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# Math Common Core 7Th Grade (Quick Study: Academic)

WORLD'S OF ACADEMIC STUDY  
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## Math Common Core State Standards 7th Grade

Proportions, percent, integer operations, linear equations, inequalities, geometry, probability & more

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### RATIOS & PROPORTIONS

**Ratio:** A comparison of two numbers or measurements.  
**Rate:** A ratio in which the two terms are in different units.  
**Unit rate:** A rate that is expressed as a quantity of one (for example, miles per hour).

**EX:** Bill ran 10 laps around the high school track in 12 minutes. How many laps can he run in 45 minutes? First, find the unit rate.

$$\frac{10 \text{ laps}}{12 \text{ minutes}} = x \text{ laps per minute}$$

Bill can run  $\frac{5}{6}$  laps per minute. Use the unit rate to solve:

$$\frac{5}{6} = \frac{45}{x} \Rightarrow \frac{5x}{6} = \frac{225}{6} \Rightarrow 5x = 225 \Rightarrow x = 45$$

Bill can run 45 laps in 45 minutes.

**Proportions:** Two equal ratios.  
**EX:** Solve for  $x$  to complete the proportion.

$$\frac{6}{15} = \frac{x}{25}$$

$$(15x) = (6)(25)$$

$$15x = 150$$

$$\frac{15x}{15} = \frac{150}{15}$$

$$x = 10$$

**EX:** Terry accumulated 6 vacation days after working for 9 months. How many vacation days will Terry have after working for 2 years?

$$\frac{6}{9} = \frac{x}{24}$$

$$9x = 144$$

$$\frac{9x}{9} = \frac{144}{9}$$

$$x = 16$$

Terry will have 16 vacation days after working for 2 years.

**Tip!** Use the unit rate to make sure that the units convert correctly, too!

**Proportional Relationships among Quantities**  
 Ratios of input and corresponding output values are proportional.

$x$	1	2	3	4	5	6
$y$	2	4	6	8	10	12

**Constant of proportionality:**  $y = kx$ ;  $k$  varies in direct proportion to  $x$ , and  $k$  is the constant of proportionality.

**EX:** At a constant speed, a car travels 50 meters in 2 seconds. How long would it take the car to travel 375 meters?

Elapsed Time	Distance Traveled	Speed (Ratio in m/s)
1 second	25 meters	25
2 seconds	50 meters	25
3 seconds	75 meters	25

**Time ( $t$ ) and distance ( $d$ ) are directly proportional.**  
 $\frac{d}{t} = \text{constant } (k)$   
 $\frac{d}{t} = \text{constant } (k)$   
 $\frac{25 \text{ meters per second}}{1 \text{ second}} = \frac{375 \text{ meters}}{t}$   
 $25t = 375$   
 $\frac{25t}{25} = \frac{375}{25}$   
 $t = 15$   
 It will take the car 15 seconds to travel 375 meters.

**Tip!** The graph of a directly proportional relationship will always be a straight line and must pass through the origin.

**Percent Problems**  
**Formula:**  $\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$

**EX:** Within the past year, 25% of the 16 stores in a mall have closed. How many stores closed in the mall?

$$\frac{25}{100} = \frac{x}{16}$$

$$100x = 400$$

$$\frac{100x}{100} = \frac{400}{100}$$

$$x = 4$$

Four stores closed in the mall during the past year.

**Gratuities**  
**EX:** A group of friends went out to dinner. Their bill was \$233. They want to leave an 18% tip for the waiter. How much money should they leave for the tip?

$$\frac{18}{100} = \frac{x}{233}$$

$$100x = 4194$$

$$\frac{100x}{100} = \frac{4194}{100}$$

$$x = 41.94$$

The friends should leave a tip of \$41.94.

**Percent Increase or Decrease**  
**EX:** The dues in a neighborhood increased from \$24 per month to \$30 per month. Find the percent of increase.

Subtract to find the amount of increase:  
 $30 - 24 = 6$

Use a proportion:

$$\frac{\text{difference}}{\text{original amount}} = \frac{x}{100}$$

$$\frac{6}{24} = \frac{x}{100}$$

$$24x = 600$$

$$\frac{24x}{24} = \frac{600}{24}$$

$$x = 25$$

There was a 25% increase.

**EX:** Between 3:00 p.m. and 4:00 p.m., the temperature dropped from 85 degrees to 60 degrees. Find the percent of decrease.

Subtract to find the amount of decrease:  
 $85 - 60 = 25$

Use a proportion:

$$\frac{25}{85} = \frac{x}{100}$$

$$85x = 2500$$

$$\frac{85x}{85} = \frac{2500}{85}$$

$$x = 31.8$$

The temperature decreased by about 31.8%.

**Simple Interest**  
**EX:** Carmen earns 3% a year on money in her savings account. She had \$354 in her account all year. How much interest did she earn?

$$\frac{3}{100} = \frac{x}{354}$$

$$100x = 1062$$

$$\frac{100x}{100} = \frac{1062}{100}$$

$$x = 10.62$$

Carmen earned \$10.62 in interest.

**Tip!** You can also use the formula  $i = prt$ , where:  
 $i$  = total interest paid  
 $p$  = principal (money saved)  
 $r$  = rate (percent rate)  
 $t$  = time, expressed in years

For the previous example,  
 $i = 354 \times .03 \times 1 = 10.62$

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## Synopsis

The Common Core State Standards for mathematics are a set of expectations and skills that students need to master to succeed in college and the real world. BarCharts<sup>™</sup> Math Common Core series aligns with those specific standards to help guide students through their classes. Each guide in the series features real-world problems and examples, illustrations, and tables to help students retain information. The Math Common Core Standards 7th Grade QuickStudy<sup>®</sup> guide focuses on the critical areas of the curriculum so that students can develop fluency and understanding.

## Book Information

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## Customer Reviews

Love these! I have used these with my kids for the past couple of years. They truly give a snapshot of what they are learning and it is a nice and concise reference to all the important facts they will be learning per grade. We have used it many times while doing homework when the kids have forgotten a formula or how to do a certain type of problem. I got these for 5th , 6th and 7th grade for Florida.

This has been a great tool in preparing my daughter for 7th grade math. It tells me what she will need to know for the upcoming school year and has allowed me to pinpoint what would be beneficial to cover over the summer. I am using it in conjunction with Spectrum 7th Grade Math workbook. We review a concept on the Quick Study and then I find the corresponding concept in the workbook for her to complete.

I liked that the common core study topics and examples match what is being taught in class. Wish it had room to be hole punched for notebooks

I'm not sure how I'll use this in the classroom. It's wonderful. However: It's too expensive to buy for the entire class. It's too unethical to photocopy for the entire class.

I love this quick view for CCMS. It's quick to look at and easy to review. I would like to get the 6th and 8th grade versions.

very awesome. has come in handy several times. I use it to review with my child on a daily basis

Purchased this as a side-gift to give to a child that was struggling in math. They were glad to have something that he can easily access/use.

decent chart, but it really just makes the parent feel better knowing that it's there and the kid just ignores it.

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