

## Concept: Problem Solving

Name:

- You should have completed Equations – Section 5 Part A and B: Problem Solving before beginning this handout.

### COMPUTER COMPONENT

**Instructions:** In  follow the **Content Menu** path:

**Equations > Problem Solving**

NOTE: Use the **Menu** button in order to get to the lesson where you left off.



Work through all Sub Lessons of the following Lessons **in order**:

- *Meat Mixture*
- *Coffee Mixture*
- *Rate of Work*
- *Summary – Problem Solving Using Equations*



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

### NOTES:

#### Meat Mixture

Solve the following:

Mixers Supermarket combines meat that sells for \$6.80/kg with meat that sells for \$4.40/kg. They want a 30kg mixture that sells for \$5.20/kg. *How many kilograms of each type of meat are used?*

Let \_\_\_\_\_ be the amount of \_\_\_\_\_ /kg meat.

Then \_\_\_\_\_ will be the amount of \_\_\_\_\_ /kg meat.

Fill in the table:

Meat	Amount	Value

We know the following: (*Write the equation and solve it.*)

The value of the meat at \$6.80/kg plus the value of the meat at \$4.40/kg is equal to the total value of the 30kg at \$5.10/kg

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

The amount of \$\_\_\_\_\_ /kg meat is \_\_\_\_\_ kg.

The amount of \$\_\_\_\_\_ /kg meat is \_\_\_\_\_ kg.

### Coffee Mixture

Interesting Fact:

Coffee is the second most traded commodity in the world. Oil is the first.

<http://www.gomestic.com/Consumer-Information/25-Facts-About-Coffee.42195>

I have 25kg of coffee worth \$7.00/kg. I want to add coffee worth \$5.00/kg to create a blend worth \$6.50/kg. How much should I add?

Record the steps required to answer the coffee mixture question.

Fill in the table:

Coffee	Amount	Value

### Rate of Work

To solve rate of work problems:

- (a) Determine what \_\_\_\_\_ of the job gets done in \_\_\_\_\_ hour by each person.

Mary does \_\_\_\_\_ car in an hour.

Juan does \_\_\_\_\_ car in an hour

- (b) Determine how much they can do in \_\_\_\_ hour if they work together.  
 (Hint: Add together what they can do individually.)

# of cars Mary does in one hour + # of cars Juan does in one hour = # of cars together in one hour

\_\_\_\_\_ + \_\_\_\_\_ = # of cars together in one hour

*Hint:  
Common  
Denominator*

\_\_\_\_\_ + \_\_\_\_\_ = # of cars together in one hour

\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_

- (c) To determine how long it will take to wash one car - divide one hour by how many cars they can wash in one hour.

Here is where our numbers start to make the problem look difficult. To understand what needs to be done – first use easier numbers.

If they wash 2 cars in an hour, to wash 1 car it takes  $1 \div 2 = \frac{1}{2}$  hours.

If they wash 3 cars in an hour, to wash 1 car it takes  $1 \div 3 = \frac{1}{3}$  hours.

The pattern:

If they wash  $\frac{7}{6}$  of a car in an hour, to wash 1 car it takes  $1 \div \text{---} = \text{---}$

### Another way to look at the same problem.

Let the time taken for both of them to wash one car be  $t$ .

$$\bullet \bullet \quad t \times \# \text{ of cars Mary does in 1 hour} + t \times \# \text{ of cars Juan does in 1 hour} = 1 \text{ car}$$

$$t \times \text{---} + t \times \text{---} = 1 \text{ car}$$

\_\_\_\_\_

$$t \times \text{---} + t \times \text{---} = 1 \text{ car}$$

\_\_\_\_\_

*Hint:  
Common  
Denominator*

$$t \times \frac{1}{2} + t \times \frac{1}{3} = 1 \text{ car}$$

$$t = 1 \text{ car}$$

$$\times \frac{t}{t} = 1 \text{ car} \times$$

$$t = \frac{1}{2} \text{ cars}$$

Solve for t,

*Hint:  
Multiply by the inverse.*

Working together they can wash 1 car in \_\_\_\_\_ of an hour.

### Summary: Problem Solving Using Equations

*Record the six steps in problem solving.*

**Step 1:** \_\_\_\_\_ the problem. \_\_\_\_\_ the problem.

Look for the \_\_\_\_\_.

**Step 2:** Let a \_\_\_\_\_ represent an \_\_\_\_\_ quantity.

**Step 3:** \_\_\_\_\_ any other \_\_\_\_\_ in terms of this \_\_\_\_\_.

Make a \_\_\_\_\_ in \_\_\_\_\_ and \_\_\_\_\_ questions.

Use a \_\_\_\_\_ in money problems.

Use a \_\_\_\_\_ in age problems.

**Step 4:** Write an \_\_\_\_\_. Translate from \_\_\_\_\_ to \_\_\_\_\_.

**Step 5:** \_\_\_\_\_ the equation and clearly state the \_\_\_\_\_.

**Step 6:** \_\_\_\_\_

### OFF COMPUTER EXERCISES

*Round all decimal answers to 1 decimal place.*

1. A candy store combines gum drops that sell for \$5.50/kg with gummy worms that sell for \$4.00/kg. They want to end up with 81kg of mixture that will sell for \$5.00/kg.

*How many kilograms of each type of candy should they use?*

Let  $x$  be the amount of \$5.50/kg candy used.

Then \_\_\_\_\_ will be the amount of \$4.00/kg candy used.

Fill in the table:

	Amount	Value
<b>gum drops</b> (\$5.50/kg)	$x$	
<b>gummy worms</b> (\$4.00/kg)		
<b>mixture</b> (\$5.00/kg)	81	

Solve for  $x$ .

$$\text{Value of gum drops} + \text{Value of gummy worms} = \text{value of mixture}$$

Number of kilograms of gum drops:

Number of kilograms of gummy worms:

They should use \_\_\_\_\_ of gum drops and \_\_\_\_\_ of gummy worms.

2. A gardening store combines grass seed that sells for \$2.65/kg with grass seed that sells for \$3.25/kg. The store wants a 20kg mixture that will sell for \$3.00/kg. *How many kilograms of each type of grass seed should they use*

Let  $x$  be the amount of \$2.65/kg grass seed used.

Then \_\_\_\_\_ will be the amount of \$3.25/kg grass seed used.

Solve for  $x$ .

Number of kilograms of \$2.65 grass seed: \_\_\_\_\_

Number of kilograms of \$3.25 grass seed: \_\_\_\_\_

The store should use \_\_\_\_\_ of Seed A and \_\_\_\_\_ of Seed B.

3. Sally has 22kg of white flour worth \$1.25/kg. She wants to add whole wheat flour worth \$1.75/kg to create a blend worth \$1.40/kg. *How much whole wheat flour should she add?*

Fill in the table:

Flour Type	Amount	Value
Whole Wheat Flour		
White Flour		
Blended Flour		

Let  $x$  be the amount of whole wheat flour.

Sally has \_\_\_\_\_ kg of white flour.

Then \_\_\_\_\_ will be the amount of the blend.

Solve for  $x$ .

4. Jeremy is able to pick an orchard of apples in 2 days when he works alone. Joshua is younger and is able to pick the same orchard of apples in 4 days when he works alone. They enjoy each other's company. How long would it take them if they worked together?

Let  $x$  days be the time it takes to pick the orchard if they work together.

Since Jeremy takes 2 days to pick the orchard, in 1 day he picks \_\_\_\_\_ of the orchard.

Since Joshua takes 4 days to pick the orchard, in 1 day he picks \_\_\_\_\_ of the orchard.

In  $x$  days, \_\_\_\_\_ Jeremy can pick \_\_\_\_\_ of the orchard

Joshua can pick \_\_\_\_\_ of the orchard.

So when they work together to clean the house,

Jeremy's work + Joshua's work = 1

Continue on to finish the solution.

5. Bob has 1500g nails worth \$4.45/kg. He wants to add nails worth \$4.05/kg to create a blend worth \$4.10/kg. *How many grams of the second type of nails should he add?*

*(Hint: Use a chart in money problems)*

6. If Joe works alone he can clean the house in 8 hours. Mary can clean the house alone in 6 hours. Joe and Mary decide to clean the house together. *How long will it take them?*
7. Juan can paint the house in two days when he works alone. Juanita can paint the house in three days when she works alone. *How long will it take Juan and Juanita to paint the house if they work together?*

8. It takes Max and Jennie two hours to mow the lawn when they work together. If Max works alone it takes him three hours to mow the lawn. *How long does it take Jennie to mow the lawn when she works alone?*

Interesting Fact:

The Swiss lead the world in chocolate consumption per capita. They consume roughly 22 pounds of chocolate per person per year.

[www.geocities.com/NapaValley/4908/trivia.htm](http://www.geocities.com/NapaValley/4908/trivia.htm)

9. A chocolate factory wants to combine chocolates that sell for \$5.60/kg with chocolates that sell for \$6.20/kg. They want to end up with 24kg of mixture that will sell for \$6.00/kg. *How many grams of each type should they use?*

10. Uncle Al requires a large water tank to be filled in order to plant his tomato seeds.

He has three options for filling the water tank.

Option 1: He can use a large hose ... it requires 3 minutes to fill the tank.

Option 2: He can use a small hose ... it requires 5 minutes to fill the tank.

Option 3: He can use both hoses at the same time.

*How long will it take to fill the tank using Option 3?*