

**Mixture Problems – Day 4**  
**Unit 5: Real World Applications**

**Solve each question. Round your answer to the nearest hundredth when needed.**

1. An acid solution was made by mixing 8 L of a 35% acid solution and 4 L of a 5% acid solution. Find the concentration of the new mixture.

25%

2. 4 lbs. of walnuts which cost \$6/lbs. were combined with 8 lbs. of peanuts which cost \$9/lbs. Find the cost per lbs. of the mixture.

\$8/lb

3. For her birthday party Heather mixed together 9 gal. of Brand A fruit punch and 10 gal. of Brand B. Brand A contains 54% fruit juice and Brand B contains 16% fruit juice. What percent of the mixture is fruit juice?

34%

4. 16 kg of mixed nuts containing 65% peanuts were mixed with 20 kg of another kind of mixed nuts that contain 20% peanuts. What percent of the new mixture is peanuts?

40%

5. How many lbs. of sliced peaches what cost \$3/lbs. must be added to 2 lbs. of sliced bananas which cost \$9/lbs. to make fruit salad which costs \$4/lbs.?

10 lbs

6. How much soil with 42% clay do you need to add to 8 ft<sup>3</sup> of soil with 54% clay in order to make a soil with 50% clay?

4 ft<sup>3</sup>

7. How any lbs. mixed nuts that contain 62% peanuts must Heather add to 8 lbs. of mixed nuts that contain 32% peanuts to make a mixture with 46% peanuts?

7 lbs

8. How many o. of a metal containing 86% platinum must be combined with 12 oz. of a metal containing 38% platinum to form an alloy containing 54% platinum?

6 oz.

9. Alberto made a nut mixture that contains 45% peanuts by mixing together 9 kg of mixed nuts that contain 70% peanuts and 15 kg of a different brand of mixed nuts. The second brand of mixed nuts contained what percent peanuts?

30%

10. What is the price per oz. of Arabica coffee beans if 4 oz. were mixed with 8 oz. of Robusta coffee beans which cost \$5/oz. to make 12 oz. of Lea's Premium Coffee Blend which costs \$8/oz.?

\$14 / oz

11. Kari mixed together 6 gal. of Brand A fruit drink and 7 gal. of apple juice. Find the percent of fruit juice in Brand A if the mixture contained 70% fruit juice.

35%

12. Joe and his brother mixed together some soil and some sand to make  $5 \text{ ft}^3$  of soil with a 90% sand content. They used  $4 \text{ ft}^3$  of sand and  $1 \text{ ft}^3$  of a soil they purchased. What was the sand content of the soil they purchased?

50%

13. To build the garden of your dreams you need  $10 \text{ ft}^3$  of soil containing 36% clay. You have two types of soil you can combine to achieve this: soil with 37% clay and soil with 27% clay. How much of each soil should you use?

9  $\text{ft}^3$  with 37% clay  
1  $\text{ft}^3$  with 27% clay

14. Jimmy's Red Hot Peanuts which cost \$3/kg are made by combining peanuts which cost \$1/kg with spices which cost \$4/kg. find the number of kg of peanuts and spices required to make 12 kg of Jimmy's Red Hot Peanuts.

4 kg of peanuts  
8 kg of spices

15. Brand X sells 14 kg bags of mixed nuts that contain 67% peanuts. To make their product they combine Brand A mixed nuts which contain 63% peanuts and Brand B mixed nuts which contain 70% peanuts. How much of each do they need to use?

6 kg of Brand A  
8 kg of Brand B

16. To build the garden of your dreams you need  $15 \text{ yd}^3$  of soil containing 18% silt. You have two types of soil you can combine to achieve this: soil with 10% silt and soil with 30% silt. How much of each soil should you use?

9  $\text{yd}^3$  with 10% silt  
6  $\text{yd}^3$  with 30% silt

17. Vegetable oil which costs \$2/kg is made by combining soybean oil which costs \$1/kg with canola oil which costs \$4/kg. Find the number of kg of soybean oil and canola oil required to make 12 kg of vegetable oil.

8 kg of soybean oil  
4 kg of canola oil

18. A metallurgist needs to make 10 kg of an alloy containing 9% silver. He is going to melt and combine one metal that is 45% silver with another metal that is 5% silver. How much of each should he use?

1 kg of 45% silver  
9 kg of 5% silver

$$\textcircled{1} \quad 8(0.35) + 4(0.05) = (8+4)(x)$$

$$2.8 + 0.2 = 12x$$

$$\frac{3}{12} = \frac{12x}{12}$$

$$0.25 = x$$

Move decimal 2 places to the right 25%

---

$$\textcircled{2} \quad 4(\$6) + 8(\$9) = (4+8)(x)$$

$$\$24 + \$72 = 12x$$

$$\frac{\$96}{12} = \frac{12x}{12}$$

$$\boxed{\$8/16 = x}$$

$$\textcircled{3} \quad 9(0.54) + 10(0.16) = (9+10)(x)$$

$$4.86 + 1.60 = 19x$$

$$\frac{6.46}{19} = \frac{19x}{19}$$

$$0.34 = x$$

Move decimal 2 places to the right 34%

---

$$\textcircled{4} \quad 16(0.65) + 20(0.20) = (16+20)(x)$$

$$10.4 + 4 = 36x$$

$$\frac{14.4}{36} = \frac{36x}{36}$$

$$0.40 = x$$

Move decimal 2 places to the right 40%

$$\textcircled{5} \quad x(\$3) + 2(\$9) = (x+2)(\$4)$$

$$\begin{array}{r} \$3x + \$18 = \$4x + \$8 \\ -3x \quad -8 \quad -3x \quad -8 \\ \hline \end{array}$$

$$\frac{\$10}{\$1} = \frac{\$1x}{\$1}$$

$$\boxed{10 \text{ lbs} = x}$$

$$\textcircled{6} \quad x(0.42) + 8(0.54) = (x+8)(0.50)$$

$$\begin{array}{r} 0.42x + 4.32 = 0.50x + 4 \\ -0.42x \quad -4 \quad -0.42x \quad -4 \\ \hline \end{array}$$

$$\frac{0.32}{0.08} = \frac{0.08x}{0.08}$$

$$\boxed{4 \text{ ft}^3 = x}$$

$$\textcircled{7} \quad x(0.62) + 8(0.32) = (x+8)(0.46)$$

$$\begin{array}{r} 0.62x + 2.56 = 0.46x + 3.68 \\ -0.46x \quad -2.56 \quad -0.46x \quad -2.56 \\ \hline \end{array}$$

$$\frac{0.16x}{0.16} = \frac{1.12}{0.16}$$

$$\boxed{x = 7 \text{ lbs}}$$

$$\textcircled{8} \quad x(0.86) + 12(0.38) = (x+12)(0.54)$$

$$\begin{array}{r} 0.86x + 4.56 = 0.54x + 6.48 \\ -0.54x \quad -4.56 \quad -0.54x \quad -4.56 \\ \hline \end{array}$$

$$\frac{0.32x}{0.32} = \frac{1.92}{0.32}$$

$$\boxed{x = 6 \text{ oz.}}$$

$$\textcircled{9} \quad 9(0.70) + 15(x) = (9 + 15)(0.45)$$

$$6.3 + 15x = 24(0.45)$$

$$6.3 + 15x = 10.8$$

$$\begin{array}{r} -6.3 \\ \hline \end{array}$$

$$\frac{15x}{15} = \frac{4.5}{15}$$

$$x = 0.30$$

move decimal 2 places to the right 30%

---

$$\textcircled{10} \quad 4(x) + 8(\$5) = (4 + 8)(\$8)$$

$$4x + \$40 = 12(\$8)$$

$$4x + \$40 = \$96$$

$$\begin{array}{r} -40 \\ \hline \end{array}$$

$$\frac{4x}{4} = \frac{\$56}{4}$$

$$x = \$14/\text{oz.}$$

---

$$\textcircled{11} \quad 6(x) + 7(1.00) = (6 + 7)(0.70)$$

$$6x + 7 = 13(0.70)$$

$$6x + 7 = 9.1$$

$$\begin{array}{r} -7 \\ \hline \end{array}$$

$$\frac{6x}{6} = \frac{2.1}{6}$$

$$x = 0.35$$

move decimal 2 places to the right 35%

---

$$\textcircled{12} \quad 4(1.00) + 1(x) = (4 + 1)(0.90)$$

$$4 + 1x = 5(0.90)$$

$$4 + 1x = 4.5$$

$$1x = 0.50$$

move decimal 2 places to the right. 50%

- ⑬ Let  $x$  = amount of 37% clay  
 Let  $y$  = amount of 27% clay

Total Equation

$$x + y = 10$$

multiply by  $-0.37$

$$-0.37x - 0.37y = -3.7$$

Mixture Equation

$$0.37x + 0.27y = 10(0.36)$$

$$0.37x + 0.27y = 3.6$$

$$\begin{array}{r} 0.37x + 0.27y = 3.6 \\ -0.37x - 0.37y = -3.7 \\ \hline -0.10y = -0.10 \\ \frac{-0.10}{-0.10} \quad \frac{-0.10}{-0.10} \\ y = 1 \text{ ft}^3 \end{array}$$

$$\begin{array}{r} x + y = 10 \\ x + 1 = 10 \\ \hline -1 \quad -1 \\ x = 9 \text{ ft}^3 \end{array}$$

9 ft<sup>3</sup> of 37% clay, 1 ft<sup>3</sup> of 27% clay

- ⑭ Let  $x$  = amount of peanuts  
 Let  $y$  = amount of spices

Total Equation

$$x + y = 12$$

multiply by  $-1$

$$-x - y = -12$$

Mixture Equation

$$\$1x + \$4y = 12(\$3)$$

$$\$1x + \$4y = \$36$$

$$\begin{array}{r} 1x + 4y = 36 \\ -x - y = -12 \\ \hline 3y = 24 \\ \frac{3y}{3} = \frac{24}{3} \\ y = 8 \text{ kg} \end{array}$$

$$\begin{array}{r} x + y = 12 \\ x + 8 = 12 \\ \hline -8 \quad -8 \\ x = 4 \text{ kg} \end{array}$$

4 kg of peanuts, 8 kg of spices

- 15) Let  $x$  = amount of Brand A  
 Let  $y$  = amount of Brand B

Total Equation

$$x + y = 14$$

multiply by  $-0.63$

$$-0.63x - 0.63y = -8.82$$

$$\begin{array}{r} 0.63x + 0.70y = 9.38 \\ -0.63x - 0.63y = -8.82 \\ \hline \end{array}$$

$$\frac{0.07y}{0.07} = \frac{0.56}{0.07}$$

$$y = 8 \text{ Kg}$$

6 kg of Brand A ; 8 Kg of Brand B

Mixture Equation

$$0.63x + 0.70y = 14(0.67)$$

$$0.63x + 0.70y = 9.38$$

$$x + y = 14$$

$$\begin{array}{r} x + 8 = 14 \\ -8 \quad -8 \\ \hline \end{array}$$

$$x = 6 \text{ kg}$$

- 16) Let  $x$  = amount of 10% silt  
 Let  $y$  = amount of 30% silt

Total Equation

$$x + y = 15$$

multiply by  $-0.10$

$$-0.10x - 0.10y = -1.5$$

$$\begin{array}{r} 0.10x + 0.30y = 2.7 \\ -0.10x - 0.10y = -1.5 \\ \hline \end{array}$$

$$\frac{0.20y}{0.20} = \frac{1.2}{0.20}$$

$$y = 6 \text{ yd}^3$$

9 yd<sup>3</sup> of 10% silt ; 6 yd<sup>3</sup> of 30% silt

Mixture Equation

$$0.10x + 0.30y = 15(0.18)$$

$$0.10x + 0.30y = 2.7$$

$$x + y = 15$$

$$\begin{array}{r} x + 6 = 15 \\ -6 \quad -6 \\ \hline \end{array}$$

$$x = 9 \text{ yd}^3$$

- ①⑦ Let  $x$  = amount of soybean oil  
 Let  $y$  = amount of canola oil

Total Equation

$$x + y = 12$$

multiply by  $-1$

$$-x - y = -12$$

$$\begin{array}{r} \cancel{x} + 4y = 24 \\ -\cancel{x} - y = -12 \\ \hline \end{array}$$

$$\frac{3y}{3} = \frac{12}{3}$$

$$y = 4 \text{ kg}$$

mixture Equation

$$\$1x + \$4y = 12 (\$2)$$

$$\$1x + \$4y = \$24$$

$$x + y = 12$$

$$x + 4 = 12$$

$$\begin{array}{r} -4 \quad -4 \\ \hline x = 8 \text{ kg} \end{array}$$

8 kg of soybean oil; 4 kg of canola oil

- ①⑧ Let  $x$  = amount of 45% silver  
 Let  $y$  = amount of 5% silver

Total Equation

$$x + y = 10$$

multiply by  $-0.05$

$$-0.05x - 0.05y = -0.50$$

$$\begin{array}{r} 0.45x + \cancel{0.05y} = 0.9 \\ -\cancel{0.05x} - \cancel{0.05y} = -0.5 \\ \hline \end{array}$$

$$\frac{0.40x}{0.40} = \frac{0.40}{0.40}$$

$$x = 1 \text{ kg}$$

Mixture Equation

$$0.45x + 0.05y = 10 (0.09)$$

$$0.45x + 0.05y = 0.9$$

$$x + y = 10$$

$$1 + y = 10$$

$$\begin{array}{r} -1 \quad -1 \\ \hline y = 9 \text{ kg} \end{array}$$

1 kg of 45% silver, 9 kg of 5% silver