

Chapter 1 Lesson 7

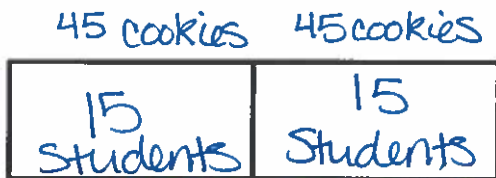
Ratio and Rate Problems

Ratio Problems

1) Bar Diagram Example:

If 45 cookies will serve 15 students, how many cookies are needed for 30 students?

1 box = 15 students



90 cookies

2) Equivalent Fractions

$$\frac{15 \text{ students}}{45 \text{ cookies}} = \frac{30 \text{ students}}{90 \text{ cookies}}$$

(Handwritten arrows indicate multiplication by 2: one from 15 to 30 and one from 45 to 90.)

Rate Problems

1) Double Number Lines

The Millers drove 105 miles on 4 gallons of gas. At this rate, how many miles can they drive on 6 gallons of gas?

a. Find the unit rate: 26.25 miles / 1 gallon

b. How many gallons did they drive on? 6 gallons

c. Multiply the unit rate by the number of gallons: 157.5 miles

$$\begin{array}{r}
 26.25 \\
 4 \overline{) 105.00} \\
 \underline{-8} \\
 25 \\
 \underline{-24} \\
 10 \\
 \underline{-8} \\
 20 \\
 \underline{-20} \\
 0
 \end{array}$$



2) Equations

Find the unit rate:

$$\frac{105 \text{ miles}}{4 \text{ gallons}} = \frac{26.25}{1 \text{ gallon}}$$

$\xrightarrow{\div 4}$ (from 105 to 26.25)
 $\xrightarrow{\div 4}$ (from 4 to 1)

Multiply the unit rate by the total number of gallons

$$\frac{26.25 \text{ miles}}{1 \text{ gallon}} = \frac{157.5 \text{ miles}}{6 \text{ gallons}}$$

$\xrightarrow{\times 6}$ (from 26.25 to 157.5)
 $\xrightarrow{\times 6}$ (from 1 to 6)

$$\begin{array}{r}
 26.25 \\
 4 \overline{) 105.00} \\
 \underline{-8} \\
 25 \\
 \underline{-24} \\
 10 \\
 \underline{-8} \\
 20
 \end{array}$$