

## Algebra RH

Essential Question: How do we solve word problems involving mixtures?

Do Now:

- Find the total value of 4 pounds of coffee costing \$6.25 per lb. and 6 pounds of coffee costing \$4.50 per lb.

$$4(6.25) + 6(4.50)$$

- If the two coffees are mixed, how much does the mixture weigh? *10 pounds*

- What is the price per pound of the mixture?  $[4(6.25) + 6(4.50)] \div 10$

## Mixture Word Problems

Key Idea

$$\begin{array}{ccc} \text{total value} = & \text{value of item A} & + \text{value of item B} \\ & \downarrow & \downarrow \\ & \text{unit value} \times \text{quantity} & \text{unit value} \times \text{quantity} \end{array}$$

- Grade A seeds cost \$8/lb. and Grade B seeds cost \$5/lb. How many pounds of each are needed to produce a 30 pound mixture with a total value of \$225?

	items	value	qty	total value
(25)	Grade A	8	x	8x
(5)	Grade B	5	30-x	5(30-x)

$$8x + 5(30-x) = 225$$

$$8x + 150 - 5x = 225$$

$$3x + 150 = 225$$

$$3x = 75$$

$$x = 25$$

- A mixture weighing 10 pounds consists of coffee that sold for \$6.25 per lb. and coffee that sold for \$4.50 per lb. If the mixture sold for \$5.20 per lb., how many pounds of each coffee was in the mixture?

	items	value	qty	total value
	coffee A	6.25	x	6.25x
	coffee B	4.50	10-x	4.50(10-x)

$$6.25x + 4.50(10-x) = 5.20(10)$$

$$6.25x + 45 - 4.5x = 52$$

$$1.75x + 45 = 52$$

$$1.75x = 7$$

$$x = 4$$

3. Emily mixed together 9 gal. of Brand A fruit drink and 8 gal. of Brand B fruit drink which contains 48% fruit juice. Find the percent of fruit juice in Brand A if the mixture contained 30% fruit juice.

items	value	qty	total value
Brand A	x	9	9x
Brand B	.48	8	8(.48)

$$9x + .48(8) = 17(.30)$$

$$9x + 3.84 = 5.1$$

$$9x = 1.26$$

$$x = .14$$

14% fruit juice in Brand A

4. How many pounds of candy worth \$7/lb must be mixed with 30 lbs of candy worth \$9/lb to produce a mixture that will sell for \$8.50/lb?

items	value	qty	total value
Candy A	7	x	7x
Candy B	9	30	9(30)

$$7x + 9(30) = 8.50(30+x)$$

$$7x + 270 = 255 + 8.5x$$

$$7x + 15 = 8.5x$$

$$15 = 1.5x$$

$$x = 10$$

10 pounds of Candy A,  
selling at \$7 a pound

Algebra RH

HW # \_\_\_\_\_

For each problem, define all unknowns, set up an equation and solve.

- Coffee selling at \$6.50/lb. and coffee worth \$9/lb. are mixed to produce a 40 lb. mixture worth \$7.50/lb. How many lbs. of each type of coffee were mixed?
- How many lbs. of candy worth \$12 per lb. should be mixed with candy costing \$19 per lb. to produce a 70 lb. mixture that sells for \$15 per lb?
- How many lbs. of coffee costing \$3.20 per lb. must be mixed with 18 lbs of coffee costing \$2.80 per lb. to produce a mixture costing \$2.96 per pound?
- 5 fl. oz. of a 2% alcohol solution was mixed with 11 fl. oz. of a 66% alcohol solution. Find the concentration of the new mixture.
- How many mg of a metal containing 45% nickel must be combined with 6 mg of pure nickel to form an alloy containing 78% nickel?