



The LEARN Performance Level Descriptors (PLDs) reflect the learning path for each standard based on students' natural progression of skills and levels of thinking for specific content. These learning progressions should be used to assess and teach students at various developmental levels. The ILEARN PLDs present learning progressions for each assessed standard. They are divided into four categories in alignment with the ILEARN performance levels: Below Proficiency, Approaching Proficiency, At Proficiency, and Above Proficiency.

Indiana researched each assessed academic standard to refine and confirm the PLDs over the course of two years. These updated, evidence-based PLDs go beyond a single test; they represent key elements of student learning. Evidence-based PLDs are the heart of a cohesive system of teaching, learning, and assessment. To learn more about the ILEARN's evidence-based PLDs, refer to this [short video](#) and [supporting presentation](#).

This PLD map represents the standards assessed in grade six, organized by standard domain. Students may move through the learning progressions of each concept in various ways depending on the current knowledge they possess. Using the ILEARN standard-level data alongside classroom assessments, educators can pinpoint students' knowledge and skills along the continuum of each standard's learning progression. Then, educators can support student growth across proficiency levels leveraging high-quality teaching practices and materials. The ILEARN Item Specifications and 2023 Math Frameworks can assist educators in further defining each proficiency level and providing high-quality instruction. For more support using and interpreting PLDs, visit the [PLD Guide](#).

Number Sense				
Standard	Below	Approaching	At	Above
6.NS.1 Use positive and negative numbers to represent and compare quantities in real-world contexts, explaining the meaning of 0 in each situation. (E) (<i>Checkpoint 1</i>)	Identify the positive or negative number that represents a given quantity in a real-world situation.	Identify and interpret real-world situations that can be modeled using a positive number, negative number, or 0.	Represent and/or compare positive and negative numbers in a given real-world situation, and identify, interpret, or explain the meaning of 0 in each situation.	Critique a representation of a real-world situation or explain the structure of a model that involves positive numbers, negative numbers, or 0 in a given context.
6.NS.2 Explain how opposite signs of numbers indicate locations on opposite sides of 0 on the number line; identify the opposite of the opposite of a number. (<i>Checkpoint 1</i>)	Identify or write the opposite of a given number with or without a given number line.	Plot 0 and/or the opposite of a given number on a number line, demonstrating the equal distances of opposites from 0 on either side of the number line.	- Identify and/or write the opposite of the opposite of a given number. - Reason about the opposite signs of numbers, their locations on a number line, and/or their absolute values to justify solutions.	- Apply knowledge of the opposites of numbers to: - Evaluate multiple expressions representing opposite relationships for accuracy, or - Interpret and make claims about given



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				generalizations. Justify claims and generalizations using symbols, equations, and explanations about the relationship between opposite numbers.
6.NS.3 Compare and order rational numbers and plot them on a number line. Write, interpret, and explain statements of order for rational numbers in real-world contexts. (<i>Checkpoint 1</i>)	- Identify the location of rational numbers on a number line. - Compare or order sets of rational numbers within the same type (integers, decimals to the thousandths, or fractions/mixed numbers).	- Identify or write inequalities that correctly compare rational numbers in mathematical or real-world contexts. - Evaluate the correctness of statements involving the order or comparison of rational numbers. - Identify quantities that are greater than or less than a given rational number.	- Record comparisons using the $>$, $=$, and $<$ symbols when comparing a set of rational numbers consisting of integers, decimals to the thousandths, and/or fractions/mixed numbers. - Record comparisons using the $>$, $=$, and $<$ symbols when comparing rational numbers in simple real-world situations. - Identify a rational number that lies between two given rational numbers.	Evaluate and explain comparisons of rational numbers with minimal differences in value in mathematical or real-world contexts.
6.NS.4 Solve real-world problems with positive fractions and decimals by using one or two operations. (E) (<i>Checkpoint 1</i>)	Solve simple real-world problems involving decimals to the hundredths, benchmark fractions and/or mixed numbers, and one or two operations.	Solve simple real-world problems that involve decimals to the hundredths, positive fractions, and mixed numbers, including converting numbers into equivalent forms when necessary to solve the problem.	Solve complex real-world problems that involve decimals up to the thousandths, positive fractions, and mixed numbers, and that require precise computation with a combination of operations.	- Evaluate the reasoning of or critique an argument involving the solution to a complex real-world problem. - Solve complex, real world, non-routine problems that involve decimals up to the thousandths, positive fractions, and mixed numbers, and that require precise computation with a combination of operations.
6.NS.5 Apply the order of operations and properties of operations (i.e., identity, inverse, commutative	Identify the first step in evaluating a numerical expression using the order of operations when	Apply the order of operations to evaluate or identify equivalent expressions for numerical	Apply the order of operations and mathematical properties to evaluate numerical	Place grouping symbols within a numerical expression to set it equal to a given value.



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properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with nonnegative rational numbers, including those using grouping symbols, such as parentheses, and involving whole number exponents. (E) (<i>Checkpoint 1</i>)	expressions include positive whole numbers and parentheses. • Identify equivalent numerical expressions generated using one of the properties of operations when expressions include positive whole numbers and parentheses. • Evaluate numerical expressions for a solution when expressions include positive whole numbers and parentheses.	expressions including positive whole numbers, benchmark fractions and decimals, exponents of 2 and 3, and parentheses and brackets. • Identify one or more equivalent expressions by applying a mathematical property.	expressions with positive rational numbers and a combination of parentheses, brackets, and whole number exponents, including 0 and 1. • Generate equivalent numerical expressions by applying one mathematical property.	• Apply the order of operations to evaluate numerical expressions that may involve complex rational expressions (rational expressions in the numerator and denominator), rational expressions divided by a whole number, whole number divided by a rational expression, more than one set of grouping symbols, or the distributive property.
6.NS.6 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers from 1 to 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. (<i>Checkpoint 1</i>)	• Identify the greatest common factor of two whole numbers related to familiar multiplication facts of 2, 3, 4, 5, and 6. • Identify equivalent expressions that demonstrate the distributive property by rewriting the sum of two whole numbers as a common factor multiplied by a sum of whole numbers.	• Identify the greatest common factor of any two whole numbers less than or equal to 100. • Identify the least common multiple of any two whole numbers less than or equal to 12. • Use the distributive property to generate a missing number in equivalent expressions that demonstrate the distributive property by rewriting the sum of two whole numbers as a common factor multiplied by a sum of whole numbers.	• Generate the greatest common factor of any two whole numbers less than or equal to 100. • Generate the least common multiple of any two whole numbers less than or equal to 12. • Apply the distributive property to write an equivalent expression for the sum of two whole numbers using a multiple of the sum.	• Solve a real-world problem using the greatest common factor or least common multiple.
6.NS.7 Apply the properties of operations (i.e., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions and to justify whether two	• Identify and name a variable, coefficient, constant, and term within a given algebraic expression. • Identify equivalent linear expressions that result from combining like terms or	• Identify equivalent linear expressions that result from applying one or more properties, including the distributive property, commutative property, or associative property, and	• Apply one or more properties of operations and/or combine like terms to generate equivalent linear expressions. • Justify whether two expressions are equivalent	• Apply properties of operations, combining like terms, or decomposing terms to write multiple equivalent equations.



linear expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them. (E) (Checkpoint 2)	applying the commutative property to expressions with compatible whole numbers.	combining like terms.	using substitution.	
6.NS.8 Evaluate positive rational numbers with whole number exponents. (Summative Only)	Determine the relationship between the base and exponent in an exponential expression.	Identify or write an equivalent expression to a given exponential expression with a rational base and a whole number exponent.	Evaluate an exponential expression with a rational base and a whole number exponent.	Analyze an error made when evaluating an exponential expression with a positive rational number base.

Ratios and Proportional Reasoning

Standard	Below	Approaching	At	Above
6.RP.1 Convert between any two representations (fractions, decimals, percents) of positive rational numbers without the use of a calculator. (E) (Checkpoint 1)	- Convert between decimals and percents when the decimal is less than 1 and written as hundredths. - Convert between fractions and decimals when the fraction's denominator is 10 or 100.	Convert between fractions, decimals, and percents when fractions are benchmark fractions or easily converted to a denominator of 10.	- Convert between fractions, decimals, and percents when more complex fractions (e.g., fractions requiring simplification) and decimals (e.g., greater than 1 or written as thousandths) are used. - Justify solutions involving conversions among fractions, decimals, and percents by applying the understanding that each form represents the same numerical value as parts of a whole, a base-10 representation, or parts per hundred.	Apply knowledge of equivalent forms of positive rational numbers to create or justify complex conversions.
6.RP.2 Understand the concept of a unit rate and use	Calculate the value of one unit from a given rate within	Write a ratio represented by a table, tape diagram, or	Calculate the unit rate from a given ratio in a real-world	Apply knowledge of unit rates as they are related to



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terms related to rate in the context of a ratio relationship. (<i>Checkpoint 3</i>)	a simple real-world context. ● Identify unit rates or ratios represented by tables, tape diagrams, or double number lines.	double number line. ● Calculate the unit rate in the form of a ratio or fraction from a given rate within a simple real-world context. ● Calculate and compare unit rates from multiple given real-world contexts.	context and apply it to solve a real-world problem. ● Identify examples of unit rates within real-world contexts.	rates to reason through, critique, and justify steps to solving a problem.
6.RP.3 Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. (<i>Checkpoint 3</i>)	● Identify ratios in real-world context and determine if they represent part-to-part or part-to-whole. ● Identify or complete a ratio table that represents a given ratio within the context of a real-world problem. ● Plot points on a coordinate grid to represent a given ratio table and identify equivalent ratios that lie on the line that is formed.	● Complete a ratio table using multiplication or division to identify one or more equivalent ratios. ● Determine which comparison statements about ratios are true by examining two given ratio tables, focusing on cases where one corresponding value is the same. ● Identify solutions to simple real-world problems about equivalent ratios by interpreting the values of points plotted on a coordinate plane.	● Construct and apply a table of equivalent ratios to solve problems ● Compare ratios in two ratio tables to solve problems. ● Graph and interpret pairs of values on a coordinate plane to solve problems about ratios.	● Construct and apply a table of equivalent ratios to solve complex problems about ratios in a part-to-part-to-part scenario. ● Compare ratios in two ratio tables to solve complex problems about ratios in a part-to-part-to-part scenario.
6.RP.4 Solve real-world and other mathematical problems involving rates and ratios using models and strategies such as reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (E) (<i>Checkpoint 3</i>)	● Solve simple real-world problems by applying a given whole number or monetary part-part rate.	● Solve simple real-world problems using given part-to-part rates in ratio form or by interpreting and applying rates from tape diagrams or the context of the problem.	● Solve real-world problems using part-to-part or part-to-whole rates interpreted from tables and double line graphs. ● Solve real-world problems by calculating the unit rate from rates in given tables, tape diagrams, double number lines, or the context of the problem and applying that unit rate to determine the final solution.	● Solve complex real-world problems by calculating and comparing rates or unit rates interpreted from models or tables.



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6.RP.5 Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E) (<i>Checkpoint 3</i>)	Identify the independent and dependent variables in a real-world situation.	- Complete a table of values to represent a proportional relationship in a real-world situation. - Analyze the relationship between the independent and dependent values in a table to identify an equation expressing the dependent variable in terms of the independent variable.	- Analyze the relationship between the independent and dependent values of a real-world situation to write an equation. - Solve real-world problems using the relationship between the independent and dependent variables when the variables represent whole numbers.	- Critique statements made about a proportional relationship. - Write equations to represent complex real-world problems and explain how each part of the equation represents the problem.
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Algebra and Functions

Standard	Below	Approaching	At	Above
6.AF.1 Define and use multiple variables when writing expressions to represent real-world and other mathematical problems, and evaluate them for given values. (E) (<i>Checkpoint 2</i>)	Define and use expressions with one variable and one operation to represent a given verbal description.	Define and use expressions with one variable to represent a given real-world situation and evaluate the expression for a given specific value.	Define and use expressions with two variables to represent real-world and mathematical problems and evaluate the expression for a given specific value.	Solve real-world problems by substituting given values for multiple variables in a given expression.
6.AF.2 Demonstrate which values from a specified set, if any, make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (E) (<i>Checkpoint 2</i>)	Determine whether a given value for a variable is a solution to an equation using substitution.	Determine whether a given value for a variable is a solution to an inequality using substitution.	Determine which number(s) from a given set make an equation or inequality true using substitution.	Solve real-world problems by determining which number(s) from a given specific set make an equation or inequality true.



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6.AF.3 Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p , q and x are all nonnegative rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E) (Checkpoint 2)	• Represent and/or solve a real-world problem using equations of the forms $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q and x are whole numbers. • Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q and x are whole numbers.	• Represent and/or solve a real-world problem using equations of the forms $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q and x are whole numbers and/or decimals. • Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p, q and x are whole numbers and/or decimals.	• Represent and/or solve a real-world problem using equations of the forms $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q and x include at least one fraction or mixed number. • Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p, q and x include at least one fraction or mixed number.	• Represent and solve a real-world problem using equations of the forms $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p, q and x are all complex nonnegative rational numbers, and describe the solution in the context of the problem.
6.AF.4 Write an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a rational number, to represent a constraint or condition in a real-world or other mathematical problem. Explain that inequalities have infinitely many solutions and how to represent solutions on a number line diagram. (Checkpoint 2)	• Match an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to a solution graphed on a number line.	• Write inequalities of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to represent a mathematical or real-world problem with a constraint or condition.	• Write inequalities of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to represent a real-world situation with a constraint or condition, and graph the solutions on a number line.	• Given two constraints or conditions within a real-world problem, identify or write a pair of inequalities to represent each and explain each inequality within the context of the problem.
6.AF.5 Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E) (Summative Only)	• Identify the parts of a coordinate plane and plot given points within the four quadrants or on the x- and y-axes.	• Calculate distance between two points to solve mathematical problems. • Represent the distance between two points on a coordinate plane using an expression, including absolute value symbols when necessary.	• Solve real-world and mathematical problems using order pairs or coordinates plotted on a coordinate plane.	• Solve real-world problems by determining multiple points that are a given distance away from an original point.



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Geometry and Measurement				
Standard	Below	Approaching	At	Above
6.GM.1 Convert between measurement systems (Customary to metric and metric to Customary) given the conversion factors, and use these conversions in solving real-world problems. <i>(Checkpoint 3)</i>	Identify an expression that can be used to find an equivalent measure in a different measurement system.	Convert between different measurement systems in a mathematical context.	Solve real-world problems involving converting units between measurement systems.	Solve complex real world problems involving unit conversions between measurement systems.
6.GM.2 Apply the sums of interior angles of triangles and quadrilaterals to solve real-world and mathematical problems. <i>(Summative Only)</i>	Identify that the sum of interior angle measures in a triangle is 180 degrees and the sum of interior angle measures in a quadrilateral is 360 degrees.	Calculate the missing angle measure in a triangle or quadrilateral when all other angle measures are given in a graphic.	Solve real-world and mathematical problems involving the sum of interior angle measures in triangles and quadrilaterals.	Solve real-world and mathematical problems involving the sum of interior angle measures in compound figures that are composed of triangles and quadrilaterals.
6.GM.3 Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems. <i>(Summative Only)</i>	- Calculate the area of a complex shape composed of two simple polygons. - Calculate the area of one polygon within a complex shape composed of two simple polygons.	- Calculate the area of a complex shape composed of three or more simple polygons. - Calculate the area of one polygon within a complex shape composed of three or more simple polygons.	Solve real-world problems by calculating the area of complex shapes composed of polygons by decomposing them into simple shapes.	- Solve real-world problems by constructing complex shapes composed of simple polygons when given the area of the whole shape. - Decompose a complex figure composed of multiple polygons in order to calculate an unknown dimension using the total area of the figure.
6.GM.4 Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by	Calculate the volume of a rectangular prism that has one fractional edge length and two whole-number edge lengths.	Calculate the volume of a rectangular prism packed with unit cubes with fractional edge lengths.	Calculate the volume of rectangular prisms with more than one fractional edge lengths to solve real-world and mathematical problems.	- Calculate the missing edge length of a rectangular prism given two edge lengths with fractional values and volume. - Calculate the edge lengths (and volume) of a rectangular prism given the number of unit cubes



multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E) (Summative Only)				packed in the prism and their fractional edge length.
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Data Analysis, Statistics, and Probability				
Standard	Below	Approaching	At	Above
6.DS.1 Select, create, and interpret graphical representations of numerical data, including line plots, histograms, and box plots. (Checkpoint 2)	• Select an appropriate display (histogram, line plot, or box plot) for numerical data. • Identify a line plot that correctly represents a given data set.	• Create a line plot, histogram, or box plot to represent given data. • Identify a box plot that correctly represents given measures of center and or spread.	• Identify a box plot that correctly represents a given data set. • Interpret a histogram or box plot, including those displaying data in fractions and decimals, to make claims. • Solve a real-world problem by interpreting data from a given histogram, box plot, or line plot.	• Create a claim or a generalization using data represented in histograms, line plots, and box plots and use the data to support the claim or generalization.
6.DS.2 Formulate statistical questions, collect and organize the data (e.g., using technology), and display and interpret the data with graphical representations (e.g., using technology). (E) (Summative Only)	• Define characteristics of a statistical question. • Distinguish between statistical and non-statistical questions. • Write statistical questions based on given information.	• Identify appropriate methods for data collection. • Collect and organize data into tables or frequency charts.	• Determine the best graphical representation for a given data set. • Analyze graphical representations of data to find trends or patterns in data sets.	• Analyze graphical representations of data to answer statistical questions, draw conclusions, and provide reasoning for solutions.



6.DS.3 Summarize numerical data sets in relation to their context in multiple ways, such as: - Report the number of observations; - Describe the nature of the attribute under investigation, including how it was measured and its units of measurement; - Determine quantitative measures of center (mean and/or median) and spread (range and interquartile range); - Describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered; and - Relate the choice of measures of center and spread to the shape of the data distribution and the context in which the data were gathered. (E) (Checkpoint 2)	• Determine the mean, median, and range of a set of data when given a simple, ordered data set. • Determine the best measure of center (mean or median) for a given data set.	• Determine the total number of observations or data points on a line graph or histogram. • Determine the values between each interval of a histogram. • Describe the nature of the attribution under investigation, including how it was measured and its units of measurement. • Determine the best measure of spread (range or interquartile range) for a given data set.	• Determine the mean, median, and range of a set of data when given a complex, unordered data set. • Analyze a given data set to describe distribution patterns (including clusters, peaks, gaps, and outliers). • Describe how measures of central tendency are affected by outliers, including in real-world situations. • Draw conclusions and make predictions based on given data sets.	• Explain how an additional data point will impact a measure of center or measure of spread. • Create or complete data sets for given attributes and information about spread of data and/or measure of center.
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