## Unit Goals – Stage 1

**Number of Days:** 25  
**October 2 – November 3, 2017**

**Unit Description:** Unit 2 builds upon the multiplication foundation started in Grade 2. First students concentrate on the meaning of multiplication and division and begin developing fluency for learning products. Students develop these concepts by working with numbers with which they are more familiar such as 2’s, 5’s and 10’s and with numbers that are easily skip counted such as 3’s and 4’s. Since multiplication is a critical area for Grade 3, students will build on these concepts throughout this year working towards fluency by the end of the year.

**Materials:** snap cubes, square tiles, two-color sided counters, graph paper, multiplication table

### Standards for Mathematical Practice

- **SMP.1** Make sense of problems and persevere in solving them.
- **SMP.2** Reason abstractly and quantitatively.
- **SMP.3** Construct viable arguments and critique the reasoning of others.
- **SMP.4** Model with mathematics.
- **SMP.5** Use appropriate tools.
- **SMP.6** Attend to precision.
- **SMP.7** Look for and make use of structure.
- **SMP.8** Look for and express regularity in repeated reasoning.

### Transfer Goals

*Students will be able to independently use their learning to...*

- Make sense of never-before-seen problems and persevere in solving them.
- Construct viable arguments and critique the reasoning of others.

### Making Meaning

**UNDERSTANDINGS**

*Students will understand that...*

- Multiplication is related to repeated addition.
- Multiplication and division can be illustrated using drawings of equal groups, arrays, and equations.

**ESSENTIAL QUESTIONS**

*Students will keep considering...*

- What do effective problem solvers do?
- Is there a more efficient way to do this?

### Acquisition

**KNOWLEDGE**

*Students will know...*

- The definition of the academic vocabulary words such as: distributive property, divide, dividend, divisor, equations, factor, inverse operation, product, quotient and related facts.
- The products of two one-digit numbers.
- How multiplication and division relate to each other.

**SKILLS**

*Students will be skilled at and/or be able to...*

- Use multiplication strategies to find the product: repeated addition, skip counting, arrays, and equal groups.
- Solve word problems using arrays, equal groups, and drawings.
- Find the unknown number in a multiplication or division sentence.
- Apply properties of operations as strategies to multiply and divide.
Standards for Mathematical Practice

SMP.1 Make sense of problems and persevere in solving them.
SMP.2 Reason abstractly and quantitatively.
SMP.3 Construct viable arguments and critique the reasoning of others.
SMP.4 Model with mathematics.
SMP.5 Use appropriate tools.
SMP.6 Attend to precision.
SMP.7 Look for and make use of structure.
SMP.8 Look for and express regularity in repeated reasoning.

Standards for Mathematical Content
Operations and Algebraic Thinking

3.OA.A Represent and solve problems involving multiplication and division.

3.OA.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.*

3.OA.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.*

3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.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 = ?*

3.OA.B Understand properties of multiplication and the relationship between multiplication and division.

3.OA.5 Apply properties of operations as strategies to multiply and divide. *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, 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.)*

3.OA.6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

3.OA.C Multiply and divide within 100.

3.OA.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.

Key: [m] = major clusters; [s] = supporting clusters; [a] = additional clusters
### Evidence of Learning – Stage 2

#### Assessment Evidence

#### Unit Assessment

**Claim 1:** Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Concepts and skills that may be assessed in Claim 1:

- **3.OA.A**
  - The student uses models to represent and solve contextual multiplication and division problems with whole numbers.
  - The student uses multiplication and division within 100 to solve straightforward one-step word problems in situations involving equal groups and arrays.
  - The student determines an unknown whole number in a multiplication or division equation relating three whole numbers with single-digit factors within 100.

- **3.OA.B**
  - The student understands the relationship between multiplication and division.
  - The student uses the properties of operations as strategies to multiply and divide.

- **3.OA.C**
  - The student accurately multiplies single-digit factors within 100.
  - The student accurately divides within 100 using single-digit divisors and single digit quotients.
  - The student connects multiplication and division to target fluencies.

**Claim 2:** Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies. Standard clusters that may be assessed in Claim 2:

- **3.OA.A**

**Claim 3:** The student can clearly and precisely construct viable arguments to support their own reasoning and critique the reasoning of others. Standard clusters that may be assessed in Claim 3:

- **3.OA.B**

**Claim 4:** The student can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems. Standard clusters that may be assessed in Claim 4:

- **3.OA.A**

#### Other Evidence:

**Formative Assessment Opportunities**

- Opening Task – Amanda Bean’s Amazing Dream
- Go Math! Show What You Know – Chapter 3
- Go Math! Getting Ready for SBAC – pages SB1 – 3
- District Unit 2 Resource – exit tickets and quizzes
- Synergy Item Bank
  - myPD Course #2531: Creating an Assessment in Synergy
- Classroom Challenge – The Spinner
- Go Math! Performance Task Chapter 6 – At the Farm Stand
- Go Math! Standards Practice Book – for quizzes or homework with lessons listed for Chapter 3, 4, & 6
# Learning Plan – Stage 3

## Teacher Resources
We encourage using the following resources throughout the unit.

- District Unit 2 Resource – exit tickets and quizzes
  - English (Word or PDF) Spanish (Word or PDF)
- Think Central
- Engage, Explore and Evaluate Problems
- Standards Posters

**myPD Courses:**
- #7455: Lesson Planning Tools
- #2821: “GoMath! Digital Resources”
- #7401: Standards for Mathematical Practice
- #7343: Math Tools
- #7401: SMP
- #7420: Math Discourse
- #7393: Growth Mindset
- #7534: Math Videos

- Mathematics Framework for CA Public Schools – Grade 3
- Which One Doesn't Belong?
- Estimation 180
- Multiplication and Division Situations

**Good Questions for Math Teaching** (Given to teachers at Tri 3 training 2014-2015)
- **Implementing the Common Core State Standards through Mathematical Problem Solving Grades 3 – 5** (Given to teachers at Tri 3 training 2014-2015)

- **Using Formative Assessment for Differentiation**
# Learning Plan – Stage 3

## Suggested Sequence of Key Learning Events and Instruction

<table>
<thead>
<tr>
<th>Days</th>
<th>Learning Target</th>
<th>Success Criteria</th>
<th>Go Math! Lessons and Activities and Core Resources</th>
<th>Supplemental Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>I will know addition and subtraction facts to 20 by...</td>
<td>• Saying them orally.</td>
<td>• Maintaining Fluency Through Fact Families pgs. 2 – 6</td>
<td>• Basic Facts Game: Tic Tac Toe Sums</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Writing Fact Families.</td>
<td>• GoMath! Strategies and Practice for Skills and Facts Fluency</td>
<td>myPD Course #2872: Maintaining Fluency through Fact Families - Addition and Subtraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Using multiple strategies.</td>
<td>• myPD Course #3495: Using the GoMath! Strategies and Practice for Skills and Facts Fluency</td>
<td>myPD Course #2863: Maintaining Fluency through Fact Families - Multiplication and Division</td>
</tr>
<tr>
<td>Daily</td>
<td>I will use mental math strategies to add and subtract by...</td>
<td>• Participating in daily Number Talks.</td>
<td>• Number Talks Strategies and Problem Sets Grades 2 - 5</td>
<td>• myPD Course #2937: Number Talks Addition in the Upper Grades</td>
</tr>
<tr>
<td>90 minutes per week</td>
<td>I will persevere in problem solving to help me understand math by...</td>
<td>• Developing long term problem solving skills.</td>
<td>ST Math Objectives</td>
<td>ST Tips</td>
</tr>
<tr>
<td>(Schools/grades with ST Math)</td>
<td></td>
<td>• Visualizing math concepts.</td>
<td>• Multiplication Concepts*</td>
<td>Go to ST Math Central</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Making connections between concepts and across grades.</td>
<td>• Division Concepts</td>
<td>Assign a minimum of five homework objectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Playing interactive games.</td>
<td>*Highly Recommended</td>
<td>Review facilitation prompts and processes to help struggling students.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>District will handle all student rostering.</td>
</tr>
<tr>
<td>Before the Unit</td>
<td>Give the “Show What You Know” Diagnostic Assessment Ch. 3. page 99 and Ch. 4 pg. 137</td>
<td>Determine if students need intervention for the unit prerequisite skills.</td>
<td></td>
<td>*Rule of Thumb: Rather than doing the “Vocabulary Builder” on pg 100, pg. 138, &amp; pg. 218, as a separate activity, incorporate vocabulary where appropriate in daily lessons. (e.g. as students build conceptual understanding with different tasks, insert mathematical vocabulary during the class discussion, building word walls, or vocabulary lists in notebooks with the students.)</td>
</tr>
</tbody>
</table>
# Learning Plan – Stage 3

## Suggested Sequence of Key Learning Events and Instruction

<table>
<thead>
<tr>
<th>Days</th>
<th>Learning Target</th>
<th>Success Criteria</th>
<th>Go Math! Lessons and Activities and Core Resources</th>
<th>Supplemental Resources</th>
</tr>
</thead>
</table>
| 1    | I can investigate multiplication by… | OPENING TASK - Amanda Bean’s Amazing Dream”  
> - Counting.  
> - Thinking about groups, rows, and columns  
> - Using addition.  
> - Answering questions such as:  
>   - Those found at the back of the Amanda Bean book. | Amanda Bean’s Amazing Dream (handed out in Tr1 2014-15)  
>   - Extending Children’s Learning (back pages) | *Coach’s Note:* These activities should be used as a formative assessment for this unit. |
| 2    | I can count equal groups by… |  
> - Skip counting  
> - Using models or drawings.  
> - Answering questions such as:  
>   - What does equal mean?  
>   - How can you use equal groups to find how many in all? | Ch. 3 “Math Detective” pg. 99  
> Lesson 3.1: Count Equal Groups pgs. 101A – 104 | Application:  
> Exit Ticket – What if you made 3 groups of 2 and your friend made 2 groups of 3. Would you both have the same answer? |
| 3 – 4 | I can connect addition to multiplication by… |  
> - Creating equal groups.  
> - Skip counting.  
> - Communicating my reasoning.  
> - Answering questions such as:  
>   - Why do you think this addition can be called repeated addition? | Lesson 3.2: Relate Addition and Multiplication pgs. 105A – 108  
>   - Math Talk pg. 106  
> Mid-Chapter Checkpoint pgs. 113 – 114, # 1-8; # 10, 12,  
> *SKIP Lesson 3.3: Skip Count on a Number Line: Number line is not a requirement of 3.OA.A or 3.OA.B work. The abstract representation does not allow students to develop an understanding of the meaning of multiplication as defined in 3.OA.A.1 |
### Suggested Sequence of Key Learning Events and Instruction

<table>
<thead>
<tr>
<th>Days</th>
<th>Learning Target</th>
<th>Success Criteria</th>
<th>Go Math! Lessons and Activities and Core Resources</th>
<th>Supplemental Resources</th>
</tr>
</thead>
</table>
| 5 – 6 | I can learn to multiply by… | • Building arrays.  
• Creating equal groups.  
• Using the commutative property of multiplication.  
• Answering questions such as:  
  o How is multiplication like addition? | Coach’s Note – Read pg. 119A, “Using Arrays to Model Multiplication”  
• Lesson 3.5: Model with Arrays  
  o Math Talk pg. 119  
  o pg. 121 #10 and pg. 122 #11 – 14  
• Lesson 3.6: Commutative Property of Multiplication  
  o Math Talk pg. 123  
  o Advanced Learners pg. 121 | Conceptual Understanding:  
• Relate Multiplication to an Array  
Application:  
• Equal to Equals Task |
| 7 – 9 | I can multiply with the factors 0, 1, 2, and 4 by … | • Using counters to make equal groups.  
• Building arrays.  
• Skip counting and finding patterns.  
• Using commutative property of multiplication.  
• Answering questions such as:  
  o What happens when you multiply a number by 0 or 1?  
  o How can you use doubles to find 2 x 14? | Lesson 3.7: Multiply with 1 and 0  
  o Advanced Learners pg. 129  
  o Ch. 4 “Math Detective” pg. 137  
• Lesson 4.1: Multiply with 2 and 4  
  pgs. 139A – 142 | Conceptual Understanding:  
• Pumpkin Patch Task  
Application:  
• Exit Ticket: How can you use a 2’s fact to solve 4 x 6? |
| 10 – 12 | I can multiply with the factors 3, 5, 6, and 10 by … | • Creating equal groups.  
• Making arrays.  
• Drawing a picture.  
• Using distributive property as a strategy.  
• Answering questions such as:  
  o Why are multiples of 10 also multiples of 5?  
  o Why does doubling the 3’s fact give the 6’s fact? | Ch. 3 Performance Task “Tile Designs” (#2 – 5)  
• Lesson 4.2: Multiply with 5 and 10  
  pgs. 143A – 146  
• Lesson 4.3: Multiply with 3 and 6  
  pgs. 147A – 150 | Conceptual Understanding:  
• Carnival Rides Task  
• Basketball Scores Task  
• Halloween Candy Task |
### Learning Plan – Stage 3

#### Suggested Sequence of Key Learning Events and Instruction

<table>
<thead>
<tr>
<th>Days</th>
<th>Learning Target</th>
<th>Success Criteria</th>
<th>Go Math! Lessons and Activities and Core Resources</th>
<th>Supplemental Resources</th>
</tr>
</thead>
</table>
| 13 – 14 | I can use my understanding of multiplication to solve problems by… | **Formative Assessment Lesson**  
*The Spinner*  
- Finding the product of two factors.  
- Comparing the products.  
- Determining all possible factors when the product is given. |  
- The Spinner FAL |  |
| 15 – 16 | I can use the distributive property to find products by…  
OA.5 |  
- Building arrays.  
- Breaking apart arrays into smaller arrays.  
- Answering questions such as:  
  o What are different ways to multiply?  
  o Does breaking apart a larger array into 2 smaller arrays make the problem easier to solve? Explain? |  
- Lesson 4.4: Distributive Property pgs. 151A – 154  
- Read “About the Math” pg. 151A |  
Conceptual Understanding:  
- Is Penelope Correct? Task  
- Distributive Property Lesson |
| 17 – 18 | I can investigate division by…  
OA.2 |  
- Determining the number of equal groups.  
- Separating counters into equal groups.  
- Answering questions such as:  
  o When you solved your problem, did you find the number of groups or the number in each group? |  
- Ch. 6 “Math Detective” pg. 217  
- Lesson 6.1: Problem Solving, Model Division pgs. 219A – 222  
- Lesson 6.2: Advanced Learners pg. 225  
- Lesson 6.3: Number of Equal Groups pgs. 227A - 230 |  |
| 19 – 21 | I can divide by… |  
- Separating counters into equal groups.  
- Building arrays.  
- Explaining my reasoning.  
- Answering questions such as:  
  o How do you know your answer is correct?  
  o What questions can you answer with division? |  
- Lesson 6.4: Model with Bar Models: use this lesson to introduce the division vocabulary: Dividend, Divisor, and Quotient.  
- SKIP Lesson 6.5: Relate Subtraction and Division: 3.OA.7 asks for fluency and this lesson works against it.  
- Mid-Chapter Checkpoint pgs. 239 – 240 |  
Conceptual Understanding:  
- Recycling Task  
Procedural Skills and Fluency:  
- Triangle Flash Cards (Internet: M, Mathematics, Family Resources, Activities, |
## Learning Plan – Stage 3

### Suggested Sequence of Key Learning Events and Instruction

<table>
<thead>
<tr>
<th>Days</th>
<th>Learning Target</th>
<th>Success Criteria</th>
<th>Go Math! Lessons and Activities and Core Resources</th>
<th>Supplemental Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OA.3, 7</td>
<td>o In the array, what represents the Dividend? Quotient? Divisor? o What happens when you divide a number (except 0) by itself?</td>
<td>• Lesson 6.6: Model with Arrays pgs. 241A – 244 • Lesson 6.9: Algebra – Division Rules for 1 and 0 pgs. 253A – 256</td>
<td>Multiplication/Division Triangle Flashcards)</td>
</tr>
<tr>
<td>22 – 23</td>
<td>I can relate division to multiplication by…</td>
<td>• Creating equal groups. • Drawing pictures. • Using arrays. • Determining the unknown factor. • Answering questions such as: o How can an array show both a multiplication problem and a division problem?</td>
<td>• Lesson 6.7: Relate Multiplication and Division pgs. 245A – 247 • Lesson 6.8: Write Related Facts pgs. 249A – 252</td>
<td>Application: • Quiz</td>
</tr>
<tr>
<td></td>
<td>OA 4, 6, 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>I will prepare for the unit assessment on exploring multiplication and division by …</td>
<td>• Applying what I’ve learned to complete a task or a set of problems.</td>
<td>• Ch.3 Review pgs. 131 – 134, #’s 1, 2, 4 – 8, 9 – 13 • Ch. 6 Review pgs. 257 – 260 , #’s 1 – 4, 6, 10 – 14</td>
<td>Application: • Ch. 6 Performance Task “At the Farm Stand”</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td>Unit Assessment</td>
</tr>
</tbody>
</table>

2017 – 2018 LBUSD