

Lesson Title: Fraction-Decimal-Percent Estimation		Pre 2.7
Utah State Core Standard and Indicators Pre-Algebra Standards 1 Process Standards 1, 4		
Summary		
In the first activity, students order fractions and decimals. In the second and third activity, students estimate fractional quantities using common fraction, decimal and percentage equivalents.		
Enduring Understanding	Essential Questions	
Estimating, specifically using fractions, decimals and percentages, is crucial to our understanding and functioning in our world.	<ul style="list-style-type: none"> • What is the basis of fraction sense? • How do we know the size of decimals? • Why is it valuable to interchange common fractions, decimals and percentages when estimating? 	
Skill Focus	Vocabulary Focus	
<ul style="list-style-type: none"> • Fraction, decimal, percentage estimation 		
Assessment		
Materials: calculators for checking		
Launch ideas: “We talked about how we launched the lesson; students don’t always have to know an exact answer. They can estimate and round to get a ballpark figure.” [Maybe the estimation shoot games should come first to help prepare students more!]		
Explore ideas: “Many students were too frustrated to explore. We, as teachers, might have been too! We mostly did this as class assignments, because the students needed much guiding.” [Perhaps we needed to do the “estimation shoot” games first to develop the concept more thoroughly—students should have more estimation sense than they do!]		
Summarize		
Apply		

Directions:

Students should use calculators to check their estimates.

Students have great difficulty switching back and forth among common fractions and percentages. The teacher will probably have to lead the students for the first Fraction, Decimal, and Percentage worksheet. This is why several versions have been included.

Estimation Shoot Games have also been included below.

Pre 2.7a

Fraction Sense

Classify these fractions as close to 0, close to 1/2, close to 1

1/2 1/9 5/8 5/6 7/8 1/5 5/9 3/8 1/7

Close to 0

Close to 1/2

Close to 1

Order the above from lowest to highest. Then check using decimals.

Fractions: _____

Decimal equivalents: _____

Classify these fractions

1/2 4/28 3/4 2/7 5/14 2/11 4/5 7/9

Close to 0

Close to 1/2

Close to 1

Order the above from lowest to highest. Then check using decimals

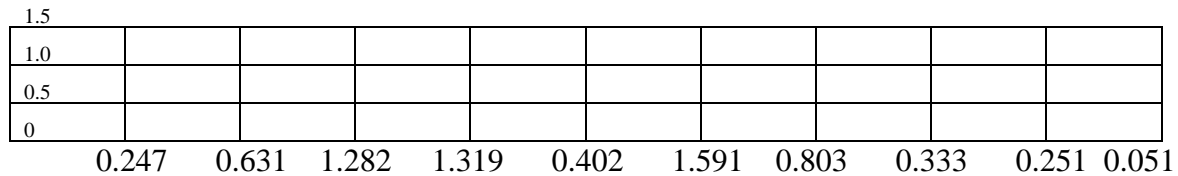
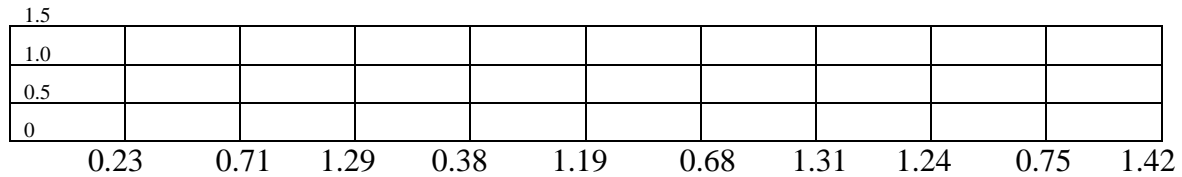
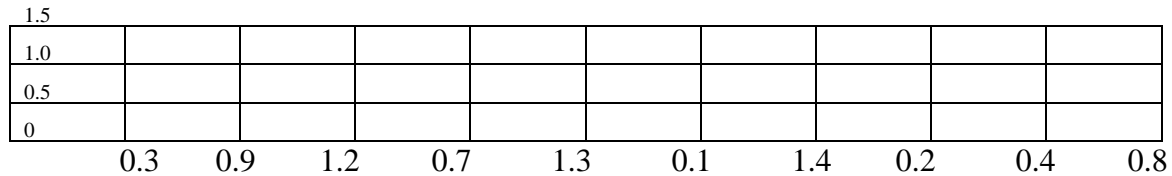
Fractions: _____

Decimal equivalents: _____

Decimal Sense

Plot each decimal on the graph by following these rules.

- If the decimal is closer to 0 than 0.5, plot 0
- If the decimal is closer to 0.5 than it is to 0 or 1, plot 0.5
- If the decimal is closer to 1.5 than it is to 1, plot 1.5

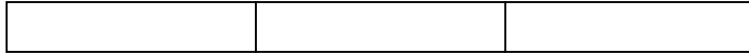


Pre 2.7b Common Fraction/Decimal/Percentage Equivalents

Write the equivalent values for the following parts of a candy bar.

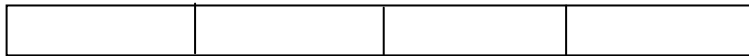


One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)



One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)

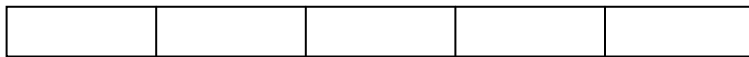
Two parts _____



One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)

Two parts _____

Three parts _____



One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)

Two parts _____

Three parts _____

Four parts _____

Five parts _____



One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)

Two parts _____

Three parts _____

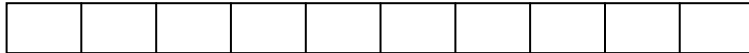
Four parts _____

Five parts _____

Six parts _____

Seven parts _____

Eight parts _____



One part above is worth _____ (fraction) = _____ (decimal) = _____ (percentage)

Two parts _____

Three parts _____

Four parts _____

Five parts _____

Six parts _____

Seven parts _____

Eight parts _____

Nine parts _____

What common fraction is closest to these decimals or percentages?

- 1) .32 _____ .67 _____ .76 _____ .21 _____ .24 _____ .48 _____
 2) .61 _____ 23% _____ 98% _____ 41% _____ 34% _____ 79% _____

Write as a fraction. Estimate the fraction to the closest common fraction.

	Fraction	Estimate Fraction	=	_____ %
3) 9 out of 24	_____	_____	=	_____ %
61 out of 99	_____	_____	=	_____ %
9 out of 48	_____	_____	=	_____ %
21 out of 31	_____	_____	=	_____ %
8 out of 33	_____	_____	=	_____ %

Rewrite to estimate using a common fraction and a convenient number.

- 4) 26% of 48 $\frac{\text{(fraction)}}{\text{_____}}$ of $\text{(number)} \text{_____}$ = _____
 .76 * 29 _____ of _____ = _____
 33% of 59 _____ of _____ = _____
 (.65) (18) _____ of _____ = _____
 52 % of 81 _____ of _____ = _____
 (.21) (25) _____ of _____ = _____
 9% of 69 _____ of _____ = _____
 39 % * 49 _____ of _____ = _____

- 5) What is the fastest way to estimate 10 % of \$49.00? _____
 How would you figure out the tip (15%) on a \$49.00 dinner?

What common fraction is closest to these decimals or percentages?

- 1) .34 _____ .32 _____ .24 _____ .59 _____ .73 _____ .53 _____
 2) .22 _____ 76% _____ 97% _____ 81% _____ 65% _____ .91 _____

Write as a fraction. Estimate the fraction to the closest common fraction.

- | | Fraction | Estimate Fraction | | |
|----------------|----------|-------------------|---|---------|
| 3) 9 out of 27 | _____ | _____ | = | _____ % |
| 11 out of 40 | _____ | _____ | = | _____ % |
| 8 out of 41 | _____ | _____ | = | _____ % |
| 11 out of 15 | _____ | _____ | = | _____ % |
| 4 out of 19 | _____ | _____ | = | _____ % |

Rewrite to estimate using a common fraction and a convenient number.

- | | (fraction) | (number) | | |
|--------------|------------|----------|---|-------|
| 4) 24% of 36 | _____ | of _____ | = | _____ |
| .74 * 24 | _____ | of _____ | = | _____ |
| 33% of 21 | _____ | of _____ | = | _____ |
| (.65) (15) | _____ | of _____ | = | _____ |
| 52 % of 90 | _____ | of _____ | = | _____ |
| (.19) (35) | _____ | of _____ | = | _____ |
| 11% of 86 | _____ | of _____ | = | _____ |
| 41 % * 25 | _____ | of _____ | = | _____ |

- 5) What is the fastest way to estimate 10 % of \$61.00? _____
 How would you figure out the tip (15%) on a \$61.00 dinner?

What common fraction is closest to these decimals or percentages?

1) .34 _____ .65 _____ .74 _____ .19 _____ .26 _____ .51 _____

2) .59 _____ .26% _____ 99% _____ 39% _____ 32% _____ 81% _____

Write as a fraction. Estimate the fraction to the closest common fraction.

Fraction Estimate Fraction

3) 7 out of 24 _____ = _____ %

59 out of 99 _____ = _____ %

11 out of 49 _____ = _____ %

19 out of 29 _____ = _____ %

8 out of 31 _____ = _____ %

Rewrite to estimate using a common fraction and a convenient number.

(fraction) (number)

4) 24% of 36 _____ of _____ = _____

.74 * 19 _____ of _____ = _____

33% of 26 _____ of _____ = _____

(.67) (24) _____ of _____ = _____

48 % of 58 _____ of _____ = _____

(.19) (35) _____ of _____ = _____

11% of 89 _____ of _____ = _____

41 % * 46 _____ of _____ = _____

5) What is the fastest way to estimate 10 % of \$89.00? _____
 How would you figure out the tip (15%) on an \$89.00 dinner?

What common fraction is closest to these decimals or percentages?

1) .67 _____ .32 _____ .26 _____ .79 _____ .76 _____ .48 _____

2) .19 _____ 77% _____ 101% _____ 61% _____ 62% _____ 65% _____

Write as a fraction. Estimate the fraction to the closest common fraction.

Fraction Estimate Fraction

3) 18 out of 24 _____ = _____ %

29 out of 89 _____ = _____ %

9 out of 28 _____ = _____ %

10 out of 29 _____ = _____ %

8 out of 39 _____ = _____ %

Rewrite to estimate using a common fraction and a convenient number.

(fraction) (number)

4) 76% of 36 _____ of _____ = _____

.24 * 19 _____ of _____ = _____

65% of 27 _____ of _____ = _____

(.34) (24) _____ of _____ = _____

51% of 98 _____ of _____ = _____

(.41) (35) _____ of _____ = _____

9% of 69 _____ of _____ = _____

61% * 45 _____ of _____ = _____

5) What is the fastest way to estimate 10 % of \$54.50? _____
 How would you figure out the tip (15%) on a \$54.50 dinner?

Estimation Shoot

Use your estimation skills to find two numbers and one operation that will give you the most points.

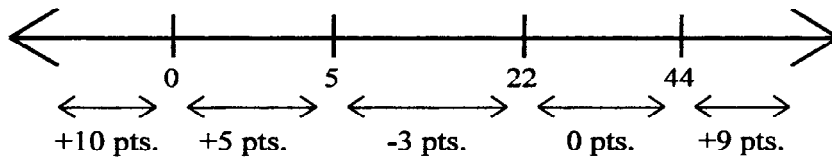
The winner is the person with the most points at the end of 4 or 5 rounds.

- 1) Decide who will go first. Play proceeds clockwise.
- 2) The player chooses two numbers and one operation from the grid. Cross off both numbers and the operation sign so they can't be used again.
- 3) Predict the answer and tell the group.
- 4) Use the calculator to find the answer. If your predicted answer is within 2 units of the correct answer, then take the points you earned based on the chart at the bottom.

Estimation Shoot Grid One

$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{5}$	$\frac{7}{8}$	$\frac{7}{15}$	$\frac{9}{19}$	$\frac{21}{23}$
$1\frac{2}{7}$	$1\frac{3}{11}$	$1\frac{15}{17}$	$1\frac{4}{9}$	$1\frac{1}{8}$	$1\frac{5}{6}$	$1\frac{9}{10}$
$2\frac{1}{10}$	$2\frac{20}{21}$	$2\frac{3}{17}$	$2\frac{14}{27}$	$2\frac{4}{5}$	$2\frac{1}{2}$	$2\frac{3}{4}$
$3\frac{2}{7}$	$3\frac{1}{3}$	$3\frac{2}{5}$	$4\frac{1}{2}$	$4\frac{7}{9}$	$4\frac{3}{5}$	$4\frac{1}{9}$
5	5	5	5	5	6	6
7	7	7	7	8	8	8

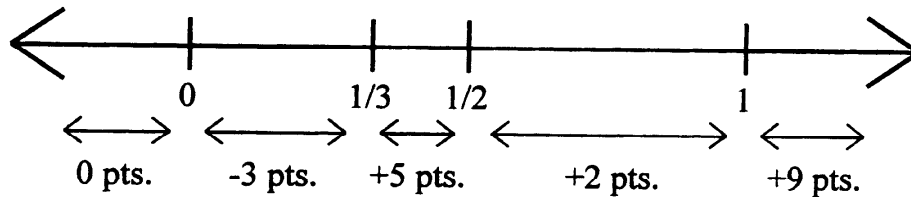
Operations: + + - - x x x x ÷ ÷ ÷ ÷
 + + - - x x x x ÷ ÷ ÷ ÷



Estimation Shoot Grid Two

$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{5}$	$\frac{7}{8}$	$\frac{7}{15}$	$\frac{9}{19}$	$\frac{21}{23}$
$1\frac{2}{7}$	$1\frac{3}{11}$	$1\frac{15}{17}$	$1\frac{4}{9}$	$1\frac{1}{8}$	$1\frac{5}{6}$	$1\frac{9}{10}$
$2\frac{1}{10}$	$2\frac{20}{21}$	$2\frac{3}{17}$	$2\frac{14}{27}$	$2\frac{4}{5}$	$2\frac{1}{2}$	$2\frac{3}{4}$
$3\frac{2}{7}$	$3\frac{1}{3}$	$3\frac{2}{5}$	$4\frac{1}{2}$	$4\frac{7}{9}$	$4\frac{3}{5}$	$4\frac{1}{9}$
5	5	5	5	5	6	6
7	7	7	7	8	8	8

Operations: x x x x x x ÷ ÷ ÷ ÷ ÷ ÷
 x x x x x x ÷ ÷ ÷ ÷ ÷ ÷



Bullseye

- 1) Complete the first column of answers on your own.
- 2) Use the calculator to find the 2nd and 3rd column answers.
- 3) Use the 3rd column correctness ratios and find your scores on the Bullseye scoring chart.
For example, if one of your correctness ratios came out to be 1.12, you would receive 2 points.

Bullseye				
	Approximate Answer	Exact Answer	Approximate ÷ Exact Answer	Points Scored
4.872×3.127				
25.2×20.02				
0.62×0.57				
$19.8 \div 1.52$				
$0.91 \div 12.13$				
$54.45 \div 14.79$				

	Approximate Answer	Exact Answer	Approximate ÷ Exact Answer	Points Scored
$3\frac{9}{10} \times \frac{5}{7}$				
$\frac{2}{5} \times 8\frac{1}{4}$				
$9\frac{1}{5} \times 6\frac{3}{4}$				
$\frac{9}{10} \div \frac{2}{5}$				
$\frac{8}{25} \div \frac{3}{8}$				
$11\frac{3}{5} \div 6\frac{1}{2}$				

Bullseye

