

Math 6

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
6.PS	Problem Solving		
0	Students will build new mathematical knowledge through problem solving.	Unit 5	Sections 1 and 5
6.PS.1	Know the difference between relevant and irrelevant information when solving problems	Unit 5	Sections 1 and 5
6.PS.2	Understand that some ways of representing a problem are more efficient than others	Unit 5	Section 1
6.PS.3	Interpret information correctly, identify the problem, and generate possible strategies and solutions	Unit 5	Sections 1 and 5
0	Students will solve problems that arise in mathematics and in other contexts.	Unit 4	Section 4
6.PS.4	Act out or model with manipulatives activities involving mathematical content from literature	Unit 5	Section 1
6.PS.5	Formulate problems and solutions from everyday situations	Unit 3	Section 4
6.PS.6	Translate from a picture/diagram to a numeric expression	Unit 6	Section 2

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6.PS.7	Represent problem situations verbally, numerically, algebraically, and/or graphically	Unit 5	Section 2
6.PS.8	Select an appropriate representation of a problem	Unit 8	Section 2
6.PS.9	Understand the basic language of logic in mathematical situations (and, or, and not)		
0	Students will apply and adapt a variety of appropriate strategies to solve problems.	Unit 5	Section 2
6.PS.10	Work in collaboration with others to solve problems		

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		Unit 6	Section 2
6.PS.11	Translate from a picture/diagram to a number or symbolic expression		
6.PS.12	Use trial and error and the process of elimination to solve problems		
6.PS.13	Model problems with pictures/diagrams or physical objects	Unit 5	Section 2
6.PS.14	Analyze problems by observing patterns	Unit 1	Section 3
6.PS.15	Make organized lists or charts to solve numerical problems	Unit 5	Sections 2 and 3

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		Unit 5	Section 5
0	Students will monitor and reflect on the process of mathematical problem solving.		
6.PS.16	Discuss with peers to understand a problem situation		
		Unit 7	Section 4
6.PS.17	Determine what information is needed to solve problem		
6.PS.18	Determine the efficiency of different representations of a problem		
6.PS.19	Differentiate between valid and invalid approaches		

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6.PS.20	Understand valid counterexamples		
6.PS.21	Explain the methods and reasoning behind the problem solving strategies used		
6.PS.22	Discuss whether a solution is reasonable in the context of the original problem		
6.PS.23	Verify results of a problem	Unit 3	Section 4
6.RP	Reasoning and Proof		
0	Students will recognize reasoning and proof as fundamental aspects of mathematics.		
6.RP.1	Recognize that mathematical ideas can be supported using a variety of strategies		
6.RP.2	Understand that mathematical statements can be supported, using models, facts, and relationships to explain their thinking		
0	Students will make and investigate mathematical conjectures.		
6.RP.3	Investigate conjectures, using arguments and appropriate mathematical terms		

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6.RP.4	Make and evaluate conjectures, using a variety of strategies		
0	Students will develop and evaluate mathematical arguments and proofs.		
6.RP.5	Justify general claims or conjectures, using manipulatives, models, expressions, and mathematical relationships		
6.RP.6	Develop and explain an argument verbally, numerically, algebraically, and/or graphically		
6.RP.7	Verify claims other students make, using examples and counterexamples when appropriate		
0	Students will select and use various types of reasoning and methods of proof.		
6.RP.8	Support an argument through examples/counterexamples and special cases		
6.RP.9	Devise ways to verify results		
6.CM	Communication		
0	Students will organize and consolidate their mathematical thinking through communication.		
6.CM.1	Provide an organized thought process that is correct, complete, coherent, and clear		
6.CM.2	Explain a rationale for strategy selection		
6.CM.3	Organize and accurately label work	Unit 6	Section 4
0	Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.		
6.CM.4	Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models, and symbols in written and verbal form		
6.CM.5	Answer clarifying questions from others		
0	Students will analyze and evaluate the mathematical thinking and strategies of others.		

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6.CM.6	Understand mathematical solutions shared by other students		
6.CM.7	Raise questions that elicit, extend, or challenge others' thinking		
6.CM.8	Consider strategies used and solutions found by others in relation to their own work		
0	Students will use the language of mathematics to express mathematical ideas precisely.		
6.CM.9	Increase their use of mathematical vocabulary and language when communicating with others		
6.CM.10	Use appropriate vocabulary when describing objects, relationships, mathematical solutions, and rationale		
6.CM.11	Decode and comprehend mathematical visuals and symbols to construct meaning		
6.CN	Connections		
0	Students will recognize and use connections among mathematical ideas.	Unit 8	Section 1
6.CN.1	Understand and make connections and conjectures in their everyday experiences to mathematical ideas	Unit 3	Section 4
6.CN.2	Explore and explain the relationship between mathematical ideas		
6.CN.3	Connect and apply mathematical information to solve problems	Unit 5	Section 5
0	Students will understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Unit 5	Section 5
6.CN.4	Understand multiple representations and how they are related	Units 3 and 8	Unit 3: Section 3 Unit 8: Section 2
6.CN.5	Model situations with objects and representations and be able to draw conclusions	Unit 3	Section 4
0	Students will recognize and apply mathematics in contexts outside of mathematics.	Unit 7	Section 4
6.CN.6	Recognize and provide examples of the presence of mathematics in their daily lives	Unit 7	Section 4

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6.CN.7	Apply mathematics to problem situations that develop outside of mathematics	Unit 7	Section 4
6.CN.8	Investigate the presence of mathematics in careers and areas of interest		
6.CN.9	Recognize and apply mathematics to other disciplines and areas of interest		
6.R	Representation		
0	Students will create and use representations to organize, record, and communicate mathematical ideas.	Unit 5	Section 2
6.R.1	Use physical objects, drawings, charts, tables, graphs, symbols, equations, or objects created using technology as representations	Unit 5	Section 2
6.R.2	Explain, describe, and defend mathematical ideas using representations	Unit 5	Section 3
6.R.3	Read, interpret, and extend external models	Unit 5	Section 3
6.R.4	Use standard and nonstandard representations with accuracy and detail		
0	Students will select, apply, and translate among mathematical representations to solve problems.	Unit 4	Sections 1 and 2
6.R.5	Use representations to explore problem situations	Unit 8	Section 2
6.R.6	Investigate relationships between different representations and their impact on a given problem		
0	Students will use representations to model and interpret physical, social, and mathematical phenomena.		
6.R.7	Use mathematics to show and understand physical phenomena (e.g., determine the perimeter of a bulletin board)	Unit 7	Section 3
6.R.8	Use mathematics to show and understand social phenomena (e.g., construct tables to organize data showing book sales)		
6.R.9	Use mathematics to show and understand mathematical	Unit 1	Sections 3 and 4

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	phenomena (e.g., Find the missing value: $(3 + 4) + 5 = 3 + (4 + \underline{\quad})$)		
6.N	Number Sense and Operations		
0	Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.	Unit 1	Sections 1 – 4
0	Number Systems		
6.N.1	Read and write whole numbers to trillions	Unit 1	Section 1
6.N.2	Define and identify the commutative and associative properties of addition and multiplication	Unit 1	Section 4
6.N.3	Define and identify the distributive property of multiplication over addition	Unit 1	Section 4
6.N.4	Define and identify the identity and inverse properties of addition and multiplication		
6.N.5	Define and identify the zero property of multiplication		
6.N.6	Understand the concept of rate		
6.N.7	Express equivalent ratios as a proportion	Unit 8	Sections 1 and 2
6.N.8	Distinguish the difference between rate and ratio		
6.N.9	Solve proportions using equivalent fractions	Unit 8	Section 1
6.N.10	Verify the proportionality using the product of the means equals the product of the extremes		
6.N.11	Read, write, and identify percents of a whole (0% to 100%)	Unit 4	Section 1
6.N.12	Solve percent problems involving percent, rate, and base	Unit 4	Section 2
6.N.13	Define absolute value and determine the absolute value of rational numbers (including positive and negative)		
6.N.14	Locate rational numbers on a number line (including positive and negative)	Unit 1	Section 1
6.N.15	Order rational numbers (including positive and negative)	Units 1 and 2	Section 1
0	Students will understand meanings of operations and procedures, and	Unit 2	Sections 3 – 5

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	how they relate to one another.		
0	Operations		
6.N.16	Add and subtract fractions with unlike denominators	Unit 3	Section 4
6.N.17	Multiply and divide fractions with unlike denominators	Unit 3	Section 5
6.N.18	Add, subtract, multiply, and divide mixed numbers with unlike denominators	Unit 3	Sections 4 and 5
6.N.19	Identify the multiplicative inverse (reciprocal) of a number	Unit 3	Section 5
6.N.20	Represent fractions as terminating or repeating decimals	Unit 2	Section 1
6.N.21	Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100)	Unit 4	Section 1
6.N.22	Evaluate numerical expressions using order of operations (may include exponents of two and three)		
6.N.23	Represent repeated multiplication in exponential form	Unit 1	Section 2
6.N.24	Represent exponential form as repeated multiplication	Unit 1	Section 2
6.N.25	Evaluate expressions having exponents where the power is an exponent of one, two, or three	Unit 1	Section 2
0	Students will compute accurately and make reasonable estimates.	Unit 2	Section 2
0	Estimation		
6.N.26	Estimate a percent of quantity (0% to 100%)	Unit 4	Section 2
6.N.27	Justify the reasonableness of answers using estimation (including rounding)	Unit 2	Section 2
6.A	Algebra		
0	Students will represent and analyze algebraically a wide variety of problem solving situations.	Unit 5	Section 5
0	Variables and Expressions		
6.A.1	Translate two-step verbal expressions into algebraic expressions		
0	Students will perform algebraic procedures accurately.	Unit 6	Section 2
0	Variables and Expressions		
6.A.2	Use substitution to evaluate	Unit 7	Section 3

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	algebraic expressions (may include exponents of one, two and three)		
0	Equations and Inequalities		
6.A.3	Translate two-step verbal sentences into algebraic equations		
6.A.4	Solve and explain two-step equations involving whole numbers using inverse operations		
6.A.5	Solve simple proportions within context	Unit 8	Section 1
6.A.6	Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.)	Unit 7	Section 3
6.G	Geometry		
0	Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.	Unit 6	Section 2
0	Shapes		
6.G.1	Calculate the length of corresponding sides of similar triangles, using proportional reasoning		
6.G.2	Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas	Unit 7	Section 3
6.G.3	Use a variety of strategies to find the area of regular and irregular polygons	Unit 7	Section 3
6.G.4	Determine the volume of rectangular prisms by counting cubes and develop the formula		
6.G.5	Identify radius, diameter, chords and central angles of a circle	Unit 6	Section 3
6.G.6	Understand the relationship between the diameter and radius of a circle	Unit 6	Section 3
6.G.7	Determine the area and circumference of a circle, using the appropriate formula		
6.G.8	Calculate the area of a sector of a circle, given the measure of a central angle and the radius of the circle		
6.G.9	Understand the relationship		

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	between the circumference and the diameter of a circle		
0	Students will apply coordinate geometry to analyze problem solving situations.	Unit 6	Section 4
0	Coordinate Geometry		
6.G.10	Identify and plot points in all four quadrants	Unit 6	Section 4
6.G.11	Calculate the area of basic polygons drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths)	Unit 6	Section 4
6.M	Measurement		
0	Students will determine what can be measured and how, using appropriate methods and formulas.	Unit 7	Section 1
0	Units of Measurement		
6.M.1	Measure capacity and calculate volume of a rectangular prism		
6.M.2	Identify customary units of capacity (cups, pints, quarts, and gallons)		
6.M.3	Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons)		
6.M.4	Identify metric units of capacity (liter and milliliter)	Unit 7	Section 1
6.M.5	Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter)	Unit 7	Section 2
0	Tools and Methods		
6.M.6	Determine the tool and technique to measure with an appropriate level of precision: capacity		
0	Students will develop strategies for estimating measurements.	Unit 7	Section 1
0	Estimation		
6.M.7	Estimate volume, area, and circumference (see figures identified in geometry strand)		
6.M.8	Justify the reasonableness of estimates		
6.M.9	Determine personal references for capacity		
6.S	Statistics and Probability		
0	Students will collect, organize, display, and analyze data.	Unit 5	Section 5

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0	Collection of Data		
6.S.1	Develop the concept of sampling when collecting data from a population and decide the best method to collect data for a particular question		
0	Organization and Display of Data		
6.S.2	Record data in a frequency table	Unit 5	Section 5
6.S.3	Construct Venn diagrams to sort data		
6.S.4	Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph)	Unit 5	Section 5
0	Analysis of Data		
6.S.5	Determine the mean, mode and median for a given set of data	Unit 5	Section 4
6.S.6	Determine the range for a given set of data	Unit 5	Section 4
6.S.7	Read and interpret graphs	Unit 5	Section 3
0	Students will make predictions that are based upon data analysis.	Unit 5	Sections 1 and 3
0	Predictions from Data		
6.S.8	Justify predictions made from data	Unit 5	Section 1
0	Students will understand and apply concepts of probability.	Unit 5	Section 1
0	Probability		
6.S.9	List possible outcomes for compound events	Unit 5	Section 1
6.S.10	Determine the probability of dependent events	Unit 5	Section 1
6.S.11	Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability		