

Ellis School K-8 Mathematics Competencies

“I can statements” are models of what educators may see in performance tasks when students demonstrate increasing understanding and use of the competencies.

	K-2	3-4	5-6	7-8
1. Competency Statements for Foundations of Math – Symbolic Expression	Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for different purposes.	Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols, expressions and equations for a variety of purposes, including variables.	Students will reason abstractly manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.	Students will reason abstractly manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.
	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can write my numbers 1-20. ✓ I can use +, -, and = in combinations of 5. ✓ I can understand a quantity is greater than or less than another. 	<ul style="list-style-type: none"> ✓ I can use whole number quantities in multiple ways (words, symbols, etc.) ✓ I can explain relationships between addition, subtraction, multiplication and division and how they interact. ✓ I can explain mathematical symbols (>, <, +, -, x, ÷, =). ✓ I can represent unknown quantities in 	<ul style="list-style-type: none"> ✓ I can use positive numbers and letters to state equivalent expressions and equations, inequalities, ordered pairs, opposite operations, ratio relationships, and exponents. ✓ I can use the different mathematical symbols for addition, subtraction, multiplication and 	<ul style="list-style-type: none"> ✓ I can symbolically represent relationships involving rational (7th) and irrational (8th) numbers such as constant rates of change, equivalent expressions, equations, inequalities, ordered pairs, inverse operations, exponents, absolute value.

		mathematical expressions and equations using variables.	division. ✓ I can explain mathematical rules that I am using with expressions, equations, and inequalities.	✓ I can interpret and apply the use of varied symbols in mathematical relationships, formulas, expressions, and operations. ✓ I can provide mathematical justification when evaluating expressions and modeling linear equations (slope, rate of change) and inequalities.
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can use and represent whole number quantities up to 120 in multiple ways. ✓ I can use +, -, <, >, and = with numbers up to 20. ✓ I can use multiple formats to add and subtract (a model, vertical, horizontal, and the position of the = sign) 	<ul style="list-style-type: none"> ✓ I can represent whole number, decimal, and fractional quantities in multiple ways. (i.e. words, symbols, models, expressions, equations, etc.) ✓ I can explain the relationship between multiplication and division and the symbols that go with them. ✓ I can compare, order, and find equivalents of fractions and decimals. ✓ I understand that the four operations can be represented in multiple ways. ✓ I can represent unknown quantities in mathematical expressions and equations using variables. 		
	Second Grade			
	✓ I can represent whole			

	<p>number quantities in multiple ways (words, symbols, expressions, equations, etc.)</p> <ul style="list-style-type: none"> ✓ I can explain the meanings of the symbols +, -, >, <, =, and how to use them. ✓ I can read and write numbers to 1,000. ✓ I can compare 3 digit numbers using >, <, =. 			
2. Competency Statements for Numbers and Number Systems	Students will demonstrate an understanding of the nature of numbers, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers.	Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.	Students will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems when using rational numbers.	Students will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems when using rational and irrational numbers.
	<p>Kindergarten</p> <ul style="list-style-type: none"> ✓ I can count to 100. ✓ I can compare quantities. ✓ I can put numbers in order up to 20. ✓ I can model combinations of 10 (addition and subtraction) to help me answer a question (i.e. use a 10 frame). 	<p>Third Grade</p> <ul style="list-style-type: none"> ✓ I can model, compare, order, estimate and represent quantities using my understanding of place value to explain my solution or strategy. ✓ I can distinguish among and represent whole numbers and fractional numbers (e.g., using set, area, 	<p>Fifth and Sixth Grade</p> <ul style="list-style-type: none"> ✓ I can justify how place value and multiple representations can be used to estimate and compare fractions, decimals, percent, ratios, and integers in real-world/applied contexts. ✓ I can use exponents to express quantities and relationships in 	<p>Seventh and Eighth Grade</p> <ul style="list-style-type: none"> ✓ I can justify how place value and multiple representations can be used to estimate and compare fractions, decimals, percent, ratios, proportions and integers in real world/applied contexts. ✓ I can use positive (7th) and negative (8th)

		and linear models).	problem solving.	exponents to express quantities and relationships in problem solving.
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can count, compare, order, and represent quantities up to 120 using my understanding of place value to show my answer or strategy. ✓ I can use a model to break apart whole numbers within 20 to help me understand a number or solve a problem. 	<ul style="list-style-type: none"> ✓ I can model, compare, order, estimate and represent quantities using my understanding of place value to explain my solution or strategy. ✓ I can distinguish among and represent whole numbers and fractional numbers (e.g., using set, area, and linear models). ✓ I can model and explain why decomposition or composition of numbers will help me solve a problem. 		
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can count, compare, order, and represent quantities up to 1000 using my understanding of place value to show my answer or strategy. ✓ I can model and explain why decomposition of whole numbers will help me understand a number, or answer a question, or solve a problem. 			
3. Competency Statements for Reasoning	Students will apply additive reasoning using	Students will apply additive, multiplicative,	Students will expand the use of computational	Students will expand the use of computational

and Computational Strategies	multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	strategies, algorithms, and proportional reasoning to rational numbers.	strategies, algorithms, and proportional reasoning to rational and irrational numbers.
	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can fluently add and subtract whole numbers up to five. ✓ I can add and subtract up to 10 using drawings and manipulatives. 	<ul style="list-style-type: none"> ✓ I can fluently add, subtract, multiply, divide and estimate using whole numbers. ✓ I can perform operations with whole numbers. ✓ I can determine and explain my reasoning for more than one appropriate approach for a given situation. 	<ul style="list-style-type: none"> ✓ I can perform operations fluently with positive whole, fractions, and decimal numbers. ✓ I can explain how multiplication and division are related to fractions. ✓ I can apply properties and inverse operations to solve and justify solutions. 	<ul style="list-style-type: none"> ✓ I can perform operations fluently with rational numbers. ✓ I can generate equivalence of indicated division and fractional parts. ✓ I can apply properties and inverse operations to solve and justify solutions. ✓ I can generate and evaluate the appropriateness or efficiency of possible approaches for a given situation and conditions, such as application in authentic applied contexts.
	First Grade	Fourth Grade	<ul style="list-style-type: none"> ✓ I can generate and evaluate possible approaches for a given authentic situation. 	
<ul style="list-style-type: none"> ✓ I can fluently add and subtract whole numbers up to 10. ✓ I can add and subtract up to 20 using multiple models and strategies. ✓ I can add a two digit number and a one digit number within 100. ✓ I can add a two digit number and a multiple of 10 within 100 using tools, models, and 	<ul style="list-style-type: none"> ✓ I can fluently add, subtract, multiply, divide and estimate using whole numbers. ✓ I can fluently add, subtract, multiply, divide and estimate using fractions, mixed numbers and decimals. ✓ I can multiply a fraction by a whole number. ✓ I can perform 			

	<p>drawings.</p> <ul style="list-style-type: none"> ✓ I understand the relationship between addition and subtraction. 	<p>operations with whole numbers, fractions, and mixed numbers using models, representations, and math language.</p>		
	<p>Second Grade</p> <ul style="list-style-type: none"> ✓ I can explain my thinking using models, symbols, and math language. ✓ I know that addition is the opposite of subtraction and that subtraction is the opposite of addition. ✓ I can decide on a strategy and explain why I used it. 	<ul style="list-style-type: none"> ✓ I can apply properties and inverse operations between multiplication and division to solve and justify solutions. ✓ I can solve a problem using multiple strategies. 		
4.Competency Statements for Metacognitive Skills and Communication	Students will use reasoning and self-monitoring to analyze and explain a solution pathway.	Students will use reasoning and self-monitoring to analyze and justify one or more solution pathways.	Students will use reasoning and metacognitive skills through making conjectures, justifying, and communicating mathematical solutions and arguments.	Students will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments.
	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can develop a model to explain my thinking. ✓ I can tell whether an answer is reasonable. 	<ul style="list-style-type: none"> ✓ I can check the reasonableness of solutions (e.g., with estimation and rounding, diagrams, data tables, models). ✓ I can critique, explain, 	<ul style="list-style-type: none"> ✓ I can use pictures or drawings and formulas to support the reasonableness of a solution. ✓ I can make, test, and justify my math ideas 	<ul style="list-style-type: none"> ✓ I can use stated assumptions, definitions, patterns, or previously established results to support the reasonableness of

		and defend the strategy and mathematical reasoning used in a problem.	using concepts and models.	arguments and/or justifications. ✓ I can make, test, evaluate, and justify conjectures using mathematical concepts and models.
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can develop a logical model to explain my thinking. ✓ I can tell whether my answer is reasonable. ✓ I can choose from a variety of strategies and use the one that is best for the situation and for me. 	<ul style="list-style-type: none"> ✓ I can check the reasonableness of solutions (e.g., with estimation and rounding, diagrams, data tables, models). ✓ I can critique, explain, and defend the strategy and mathematical reasoning used in a problem. 		
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can explain why my answers make sense using strategies such as estimation, diagrams and tables. ✓ I can explain and tell why I used a strategy to solve a problem. 			
5. Competency Statements for Measurement	Students will use standard and nonstandard measurement tools, units, and attributes to describe and compare objects, authentic applied situations, or events, to solve measurement problems.	Students will use measurement tools, units, and attributes to describe and compare objects, situations, or events, and to solve authentic applied measurement problems.	Students will use tools and apply precision and reasoning to solve measurement problems authentic applied contexts.	Students will strategically use tools and apply proportional reasoning and precision to solve measure problems in pure/theoretical and authentic applied contexts.

	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can describe and compare relative sizes of objects using terms such as: short-long, heavy-light, more-less, large-small, thick-thin. 	<ul style="list-style-type: none"> ✓ I can apply appropriate tools, and techniques while attending to precision to solve problems involving measurement (liquid volume, mass, perimeter, area, time, angles, money, distances). ✓ I can estimate and justify measurements using appropriate units. ✓ I can explain and use relationships among units within a measurement system (e.g., minutes/hour, inches/ft. or yd.). 	<ul style="list-style-type: none"> ✓ I can make and justify estimates and conversions within measurement systems. ✓ I can compare measurement attributes, measures, and models, and select the appropriate customary or metric units of measure and formula for the given task (volume, surface area). 	<ul style="list-style-type: none"> ✓ I can make and justify estimates and conversions within measurement systems. ✓ I can compare measurement attributes, measures, and models, and select the appropriate customary or metric units of measure and formula for the given task (scale drawings, similar figures, and distance between two points).
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can use tools to solve time to the half hour, and length to the nearest whole unit. ✓ I can compare three lengths using tools. 	<ul style="list-style-type: none"> ✓ I can apply appropriate tools, and techniques while attending to precision to solve problems involving measurement (liquid volume, mass, perimeter, area, time, angles, money, distances). 		
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can choose the correct tools and strategies to solve problems of time, 			

	<p>money, length and height.</p> <ul style="list-style-type: none"> ✓ I can use the correct metric or customary units to measure. ✓ I can describe and compare relative sizes of objects using terms such as short-long, short-tall, heavy-light, more-less, large-small, thick-thin. 	<ul style="list-style-type: none"> ✓ I can estimate and justify measurements using appropriate units given relative sizes. ✓ I can explain and use relationships among units within a measurement system (e.g., minutes/hour, inches/ft. or yd., cm/m). 		
6. Competency Statements for Algebraic Functions, Patterns and Relationships	Students will make use of structure to represent, interpret, and analyze change or patterns in various contexts using models, rules and explanations.	Students will make use of structure to represent, analyze, and generalize change or patterns in various contexts using models and justification.	Students will make use of structure to describe and compare situations that involve change or patterns and use the information to make conjectures and justify conclusions/solutions.	Students will make use of structure to describe and compare situations that involve proportionality, change or patterns and use the information to make conjectures and justify conclusions/solutions.
	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can use manipulatives to demonstrate and extend patterns. ✓ I can use manipulatives or drawings to show how situations change. ($2+\square=5$) 	<ul style="list-style-type: none"> ✓ I can use concrete, pictorial, and symbolic representations to identify, describe, compare, and model situations that involve change. ✓ I can interpret, analyze, and extend patterns (repeating and growing) using functions involving 	<ul style="list-style-type: none"> ✓ I can make multiple models to show the mathematics I am doing. ✓ I can calculate constant rates of change for authentic situations. ✓ I can interpret, analyze, and generalize a variety of mathematical 	<ul style="list-style-type: none"> ✓ I can model contextual situations using multiple representations (i.e., interpreting slope). ✓ I can calculate constant rates of change for authentic situations. ✓ I can interpret, analyze, and generalize a variety of

		addition, subtraction and multiplication.	patterns, and arithmetic relations.	mathematical patterns, relations, or explicit and recursive functions. (8 th)
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can use manipulatives, drawings and math symbols (+, -, = and numbers) to model stories or word problems that involve change. ✓ I can use repeating patterns to skip count. 	<ul style="list-style-type: none"> ✓ I can use concrete, pictorial, and symbolic representations to identify, describe, compare, and model situations that involve change. ✓ I can interpret, analyze, and extend patterns (repeating and growing) using functions involving addition, subtraction multiplication and division. 		
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can use pictures, drawings, data, line plots and graphs to answer questions involving change. ✓ I can identify, interpret, and analyze patterns using rules involving addition and subtraction. ✓ I can make a table to explain the pattern in word problems and/or data. 			
7. Competency Statements for Geometry	Students will recognize and use attributes of two- and three- dimensional figures to solve problems.	Students will use attributes of two-dimensional shapes and complex figures to solve authentic applied problems.	Students will solve problems involving reasoning using properties of two and three dimensional shapes to analyze, represent, and	Students will solve problems involving reasoning using properties of two and three dimensional shapes to analyze, represent, and

			model geometric relationships in authentic applied contexts.	model geometric relationships in pure/theoretical and authentic applied contexts.
	Kindergarten	Third Grade	Fifth and Sixth	Seventh and Eighth Grade
	<ul style="list-style-type: none"> ✓ I can describe, compare, and classify geometric shapes. 	<ul style="list-style-type: none"> ✓ I can describe, compare, and explain how to classify objects and figures based on shared geometric attributes such as angles, sides and points. ✓ I can create and draw figures applying spatial reasoning. 	<ul style="list-style-type: none"> ✓ I can solve problems and justify solutions using geometric relationships, and formulas (volume, surface area). ✓ I can decompose figures into new figures and construct geometric figures with given conditions. ✓ I can represent authentic situations using coordinate graphing and diagrams. 	<ul style="list-style-type: none"> ✓ I can solve problems and justify solutions using geometric relationships, properties (parallel and/or perpendicular lines, angles), and formulas. ✓ I can decompose figures into new figures and construct geometric figures with given conditions. ✓ I can demonstrate transformations using multiple contexts (coordinate grid, models, technology). (8th)
	First Grade	Fourth Grade		
	<ul style="list-style-type: none"> ✓ I can describe, compare, and explain different classifications of objects and figures based on geometric attributes. ✓ I can compose, decompose, and draw geometric figures using spatial reasoning. 	<ul style="list-style-type: none"> ✓ I can describe, compare, and explain how to classify objects and figures based on shared geometric attributes such as angles, sides and vertices. ✓ I can solve problems related to composing, decomposing angles. ✓ I can apply and explain concepts of symmetry in a variety of figures or for different 		
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can describe, compare, and explain 			

	<p>possible classifications of objects and figures based on sides, vertices, angles and edges.</p> <p>✓ I can compose, decompose, and draw figures applying spatial reasoning.</p>	<p>authentic situations.</p>		
8. Competency Statements for Data Analysis, Probability, and Statistics	<p>Students will gather, represent, and interpret data related to a particular/single unit scale including authentic applications.</p>	<p>Students will gather, represent, and interpret data related to a particular/single context, including authentic applications.</p>	<p>Students will design investigations and gather data involving populations (data sets).</p>	<p>Students will design investigations and conduct probability experiments involving populations.</p>
	Kindergarten	Third Grade	Fifth and Sixth Grade	Seventh and Eighth Grade
	<p>✓ I can gather data by answering questions which the teacher records.</p>	<p>✓ I can ask questions and gather, record, and organize data to support my answers.</p> <p>✓ I can represent a data set with multiple categories using a key.</p> <p>✓ I can identify and explain the data.</p>	<p>✓ I can formulate questions, gather data, and build representations (box plots, dot and line plots, histograms) to support my conclusions.</p> <p>✓ I can compare populations by analyzing distributions in terms of variability and mean, median and mode.</p>	<p>✓ I can formulate questions, gather data, and build representations (box plots, scatter plots, circle graphs, histograms) to justify or refute my conjectures and conclusions. (7th)</p> <p>✓ I can compare populations by analyzing distributions in terms of variability and measures of central tendency, interquartile ranges, and outliers. (7th)</p>
	First Grade	Fourth Grade		
<p>✓ I can record and organize data, and ask and answer questions about it.</p> <p>✓ I can construct and interpret data (i.e. pictograph, bar graph or tally chart) to</p>	<p>✓ I can formulate questions and gather, record, and organize data to support my answers.</p> <p>✓ I can represent a data set with multiple categories using a key</p>			

	answer questions.			
	Second Grade			
	<ul style="list-style-type: none"> ✓ I can create questions and gather, record, and organize data to answer them. ✓ I can construct and interpret data (using pictograph, bar graph, tally chart) to answer questions or identify patterns. 	<ul style="list-style-type: none"> ✓ I can identify and describe variations in data using a line plot or scaled pictograph. 		<ul style="list-style-type: none"> ✓ I can generate random samples to characterize variability in estimates and predictions about a population. ✓ I can build and analyze models representing the association between two variables. (8th)