

Input/Output Practice Worksheet

NAME \_\_\_\_\_ Date \_\_\_\_\_

Find a rule. Write the rule as an equation. Use the equation to complete the pattern.

<b>1</b>	Rule:	
	Equation:	
	Input	Output
	x	y
	6	12
	14	
	9	15
	11	17

<b>2</b>	Rule:	
	Equation:	
	Input	Output
	a	b
	18	10
	9	1
	12	4
	15	

<b>3</b>	Rule:	
	Equation:	
	Input	Output
	r	k
	45	39
	27	
	18	12
	21	15

<b>4</b>	Rule:	
	Equation:	
	Input	Output
	t	m
	13	
	8	20
	17	29
	3	15

Use the rule and equation to make an Input/Output table.

<b>5</b>	Rule: Add 8	
	Equation: $t + 8 = p$	
	Input	Output

<b>6</b>	Rule: Subtract 3	
	Equation: $w - 3 = t$	
	Input	Output

# Linear Relationships in the Form $y = mx + b$

Q. How do you use tables and verbal descriptions to describe a linear relationship?

A. Look at the \_\_\_\_\_ in a table to show that as 1 quantity changes by a \_\_\_\_\_ amount, the other quantity also changes by a \_\_\_\_\_ amount. Then put the pattern into \_\_\_\_\_ to describe the linear relationship.

## Vocab

\_\_\_\_\_ A relationship between 2 quantities in which 1 variable changes by a constant amount as the other variable changes by a constant amount

**A man's shoe size is approximately 3 times his foot length in inches minus 22. Use a table to represent the relationship between foot length and shoe size.**

### Example 1

**STEP 1** Make a table. Label the top row Foot length (in.) and the bottom row Shoe size.

**STEP 2** Enter some foot lengths in inches. Since it is impossible to have a negative shoe size, pick a foot length that when multiplied by 3 will be greater than 22.

Think:

$3 \times 7 = 21$   $21 - 22 = -1$ ; this cannot be a man's shoe size.

$3 \times 8 = 24$   $24 - 22 = 2$ ; start the table at 8 inches.

Remember that a man's shoe size is 3 times his foot length in inches minus 22.

**STEP 3** Make a table relating foot length to shoe size.

Foot length (in.)	8	9	10	11	12
Shoe size	2	5	8	11	14

Lea's house is 350 meters from her friend's house. Lea walks to her friend's house at a constant rate of 50 meters per minute. Use a table to represent the relationship between time and the distance Lea has left to walk to her friend's house.


# Linear Relationships in the Form $y = mx + b$

Q. How do you use tables and verbal descriptions to describe a linear relationship?

A. Look at the Patterns in a table to show that as 1 quantity changes by a constant amount, the other quantity also changes by a constant amount. Then put the pattern into words to describe the linear relationship.

## Vocab

Linear relationship A relationship between 2 quantities in which 1 variable changes by a constant amount as the other variable changes by a constant amount

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**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

**Reading Strategies: Find a Pattern**

When the rate of change in a relationship is a constant, the relationship is a linear relationship. You can analyze patterns to decide whether a relationship is or is not a linear relationship.

A grocer received a shipment of oranges. The table below shows the weight for various numbers of oranges.

<b>Number of Oranges</b>	8	12	16	20	24	28
<b>Weight (lb)</b>	5	$7\frac{1}{2}$	10	$12\frac{1}{2}$	15	$17\frac{1}{2}$

Look for a pattern of changes in each row.

<b>Number of Oranges</b>	x	8	12	16	20	24	28
<b>Weight (lb)</b>	y	5	$7\frac{1}{2}$	10	$12\frac{1}{2}$	15	$17\frac{1}{2}$

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Each increases by 4.

Each increases by  $2\frac{1}{2}$ .

For each increase of 4 in  $x$  there is an increase of  $2\frac{1}{2}$  in  $y$ , so the relationship is a linear relationship.

To find the rate of change, find:  $\frac{\text{rate of change of } y}{\text{rate of change of } x} = \frac{2\frac{1}{2}}{4} = 2\frac{1}{2} \div 4 = \frac{5}{2} \cdot \frac{1}{4} = \frac{5}{8}$

The rate of change is  $\frac{5}{8}$  pound for each orange.

Use the table below to answer each question.

A worker made the table below to show that the amount earned depends on how many hours are worked.

<b>Hours Worked</b>	x	3	6	9	12	15
<b>Amount Earned (\$)</b>	y	51	102	153	204	255

1. What is the change in hours worked? \_\_\_\_\_
2. What is the change in amount earned? \_\_\_\_\_
3. Does the table show a linear relationship? How can you tell?  
\_\_\_\_\_

**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

*Success for English Learners*

**Problem 1**

Ron earns money for delivering flyers. The table shows the relationship between the number of flyers he delivers and the money he earns.

<b>Flyers Delivered</b>	100	200	300	400	500
<b>Amount Earned</b>	\$10	\$15	\$20	\$25	\$30

Describe in words the amount Ron will earn based on the number of flyers delivered.

		$+100$	$+100$	$+100$	$+100$	
<b>Flyers Delivered</b>	100	200	300	400	500	
<b>Amount Earned</b>	\$10	\$15	\$20	\$25	\$30	
		$+\$5$	$+\$5$	$+\$5$	$+\$5$	

Each increase is 100.

Each increase is \$5.

How much for 1 flyer  
 $\$5 \div 100 = \$0.05$

Ron earns \$0.05 for every flyer delivered **plus** an additional \$5 for the job.

**Problem 2**

Kayla charges \$10 for transportation plus \$17 per hour for cleaning offices. Make a table to show how much Kayla would earn based on the number of hours worked.

Tell what each row represents.

Think: Amount charged equals \$10 plus \$17 per hour

<b>Number of Hours</b>	1	2	3	4	5
<b>Amount Charged</b>	$10 + 17 \cdot 1$ \$27	$10 + 17 \cdot 2$ \$44	$10 + 17 \cdot 3$ \$61	$10 + 17 \cdot 4$ \$78	$10 + 17 \cdot 5$ \$95

**Solve.**

- You charge a planning fee plus an hourly rate for home-decorating. First, read the information in the table below. Then, describe in words the amount you will charge based on the number of hours.

<b>Number of Hours</b>	2	4	6	8	10
<b>Amount Charged</b>	\$120	\$190	\$260	\$330	\$400

**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

***Practice and Problem Solving: D***

Use the description below for Exercises 1–3. The first one is done for you.

It costs \$5 to get into the carnival grounds. Then it costs \$2 for each ride.

1. Leona went to the carnival. She paid to get in and rode 8 rides. How much did Leona spend?

$$\$5 + \$2 \cdot 8 = \$5 + \$16 = \$21$$


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2. Newton went to the carnival. He paid to get in and rode 2 rides. How much did Newton spend?
- 

3. In the table below, show the relationship between the number of carnival rides taken and the amount spent.

<b>Number of Rides</b>	1	2	3	4	5
<b>Amount Spent</b>					

Use the description below for Exercises 4–7. The first one is done for you.

A youth group rakes leaves to raise money. The group charges a flat fee plus a certain amount for each bag filled. The table below shows the amounts charged.

<b>Number of Bags Filled</b>	2	4	6	8	10
<b>Amount Charged</b>	\$11	\$17	\$23	\$29	\$35

4. What is the difference between the amount charged for filling 2 bags and for filling 4 bags? What is the amount charged for filling 1 bag?

$$\$17 - \$11 = \$6; \$6 \div 2 = \$3$$


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5. Use the information in the table. What is the amount of the flat fee?
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6. Based on the answers to Exercises 4 and 5, how much should the youth group charge if they fill 15 bags of leaves?
- 

7. Give a verbal description of the relationship between the amount charged and the number of bags filled.
-

**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

**Practice and Problem Solving: A/B**

**Solve.**

1. When Mack babysits, he charges \$8 an hour plus bus fare. The amount Mack is paid depends on the number of hours he babysits.
  - a. If Mack babysits for 1 hour and the bus fare is \$2.50, how much will Mack be paid? \_\_\_\_\_
  - b. If Mack babysits for 4 hours and the bus fare is \$2.50, how much will Mack be paid? \_\_\_\_\_
  - c. The bus fare for one job is \$2.50. In the table below, show the relationship between the number of hours Mack babysits and the amount he gets paid.

<b>Number of Hours</b>					
<b>Amount Paid</b>					

2. A pipe is draining water from a tank. The table below shows the time in minutes and the number of gallons remaining in the tank.

<b>Time (min)</b>	5	10	15	20	25
<b>Amount in Tank (gal)</b>	300	260	220	180	140

- a. How many gallons drain from the tank in 5 minutes? \_\_\_\_\_
- b. Based on your answer to Exercise 2a, how many gallons will drain from the tub in one-half hour? \_\_\_\_\_
- c. Give a verbal description of the relationship between the number of minutes and the amount of water in the tank.

\_\_\_\_\_

\_\_\_\_\_

- d. Based on the information in the table, how many gallons of water were in the tank before the draining started? \_\_\_\_\_
- e. Based on the information in the table, how long will it take to empty all the water from the tank? \_\_\_\_\_

**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

**Reading Strategies: Find a Pattern**

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The rate of change is  $\frac{5}{8}$  pound for each orange.

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<b>Hours Worked</b>	<i>x</i>	3	6	9	12	15
<b>Amount Earned (\$)</b>	<i>y</i>	51	102	153	204	255

1. What is the change in hours worked? 3
2. What is the change in amount earned? 51
3. Does the table show a linear relationship? How can you tell?

Yes Each increase of 3 hours has an increase of \$51



**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**   
**Success for English Learners**

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<b>Flyers Delivered</b>	100	200	300	400	500	
<b>Amount Earned</b>	\$10	\$15	\$20	\$25	\$30	
		<b>+\$5</b>	<b>+\$5</b>	<b>+\$5</b>	<b>+\$5</b>	

Each increase is 100.

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How much for 1 flyer  
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Ron earns \$0.05 for every flyer delivered plus an additional \$5 for the job.

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<b>Amount Charged</b>	\$120	\$190	\$260	\$330	\$400

*\$35 per hour w/ a \$50 planning fee charge.*

**LESSON**  
**7-1**

**Linear Relationships in the Form  $y = mx + b$**

**Practice and Problem Solving: D**

Use the description below for Exercises 1–3. The first one is done for you.

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1. Leona went to the carnival. She paid to get in and rode 8 rides. How much did Leona spend?

$$\$5 + \$2 \cdot 8 = \$5 + \$16 = \$21$$

2. Newton went to the carnival. He paid to get in and rode 2 rides. How much did Newton spend?

$$\$5 + \$2 \cdot 2 = 5 + 4 = \$9$$

3. In the table below, show the relationship between the number of carnival rides taken and the amount spent.

Number of Rides	1	2	3	4	5
Amount Spent	7	9	11	13	15

Use the description below for Exercises 4–7. The first one is done for you.

A youth group rakes leaves to raise money. The group charges a flat fee plus a certain amount for each bag filled. The table below shows the amounts charged.

Number of Bags Filled	2	4	6	8	10
Amount Charged	\$11	\$17	\$23	\$29	\$35

4. What is the difference between the amount charged for filling 2 bags and for filling 4 bags? What is the amount charged for filling 1 bag?

$$\$17 - \$11 = \$6; \$6 \div 2 = \$3$$

5. Use the information in the table. What is the amount of the flat fee?

$$\$11 - \$6 = \$5$$

6. Based on the answers to Exercises 4 and 5, how much should the youth group charge if they fill 15 bags of leaves?

$$15 \times 3 = 45 + 5 = 50$$

7. Give a verbal description of the relationship between the amount charged and the number of bags filled.

\$5 fee and \$3 per bag is charged