

Ratios and Proportional Relationships

Domain Overview

GRADE 6

Sixth graders are introduced to ratio, a relationship or comparison of two quantities or measures. Students represent ratios in various forms and compare types of ratios. At this level, they use reasoning about multiplication and division to solve ratio and rate problems about quantities. Students learn how and where ratios and rates are used in the real world.

GRADE 7

Continuing to develop an understanding of operations with rational numbers, seventh graders describe situations in which opposite quantities combine to make zero and determine the absolute value for a given number. Students estimate solutions, then add, subtract, multiply, and divide integers in the context of real-world problems. Given a real-world context, students simplify an expression using four integer operations and the order of operations.

SUGGESTED MATERIALS FOR THIS DOMAIN

6 7

✓	✓	Common objects such as tennis shoes, cereal boxes, etc.
	✓	Copies of restaurant menus
✓		Counters (two-color, chips, etc.)
✓	✓	Graph paper
✓		Newspapers or grocery ads
✓		Percent wheel

KEY VOCABULARY

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✓	✓	commission a percentage of sales paid to a salesperson
✓		complex fraction a fraction with a fraction in the numerator and/or a fraction in the denominator
✓	✓	constant of proportionality same as unit rate
	✓	coordinate plane a plane formed by the intersection of a horizontal number line (called the <i>x</i> -axis) with a vertical number line (called the <i>y</i> -axis). The number lines intersect at their zero points, called the origin
	✓	covariance a measurement of how related the variances are between two variables. The extent to which any two random variables change together or vary together.
✓	✓	discount amount a store takes off of the original price of an item. It is usually expressed as a percent or fraction.
✓		double number lines two number lines used when quantities have different units to easily see there are numerous pairs of numbers in the same ratio
✓	✓	equation a mathematical statement of the equality of two mathematical expressions. An equation uses a sign stating two things are equal (=).
✓		equivalent ratios ratios that have the same value
✓		gratuity tip
✓	✓	markdown a reduction in price
✓	✓	markup the difference between the wholesale price and the selling price
✓	✓	origin on a coordinate plane, the point (0, 0)
✓	✓	percent a ratio per 100 such as 25% is 25 parts of 100

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KEY VOCABULARY

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✓	✓	percent error the ratio of the error compared to the exact value. For example, my estimate was off by 7. The exact value was 35, so the percent error is $\frac{7}{35} \times 100\% = 20\%$.
✓	✓	percent increase/decrease the amount of increase or decrease expressed as a percent of the original amount
✓	✓	proportion two equal ratios
✓	✓	proportional reasoning multiplicative reasoning as opposed to additive reasoning. It is often used when finding the better buy, sharing two items with three students, adjusting calculations of travel time with different speeds, or calculating a sale price when everything is 40% off.
✓		rate ratio that compares two quantities of different units such as 3 ft per second
✓	✓	ratio comparison of two quantities
✓		ratio language language used to describe a ratio relationship in number or quantity between two things such as "For every vote candidate A received, candidate C received nearly three votes"
	✓	ratio table a table that shows the relationships between different ratios and/or a comparison of two or more quantities
✓	✓	simple interest the formula is $I = prt$, where I is interest, p is principle, r is rate, and t is time
✓		simplify a ratio divide each number in the ratio by its greatest common factor; $\frac{2}{6}$ simplifies to $\frac{1}{3}$ by dividing 2 and 6 by 2
✓		tape diagram a drawing that looks like a segment of tape, used to illustrate number relationships; Also known as a strip diagram, bar model, fraction strip, or length model
✓	✓	unit rate ratio comparing an amount to one