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?

$8 \times 4 = 32$ *It would cost $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 200 jumping jacks*

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

$5 \times 7 = 35$ *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   work 240 hours in 12 weeks

$22.50 for 4 movie tickets   *$5.61 for 3 pounds*

136 miles on 5 gallons

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?

$9 \overline{) 180}$ *Your parent's car*
$ 18$ *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 __one__.

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?

$\begin{array}{r} 21 \\ 12 \overline{) 252} \\ -24 \\ \hline 12 \\ 12 \end{array}$ *Jackson can make 21 phone calls per day.*

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

$\begin{array}{r} 152 \\ 3 \overline{) 456} \\ -3 \\ \hline 15 \\ 15 \\ \hline 06 \\ 6 \end{array}$ *The skydiver falls 152 feet per second.*

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

```
      48
  4 )192
    -16↓
      32
     -32
       0
```

You can fit 48 students per bus

If 50 pounds of pet food cost $37.99, how much does 1 pound cost?

```
       .7598
 50 )37.9900
     35 0
      2 99
      2 50
        490
        450
        400
       -400
          0
```

Round to nearest hundredth .76

It cost .76¢ per pound.

Sam earned $343.75 for working 25 hours last week. How much does he get paid per hour?

```
      13.75
 25 )343.75
    -25↓
     93
    -75↓
     187
     175
      25
      25
       0
```

Sam gets paid $13.75 per hour.

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

Find unit rate
```
      8.5
  6 )51 0
     48↓
      30
      30
       0
```

8.50 per pound

Multiply 9 x 8.50
```
   8.50
  x .9
  76.50
```
Nine ponds will cost $76.50.

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

Find unit rate
```
     8
 2 )16
   -16
     0
```
8 dollars per pound.

Multiply 7 x 8 = 56

7 pounds will cost $56.