

MA 1C	Mathematics Embedded Credit
Cape Career & Technology Center	Last Update: April 2017
Topic: Integers	Focus: Word Problems

Show-Me Standards: MA1, MA5, G3-4	MO Grade Level Expectations: N2D10, N3C9	NCTM Standards: 2A, 3A, 3B, 18A, 18B, 18C, 18D
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OBJECTIVE: Students will be able to calculate solutions to whole number word problems using basic operations.

Introduction:

Word problems often appear to be complicated. The importance of word problems cannot be overstressed. The majority of real-world math problems are calculations phrased in written, or spoken, word problems. Very seldom will an individual be given a sheet of math calculations to solve while "on-the-job". One of the better ways to solve word problems is like any other activity where excellence is desired: PRACTICE. Throughout these lessons, we will attempt to place as many problems in a real world context as is possible.

The following steps will allow you to calculate the solutions to most word problems. Remember that the "real world" is not always neat and orderly. In some cases you will have to dig to find information needed to solve the problem that is presented.

STEPS TO SOLVING WRITTEN OR SPOKEN WORD PROBLEMS:
<i>A. Read/listen to the entire problem or question.</i>
<i>B. Determine from the information what you are looking for.</i>
<i>C. Find/list out what is given to you in the presented problem.</i>
<i>D. Determine what operation, or operations, will be necessary to solve the problem.</i>
<i>E. Set up the mathematical representation of the problem using the given information and operations.</i>
<i>F. Perform the mathematical operations to solve the mathematical representation.</i>
<i>G. Determine if the answer is reasonable by estimation, and include the units in the answer.</i>

Below you will find common terms used to describe basic operations. Some space has been left for you to add terms that you find that are not included in the chart.

Addition:	Subtraction:	Multiplication:	Division:
Sum	Difference	Product	Quotient
Total	Fewer	At	Divided into
In addition to...	Less than	Times	Per (=each)
Plus	Reduced	By	
Increase	Reduce	Rate	
More than...	Decrease	Per (=each)	
And			

Example:

The owner of the Day Care, where you work, wants you to calculate the cost of a new brand of diapers being carried at a local store. You are given the following information. The cost of a case of diapers is \$41.88. Each case contains 6 packages of diapers. The Day Care owner has always bought diapers by the package. She is considering the purchase of cases, if it is cost effective. She wants you to determine the cost of the diapers so she can compare it to what she has been paying per package. What is the price per package of this brand of diapers prior to any state and local taxes?

What are you looking for?	Price per package of diapers in a case.
What is given?	One case of diapers has 6 packages and costs \$41.88.
What operation(s) is/are needed?	Division
Set up the problem:	$\$41.88/6 =$ the price per package of diapers
Perform the operation(s):	$\$41.88/6 = 6.98$
Determine if the answer is reasonable by estimation and include the units in the answer.	$\$42/6 = \7 per package $\$6.98$ per package, "my final answer"

NOTE: ALWAYS remember to include units with your answer. Make sure you have the correct units. This part of the answer can change the entire problem!

PROBLEMS:

1. You have just purchased a used car and you desire to find an estimation of the gas mileage that the vehicle gets. The odometer reads 65787 after you fill the gas tank. You then drive the vehicle for four days. You need more gas so you go to a local gas station. The odometer reads 66177 when you put 26 gallons of gas in the car. What is the approximate gas mileage you are getting with this vehicle?
2. An auto collision and repair shop charges \$465 for repairs to your car. The actual amount of labor paid to the employee was \$196. Paint and materials cost the shop \$67. Replacement parts were ordered at a cost of \$110 to the shop. How much profit did the shop owner make on this repair?
3. A welder needs to cut a 28 ft. piece of steel into four-inch sections to meet a customer's specifications. How many sections of steel will the welder make while completing the job as specified by the customer?

4. A roofing contractor estimates 12 bundles of shingles for one section of roof, 15 bundles of shingles for another section of roof and 25 bundles of shingles for the final section of roof. Each bundle of roofing shingles will cost \$19.95, nails for the entire project will cost \$49.95, labor will cost you \$15/hour for 6 people working 48 hours each (do not include overtime pay) and miscellaneous materials and supplies will cost approximately \$250. You are assigned to calculate the total cost of the project. What total would you tell the roofing contractor should be bid on the project?

5. An electric meter reads 14087-kilowatt hours used when the electric company employee reads it at the end of October. When the employee returns at the end of November, the meter reads 16897-kilowatt hours used. How many kilowatt-hours of electricity were used between the October reading and the November reading of the meter?

6. A customer brings a computer into you for repair. After determining the problem, you pull the part that needs to be replaced. In checking with the manufacturer, you are told that the part has a "limited warranty" that covers 25% of the replacement cost for the part at this time and all shipping costs. If a new part costs \$198.50, what are you going to charge the customer, prior to any sales tax, if your labor costs are \$75 for the work you did?

7. A mechanic buys a customer's car for \$2100 prior to any repairs. After sinking half the cost of the car into new parts, and \$360 for labor, what price does the mechanic have to put on the car to make \$600 profit?

8. You pay \$9000 to take over a small business. Current debts at the time of the sale are \$6500. At the end of the year, the store records operating expenses of twice the amount of the debts at the time of the sale. How much money must the store gross in this time period to break even?