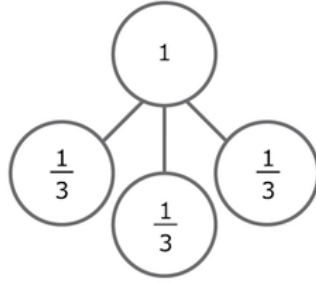
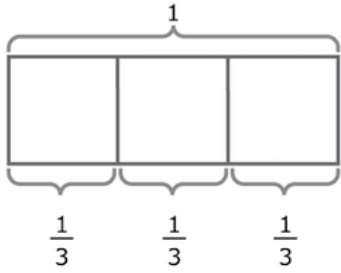


# 4th Grade Mission 5 Notes

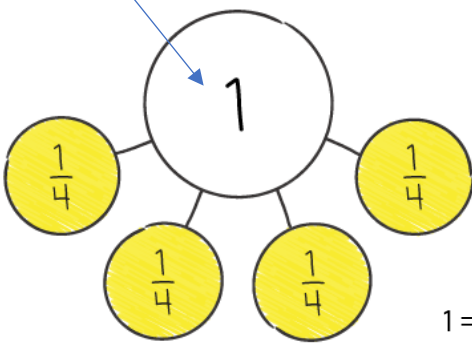


$$1 = \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$$

$$1 = \left( \frac{1}{3} + \frac{1}{3} \right) + \frac{1}{3}$$

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

whole

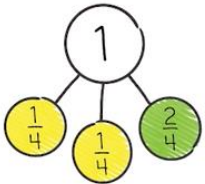


unit fractions always have 1 in the numerator

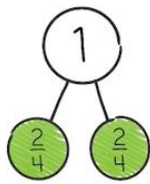
4 fourths = 1 whole

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

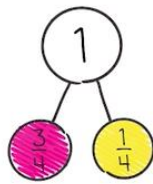
Other ways to decompose 1 whole into fourths:



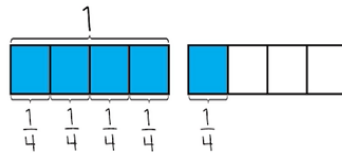
$$1 = \frac{1}{4} + \frac{1}{4} + \frac{2}{4}$$



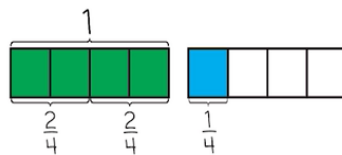
$$1 = \frac{2}{4} + \frac{2}{4}$$



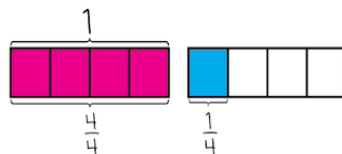
$$1 = \frac{3}{4} + \frac{1}{4}$$



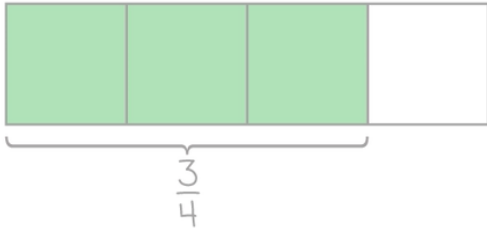
$$\frac{5}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$



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

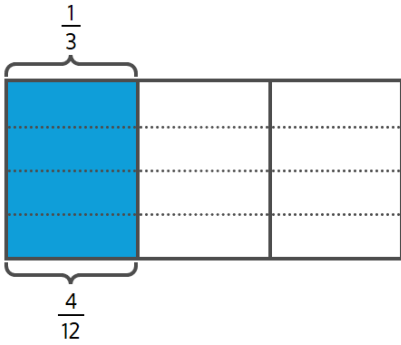


$$\frac{5}{4} = \frac{4}{4} + \frac{1}{4}$$



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

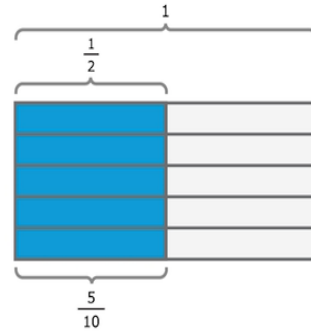
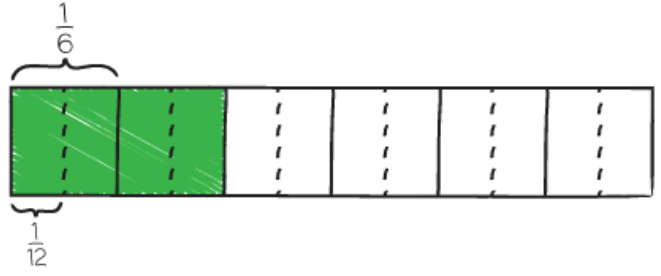
$$\frac{3}{4} = 3 \times \frac{1}{4}$$



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

$$\frac{1}{3} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12}$$

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



$$\frac{1}{2} = \frac{5}{10}$$

$$\frac{1}{2} = \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$$

$$\frac{1}{2} = 5 \times \frac{1}{10}$$

0

1

2

$\frac{0}{4}$

$\frac{1}{4}$

$\frac{2}{4}$

$\frac{3}{4}$

$\frac{4}{4}$

$\frac{5}{4}$

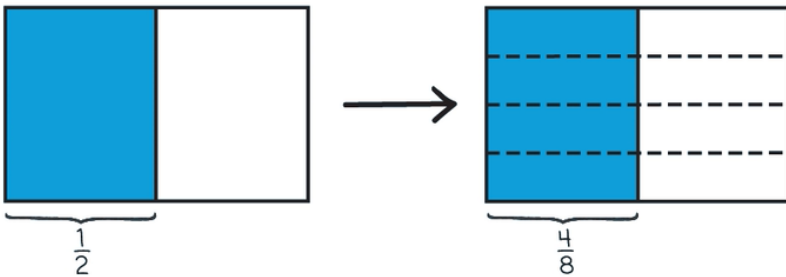
$\frac{6}{4}$

$\frac{7}{4}$

$\frac{8}{4}$

$\frac{9}{4}$

$\frac{10}{4}$



Number of units increased 4 times.

Size of each unit decreased.

Whole stayed the same

$$\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}$$

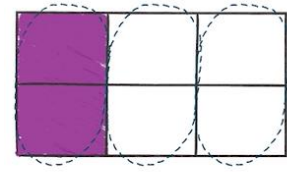
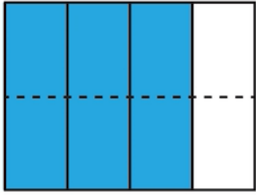
Numerator →  $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$

Denominator →

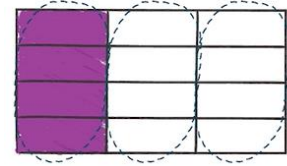
Whatever you do to the numerator, you must do to the denominator.

$\frac{3}{4} = \frac{6}{8}$  ✓ This is true, because if you multiply the numerator and denominator by the same number you will get an equivalent (equal) fraction.

$\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$



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



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

$\frac{6}{12} = \frac{6 \div 6}{12 \div 6} = \frac{1}{2}$  To get the largest units (partition into less pieces) in an equivalent fraction, you need to divide by the largest common factors.

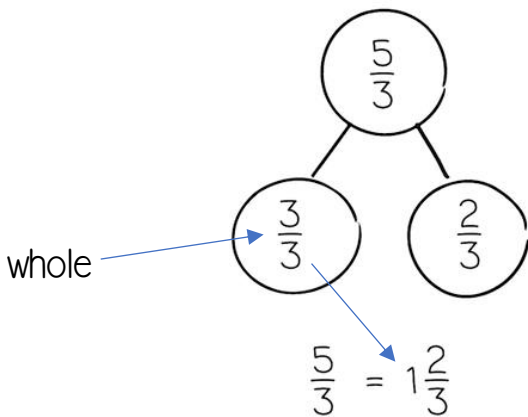
$\frac{7}{8}$  is less than 1.

$\frac{4}{4}$  is the same as 1.

$\frac{6}{4}$  is greater than 1.

$\frac{2}{4}$  is the same as  $\frac{1}{2}$ .

That means  $\frac{6}{4}$  equals  $1\frac{1}{2}$



# Comparing Fractions

**Comparing Fractions**

\* If both your **DENOMINATORS** are the same...

$\frac{1}{4} < \frac{3}{4}$

The alligator eats the **greater** numerator!

\* If both your **NUMERATORS** are the same...

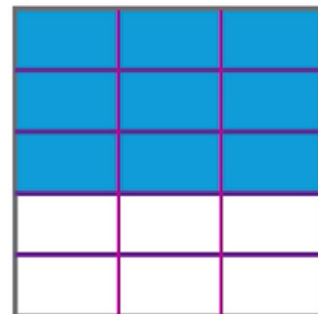
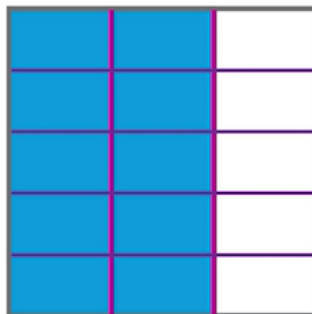
$\frac{3}{4} > \frac{3}{8}$

The alligator eats the **smaller** denominator!

$$\frac{2}{3} = \frac{10}{15}$$

>

$$\frac{3}{5} = \frac{9}{15}$$

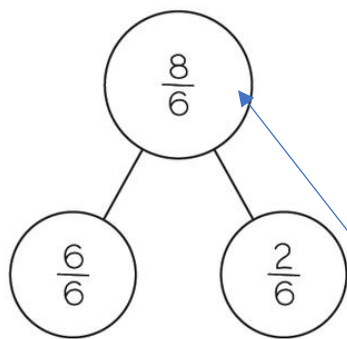


When the fractions have different numerators and different denominators find like units by partitioning each whole to have the same number of units.

$$\frac{9}{5} = \frac{9 \times 8}{5 \times 8} = \frac{72}{40}$$

>

$$\frac{10}{8} = \frac{10 \times 5}{8 \times 5} = \frac{50}{40}$$

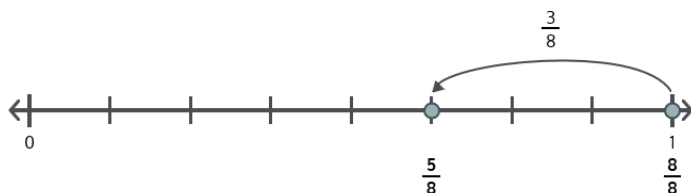
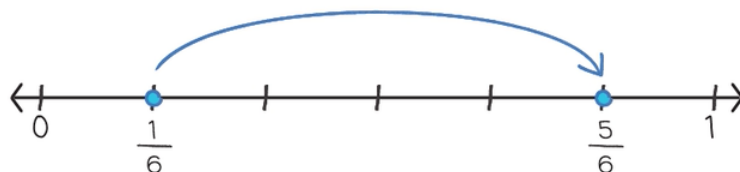


$$1 \frac{2}{6}$$

A fraction greater than 1 changed into a mixed number.

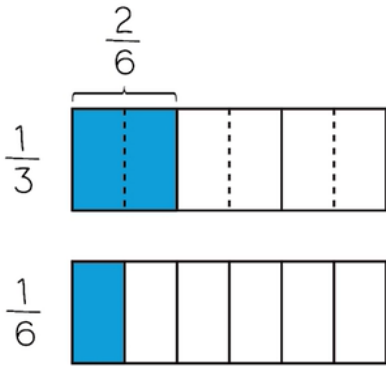
$$5 \text{ sixths} - 4 \text{ sixths} = 1 \text{ sixth}$$

$$4 \text{ sixths} + 1 \text{ sixth} = 5 \text{ sixths}$$



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

When adding fractions with unlike denominators, find a common denominator (unit). Then, add the numerators. Remember the denominators stay the same.

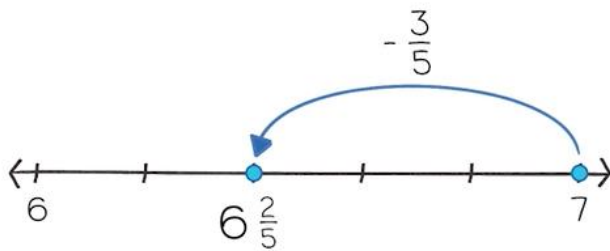


$$\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$

$$\frac{2}{3} + \frac{5}{6}$$

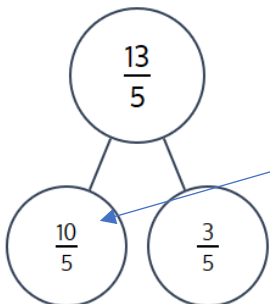
Since both fractions are greater than  $\frac{1}{2}$ , their sum will be greater than 1.

The sum will be greater than 1.



When subtracting a fraction from a whole number, decompose the whole number into parts (1 one as a fraction that is the same as the other fraction's denominator and then how many ones are left). Then, subtract.

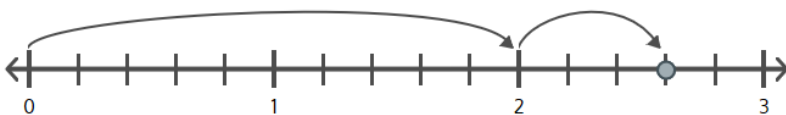
$$\begin{array}{r} 7 - \frac{3}{5} = 6 \frac{2}{5} \\ \swarrow \searrow \\ 6 \frac{5}{5} - \frac{3}{5} = 6 \frac{2}{5} \end{array}$$



$$\frac{13}{5} = 2 \frac{3}{5}$$

Find the greatest number of wholes that are closest to the numerator without going over.

$$\frac{10}{4} = 2 \frac{2}{4}$$



$$\begin{aligned}
 4 \frac{1}{4} &= (4 \times \frac{4}{4}) + \frac{1}{4} \\
 &= \frac{16}{4} + \frac{1}{4} \\
 &= \frac{17}{4}
 \end{aligned}$$

Changed fractions into mixed numbers

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

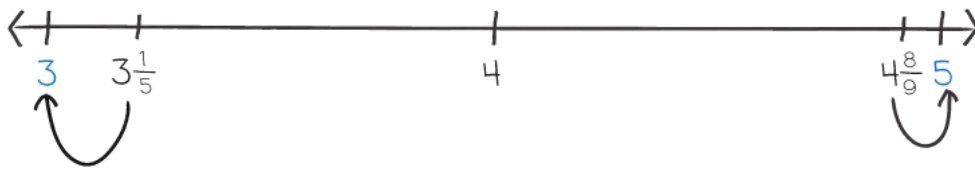
$$\frac{31}{8} = 3 \frac{7}{8}$$

$4 \frac{1}{7}$  is a little bit more than 4.

$3 \frac{7}{8}$  is a little bit less than 4.

$$4 \frac{1}{7} > 3 \frac{7}{8}$$

Estimate- closest to the answer



$$3 \frac{1}{5} + 4 \frac{8}{9} \approx 8$$

$$3 + 5 = 8$$

If a fraction is equal to 1, then it has the same number in the numerator and denominator.

$$\frac{3}{8} \text{ and } \frac{5}{8} \text{ make } 1.$$

$$3 \frac{1}{8} + \frac{7}{8} = 4$$

$$\frac{1}{8} + \frac{7}{8} = \frac{8}{8}$$

$$3 + \frac{8}{8} = 4$$

$$5 \frac{2}{4} + \frac{3}{4} = 5 \frac{5}{4}$$

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

$$= 6 \frac{1}{4}$$

## Adding Mixed Numbers

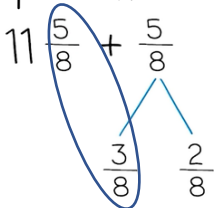
Step 1: Add the ones

$$5 \frac{5}{8} + 6 \frac{5}{8} = 11 \frac{5}{8} + \frac{5}{8}$$

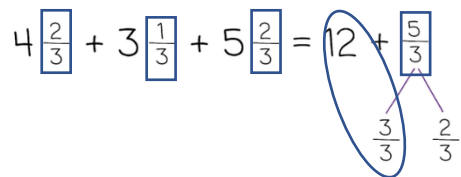
$$4 \frac{2}{3} + 3 \frac{1}{3} + 5 \frac{2}{3} = 12$$

Step 2: Decompose the added fraction to make the mixed number fraction have another whole.

and then

$$11 \frac{5}{8} + \frac{5}{8}$$


Or add the fractions together and decompose.

$$4 \frac{2}{3} + 3 \frac{1}{3} + 5 \frac{2}{3} = 12 + \frac{5}{3}$$


Step 3: Add the decomposed fraction to the mixed number.

$$11 \frac{5}{8} + \frac{3}{8} = 12$$

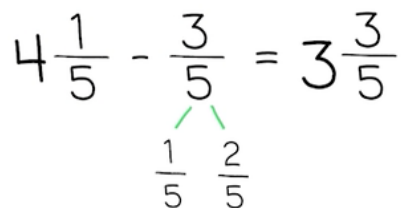
$$12 + \frac{3}{3} = 13$$

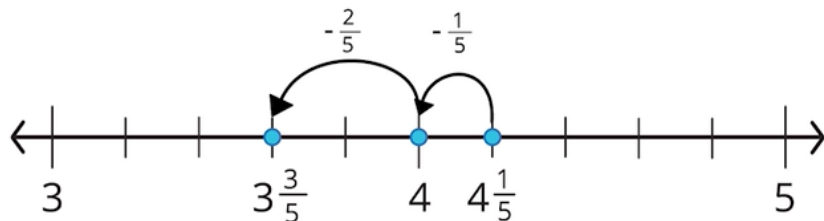
Step 4: Add the whole to the remaining fraction.

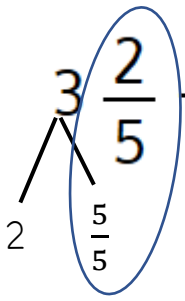
$$12 + \frac{2}{8} = 12 \frac{2}{8}$$

$$13 + \frac{2}{3} = 13 \frac{2}{3}$$

## Subtract Fractions with Count Back Strategy

$$4 \frac{1}{5} - \frac{3}{5} = 3 \frac{3}{5}$$






Decompose the largest ones into a whole and a fractional whole.  
 Add the fractional whole with the original fraction. Don't forget to bring the ones along. Now, subtract.

$$2\frac{7}{5} - 1\frac{3}{5} = 1\frac{4}{5}$$

$$\frac{5}{6} + \frac{5}{6} + \frac{5}{6} + \frac{5}{6} + \frac{5}{6} = 5 \times \frac{5}{6} = \frac{5 \times 5}{6}$$

$$\begin{aligned} 2 \times 3\frac{1}{5} &= (2 \times 3) + (2 \times \frac{1}{5}) \\ &= 6 + \frac{2}{5} \\ &= 6\frac{2}{5} \end{aligned}$$

$$\begin{aligned} 3 \times 7\frac{3}{4} &= (3 \times 7) + (3 \times \frac{3}{4}) \\ &= 21 + \frac{9}{4} \\ &= 21 + 2\frac{1}{4} \\ &= 23\frac{1}{4} \end{aligned}$$