Model Curricula Alignment Template for Mathematics

Resource Name: Imagine Learning Illustrative Mathematics Grade 4

Model Unit Name	Model Unit Standards	Resource Unit(s) Number and Lessons	Standard Frequency
This is the title of the unit in the model curricula	*These are the standards addressed in the unit*	*This is the unit(s) that aligns with the model unit from the resource*	*This is the total number of lessons the standard is addressed*
Pacing - Illustrative Mathematics 3-5 lessons are designed to fit within a class period that is at least 60 minutes long. Pacing guidance for each activity is provided in the lesson plans.			
Understanding and Using Place Value to Multiply and Divide			
	4.NBT.A.1	Unit 4, Lesson 6: How Much is 10,000? Unit 4, Lesson 10: Ten Times as Much	6 Lessons
	4.NBT.A.2	Unit 4, Lesson 7: Numbers Within 100,000 Unit 4, Lesson 12: Compare Multi-Digit Numbers	9 Lessons
	4.NBT.A.3	Unit 4, Lesson 14: Multiples of 10,000 and 100,000 Unit 4, Lesson 16: Round Numbers	4 Lessons
	4.NBT.B.5	Unit 6, Lesson 5: Products Beyond 100 Unit 6, Lesson 8: Multiply 2 Two-digit Numbers	20 Lessons

	4.NBT.B.6	Unit 6, Lesson 13: Situations Involving Equal-size Groups	15 Lessons
		Unit 6, Lesson 14: Situations Involving Factors and Multiples	
Factors and Multiples			
	4.OA.A.1	Unit 5, Lesson 2: Interpret Representations of Multiplicative Comparison	5 Lessons
		Unit 5, Lesson 3: Solve Multiplicative Comparison Problems	
	4.OA.B.4	Unit 1, Lesson 1: Multiples of a Number	9 Lessons
		Unit 1, Lesson 3: Prime and Composite Numbers	
	4.OA.C.5	Unit 6, Lesson 1: Patterns that Grow	6 Lessons
		Unit 6, Lesson 2: Patterns that Repeat	
Multi-Digit Whole Number Computation			
	4.NBT.B.4	Unit 4, Lesson 19: Compose and Decompose to Add and Subtract	13 Lessons
		Unit 4, Lesson 21: Zeros in the Standard Algorithm	
	4.OA.A.2	Unit 5, Lesson 4: Solve Multiplicative Comparison Problems with Large Numbers	13 Lessons
		Unit 5, Lesson 5: One- and Two-step Comparison Problems	
	4.OA.A.3	Unit 5, Lesson 10: Multi-step Measurement Problems	20 Lessons
		Unit 6, Lesson 21: Different Ways to Solve Problems	

Comparing Fractions and Understanding Decimal Notation			
	4.NF.A.1	Unit 2, Lesson 4: Same Size, Related Sizes Unit 2, Lesson 5: Fractions on Number Lines	13 Lessons
	4.NF.A.2	Unit 2, Lesson 3: Same Denominator or Numerator Unit 2, Lesson 6: Relate Fractions to Benchmarks	9 Lessons
	4.NF.C.5	Unit 3, Lesson 16: Tenths and Hundredths, Together Unit 3, Lesson 17: Sums of Tenths and Hundredths	8 Lessons
	4.NF.C.6	Unit 4, Lesson 1: Decimal Numbers Unit 4, Lesson 5: Compare and Order Decimals and Fractions	4 Lessons
	4.NF.C.7	Unit 4, Lesson 3: Decimals on Number Lines Unit 4, Lesson 4: Compare and Order Decimals	5 Lessons
Building Understanding of Addition, Subtraction and Multiplication of Fractions			
	4.NF.B.3	Unit 3, Lesson 7: Fractions as Sums Unit 9, Lesson 1: Add, Subtract, and Multiply Fractions	2 Lessons
	4.NF.B.4	Unit 3, Lesson 1: Equal Groups of Unit Fractions Unit 3, Lesson 2: Representations of Equal Groups of Fractions	12 Lessons
Solving Problems Involving Measurement and Data			
	4.MD.A.1	Unit 5, Lesson 7: Meters and Centimeters Unit 5, Lesson 8: Meters and Kilometers	7 Lessons

	4.MD.A.2	Unit 5, Lesson 17: More Perimeter Problems Unit 5, Lesson 10: Multi-step Measurement Problems	12 Lessons
	4.MD.A.3	Unit 5, Lesson 16: Compare Perimeters of Rectangles Unit 6, Lesson 15: Situations Involving Area	6 Lessons
Exploring Angles and Angle Measurement			
	4.MD.C.5	Unit 7, Lesson 5: What is an Angle? Unit 7, Lesson 6: Compare and Describe Angles	3 Lessons
	4.MD.C.6	Unit 7, Lesson 9: Use a Protractor to Measure Angles Unit 7, Lesson 10: Angle Measurement and Perpendicular Lines	4 Lessons
	4.MD.C.7	Unit 7, Lesson 8: The Size of Angles in Degrees Unit 7, Lesson 13: Find Angle Measurements	8 Lessons
Understanding Properties of Two-Dimensional Figures			
	4.G.A.1	Unit 7, Lesson 1: How Would You Describe These Figures? Unit 7, Lesson 2: Points, Lines, Rays, and Segments	17 Lessons
	4.G.A.2	Unit 7, Lesson 16: Guess the Figure Unit 8, Lesson 1: Ways to Look at Figures	7 Lessons
	4.G.A.3	Unit 8, Lesson 4: Symmetry in Figures (Part 1) Unit 8, Lesson 6: All Kinds of Attributes	7 Lessons

Scope and Sequence

If a district uses this resource to implement the state model curriculum for grade 4, the following scope and sequence should be followed to ensure alignment and attention to the progressions of mathematics.

Unit Number/Title	Lesson Title	Lesson Objectives	# of Days/Weeks (assume 1 hour of instruction)
Unit 1: Factors and Multiples			**8-10 Days of Instruction -- 2 Weeks**
	Understand Factors and Multiples		
	Lesson 1	Find areas of different rectangles with a given side length.	
		Understand that the area of a rectangle is a multiple of each of its side lengths.	
	Lesson 2	Find side lengths of different rectangles with a given area.	
		Understand that each side length of a rectangle is a factor of its area.	
	Lesson 3	Determine whether a given whole number in the range 1–100 is prime or composite.	
		Find the factor pairs of a given whole number 1–100.	
	Lesson 4- Optional	Practice multiplication within 100.	
	Find Factor Pairs and Multiples		
	Lesson 5	Apply understanding of multiplication and multiples in the range 1–100 to solve real-world problems.	
	Lesson 6	Apply understanding of factors, multiples, and prime and composite numbers to solve problems.	
	Lesson 7	Determine whether a number from 1–100 is a multiple of another number.	
		Find all factor pairs of a given whole number from 1–100.	

	Lesson 8 - Optional	Apply understanding of factors, multiples, prime and composite numbers to create a geometric design.	
Unit 2: Fraction Equivalence and Comparison			**18-19 Days of Instruction -- 4 Weeks**
	Size and Location of Fractions		
	Lesson 1	Make sense of the numerator and denominator of unit fractions that have denominators 2, 3, 4, 5, 6, 8, 10, and 12.	
		Use physical and visual representations to reason about fractions.	
	Lesson 2	Make sense of the numerator and denominator of unit fractions that have denominators 2, 3, 4, 5, 6, 8, 10, and 12.	
		Use diagrams to represent fractions.	
	Lesson 3	Compare fractions with the same numerator or the same denominator using physical or visual representations.	
		Use the meaning of numerator and denominator to reason about the size of fractions.	
	Lesson 4	Use the relationships between fractions whose denominators are multiples of one another (for instance ½, ¼, and ⅛) to locate fractions on the number line.	
		Use visual representations to reason about fractions that have the same size. Recall that these fractions are equivalent.	
	Lesson 5	Identify equivalent fractions on a number line.	
		Recognize that fractions that describe the same point on the number line are equivalent.	

	Lesson 6	Locate fractions on the number line and compare their size to ½ and to 1.	
	Equivalent Fractions		
	Lesson 7	Generate equivalent fractions using a representation that makes sense to students.	
	Lesson 8	Reason about and generate equivalent fractions on the number line.	
	Lesson 9	Determine if given fractions are equivalent in a way that makes sense to them.	
		Given a pair of equivalent fractions, explain why they are equivalent.	
	Lesson 10	Make sense of a way to generate equivalent fractions by using multiples of the numerator and denominator.	
	Lesson 11	Generate equivalent fractions by using factors of the numerator and denominator.	
		Reason about fraction equivalence numerically, by using multiples or factors of the numerator and denominator.	
	Fraction Comparison		
	Lesson 12	Compare fractions using methods that make sense to them.	

	Lesson 13	Compare two fractions by rewriting one of them into an equivalent fraction with the same denominator as the other.	
	Lesson 14	Solve fraction comparison problems in and out of context.	
	Lesson 15	Compare two fractions with different denominators by rewriting both into equivalent fractions with a common denominator.	
	Lesson 16	Compare and order fractions using any strategy.	
	Lesson 17 - Optional	Locate and compare fractions on the number line.	
Unit 3: Extending Operations to Fractions			**20-22 Days of Instruction -- 4 Weeks**
	Equal Groups of Fractions		
	Lesson 1	Interpret and relate descriptions, drawings, and expressions that represent situations involving equal groups of fractions.	
	Lesson 2	Interpret diagrams and expressions that represent multiplication of a whole number and a unit fraction.	
		Use diagrams and expressions to represent and find the product of a whole number and a unit fraction.	
	Lesson 3	Evaluate multiplication expressions and recognize that $n \times 1/b = n/b$.	
	Lesson 4	Recognize that $n \times a/b = n \times a/b$.	
		Use diagrams to represent and evaluate the product of a whole number and a non-unit fraction.	

	Lesson 5	Write equivalent expressions for the multiplication of a fraction by a whole number and explain or show that the expressions are equivalent.	
	Lesson 6	Represent and solve problems involving multiplication of a fraction by a whole number.	
	Addition and Subtraction of Fractions		
	Lesson 7	Recognize that a fraction can be decomposed into a sum of fractions with the same denominator.	
		Write equations to represent fraction decomposition.	
	Lesson 8	Decompose fractions greater than 1 into a sum of a whole number and a fraction less than 1.	
		Reason about addition of fractions with the same denominator using a number line.	
	Lesson 9	Reason about subtraction of fractions with the same denominator using a number line.	
	Lesson 10	Subtract a fraction from a whole number by decomposing the whole number and reasoning about equivalence.	
	L:esson 11	Subtract fractions and mixed numbers by decomposing numbers and reasoning about equivalence.	
	Lesson 12	Add and subtract fractions (including mixed numbers) with the same denominator.	
		Analyze strategies for reasoning about sums and differences of fractions with the same denominator.	
	Lesson 13	Analyze and interpret fractional measurement data on line plots.	
		Organize measurement data in fractions of a unit (⅛, ¼, ½) onto line plots.	
	Lesson 14	Use information on line plots to solve problems involving addition and subtraction of fractions and mixed numbers.	

	Addition of Tenths and Hundredths		
	Lesson 15	Use equivalence to reason about addition and subtraction problems.	
	Lesson 16	Use equivalent fractions to add tenths and hundredths, up to a sum of 1.	
	Lesson 17	Use equivalent fractions to add tenths and hundredths, where the sum is greater than 1.	
	Lesson 18	Find the sum of three or more tenths and hundredths, using the commutative and associative properties strategically.	
	Lesson 19 - Optional	Interpret and solve problems that involve the addition, subtraction, and multiplication of fractions.	
	Lesson 20 - Optional	Use addition, subtraction, and multiplication of fractions to model and solve a design problem.	
Unit 4: From Hundredths to Hundred-thousands			**24-25 Days of Instruction -- 5 Weeks**
	Decimals with Tenths and Hundredths		
	Lesson 1	Make sense of tenths and hundredths in decimal notation using unit square grids.	
	Lesson 2	Reason about equivalent tenths and hundredths in decimal notation.	
	Lesson 3	Reason about and compare the size of decimals to hundredths using a number line.	
	Lesson 4	Compare and order decimals to hundredths by reasoning about their size.	
	Lesson 5	Compare and order fractions and decimals to the hundredths by reasoning about their size.	
	Place-value Relationships through 1,000,000		
	Lesson 6	Develop a sense of the relative magnitude of 10,000.	
		Recognize ten thousand as 10 groups of 1,000.	
	Lesson 7	Represent, read, and write multi-digit whole numbers to the ten-thousands.	

	Lesson 8	Represent, read, and write multi-digit whole numbers within 1,000,000, including in expanded form.	
	Lesson 9	Describe that the value of a digit in one place represents ten times what it represents in the place to its right.	
	Lesson 10	Write equations to show that each place in a multi-digit number is ten times the value of the place to its immediate right.	
	Lesson 11	Describe the relative magnitude of multi-digit whole numbers within 1,000,000 using a number line and place value understanding.	
	Compare, Order, and Round		
	Lesson 12	Compare 2 multi-digit whole numbers within 1,000,000 using place value reasoning.	
	Lesson 13	Compare and order multi-digit whole numbers within 1,000,000.	
	Lesson 14	Identify the closest multiples of 1,000, 10,000, and 100,000 to a given whole number.	
	Lesson 15	Identify the nearest multiple of 1,000, 10,000, and 100,000 given a multi-digit whole number.	
	Lesson 16	Round multi-digit whole numbers to the nearest 1,000, 10,000, and 100,000.	
	Lesson 17	Describe how rounding can help or hinder problem-solving	
		Round multi-digit whole numbers within 1,000,000 to solve problems.	
	Add and Subtract		
	Lesson 18	Add multi-digit numbers, with composing, using the standard algorithm.	
		Subtract multi-digit numbers, without decomposing, using the standard algorithm.	
	Lesson 19	Add and subtract multi-digit numbers, with composing or decomposing, using the standard algorithm.	
	Lesson 20	Add and subtract multi-digit numbers, with multiple compositions or decompositions, using the standard algorithm.	

	Lesson 21	Use the standard algorithm to subtract in the ten-thousands when the minuend has several zeros.	
	Lesson 22	Interpret and solve problems that involve finding sums and differences of multi-digit whole numbers.	
	Lesson 23 - Optional	Add and subtract multi-digit whole numbers using the standard algorithm.	
		Use place value understanding to make reasonable estimates.	
Unit 5: Multiplicative Comparison and Measurement			**19-20 Days of Instruction -- 4 Weeks**
	Multiplicative Comparison		
	Lesson 1	Represent multiplicative comparison situations using objects and drawings.	
	Lesson 2	Interpret different representations of multiplicative comparison (situations, diagrams, and equations).	
	Lesson 3	Represent and solve multiplicative comparison problems, including those involving unknown factors.	
	Lesson 4	Represent and solve multiplicative comparison problems with larger numbers.	
	Lesson 5	Multiply or divide to solve one- and two-step problems involving multiplicative comparison.	
	Lesson 6	Write, represent, and solve multiplicative comparison problems involving “10 times as many.”	
	Measurement Conversion		
	Lesson 7	Express meters in terms of centimeters.	
		Understand the relative size of meters and centimeters.	
	Lesson 8	Describe the multiplicative relationship between kilometers and meters.	
		Express kilometers in terms of meters.	

	Lesson 9	Describe the multiplicative relationships between liters and milliliters, and kilograms and grams.	
		Express liters in terms of milliliters, and kilograms in terms of grams.	
	Lesson 10	Solve multi-step problems that involve multiplicative comparison and measurement with whole numbers.	
	Lesson 11	Describe the multiplicative relationship between pounds and ounces.	
		Express pounds in terms of ounces.	
	Lesson 12	Describe the multiplicative relationships between units of time.	
		Express hours in terms of minutes and seconds.	
	Lesson 13	Solve multi-step problems that involve multiplicative comparison and measurement with whole numbers and fractions.	
	Let's Put it to Work		
	Lesson 14	Use multiplicative comparison and unit conversion to solve multi-step problems about weight and capacity (in pounds, ounces, gallons, quarts, and cups.	
	Lesson 15	Use multiplicative comparison and unit conversion to solve multi-step problems about length (in yards, feet, inches).	
	Lesson 16	Solve problems involving the perimeter of rectangles using multiplicative comparison.	
	Lesson 17	Solve problems involving perimeter using multiplicative comparison and addition or subtraction of fractions (including mixed numbers).	
	Lesson 18 - Optional	Analyze, describe, and represent multiplicative comparison situations.	
		Convert from larger units to smaller units within a given system of measurement.	
		Solve problems involving multiplicative comparison and measurement.	

Unit 6: Multiplying and Dividing Multi-digit Numbers			26-27 Days of Instruction -- 6 Weeks
	Features of Patterns		
	Lesson 1	Analyze and describe number and shape patterns.	
	Lesson 2	Analyze, describe, and generate patterns that follow a given rule.	
	Lesson 3	Analyze patterns represented visually and numerically.	
		Use numbers, words, and the idea of factors and multiples to describe and extend patterns in the features of rectangles.	
	Lesson 4	Analyze and describe patterns in numbers that follow a rule.	
		Use understanding of place value and operations to explain and extend patterns of numbers.	
	Multi-digit Multiplication		
	Lesson 5	Multiply two-digit by one-digit whole numbers in ways that make sense to them.	
	Lesson 6	Multiply two-digit and one-digit whole numbers using place value understanding and properties of operations.	
	Lesson 7	Multiply three- and four-digit numbers using place value understanding and properties of operations.	
	Lesson 8	Multiply 2 two-digit numbers using place value understanding and properties of operations.	
	Lesson 9	Multiply multi-digit whole numbers by one-digit numbers using an algorithm that uses partial products.	
	Lesson 10	Multiply 2 two-digit numbers using an algorithm that uses partial products.	
	Lesson 11	Identify similarities and differences between algorithms that use partial-products and the standard algorithm for multiplication.	
		Make sense of the standard algorithm for multiplication.	

	Lesson 12	Multiply multi-digit numbers using strategies based on place value and the properties of operations.	
	Multi-digit Division		
	Lesson 13	Reason about division of two- and three-digit numbers in situations involving equal-size groups.	
	Lesson 14	Reason about division of two- and three-digit numbers in situations involving factors and multiples.	
	Lesson 15	Reason about division of two- and three-digit numbers in situations involving area of rectangles.	
	Lesson 16	Divide two-digit numbers by one-digit divisors using base-ten blocks.	
	Lesson 17	Divide two- and three-digit by one-digit numbers using base-ten diagrams.	
	Lesson 18	Analyze ways of using and recording partial quotients to divide multi-digit numbers.	
	Lesson 19	Find whole-number quotients and remainders using an algorithm that uses partial quotients.	
	Lesson 20	Interpret the result and remainder of division in situations.	
		Represent and solve problems that involve finding whole-number quotients and remainders.	
	Let's Put It to Work: Problem Solving with Large Numbers		
	Lesson 21	Interpret products, quotients, and remainders in terms of a situation.	
		Solve multi-step problems in ways that make sense to students.	
	Lesson 22	Solve multi-step problems involving measurement conversions, perimeter, and area.	
	Lesson 23	Solve multi-step problems involving the four operations.	
	Lesson 24	Assess the reasonableness of responses.	
	L	Solve multi-step problems involving the four operations.	

	Lesson 25 - Optional	Generate a pattern of numbers or shapes that follows a given rule.	
		Use the four operations to solve problems that involve multi-digit whole numbers and assess the reasonableness of responses.	
Unit 7: Angles and Angle Measurement			**17-18 Days of Instruction -- 4 Weeks**
	Points, Lines, Segments, Rays, and Angles		
	Lesson 1	Draw points, lines, and line segments, and identify them in geometric figures.	
	Lesson 2	Draw points, lines, rays, and segments.	
		Identify points, lines, rays, and segments in geometric drawings.	
	Lesson 3	Draw parallel and intersecting lines.	
		Identify parallel and intersecting lines.	
	Lesson 4	Draw figures with parallel and intersecting lines.	
		Identify parallel and intersecting lines in figures and drawings.	
	Lesson 5	Identify angles in two-dimensional figures.	
		Recognize angles as geometric figures that are formed wherever two rays share a common endpoint.	
	The Size of Angles		
	Lesson 6	Compare angles in ways that make sense to students.	
		Reason about how to describe the size of angles.	
	Lesson 7	Describe the size of an angle as a turn of one ray from the other.	
		Use the features of an analog clock to describe and compare the size of angles.	
	Lesson 8	Understand that the measure of a full rotation of a ray at a fixed point is 360 degrees.	
		Use benchmark angle measurements (such as	

		90◦, 180◦, 270◦, 360◦) to reason about and estimate the size of angles in degree.	
	Lesson 9	Recognize that 1 degree is a measurement of a 1/360 turn through a full circle.	
		Use tools to measure angles.	
	Lesson 10	Recognize that perpendicular lines meet or cross at a right angle.	
		Use a protractor to measure angles.	
	Lesson 11	Use a protractor to draw angles of given measurements.	
	Angle Analysis		
	Lesson 12	Draw acute and obtuse angles.	
		Identify acute, obtuse, right, and straight angles in two-dimensional figures.	
	Lesson 13	Compose and decompose angles to determine their measurements.	
	Lesson 14	Draw angles of given measurement.	
		Reason about angle measurements within a circle.	
	Lesson 15	Represent angle relationships and solve for unknown angle measurements.	
	Lesson 16 - Optional	Draw and identify acute, obtuse, right, and straight angles in two-dimensional figures.	
		Draw and identify points, lines, rays, segments, and parallel and intersecting lines in geometric figures.	
Unit 8: Properties of Two-dimensional Shapes			**9-12 Days of Instruction -- 2 Weeks**
	Side Lengths, Angles, and Lines of Symmetry		
	Lesson 1	Analyze the attributes of two-dimensional shapes and categorize the shapes in a way that makes sense to them.	
	Lesson 2	Classify triangles based on the their side lengths and size of their angles.	

	Lesson 3	Classify quadrilaterals based on the length of their sides, the size of their angles, and presence of parallel sides.	
	Lesson 4	Describe lines of symmetry for two-dimensional figures and identify figures with line symmetry.	
	Lesson 5	Identify figures with line symmetry and draw lines of symmetry on two-dimensional figures.	
	Lesson 6 - Optional	Draw line symmetric figures and identify lines of symmetry.	
		Identify two-dimensional figures using an understanding of parallelism and perpendicularity.	
	Reason about Attributes to Solve Problems		
	Lesson 7	Find the perimeter of two-dimensional shapes using their properties.	
	Lesson 8	Find the unknown side lengths of two-dimensional shapes using their attributes.	
	Lesson 9 - Optional	Solve problems involving symmetry, side lengths, and perimeter of two-dimensional figures.	
	Lesson 10 - Optional	Find unknown angle measurements using the attributes of two-dimensional figures.	
Unit 9: Putting It All Together			**14 Days of Instruction -- 3 Weeks**
	Reason with Fractions		
	Lesson 1	Solve problems involving addition and subtraction of fractions.	
		Solve problems involving multiplication of a fraction by a whole number.	
	Lesson 2	Add and subtract fractions and mixed numbers with like denominators.	
		Compare fractions and mixed numbers by reasoning about equivalence.	
	Lesson 3	Solve and create word problems involving addition and subtraction of fractions referring to the same whole.	
	Whole-number Operations		
		Compare different methods for subtracting multi-digit numbers.	

	Lesson 4	Subtract multi-digit numbers using the standard algorithm.	
	Lesson 5	Multiply multi-digit numbers using strategies based on place value and the properties of operations.	
	Lesson 6	Divide up to four-digit numbers by single digit numbers using place value strategies.	
	Solve Problems with Multiplication and Division		
	Lesson 7	Use the four operations to solve word problems involving multiplicative comparison.	
	Lesson 8	Determine if a solution to a word problem is reasonable using mental strategies and estimation.	
		Interpret remainders in word problems involving division.	
		Solve multi-step word problems using the four operations.	
	Lesson 9	Write and solve multi-step word problems using the four operations.	
	Creation and Design		
	Lesson 10	Analyze and write estimation problems.	
	Lesson 11	Analyze numbers, expressions, geometric figures, and computations, and identify their shared and unique features.	
		Create a Which One Doesn't Belong set of items with both shared and unique features.	
	Lesson 12	Apply understanding of addition, subtraction, multiplication, and division to create a Number Talk activity.	

Supports of Diversity, Equity and Inclusion

Please provide any information relative to supporting culturally responsive instruction, multi-language learners, and students with disabilities.

Review Site Information:

URL: review-ct.ilclassroom.com
Username: CT@example.com
Password: teacher

Culturally Responsive Instruction:

Illustrative Mathematics includes culturally relevant materials and culturally responsive teaching and instructional practices. Materials are inclusive of various cultures and ethnicities and are free from bias in the portrayal of ethnic groups, gender, age, class, cultures, religions, and people with disabilities.

We address racial, cultural, and religious bias in the following ways:

- The materials contain racial/ethnic balance in the main characters and illustrations.
- Minorities are represented as central figures in text and illustrations.
- Minority figures reflect leadership, intelligence, imagination, and courage.
- The materials provide an opportunity for various racial, ethnic, and cultural perspectives.
- The vocabulary or depiction of racism is avoided (i.e., insulting overtones).
- Race/culture stereotyping language is avoided.
- Biographical or historical content includes minority figures and their discoveries and contributions to society.

Multi-Language Learners:

In a problem-based mathematics classroom, sense-making and language are interwoven. Mathematics classrooms are language-rich and, therefore, language-demanding learning environments for every student. The linguistic demands of doing mathematics include reading, writing, speaking, listening, conversing, and representing (Aguirre & Bunch, 2012). Students are expected to say or write mathematical explanations, state assumptions, make conjectures, construct mathematical arguments, and listen to and respond to the ideas of others. To advance the mathematics and language learning of all students, the materials purposefully engage students in sense-making and using language to negotiate meaning with their peers. To support students who are learning English in their development of language, this curriculum includes instruction devoted to fostering language development alongside mathematics learning, fostering language-rich environments where there is space for all students to participate.

This interwoven approach is grounded in four design principles that promote mathematical language use and development:

Principle 1. Support sense-making: Scaffold tasks and amplify language so students can make their own meaning. Students need multiple opportunities to talk about their mathematical thinking, negotiate meaning with others, and collaboratively solve problems with targeted guidance from the teacher. Teachers can make language more accessible by amplifying rather than simplifying speech or text. Simplifying includes avoiding the use of challenging words or phrases. Amplifying means anticipating where students might need support in understanding concepts or mathematical terms and providing multiple ways to access them.

Principle 2. Optimize output: Strengthen opportunities for students to describe their mathematical thinking to others orally, visually, and in writing. All students benefit from repeated, strategically optimized, and supported opportunities to articulate mathematical ideas into linguistic expression, to communicate their ideas to others. Opportunities for students to produce output should be strategically optimized for both (a) important concepts of the unit or course, and (b) important disciplinary language functions (for example, explaining reasoning, critiquing the reasoning of others, making generalizations, and comparing approaches and representations).

Principle 3. Cultivate conversation: Strengthen opportunities for constructive mathematical conversations. Conversations are back-and-forth interactions with multiple turns that build up ideas about math. Conversations act as scaffolds for students developing mathematical language because they provide opportunities to simultaneously make meaning, communicate that meaning, and refine how content understandings are communicated. During effective discussions, students pose and answer questions, clarify what is being asked and what is happening in a problem, build common understandings, and share experiences relevant to the topic. Meaningful conversations depend on the teacher using activities and routines as opportunities to build a classroom culture that motivates and values efforts to communicate.

Principle 4. Maximize meta-awareness: Strengthen the meta-connections and distinctions between mathematical ideas, reasoning, and language. Meta-awareness, consciously thinking about one's own thought processes or language use, develops when students consider how to improve their communication and reasoning about mathematical concepts. When students are using language in ways that are purposeful and meaningful for themselves, in their efforts to understand—and be understood by—each other, they are motivated to attend to ways in which language can be both clarified and clarifying. Students learning English benefit from being aware of how language choices are related to the purpose of the task and the intended audience,

especially if oral or written work is required. Both metacognitive and metalinguistic awareness are powerful tools to help students self-regulate their academic learning and language acquisition.

These design principles and related mathematical language routines, described below, ensure language development is an integral part of planning and delivering instruction. Moreover, they work together to guide teachers to amplify the most important language students are expected to know and use in each unit.

Mathematical Language Routines

Mathematical Language Routines (MLRs) are instructional routines that provide structured but adaptable formats for amplifying, assessing, and developing students' language. The MLRs included in this curriculum were selected because they simultaneously support students' learning of mathematical practices, content, and language. They are particularly well-suited to meet the needs of linguistically and culturally diverse students learning mathematics while simultaneously acquiring English. These routines are flexible and can be adapted to support students at all stages of language development in using and improving their English and disciplinary language use.

These routines are included in the Curriculum Guide and noted below:

- MLR 1: Stronger and Clearer Each Time
- MLR 2: Collect and Display
- MLR 3: Clarify, Critique, Correct
- MLR 4: Information Gap
- MLR 5: Co-Craft Questions
- MLR 6: Three Reads
- MLR 7: Compare and Connect
- MLR 8: Discussion Supports

MLRs are included in select activities in each unit to provide all students with explicit opportunities to develop mathematical and academic language proficiency. These "embedded" MLRs are described in the teacher notes for the lessons in which they appear.

Each lesson also includes optional, suggested MLRs that can be used to support access and language development for English learners based on the language demands students will encounter. They are described in the activity narrative under the heading "Access for English Learners." Teachers can use the suggested MLRs and language strategies as appropriate to provide students

with access to an activity without reducing the mathematical demand of the task. When using these supports, teachers should take into account the language demands of the specific activity and the language needed to engage the content more broadly in relation to their students' current ways of using language to communicate ideas as well as their students' English language proficiency. Using these supports can help maintain student engagement in mathematical discourse and ensure that struggle remains productive. All of the supports are designed to be used as needed and use should fade out as students develop understanding and fluency with the English language.

In addition to the comprehensive pedagogical design of the program, Spanish translations are available for the educator components, including teacher slides, and the student components, including the student workbook (print version).
Materials are also available in Spanish as follows:

What's in Spanish for IM?

K-5	6-8	AGA
• Printed: Student Workbooks • eBook/PDF: Student, Teacher, Teacher Resource Pack • Spanish Lesson Cards **Other Materials** *(no solutions translated)* • Task Statements (PDF) • Cool-Down (PDF) • Practice Problems (PDF) • Unit Assessments (PDF) • Section Checkpoint Quizzes (PDF) • Family Supports (PDF) • Center Materials (PDF) • Glossary entries	**6-8 Courses Only (Not Acc.)** • Printed: Student Workbooks • eBook/PDF: Student **Other Materials** *(no solutions translated)* • Task Statements (PDF) • Cool-Down (PDF) • Practice Problems (PDF) • Unit Assessments Option B, (PDF) • Glossary entries	**Algebra 1 Only** eBook/PDF: Student Workbook *Print coming for BTS 2023 **Other Materials** *(no solutions translated)* • Task Statements (PDF) • Cool-Down (PDF) • Practice Problems (PDF) • Unit Assessments (PDF) • Modeling prompts • Glossary entries

Exceptional Learners:

Imagine Learning Illustrative Mathematics materials empower all students with activities that capitalize on their existing strengths and abilities to ensure that all learners can participate meaningfully in rigorous mathematical content. Lessons support a flexible approach to instruction and provide teachers with options for additional support to address the needs of a diverse group of students, positioning all learners as competent, valued contributors. When planning to support access, teachers should consider the strengths and needs of their particular students.

Each lesson is carefully designed to maximize engagement and accessibility for all students. Purposeful design elements that support access for all learners but that are especially helpful for students with disabilities include:

Lesson Structures are Consistent
The structure of every lesson is the same: warm-up, activities, synthesis, and cool-down. By keeping the components of each lesson similar from day to day, the flow of work in class becomes predictable for students. This consistency reduces cognitive demand and enables students to focus on the mathematics at hand rather than the mechanics of the lesson.

Concepts Develop from Concrete to Abstract
Mathematical concepts are introduced simply, concretely, and repeatedly, with complexity and abstraction developing over time. Students begin with concrete examples and transition to diagrams and tables before relying exclusively on symbols to represent the mathematics they encounter.

Individual to Pair or Small Group to Whole Class Progression
Providing students with time to think through a situation or question independently before engaging with others allows students to carry the weight of learning, with support arriving just in time from the community of learners. This progression allows students to activate what they already know and continue to build from this base with others.

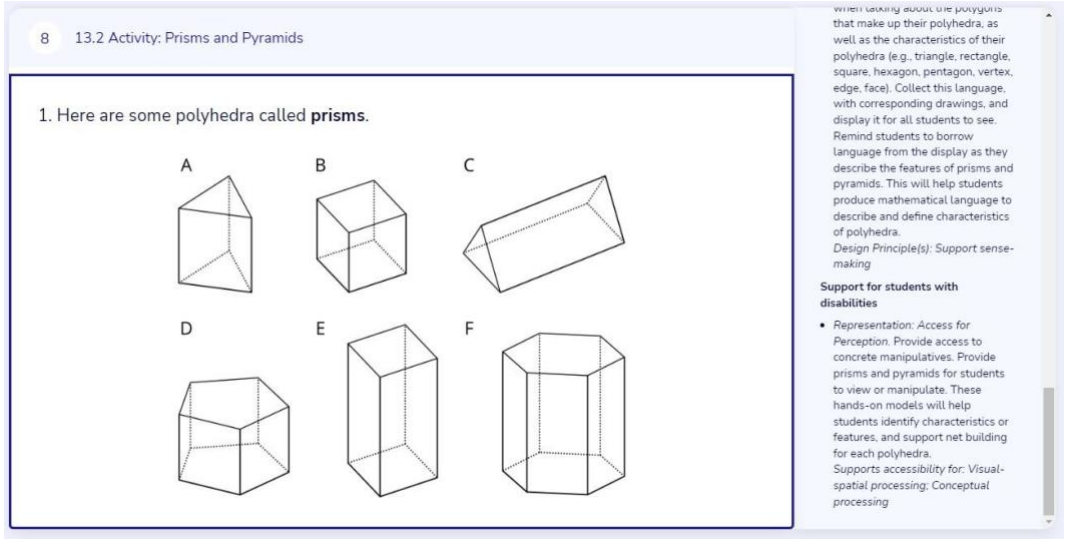
Opportunities to Apply Mathematics to Real-World Contexts
Giving students opportunities to apply the mathematics they learn clarifies and deepens their understanding of core math concepts and skills and provides motivation and support. Mathematical modeling is a powerful activity for all students but especially students with disabilities. Each unit has a culminating activity designed to explore, integrate, and apply all the big ideas of the unit. Centering instruction on these contextual situations can provide students with disabilities an anchor on which to base their mathematical understandings.

Supplemental instructional strategies that can be used to increase access, reduce barriers and maximize learning are included in each lesson, listed in the activity narratives under "*Access for Students with Disabilities.*" Each support is aligned to the Universal Design for Learning Guidelines and based on one of the three principles of UDL to provide alternative means of *engagement, representation,* or *action and expression*. These supports provide teachers with additional ways to adjust the learning environment so students can access activities, engage in content, and communicate their understanding. In addition, these supports are tagged

with the areas of cognitive functioning they are designed to address to help teachers identify and select appropriate supports for their students. Designed to facilitate access to Tier 1 instruction by capitalizing on student strengths to address challenges related to cognitive functions or disabilities, these strategies and supports are appropriate for any students who need additional support to access rigorous, grade-level content.

Teachers are encouraged to use what they know about their students' IEPs, strengths and challenges, and a UDL approach to ensure access.

There are embedded supports for exceptional students in most lessons. Teachers will find these in the **Teaching Notes** section. Illustrative Mathematics 3-5 student-facing materials meet Section 508 compliance standards, meaning students can use assistive technology to navigate the site. Illustrative Mathematics K-5 digital materials were added during the 21-22 School Year and are 508 compliant as well. Outlined in the Curriculum Guide are features, supports, and strategies available.



The curriculum authors drew heavily on the UDL framework in the design of these materials. The curriculum's number one design principle is "Access for all". This foundational principle draws from the UDL framework. It shapes the instructional goals, recommended practices, lesson plans, and assessments to support a flexible approach to instruction, ensuring all students have an equitable opportunity to learn.

Imagine Learning software is browser-based so it will work with any browser-based text-to-speech tools. Also, fonts can be adjusted in type and size, and non-text navigation elements can be adjusted in size. Math equation editing is available on assessment items and practice problems.

Imagine Learning can provide a NIMAS-compatible version of Illustrative Mathematics content. In addition, these files may be used to produce alternate formats as permitted under the law for students with disabilities