

# SOLVING WORD PROBLEMS

## a Presentation by Mrs. Gumas



### What is an Algebra Word Problem??????



- A problem solved with an equation is an algebra problem. The unknown in the problem is expressed as a variable in the equation. On the next few slides you will find some information and examples to help you solve word problems.

## Four Main Steps...

- Understand the problem
- Plan a strategy
- Do the plan
- Check your work



## Let's look at a problem...



- Betty bought 12 baseball cards, and now has 349 in her collection. How many cards did she have before her new purchase?

- **STEP #1 UNDERSTANDING THE PROBLEM**

What is the Problem about?

Is there enough information to solve this?

- Does the problem "imply" an equation?



## Step #2

Plan a Strategy: Unlock the Problem



Pick a letter or symbol to stand for the number of cards since this is the unknown. Let  $c$  stand for the original number of cards. Write an equation using the variable, the given numbers, the operations and math symbols:

SO: Let  $C =$   
Equation =

(Notice the variable is in the equation – not at the end)

- Betty bought 12 baseball cards, and now has 349 in her collection. How many cards did she have before her new purchase?

Let's look at a different kind of problem:

A pair of shoes costs \$10 more than a pair of sneakers. Together, their cost is \$110. Find the cost of the sneakers.

- In this problem we are looking for 2 things: \_\_\_\_\_ and \_\_\_\_\_
- Which one do we know the least about? \_\_\_\_\_ because we have more information about the \_\_\_\_\_ – that they cost more than the \_\_\_\_\_.
- Let  $x =$  \_\_\_\_\_ because that is what we know the least about
- If  $x =$  \_\_\_\_\_, then  $x + 10 =$  \_\_\_\_\_
- We know from the information in the problem that together the shoes and the sneakers cost \$110, so we can make an equation...

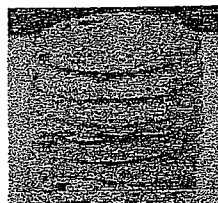
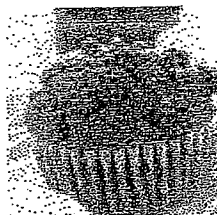
- Now solve the equation:



- So, if the sneakers cost \_\_\_\_\_, then the shoes must be \_\_\_\_\_ more than that or \_\_\_\_\_

## Let's try this one together:

The number of calories in a muffin is 50 more than twice the number of calories in a cookie. Together they have 350 calories. How many calories are in a cookie?



## Let's attack this....

The number of calories in a muffin is 50 more than twice the number of calories in a cookie. Together they have 350 calories. How many calories are in a cookie?



- What do you know the least about?  
\_\_\_\_\_
- Set up 2 simple equations ~~expressions~~  
 $x =$  \_\_\_\_\_  
\_\_\_\_\_
- Add together to equal 350  
\_\_\_\_\_
- Solve: \_\_\_\_\_

Another one...

(Be sure to show Let  $x =$  )

There is a total of 31 kinds of burgers and sandwiches on a menu. The sandwiches total five more than the burgers. How many kinds of burgers are on the menu?  
How many sandwiches?

Another one to try:

Twice a number, divided by three,  
is fifteen.

- Let  $x =$  \_\_\_\_\_
- Write an equation:

$$\frac{\quad}{3} =$$

- Multiply both sides by 3 and get

- Divide both sides by 2 and get:

$$x = \underline{\quad}$$

## You try this one:

Melanie is 12 years old. This is 3 years less than one-third her father's age. How old is her father?



### The Problem:

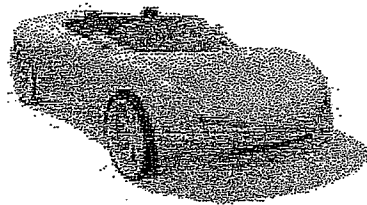
An evergreen in Sam's yard is now 78 in. tall. If it grows 6 inches each year, how many years will it take to grow to a height of 105 inches?

- You need to consider that the tree is growing 6 inches per year. What operation does this imply??

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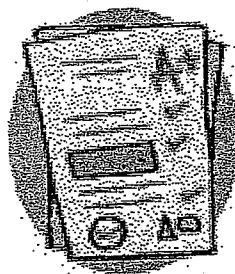
Felicia wants to buy 4 chrome wheels for her car.  
She can spend no more than \$75 per wheel. A  
local newspaper advertises 4 wheels on sale for  
\$320. They usually cost \$359. Can Felicia afford  
to buy the wheels?

TRY THIS ONE ON YOUR OWN....



Here's one you can use in your  
everyday life...

You want to have a  
93% average in math.  
Your test scores so  
far are 88%, 99%,  
93%, 82% (oops,  
forgot to study!), and  
97%. What do you  
have to get on the  
test to have that 93%  
average????



## You try one like that:

Your goal is to spend an average of 95 minutes a night studying during the week. On Monday you studied 85 mins, on Tuesday 110 mins, on Wednesday 88 mins, and on Thursday 120 mins. How many minutes must you study on Friday to keep your average of 95 minutes for the week?



## Here's another type

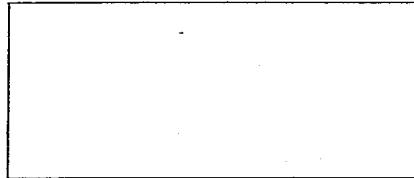
Miley is a maid. She charges \$21 an hour plus \$23 for coming. She came on Tuesday and charged \$86. For how long did she work? (By Samantha Beckwith)





**PERIMETER PROBLEMS:** Many different types. Here is one:

The perimeter of a rectangle is 36 feet. The length is twice the width. What are the length and width of the rectangle? (by Kate Letai)



A FORMULA FOR YOU TO USE:

$$\text{PROFIT} = \text{INCOME} - \text{EXPENSES}$$

Profit is how much extra you make.

Income is how much money you take in.

Expenses is how much money you spend.



Rose just started a business making and selling ice cream. She spends \$4000 for the equipment and it costs her \$3 for every ice cream cone she makes. If Rose sells each cone for \$5, how many cones does she have to sell to make a profit of \$2000?

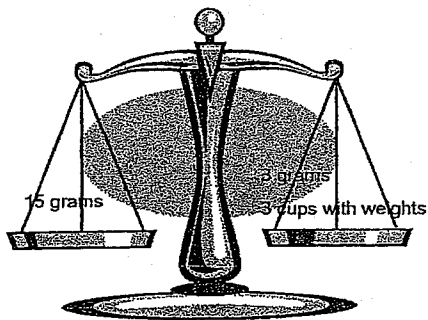


**Let's take a look at consecutive  
numbers like 3, 4, 5**

**If  $x = 3$ , then  $x + 1 = 4$  and  $x + 2 = 5$**

**Here's a problem using consecutive  
numbers:**

**3 consecutive numbers have a sum of 213. What  
is each of the numbers? (by Peter Woodsum)**



There is a balanced scale in front of you. On one side of the scale is 15 grams in weights. On the other side of the scale, there is 3 grams and 3 cups upside down with an equal weight under each cup. How many grams are under each cup? The cups don't weigh anything. (by Margaret Sullivan)