

ST Math Immersion (Virtual)

Grade 5 Problem Solving - Answer Key

Week 2



Activate Prior Knowledge (G5_GPK_W2_D1)

Cayden wanted to play the piano for 7 hours this week to prepare for his concert on Saturday. Here is how much he played each day:

Monday	$\frac{7}{6}$ of an hour
Tuesday	$\frac{5}{2}$ of an hour
Wednesday	$\frac{3}{4}$ of an hour
Thursday	?
Friday	?

How much did he practice Thursday and Friday if he wanted to reach his goal?

Student answers will vary. The amount practiced Thursday and Friday should sum to 2 hours and 35 minutes, or $2\frac{7}{12}$ of an hour.

If he wanted to take a break Thursday, how could he reach his goal?

On Friday, Cayden would need to practice 2 hours and 35 minutes, or $2\frac{7}{12}$ of an hour.

Number Line Equivalence Pre-Work

Can two fractions have more than one common denominator? Explain

Fractions can have more than one common denominator because they can have common multiples. (For example, halves and thirds have a common denominator of sixths, twelfths, eighteenths, and so on.)

Is $\frac{2}{4} + \frac{4}{6} = \frac{6}{10}$? Why or why not?

$\frac{2}{4} + \frac{4}{6}$ does not equal $\frac{6}{10}$. Students might reason that since each addend is greater than or equal to one-half, the sum must be greater than or equal to one whole. They might also draw a model to show why $\frac{6}{10}$ is not a possible answer.

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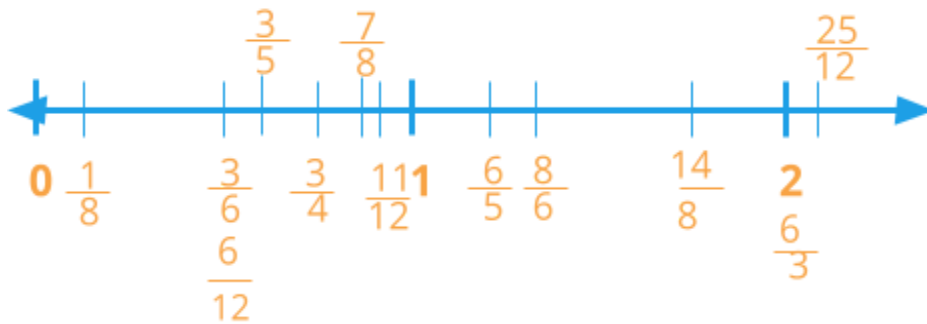
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Mallory and Yuto ordered two identical pizzas. Mallory ate $\frac{2}{3}$ of her pizza. Yuto ate $\frac{5}{6}$ of his pizza. How much pizza did Mallory and Yuto eat all together? Explain.

Mallory and Yuto ate $\frac{9}{6}$ of their pizzas. Students might also represent this quantity as $1\frac{3}{6}$, $1\frac{1}{2}$, or any other equivalent value. Explanations might include a model and/or description of how to find common denominators to add/join like parts.

Problem of the Day (G5_POD_W2_D2)

Create a number line using all of the given fractions ($\frac{3}{6}$, $\frac{7}{8}$, $\frac{11}{12}$, $\frac{8}{6}$, $\frac{1}{8}$, $\frac{3}{4}$, $\frac{25}{12}$, $\frac{6}{3}$, $\frac{6}{12}$, $\frac{6}{5}$, $\frac{3}{5}$, $\frac{14}{8}$). Be as exact as possible. Select three of the fractions and write an explanation of how you determined their placement.



Student explanations will vary.

Look for:

Benchmarks	Common Numerator Comparison	Pieces away from one whole:
<ul style="list-style-type: none"> $\frac{1}{2} = \frac{3}{6} = \frac{3}{12}$ $2 \text{ wholes} = \frac{6}{3}$ 	$\frac{3}{4} > \frac{3}{5} > \frac{3}{6}$	<ul style="list-style-type: none"> $\frac{11}{12} > \frac{7}{8} > \frac{3}{4}$ $\frac{25}{12} > 2 \text{ wholes}$ $\frac{6}{5} = 1\frac{1}{5}$, $\frac{8}{6} = 1\frac{1}{3}$, $1\frac{1}{5} < 1\frac{1}{3}$

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Problem of the Day (G5_POD_W2_D3)

Addie is making two different recipes for the school bake sale. The brownie recipe calls for $\frac{2}{3}$ cup of milk and the cut-out cookie recipe calls for $\frac{3}{4}$ cup of milk. How much total milk will Addie need to make both of her recipes? Explain.

Addie will need $1\frac{5}{12}$ cups of milk.

Student explanations will vary. Look for common denominators/equal parts in student solutions.

Problem of the Day (G5_POD_W2_D4)

Darla wanted to make 2 gallons of punch to take to the school picnic. She found a recipe that called for $\frac{3}{4}$ gal of fruit punch, 2 quarts of orange juice, $\frac{3}{8}$ gal of 7UP, and $\frac{1}{2}$ gal of water. If Darla makes this recipe, will she have as much punch as she wants? Justify your solution.

Yes, Darla will have more than 2 gallons of punch to take to the school picnic.

Possible Student Strategies

$\frac{3}{4}$ gallon = 3 quarts (Fruit Punch) 2 quarts (Orange Juice)	<table border="1"><tr><td>FP</td><td>FP</td><td>FP</td><td>OJ</td></tr></table> 1 gallon	FP	FP	FP	OJ	
FP	FP	FP	OJ			
$\frac{1}{2}$ gallon = 2 quarts (Water)	<table border="1"><tr><td>OJ</td><td>H2O</td><td>H2O</td><td>7UP</td><td>7UP</td></tr></table> 1 gallon	OJ	H2O	H2O	7UP	7UP
OJ	H2O	H2O	7UP	7UP		
$\frac{3}{8}$ gallon = $1\frac{1}{2}$ quarts (7UP)	<table border="1"><tr><td>7UP</td></tr></table> $\frac{1}{8}$ gallon	7UP				
7UP						
$3 + 2 + 2 + 1\frac{1}{2} = 8\frac{1}{2}$ quarts altogether						
Quarts in one gallon = 4 Quarts in two gallons = 8						
$8\frac{1}{2} > 8$						

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Math Writing Prompt (G5_Journal_W2_D4)

Halley solved this subtraction problem: $\frac{7}{8} - \frac{1}{2} = \frac{6}{6}$. Compare the fractions in the equation to help explain why Halley's solution is not reasonable.

Student explanations will vary.

Look for:

- $\frac{7}{8}$ is less than one whole. $\frac{6}{6}$, Halley's solution, is equivalent to one whole. When $\frac{1}{2}$ is taken away from $\frac{7}{8}$, the solution will be even less than $\frac{7}{8}$, which is already less than one whole.

Small Group Activity (G5_ProblemSolving_W2_D5)

- Kevin filled 4 glasses with different amounts of water so they would make different sounds when he rubbed his finger along the rim.
- Glass A held $\frac{5}{8}$ cup of water, glass B held $\frac{3}{4}$ cup of water, glass C held $\frac{3}{6}$ cup of water, glass D held $\frac{2}{6}$ cup of water.
- How much water did Kevin use?
- How much water could he put in a fifth glass if he had 3 cups of water?

Kevin used $2\frac{5}{24}$ cups of water.

Glass 5 can hold $\frac{19}{24}$ cup of water.

Student strategies will vary.

Possible Student Strategies

<i>Establishing Common Denominators</i>	<i>Using $\frac{1}{2}$ as a benchmark</i>
$\frac{3}{4} = \frac{6}{8} \text{ (B)}$	$\frac{5}{8} = \frac{1}{2} + \frac{1}{8}$
$\frac{5}{8} \text{ (A)} + \frac{6}{8} \text{ (B)} = \frac{11}{8} = \frac{33}{24}$	$\frac{3}{4} = \frac{1}{2} + \frac{1}{4}$
$\frac{3}{6} \text{ (C)} + \frac{2}{6} \text{ (D)} = \frac{5}{6} = \frac{20}{24}$	$\frac{3}{6} = \frac{1}{2}$
$33 + 20 = \frac{53}{24}$	$\frac{2}{6} = \frac{1}{2} - \frac{1}{6}$
$\frac{53}{24} = 2\frac{5}{24}$	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2 \text{ wholes}$
	$\frac{1}{8} + \frac{1}{4} = \frac{3}{8}$

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	$\frac{3}{8} - \frac{1}{6} = \frac{9}{24} - \frac{4}{24}$ $\frac{9}{24} - \frac{4}{24} = \frac{5}{24}$ <p><i>2 wholes and $\frac{5}{24}$</i></p>
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Small Group Activities (G5_Journal_W2_D5)

Bart solved this addition problem: $\frac{1}{2} + \frac{3}{8} = \frac{4}{10}$. Use equivalent fractions to explain to Bart that his solution is not reasonable.

Student explanations will vary.

Look for:

- $\frac{1}{2} = \frac{5}{10}$.
- $\frac{5}{10} > \frac{4}{10}$, so $\frac{1}{2} + \frac{3}{8} > \frac{4}{10}$