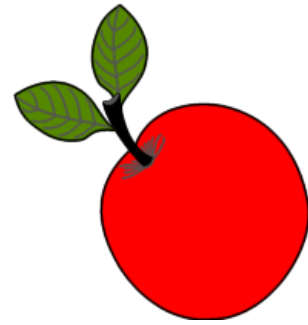
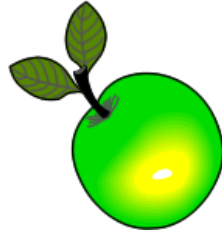


## Lesson 20: Writing and Evaluating Expressions—Multiplication and Division



### Classwork

#### Exercises

1. The farmers' market is selling bags of apples. In every bag, there are 3 apples.
- a. Complete the table.



Number of Bags	Total Number of Apples
1	3
2	6
3	9
4	12
$B$	$B \cdot 3$ or $3 \cdot B$ or $3B$

Mar 4-5:34 AM

- b. What if the market had 25 bags of apples to sell? How many apples is that in all?

$$75 \text{ apples} \quad 25 \cdot 3 = 75$$

- c. If a truck arrived that had some number,  $a$ , more apples on it, then how many bags would the clerks use to bag up the apples?

$$a \div 3$$

- d. If a truck arrived that had 600 more apples on it, how many bags would the clerks use to bag up the apples?

$$600 \div 3 = 200 \text{ bags}$$

- e. How is part (d) different from part (b)?

~~A~~ you are dividing because you are deciding how many bags.

B you are multiplying to find how many apples.



Mar 4-5:36 AM

2. In New York State, there is a five-cent deposit on all carbonated beverage cans and bottles. When you return the empty can or bottle, you get the five cents back.
- a. Complete the table.



Number of Containers Returned	Refund in Dollars
1	0.05
2	0.10
3	0.15
4	0.20
10	0.50
50	2.50
100	5.00
$C$	$C \cdot 0.05$ or $0.05C$



$$\begin{array}{r} 50 \\ \times 0.05 \\ \hline 250 \end{array}$$

- b. If we let  $C$  represent the number of cans, what is the expression that shows how much money is returned?

Mar 4-5:37 AM

- c. Use the expression to find out how much money Brett would receive if he returned 222 cans.

$$222 \cdot 0.05 = \$11.10$$

$$\begin{array}{r} 222 \\ \times 0.05 \\ \hline 11.10 \end{array}$$

- d. If Gavin needs to earn \$4.50 for returning cans, how many cans does he need to collect and return?

$$4.50 \div 0.05 = 90 \text{ cans}$$

- e. How is part (d) different from part (c)?

D we divide

C we multiplied

Mar 4-5:38 AM

3. The fare for a subway or a local bus ride is \$2.50.

a. Complete the table.



Number of Rides	Cost of Rides in Dollars
1	
2	
3	
4	
5	
10	
30	
$R$	

b. If we let  $R$  represent the number of rides, what is the expression that shows the cost of the rides?

Mar 4-5:39 AM

4. A pendulum swings through a certain number of cycles in a given time. Owen made a pendulum that swings 12 times every 15 seconds.

a. Construct a table showing the number of cycles through which a pendulum swings. Include data for up to one minute. Use the last row for  $C$  cycles, and write an expression for the time it takes for the pendulum to make  $C$  cycles.

# of Cycles( $C$ )	Time in Sec
12	15
24	30
36	45
48	60
$C$	$\frac{15C}{12}$

$$\begin{array}{r} 15 \cdot 16 \\ \hline 12 \\ \hline 15C \\ \hline 12 \end{array}$$

b. Owen and his pendulum team set their pendulum in motion and counted 16 cycles. What was the elapsed time?

16 20 seconds

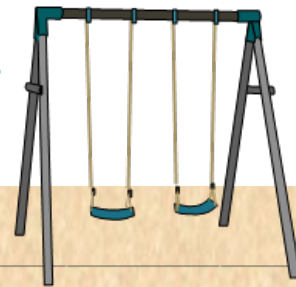
Mar 4-5:40 AM

- c. Write an expression for the number of cycles a pendulum swings in  $S$  seconds.

$$\frac{12}{15} S$$

- d. In a different experiment, Owen and his pendulum team counted the cycles of the pendulum for 35 seconds. How many cycles did they count?

$$\frac{12}{15} \cdot 35 = 28 \text{ cycles}$$



Mar 4-5:41 AM

### Problem Set

- A radio station plays 12 songs each hour. They never stop for commercials, news, weather, or traffic reports.
  - Write an expression describing how many songs are played by the radio station in  $H$  hours.
  - How many songs will be played in an entire day (24 hours)?
  - How long does it take the radio station to play 60 consecutive songs?
- A ski area has a high speed lift that can move 2,400 skiers to the top of the mountain each hour.
  - Write an expression describing how many skiers can be lifted each hour.
  - How many skiers can be moved to the top of the mountain in 14 hours?
  - How long will it take to move 3,600 skiers to the top of the mountain?
- Polly writes a magazine column, for which she earns \$35 per hour. Create a table of values that shows the relationship between the number of hours that Polly works,  $H$ , and the amount of money Polly earns in dollars,  $E$ .


Mar 4-5:42 AM

- If you know how many hours Polly works, can you determine how much money she earned? Write the corresponding expression.
- Use your expression to determine how much Polly earned after working for  $3\frac{1}{2}$  hours.
- If you know how much money Polly earned, can you determine how long she worked? Write the corresponding expression.
- Use your expression to determine how long Polly worked if she earned \$52.50.

Mar 4-5:43 AM

**Exit Ticket**

- Anna charges \$8.50 per hour to babysit. Complete the table and answer the questions below.

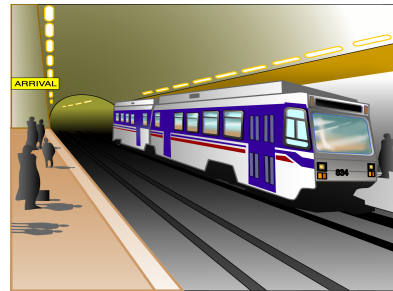
Number of Hours	Amount Anna Charges in Dollars
1	
2	
5	
8	
$H$	

- Write an expression describing her earnings for working  $H$  hours.
- How much will she earn if she works for  $3\frac{1}{2}$  hours?
- How long will it take Anna to earn \$51.00?



Mar 4-5:43 AM

- c. Use the expression to find out how much money 60 rides would cost.
- d. If a commuter spends \$175.00 on subway or bus rides, how many trips did the commuter take?



- e. How is part (d) different from part (c)?

Mar 4-5:39 AM