

Red Oak Community School District Mathematics Education

MATHEMATICS EDUCATION (GRADES 6-8)				Grade 6	Grade 7	Grade 8
ROCSD Mathematics Standards and Benchmarks						
I	*	*	STANDARD: Number and Operations.			
Benchmarks and Performance Indicators						
>	1		Understand numbers, ways of representing numbers, relationships among numbers, and number systems			
			Grades 6–8 Expectations:			
		p	work flexibly with fractions, decimals, and percents to solve problems; (CE, GE, LS, T)	I	D	D
		q	compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line; (CE, GE, HOTS, LS, T)	I	D	D
		r	develop meaning for percents greater than 100 and less than 1; (CE, GE, HOTS, LS)	I	D	D
		s	understand and use ratios and proportions to represent quantitative relationships; (CE, GE, HOTS)		I	D
		t	develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation; (T)		I	D
		u	use factors, multiples, prime factorization, and relatively prime numbers to solve problems; (LS)	I	D	D
		v	develop meaning for integers and represent and compare quantities with them. (HOTS)	I	I	D
>	2		Understand meanings of operations and how they relate to one another			
			Grades 6–8 Expectations:			
		i	understand the meaning and effects of arithmetic operations with fractions, decimals, and integers; (CE, LS)	I	D	D
		j	use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals; (CE, LS)	I	D	D
		k	understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems. (CE, LS)	I	D	D
>	3		Compute fluently and make reasonable estimates			
			Grades 6–8 Expectations:			
		j	select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods; (CE, HOTS, T)	I	D	D
		k	develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use; (CE, HOTS)		I	D
		l	develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results; (CE, HOTS)	I	D	D
		m	develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios. (CE, CM, GE, HOTS, MCGF, T)		I	D
II	*	*	Standard: Algebra.			
Benchmarks and Performance Indicators						
>	1		Understand patterns, relations, and functions			
			Grades 6–8 Expectations:			
		f	represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules;		I	D
		g	relate and compare different forms of representation for a relationship; (LS)			I
		h	identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations. (CE, HOTS, LS, MCGF)			I

Red Oak Community School District Mathematics Education

MATHEMATICS EDUCATION (GRADES 6-8)			Grade 6	Grade 7	Grade 8
>	2	Represent and analyze mathematical situations and structures using algebraic symbols			
		Grades 6–8 Expectations:			
	f	develop an initial conceptual understanding of different uses of variables; (CM, LS)	I	D	D
	g	explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope			I
	h	use symbolic algebra to represent situations and to solve word problems, especially those that involve linear relationships; (CM, LS)		I	D
	i	recognize and generate equivalent forms for simple algebraic expressions and solve linear equations (HOTS)	I	I	D
>	3	Use mathematical models to represent and understand quantitative relationships			
		Grades 6–8 Expectations:			
	c	model and solve contextualized problems using various representations, such as graphs, tables, and equations. (CE, HOTS, MCGF)	I	I	D
>	4	Analyze change in various contexts			
		Grades 6–8 Expectations:			
	d	use graphs to analyze the nature of changes in quantities in linear relationships. (CE, HOTS)			I
III	*	* Standard: Geometry			
		Benchmarks and Performance Indicators			
>	1	Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships			
		Grades 6–8 Expectations:			
	i	precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties	I	D	D
	j	understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects; (GE, LS, MCGF)	D	D	D
	k	create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship. (GE, HOTS, MCGF)		I	D
>	2	Specify locations and describe spatial relationships using coordinate geometry and other representational systems			
		Grades 6–8 Expectations:			
	g	use coordinate geometry to represent and examine the properties of geometric shapes; (LS)	I	D	D
	h	use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.	I	D	D
>	3	Apply transformations and use symmetry to analyze mathematical situations			
		Grades 6–8 Expectations:			
	f	describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling; (GE, MCGF)		I	D
	g	examine the congruence, similarity, and line or rotational symmetry of objects using transformations. (HOTS)			I
>	4	Use visualization, spatial reasoning, and geometric modeling to solve problems			
		Grades 6–8 Expectations:			
	k	draw geometric objects with specified properties, such as side lengths or angle measures; (GE, LS, MCGF)	D	D	D
	l	use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume; (GE, MCGF)	I	I	D

Red Oak Community School District Mathematics Education

MATHEMATICS EDUCATION (GRADES 6-8)				Grade 6	Grade 7	Grade 8
		m	use visual tools such as networks to represent and solve problems; (LS)			I
		n	use geometric models to represent and explain numerical and algebraic relationships; (HOTS)	I	D	D
		o	recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.	I	D	D
IV	*	*	Standard: Measurement			
			Benchmarks and Performance Indicators			
>	1		Understand measurable attributes of objects and the units, systems, and processes of measurement			
			Grades 6–8 Expectations:			
		j	understand both metric and customary systems of measurement; (CE, GE, LS, MCGF)	D	D	D
		k	understand relationships among units and convert from one unit to another within the same system; (GE, HOTS, MCGF, T)	D	D	D
		l	understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.	I	D	D
			Grades 9–12 Expectations:			
		m	make decisions about units and scales that are appropriate for problem situations involving measurement. (CE, MCGF)			
>	2		Apply appropriate techniques, tools, and formulas to determine measurements.			
			Grades 6–8 Expectations:			
		j	use common benchmarks to select appropriate methods for estimating measurements; (CE, GE, LS, MCGF)	I	D	D
		k	select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision	D	D	D
		l	develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes; (GE, HOTS, MCGF, T)	I	D	D
		m	develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders; (GE, HOTS, MCGF, T)		I	D
		n	solve problems involving scale factors, using ratio and proportion; (GE, HOTS, MCGF, T)		I	D
		o	solve simple problems involving rates and derived measurements for such attributes as velocity and density. (GE, HOTS, MCGF, T)		I	D
V	*	*	Standard: Data Analysis and Probability			
			Benchmarks and Performance Indicators			
>	1		Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them			
			Grades 6–8 Expectations:			
		h	formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population; (CE, CM, GE, HOTS, MCGF)		I	D
		i	select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots		I	D
>	2		Select and use appropriate statistical methods to analyze data			
			Grades 6–8 Expectations:			
		e	find, use, and interpret measures of center and spread, including mean and interquartile range; (CE, CM, HOTS, T)	I	D	D
		f	discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots. (CE, CM, HOTS)		I	D

Red Oak Community School District Mathematics Education

MATHEMATICS EDUCATION (GRADES 6-8)			Grade 6	Grade 7	Grade 8
>	3	Develop and evaluate inferences and predictions that are based on data			
		Grades 6–8 Expectations:			
	c	use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken; (CE, CM, GE, MCGF)			I
	d	make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit; (CE, CM, HOTS)			I
	e	use conjectures to formulate new questions and plan new studies to answer them. (CE, CM, HOTS)			I
>	4	Understand and apply basic concepts of probability			
		Grades 6–8 Expectations:			
	e	understand and use appropriate terminology to describe complementary and mutually exclusive events; (CE, CM, GE, HOTS, MCGF)			I
	f	use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations			I
	g	compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.			I
VI	*	* Process Standard			
		Benchmarks and Performance Indicators			
>	1	Use problem-solving strategies			
		Grades K–12 Expectations:			
	a	build new mathematical knowledge through problem solving (CM, HOTS)	D	D	D
	b	solve problems that arise in mathematics and in other contexts (CM, HOTS)	D	D	D
	c	apply and adapt a variety of appropriate strategies to solve problems (CM, HOTS)	D	D	D
	d	monitor and reflect on the process of mathematical problem solving (CM, HOTS)	D	D	D
>	2	Utilize reasoning and proof			
		Grades K–12 Expectations:			
	a	recognize reasoning and proof as fundamental aspects of mathematics (CM, HOTS)	D	D	D
	b	make and investigate mathematical conjectures (CM, HOTS)	D	D	D
	c	develop and evaluate mathematical arguments and proofs (CM, HOTS)	D	D	D
	d	select and use various types of reasoning and methods of proof (CM, HOTS)	D	D	D

