Grade 4 Math Curriculum Guide

In grade 4, instructional time should focus on three critical areas:

- Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends
- Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers
- Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Eugene School District 4J Elementary math curriculum is comprised of LearnZillion with Number Talks and selected math games integrated. The following document contains pacing and usage guidance for these three components.

Overall pacing guidance is given by month to ensure teachers have flexibility to use the information about the major ( ), supporting ( )and additional ( ) work for your grade-level and professional judgment when meeting the needs of students. It is most important to ensure students have opportunities to master grade-level content standards rather than teaching each lesson. Student unit workbooks are color coded to convey the primary domain of their learning.

Instructional Days	172.5	Lessons Available	159
Term 1	88	Units 0-5	78*
Term 2	84.5	Units 6-13	81**

* include Unit 0 available lessons

**Unit 6 will begin in Term 1 & assessed in Term 2

Color Key by Domain	NF	OA	CC	GEO	NBT	MD

Unit-at-a-Glance pages are available for each unit at Eugene4J.LearnZillion.com. These pages detail prior knowledge, common misconceptions, differentiation/game resources, Number Talk recommendations, and more. Unit Planners indicate important vocabulary, materials to prep/gather, possible formative checkpoints, and expected representations/strategies.

Key Concepts for each unit can provide instructional guidance around the main focus for student learning and the depth of exploration and mastery toward a standard. Key Concepts are taught through a sets of lessons based on the 3 aspects of rigor: Conceptual, Fluency/Procedure, and Application. The final focused opportunity for each standard is noted with black outline. A standard that is isolated to a single unit is indicated with +.

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Standards for Math Practice (MP#) have been listed for each unit. While the curriculum highlights opportunities to elevate these in learning, it is essential that these standards be embedded into student learning when they occur regardless of the few called out in this document. For more information on the Standards for Math Practice, please visit: Illustrative Math

Number Talk Guidance: Number Talks are an essential instructional routine provided to support development of mental math fluency and strategic number sense. This important routine should be incorporated outside of the 60-minute math block on a regular basis. A variety of Number Talks have been recommended for use at the start of school, fall, winter and spring. Use your professional judgment along with the collaborative efforts of building staff and Staff Development Specialists when meeting the needs of students.

Game Resource Guidance: It is critical to note that fluency requires a balance of conceptual understanding and computational procedures. Well-posed and engaging math games afford students excellent opportunities to develop this understanding**.** These games have been identified in Investigations and other resources and provided by unit to reinforce prior knowledge concepts or enhance the key concepts of a unit. Guidance is provided for when and how to integrate these games, however, use your professional judgment when meeting the needs of students.

A few questions teams have asked while using this document:

- What are the concepts covered term 1 vs term 2? How does the standard progress over the year? Where does the standard occur before it is finalized?
- Knowing all standards must be learned and the majority of the year (~80%) should be spent on major work ( ), where can we compact, not skip, if needed?
- What is the focus of the unit? What is the primary domain? Is it major ( ), supporting ( ), or additional ( )work?
- How will strategies for fluency (efficiency, accuracy, flexibly) be built through games and Number Talks over the year?
- What are the Key Concepts students should master in this unit? To what depth is the current unit calling for? (range of numbers, strategies, use of abstraction like equations, concept awareness and flexibility, etc.)
- Within the unit, for each Key Concept, what do I want ALL of my students to know an be able to do?
- How can I use the set of lessons available for a Key Concept to support ALL of my students in this learning?
- What “I can” or “I know” statements would make the Key Concepts clear to my learning community?
- What evidence can I gather to show students have learned the Key Concept?
- Considering the Key Concept, how will I support students who need more support or are ready for more challenge? What games or Number Talks might support my learning community?
- How can I leverage and reinforce the Math Practices as students learn Key Concepts?

Reach out to your school’s Staff Development Specialist if clarification or support is needed.

Reporting Period 1

Instructional Days: 88	**LearnZillion Units:** 0-5 (78 lessons available)

★ **Unit 0: Building a Mathematical Community in Grade 4 (Lessons: 6)**
Ideas to compact: Unit 0's Lessons 3, 4 & 5 are intended to be combined with Unit 1's Lessons 1, 2, & 3

	Lesson & Standards	Key Concepts
September - Beg. of Oct.	**Unit 1** (formerly Unit 4) **- Applying place value concepts in whole number addition and subtraction**	
	Lessons: 16 (15+assessment) 4.OA.A.1 4.NBT.A.1 4.NBT.A.2+ 4.NBT.A.3 4.NBT.A.4 MP2, MP6, MP8	1. Digits in numbers represent ten times what they represent in the place to the right.
		2. The same quantity can be named and represented in multiple ways, and changing representations or names does not change a number's value.
		3. We can use our understanding of place value to round numbers.
		4. A real number is either equal to, less than, or greater than another real number. We can compare numbers using place value, and record comparisons using <, >, and =
		5. The meaning of addition does not change depending on how we perform it. The meaning of subtraction does not change depending on how we perform it.
October	**Unit 2** (formerly Unit 1) **- Exploring multiples and factors**	
	Lessons: 11 (10+assessment) 4.0A.B.4+ 4.OA.C.5 MP3, MP4, MP7	1. A whole number is a multiple of its factors.
		2. A prime number is a natural number greater than 1 whose only integral factors are 1 and itself. A composite number is a natural number greater than 1 that is not prime.
		3. We can create patterns according to a rule, and find features of the pattern that are not explicit in the rule itself.
End of Oct. - November	**Unit 3** (formerly Unit 2) **- Using multiplication and division strategies with larger numbers**	
	Lessons: 16 (15+assessment) 4.0A.A.3 4.NBT.B.5 4.NBT.B.6 4.MD.A.3+ MP1, MP2, MP7, MP8	1. Place value understanding allows us to multiply multi-digit numbers in different ways.
		2. Place value understanding allows us to divide multi-digit numbers in different ways.
		3. The remainder can be interpreted the whole number amount left over when a quantity is divided by its greatest whole-number factor.
		4. We can use the relationship between multiplication and division to solve mathematical and real-world problems.

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End of Nov. - December	**Unit 4** (formerly Unit 3) **- Decomposing and composing fractions for addition and subtraction**	
	Lessons: 13 (12+assessment) 4.NF.B.3a 4.NF.B.3b 4.NF.B.3c 4.NF.B.3d MP1, MP2, MP3, MP4, MP7, MP8	1. Based on the definition of a fraction a/b as a parts that are the size of 1/b, we can construct a whole given any fractional part of that whole.
		2. Fractions can be decomposed into non-unit fractions in more than one way.
		3. The meanings of addition and subtraction do not change when those operations are used with fractions.
		4. Mixed numbers are a form of numbers greater than 1 that have a whole that can be decomposed in many different ways.
End of Dec. - January	**Unit 5 -Understanding fraction equivalence and comparison**	
	Lessons: 16 (15+assessment) 4.NF.A.1+ 4.NF.A.2+ MP3, MP4, MP5	1. There are three possible relationships between two given numbers with the same unit of reference, a and b: a>b, a<b, or a=b
		2. a/b = (nxa)/(nxb) because we have n times as many pieces in the whole. Each piece is n times smaller, so we need n times as many of them to cover the same distance or the same area.
		3. We can compare two numbers indirectly by comparing them both to a common benchmark.
		4. Finding common denominators is helpful in comparing fractions because it enables us to compare same-sized pieces.

Standards in Progress...	**Standards Finalized (moved to in Maintenance)**	**Standards Not Yet Taught**
4.OA.A.1 & 4.OA.A.3 - Students should begin to understand that multiplication equations (using in situations like converting to a different unit) gives a multiplicative, not additive, result (a foot is 12 times as big as an inch) within whole numbers for now. Students can solve multistep word problems where the remainder needs to be interpreted but not responsible for letter use for unknown yet. **4.OA.C.5** - Students can generate a pattern from a given rule and begin to make observation about the pattern beyond the rule **4.NBT.A.1, 4.NBT.A.3** - Students should begin to understand that a digit in a number represents ten times the digit to its right and be able to round to various place values **4.NBT.B.4, 4.NBT.B.5, 4.NBT.B.6** -Students begin to formalize the standard algorithm by relating it to other models/strategies. Students leverage place value and operations as strategies for multiplication and division (using equations, rectangular arrays, and/or area models) then begin to use the inverse relationship of multiplication and division. **4.NF.B.3.a, 4.NF.B.3.b, 4.NF.B.3.c, 4.NF.B.3.d** - Students can break apart a fraction in many ways, compose a whole with fractional parts, decompose mix numbers in many ways, and understand addition and subtraction can be applied to fractions.	4.OA.B.4 4.NBT.A.2 4.NF.A.1 4.NF.A.2 4.MD.A.3	4.OA.A.2 4.NF.B.4 4.NF.C.5 4.NF.C.6 4.NF.C.7 4.MD.A.1 4.MD.A.2 4.MD.B.4 4.MD.C.5 4.MD.C.6 4.MD.C.7 4.G.A.1 4.G.A.2 4.G.A.3

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Reporting Period 2

Instructional Days: 84.5	**LearnZillion Units:** 6-13 (81 lessons available)

January	**Unit 6** (formerly Unit 12) **- Comparing decimal fractions and understanding notation**	
	Lessons: 11 (10+assessment) 4.NF.C.5+ 4.NF.C.6+ 4.NF.C.7+ MP3 . MP4, MP7	1. Decimal notation is based on denominators that are powers of 10 (day 1 - tenths).
		2. Because we can write fractions with a denominator of 10 as an equivalent fraction with a denominator of 100, we can also write these numbers in decimal notation.
		3. We can use place value understanding to compare decimals that refer to the same whole.
February	**Unit 7** (formerly Unit 6) **- Introducing measurement conversions**	
	Lessons: 11 (10+assessment) 4.OA.A.1 4.NBT.A.1 4.MD.A.1+ MP2, MP4, MP7, MP8	1. In a multi-digit whole number, a digit in one place represents ten times what it represents in the place to the right.
		2. Multiplication can be thought of as a comparison in contexts other than place value.
		3. Multiplicative comparison can be used to convert units of length, mass, volume, and time.
		4. Within one system of measurement, different units of measure can be used to represent the same quantity.
February	**Unit 8** (formerly Unit 7) **- Solving problems using multiplicative comparison**	
	Lessons: 7 (6+assessment) 4.OA.A.2 4.NBT.A.3 4.MD.A.2 MP1, MP2, MP4, MP5, MP6, M7	1. The meaning of multiplicative comparison does not change depending on the type of problem being solved or the units involved (in measurement problems).
		2. When rounding to estimate solutions, we make choices about which place to round to depending units and quantities involved.
		3. When solving measurement problems, it sometimes makes sense to express measurements given in a larger unit in terms of a smaller unit.
March	**Unit 9** (formerly Unit 8) **- Solving measurement problems using the four operations**	
	Lessons: 8 (7+assessment) 4.OA.A.3 4.NBT.B.4 4.MD.A.2 MP1, MP2, MP6	1. We can write equations using letters to represent unknown quantities to model real-world and mathematical problems.
		2.There are a variety of strategies we can use to estimate. Estimating helps us do computations mentally.
		3. Some word problems may require two or more operations to find the solution.
April	**Unit 10** (formerly Unit 9) **- Solving addition and subtraction problems involving fractions and mixed numbers**	
	Lessons: 11 (10+assessment) 4.NF.B.3.c 4.NF.B.3.d	1. Replacing a mixed number with an equivalent fraction and using the relationship between addition and subtraction can make it easier to add and subtract fractions with like denominators.

	4.MD.4+ MP2, MP3, MP4	2. We can use visual models and equations to represent situational problems involving addition and subtraction of fractions with the same whole and like denominators.
April	**Unit 11 - Multiplying fractions by whole numbers**	
	Lessons: 11 (10+assessment) 4.OA.A.1 4.NF.B.4a 4.NF.B.4b 4.NF.B.4c MP1, MP6	1. A fraction a/b is a multiple of 1/b.
		2. A multiple of a/b is a multiple of 1/b: (n x a/b) = (n x a)/b.
		3. Because fractions are numbers, the meaning of multiplicative comparison does not change when fractions are involved.
May	**Unit 12** (formerly Unit 10) **- Angle measurement**	
	Lessons: 11 (10+assessment) 4.G.A.1 4.MD.C.5.a+ 4.MD.C.5.b+ 4.MD.C.6+ MP3, MP4, MP5, MP7	1. Points, lines, line segments, and rays have specific properties that are maintained when combined to make geometric figures. One of these new figures, an angle, is a geometric figure that is created wherever two rays share a common endpoint.
		2. An angle is measured in reference to two rays that intersect the center point of a circle. An angle that turns through 1/360th of a circle is called a one-degree angle.
		3. An angle that turns through n one-degree angles is said to have a measure of 1 degrees.
May	**Unit 13 - Recognizing and analyzing attributes of 2-dimensional shapes**	
	Lessons: 11 (10+assessment) 4.G.A.1 4.G.A.2+ 4.G.A.3+ 4.OA.C.5 4.MD.C.7+ MP1, MP2, MP4, MP6	1. Two lines are parallel if they are on the same plane and will never intersect, and perpendicular if they are on the same plane and intersect at a 90-degree angle.
		2. Angle measure is additive, and angle measures can therefore be added and subtracted.
		3. Triangles can be categorized based on their angle types.
		4. Patterns may have features that are not explicit in the rule of the pattern.
optional	**Unit 14 (optional) - Problem solving with whole numbers** Optional Focus Lessons:	
	Lessons: 16 (15+assessment) 4.OA.A.2 4.OA.A.3 4.NBT.B.4 4.NBT.B.6 MP1, MP2, MP3, MP8	1. The standard algorithms for addition and subtraction are efficient ways to add and subtract that use place value concepts.
		2. We can multiply whole numbers of up to four digits using a variety of strategies; the choice of strategy does not change the quantities involved or the relationships between them.
		3. We can find quotients of whole numbers of up to four digits using a variety of strategies; the choice of strategy does not change the quantities involved or the relationships between them.
		4. The relationship between multiplication and division holds even when the division results in a remainder. (100 / 40 = 2 R 20: therefore, 100 = 2 x 40 + 20).

NOTE 4.NBT.B.4 - Add/subtract within 1,000,000: Focus on leveraging place value and strategy for efficiency and flexibility is key for this standard. The standard algorithm is one strategy to understand by the end of Grade 4.

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Developing Math Fluency with Grade 4 Number Talks

Overview: Number Talks supports the development of students' procedural fluency from conceptual understanding. This instructional routine takes about 5-15 minutes. The routine structures classroom conversation around purposefully ordered computation problems that students solve mentally.

Recommended Number Talk Sets
Introduction (Establishing expectations for Number Talks)
Addition ● Number Sentences ● Friendly Numbers ● Breaking into Place Value
Fall
Subtraction ● Adding Up ● Removal Multiplication ● Friendly Numbers ● Partial Products
Winter
Addition ● Compensation Subtraction ● Counting Back ● Place Value and Negative Numbers ● Adjusting One Number to Create an Easier Problem Multiplication ● Doubling and Halving Division ● Partial Quotients ● Multiplying Up
Spring
Addition ● Adding Up in Chunks Subtraction ● Constant Difference Multiplication ● Breaking Factors Into Smaller Factors Division ● Proportional Reasoning

Common Tools:

- Dots or Drawings
- Open Number line
- Hundreds Chart
- Place Value Charts
- Cubes, Tiles, Counters
- Base Ten
- Array or Area Models
- Groupings
- Real-life Context

General Prompts:

- I agree with _____ because _____.
- I do not understand _____. Can you explain this again?
- I disagree with _____ because _____.
- How did you decide to _____?

Practicing Math Fluency with Grade 4 Games

Purpose: Games provide additional practice to develop fluencies and opportunity to encourage a positive relationship with mathematics and peers. While teachers have identified 2-4 games per unit to support Operations and Algebraic Thinking, other game resources have been included in a Grade-level Games Binder. Teachers are encouraged to enhance standards with other materials or activities at their discretion. Game structures such as partners, small group, or differentiated review rely on a solid foundation of positive mathematical mindsets and clear community expectations. Unit 0 provides many instructional strategies to enhance such an environment.

Unit	Games in LZ	Supplemental Game	Source	Standard(s) for Supplemental Games
Unit 1		Factor Pairs Multiple Turnover Missing Factors	Investigations Investigations Investigations	4.OA.4 4.OA.4 4.NBT.6
Unit 2	Multiple Madness Prime or Composite? Prime and Composite Paths	Small Array/Big Array Missing Factors Target 300	Investigations Investigations Other Resource	4.NBT.5 4.NBT.6 4.OA.A/B, 4.NBT.A
Unit 3*		Wipeout	Other Resource	
Unit 4		Close to 1000 Changing Places Roll 6 for 100	Investigations Investigations Other Resource	4.NBT.4 4.NBT.4 4.OA.A, 4.NBT.B
Unit 5*	Sort and Battle	Capture Fractions Greater than, Less than, Equal to (use with Fractions Cards)	Investigations Other Resource	4.NF.2 4.NF.2
Unit 6				
Unit 7*				
Unit 8*	TicTacToe, Three in a Row - Subtraction			
Unit 9		Close to 100 Close to 1000	Investigations Investigations	4.NBT.4 4.NBT.4
Unit 10				

Unit 11	Fill Three Fraction Tracks Number Line Mind Meld			
Unit 12		Decimal Compare	Investigations	4.NF.7
Unit 13		Guess My Rule - Power Polygons	Investigations	
Unit 14*	Equation Evasion			

* No additional aligned games for this unit at this time. Please select from the Games Resources binder to support prior knowledge.