First 5 Minutes — Review Question

GRADE 6 • TOPIC 5 • LESSON 5.5 | 5 points • Work independently

Lesson 5.5 • Understand Rates and Unit Rates

Find 3:12 in simplest form.

1. Show each step in your notebook.
2. Explain the operation or rule you used.

Real-Life Connection & Key Concepts

Essential question

What are rates and unit rates?

Solve & Discuss It!

Fruit juice is sold 4 bottles for $10. What is the cost of 10 bottles? How can a table or a diagram help you?

What we will learn

Write rates with units; find equivalent rates and unit rates; interpret both directions of a comparison.

Definitions & rules

Rate: a ratio that compares quantities with different units.

Unit rate: rate with a denominator of 1.

Always write the units; reversing the rate changes its meaning.

Example 1 — Understand Rates and Unit Rates

GRADE 6 • TOPIC 5 • LESSON 5.5 | Guided example • Model and explain

Problem

A race car travels 10 km in 3 minutes. At the same rate, how long will it take to travel 25 km?

Worked solution

25 ÷ 10 = 2.5.

3 × 2.5 = 7.5 minutes.

10 km/3 min = 25 km/7.5 min.

Distance (km)	5	10	15	20	25
Time (min)	1.5	3	4.5	6	7.5

Divide to obtain a rate per one unit; then multiply or divide to find the unknown.

Example 2 — Understand Rates and Unit Rates

GRADE 6 • TOPIC 5 • LESSON 5.5 | Guided example • Model and explain

Problem

Harvest Market sells a 15-pound crate of Fuji apples for $12. Find two unit rates that describe the situation.

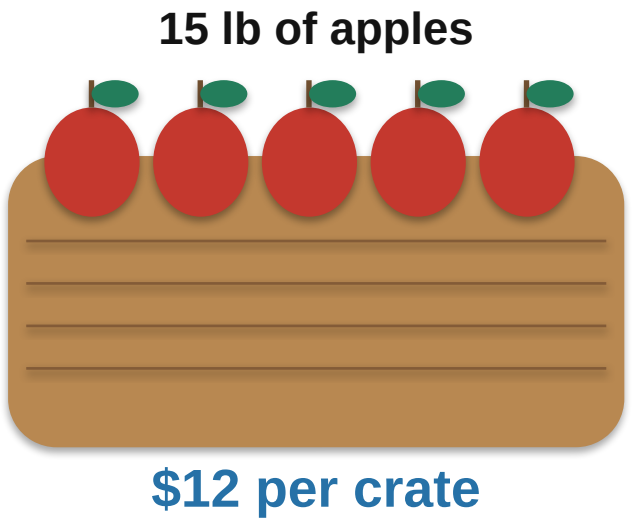
Worked solution

15 ÷ 12 = 1.25 lb per dollar.

12 ÷ 15 = $0.80 per pound.

The units tell us which quantity is per 1.

Divide to obtain a rate per one unit; then multiply or divide to find the unknown.



Example 3 — Understand Rates and Unit Rates

GRADE 6 • TOPIC 5 • LESSON 5.5 | Guided example • Model and explain

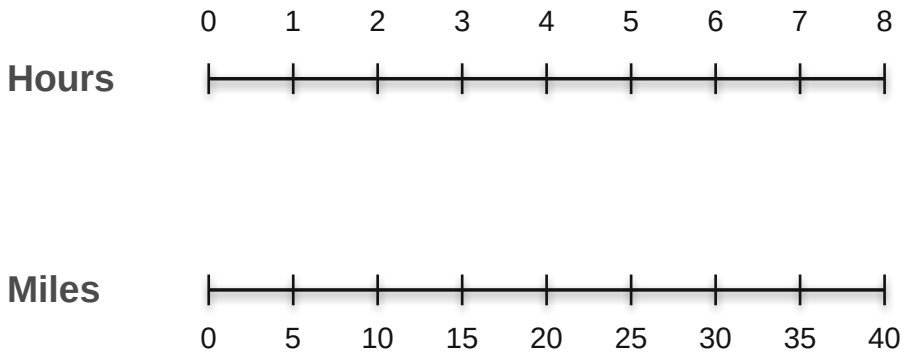
Problem

A family bicycles 25 miles in 5 hours. How far can they travel in 8 hours at the same speed?

Worked solution

25 ÷ 5 = 5 miles per hour.

5 × 8 = 40 miles.



Divide to obtain a rate per one unit; then multiply or divide to find the unknown.

Each tick pair has the same ratio.

Individual Work

GRADE 6 • TOPIC 5 • LESSON 5.5 | 10 minutes total • 10 points

Complete all five tasks. Show your reasoning.

10. (p. 297) Write a rate for 9 full moons in 252 days.

11. (p. 297) Write a rate for 38 minutes to complete 8 laps.

12. (p. 297) 16 fish are in 2 bowls. At the same rate, how many bowls are needed for 48 fish?

Individual Work — continued

GRADE 6 • TOPIC 5 • LESSON 5.5 | 10 minutes total • 10 points

Finish the remaining problems. Check your work.

13. (p. 297) 184 miles in 16 hours: find the unit rate and distance in 4 hours.

14. (p. 297) A vehicle travels 320 miles on 16 gallons. Find miles per gallon.

Individual Work — Answer Key

Divide to obtain a rate per one unit; then multiply or divide to find the unknown.

10. (p. 297)

9 full moons per 252 days (or $\frac{9}{252}$ moons per day).

11. (p. 297)

38 minutes per 8 laps (or $\frac{38}{8}$ minutes per lap).

12. (p. 297)

$\frac{16 \text{ fish}}{2 \text{ bowls}}$ = 8 fish/bowl; 48 ÷ 8 = 6 bowls.

13. (p. 297)

184 miles ÷ 16 hours = 11.5 mph. At 4 h: 46 miles.

14. (p. 297)

320 miles ÷ 16 gal = 20 miles per gallon.

Group Work

GRADE 6 • TOPIC 5 • LESSON 5.5 | 8 minutes total • 10 points

Work together. Each person must contribute a solution.

20. (p. 298) Martha swims 20 laps in 32 min; Allison 16 in 25 min; Rachel 17 in 27.2 min. Who swims fastest?

21. (p. 298) 15 books in 12 weeks. At the same rate, how many books in 4 weeks and 8 weeks?

Group Work — continued

GRADE 6 • TOPIC 5 • LESSON 5.5 | 8 minutes total • 10 points

Agree on a solution and be ready to explain it.

22. (p. 298) At 0.7 mile per minute, how long does it take to travel 0.35 mile?

23. (p. 298) At 6 cartons per minute, how long does it take to process 420 cartons?

Group Work — Answer Key

GRADE 6 • TOPIC 5 • LESSON 5.5 | Discuss and justify

Divide to obtain a rate per one unit; then multiply or divide to find the unknown.

20. (p. 298)

Martha: $\frac{20}{32}$ = 0.625 laps/min. Allison: $\frac{16}{25}$ = 0.64. Rachel: $\frac{17}{27.2}$ = 0.625. Allison is fastest.

21. (p. 298)

$\frac{15}{12}$ = 1.25 books/week. At 4 weeks: 5 books; at 8 weeks: 10 books.

22. (p. 298)

Time = distance ÷ rate = $\frac{0.35}{0.7}$ = 0.5 minute (30 seconds).

23. (p. 298)

420 ÷ 6 cartons/min = 70 minutes.

Exit Ticket

GRADE 6 • TOPIC 5 • LESSON 5.5 | 2 minutes • Independent check

Before you leave, solve this problem.

A car travels 157.5 miles in 3.5 hours. Find the speed.

Show your work.

Write the answer with the correct units or graph, if needed.