

# Chapter 1 - Whole Numbers and Decimals

## Overview & Support

**Standards:** 6.NS.2, 3,4

**Compute fluently with multi-digit numbers and find common factors and multiples.**

2. Fluently divide multi-digit numbers using the standard algorithm.
3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express  $36 + 8$  as  $4(9 + 2)$ .*

**Suggested Resources:** (all strategies with page numbers can be found in Math Number Talks Whole Number Computation)

- 6th Grade California Math Frameworks  
<https://cpb-us-w2.wpmucdn.com/blogs.egusd.net/dist/3/1081/files/2015/09/Grade-6-13p8rai.pdf>
- Number Talks Whole Number Computations (one allotted for each school site; check with your library)
- Multiplication Strategies
  - Alternative strategies to the standard algorithm: decomposition, area model pg. 236, partial products pg. 272, repeated addition, making landmarks or friendly numbers pg. 269
- Division of multidigit numbers
  - Alternative strategies to the standard algorithm: partial quotients pg. 288, partial products pg. 272, repeated subtraction pg. 287, area models pg. 236
- Prerequisite lessons: standards of mathematical practice, place value, rounding, estimation for all operations, the order of operations, alternative strategies for all operations.
- 6.NS.4 3 Act Task - <https://gfletchy.com/geared-up/>
- <https://tasks.illustrativemathematics.org/content-standards/6/NS/B/standards> (Visual Activities)
- Read *A Drive Through History* from Grab and Go Centers Kit

### Strategies from Go Math Chapter 1:

Divide multi-digit numbers: partial quotients, traditional algorithm, calculator work

prime factorization: decomposition, factor trees, factor ladder

LCM: double bubble/Venn Diagram, column strategy, multiplication chart

GCF: bubble/Venn Diagram, Prime Factorization, column strategy, distributive property, rainbow method

Add and Subtract Decimals: relating decimals to fractions, traditional algorithm, calculator work, use of grid paper for alignment

Multiplying Decimals: partial products, area models, traditional algorithm, calculator work

Dividing Decimals by whole numbers: partial products, fractions, patterns, the traditional algorithm

Divide whole numbers and decimals by decimals: see above strategies

## Manipulatives:

- base ten blocks
- place value chart (reusable if put into a sheet protector)
- graph paper
- rules of divisibility

## Vocabulary:

decomposition	recomposition	bar models	number lines	properties of multiplication and division
common factor	greatest common factor (GCF)	least common multiple (LCM)	prime factorization	compatible numbers
decimal	dividend	divisor	prime number	quotient

## Color Coding:

**Green (G)** - The lesson accurately reflects the Framework standard(s).

**Yellow (Y)** - This lesson includes notes to refer to while planning the lesson.

**Red (R)** - This lesson does not accurately reflect the Framework standard(s). Skip the lesson.

## Chapter Essential Question:

How do you solve real-world problems involving whole numbers and decimals?

## Lesson-by-Lesson Overview:

**A review of 5th grade concepts is critical for success.**

Lesson #, Standard	Title	Materials	Vocab	Notes
Show What You Know	Whole Numbers and Decimals	Labeled place value chart (reusable if put into a sheet protector)	Divisor Dividend Quotient Factors Round Compatible Numbers	Do the area model for dividing whole numbers
Division Concept Building		Number Talk Whole Number Computati	Array Area Model	Build a visual concept of dividing multi-digit numbers

		<p>on: Array Discussion pg. 236</p> <p><a href="https://players.brightcove.net/5387496875001/default_t_default/index.html?videoid=5441072864001">https://players.brightcove.net/5387496875001/default_t_default/index.html?videoid=5441072864001</a></p> <p>For struggling learners see pg. 234-236</p>		
<p><b>1.1</b> <b>Y</b> 6.NS.2</p>	<p>Divide Multi-Digit Numbers</p>	<p>Day 1: Estimation with Compatible numbers</p> <p>Day 2 Partial Quotients Strategy Number Talk Whole Number Computation: Partial Quotients pg. 288</p> <p>Day 3 Standard Algorithm</p>	<p>Quotient Dividend Divisor Compatible Numbers Estimate</p>	<p>Multiple skills embedded in this lesson. Multiple days of instruction needed.</p> <p>Estimation with benchmarks/number lines and compatible numbers (friendly numbers) strategy</p> <p>Review area model and/or partial quotients before introducing the standard algorithm. Option: use Fluency Builder on pg.5B for Lesson 1.1</p> <p>Focus on the constructed response for Example 2 on page 6</p> <p>Continue <u>daily</u> division practice as students will need to divide decimals by the end of the unit (Check out the "Common Error" sections, solve and explain)- remember the goal is the depth of understanding division</p> <ul style="list-style-type: none"> <li>• Use of grid or lined paper to keep students' writing aligned will be helpful</li> </ul>
<p><b>1.2</b> <b>G</b></p>	<p>Prime Factorization</p>		<p>Prime factorization, prime number,</p>	<p>Color "Sieve of Eratosthenes" to identify prime and composite numbers (optional)</p>

pre-requisite for 6.NS.4			divisible, factor tree, factor ladder	<p>Identify prime numbers up to 100</p> <p>Use Factor Tree</p> <p>GoMath TE: Math Talk (page 9) Connection of divisibility to factoring whole numbers</p> <p>Prime factorization is a 5<sup>th</sup> grade standard, so students should have prior knowledge.</p> <p>Opportunity for students to Choral Count by prime numbers - <a href="https://tedd.org/choral-counting">https://tedd.org/choral-counting</a></p>
1.3 G  6.NS.4	Least common Multiple		Least Common Multiple Multiples	<p>Numbers up to 100</p> <p>Use the Venn diagram strategy</p> <p>Use listing strategy of multiples 6: 6, 12, 18, 24, 30, 36, 42... 9: 9, 18, 27, 36, 45, 54, 63...</p> <p>Column Strategy (instead of listing horizontally, list vertically to identify the least common multiple)</p> <p>Opportunity for students to Choral Count by different multiples - <a href="https://tedd.org/choral-counting">https://tedd.org/choral-counting</a></p>
1.4 G  6.NS.4	Greatest Common Factor		Common factor Greatest Common Factor (GCF) Distributive Property Addend Product	<p>Numbers up to 100</p> <p>Review Distributive Property for 3 or more numbers</p> <ul style="list-style-type: none"> <li>● Use Venn diagram strategy</li> <li>● Column strategy</li> <li>● Use other strategies if preferred</li> </ul>
1.5 G  6.NS.4	Problem Solving (apply GCF)			<p>Continuation of Lesson 1.4 Distributive Property</p> <ul style="list-style-type: none"> <li>● Continue teaching distributive property using models</li> </ul>

## Mid Chapter Checkpoint

<b>1.6</b> <b>G</b>  6.NS.3	Add and subtract Decimal	grid paper Place Value Chart (in sheet protector)	Decimal point Tenths Hundredths Thousandths	Review Order of Operations  Remind students to line up decimals  Consider alternate strategies <ul style="list-style-type: none"> <li>● <b>Number Talks Fractions, Decimals, and Percentages</b> <ul style="list-style-type: none"> <li>○ Adding by Place Value &amp; Making Benchmark Numbers pgs. 336-347</li> <li>○ Subtraction Strategy "Adding Up" pg. 350-352</li> <li>○ Subtracting by Place Value pg. 362-367</li> </ul> </li> </ul>
<b>1.7</b> <b>Y</b>  6.NS.3	Multiply Decimals	Grid paper	Factors Product	Talk about estimation as a tool to talk about the reasonableness of their solution  Use a variety of strategies to solve problems (see suggested resources) <ul style="list-style-type: none"> <li>● Partial products</li> <li>● Area models</li> <li>● Number lines</li> <li>● Standard Algorithm</li> </ul>
<b>1.8</b> <b>G</b>  6.NS.3	Divide Decimals by Whole Numbers	Grid paper	Dividend, divisor, quotient	Use grid paper or turn your lined paper to help students keep their work in columns  Partial quotients  Standard Algorithm <ul style="list-style-type: none"> <li>● Reinforce checking quotients using multiplication</li> </ul>
<b>1.9</b> <b>G</b>  6.NS.3	Divide with Decimals	Number Talk Fractions, Decimals, and Percentages: Division Proportional Reasoning on Page 298	Compatible numbers	Focus on the "Connect" portion at the top of Page 39 in the marginalia. Example:  $4.2 \div 0.35 = (4.2 \times 100) \div (0.35 \times 100) = 420 \div 35 = 12$ <p style="font-size: small;">It is vitally important for teachers to pay attention to students' understanding of place value. There is no conceptual understanding gained by referring to this only as "moving the decimal point." Teachers can refer to this more meaningfully as "multiplying by <math>\frac{n}{n}</math> in the form of <math>\frac{100}{100}</math>."</p> Found in Framework on pg. 299

## End of Chapter Assessment

<b>Reteach Options (1 day)</b>	<p>Reteach standards from this unit to help meet students' need. Some ideas for reteach activities are listed below:</p> <ul style="list-style-type: none"><li>● Math centers or math games focused on unit standards</li><li>● Small group instruction focused on a single standard</li><li>● Whole group instruction focused on a single standard</li><li>● My Favorite No – Rewrite student work with an error and work as a class to identify positives in the work and areas that need to be revised</li><li>● Select 1 – 3 problems to resolve in their groups and discuss with the whole class. We want new learning to occur on this day that helps students overcome misconceptions.</li><li>● Complete the “Performance Task” from Go Math! In the Assessment Book in small groups. Share strategies and discuss as a whole class.</li><li>● Use the Reteach activities based on standards that need intervention.</li></ul>
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