

Essential Question: How can we set up an equation to solve problems involving money?

Do Now: I. Fill in the Chart:

coin	value of one coin	quantity # (how many coins)	total value \$ (how much money)
quarter	25	5	125
dime	10	8	80
nickel	5	10	50
penny	1	32	32
quarter	25	$x$	$25x$
dime	10	$2x$	$10(2x) \rightarrow 20x$
nickel	5	$x+5$	$5(x+5) \rightarrow 5x+25$

II. Mrs. Huntley has 20 coins in her wallet:

- a) If she gives 12 coins to Ms. Fonseca, how many does she have left?  $20 - 12 \rightarrow 8$
- b) If she gives 15 coins to Mrs. Gizzi, how many does she have left?  $20 - 15 \rightarrow 5$
- c) If she gives  $x$  coins to Mr. Kohart, how many does she have left?  $20 - x$

### COIN PROBLEMS

- 1) Jack has 5 more dimes than quarters in his pocket. The total amount of money in his pocket is \$1.55. How many of each coin does he have in his pocket?

	value per coin (value of one coin)	quantity (how many)	total value (how much money)
8	10	$x+5$	$10(x+5)$
3	25	$x$	$25x$

} = 155 cents

$$10(x+5) + 25x = 155$$

$$10x + 50 + 25x = 155$$

$$35x + 50 = 155$$

$$35x = 105$$

$$x = 3$$

quick check =

8 dimes .80

3 quarters .75

total \$1.55

Procedure:

- 1) Set up a table to organize information.
- 2) Write an equation relating the information.
- 3) Solve the equation.
- 4) Answer the question.
- 5) Check for reasonableness.

*Helpful Hint: Create an equivalent equation without decimals by multiplying by 100 on both sides of the equation!*

Multiplication Property of Equality

- 2) John has 10 coins made up of dimes and quarters worth a total of \$1.45. How many coins of each type does he have?

	value per coin	quantity	total value \$	
7	dimes	10	X	10X
3	quarters	25	10 - X	25(10 - X)

$$10X + 25(10 - X) = 145$$

$$10X + 250 - 25X = 145$$

$$250 - 15X = 145$$

$$-15X = -105$$

$$X = 7$$

- 3) Mr. Jones has nickels, dimes and quarters worth \$3.20 in his piggy bank. There are three times as many quarters as nickels and 5 more dimes than nickels. How many coins of each kind are there? **Set up only!**

	value per coin	quantity	total value	
3	nickels	5	X	5X
8	dimes	10	X + 5	10(X + 5)
9	quarters	25	3X	25(3X)

$$5X + 10(X + 5) + 25(3X) = 320$$

$$5X + 10X + 50 + 75X = 320$$

$$90X + 50 = 320$$

$$90X = 270$$

$$X = 3$$

Can we apply the "coin concept" to other types of problems?



- 4) Barry bought 25 stamps. Some stamps are worth 20 cents each while others are worth 5 cents each. If the total value of the stamps is \$3.65, how many stamps of each kind did Barry buy?

	value per stamp	quantity	total value	
(9) .05 stamps	5	x	5x	$5x + 20(25-x) = 365$
(16) .20 stamps	20	25 - x	20(25-x)	$5x + 500 - 20x = 365$
				$-15x + 500 = 365$
				$-15x = -135$
				$x = 9$

- 5) A ticket booth for a local community theater charged \$3.00 for an adult ticket and \$2.00 for a child ticket for the upcoming play. During one production, the number of child tickets sold was 10 more than twice the number of adult tickets sold. The total sales from tickets for the evening was \$370. How many adult tickets were sold?

	value per ticket	qty	total value	
(50) adult tickets	3	x	3x	$3x + 2(2x + 10) = 370$
(110) children tickets	2	2x + 10	2(2x + 10)	$3x + 4x + 20 = 370$
				$7x + 20 = 370$
				$7x = 350$
				$x = 50$

- 6) John earns money after school by babysitting and tutoring. He charges \$12.50 an hour for babysitting and \$25 an hour for tutoring. Over a two-week period, John worked 35 hours and earned a total of \$612.50. How many hours did he spend tutoring? How many hours did he spend babysitting? Set up only!

$h$  = number of hours babysitting  
 $35 - h$  = number of hours tutoring

$$\begin{array}{ccccccc}
 12.50h & + & 25(35-h) & = & 612.50 \\
 \uparrow & & \uparrow & & \uparrow \\
 \text{amount per} & & \text{value} & & \text{total} \\
 \text{one hour} & & \text{for one hour} & & \text{value} \\
 \uparrow & & \uparrow & & \\
 \text{number} & & \text{number of} & & \\
 \text{of hours} & & \text{hours} & & 
 \end{array}$$

**TAKE AWAY**

A table can be used to help organize information in a problem. The key concept to remember from today's problems is...

value per one × quantity = total value (\$)