FRACTIONS are numbers that are part of a ___whole___ .
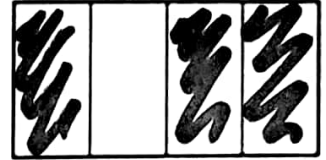
how many
we have

$$\frac{3}{4}$$

how many
make a whole

$$\frac{1}{2} \qquad \frac{1}{4} \qquad \frac{3}{6} \qquad \frac{8}{8} \qquad \frac{5}{12}$$

$$\frac{8}{8} = 1 \qquad \frac{4}{4} = 1$$

$$\frac{3}{3} = 1$$

Multiplying Fractions:

When multiplying fractions, multiply the numbers in the numerator (top) and multiply the numbers in the denominator (bottom):

$$\frac{2}{3} \times \frac{4}{7} = \frac{2 \times 4}{3 \times 7} = \frac{8}{21}$$

$$\frac{2}{5} \times \frac{1}{3} = \boxed{\frac{2}{15}}$$

$$\frac{3}{4} \times \frac{2}{3} = \boxed{\frac{6}{12}}$$

$$\frac{6}{12} = \frac{2 \times 3}{4 \times 3}_{1} = \frac{2}{4}$$

$$\frac{2}{4} = \frac{2 \times 1}{2 \times 2}_{1} = \frac{1}{2}$$

adding more divisions!

$$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$$

Adding and Subtracting Fractions:

When adding or subtracting fractions, the denominators (bottom) *must* **match:**

$$\frac{1}{3} \quad + \quad \frac{1}{3} \quad = \quad \frac{2}{3}$$

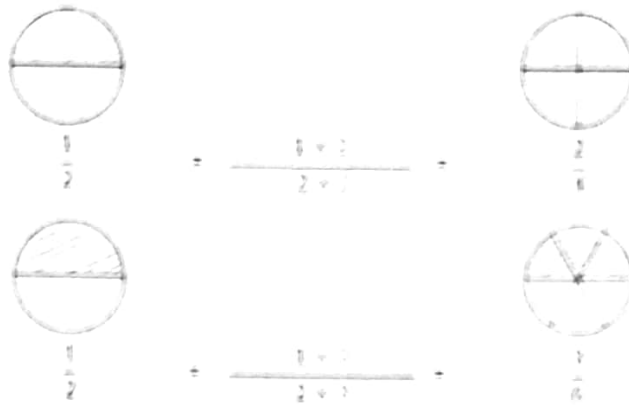$$\frac{1}{2} + \frac{2}{2} = \frac{3}{2}$$

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

$$\frac{2}{7} + \frac{4}{7} = \frac{6}{7}$$

$$\frac{6}{7} - \frac{2}{7} = \frac{4}{7}$$

Adding and Subtracting Fractions:

If the denominators do *not* match, scale one (or both)
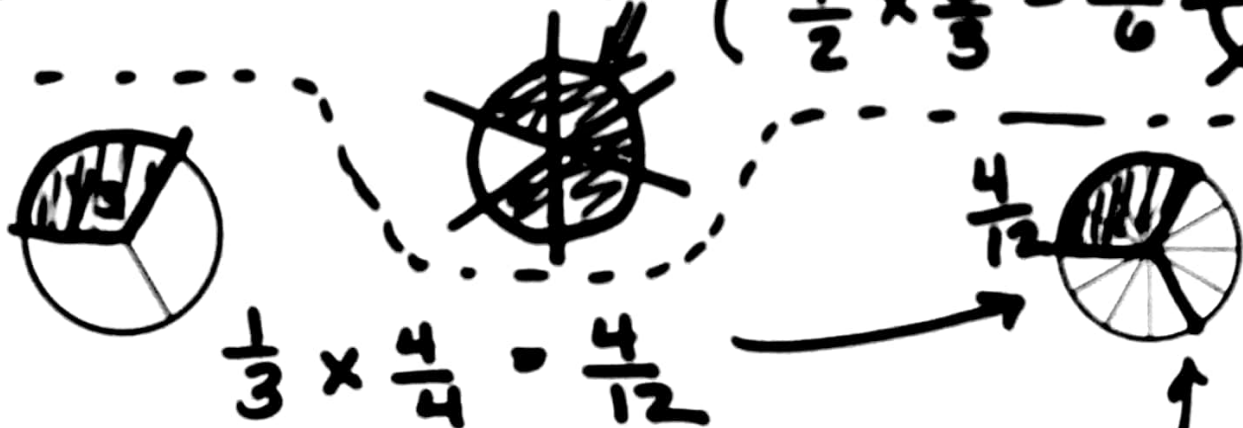by multiplying the fraction by a form of 1:

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \boxed{\frac{3}{4}}$$

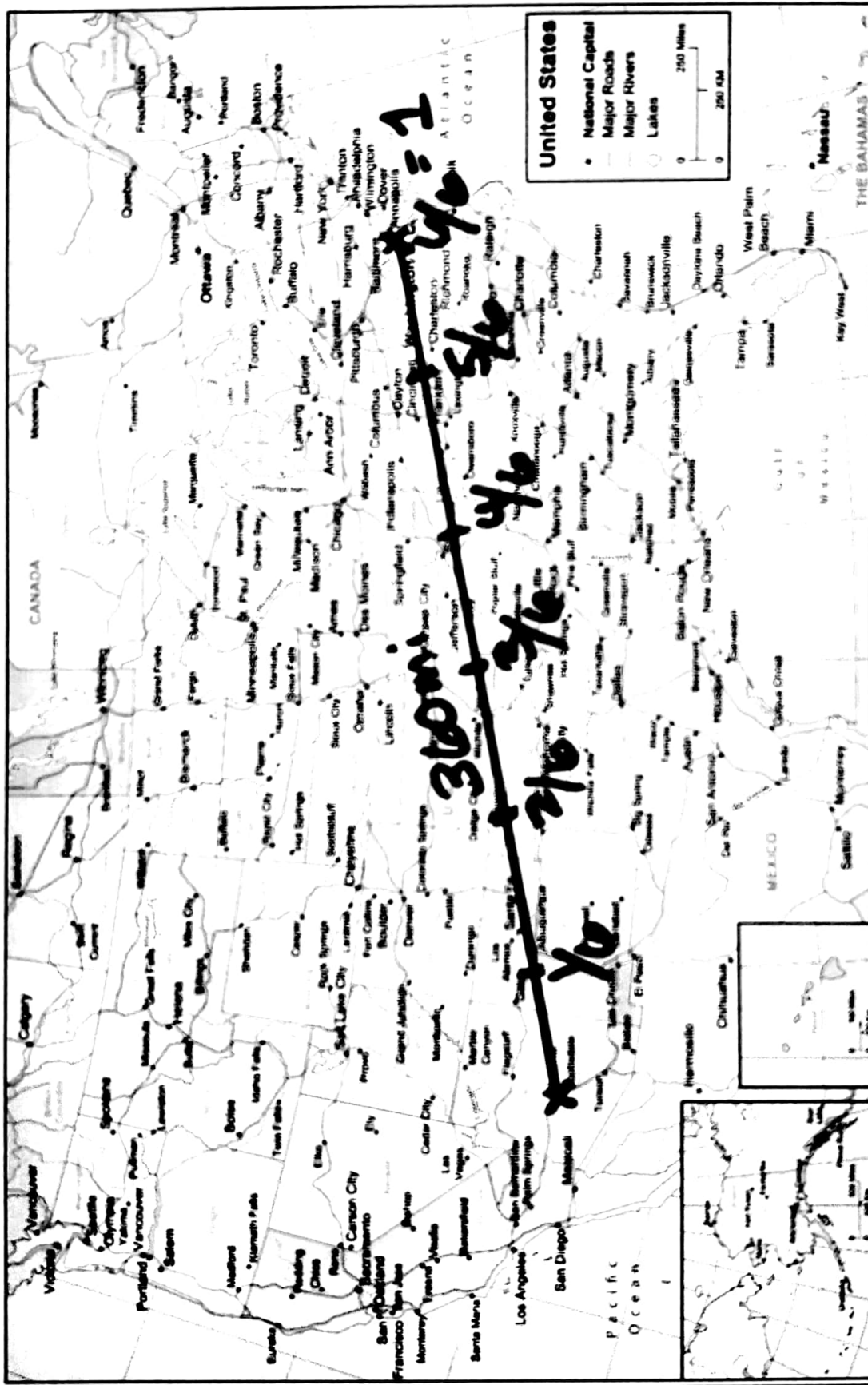$$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$$

$$\frac{1}{3} + \frac{1}{2} = \frac{2}{6} + \frac{3}{6} = \boxed{\frac{5}{6}} \quad \frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$$

$$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$$

$$\frac{4}{12}$$

When we scale fractions, we are changing the ___**number**___ of divisions.

(how many
make a whole)

PHX → DC : 34 hrs
2,160 miles

Road Trip! PHX → DC

Given:
34 hours
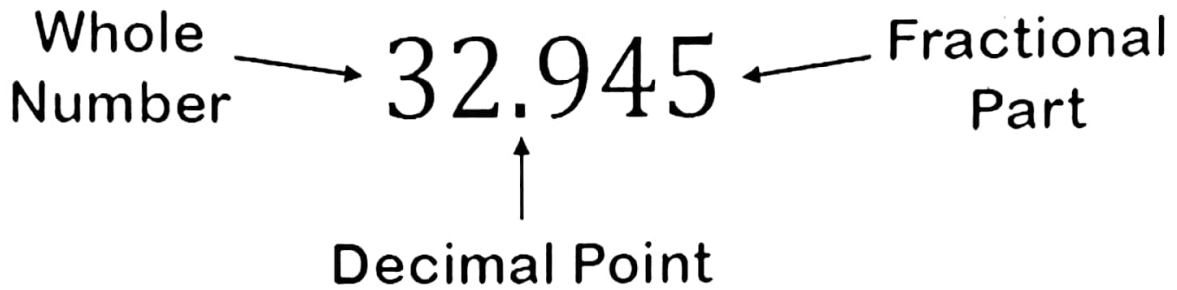2,160 miles

Assume: 60 mph
drive 6 hrs/day

Solution:

How many miles traveled each day? } $\frac{60 \text{ miles}}{\text{hr}} \times 6 \text{ hrs}$

$= \underline{360 \text{ miles}}$

How long does it take to go 2,160 miles? Z

$$\frac{2,160 \text{ miles}}{\frac{360 \text{ miles}}{\text{day}}} = \underline{\underline{6 \text{ days!}}}$$

So: 360 miles is $\frac{1}{6}$ of the entire trip!

DECIMALS have a whole number part *and* a ___**fraction**___ part separated by a decimal point.

Whole Number → 32.945 ← Fractional Part

↑ Decimal Point

4.51

tenth   hundredth

4.3 ↖ tenth

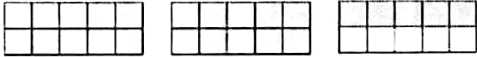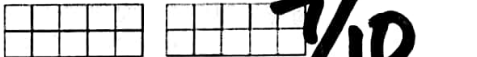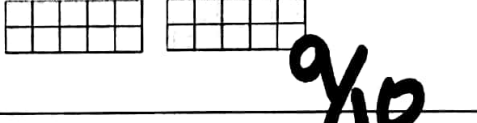|		
2.2		$\frac{2}{10}$
5.1		$\frac{1}{10}$
3.4		$\frac{4}{10}$
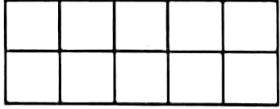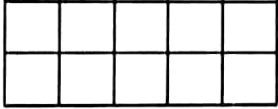
Here, three tenths ($\frac{3}{10}$) of the shape are shaded.

In this shape, all ten tenths ($\frac{10}{10}$) are shaded. We can count this shape as <u>one whole.</u>

Image	Whole	Tenths	Decimal Number
	4	1	4.1
	2	5	2.5
7/10	1	7	1.7
4/10	5	4	5.4
9/10	1	9	1.9
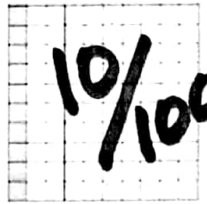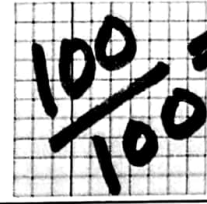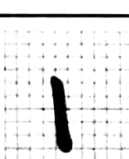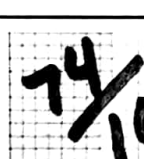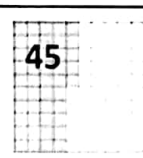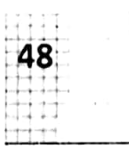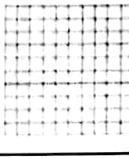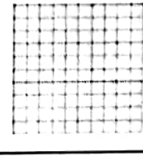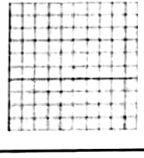
Here, three hundredths ($\frac{3}{100}$) of the shape are shaded.	When ten hundredths ($\frac{10}{100}$) of the shape are shaded, it is the same as one tenth ($\frac{1}{10}$).	In this shape, all one hundred hundredths ($\frac{100}{100}$) are shaded. We can count this shape as one whole.
$\frac{3}{100}$	$\frac{10}{100}$	$\frac{100}{100} = 1$

Image	Whole	Tenths	Hundredths	Decimal Number
1 $\frac{74}{100}$	2	7	4	2.74
1 45	1	4	5	1.45
48	0	4	8	0.48
17 $\frac{17}{100}$	3	1	7	3.17

Adding Decimals

When adding with decimals, you must line up the decimal points.

1.2 + 2.4 =

$$
\begin{array}{r}
1.2 \\
+\ 2.4 \\
\hline
3.6
\end{array}
$$

23.5 + 62.9 =

$$
\begin{array}{r}
2\overset{1}{3}.5 \\
+\ 62.9 \\
\hline
86.4
\end{array}
$$

3.5 + 11.2

$$
\begin{array}{r}
3.5 \\
+\ 11.2 \\
\hline
14.7
\end{array}
$$

$$
\begin{array}{r}
6.8 \\
-\ 1.2 \\
\hline
5.6
\end{array}
$$

$$
\begin{array}{r}
\$2.00 \\
\$20.00 \\
\hline
40.00
\end{array}
$$

$$
\begin{array}{r}
20.00 \\
2.00 \\
\hline
22.00
\end{array}
$$

Adding & Subtracting Decimal Numbers:

You have: $\$9.50$

Buy a cookie: -1.25

Now you have: 8.25

Mom gives you: $+2.00$

Now you have: $\boxed{\$10.25}$ total

Cookie: $\$1.25$

Mom: $\$2.00$

Multiplying Decimal Numbers:

$1.2 \times 3 \rightarrow 12 \times 3 = 36$, so $\boxed{3.6} = 1.2 \times 3$

$1.1 \times 5 = \rightarrow 11 \times 5 = 55$, so $1.1 \times 5 = \boxed{5.5}$

$0.9 \times 2 = \rightarrow 9 \times 2 = 18$, so $0.9 \times 2 = \boxed{1.8}$

$36.5 \rightarrow 365$
$\times 2.4 \quad \times 24$ (2 hops)
$\boxed{87.60} \leftarrow 8760$

$19.8 \rightarrow 198$
$\times 0.56 \quad \times 56$ (3 hops)
$\boxed{11.088} \leftarrow 11088$

$8.52 \rightarrow 852$
$\times 4.9 \quad \times 49$ (3 hops)
$\boxed{41.748} \quad 41748$

Plan a Party!

You earn $ **$15.50** per hour.

You worked **16** hours.

You have $ **$127.00** saved to use.

$$\begin{array}{r} 15.50 \\ \times\ 16 \\ \hline = 248.00 \end{array} \rightarrow \begin{array}{r} 1550 \\ \times\ 16 \\ \hline 24800 \end{array}$$

$$= 248.00 \leftarrow 24800$$

$$+\ 127.00$$

$$= \$375.00 \quad \text{Party budget!}$$

Cake: **$5 or $22**

Balloons & Streamers: **$5 or $75**

Pizza: **$15 for Large (12 pcs)**

Soda: **$4 for 8 cans**

Entertainment:

- Magician: $150, any size party
- Skate Park: Free, any size party
- Soccer game: $40 for a coach, up to 20 kids for 90 minutes
- Bounce House: $250, up to 12 kids
- Laser Tag Rental: $300, up to 8 people for 60 minutes

So plan for 20 kids!

Party Planning:

$$\$ 375.00$$
$$- \quad 5.00 \quad \text{cake}$$
$$\overline{370.00}$$
$$- \quad 5.00 \quad \text{decorations}$$
$$\overline{365.00}$$
$$-150.00 \quad \text{magician (60 min)}$$
$$\overline{215.00}$$
$$- 40.00 \quad \text{soccer (90 min)}$$
$$\overline{175.00}$$
$$- 60.00 \quad \text{pizza} \left(\begin{array}{c} 4 \text{ Large} \\ \times \$15 \end{array} \right)$$
$$\overline{115.00}$$
$$- 12.00 \quad \text{soda} \left(\begin{array}{c} 3 \text{ packs} \\ \text{of } 8 \text{ at} \\ \$4 \text{ ea} \\ \text{pack} \end{array} \right)$$
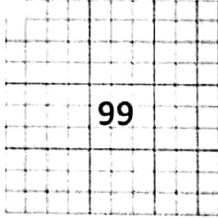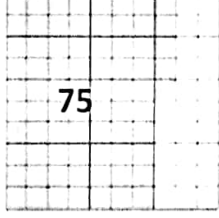$$\overline{\sim 103.00}$$

$100 for 20 kids
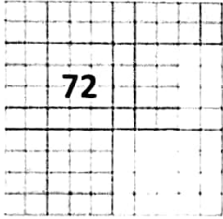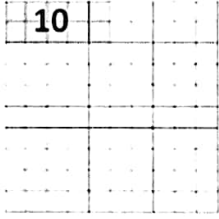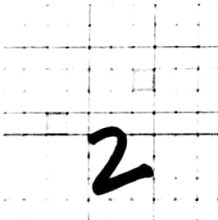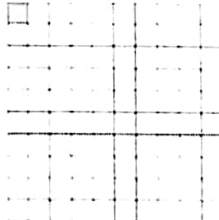
$$\frac{\$100}{20 \text{ kids}} = \begin{array}{c} \$5 \text{ per} \\ \text{kid for} \\ \text{party} \\ \text{favors!} \end{array} \left\{ \begin{array}{l} \bullet \text{ marbles} \\ \bullet \text{ dice} \\ \bullet \text{ cards} \\ \bullet \text{ pocket magic} \\ \bullet \text{ ball} \\ \bullet \text{ chocolate} \end{array} \right.$$

A PERCENTAGE is another way of writing a fraction where the denominator is 100.

Fraction: $\dfrac{99}{100}$

Decimal: .99

Percent: 99%

Fraction: $\dfrac{75}{100}$

Decimal: 0.75

Percent: 75%

Fraction: $\dfrac{72}{100}$

Decimal: 0.72

Percent: 72%

Fraction: $\dfrac{10}{100}$

Decimal: 0.1

Percent: 10%

Fraction: $\dfrac{2}{100}$

Decimal: 0.02

Percent: 2%

Fraction: $\dfrac{1}{100}$

Decimal: 0.01

Percent: 1%

$$100\% - 30\% = 70\%$$

$\$3^{50}$

($\$350 = 100\%$ price)

What is **70%** of **$350** ?

$$X = \frac{70}{100} \cdot 350$$

$$X = \boxed{\$245}$$

50% OFF SALE

$45

What is **50%** of $^\$45$?

$$X = \frac{50}{100} \cdot 45$$

$$X = \$22.^{50}$$

2% Real Estate Commissions

$250,

What is **2%** of **$250,000** ?

$$X = \frac{2}{100} \cdot (250,000)$$

$$\boxed{X = \$5,000}$$