

Colorado's Standards

CSAP Mathematics Assessment Framework

Grade 7

ASSESSMENT FRAMEWORK– defines what will be assessed on the State paper and pencil, standardized, timed assessment (CSAP). This document is organized as follows:

Standard	<i>Indicates the broad knowledge and skills that all students should be acquiring in Colorado schools at grade level. Each standard is assessed every year.</i>	
Benchmark	<i>Tactical description of the knowledge and skills students should acquire within each grade level range (i.e., K-4, 5-8, or 9-12).</i>	
Assessment Objectives	a	<i>Specific knowledge and skills measured by CSAP for each grade level assessed. Assessment Objectives are assessed on a cyclical basis.</i>

*Note: The appearance of an * behind a word or phrase indicates it appears in the glossary of the Colorado Model Content Standards for Mathematics.*

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Standard 1	Students develop number sense* and use numbers and number relationships in problem-solving situations* and communicate the reasoning used in solving these problems.	
Benchmark 1	Demonstrate meanings for integers*, rational numbers*, percents, exponents*, square roots* and pi (π) using physical materials and technology in problem-solving situations*.	
Assessment Objectives	a	Recognize and use equivalent representations of positive rational numbers*.
	b	Use models* to represent integers.
	c	Use exponents* to indicate how many times a base is used as a factor for positive integers.
Benchmark 2	Read, write and order integers, rational numbers* and common irrational numbers* such as $\sqrt{2}$, $\sqrt{5}$, and π .	
Assessment Objectives	a	Read, write, order and compare positive rational numbers* and integers.
	b	Locate positive rational numbers* and integers on a number line.
Benchmark 3	Apply number theory concepts (for example, primes*, factors, multiples) to represent numbers in various ways.	
Assessment Objectives	a	Describe numbers by their characteristics (for example, even, odd, prime*, composite, divisibility, square).
Benchmark 4	Use the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations*.	
Assessment Objectives	a	Use the relationships among fractions, decimals and percents. including the concepts of ratio and proportion, in problem-solving situations*.

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Benchmark 5	Develop, test, and explain conjectures* about properties of integers and rational numbers*.	
Assessment Objectives	<i>No objectives assessed at this level.</i>	
Benchmark 6	Use number sense* to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers*, and common irrational numbers* such as $\sqrt{2}$, $\sqrt{5}$, and π .	
Assessment Objectives	a	Estimate, solve and justify the reasonableness of solutions to problems involving positive rational numbers* or integers.
Standard 2	Students use algebraic methods* to explore, model*, and describe patterns* and functions* involving numbers, shapes, data, and graphs in problem-solving situations* and communicate the reasoning used in solving these problems.	
Benchmark 1	Represent, describe, and analyze patterns* and relationships using tables, graphs, verbal rules, and standard algebraic notation.	
Assessment Objectives	a	Represent, describe, and analyze numeric or geometric patterns* involving common positive rational numbers* or integers* using tables, graphs, rules, or symbols.
Benchmark 2	Describe patterns* using variables*, expressions, equations, and inequalities in problem-solving situations*.	
Assessment Objectives	a	Solve problems by representing and analyzing patterns* involving positive rational numbers* or integers* using tables, graphs, or rules.
Benchmark 3	Analyze functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time).	
Assessment	a	Predict and describe how a change in one quantity results in a change in another quantity in a linear

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Objectives		relationship.
Benchmark 4	Distinguish between linear and nonlinear functions* through informal investigations.	
Assessment Objectives	<i>No objectives assessed at this level.</i>	
Benchmark 5	Solve simple linear equations in problem-solving situations* using a variety of methods (informal, formal, and graphical) and a variety of tools (physical materials, calculators, and computers).	
Assessment Objectives	a	Solve simple linear equations in problem-solving situations* using a variety of methods (informal, formal, or graphic).
	b	Translate written words to algebraic expressions/equations and conversely, algebraic expressions/equations to words.
Standard 3	Students use data collection and analysis, statistics*, and probability* in problem-solving situations* and communicate the reasoning used in solving these problems.	
Benchmark 1	Read and construct displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots*, box plots*, stem-and-leaf plots*) and appropriate technology.	
Assessment Objectives	a	Construct a histogram or stem and leaf from a set of given data.
	b	Read, interpret and draw conclusions from histograms, circle graphs, stem and leaf plots, and scatter plots*.

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Benchmark 2	Display and use measures of central tendency*, such as mean, median and mode and measures of variability*, such as range and quartiles.	
Assessment Objectives	a	Given a display of data (for example, line plot, stem and leaf plot, list of data), determine the mean, mode, median and range.
Benchmark 3	Evaluate arguments that are based on statistical claims.	
Assessment Objectives	a	Evaluate arguments that are based on measures of central tendency* or data displays.
Benchmark 4	Formulate hypotheses, drawing conclusions, and making convincing arguments based on data analysis.	
Assessment Objectives	a	Analyze data and draw conclusions to predict outcomes based on data displays such as histograms and stem and leaf plots.
Benchmark 5	Determine probabilities* through experiments or simulations.	
Assessment Objectives	<i>No objectives assessed at this level.</i>	
Benchmark 6	Make predictions and compare results using both experimental and theoretical probability* drawn from real-world problems*.	
Assessment Objectives	a	Report the probability* of an event in fraction, decimal and percent form.
	b	Determine the probability* of simple independent events (for example, tossing a coin and rolling a die).
	c	Make predictions based on theoretical probability*.

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Benchmark 7	Using counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken).	
Assessment Objectives	a	Determine the number of possible outcomes from a given event using a variety of strategies, such as: tree diagrams, or organized lists.
Standard 4	Students use geometric concepts, properties, and relationships in problem-solving situations* and communicate the reasoning used in solving these problems.	
Benchmark 1	Construct two- and three-dimensional models* using a variety of materials and tools.	
Assessment Objectives	<i>No objectives assessed at this level.</i>	
Benchmark 2	Describe, analyze and reason informally about the properties (for example, parallelism, perpendicularity, congruence*) of two- and three-dimensional figures.	
Assessment Objectives	a	Describe, analyze and reason informally about the attributes of two- and three-dimensional shapes (for example, angles, sides, edges, faces, vertices).
Benchmark 3	Apply the concept of ratio, proportion and similarity* in problem-solving situations*	
Assessment Objectives	a	Identify and compare similar shapes using ratio, proportion, or scale factor.
Benchmark 4	Solve problems using coordinate geometry*.	
Assessment Objectives	a	Construct a coordinate graph and plot ordered integer* pairs in all four quadrants.

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Benchmark 5	Solving problems involving perimeter and area in two dimensions, and involving surface area and volume* in three dimensions.	
Assessment Objectives	a	Solve problems involving the circumference of a circle (formulas not provided).
	b	Solve problems involving the areas of circles, triangles, and parallelograms (formulas not provided).
	c	Solve problems involving the surface area of rectangular prisms (formulas not provided).
Benchmark 6	Transforming geometric figures using reflections*, translations*, and rotations* to explore congruence*.	
Assessment Objectives	a	Use reflections*, translations*, and/or rotations*, to determine congruence* between figures.
Standard 5	Students use a variety of tools and techniques to measure, apply the results in problem-solving situations*, and communicate the reasoning used in solving these problems.	
Benchmark 1	Estimate, use and describe measures of distance, perimeter, area, volume*, capacity*, weight, mass, and angle comparison.	
Assessment Objectives	a	Estimate the area of irregular shapes, angle measurement, or weight of common objects.
Benchmark 2	Estimate, make, and use direct and indirect measurements to describe and make comparisons.	
Assessment Objectives	a	Estimate, make and use direct and indirect measurements to describe and make comparisons.

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Benchmark 3	Read and interpret various scales including those based on number lines, graphs, and maps.	
Assessment Objectives	a	Read and interpret scales on number lines, graphs and maps (for example, given a map and a scale, determine the distance between two points on the map).
	b	Select the appropriate scale for a given problem (for example, using the appropriate scale when setting up a graph or intervals on a histogram).
Benchmark 4	Develop and use formulas and procedures to solve problems involving measurement.	
Assessment Objectives	a	Develop and use procedures or formulas to solve problems involving area of polygons (for example, trapezoids, regular hexagons, regular octagons).
Benchmark 5	Describe how a change in an object's linear dimensions affects its perimeter, area, and volume*.	
Assessment Objectives	a	Describe how a change in an object's linear dimensions affects its perimeter and area (for example, how a change in the radius or diameter will affect the circumference and area of a circle).
Benchmark 6	Select and use appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation*.	
Assessment Objectives	a	Select and use appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation* (for example, reconstruct a replica of a given figure).

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Standard 6	Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic*, paper-and-pencil, calculators, and computers, in problem-solving situations* and communicate the reasoning used in solving these problems.	
Benchmark 1	Use models* to explain how ratios, proportions, and percents can be used to solve real-world problems*.	
Assessment Objectives	a	Use concrete materials or pictures to explain how ratios, proportion, and percents can be used to solve real world problems*.
Benchmark 2	Construct, use and explain procedures to compute and estimate with whole numbers, fractions, decimals, and integers*.	
Assessment Objectives	a	Apply order of operations (including exponents* with positive rational numbers*.
	b	Add, subtract, multiply, and divide positive rational numbers* or integers*.*
	c	Explain strategies to add, subtract and multiply positive rational numbers*.
Benchmark 3	Develop, apply and explain a variety of different estimation strategies in problem-solving situations*, and explain why an estimate may be acceptable in place of an exact answer.	
Assessment Objectives	a	Explain why an estimate may be acceptable in place of an exact answer.
	b	Solve problems using estimation and justify choice of techniques.

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Benchmark 4	Select and use appropriate methods algorithms* for computing with commonly used fractions and decimals, percents, and integers* in problem-solving situations* from among mental arithmetic*, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable.	
Assessment Objectives	a	Determine what information is necessary or missing in a problem-solving situation*.
	b	Solve problems involving positive rational numbers* and/or integers*.
	c	Create a situation that matches a given number sentence involving positive rational numbers* or integers*, excluding division of fractions and decimals.
	d	Justify the reasonableness of a solution in a problem-solving situation*.