

Foundations of Algebra
 Day 3: Fractions on a Number Line

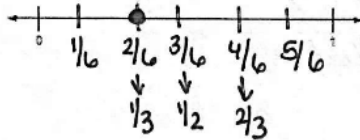
Unit 1: Number Sense & Quantity

Name: Key Practice

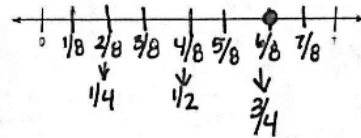
Practice Assignment

0 25 50 75 100

1. Divide & label the number line into sixths. Plot $\frac{1}{3}$.



2. Divide & label the number line into eighths. Plot $\frac{3}{4}$.



2. Order the fractions from least to greatest. Show or explain your reasoning.

a. $\frac{5}{11}, \frac{5}{6}, \frac{5}{13}, \frac{5}{3}, \frac{5}{17}, \frac{5}{8}$

$\frac{5}{17}, \frac{5}{13}, \frac{5}{11}, \frac{5}{8}, \frac{5}{6}, \frac{5}{3}$

b. $\frac{7}{5}, \frac{7}{15}, \frac{7}{4}, \frac{7}{22}, \frac{7}{9}, \frac{7}{12}$

$\frac{7}{22}, \frac{7}{15}, \frac{7}{12}, \frac{7}{9}, \frac{7}{5}, \frac{7}{4}$

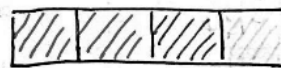
the bigger the denominator, the smaller the pieces

3. Create a rectangle that represents the following fractions and their colors:

a. $\frac{1}{4}$ yellow & $\frac{3}{4}$ red



b. $\frac{1}{4}$ red, $\frac{1}{4}$ blue, & $\frac{1}{2}$ yellow



c. $\frac{5}{8}$ green, $\frac{1}{4}$ red, & $\frac{1}{8}$ blue



d. $\frac{1}{3}$ red, $\frac{1}{6}$ blue, $\frac{1}{6}$ green, & $\frac{1}{3}$ yellow



Foundations of Algebra

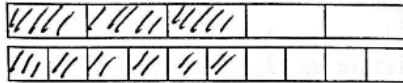
Unit 1: Number Sense & Quantity

Practice

4. Determine which fraction is equivalent to the following by shading in the appropriate boxes.

a.

Show that $\frac{3}{5}$ is equivalent to $\frac{6}{10}$.



b.

Show that $\frac{2}{3}$ is equivalent to $\frac{4}{6}$.



5. Simplify each fraction using the GCF or Prime Factorization Method.

a. $\frac{6}{16} \div 2 = \frac{3}{8}$

b. $\frac{21}{24} \div 3 = \frac{7}{8}$

c. $\frac{12}{30} \div 6 = \frac{2}{5}$

d. $\frac{42}{54} \div 6 = \frac{7}{9}$

6. Each year, AHS puts on a talent show to showcase student talent. This year, 36 students are participating. Create a fraction to show what portion of the show is each talent and then simplify your fraction. You will also include what the GCF was for each fraction that you simplified.

Type of Act	Number of Acts	Portion of Show	GCF	Simplified Portion of Show
Singing	10	10/36	2	5/18
Dancing	9	9/36	9	1/4
Playing an instrument	8	8/36	4	2/9
Lip-synching	4	4/36	4	1/9
Other	5	5/36	none	5/36

7. Convert each fraction to either an improper fraction or mixed number. Make sure your fraction is simplified.

a. $\frac{21}{6}$

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

b. $2\frac{1}{5}$

$\frac{5}{5} + \frac{5}{5} + \frac{1}{5}$
 $\frac{11}{5}$

c. $\frac{29}{5}$

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

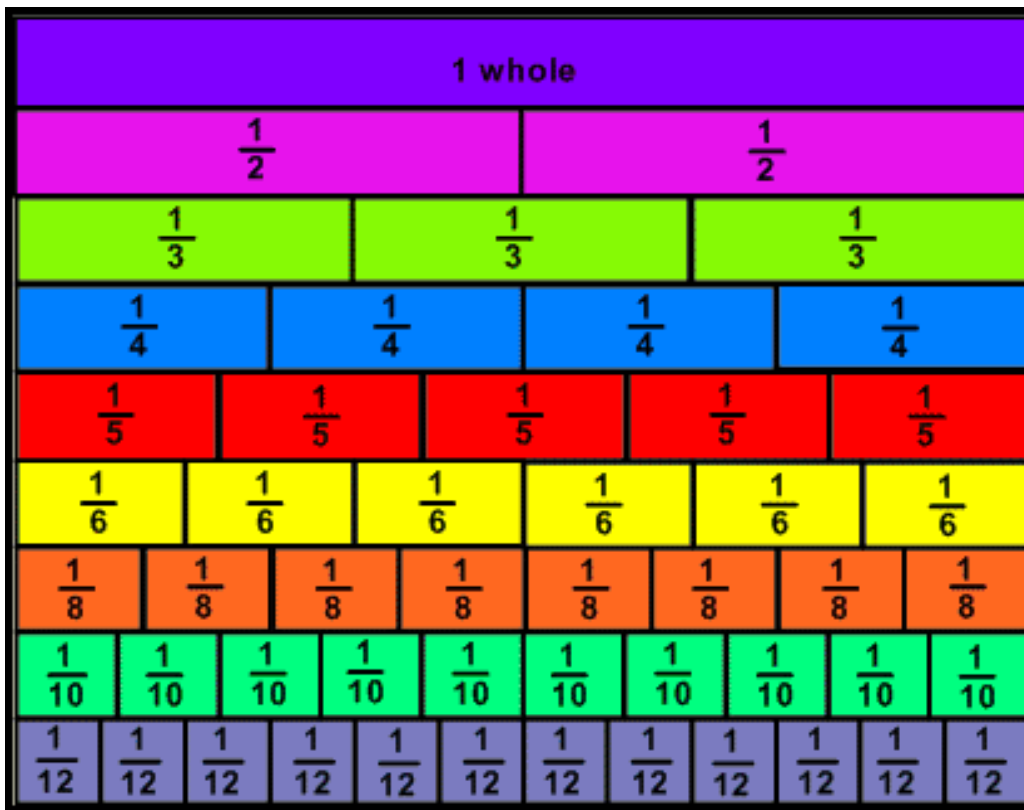
d. $4\frac{3}{5}$

$\frac{5}{5} + \frac{5}{5} + \frac{5}{5} + \frac{5}{5} + \frac{3}{5}$
 $\frac{23}{5}$



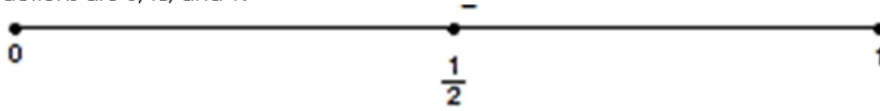
Today's Notes

Fractions



Day 6 - Benchmark Fractions

Benchmark Fractions are common fraction you can use to estimate the value of fractions. The most common benchmark fractions are 0, $\frac{1}{2}$, and 1.



Directions: After you sort your cards, record them under the following categories.

Close to 0	Close to $\frac{1}{2}$	Close to 1
$\frac{1}{6}$ $\frac{1}{8}$ $\frac{0}{9}$ $\frac{1}{12}$ $\frac{1}{9}$	$\frac{2}{4}$ $\frac{3}{6}$ $\frac{8}{15}$ $\frac{6}{12}$ $\frac{5}{11}$ $\frac{4}{10}$ $\frac{6}{10}$ $\frac{5}{9}$ $\frac{4}{9}$	$\frac{7}{8}$ $\frac{14}{15}$ $\frac{9}{10}$ $\frac{5}{6}$ $\frac{11}{12}$ $\frac{8}{8}$
What did you notice about fractions close to 0? 1 in the numerator numbers are fur apart	What did you notice about fractions close to $\frac{1}{2}$?	What did you notice about fractions close to 1? numerator is 1 away from denominator

Practice: Name the closest benchmark fraction for each fraction given.

- a. $\frac{4}{9}$ b. $\frac{8}{9}$ c. $\frac{5}{11}$ d. $\frac{2}{17}$ e. $\frac{12}{13}$ f. $\frac{6}{100}$ g. $\frac{3}{7}$
- $\frac{1}{2}$ 1 $\frac{1}{2}$ 0 1 0 $\frac{1}{2}$

Practice: Fill in the missing numbers:

a. Write the unknown numerator or denominator so that each fraction is close to but less than 1.

$\frac{11}{12}$ $\frac{26}{27}$ $\frac{6}{7}$ $\frac{11}{12}$ $\frac{14}{15}$ $\frac{9}{10}$

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



The illustration shows a person in silhouette sorting items into a grid of compartments. A timer overlay is present in the top right corner of the illustration area, displaying a time of 0:04:54. Below the timer are settings for Alert Sounds (Bell 1), Counter (Count Down), Style (Rectangle), Action (Nothing), and a Color selection bar.

SORTING ACTIVITY

~~4/9~~ ~~4/7~~ ~~4/2~~ ~~4/9~~ ~~5/11~~ ~~4/9~~ ~~4/9~~ ~~6/10~~ ~~8/15~~
 Foundations of Algebra Unit 1: Number Sense & Quantity Notes

Directions: Take the fractions, from above, that were in your "Close to 1/2" pile and now sort them according to the following categories.

Fractions less than 1/2	Fractions equal to 1/2	Fractions more than 1/2
$\frac{4}{10}$ $\frac{4}{9}$ $\frac{5}{11}$	$\frac{6}{12}$ $\frac{2}{4}$ $\frac{3}{6}$	$\frac{5}{9}$ $\frac{6}{10}$ $\frac{8}{15}$
How did you determine if fractions were less than 1/2?	How did you determine if fractions were equal to 1/2?	How did you determine if fractions were more than 1/2?

Practice: Fill in the missing numbers:

b. Write the unknown numerator or denominator so that each fraction is close to but more than 1/2.

$\frac{7}{12}$ $\frac{14}{27}$ $\frac{6}{11}$ $\frac{11}{21}$ $\frac{8}{15}$ $\frac{9}{17}$
 $\frac{6}{12}$ $\frac{13.5}{27}$

c. Write the unknown numerator or denominator so that each fraction is close to but less than 1/2.

$\frac{5}{12}$ $\frac{13}{27}$ $\frac{6}{13}$ $\frac{11}{23}$ $\frac{7}{15}$ $\frac{9}{19}$
 $\frac{6}{12}$

Foundations of Algebra

Unit 1: Number Sense & Quantity

Notes

Using Benchmark Fractions to Estimate 0, 1/2, 1

We can use benchmark fractions to help us estimate the sum or difference of two fractions. For the following problems, rewrite each expression using benchmark fractions. Then, estimate the sum. Explain your reasoning.

Expression	Estimated Sum	Reasoning
$\frac{6}{7} + \frac{11}{12}$	$1 + 1 = 2$	
$\frac{1}{12} + \frac{4}{7}$	$0 + \frac{1}{2} = \frac{1}{2}$	
$\frac{5}{6} + \frac{6}{7} + \frac{7}{8} + \frac{8}{9}$	$1 + 1 + 1 + 1 = 4$	
$\frac{8}{17} + \frac{6}{10} + \frac{15}{17} + \frac{11}{12}$	$\frac{1}{2} + \frac{1}{2} + 1 + 1 = 3$	

Critical Thinking: Answer the following and explain your reasoning.

a. If three fractions are greater than 1/2 but less than 1 are added together, what can you say about their sum?

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

$$1 + 1 + 1 = 3$$

bigger than $1\frac{1}{2}$ but smaller than 3

b. If two fractions are less than 1/2 but greater than 0 are added together, what can you say about their sum?

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

$$0 + 0 = 0$$

between 0 and 1

c. If eight fractions that are slightly less than 1 are added together, what can you say about their sum?

$$1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 8$$

a little less than 8

Comparing and Ordering Fractions

To compare fractions, you can use a variety of strategies, such as using benchmark fractions, creating equivalent fractions, and converting fractions to decimals.

Method 1: Using Benchmark Fractions

When using Benchmark Fractions, try to determine if your fractions are close to 0, little less than $\frac{1}{2}$, little more than $\frac{1}{2}$, or close to 1.

$a. \frac{1}{2} < \frac{3}{4}$ <p style="color: blue; font-size: 1.2em;">1/2 less than 3/4</p>	$b. \frac{2}{3} > \frac{5}{10}$ <p style="color: red; font-size: 1.2em;">greater than</p>	$c. \frac{11}{12} > \frac{2}{5}$ <p style="color: blue; font-size: 1.2em;">greater than</p>	$d. \frac{7}{16} < \frac{51}{100}$ <p style="color: green; font-size: 1.2em;">less than</p>
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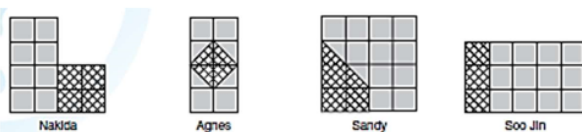
Method 2: Creating Equivalent Fractions

- If you notice the denominators are the same, then you just need to compare the numerators.
- If you notice the numerators are the same, then you need to think about the size of the groups of the number in the denominator.
- If you notice that you could easily make an equivalent fraction with one of the fractions, then create equivalent fractions.
- You can also always draw a picture.

$a. \frac{49}{100} < \frac{51}{100}$ <p style="color: blue; font-size: 1.2em;">less than</p>	$b. \frac{2}{3} > \frac{2}{5}$ <p style="color: blue; font-size: 1.2em;">greater than</p>	$c. \frac{7}{10} > \frac{7}{12}$ <p style="color: green; font-size: 1.2em;">greater than</p>	$d. \frac{1}{5} < \frac{1}{4}$ <p style="color: red; font-size: 1.2em;">less than</p>
$e. \frac{5}{4} < \frac{5}{2}$ <p style="color: red; font-size: 1.2em;">less than</p>	$f. \frac{8}{12} = \frac{2}{3}$ <p style="color: red; font-size: 1.2em;">2/3 = 2/3</p>	$g. \frac{9}{10} > \frac{3}{5}$ <p style="color: red; font-size: 1.2em;">9/10 > 6/10</p>	$h. \frac{4}{6} < \frac{9}{12}$ <p style="color: red; font-size: 1.2em;">8/12 < 9/12</p>

Who is Right??? Read the following scenario and determine who is correct.

Four students are designing a logo that involves patterns and solid colors. Nakida claims she has the greatest fractional part of plaid in her design while Sandy claims she has the greatest fractional part of plaid in her design. Who is correct and why?



$\frac{4}{12}$	$\frac{2}{8}$	$\frac{4}{16}$	$\frac{3}{15}$
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Simplify $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{5}$

Nakida has the most



Additional Practice

Foundations of Algebra

Unit 1: Number Sense & Quantity

Practice

Day 4: Benchmark Fractions & Fractions on a Number Line

Name: _____

Practice Assignment

0 25 50 75 100

1. Order the fractions from least to greatest. Show or explain your reasoning.

a.

$$\frac{5}{9}, \frac{6}{13}, \frac{11}{13}, \frac{3}{28}$$

b.

$$\frac{5}{10}, \frac{2}{21}, \frac{7}{13}, \frac{6}{7}, \frac{8}{17}$$

c.

$$\frac{24}{25}, \frac{3}{6}, \frac{5}{11}, \frac{1}{16}, \frac{3}{5}$$

2. Fill in the missing numerator or denominator so that the fraction is close to but greater than $\frac{1}{2}$.

a. $\frac{\quad}{15}$

b. $\frac{7}{\quad}$

c. $\frac{19}{\quad}$

d. $\frac{\quad}{20}$

3. Fill in the missing numerator or denominator so that the fraction is close to 0.

a. $\frac{\quad}{9}$

b. $\frac{2}{\quad}$

c. $\frac{4}{\quad}$

d. $\frac{\quad}{13}$

4. The table shows the fraction of an hour that students spent running laps at a track practice one afternoon. Use the table to answer the following questions:

Student	Fraction of One Hour Spent Running Laps
Denise	$\frac{1}{10}$
Patrick	$\frac{2}{3}$
Tyrone	$\frac{11}{12}$
Su Lee	$\frac{3}{4}$
Jasmine	$\frac{7}{15}$

a. Which student(s) ran for almost an entire hour?

b. Which student(s) ran for more than half an hour?

c. Which student(s) for less than half an hour?

5. Kara walks five days each week. This week she walked $\frac{7}{8}$ mile on Monday, $\frac{3}{5}$ mile on Tuesday, $\frac{4}{10}$ mile on Wednesday, $\frac{1}{10}$ mile on Thursday, and $\frac{9}{10}$ mile on Friday. Use benchmark fractions to estimate the total distance Kara walked this week. **Show and explain your reasoning.**

Foundations of Algebra

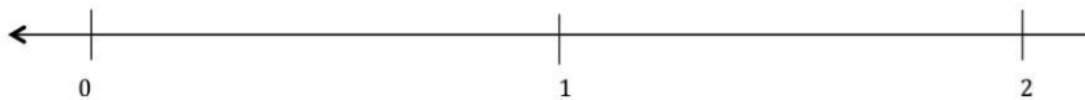
Unit 1: Number Sense & Quantity

Practice

6. A school participates in a reading contest. The table shows each class portion of the grade's total reading minutes. Order the portion of reading minutes for each teacher in order from greatest to least. Explain your reasoning. ©CarnegieLearning

Class	Portion of Reading Minutes
Mr. Karlie	$\frac{5}{12}$
Ms. Jacobs	$\frac{1}{18}$
Ms. Suarez	$\frac{4}{9}$
Mr. Mitchell	$\frac{1}{12}$

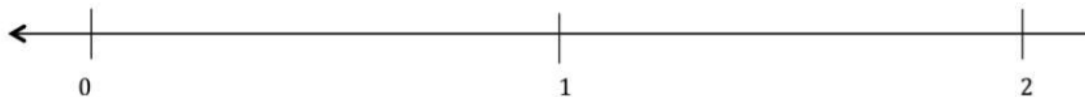
7. Mary swims $\frac{1}{8}$ of a mile each day. Use the number line to help you answer the following questions:



a. How many miles will she have swam in 12 days?

b. How many days does it take to swim $\frac{3}{4}$ of a mile?

8. Caleb swam $\frac{1}{6}$ mile a day for 8 days. At the end of 8 days, Caleb told his friends he swam $\frac{4}{3}$ miles all together. Did Caleb use the correct fraction? Show your work and explain if you think Caleb is correct or incorrect.



9. Plot the following fractions on the number (estimate if necessary).

- A. $\frac{3}{2}$ B. $1\frac{1}{4}$ C. $1\frac{9}{10}$ D. $2\frac{1}{2}$ E. $\frac{2}{5}$

