Indiana Department of Education
Dr. Katie Jenner, Secretary of Education

## Standards in Essential Need of Support
Early Mathematics
Published April 29, 2022

The Indiana Department of Education (IDOE) will identify the Indiana Academic Standards ("standards") in essential need of support for mathematics and English/language Arts (kindergarten through grade eight) each year beginning April 2022. This document provides information about these standards and resources to support their use in local schools, including:

- What are Standards in Essential Need of Support (SENS)?
- How did IDOE identify SENS?
- How should schools use SENS?
- What is the timeline for updating SENS as student performance changes?
- Who should schools contact for support about SENS?
- What are major trends of identified needs?
- What are the SENS (and supporting resources) for mathematics from April 2022?

What are Standards in Essential Need of Support (SENS)?
SENS are standards which contain content and skills essential for student success **and** for which data indicate students are performing significantly below expectations.
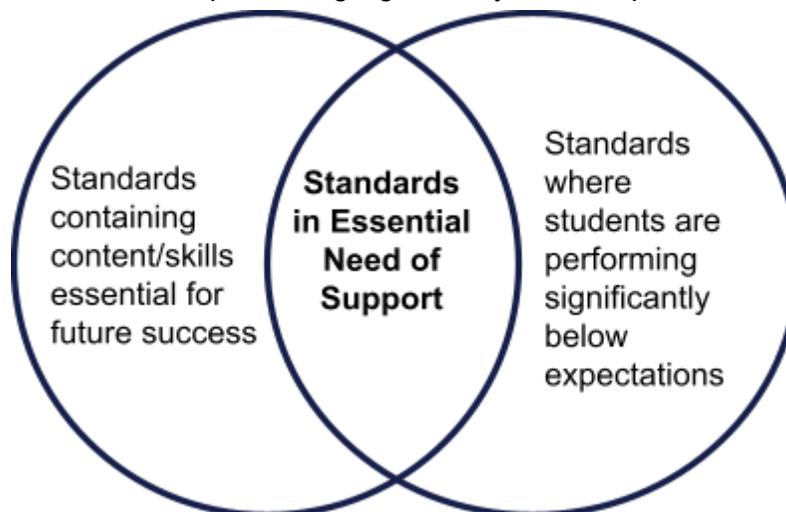
SENS are **not** content priorities alone, nor are they intended to remove standards from teaching and learning plans. Some standards may contain important content and skills, but students are performing well, therefore, the standards are not identified as in essential need of support. Other standards may be performing significantly below expectations but do not include highest priority content, therefore the standards are not identified as in essential need of support.

Indiana Department of Education

Dr. Katie Jenner, Secretary of Education

How did IDOE Identify SENS?

IDOE began with a quantitative, data-driven process to identify an initial list of SENS. The quantitative process considered content priorities, as defined by Indiana educator committees, identified in the assessment blueprints and performance data (from ILEARN and interim/benchmark assessments). Then, Indiana educator content experts reviewed the initial list of identified standards and provided qualitative feedback from current classroom experience. Schools may access these templates for English/language arts and mathematics and the accompanying process documents to support a local application of the process, if desired. Template documents address grades three through eight only as kindergarten through grade two use data compiled from various interim assessment providers which may not be available to all school corporations.

Overview of SENS Identification Process

Quantitative Identification Steps	Identify grade-level content priorities using Indiana educator decisions reflected in grade-level ILEARN blueprints.* Assign higher values for higher priority.
	Identify next-grade-level content priorities using the priority of the vertically aligned standard reflected in the next-grade-level ILEARN blueprints.* Assign higher values for higher priority.
	Identify the proficiency level acquired for that standard on the most recent ILEARN assessment.* Assign higher values for lower performance.
	Compare the performance of each standard on ILEARN with data from interim assessment providers and adjust for discrepancies, as needed.
	Add all the values assigned to the standards for a total indicator. Identify the top 10-15 (using natural breaks found in the final values as a guide) as SENS.
Qualitative Review	Content-area experts review identified SENS for overall themes and to ensure they align with current classroom experiences. Outliers or standards which are "borderline" are reviewed to determine the level of support needed.
	Confirm findings with interim/benchmark assessment providers.
	Finalize list of SENS based on all data and reviews.

*For special considerations related to grades kindergarten, one, two, and eight, refer to the template and process document.

How Should Schools Use SENS?

Schools should consider how they can provide additional support for these standards and how they may engage in a similar identification process at the local level to determine any local variations.

Consider additional support for the standards.	- Should additional time be allotted in curricular plans? - Should the order that content is taught be reconsidered? - Are there content-area themes that need support which should be considered throughout the school year? - Is professional learning needed to support teachers as they unpack the standard and provide instruction? - Is the standard being taught to the level of rigor required? - Are additional supports or resources needed to support the instruction of the identified standards? - Are all students in the class or grade in need of additional support of the identified standards? How should differentiated support be provided?
Consider local application of the process.	- Is local student performance showing the same areas of need as statewide student performance?* - Can schools and districts engage with one another to learn from each other if there are differences?

*Schools can apply the process described under the header "How Did IDOE Identify SENS?" to their own ILEARN and interim/benchmark data sets to see how local performance may impact the identification of SENS for a specific school or corporations. Template documents are available to streamline the process. See templates linked above.

What is the Timeline for Updating SENS as Student Performance Changes?
IDOE will perform the statewide SENS analysis every year as soon as final ILEARN data is available. Updates to SENS are scheduled to publish each July. An initial publication will occur April 2022 using assessment data (ILEARN and interim/benchmark data) from spring and fall 2021. The initial publication provides schools time to understand the process and resources prior to the end of school year 2021-2022. Updates based on data from spring 2022 will be published in July.

Who Should Schools Contact for Support about SENS?
The Office of Teaching and Learning and the Office of Student Assessment jointly identify SENS and support the response to these needs. Contact the Office of Teaching and Learning at teachingandlearning@doe.in.gov.

What are the Major Trends of Identified Needs?

During the SENS identification process, themes of need appeared across mathematics.

Mathematics

- Number Sense involves understanding, expressing, and using fractions, rational, and irrational numbers.
- Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
- Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
- Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world.
- Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.

Indiana Department of Education
Dr. Katie Jenner, Secretary of Education

SENS and Supporting Resources for Elementary School Mathematics

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
K.CA.1	1.CA.1	2.CA.1	3.AT.1	4.AT.1	5.AT.1
K.CA.2	1.CA.2	2.CA.2	3.AT.2	4.AT.4	5.AT.2
K.G.2	1.CA.3	2.CA.3	3.C.1	4.AT.5	5.AT.5
K.M.1	1.CA.5	2.CA.4	3.C.2	4.DA.1	5.AT.8
K.NS.1	1.CA.7	2.CA.5	3.C.3	4.C.1	5.C.2
K.NS.2	1.G.1	2.CA.7	3.C.4	4.C.2	5.C.4
K.NS.3	1.G.2	2.G.1	3.C.6	4.C.4	5.G.1
K.NS.4	1.M.2	2.G.2	3.G.2	4.C.6	5.G.2
K.NS.5	1.M.3	2.G.5	3.G.3	4.G.1	5.M.2
K.NS.6	1.NS.1	2.M.2	3.M.1	4.M.1	5.M.3
K.NS.7	1.NS.2	2.M.7	3.M.2	4.M.2	5.M.4
K.NS.9	1.NS.4	2.NS.1	3.M.5	4.M.4	5.M.5
K.NS.10	1.NS.5	2.NS.2	3.NS.1	4.NS.3	5.NS.1
K.NS.11	1.NS.6	2.NS.3	3.NS.3	4.NS.4	5.NS.2
		2.NS.7	3.NS.7		

Academic Standard	Resources to Understand and Support Instruction	ILEARN Item Specifications	Connection to Themes of Need
Kindergarten			
K.CA.1 Use objects, drawings, mental images, sounds, etc., to represent addition and subtraction within 10.	• Math Framework • Adding and Subtracting Fluently: Kindergarten	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
K.CA.2 Solve real-world problems that involve addition and subtraction within 10 (e.g., by using objects or drawings to represent the problem).	• Math Framework • Real World Addition and Subtraction • Real-World Addition & Subtraction: Kindergarten	N/A	Solving real-world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
K.G.2 Compare two- and three-dimensional shapes in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).	• Math Framework • Which One Doesn't Belong • Open Middle - Describing Shapes	N/A	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
K.M.1 Make direct comparisons of the length, capacity, weight, and temperature of objects, and recognize which object is shorter, longer, taller, lighter, heavier, warmer, cooler, or holds more.	• Math Framework • Which Is Heavier?	N/A	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems

K.NS.1 Count to at least 100 by ones and tens and count on by one from any number.	● [Math Framework](#) ● [Multiplying and Dividing Fluently: K and First](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.2 Write whole numbers from zero to 20 and recognize number words from zero to 10. Represent a number of objects with a written numeral zero to 20 (with zero representing a count of no objects).	● [Math Framework](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.3 Find the number that is one more than or one less than any whole number up to 20.	● [Math Framework](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.4 Say the number names in standard order when counting objects, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number describes the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.	● [Math Framework](#) ● [One-to-One Correspondence](#) ● [Counting Cup](#) ● [Number Rods](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.5 Count up to 20 objects arranged in a line, a rectangular array, or a circle. Count up to 10 objects in a scattered configuration. Count out the number of objects, given a number from one to 20.	● [Math Framework](#) ● [Global Digital Library - Addition within 20](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8

K.NS.6 Recognize sets of one to 10 objects in patterned arrangements and tell how many without counting.	• Math Framework • Global Digital Library - Making 10	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.7 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (e.g. by using matching and counting strategies).	• Math Framework • Which Number is Greater? Which Number is Less? How Do You Know?	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.9 Correctly use the words for comparison, including: one and many; none, some and all; more and less; most and least; and equal to, more than and less than.	• Math Framework	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.10 Separate sets of 10 or fewer objects into equal groups.	• Math Framework	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
K.NS.11 Develop initial understandings of place value and the base 10 number system by showing equivalent forms of whole numbers from 10 to 20 as groups of tens and ones using objects and drawings.	• Math Framework • What Makes a Teen Number?	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
Grade 1			
1.CA.1 Demonstrate fluency with addition facts and the	• Math Framework • Adding and	N/A	Computation: Use models, strategies, algorithms, and

corresponding subtraction facts within 20. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a 10 (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). Understand the role of 0 in addition and subtraction.	Subtracting Fluently-First:Part 1 ● Adding and Subtracting Fluently-First: Part 2 ● Addition Strategies for 1st Grade		properties to understand, represent, and solve problems involving the four operations
1.CA.2 Solve real-world problems involving addition and subtraction within 20 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).	● Math Framework ● Real World Addition and Subtraction ● Real-World Addition & Subtraction: First Grade	N/A	Solving real-world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
1.CA.3 Create a real-world problem to represent a given equation involving addition and subtraction within 20.	● Math Framework	N/A	Solving real-world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
1.CA.5 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit	● Math Framework ● Ford and Logan Add 45+36	N/A	Computation: Use models, strategies, algorithms, and properties to understand,

number and a multiple of 10, using models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; describe the strategy and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones, and that sometimes it is necessary to compose a ten.			represent, and solve problems involving the four operations
1.CA.7 Create, extend, and give an appropriate rule for number patterns using addition within 100.	• [Math Framework](#)	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
1.G.1 Identify objects as two-dimensional or three-dimensional. Classify and sort two-dimensional and three-dimensional objects by shape, size, roundness and other attributes. Describe how two-dimensional shapes make up the faces of three-dimensional objects.	• [Math Framework](#) • [Which One Doesn't Belong](#)	N/A	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
1.G.2 Distinguish between defining attributes of two- and three-dimensional shapes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size). Create and draw two-dimensional shapes with defining attributes.	• [Math Framework](#) • [Which One Doesn't Belong](#) • [All vs. Only Some](#) • [3-D Shape Sort](#)	N/A	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.

1.M.2 Tell and write time to the nearest half-hour and relate time to events (before/after, shorter/longer) using analog clocks. Understand how to read hours and minutes using digital clocks.	● Math Framework ● Would You Rather Math ● Global Digital Library - Time	N/A	
1.M.3 Identify the value of a penny, nickel, dime, and a collection of pennies, nickels, and dimes.	● Math Framework ● Would You Rather Math	N/A	
1.NS.1 Count to at least 120 by ones, fives, and tens from any given number. In this range, read and write numerals and represent a number of objects with a written numeral.	● Math Framework ● Global Digital Library - Skip Counting ● Multiplying and Dividing Fluently: K and First ● Hundred Chart Digit Game ● Where Do I Go?	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
1.NS.2 Understand that 10 can be thought of as a group of ten ones — called a "ten." Understand that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. Understand that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	● Math Framework ● Roll and Build ● The Very Hungry Caterpillar	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
1.NS.4	● Math Framework ● Ordering Numbers	N/A	Number Sense: Understanding, expressing, and using fractions,

Use place value understanding to compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	• Comparing Numbers		rational and irrational numbers in grades K-8
1.NS.5 Find mentally ten more or ten less than a given two-digit number without having to count, and explain the thinking process used to get the answer.	• Math Framework • Global Digital Library - Adding Tens • Global Digital Library - Subtracting Tens •	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
1.NS.6 Show equivalent forms of whole numbers as groups of tens and ones, and understand that the individual digits of a two-digit number represent amounts of tens and ones.	• Math Framework	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
Grade 2			
2.CA.1 Add and subtract fluently within 100.	• Math Framework • Adding and Subtracting Fluently: Second • Building Towards Fluency • Hitting the Target Number	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
2.CA.2	• Math Framework • Real-World	N/A	Solving real world problems: Applying procedural and

Solve real-world problems involving addition and subtraction within 100 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem). Use estimation to decide whether answers are reasonable in addition problems.	Addition & Subtraction: Second Grade ● A Pencil and a Sticker ● Saving Money 2		conceptual thinking to solve problems applicable to the real world in grades K-8
2.CA.3 Solve real-world problems involving addition and subtraction within 100 in situations involving lengths that are given in the same units (e.g., by using drawings, such as drawings of rulers, and equations with a symbol for the unknown number to represent the problem).	● Math Framework ● High Jump Competition	N/A	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
2.CA.4 Add and subtract within 1000, using models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; describe the strategy and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones, and that sometimes it is necessary to compose or decompose tens or hundreds.	● Math Framework ● Would You Rather Math - Subtraction ● Would You Rather Math - Adding within 1000 ● Addition and Subtraction in 2nd Grade ● Choral Counting ● Many Ways to Do Addition	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations

2.CA.5 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal groups.	● Math Framework ● Real-World Multiplication and Division ● Counting Dots in Arrays ● Partitioning a Rectangle into Unit Squares	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
2.CA.7 Create, extend, and give an appropriate rule for number patterns using addition and subtraction within 1000.	● Math Framework	N/A	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
2.G.1 Identify, describe, and classify two- and three-dimensional shapes (triangle, square, rectangle, cube, right rectangular prism) according to the number and shape of faces and the number of sides and/or vertices. Draw two-dimensional shapes.	● Math Framework ● Which One Doesn't Belong ● Open Middle - Drawing and Naming Shapes	N/A	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
2.G.2 Create squares, rectangles, triangles, cubes, and right rectangular prisms using appropriate materials.	● Math Framework	N/A	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
2.G.5 Partition circles and rectangles into two, three, or four equal parts; describe the shares using the	● Math Framework ● Open Middle - Shape Partitions ● Making Sense of Fractions: Second	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8

words halves, thirds, half of, a third of, etc.; and describe the whole as two halves, three thirds, four fourths. Recognize that equal parts of identical wholes need not have the same shape.	● [Which Picture Represents One Half?](#)		
2.M.2 Estimate and measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes to the nearest inch, foot, yard, centimeter and meter.	● [Math Framework](#) ● [Global Digital Library - Measuring Length](#) ● [Determining Length](#) ● [Hand Span Measures](#) ● [Growing Bean Plants](#)	N/A	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
2.M.7 Find the value of a collection of pennies, nickels, dimes, quarters and dollars.	● [Math Framework](#) ● [Kaplinsky's Depth of Knowledge - Elementary](#) ● [Open Middle - Making Change](#)	N/A	
2.NS.1 Count by ones, twos, fives, tens, and hundreds up to at least 1,000 from any given number.	● [Saving Money 2](#) ● [Math Framework](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
2.NS.2 Read and write whole numbers up to 1,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000.	● [Math Framework](#) ● [Would You Rather Math](#) ● [Looking at Numbers Every Which Way](#)	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8

2.NS.3 Plot and compare whole numbers up to 1,000 on a number line.	• Math Framework • Frog and Toad on the Number Line	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
2.NS.7 Use place value understanding to compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	• Math Framework • Ordering 3-Digit Numbers • Comparisons 1 • Using Pictures to Explain Number Comparisons	N/A	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
Grade 3			
3.AT.1 Solve real-world problems involving addition and subtraction of whole numbers within 1000 (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	• Math Framework • Real World Addition and Subtraction • Real-World Addition & Subtraction: Third Grade	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
3.AT.2 Solve real-world problems involving whole number multiplication and division within 100 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).	• Math Framework • Real-World Multiplication and Division • Let's Eat Some Pepperoni Pizza! • Seesaw 3-Act Math Lesson	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8

3.C.1 Fluently add and subtract whole numbers within 1000 using strategies and algorithms based on place value, properties of operations, and relationships between addition and subtraction.	• Math Framework • Adding and Subtracting Fluently: Third • Kaplinsky's Depth of Knowledge - Elementary • Mathigon - Don't Break the Bank • Finding the Unknown • Step Up to the Table with Estimation	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
3.C.2 Represent the concept of multiplication of whole numbers with the following models: equal-sized groups, arrays, area models, and equal "jumps" on a number line. Understand the properties of 0 and 1 in multiplication.	• Math Framework	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
3.C.3 Represent the concept of division of whole numbers with the following models: partitioning, sharing, and an inverse of multiplication. Understand the properties of 0 and 1 in division.	• Math Framework	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
3.C.4 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	• Math Framework • Fish Tanks • Markers in Boxes	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand,

into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each).			represent, and solve problems involving the four operations
3.C.6 Demonstrate fluency with mastery of multiplication facts and corresponding division facts of 0 to 10.	● Math Framework ● Open Middle - Multiply and Divide Within 100 ● Multiplying and Dividing Fluently	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
3.G.2 Understand that shapes (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize and draw rhombuses, rectangles, and squares as examples of quadrilaterals. Recognize and draw examples of quadrilaterals that do not belong to any of these subcategories.	● Math Framework ● How Can a Square Be a Rectangle? ● Quadrilaterals: Build It and Justify ● Sorting Shapes	ILEARN Item Specifications	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
3.G.3 Identify, describe and draw points, lines and line segments using appropriate tools (e.g., ruler, straightedge, and technology), and use these terms when describing two-dimensional shapes.	● Math Framework ● Creating a Geographic Map ● What's the Point	ILEARN Item Specifications	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
3.M.1 Estimate and measure the mass of objects in grams (g) and kilograms (kg) and the volume of objects in	● Math Framework ● Don't Let Problems Weigh You Down ● How Heavy?	ILEARN Item Specifications	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of

			measurement to solve problems
quarts (qt), gallons (gal), and liters (l). Add, subtract, multiply, or divide to solve one-step real-world problems 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).			
3.M.2 Choose and use appropriate units and tools to estimate and measure length, weight, and temperature. Estimate and measure length to a quarter-inch, weight in pounds, and temperature in degrees Celsius and Fahrenheit.	• Math Framework	ILEARN Item Specifications	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
3.M.5 Find the area of a rectangle with whole-number side lengths by modeling with unit squares, and show that the area is the same as would be found by multiplying the side lengths. Identify and draw rectangles with the same perimeter and different areas or with the same area and different perimeters.	• Math Framework • Different Area, Same Perimeter • Let's Look Around • Halves, Thirds, and Sixths • India's Bathroom Tiles	ILEARN Item Specifications	Area: Find the area and perimeter of specific polygons with whole and fractional side lengths using multiple methods to solve problems
3.NS.1 Read and write whole numbers up to 10,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 10,000.	• Math Framework	ILEARN Item Specifications	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8

3.NS.3 Understand a fraction, 1/b, as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction, a/b, as the quantity formed by a parts of size 1/b. [In grade 3, limit denominators of fractions to 2, 3, 4, 6, 8.]	● Math Framework ● Making Sense of Fractions: Third ● Naming the Whole of a Fraction	ILEARN Item Specifications	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
3.NS.7 Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent (e.g., by using a visual fraction model).	● Math Framework ● Understanding Equivalent Fractions: Halves ● Jon and Charlie's Run ● Fraction Comparisons with Pictures	ILEARN Item Specifications	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
Grade 4			
4.AT.1 Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	● Math Framework ● Real World Addition and Subtraction ● Real-World Addition & Subtraction: Fourth Grade ● Let's Party: Multi-Step Word Problems ● Lemonade Stand	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
4.AT.4 Solve real-world problems with whole numbers	● Math Framework ● Real-World Multiplication and	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve

involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]	Division ● Mystery Legos ● Illustrative Math: Comparing Money Raised		problems applicable to the real world in grades K-8
4.AT.5 Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).	● Math Framework ● Fraction Word Problems	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
4.DA.1 Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.	● Math Framework	ILEARN Item Specifications	
4.C.1 Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.	● Math Framework ● Adding and Subtracting Fluently:Fourth-Part 1 ● Adding and Subtracting Fluently: Fourth-Part 2 ● Digits Down	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations

4.C.2 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.	• Math Framework • Would You Rather Math • Monstrous Multiplication • Crack the Code • Illustrative Math: Thousands and Millions of Fourth Graders	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
4.C.4 Multiply fluently within 100.	• Math Framework • Multiplying and Dividing Fluently: Part 1 • Illustrative Math: Kiri's Multiplication Matching Game	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
4.C.6 Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).	• Math Framework • Build Fractions from Unit Fractions • Subtracting Fractions with Like Denominators • Illustrative Math: Cynthia's Perfect Punch • Illustrative Math: Peaches • Illustrative Math: Plastic Building Blocks • Illustrative Math: Writing a Mixed Number as an	ILEARN Item Specifications	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations

	[Equivalent Fraction](#)		
4.G.1 Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).	• [Math Framework](#)	[ILEARN Item Specifications](#)	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
4.M.1 Measure length to the nearest quarter-inch, eighth-inch, and millimeter.	• [Math Framework](#)	[ILEARN Item Specifications](#)	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
4.M.2 Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.	• [Math Framework](#) • [Soaking up a Mathematical Argument](#) • [Who is the Tallest?](#)	[ILEARN Item Specifications](#)	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
4.M.4 Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems.	• [Math Framework](#) • [An Area Investigation](#) • [Illustrative Math: Three Hidden Rectangles](#)	[ILEARN Item Specifications](#)	Area: Find the area and perimeter of specific polygons with whole and fractional side lengths using multiple methods to solve problems

4.NS.3 Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.	• [Math Framework](#) • [Making Sense of Fractions: Fourth](#)	[ILEARN Item Specifications](#)	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
4.NS.4 Explain why a fraction, a/b, is equivalent to a fraction, (n × a)/(n × b), by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]	• [Math Framework](#) • [Fractions: Equivalent or Bust](#) • [Let's Draw Equivalent Fractions](#) • [Morphing into Equivalent Fractions](#) • [Illustrative Math: Explaining Fraction Equivalence with Pictures](#) • [Illustrative Math: Fractions and Rectangles](#)	[ILEARN Item Specifications](#)	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
Grade 5			
5.AT.1 Solve real-world problems involving multiplication and division of whole numbers (e.g. by using equations to represent the problem). In division problems that involve a remainder, explain how the remainder affects the solution to the problem.	• [Math Framework](#) • [Real-World Multiplication and Division Problems: Fifth Grade](#) • [Let's Party: Multi-Step Word Problems](#)	[ILEARN Item Specifications](#)	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8

	• Lemonade Stand • Illustrative Math: Carnival Tickets • Illustrative Math: Karl's Garden		
5.AT.2 Solve real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (e.g., by using visual fraction models and equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess whether the answer is reasonable.	• Math Framework • App Mazing Fractions • Illustrative Math:Do These Add Up • Illustrative Math: Salad Dressing • Illustrative Math: Sharing Lunches	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
5.AT.5 Solve real-world problems involving addition, subtraction, multiplication, and division with decimals to hundredths, including problems that involve money in decimal notation (e.g. by using equations, models or drawings and strategies based on place value or properties of operations to represent the problem).	• Math Framework • Real-World Addition and Subtraction Problems: Fifth Decimal Mart. • Illustrative Math: The Value of Education • Illustrative Math: What is 23 ÷ 5?	ILEARN Item Specifications	Solving real world problems: Applying procedural and conceptual thinking to solve problems applicable to the real world in grades K-8
5.AT.8 Define and use up to two variables to write linear expressions that arise from real-world problems, and evaluate them for given values.	• Math Framework • Illustrative Math: Distance to School • Illustrative Math: Rectangle	ILEARN Item Specifications	

	[Perimeter 1](#)		
5.C.2 Find whole-number quotients and remainders with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning used.	• [Math Framework](#) • [I Can Divide](#)	[ILEARN Item Specifications](#)	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
5.C.4 Add and subtract fractions with unlike denominators, including mixed numbers.	• [Math Framework](#) • [Adding and Subtracting Fluently: Fifth-Part 2](#) • [Fraction Action](#) • [Fraction Satisfaction](#) • [App Mazing Fractions](#) • [Illustrative Math: Measuring Cups](#)	[ILEARN Item Specifications](#)	Computation: Use models, strategies, algorithms, and properties to understand, represent, and solve problems involving the four operations
5.G.1 Identify, describe, and draw triangles (right, acute, obtuse) and circles using appropriate tools (e.g., ruler or straightedge, compass and technology). Understand the relationship between radius and diameter.	• [Math Framework](#)	[ILEARN Item Specifications](#)	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.

5.G.2 Identify and classify polygons including quadrilaterals, pentagons, hexagons, and triangles (equilateral, isosceles, scalene, right, acute and obtuse) based on angle measures and sides. Classify polygons in a hierarchy based on properties.	● Math Framework ● Geometry ● Shapes Presentation ● Illustrative Math: Always, Sometimes, Never ● Illustrative Math: What do these shapes have in common? ● Illustrative Math: What is a Trapezoid? (Part 2)	ILEARN Item Specifications	Polygons: Identify, classify, create and apply characteristics of polygons to solve problems.
5.M.2 Find the area of a rectangle with fractional side lengths by modeling with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	● Math Framework ● How Much Area? ● Illustrative Math: Chavone's Bathroom Tiles ● Illustrative Math: New Park	ILEARN Item Specifications	Area: Find the area and perimeter of specific polygons with whole and fractional side lengths using multiple methods to solve problems
5.M.3 Develop and use formulas for the area of triangles, parallelograms and trapezoids. Solve real-world and other mathematical problems that involve perimeter and area of triangles, parallelograms and trapezoids, using appropriate units for measures.	● Math Framework	ILEARN Item Specifications	Area: Find the area and perimeter of specific polygons with whole and fractional side lengths using multiple methods to solve problems
5.M.4	● Math Framework ● Rectangular	ILEARN Item Specifications	Measurement: Use estimation, conversions, and appropriate

Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or multiplying the height by the area of the base.	Prisms: An Investigation of Volume ● Volume Concepts		tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
5.M.5 Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for right rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths to solve real-world problems and other mathematical problems.	● Math Framework. ● Volume Formulas ● Try Our New Volumizing Formula! ● Illustrative Math: Cari's Aquarium	ILEARN Item Specifications	Measurement: Use estimation, conversions, and appropriate tools to measure length, weight, temperature, capacity, and volume in appropriate units of measurement to solve problems
5.NS.1 Use a number line to compare and order fractions, mixed numbers, and decimals to thousandths. Write the results using >, =, and < symbols.	● Math Framework ● Place Value Systems ● Number and Operations in Base Ten ● Illustrative Math: Drawing Pictures to Illustrate Decimal Comparisons	ILEARN Item Specifications	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8
5.NS.2 Explain different interpretations of fractions, including: as parts of a whole, parts of a set, and division of whole numbers by whole numbers.	● Math Framework ● Making Sense of Fractions: Fifth Fractions and Division Can Be Friends, ● Illustrative Math: How Much Pie?	ILEARN Item Specifications	Number Sense: Understanding, expressing, and using fractions, rational and irrational numbers in grades K-8