

## 5.3 RATES

### ESSENTIAL QUESTION:

what is a unit rate and how do you find one?

If one large pizza costs 8 dollars, how much would 4 cost? It would cost \$32.

$$8 \times 4 = 32$$

If you could do 40 jumping jacks in one minute, how many could you do in 5 minutes?

$$40 \times 5 = 200$$

You could do

If you earn 5 dollars for mowing one lawn, how much would you earn for mowing 7 lawns?

$$5 \times 7 = 35 \quad \text{You would earn \$35.}$$

The answers to the three questions we just answered are examples of rates.

A rate is a special type of ratio that compares quantities that aren't measured the same.

Some examples of rates are:

100 beats in 6 seconds

\$22.50 for 4 movie tickets

130 miles on 5 gallons

work 240 hours in 12 weeks

\$5.61 for 3 pounds

Let's suppose your parent's car can go 180 miles on 9 gallons of gas. How many miles can your parent's car go on 1 gallon of gas?

$$\begin{array}{r} 20 \\ 9 \overline{)180} \\ \underline{-180} \\ 0 \end{array}$$

Your parent's car can go 20 miles per gallon

What we have just done is find what is called a unit rate.

A unit rate is a rate (ratio) that compares a quantity to one unit of another quantity using the word per

PER means 1.

### FINDING UNIT RATES EXAMPLES

Jackson made 252 phone calls in 12 days. What is the average number of phone calls he made in a day?

$$\begin{array}{r} 21 \\ 12 \overline{)252} \\ \underline{-24} \phantom{0} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

Jackson can make 21 phone calls per day.

A skydiver falls 456 feet in three seconds. How far does the skydiver fall per second?

$$\begin{array}{r} 152 \\ 3 \overline{)456} \\ \underline{-3} \phantom{0} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$

The skydiver falls 152 feet per second.

If 192 students can fit in 4 buses, how many students can fit in one bus?

$$\begin{array}{r} 48 \\ 4 \overline{) 192} \\ \underline{-160} \phantom{0} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

You can fit 48 students per bus.

A chef buys 6 pounds of salmon fillets for \$51. How much will the chef pay for 9 more pounds of salmon fillets?

① Find the unit rate



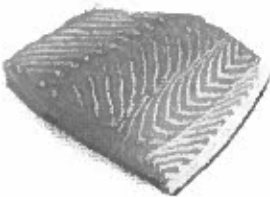
$$\begin{array}{r} 8.5 \\ 6 \overline{) \$11.0} \\ \underline{-48} \phantom{0} \\ 30 \\ \underline{\times 30} \end{array} \quad \begin{array}{l} \$8.50 \\ \text{per pound} \end{array}$$

↖ Multiply  
 $8.50 \times 9$

$$\begin{array}{r} 8.50 \\ \times 9 \\ \hline 16.50 \end{array}$$

The chef will pay \$16.50 for 9 more pounds.

You buy 2 pounds of tilapia fillets for \$16. What is the cost for 7 pounds of tilapia fillets?



Find the unit rate

$$\begin{array}{r} 8 \\ 2 \overline{) 16} \\ \underline{16} \\ 0 \end{array}$$

8 dollars per pound

↖ Multiply  
 $7 \times 8 = 56$

7 pounds will cost \$56.