

PARENT GUIDE

GRADE SEVEN MATHEMATICS CURRICULUM

DIOCESE OF CLEVELAND

Below is a list of skills your child will be taught in Grade Seven Mathematics.

As parents, you are encouraged to support the work of your child's teacher in helping your child acquire each of these skills.

RATIOS AND PROPORTIONAL RELATIONSHIPS	
ANALYZE PROPORTIONAL RELATIONSHIPS AND USE THEM TO SOLVE REAL-WORLD AND MATHEMATICAL PROBLEMS.	
	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
	Recognize and represent proportional relationships between quantities.
	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
	Represent proportional relationships by equations.
	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.
	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
NUMBER SYSTEM	
APPLY AND EXTEND PREVIOUS UNDERSTANDINGS OF OPERATIONS WITH FRACTIONS.	
	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
	Describe situations in which opposite quantities combine to make 0.
	Understand $p + q$ as the number located a distance $ q $ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
	Apply properties of operations as strategies to add and subtract rational numbers.
	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
	Apply properties of operations as strategies to multiply and divide rational numbers.
	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
	Solve real-world and mathematical problems involving the four operations with rational numbers.

STATISTICS & PROBABILITY	
USE RANDOM SAMPLING TO DRAW INFERENCES ABOUT A POPULATION.	
	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
DRAW INFORMAL COMPARATIVE INFERENCES ABOUT TWO POPULATIONS.	
	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
INVESTIGATE CHANCE PROCESSES AND DEVELOP, USE, AND EVALUATE PROBABILITY MODELS.	
	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
	Design and use a simulation to generate frequencies for compound events.
DOC: Patterns, Functions and Algebra	
ALGEBRAIC REPRESENTATION	
	Describe problem situations involving ratios, proportions, and percents with algebraic expressions.
	Continue to explore the effects of the order of operations on computations and use parentheses appropriately to group numbers.
DOC: Measurement	
MEASUREMENT TECHNIQUES AND TOOLS	
	Solve problems involving proportional relationships and scale factors; e.g., scale models that require unit conversions within the same measurement system.
DOC: Geometry and Spatial Sense	
CHARACTERISTICS AND PROPERTIES	
	Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.
	Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.

DOC: Geometry and Spatial Sense continued	
VISUAL AND GEOMETRIC MODELS	
	Recognize and apply geometric ideas and relationships to areas such as art, science, music, and everyday life.
DOC: Data Analysis and Probability	
DATA COLLECTION	
	Design experiments and surveys and consider potential sources of bias in design and data collection.
	Read, create, and interpret box-and-whisker plots, stem-and-leaf plots, histograms, and other types of graphs.
STATISTICAL METHODS	
	Identify misuses of statistical data in articles, advertisements, and other media.
PROBABILITY	
	Explore relationships such as independent and dependent events, permutations and combinations when determining probabilities.

DATE TAUGHT	
OH: CCSS: Literacy: Reading: Science & Technical Subjects	
KEY IDEAS AND DETAILS	
	Cite specific textual evidence to support analysis of science and technical texts.
CRAFT AND STRUCTURE	
	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
OH: CCSS: Literacy: Writing	
TEXT TYPES AND PURPOSES	
	Write arguments focused on discipline-specific content.
	Use precise language and domain-specific vocabulary to inform about or explain the topic.
USE TECHNOLOGY, INCLUDING THE INTERNET, TO PRODUCE AND PUBLISH WRITING AND TO INTERACT AND COLLABORATE WITH OTHERS.	
	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.



(Source: [1] National Governors Association Center for Best Practices, Council of Chief State School Officers. 2010. *Common Core State Standards for Mathematics*. Washington, D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.[2] Office of Catholic Education. 2007. *Mathematics Curriculum*. Cleveland, Ohio: Office of Catholic Education.)

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