

**WORD PROBLEM PRACTICE – MIXTURE PROBLEMS**

**INTRODUCTION:**

Word problems known as MIXTURE PROBLEMS consist of combining two or more things. The things you are “combining” could be any of a wide variety of things:

- Candy of two different prices (like truffles vs. soft centers at See’s Candy)
- Tickets of two different prices (like adult and children)
- Speed and distances of vehicles (planes, trains, automobiles, bicycles, canoes, etc.)
- Rates of interest of multiple investments
- More and less concentrated solutions in chemistry or medicine
- Rates of two people working on the same job together
- Values of coins or bills of more than one type put together

As you can see, there is a VERY wide variety of problems you will work with under the heading of “mixture problems.” The good news is that they all follow the same basic principles, but with minor variations. (HINT: With problems involving vehicles it is ALWAYS a good idea to draw a picture in order to understand how to set up the problem.)

**WARM-UPS:**

What is the value of 3 quarters?

What is the value of 7 twenty-dollar bills?

What is the distance a car travels after 2 hours at a rate of 60mph?

What is the cost of two adult tickets for a matinee if the tickets are each \$7.50?

What interest is earned in a year on an investment of \$100 at 2.3% (simple interest)?

What is the total amount of salt in a 2 gallon saline solution with a concentration of 50%?

What is the total amount of salt in a 7 gallon saline solution with a concentration of 50%?

What is the total amount of salt in a 7 gallon saline solution with a concentration of 23%?

**NOTE:** I will be showing you how to do all the different sorts of mixture problems using a CHART. The chart is not essential, but it is very, very helpful, and I suggest you use it until or unless you are 100% confident in doing every problem of this sort absolutely correctly. (I have been teaching math for Over 30 years, and I still use this chart when I’m working on my own!!)

1) Caleb has been saving up coins in his piggy bank. He has a total of 40 coins, all of them dimes or quarters. The total amount of money is \$7.45. How many dimes and how many quarters does he have?

Labels	Amount	Rate	Total

2) Ann invested \$12,000 in two bank accounts. One of the accounts pays 6% annual interest, and the other account pays 5% annual interest. If the combined interest earned in both accounts after a year was \$700, how much money was invested in each account?

Labels	Amount	Rate	Total

3) A pharmacist needs 100 liters of 50% alcohol solution. She has on hand 30% alcohol solution and 80% alcohol solution, which she can mix. How many liters of each will be required to make the 100 liters of 50% alcohol solution?

<b>Labels</b>	<b>Amount</b>	<b>Rate</b>	<b>Total</b>

4) A 40% dye solution is to be mixed with a 70% dye solution to get 120 liters of a 50% dye solution. How many liters of the 40% and 70% solutions are needed?

<b>Labels</b>	<b>Amount</b>	<b>Rate</b>	<b>Total</b>

5) It takes a boat 1.5 hours to go 12 miles downstream, and 6 hours to return. Find the speed of the boat in still water and the speed of the current. (HINT: We don't need the bottom row of the chart here. QUESTION: Why not?)

Labels	Amount	Rate	Total

6) A boat takes 3 hours to go 24 miles upstream. It can go 36 miles downstream in the same amount of time. Find the speed of the current and the speed of the boat in still water. (QUESTION: Do we need the bottom row of the chart?)

Labels	Amount	Rate	Total

7) A merchant wishes to mix coffee worth \$6 per pound with coffee worth \$3 per pound to get 90 pounds of a mixture worth \$4 per pound. How many pounds of the \$6 and the \$3 coffee will be needed?

Labels	Amount	Rate	Total

8) A 90% antifreeze solution is to be mixed with a 75% antifreeze solution to make 120 liters of a 78% solution. How many liters of the 90% and the 75% solutions will be used?

Labels	Amount	Rate	Total