 5 x 6) students interpret the expression using a multiplication context. (See Table 2) They should begin to use the terms, *factor* and *product,* as they describe multiplication.<br><br>Students may use interactive whiteboards to create digital models. | **Engage NY**<br>M1 Lessons 1-3, 7-10, 14-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 4 |

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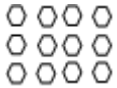
| **3.OA** | **A** | **2** | Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.4.* Model with mathematics.<br>*3.MP.7.* Look for and make use of structure. | Students recognize the operation of division in two different types of situations. One situation requires determining how many groups and the other situation requires sharing (determining how many in each group). Students should be exposed to appropriate terminology (quotient, dividend, divisor, and factor).<br><br>To develop this understanding, students interpret a problem situation requiring division using pictures, objects, words, numbers, and equations. Given a division expression (e.g., 24 ÷ 6) students interpret the expression in contexts that require both interpretations of division. (See Table 2)<br><br>Students may use interactive whiteboards to create digital models. | **Engage NY**<br>M1 Lessons 4-6, 11-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 7 |
| **3.OA** | **A** | **3** | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and-measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.4.* Model with mathematics.<br>*3.MP.7.* Look for and make use of structure. | Students use a variety of representations for creating and solving one-step word problems, i.e., numbers, words, pictures, physical objects, or equations. They use multiplication and division of whole numbers up to 10 x10. Students explain their thinking, show their work by using at least one representation, and verify that their answer is reasonable.<br>Word problems may be represented in multiple ways:<br>• Equations: 3 x 4 = ?**,** 4 x 3 = ?, 12 ÷ 4 = ? and 12 ÷ 3 = ?<br>• Array:<br>  <br>• Equal groups<br>  <br>• Repeated addition: 4 + 4 + 4 or repeated subtraction<br><br>• Three equal jumps forward from 0 on the number line to 12 or | **Engage NY**<br>M1 Lessons 1-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 4,5,6,7,8,9 |

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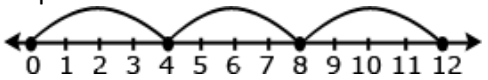
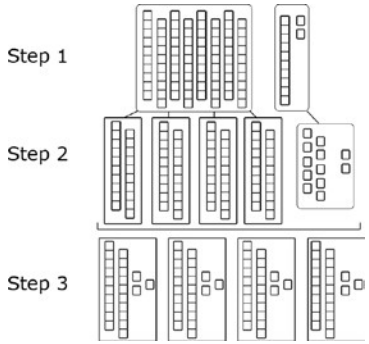
| | | | | three equal jumps backwards from 12 to 0<br>  <br><br>**Examples of division problems**:<br>• Determining the number of objects in each share (partitive division, where the size of the groups is unknown):<br>o The bag has 92 hair clips, and Laura and her three friends want to share them equally. How many hair clips will each person receive?<br>  <br><br>• Determining the number of shares (measurement division, where the number of groups is unknown)<br>o Max the monkey loves bananas. Molly, his trainer, has 24 bananas. If she gives Max 4 bananas each day, how many days will the bananas last? | |

| Starting | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 |
|---|---|---|---|---|---|---|
| 24 | 24-4=20 | 20-4=16 | 16-4=12 | 12-4=8 | 8-4=4 | 4-4=0 |

Solution: The bananas will last for 6 days.

Students may use interactive whiteboards to show work and justify their thinking.

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| **3.OA** | **A** | **4** | Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = △ ÷ 3, 6 × 6 = ?.<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.2*. Reason abstractly and quantitatively.<br>*3.MP.6.* Attend to precision.<br>*3.MP.7.* Look for and make use of structure. | This standard is strongly connected to 3.AO.3 when students solve problems and determine unknowns in equations. Students should also experience creating story problems for given equations. When crafting story problems, they should carefully consider the question(s) to be asked and answered to write an appropriate equation. Students may approach the same story problem differently and write either a multiplication equation or division equation.<br>Students apply their understanding of the meaning of the equal sign as "the same as" to interpret an equation with an unknown.<br>• When given 4 x ? = 40, they might think:<br>o 4 groups of some number is the same as 40<br>o 4 times some number is the same as 40<br>o I know that 4 groups of 10 is 40 so the unknown number is 10<br>o The missing factor is 10 because 4 times 10 equals 40.<br>Equations in the form of a x b = c and c = a x b should be used interchangeably, with the unknown in different positions.<br>**Examples**:<br>• Solve the equations below:<br>24 = ? x 6<br>$72 \div \Delta = 9$<br>• Rachel has 3 bags. There are 4 marbles in each bag. How many marbles does Rachel have altogether? 3 x 4 = m<br>Students may use interactive whiteboards to create digital models to explain and justify their thinking. | **Engage NY**<br>M1 Lessons 4-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 7 |
| **3.OA** | **B** | **5** | Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10,* | Students represent expressions using various objects, pictures, words and symbols in order to develop their understanding of properties. They multiply by 1 and 0 and divide by 1. They change the order of numbers to determine that the order of numbers does not make a difference in multiplication (but does make a difference in division). Given three factors, they investigate changing the order of how they multiply the numbers to determine that changing the order does not change the product. They also decompose numbers to build fluency with | **Engage NY**<br>M1 Lessons 7-10, 14-21<br>Appears again in Module 3.<br>**Factors are limited to** |

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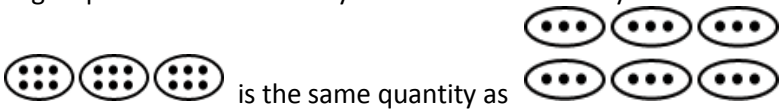
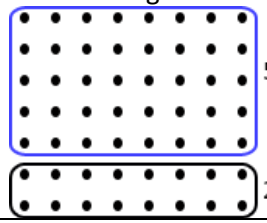
| | | | *then 3 × 10 = 30. (Associative property of multiplication.)-Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*<br><br>*3.MP.1*. Make sense of problems and persevere in solving them.<br>*3.MP.4.* Model with mathematics.<br>*3.MP.7.* Look for and make use of structure.<br>*3.MP.8.* Look for and express regularity in repeated reasoning. | multiplication.<br>Models help build understanding of the commutative property:<br>**Example**: 3 x 6 = 6 x 3<br>In the following diagram it may not be obvious that 3 groups of 6 is the same as 6 groups of 3. A student may need to count to verify this.<br>  is the same quantity as<br>**Example**: 4 x 3 = 3 x 4<br>An array explicitly demonstrates the concept of the commutative property.<br>   <br>4 rows of 3 or 4 x 3 3 rows of 4 or 3 x 4<br>Students are introduced to the distributive property of multiplication over addition as a strategy for using products they know to solve products they don't know.<br>**Example**:<br>• If students are asked to find the product of 7 x 8, they might decompose 7 into 5 and 2 and then multiply 5 x 8 and 2 x 8 to arrive at 40 + 16 or 56. Students should learn that they can decompose either of the factors. It is important to note that the students may record their thinking in different ways.<br>5 x 8 = 40<br>2 x 8 = +16<br>  <br>5 x 8 = 40<br>2 x 8 = 16 | **2, 3, 4, 5, and 10 in this unit.**<br>**The Associative Property is addressed in Unit 3.**<br><br>**enVision**<br>Topic 4,6 |

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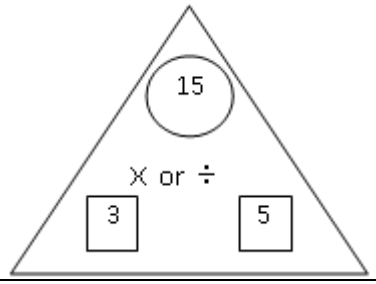
| | | | | 7 x 4 = 28<br><br>7 x 4 = + 28<br><br>To further develop understanding of properties related to multiplication and division, students use different representations and their understanding of the relationship between multiplication and division to determine if the following types of equations are true or false.<br>• 0 x 7 = 7 x 0 = 0 (Zero Property of Multiplication)<br>• 1 x 9 = 9 x 1 = 9 (Multiplicative Identity Property of 1)<br>• 3 x 6 = 6 x 3 (Commutative Property)<br>• 8 ÷ 2 = 2 ÷ 8 (Students are only to determine that these are not equal)<br>• 2 x 3 x 5 = 6 x 5<br>• 10 x 2 < 5 x 2 x 2<br>• 2 x 3 x 5 = 10 x 3<br>• 0 x 6 > 3 x 0 x 2 | |
| **3.OA** | **B** | **6** | Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.<br><br>3.*MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.7.* Look for and make use of structure. | Multiplication and division are inverse operations and that understanding can be used to find the unknown. Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient.<br>**Examples**:<br>• 3 x 5 = 15 5 x 3 = 15<br>• 15 ÷ 3 = 5 15 ÷ 5 = 3<br>  <br> | **Engage NY**<br>M1 Lessons 4-6, 11-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 7 |

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| | | | | Students use their understanding of the meaning of the equal sign as "the same as" to interpret an equation with an unknown.<br>• When given 32 ÷ ☐ = 4, students may think:<br>o 4 groups of some number is the same as 32<br>o 4 times some number is the same as 32<br>o I know that 4 groups of 8 is 32 so the unknown number is 8<br>o The missing factor is 8 because 4 times 8 is 32.<br>Equations in the form of a ÷ b = c and c = a ÷ b need to be used interchangeably, with the unknown in different positions. | |
| **3.OA** | **C** | **7** | Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.<br><br>*3.MP.2.* Reason abstractly and quantitatively.<br>*3.MP.7.* Look for and make use of structure.<br>*3.MP.8.* Look for and express regularity in repeated reasoning. | By studying patterns and relationships in multiplication facts and relating multiplication and division, students build a foundation for fluency with multiplication and division facts. Students demonstrate fluency with multiplication facts through 10 and the related division facts. Multiplying and dividing fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.<br>Strategies students may use to attain fluency include:<br>• Multiplication by zeros and ones<br>• Doubles (2s facts), Doubling twice (4s), Doubling three times (8s)<br>• Tens facts (relating to place value, 5 x 10 is 5 tens or 50)<br>• Five facts (half of tens)<br>• Skip counting (counting groups of and knowing how many groups have been counted)<br>• Square numbers (ex: 3 x 3)<br>• Nines (10 groups less one group, e.g., 9 x 3 is 10 groups of 3 minus one group of 3)<br>• Decomposing into known facts (6 x 7 is 6 x 6 plus one more group of 6)<br>• Turn-around facts (Commutative Property)<br>• Fact families (Ex: 6 x 4 = 24; 24 ÷ 6 = 4; 24 ÷ 4 = 6; 4 x 6 = 24)<br>• Missing factors<br>General Note: Students should have exposure to multiplication and division problems presented in both vertical and horizontal forms. | **Engage NY**<br>M1 Lessons 11-21<br>Appears again in Module 3.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 8 |

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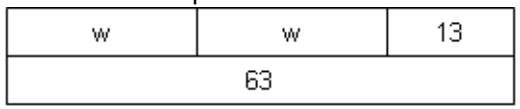
| **3.OA** | **D** | **8** | Solve two-step word problems using the ~~four operations~~ *(multiplication and division).* Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.2.* Reason abstractly and quantitatively.<br>*3.MP.4.* Model with mathematics.<br>*3.MP.5.* Use appropriate tools strategically. | Students should be exposed to multiple problem-solving strategies (using any combination of words, numbers, diagrams, physical objects or symbols) and be able to choose which ones to use.<br>**Examples**:<br>• The soccer club is going on a trip to the water park. The cost of attending the trip is $63. Included in that price is $13 for lunch and the cost of 2 wristbands, one for the morning and one for the afternoon. Write an equation representing the cost of the field trip and determine the price of one wristband.<br>  <br>The above diagram helps the student write the equation, w + w + 13 = 63. Using the diagram, a student might think, "I know that the two wristbands cost $50 ($63-$13) so one wristband costs $25." To check for reasonableness, a student might use front end estimation and say 60-10 = 50 and 50 ÷ 2 = 25.<br><br>When students solve word problems, they use various estimation skills which include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of solutions.<br>• Estimation strategies include, but are not limited to:<br>o using benchmark numbers that are easy to compute<br>o front-end estimation with adjusting (using the highest place value and estimating from the front end making adjustments to the estimate by taking into account the remaining amounts) rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding changed the original values) | **Engage NY**<br>M1 Lessons 11-13, 18-21<br>Appears again in Module 3 and 7.<br>**Factors are limited to 2, 3, 4, 5, and 10 in this unit.**<br><br>**enVision**<br>Topic 3 |

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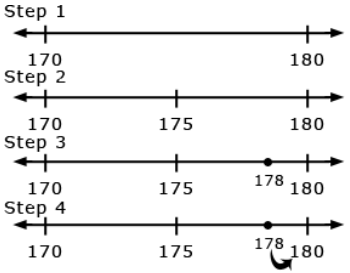
| **Module 2: Place Value and Problem Solving with Units of Measure**<br>**Approximately 20 Days – Begin around August 31st**<br>Module 2 uses place value to unify measurement, rounding skills, and the standard algorithms for addition and subtraction. The unit begins with plenty of hands-on experience using a variety of tools to build practical measurement skills and conceptual understanding of metric and time units. Estimation naturally surfaces through application; this transitions students into rounding. In the unit's final topics students round to assess whether or not their solutions to problems solved using the standard algorithms are reasonable. | | | | | |
| **Major Clusters:** | | | **3.MD.A – Solve problems involving measurement and estimation of intervals of time, liquid volumes and masses of objects.** | | |
| Supporting Clusters: | | | 3.NBT.A – Use place value understanding and properties of operations to perform multi-digit arithmetic. | | |
| Vocabulary | | | About, addend, analog clock, capacity, compose, continuous, endpoint, gram, halfway, Interval, Kilogram, Liquid volume, Liter, Milliliter, Plot, Point, Reasonable, Rename, Round, Second, ≈ | | |
| 3.NBT | A | 1 | Use place value understanding to round whole numbers to the nearest 10 or 100.<br><br>3.MP.5. Use appropriate tools strategically.<br>3.MP.7. Look for and make use of structure.<br>3.MP.8. Look for and express regularity in repeated reasoning. | **Example:**<br>• Round 178 to the nearest 10.<br>  <br><br>Step 1: The answer is either 170 or 180.<br>Step 2: The halfway point is 175.<br>Step 3: 178 is between 175 and 180.<br>Step 4: Therefore, the rounded number is 180. | **Engage NY**<br>M2 Lessons 12-21<br><br>**enVision**<br>Topic 1,2 |
| 3.NBT | A | 2 | Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.<br><br>3.MP.2. Reason abstractly and quantitatively.<br>3.MP.7. Look for and make use of structure.<br>3.MP.8. Look for and express regularity in repeated reasoning. | Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students explain their thinking and show their work by using strategies and algorithms, and verify that their answer is reasonable. An interactive whiteboard or document camera may be used to show and share student thinking.<br>Example:<br>• Mary read 573 pages during her summer reading challenge. She was only required to read 399 pages. How many extra pages did | **Engage NY**<br>M2 Lessons 1-11, 15-21<br><br>**enVision**<br>Topic 1,2,3 |

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| | | | | Mary read beyond the challenge requirements?<br>Students may use several approaches to solve the problem including the traditional algorithm. Examples of other methods students may use are listed below:<br>o 399 + 1 = 400, 400 + 100 = 500, 500 + 73 = 573, therefore 1+ 100 + 73 = 174 pages (Adding up strategy)<br>o 400 + 100 is 500; 500 + 73 is 573; 100 + 73 is 173 plus 1 (for 399, to 400) is 174 (Compensating strategy)<br>o Take away 73 from 573 to get to 500, take away 100 to get to 400, and take away 1 to get to 399. Then 73 +100 + 1 = 174 (Subtracting to count down strategy)<br>o 399 + 1 is 400, 500 (that's 100 more). 510, 520, 530, 540, 550, 560, 570, (that's 70 more), 571, 572, 573 (that's 3 more) so the total is 1 + 100 + 70 + 3 = 174 (Adding by tens **or** hundreds strategy) | |
| **3.MD** | **A** | **1** | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.4*. Model with mathematics.<br>*3.MP.6.* Attend to precision. | Students in second grade learned to tell time to the nearest five minutes. In third grade, they extend telling time to the nearest minute and measure time intervals in minutes. Students solve word problems involving addition and subtraction of time intervals by using a number line diagram. These problems are limited to time intervals in minutes such as 20 minutes + 25 minutes + 12 minutes.<br><br>Students may use an interactive whiteboard to demonstrate understanding and justify their thinking. | **Engage NY**<br>M2 Lessons 1-5, 12-21<br><br>**enVision**<br>Topic 12 |
| **3.MD** | **A** | **2** | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as $cm^3$ and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems | Students need multiple opportunities weighing classroom objects and filling containers to help them develop a basic understanding of the size and weight of a liter, a gram, and a kilogram. Milliliters may also be used to show amounts that are less than a liter.<br><br>**Example**:<br>Students identify 5 things that weigh about one gram. They record their | **Engage NY**<br>M2 Lessons 6-21<br><br>**enVision**<br>Topic 15 |

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| | | | involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Table 2).<br><br>*3.MP.1.* Make sense of problems and persevere in solving them.<br>*3.MP.2.* Reason abstractly and quantitatively<br>*3.MP.4.* Model with mathematics.<br>*3.MP.5.* Use appropriate tools strategically.<br>*3.MP.6.* Attend to precision. | findings with words and pictures. (Students can repeat this for 5 grams and 10 grams.) This activity helps develop gram benchmarks. One large paperclip weighs about one gram. A box of large paperclips (100 clips) weighs about 100 grams so 10 boxes would weigh one kilogram. | |