MATH NEWS

4th Grade Unit 4

Volume 4 — 2nd 9 Weeks

UNIT 4 GOALS:

- Find equivalent fractions.
- Compare fractions with different numerators and denominators realizing that a comparison is only valid when the two fractions refer to the same whole.
- Decompose fractions to the sum of unit fractions.
- Add and subtract fractions with like denominators.
- Construct a line plot using fractions to display data.

VOCABULARY

Numerator- top number in a fraction that tells how many equal parts are being described.

Denominator- bottom number in a fraction that tells the number of equal parts into which the whole is divided.

Fraction- numerical quantity that is not a whole number.

Unit fraction- fraction with a numerator 1.

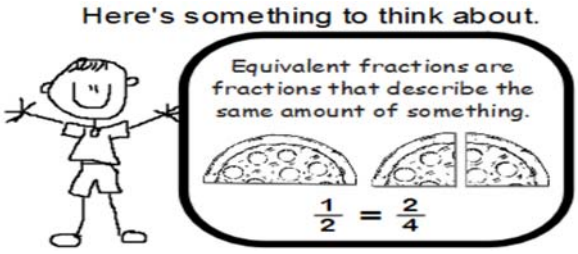
Equivalent fractions- fractions that name the same size or amount.

Mixed number- number made up of a whole number and a fraction less than one.

Decompose- change a fraction or a mixed number to the sum of its parts or unit fractions.

Resources for how to compare fractions:

Equivalent Fractions



Equivalent Fractions

The area model shows $\frac{3}{4}$.

$\frac{3}{4}$

The dotted line decomposes the whole into two equal rows. There were 4 pieces but now there are eight. Each part was decomposed into two pieces. Even though the parts changed, the area covered by the shaded region did not change.

$\frac{6}{8}$

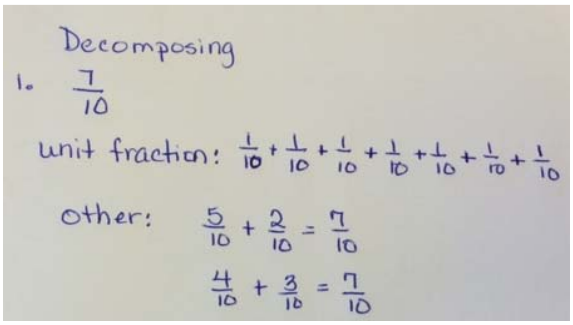
Comparing Fractions-*Students will use strategies to compare fractions. Listed below are some common strategies used to compare fractions.*

Toolkit for Comparing Fractions *Students should be supported in developing these strategies through intentional instruction based on teaching for understanding.*	
Compare unit fractions: $\frac{1}{2} > \frac{1}{8}$	Students should reason about the sizes of the pieces. The one half pieces are much larger than the one eighth pieces so one half is greater than one eighth.
Compare fractions with common numerators: $\frac{3}{12} < \frac{3}{4}$	Students should reason about the size of the parts. When a rectangle is decomposed into twelve parts those parts would be much smaller than fourths.
Compare fractions that are one unit fraction from One whole: $\frac{7}{8} > \frac{5}{6}$	Students should reason that one eighth is smaller than one sixth so seven eighths is greater than five sixths.
Compare fractions to $\frac{1}{2}$: $\frac{4}{8} > \frac{4}{16}$	Fourth eighths is equivalent to one half and four sixteenths is less than one half. Students should realize that four eighths is greater than four sixteenths.
Change fractions to equivalent fractions: **Compare** $\frac{2}{12}$; $\frac{1}{4}$	$\frac{2}{12} < \frac{2}{8}$ – Student used comparing fractions with common numerators to determine that one fourth is greater than two twelfths. $\frac{2}{12} < \frac{3}{12}$ –Student changed one fourth to three twelfths to easily compare the two fractions with a common denominator. $\frac{1}{6} < \frac{1}{4}$ –Student used comparing unit fractions. Which means the student must know that when decomposing into four equal parts those parts are larger than decomposing into six equal parts.

Images courtesy of Google Images and Mrs. C Classroom Blog

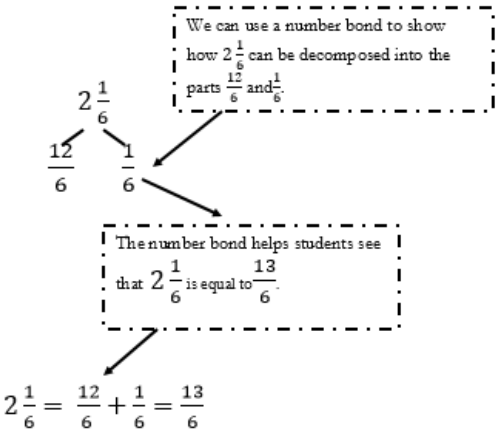
Decomposing Fractions

The students will decompose fractions into their unit fractions or sum of fractions using addition sentences and models.



Decomposing Fractions Greater than 1

Understanding what a fraction or mixed number is equal to will help students successfully add and subtract fractions.



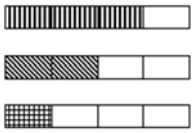
Adding and Subtracting Fractions

Students will add and subtract fractions with like denominators.

Mark mixed $\frac{3}{4}$ cup of apple juice, $\frac{2}{4}$ cup of orange juice, and $\frac{1}{4}$ cup of grape juice for his fruit punch. How many cups of juice did he put in his fruit punch in all?

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

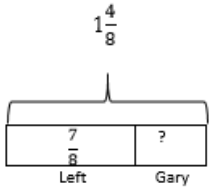
When counting, we consider the items that are counted as units as in one tree, two trees, three trees, and so on. Fractional units work the same way. In our example, the fractional units are fourths. To solve the problem, we will model with a tape diagram.



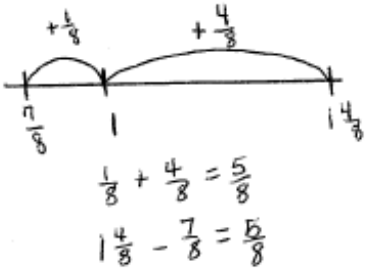
Fraction Word Problems

Mrs. Jones had $1\frac{4}{8}$ pizzas left after a party. After giving some to Gary, she had $\frac{7}{8}$ pizza left. What fraction of a pizza did she give Gary?

$$1\frac{4}{8}-\frac{7}{8}=?$$



Students can use a number line to help them finish the problem.



Line Plots

Students will collect data and create line plots to display that data.

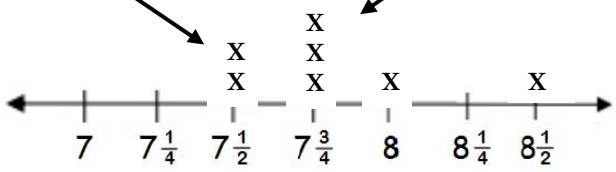
A group of children measured the lengths of their shoes. The table below shows the data collected.

Make a line plot to display the data.

Child	Jim	Sue	Kim	Ted	Jan	Max	Sam
Length of Shoe (in inches)	$7\frac{1}{2}$	$7\frac{3}{4}$	$7\frac{2}{4}$	$8\frac{1}{2}$	$7\frac{3}{4}$	8	$7\frac{3}{4}$

The student recognized that Jim's measurement of $7\frac{1}{2}$ was equivalent to Kim's measurement of $7\frac{2}{4}$ so those measurements were marked on the same position on the number line.

Three children had shoe measurements of $7\frac{3}{4}$ so the student put 3 marks above $7\frac{3}{4}$.



The number line the student drew ranges from 7 to $8\frac{1}{2}$.