Decimal Ops Unit Test Study Guide

Vocabulary to know and understand:

dividend	divisor	quotient
estimate	unit rate	ratio
repeating decimal	terminating decimal	percent
tip	tax	discount

Concepts to know and understand:
- Add, subtract, multiply & divide with decimals
- Estimating with decimals to solve problems
- Find percents of amounts
- Find what percent a part of a whole represents
- Find what the total amount given the percent and the part
- Know how to find tips, taxes, and discounts on the price of something
- Understand the impact tips, taxes & discounts have on the price of something
- Understand and find equivalent fractions, decimals and percents
- Problem solving involving decimals and percents

Important Concepts	Examples
Choosing an Operation and Estimating When you encounter situations involving decimals… ● decide which operation to use to find a solution. ● estimate to choose operations and check your work.	Chakara makes a rectangular tablecloth that is 3.5 meters long and 1.5 meters wide. What is the area of the tablecloth? The dimensions are about 4 meters by about 2 meters. To find the approximate area, multiply 4 × 2. To find the exact area, multiply 3.5 × 1.5.
Addition and Subtraction of Decimals Strategies include... Decimals as Fractions You can write decimals as fractions. Find common denominators to add or subtract the fractions. Then express the answer as a decimal. Place Value Interpretation *(standard algorithm)* Line up the numbers based on their place value (and the decimal points).	Zeke buys cider for $1.97 and pretzels for $.89. What is the total cost? Written as fractions with denominator 100, the cost is $\frac{197}{100}$ + $\frac{89}{100}$, or $\frac{286}{100}$, or 2.86. This is comparable to thinking of the cost in pennies and writing the sum in dollars. To find the difference 3.725 − 0.41, subtract thousandths from thousandths (0.005 − 0.000), hundredths from hundredths (0.02 − 0.01), tenths from tenths (0.7 − 0.4), and ones from ones (3 − 0).

Multiplication of Decimals Strategies include… Decimals as Fractions Write the decimals as fractions. Multiply the fractions. Then write the answer as a decimal. The number of decimal places in the factors relates to the number of decimal places in the product. Place Value Interpretation *(standard algorithm)* Multiply the two numbers as if they were whole numbers (ignore the decimal points). Count the decimal places in the factors or use estimation to find the location of the decimal point in the product.	Find the product 0.3×2.3. As fractions, this is $\frac{3}{10} \times 2\frac{3}{10} = \frac{3}{10} \times \frac{23}{10}$; the product is $\frac{69}{100}$, or 0.69. The denominator of the fraction tells the place value of the decimal. Find the product 0.25×0.31. Use the fact that $25 \times 31 = 775$. Tenths $\times$ tenths results in hundredths in the product, so $2.5 \times 3.1 = 7.75$. Tenths $\times$ hundredths results in thousandths, so $2.5 \times 0.31 = 0.775$. Hundredths $\times$ hundredths results in ten-thousandths, so $0.25 \times 0.31 = 0.0775$.
Division of Decimals Strategies include… Decimals as Fractions Express decimals as fractions. Use strategies for dividing fractions. This includes changing the operation to multiplication and using the reciprocal of the second factor, or finding common denominators and then dividing the numerators only. Place Value Interpretation *(standard algorithm)* Write an equivalent problem: multiply the dividend and the divisor by the same power of ten until the divisor is a whole number.	Find the quotient $3.25 \div 0.5$. Rewrite the expression as $\frac{325}{100} \div \frac{5}{10} = \frac{325}{100} \div \frac{50}{100}$. This is the same as $325 \div 50$, which is $6\frac{1}{2}$ or 6.5. This approach explains why moving decimal points works. $0.015\overline{)37.5} = 0.015 \times 1,000\overline{)37.5 \times 1,000} = 15\overline{)37,500}$
Decimal Forms of Rational Numbers Terminating Decimals Rational numbers with decimal forms that "end" are terminating decimals. The simplified fraction form has only 2s or 5s in the prime factorization of the denominator. Repeating Decimals Rational numbers with decimal forms that "continue forever," but repeat, are repeating decimals. The simplified fraction form has numbers other than 2 or 5 in the prime factorization of the denominator.	$\frac{1}{2} = 0.5$; $\frac{3}{4} = 0.75$; $\frac{1}{8} = 0.125$; $\frac{12}{75} = 0.16$ $\frac{1}{3} = 0.3333\ldots$; $\frac{2}{3} = 0.6666\ldots$; $\frac{8}{15} = 0.5333\ldots$; $\frac{3}{7} = 0.4285714285714\ldots$
Finding Percents This unit includes many types of percent problems, including to find ● a percent of a number, based on the whole and percent ● the whole amount, based on the part and the percent ● the percent, based on the part and the whole	Jill buys a $7.50 CD. Sales tax is 6%. How much is the tax? 1% of $7.50 = $\frac{1}{100}$ of $7.50, or 0.075. So, 6% of $7.50 is 0.075×6, or $.45. Jill received a $2.50 tip. The tip was 20% of the bill. How much was the bill? 20% of some number is $2.50. It takes five 20%s to make 100%. $5 \times \$2.50 = \$12.50$, so the total bill was $12.50. Sam got a $12 discount on a $48 shirt. What percent was the discount? There are four 12s in 48, so the percent is $\frac{1}{4}$ of 100%, or 25%.

Practice Problems
Show your work on ALL problems.

1. Tim is mailing some cards. Five cards each require $0.46 worth of postage. Two larger cards each require $0.92 worth of postage.

      a.) Estimate the total postage Tim needs to pay. Show your thinking.

      b.) What is the total postage Tim needs to pay.

2. Ava has a $20 gift card to spend at an online store. The table shows the prices of the digital downloads that are available.

Downloads	Cost
Single Song	$0.89
Music Album	$10.49
Game	$2.89
Ring-tone	$0.49

      a.) How many games could Ava purchase with the gift card?

      b.) Ava decides to buy 1 music album and spend the rest on games. How many games could Ava buy? How much money would be left on the gift card?

      c.) The music album Ava decides to buy has 12 songs. Is it cheaper to buy the music album or the 12 songs as singles? What is the difference in cost?

3. The price of a new car is $42,500. If the sales tax rate is 6.5%, then how much sales tax is being charged? What is the total cost for the car including tax?

4.   You went out to eat with 3 friends and the meal came to $72.50 before tax and tip.

   a.)   If there is a 6.75% sales tax, how much tax will you pay on the meal?

   b.) If you decide to tip the waiter 20% (before tax), how much will the tip be?

   c.) How much is the total bill with tax and tip?

   d.) How much will each person pay for the meal?

Decimal Ops Reflection   Name:_____

                                          Math Class Color:_____

1A) Estimate 2.8 x 50.17: _____ x _____ = _____
Explain your estimate:

1B) Now do the math 2.8 x 50.17, showing all of your work:

1C) How did you know where to put the decimal into your answer in 1B?

2A) Estimate 120.45 9.8 = _____ ÷ _____ = _____
Explain your estimate:

2B) Now do the math 120.45 9.8, showing all of your work:

2C) How did you know where to put the decimal into your answer in 2B?

3A) Explain how Taxes, tips and discounts all have the following **similarities**
- How they are calculated
- How they affect the cost of something

3B) Explain how Taxes, tips, and discounts all have the following **differences**:
- How they are calculated
- How they affect the cost of something