

# LET'S DO SOME WORD PROBLEMS!

Your Name: \_\_\_\_\_

Partner #1: \_\_\_\_\_

Partner #2: \_\_\_\_\_

Partner #3: \_\_\_\_\_

Directions: Study the following strategy for solving word problems. Discuss what each STEP means as a group. Then review each of the sample problems and work on the group's problems including all the STEPS from the cohort strategy!

## THE COHORT STRATEGY!

**STEP 1** Read the problem at least once carefully. Look for keywords and phrases. Determine the known and unknown quantities. Let  $x$  or another variable represent one of the unknown quantities in the problem.

**STEP 2** If necessary, write algebraic expressions for any other unknown quantities in using the variable in **STEP 1**.

**STEP 3** Write a summary of the problem as an English statement. Then write an equation based on your summary.

**STEP 4** Solve the equation.

**STEP 5** Check the solution. Ask yourself "Is my answer reasonable?"

**STEP 6** Write a sentence explaining what was asked for in the problem. Remember to include the correct units as part of the solution. (inches, square feet, cubic yards, etc. for example)

Sample Problem #1) Twelve subtracted from twice a number is  $-42$ . Find the number.

**STEP 1** Let  $x$  = the unknown number

**STEP 2** There are no other unknown quantities in the problem which allows us to skip this STEP.

**STEP 3** Twelve subtracted from twice a number is  $-42$

$$2x - 12 = -42$$

**STEP 4** Solve!

$$2x - 12 = -42$$

$$\begin{array}{r} + 12 \quad +12 \\ \hline 2x \quad = -30 \\ x = -15 \end{array}$$

**STEP 5** Check!

$$2x - 12 = -42$$

$$2 \cdot (-15) - 12 \stackrel{?}{=} -42$$

$$-30 - 12 \stackrel{?}{=} -42$$

$$-30 + (-12) \stackrel{?}{=} -42 \checkmark$$

**STEP 6** The number is  $-15$ .

Group Problem #1) Five more than four times a number is that number increased by 35. Find the number.

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6

Sample Problem # 2) Two of the most expensive movies ever made were *Titanic* and *Waterworld*. The cost to make *Titanic* exceeded the cost to make *Waterworld* by \$25 million dollars. The combined cost to make the two movies was \$375 million dollars. Find the cost of making each of these movies.

**STEP 1** Let  $x$  = the cost of making *Waterworld* in millions

**STEP 2** Then  $x + 25$  = the cost of making *Titanic* in millions

**STEP 3**

the cost of <i>Waterworld</i>	+	the cost of <i>Titanic</i>	=	total cost
$x$		$x + 25$		$= 375$

**STEP 4** Solve!

$$\begin{aligned}
 x + (x + 25) &= 375 \\
 2x + 25 &= 375 \\
 \underline{- 25 \quad -25} & \\
 2x &= 350 \\
 \frac{2x}{2} &= \frac{350}{2} \\
 x &= 175
 \end{aligned}$$

**STEP 5** Check!

$$\begin{aligned}
 x + (x + 25) &= 375 \\
 175 + (175 + 25) &\stackrel{?}{=} 375 \\
 175 + 200 &\stackrel{?}{=} 375 \\
 375 &= 375 \checkmark
 \end{aligned}$$

**STEP 6** The cost of making *Waterworld* was \$175 million and the cost of making *Titanic* was  $(x+25) = 175 + 25 = \$200$  million.

Group Problem #2) As of September 13th, the Dodgers had won 26 games more than they had lost. If the Dodgers had played 144 games up to that day, how many games had they lost and how many games had they won?

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6

Sample Problem #3) A basketball court is a rectangle with a perimeter of 86 meters. The length of the court is 13 meters longer than the width of the court. Find the width and the length of the basketball court.

**STEP 1** Let  $x$  = the width of the basketball court

**STEP 2** Then  $x + 13$  = the length of the basketball court

$$\begin{array}{ccccccc} \boxed{\text{STEP 3}} & \boxed{2 \text{ times the width}} & + & \boxed{2 \text{ times the length}} & = & \boxed{\text{the perimeter}} & \\ & 2x & & 2(x+13) & & 86 & \end{array}$$

**STEP 4** Solve!

$$2x + 2(x + 13) = 86$$

$$2x + 2x + 26 = 86$$

$$4x + 26 = 86$$

$$4x = 60$$

$$x = 15$$

**STEP 5** Check!

$$2x + 2(x + 13) = 86$$

$$2 \cdot 15 + 2(15 + 13) \stackrel{?}{=} 86$$

$$2 \cdot 15 + 2 \cdot 28 \stackrel{?}{=} 86$$

$$30 + 56 \stackrel{?}{=} 86$$

$$86 = 86 \checkmark$$

**STEP 6** The width of a basketball court is 15 meters and the length of a basketball court is 28 meters.

Group Problem #3) If the perimeter of a tennis court is 228 feet and the length is 6 feet longer than twice the width, then what are the width and the length of a tennis court?

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6

Sample Problem #4) After a 70% reduction, you purchase a pair of polarized sunglasses for \$30. What was the original price of the sunglasses before the reduction?

**STEP 1** Let  $x$  = the original price of the sunglasses

**STEP 2** There are no other unknown quantities in the problem which allows us to skip this STEP.

**STEP 3** the original price - % of the original price = reduced price

$$x - 0.70x = 30$$

**STEP 4** Solve!

$$x - 0.70x = 30$$

$$1.00x - 0.70x = 30$$

$$0.30x = 30$$

$$\frac{0.30x}{0.30} = \frac{30}{0.30}$$

$$x = 100$$

**STEP 5** Check!

$$x - 0.70x = 30$$

$$100 - 0.70 \cdot 100 \stackrel{?}{=} 30$$

$$100 - 70 \stackrel{?}{=} 30$$

$$30 = 30 \checkmark$$

**STEP 6** The original price of the polarized sunglasses was \$100.



Group Problem #4) After a 20% reduction, you purchase a television set for \$320. What was the television's price before the reduction?

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6

Sample Problem #5) The amount of runs batted in that Albert Pujols and Prince Fielder have so far this 2009 season in the National League are consecutive integers whose sum is 249. Determine the number of runs batted in that Albert Pujols has and the number of runs batted in that Prince Fielder has.

**STEP 1** Let  $x$  = the 1st integer, the runs batted in by Albert Pujols

**STEP 2** Then  $x + 1$  = the 2nd integer, the runs batted in by Prince Fielder

$$\begin{array}{rccccccc} \text{STEP 3} & \boxed{\text{rbis by Pujols}} & + & \boxed{\text{rbis by Fielder}} & = & \boxed{\text{total rbis}} & \\ & x & + & (x + 1) & = & 249 & \end{array}$$

**STEP 4** Solve!

$$x + 1(x + 1) = 249$$

$$x + x + 1 = 249$$

$$2x + 1 = 249$$

$$2x = 248$$

$$x = 124$$

**STEP 5** Check!

$$x + (x + 1) = 249$$

$$124 + (124 + 1) \stackrel{?}{=} 249$$

$$124 + 125 \stackrel{?}{=} 249$$

$$249 = 249 \checkmark$$

**STEP 6**

Albert Pujols had 124 runs batted in and Prince Fielder had  $x + 1 = 124 + 1 = 125$  runs batted in.

Group Problem #5) Two consecutive odd integers have a sum of 152. What are the integers?

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6

Group Problem #6) Can you do it without a sample problem? Payrolls for the three highest paid baseball teams (the Yankees, Red Sox, and Angels) for 2006 totaled \$418 million. If the team payroll for the Yankees was \$75 million greater than the payroll for the Red Sox and the payroll for the Red Sox was \$17 million dollars greater than the payroll for the Angels, then what was the 2006 payroll for each team?

STEP 1

STEP 2

STEP 3

STEP 4 Solve!

STEP 5 Check!

STEP 6