

**LESSON**

**Practice B**

**5-2 Rates and Unit Rates**

1. Copper weighing 4480 kilograms has a volume of 0.5 cubic meters. What is the density of copper?

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2. Yoshi's yogurt contains 15 calories per ounce. How many calories are in an 8-ounce container of Yoshi's yogurt?

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3. Emily earns \$7.50 per hour. How much does she earn in 3 hours?

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**Estimate the unit rate.**

4. 43 apples in 5 bags

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5. \$71.00 for 8 hours

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6. 146 students in 6 classes

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7. \$52.00 for 5 hours

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8. 7 miles in 64 minutes

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9. \$3.55 for 4 pounds

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**Determine the lower unit price.**

10. 8.2 oz of toothpaste for \$2.99 or 6.4 oz of toothpaste for \$2.49

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11. a 3 lb bag of apples for \$2.99 or a 5 lb bag of apples for \$4.99

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12. 16 oz bottle of soda for \$1.25 or 20 oz bottle of soda for \$1.55

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13. Mavis rides the bus every day. She bought a bus pass good for the month of October for \$38.75. How much was Mavis charged per day for the bus pass?

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**LESSON Practice A**  
**5-2 Rates and Unit Rates**

- Two cubic meters of olive oil have a mass of 1830 kilograms. What is the density of olive oil?  
 $\frac{915 \text{ kg}}{\text{m}^3}$
- Fabiana hikes at a rate of 3 miles per hour. How far can she hike in 4 hours?  
12 mi
- Cameron earns \$7 per hour. How much does he earn in 5 hours?  
\$35

**Estimate the unit rate.**

4. 79 students in 4 classes <u>about 20 students per class</u>	5. \$52.00 for 5 hours <u>about \$10 per hour</u>
6. 208 heart beats in 3 minutes <u>about 70 beats per minute</u>	7. 75 calories in 8 ounces <u>about 9 calories per ounce</u>
8. 2 miles in 21 minutes <u>about 10 minutes per mile</u>	9. 3 pounds for \$9.02 <u>about \$3 per pound</u>

**Determine the lower unit price.**

- 12 oz container of juice for \$0.85 or 8 oz container of juice for \$0.50  
8 oz for \$0.50
- \$9 to deliver a 2 lb package or \$14.25 to deliver a 3 lb package  
\$9 to deliver a 2 lb package
- 24 oz jar of cheese sauce for \$2.88 or 16 oz jar of cheese sauce for \$1.79  
16 oz jar for \$1.79

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**LESSON Practice B**  
**5-2 Rates and Unit Rates**

- Copper weighing 4480 kilograms has a volume of 0.5 cubic meters. What is the density of copper?  
 $\frac{8960 \text{ kg}}{\text{m}^3}$
- Yoshi's yogurt contains 15 calories per ounce. How many calories are in an 8-ounce container of Yoshi's yogurt?  
120 calories
- Emily earns \$7.50 per hour. How much does she earn in 3 hours?  
\$22.50

**Estimate the unit rate.**

4. 43 apples in 5 bags <u>about 9 apples per bag</u>	5. \$71.00 for 8 hours <u>about \$9 per hour</u>
6. 146 students in 6 classes <u>about 25 students per class</u>	7. \$52.00 for 5 hours <u>about \$10 per hour</u>
8. 7 miles in 64 minutes <u>about 9 minutes per mile</u>	9. \$3.55 for 4 pounds <u>about \$0.90 per pound</u>

**Determine the lower unit price.**

- 8.2 oz of toothpaste for \$2.99 or 6.4 oz of toothpaste for \$2.49  
8.2 oz for \$2.99
- a 3 lb bag of apples for \$2.99 or a 5 lb bag of apples for \$4.99  
3 lb bag for \$2.99
- 16 oz bottle of soda for \$1.25 or 20 oz bottle of soda for \$1.55  
20 oz bottle for \$1.55
- Mavis rides the bus every day. She bought a bus pass good for the month of October for \$38.75. How much was Mavis charged per day for the bus pass?  
\$1.25

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**LESSON Practice C**  
**5-2 Rates and Unit Rates**

- Two cubic meters of mercury have a mass of 27,190 kilograms. What is the density of mercury?  
 $\frac{13,595 \text{ kg}}{\text{m}^3}$
- Lead weighing 1130 kilograms has a volume of 0.1 cubic meters. What is the density of lead?  
 $\frac{11,300 \text{ kg}}{\text{m}^3}$
- Mr. Acito takes his students on a field trip to the theater. As the teacher, his ticket is free, but he is charged \$472 for his 32 students. What is the price per ticket for each student?  
\$14.75 a ticket

**Estimate the unit rate.**

4. 4858 mi in 15 days <u>about 300 mi per day</u>	5. \$16 for 3 hours <u>about \$5 per hour</u>	6. 578 heartbeats in 8 min <u>about 70 beats per minute</u>
7. 632 desks in 18 rooms <u>about 35 desks per room</u>	8. 324 mi on 16 gal of gasoline <u>about 20 mi per gallon</u>	9. \$3.95 for 10 lb of oranges <u>about \$0.40 per pound</u>
10. 1168 mi in 18 hours <u>about 60 mi per hour</u>	11. 286 students in 15 rooms <u>about 20 students per room</u>	12. 2375 words in 37 min <u>about 60 words per minute</u>

**Find each unit price and tell which is lowest.**

- 3 lb beef roast for \$8.97; 5 lb beef roast for \$14.85  
3 lb unit price is \$2.99; 5 lb unit price is \$2.97; better buy is 5 lb for \$14.85
- 3 dozen binder clips for \$2.88; 72 binder clips for \$5.40  
3 dozen clips unit price is \$0.08; 72 clips unit price is \$0.075; the better buy is 72 clips for \$5.40
- 14.5 gallons of gasoline for \$18.56; 18.6 gallons for \$23.25  
14.5 gallons unit price is \$1.28; 18.6 gallons unit price is \$1.25; better buy is 18.6 gallons for \$23.25

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**LESSON Review for Mastery**  
**5-2 Rates and Unit Rates**

A **rate** is a ratio that compares two *different kinds* of quantities.

2 aides for 18 students $\frac{2 \text{ aides}}{18 \text{ students}}$	135 words in 3 minutes $\frac{135 \text{ words}}{3 \text{ minutes}}$	7 ads per 4 pages of copy $\frac{7 \text{ ads}}{4 \text{ pages of copy}}$
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**Express each comparison as a rate in ratio form.**

1. 275 students per 11 teachers $\frac{275 \text{ students}}{11 \text{ teachers}}$	2. 3 books in 2 months $\frac{3 \text{ books}}{2 \text{ months}}$	3. 15 strike-outs in 6 innings $\frac{15 \text{ strike-outs}}{6 \text{ innings}}$
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In a **unit rate**, the second quantity is 1.

300 miles in 6 hours $\frac{300 \text{ miles}}{6 \text{ hours}} = \frac{300 \div 6}{6 \div 6} = \frac{50 \text{ miles}}{1 \text{ hour}}$	81 entries in 4 minutes $\frac{81 \text{ entries}}{4 \text{ minutes}} = \frac{81 \div 4}{4 \div 4} = \frac{20.25 \text{ entries}}{1 \text{ minute}}$
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**Express each comparison as a unit rate.**

4. 28 patients for 2 nurses $\frac{28 \text{ patients}}{2 \text{ nurses}} = \frac{28 \div 2}{2 \div 2} = \frac{14 \text{ patients}}{1 \text{ nurse}}$	5. 16 children in 7 families $\frac{16 \text{ children}}{7 \text{ families}} = \frac{16 \div 7}{7 \div 7} = \frac{2.3 \text{ children}}{1 \text{ family}}$
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A **unit price** tells the price per 1 unit.

\$2.49 for 3 muffins $\frac{\$2.49}{3 \text{ muffins}} = \frac{2.49 \div 3}{3 \div 3} = \frac{\$0.83}{1 \text{ muffin}}$	\$1.67 for 10 pencils $\frac{\$1.67}{10 \text{ pencils}} = \frac{1.67 \div 10}{10 \div 10} = \frac{\$0.167}{1 \text{ pencil}}$
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**Find each unit price.**

6. \$10.74 for 3 reams of paper $\frac{\$10.74}{3 \text{ reams}} = \frac{10.74 \div 3}{3 \div 3} = \frac{\$3.58}{1 \text{ ream}}$	7. \$9.99 for 6 blank jewel cased CDs $\frac{\$9.99}{6 \text{ CDs}} = \frac{9.99 \div 6}{6 \div 6} = \frac{\$1.665}{1 \text{ CD}}$	8. \$8.99 for a 12-pack of gel pens $\frac{\$8.99}{12 \text{ pens}} = \frac{8.99 \div 12}{12 \div 12} = \frac{\$0.7492}{1 \text{ pen}}$
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