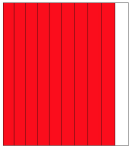
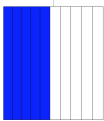
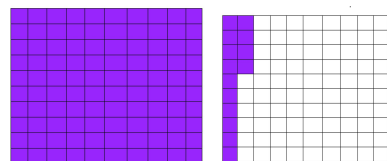


How do Fractions Relate to Decimals?

Fractions and decimals are TWO ways to describe **parts** of a **whole**.

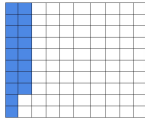
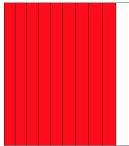
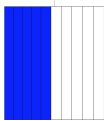
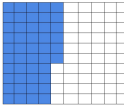
Fraction	Decimal	Picture
$18/100$	0.18	
$9/10$	0.9	
$5/10$	0.5	
$46/100$	0.46	

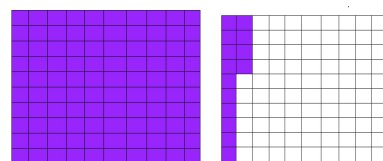


= 1 and $14/100$

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$18/100$	0.18	
$9/10$	0.9	
$5/10$	0.5	
$46/100$	0.46	

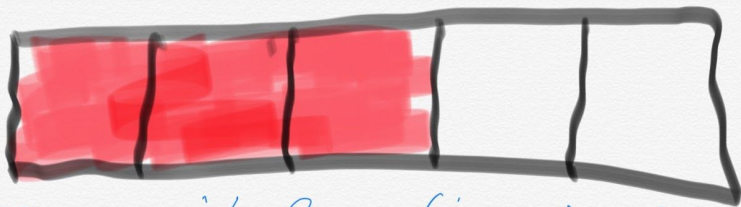


= 1 and $14/100$

What is a Unit Fraction?

Unit Fractions

A unit fraction is a fraction that has a numerator of 1. ($\frac{1}{x}$) It is one equal part of a whole.



The unit fraction is $\frac{1}{5}$

$$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$$

Try it: Write $\frac{4}{6}$ and $\frac{7}{9}$ as a sum of unit fractions.

Write the following as a sum of unit fractions:

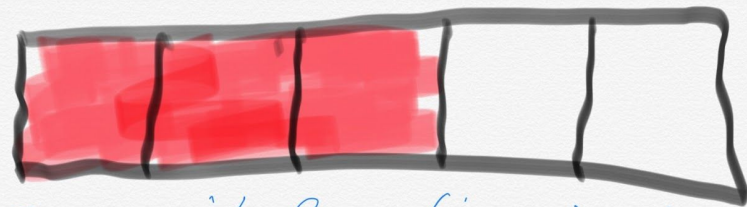
$$6/8 =$$

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Write the following as a sum of unit fractions:

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Decomposing Fractions

Decomposing Fractions

-We decompose fractions when we break fractions into smaller pieces.

Examples

$$\frac{5}{6} = \frac{1}{6} + \frac{4}{6} \text{ or } \frac{2}{6} + \frac{3}{6} \text{ or } \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$$

$$2\frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{1}{4} \text{ or } \frac{5}{4} + \frac{4}{4}$$

$$\frac{6}{8} = \frac{2}{8} + \frac{3}{8} + \frac{1}{8} \text{ or } \frac{5}{8} + \frac{1}{8}$$

Try it: Decompose the following fractions

$$\frac{4}{9} =$$

$$\frac{10}{3} =$$

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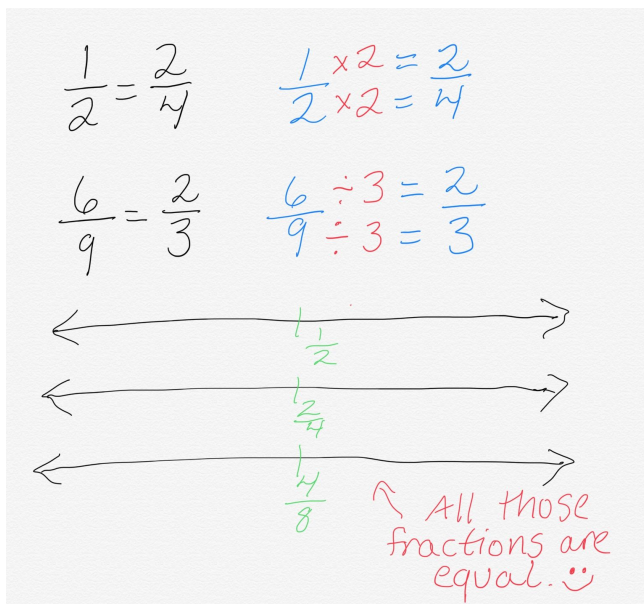
$$\frac{4}{9} =$$

$$\frac{10}{3} =$$

Equivalent Fractions

Equivalent fractions have the **same** value even though they have different numerators and denominators.

Golden Rule of Equivalent Fractions: Do unto the numerator as you do unto the denominator (That means, you do the SAME thing to both.)



Practice generating equivalent fractions.

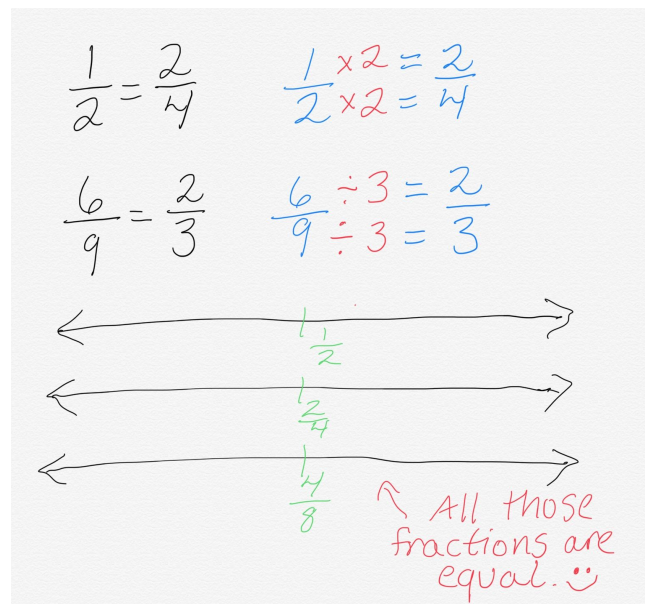
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Simplifying Fractions

- **Simplifying fractions** means writing the fraction in **lowest terms**.
- **We want the smallest numerator and denominator, without changing the value of the fraction**

Simplifying Fractions

$\frac{4}{8} = ?$ in simplest form.

1. Ask yourself "Can I divide the denominator by the numerator?"
If you can, divide both by that number.
8 can be divided by 4

$\frac{4 \div 4}{8 \div 4} = \frac{1}{2}$ $\frac{1}{2}$ is $\frac{4}{8}$ in simplest form.

$\frac{8}{36} = ?$ in simplest form.

You cannot divide 36 by 8 so follow these steps.

1. Find factors of both numbers
8 = 1, 2, ~~4~~, 8
36 = 1, 2, 3, ~~4~~, 6, 9, 12, 18, 36
2. Find the greatest factor.
3. Divide both the numerator and denominator by the greatest factor.

$\frac{8 \div 4}{36 \div 4} = \frac{2}{9}$ $\frac{2}{9}$ is $\frac{8}{36}$ in simplest form.

NOTE: A fraction with NO common factors or a numerator of 1 is already in simplest form.

Simplify the following fractions:

12/36

25/60

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Comparing Fractions

Vocabulary:

benchmark: a known size or amount that helps you understand a different size or amount

When we compare fractions, we look for similarities and differences. Which one is larger, smaller or are they equal?

5 Strategies for Comparing Fractions

1. Common Denominator \Rightarrow compare numerators

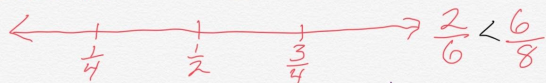
$$\frac{2}{4} < \frac{3}{4} \quad \leftarrow \text{more pieces}$$

2. Common Numerators \Rightarrow compare denominators

$$\frac{2}{6} > \frac{2}{8}$$

bigger parts

3. Use $\frac{1}{2}$ as a benchmark



4. Change one denominator to match.

$$\frac{2}{5} > \frac{3}{10} \quad \frac{2 \times 2 = 4}{5 \times 2 = 10} \quad \frac{4}{10} > \frac{3}{10}$$

5. Find a common denominator

$$\frac{4}{6} < \frac{3}{4} \quad \frac{4 \times 4 = 16}{6 \times 4 = 24} \quad \frac{3 \times 6 = 18}{4 \times 6 = 24}$$

Practice comparing the fractions:

$$\frac{3}{4} \quad \frac{16}{24} \quad \frac{2}{3} \quad \frac{2}{7} \quad \frac{5}{7} \quad \frac{12}{14}$$

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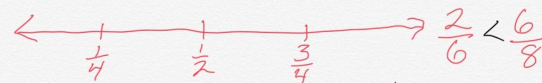
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Finding Common Denominators

1. List multiples of both denominators.
2. Circle the first multiple that both numbers have in common.
☆Ths number is the **Least Common Multiple**
LCM=Common Denominator

Example: $\frac{3}{9}$ and $\frac{5}{6}$

9: 9, **18**, 27, 36

6: 6, 12, **18**, 24, 30 18 is the least common multiple

$\frac{3}{9} = \frac{6}{18}$ (Multiply both numerator and denominator by 2)

$\frac{5}{6} = \frac{15}{18}$ (Multiply both numerator and denominator by 3)

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Ordering Fractions

To compare and order fractions, they must be the same size and shape.

$\frac{2}{3}$, $\frac{3}{4}$, $\frac{1}{2}$

1. Find the LCM (Least Common Multiple of the Denominators)

3: 3, 6, 9, **12**, 15, 18, 21, 24

4: 4, 8, **12**, 16, 20, 24

2: 2, 4, 6, 8, 10, **12**, 14, 16, 18, 20, 22, 24

The LCM IS 12.

2. Create Equivalent Fractions

$$\frac{2}{3} = \frac{8}{12}$$

$$\frac{3}{4} = \frac{9}{12}$$

$$\frac{1}{2} = \frac{6}{12}$$

Compare and order original fractions

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$$

Try ordering the following fractions:

$\frac{3}{9}$; $\frac{2}{6}$; $\frac{1}{3}$

$\frac{4}{6}$; $\frac{2}{3}$; $\frac{1}{4}$; $\frac{1}{6}$

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To compare and order fractions, they must be the same size and shape.

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$\frac{4}{6}$; $\frac{2}{3}$; $\frac{1}{4}$; $\frac{1}{6}$

Adding and Subtracting Fractions

Adding and Subtracting Fractions

$$\frac{2}{5} + \frac{1}{5} = \frac{6}{8} - \frac{5}{8}$$

1. Add or subtract the numerators.
 $2+1=3$ $6-5=1$

2. Keep the denominator the same. $\frac{3}{5}$ $\frac{1}{8}$

3. Simplify or reduce if necessary.

$$\frac{2}{5} + \frac{1}{5} = \frac{3}{5} \quad \frac{6}{8} - \frac{5}{8} = \frac{1}{8}$$

Try the following:

$$3/6 + 2/6 =$$

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Adding and Subtracting Mixed Numbers

Adding and Subtracting
Mixed Numbers

1. Step 1: Add/subtract whole numbers

$$3\frac{1}{4} + 2\frac{2}{4} = 5 \quad 5\frac{6}{8} - 2\frac{4}{8} = 3$$

2. Step 2: Add/subtract
numerators

$$3\frac{\textcircled{1}}{4} + 2\frac{\textcircled{2}}{4} = 5^3 \quad 5\frac{\textcircled{6}}{8} - 2\frac{\textcircled{4}}{8} = 3^2$$

3. Denominators stay the
same.

$$3\frac{\textcircled{1}}{\textcircled{4}} + 2\frac{\textcircled{2}}{\textcircled{4}} = 5\frac{3}{4} \quad 5\frac{\textcircled{6}}{\textcircled{8}} - 2\frac{\textcircled{4}}{\textcircled{8}} = 3\frac{2}{8}$$

4. Simplify if needed $3\frac{2}{8} = 3\frac{1}{4}$

Try the following:

$$5\frac{3}{4} + 9\frac{1}{4} =$$

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Borrowing Method for Subtracting Mixed Numbers

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$$6\frac{2}{8} - 4\frac{5}{8}$$

Use when the numerator is greater in the second mixed number

1. Borrow a 1 from the whole number.
2. Add the 1 in fraction form to the fraction.
3. Subtract the mixed numbers.

$$5\cancel{6}\frac{2+8}{8} = 5\frac{10}{8} - 4\frac{5}{8} = 1\frac{5}{8}$$

Practice It:

$$3\frac{5}{8} - 1\frac{7}{8} =$$

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

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Mixed Numbers to Improper Fractions

Make mixed numbers *MAD* by changing them to improper fractions.

$7 \frac{1}{4}$ MULTIPLY the whole number by the numerator.
 $7 \times 4 = 28$
ADD the product and the numerator.
 $28 + 1 = 29$
DENOMINATOR stays the same.
 $7 \frac{1}{4} = 29/4$

Improper Fractions to Mixed Numbers

$29/4$ GO DIVIDE the numerator by the denominator.
 $29 \div 4 = 7 \text{ remainder } 1$
LEAVE the quotient whole number as the whole number in the mixed number.
ALWAYS put the remainder as the numerator.
DENOMINATOR stays the same.

$$29/4 = 7 \frac{1}{4}$$

Try it:

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Try it:
 $27/8 =$

$$3 \frac{3}{8} =$$

$27/8 =$

$3 \frac{3}{5} =$