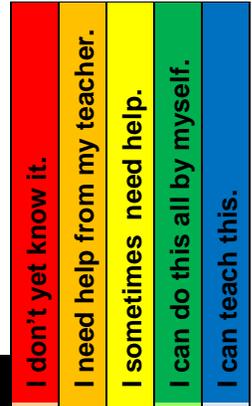# *I Can…* Grade 7 Mathematics

EOY—End of Year Assessment   PBA—Performance-Based Assessment

| Major Content | Supporting Content | Additional Content |

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	I Can…	Example	I don't yet know it.	I need help from my teacher.	I sometimes need help.	I can do this all by myself.	I can teach this.
Ratios & Proportions	**1** I can compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	If a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $\frac{1}{2}/\frac{1}{4}$ miles per hour, equivalently 2 miles per hour.					
	2a I can decide whether two quantities are in a proportional relationship.	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.					
	2b I can identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	"This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."					
	2c I can represent proportional relationships by equations.	If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.					
	2d I can explain what a point (x, y) on the graph of a proportional relationships means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	Explain what a point on the graph of a proportional relationship means in terms of the situation.					

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Unit	I Can…	Example					
	3-1 I can use proportional relationships to solve multistep ratio problems.	You buy a bicycle helmet for $22.26, which includes a 6% sales tax. The helmet is discounted 30% off the selling price. What is the original price?					
	3-2 I can use proportional relationships to solve multistep percent problems.	Simple interest, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.					
	1a I can describe situations in which opposite quantities combine to make 0.	A hydrogen atom has 0 charge because its two constituents are oppositely charged.					
	1b-1 I can 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.	*5−(−11)*					
	1b-2 I can interpret sums of rational numbers by describing real-world contexts.	It was extremely cold at midnight. During the morning, the temperature rose by 5 degrees. By midday, it had reached −11 degrees. What was the temperature at midnight?					
Number Systems	**1c-1** I can understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Apply this principle in real-world contexts.	Require students to create or identify a situation described by a specific equation of the general form p-q =p +(-q) such as 3-5 = 3 + (-5)					
	1d I can apply properties of operations as strategies to add and subtract rational numbers.	Given the sum -8.1 + 7.4, the student might be asked to recognize or produce the equivalent expression –(8.1-7.4).					

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Unit	I Can…	Example					
	2a-1 I can 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.	Given the expression $(-3)(6 + -4 + -3)$, the student might be asked to recognize that the given expression is equivalent to $(-3)(6 + -4) + (-3)(-3)$.					
	2a-2 I can interpret products of rational numbers by describing real-world.	If the product of 6 integers is negative, at most how many of the integers can be negative?					
Expressions & Equations	**2b-1** I can 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 $-(p/q) = (-p)/q = p/(-q)$.	Divide five by four. Is your answer a rational number? Explain					
	2b-2 I can interpret quotients of rational numbers by describing real-world contexts.	A trail is 13.5 miles long. There are markers every 0.25 mile along the trail, including at the end of the trail. How many markers are there in all? Show your work.					
	2c I can apply properties of operations as strategies to multiply and divide rational numbers.	Given the expression $(-8)(6)(-3)$, the student might be asked to recognize the produce the equivalent expression $-(8/3)(-6)$.					
	3 I can solve real-world and mathematical problems involving the four operations with rational numbers.	The three seventh grade classes at Sunview Middle School collected the most box tops for a school fundraiser, and so they won a $600 prize to share among them. Mr. Aceves' class collected 3,760 box tops, Mrs. Baca's class collected 2,301, and Mr. Canyon's class collected 1,855. How should they divide the money so that each class gets the same fraction of the prize money as the fraction of the box tops that they collected?					

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Unit	I Can…	Example					
	1 I can apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	What is the factored form of 12x+18?					
	2 I can understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."					
	3 I can solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.					
	4a-1 I can solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers.	This is the call plan for Minna's cell phone: $15 a month plus $0.20 per minute of call time. Free texting. Minna made 30 minutes of calls this month, and sent 110 texts. How much does she have to pay the phone company? Explain how you figure this out.					
	4a-2 I can fluently solve equations of the form px + q = r and p(x+q) = r, where p, q, and r are specific rational numbers.	The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?					
	4b I can solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.					

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Unit	I Can…	*Example*					
Geometry	**1** I can solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Mariko has an 80:1 scale drawing of the floor plan of her house. On the floor plan, the dimensions of her rectangular living room are $1\frac{7}{8}$ inches by $2\frac{1}{2}$ inches. What is the area of her real living room in square feet?					
	2 I can draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	In the space below, draw an acute scalene triangle.					
	3 I can describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	What cross section results when you cut a cylinder perpendicular to its base?					
	4-1 I can know the formulas for the area and circumference of a circle and use them to solve problems.	There is a Tornado Warning in Frank Ocean's neighborhood. The reporters say that the tornado covers an area of 254.34 square feet. What is the diameter of the tornado?					
	4-2 I can give an informal derivation of the relationship between the circumference and area of a circle.	A circle has an area of 71 square yards. What is the circumference of the circle?					
	5 I can use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	<TMW and <WMF are complementary and congruent. What is the measure of <TMW?					

Unit	I Can…	Example					
	6 I can solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	The total area of six faces of a cube is 1000 sq. cm. What is the length of one edge of the cube? Round your answer to three decimal places.					
	1 I can 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.	A psychology researcher posts an advertisement offering $20 in exchange for participation in a short study. The researcher accepts the first ten people who respond to the advertisement. Is the researcher's study likely to be biased? Use mathematics to explain your answer.					
	2 I can 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.	Estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.					
	3 I can informally assess the degree of visual overlap of two numerical data distributions with similar variability, measuring the difference between the centers by expressing it as a multiple of a measure of variability.	The mean height of players on the basketball team is 10cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.					
	4 I can use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	Decide whether the words in a chapter of a seventh grade science book are generally longer than the words in a chapter of a fourth grade science book.					
	5 I can 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.					

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Unit	I Can…	Example					
	6 I can 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.	When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.					
	7a I can develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.	If a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.					
	7b I can develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	Find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?					
Statistics & Probability	**8a** I can 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.	Find the probability of flipping a heads, then a tails, then a heads again on a coin.					
	8b I can 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.					
	8c I can design and use a simulation to generate frequencies for compound events.	Use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?					