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Unit 6.3, Family Resource

Unit 3 Summary

Prior Learning	Math 6, Unit 3	Future Learning
Grades 2–5 • Measuring length, volume, mass, or weight • Multiplication as scaling • Multiplication of fractions and decimals Math 6, Unit 2 • Introduction to ratios	• Units and measurement • Unit rates • Percentages	Math 6, Unit 5 • Operations with decimals Math 7, Unit 4 • Proportional relationships • Percent increase and decrease

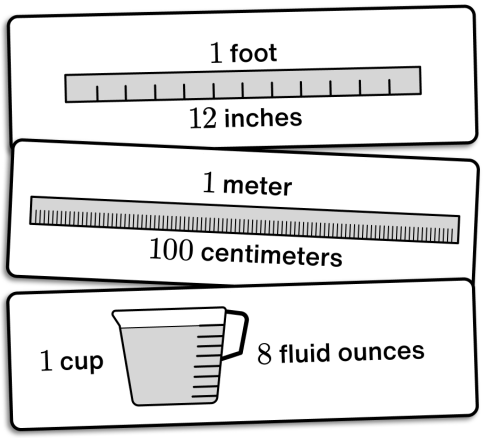
Units and Measurement

Sometimes, measurements are given in one unit and they would be more helpful in a different unit.

When converting, it can be helpful to think about which unit is larger. For example, one foot is larger than one inch, so you would need more inches to measure the same length.

Since there are 12 inches in a foot, you can convert from feet to inches by multiplying by 12.

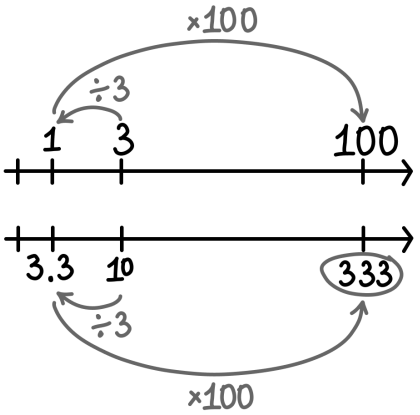
You can convert from inches to feet by multiplying by $\frac{1}{12}$.



Sometimes the conversions aren't as neat.

If you want to know how many feet a 100-meter race is, you can use the relationship 3 meters $\approx$ 10 feet.

You can use the ratio strategies from the previous unit, like making a double number line diagram or a table, to convert 100 meters to feet.



100 meters $\approx$ 333 feet

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Unit Rates

A *unit rate* is a ratio expressed as something "per 1." Every ratio has two unit rates.

For example, a parking meter says the price is $3 for 60 minutes.

You can use a double number line or table to determine two unit rates for this situation:

20 minutes per dollar and $0.05 per minute

Dollars	Time (min.)
3	60
1	20

(÷3 between Dollars; ÷3 between Time)

Dollars	Time (min.)
3	60
0.05	1

(÷60 between Dollars; ÷60 between Time)

Different unit rates are useful depending on the problem you're solving.

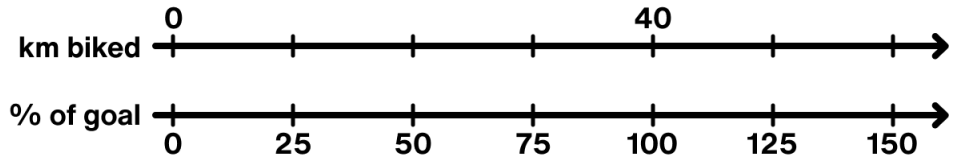
- If you have $1.35 in your pocket, you can get $1.35 \cdot 20 = 27$ minutes of parking.
- If you need 45 minutes of parking, you should pay the meter $45 \cdot 0.05 = \$2.25$.

Percentages

Unit rates are "rates per 1." *Percentages* are "rates per 100." For example, 5% means 5 per 100.

You can use ratio strategies like tape diagrams, double number lines, and tables to reason about percentages.

For example, if Binta's goal is to ride 40 kilometers, you can create a double number line where 40 kilometers lines up with 100%. Then, 50% of the ride is 20 kilometers, 75% is 30 kilometers, etc.



For more complicated percentages, expressions can help. To calculate 83% of 40 kilometers, you can first calculate 1% of 40 ($\frac{40}{100}$) and then multiply by 83. In all, $\frac{40}{100} \cdot 83 = 33.2$ kilometers.

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Try This at Home

Units and Measurement

10 kilograms weighs about the same as 22 pounds.

1.1 Which is heavier: 1 pound or 1 kilogram?

1.2 A canoe weighs 88 pounds. About how many kilograms does it weigh?

1.3 A watermelon weighs 13 kilograms. About how many pounds does it weigh?

Unit Rates

A store sells a 12-ounce bag of pistachios for $15.

2.1 What is the cost **per ounce**?

2.2 How many ounces of pistachios do you get **per dollar**?

2.3 Customers may choose to buy pistachios in other amounts at the same rate. How much would 17 ounces of pistachios cost?

2.4 How many ounces of pistachios can you buy for $7?

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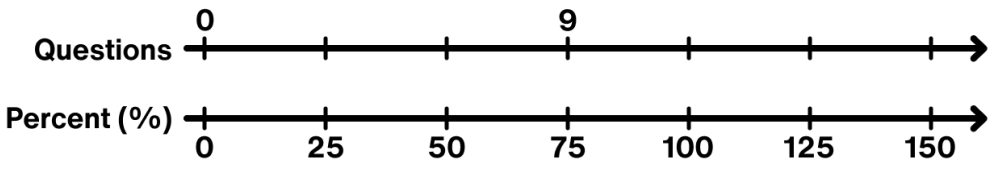
Percentages

3. Arturo gets a burger and fries for $\$12$. He wants to give a 20% tip. How much is the tip?

4. Sadia got 75% of the questions right in a trivia game. If she got 9 questions right, how many questions are in the game? Use the double number line if it helps with your thinking.



5. Chloe set a goal to run 8 miles. She ended up running 12 miles. What percent of her goal did she run? Make a double number line if it helps with your thinking.

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Solutions:

1.1 1 kilogram

1.2 About 40 kilograms

1.3 About 28.6 pounds

2.1 $1.25 per ounce

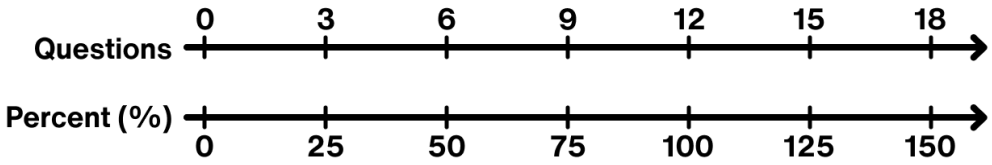
2.2 0.8 ounces per dollar

2.3 $21.25

2.4 5.6 ounces

3. $2.40

4. 12 questions



5. 150%