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Math Content Guide
5.NF.1-2

K-8 Curriculum & Assessment Team, 2021-22

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Standards in this Content Guide:

CCSS.MATH.CONTENT.5.NF.A.1
Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

CCSS.MATH.CONTENT.5.NF.2
Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2*.

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PREPARE

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What is this? These articles come from the Progressions Document from the Common Core State Standards and the North Carolina Unpacked Standards.
What should I consider? These documents provide an overview of the mathematics and ideas behind this standard.
How should I use this? Review this information in order to help you unpack the standards when preparing for a lesson/data meeting with a deeper sense of what they mean. and how they are represented.

Build the Background Content Knowledge

Common Core Progressions Document:

Grade 5

Adding and subtracting fractions In Grade 4, students have some experience calculating sums of fractions with different denominators in their work with decimals, where they add fractions with denominators 10 and 100, such as

$$\frac{2}{10} + \frac{7}{100} = \frac{20}{100} + \frac{7}{100} = \frac{27}{100}.$$

Note that this is a situation where one denominator is a divisor of the other, so that only one fraction has to be changed. They might have encountered other similar situations, for example using a fraction strip to reason that

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

They understand the process as expressing both summands in terms of the same unit fraction so that they can be added. Grade 5 students extend this reasoning to situations where it is necessary to re-express both fractions in terms of a new denominator.[5.NF.1] For example, in calculating $\frac{2}{3} + \frac{5}{4}$ they reason that if each third in $\frac{2}{3}$ is subdivided into fourths, and if each fourth in $\frac{5}{4}$ is subdivided into thirds, then each fraction will be a sum of unit fractions with denominator $3 \times 4 = 4 \times 3 = 12$:

$$\frac{2}{3} + \frac{5}{4} = \frac{2 \times 4}{3 \times 4} + \frac{5 \times 3}{4 \times 3} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}.$$

In general two fractions can be added by subdividing the unit fractions in one using the denominator of the other:

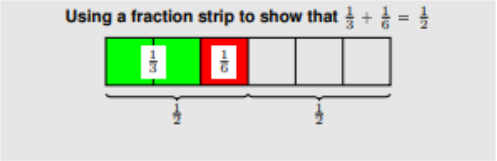
$$\frac{a}{b} + \frac{c}{d} = \frac{a \times d}{b \times d} + \frac{c \times b}{d \times b} = \frac{ad + bc}{bd}.$$

It is not necessary to find a least common denominator to calculate sums of fractions, and in fact the effort of finding a least common denominator is a distraction from understanding algorithms for adding fractions.

Students make sense of fractional quantities when solving word problems, estimating answers mentally to see if they make sense.[5.NF.2] For example in the problem

> Ludmilla and Lazarus each have a lemon. They need a cup of lemon juice to make hummus for a party. Ludmilla squeezes $\frac{1}{2}$ a cup from hers and Lazarus squeezes $\frac{2}{5}$ of a cup from his. How much lemon juice to they have? Is it enough?

students estimate that there is almost but not quite one cup of lemon juice, because $\frac{2}{5} < \frac{1}{2}$. They calculate $\frac{1}{2} + \frac{2}{5} = \frac{9}{10}$, and see this as $\frac{1}{10}$ less than 1, which is probably a small enough shortfall that it will not ruin the recipe. They detect an incorrect result such as $\frac{1}{2} + \frac{2}{5} = \frac{3}{7}$ by noticing that $\frac{3}{7} < \frac{1}{2}$.



5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

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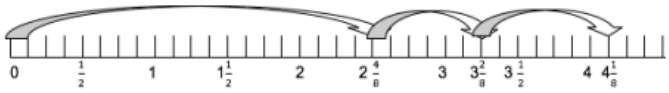
North Carolina Unpacking the Standards:

Use equivalent fractions as a strategy to add and subtract fractions.

NC.5.NF.1 Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths.

- Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
- Solve one-and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem in an equation.

Clarification	**Checking for Understanding**
While working on NC.5.NF.1 students should be able to estimate and find the answer to one- and two- step word problems involving fractions with unlike denominators using related fractions. Adding and subtracting only related fractions is new to 5th grade. Related fractions are fractions in which one denominator is a multiple of the other, e.g., halves, fourths, and eighths. Students should be able to assess the reasonableness of answers by estimating sums and differences to the nearest half or whole number. Students should have ample experiences creating area and length models to build understanding. The use of these models allows students to use reasonableness to find a common denominator prior to using the algorithm. For example, when adding 1/3 + 1/6, Grade 5 students should apply their understanding of equivalent fractions and their ability to rewrite fractions in an equivalent form to find common denominators.	There is some ham in the refrigerator. Tyrisha uses ¾ of a pound to make sandwiches and Jacquel uses 7/8 of a pound to make sandwiches. If there is now 2 ½ pounds of ham left over, how much ham was there before Tyrisha and Jacquel used some. *Possible responses:* Student 1: *We do not know what we started with but we know we ended with 2 ½ pounds of ham. Before Jacquel took ham, there was 7/8 of a pound more ham. I need to solve 2 ½ + 7/8 + 3/4. I knew that since 7/8 and ¾ were greater than a half but less than 1, that my total would be close to but less than 4 and ½.*  *When I found the total amount shaded it was 4 and 1/8, which is close to my estimate.* Student 2: *I know that 2 ½ is the same as 2 and 4/8. I also know that ¾ is 6/8. So, I used the expression:* *2 4/8 + 6/8 + 7/8.* *I used the number line to jump from zero.* 

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

This standard refers to number sense, which means students' understanding of fractions as numbers that lie between whole numbers on a number line. Number sense in fractions also includes moving between decimals and fractions to find equivalents, also being able to use reasoning such as 7/8 is greater than ¾ because 7/8 is missing only 1/8 and ¾ is missing ¼ so 7/8 is closer to a whole Also, students should use benchmark fractions to estimate and examine the reasonableness of their answers. Example here such as 5/8 is greater than 6/10 because 5/8 is 1/8 larger than ½(4/8) and 6/10 is only 1/10 larger than ½ (5/10)

Example:
Your teacher gave you 1/7 of the bag of candy. She also gave your friend 1/3 of the bag of candy. If you and your friend combined your candy, what fraction of the bag would you have? Estimate your answer and then calculate. How reasonable was your estimate?

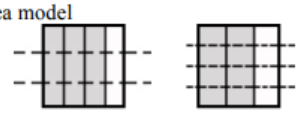
> Student 1
> 1/7 is really close to 0. 1/3 is larger than 1/7, but still less than 1/2. If we put them together we might get close to 1/2.
> 1/7 + 1/3= 3/21 + 7/21 = 10/21. The fraction does not simplify. I know that 10 is half of 20, so 10/21 is a little less than ½.
> Another example: 1/7 is close to 1/6 but less than 1/6, and 1/3 is equivalent to 2/6, so I have a little less than 3/6 or ½.

Example:
Jerry was making two different types of cookies. One recipe needed 3/4 cup of sugar and the other needed 2/3 cup of sugar. How much sugar did he need to make both recipes?

- Mental estimation:

  A student may say that Jerry needs more than 1 cup of sugar but less than 2 cups. An explanation may compare both fractions to ½ and state that both are larger than ½ so the total must be more than 1. In addition, both fractions are slightly less than 1 so the sum cannot be more than 2.

- Area model

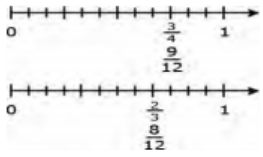


$\frac{3}{4}$ cup of sugar $\quad \frac{3}{4} = \frac{9}{12}$

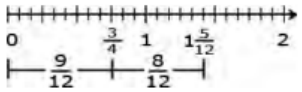
$\frac{2}{3}$ cup of sugar $\quad \frac{2}{3} = \frac{8}{12}$

$\frac{3}{4} + \frac{2}{3} = \frac{17}{12} = \frac{12}{12} + \frac{5}{12} = 1\frac{5}{12}$

- Linear model



Solution:

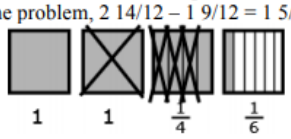


Example: Using a bar diagram

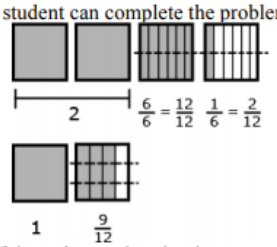
- Sonia had 2 1/3 candy bars. She promised her brother that she would give him ½ of a candy bar. How much will she have left after she gives her brother the amount she promised?
- If Mary ran 3 miles every week for 4 weeks, she would reach her goal for the month. The first day of the first week she ran 1 ¾ miles. How many miles does she still need to run the first week?
  - Using addition to find the answer:1 ¾ + n = 3
  - A student might add 1 ¼ to 1 ¾ to get to 3 miles. Then he or she would add 1/6 more. Thus 1 ¼ miles + 1/6 of a mile is what Mary needs to run during that week.

Example: Using an area model to subtract

- This model shows 1 ¾ subtracted from 3 1/6 leaving 1 + ¼ = 1/6 which a student can then change to 1 + 3/12 + 2/12 = 1 5/12. 3 1/6 can be expressed with a denominator of 12. Once this is done a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.



- This diagram models a way to show how 3 1/6 and 1 ¾ can be expressed with a denominator of 12. Once this is accomplished, a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.



Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations and can be supported through the use of physical models.

Example:
Elli drank 3/5 quart of milk and Javier drank 1/10 of a quart less than Ellie.
How much milk did they drink all together?
Solution:

$$\frac{3}{5} - \frac{1}{10} = \frac{6}{10} - \frac{1}{10} = \frac{5}{10}$$ This is how much milk Javier drank.

$$\frac{3}{5} + \frac{5}{10} = \frac{6}{10} + \frac{5}{10} = \frac{11}{10}$$ Together they drank 1 1/10 quarts of milk.

This solution is reasonable because Ellie drank more than ½ quart and Javier drank ½ quart so together they drank slightly more than one quart.

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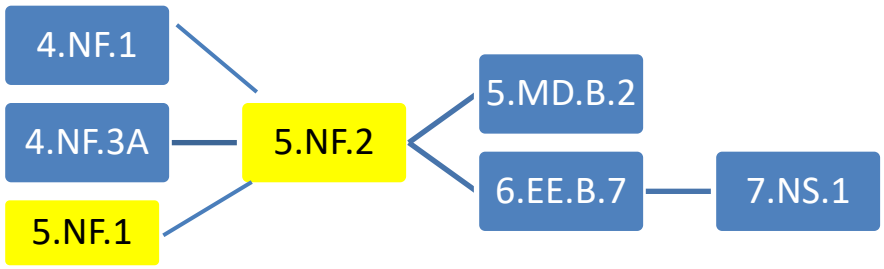
Standards Trajectory



What is this? This diagram shows the sequence of standards related to the standard of focus from previous and future grade levels, as well as related standards within the same grade level.
What should I consider? The standards from previous grade levels will tell you what students should arrive knowing, and the future standards will give you a lens into where students are headed.
How should I use this? Use previous standards to identify the prior knowledge needed to launch the lesson when preparing.

Grade	Standards
4	4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. 4.NF.B.3.A Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
5	5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.) 5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.* 5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.
6	6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

7	7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

State Test Alignment

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What is this? These items are the publicly released State Test Released Items from the NYS and PARCC (NJ) exams for the past five years.
What should I consider? Consider how the standards are interpreted through the types of questions used to assess the standards in each state. The formatting, rigor, and complexity of the relevant state released items provides an entry point to understanding the expectations of the standard as each state interprets it.
How should I use this? As you prepare for lessons or when responding to data in your classroom, keep in mind the variety of ways in which the standard is being assessed for your relevant state test. Prompting for big ideas that will be transferrable and apply to all the question types shown below will prepare mathematicians for true mastery of the standard.

NYS 2019

21 Carlos makes 1 pound of snack mix using nuts, raisins, and cereal. The list below shows how many pounds of nuts and raisins he uses.

- $\frac{1}{3}$ pound of nuts
- $\frac{2}{5}$ pound of raisins

How much cereal, in pounds, does Carlos use?

A $\frac{3}{8}$

B $\frac{5}{8}$

C $\frac{4}{15}$

D $\frac{11}{15}$

40 Joel has a goal to practice his clarinet for $4\frac{1}{2}$ hours per week. The list below shows the number of hours Joel has practiced so far this week.

- Monday: $1\frac{1}{2}$ hours
- Wednesday: $1\frac{1}{4}$ hours
- Thursday: 1 hour

How many more hours does Joel need to practice this week to meet his goal?

Show your work.

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NYS 2018

41 Mark and his friends order two pizzas of the same size.

- The first pizza is cut into 6 slices of equal size.
- The second pizza is cut into 4 slices of equal size.

Each person plans to take 2 slices of pizza. Mark concludes that he would get more pizza by taking 1 slice from each pizza, instead of 2 slices from the first pizza. Explain why Mark is correct. Be sure to include a number comparison using > or < in your explanation.

Answer

_____

_____

_____

10 A school librarian ordered new books for the library. Of the new books ordered, $\frac{1}{3}$ are science, $\frac{2}{5}$ are biography, and the rest of the books are fiction. What fraction of the books ordered are fiction?

A $\frac{3}{5}$

B $\frac{3}{8}$

C $\frac{4}{15}$

D $\frac{11}{15}$

32 What is the value of $9\frac{2}{3} - 4\frac{1}{5}$?

A $5\frac{1}{8}$

B $5\frac{7}{8}$

C $5\frac{5}{15}$

D $5\frac{7}{15}$

NYS 2017

21 Each student in a class plays one of three sports: soccer, volleyball, or basketball.

- $\frac{3}{5}$ of the number of students play soccer
- $\frac{1}{4}$ of the number of students play volleyball

What fraction of the number of students play basketball?

A $\frac{3}{20}$

B $\frac{4}{9}$

C $\frac{5}{9}$

D $\frac{17}{20}$

47 Rodney bought a 25-pound bag of dog food. His dog ate $10\frac{2}{5}$ pounds of the food in the first month and $10\frac{4}{5}$ pounds of the food in the second month. How much dog food, in pounds, was remaining in the bag at the end of the two months?

Show your work.

49 Jessie set up a lemonade stand for three days.

- On Saturday, she sold $10\frac{2}{3}$ gallons of lemonade.
- On Sunday, she sold $3\frac{1}{3}$ gallons more than she sold on Saturday.
- On Monday, she sold $2\frac{2}{3}$ gallons less than she sold on Sunday.

How many gallons of lemonade did Jessie sell on Monday?

Show your work.

55 The table below shows part of the operating budget of a small dairy farm for last year. The only expense not listed in the table is maintenance.

LAST YEAR'S OPERATING BUDGET

Expense	Fraction of Budget
Food	$\frac{1}{3}$
Housing	$\frac{1}{3}$
Medical Care	$\frac{1}{4}$

This year, the managers of the farm will change the fraction of the budget for housing to $\frac{1}{8}$ but will leave the fraction of the budget for food and medical care the same. Again, the remaining portion of the budget will be for maintenance expenses. What is the difference between the fraction of the budget for maintenance this year and last year?

Show your work.

2 Tara baked $6\frac{1}{2}$ dozen cookies. She sold $3\frac{2}{6}$ dozen of the cookies she made. How many dozens of cookies does Tara have remaining?

A $3\frac{1}{6}$

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

C $3\frac{3}{8}$

D $3\frac{5}{6}$

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NYS 2016

4 The sign below is located at the start of Pinecone Trail and shows the distances from the sign to different points of interest along the trail.

Sage hiked from the start of the trail to Lookout Point. She then hiked back to Giant Boulder to camp for the night. What was the total distance, in miles, that Sage hiked?

A $21\frac{3}{4}$

B $13\frac{1}{4}$

C $4\frac{1}{2}$

D $4\frac{1}{4}$

42 Kim's class voted on a location for a field trip.

- $\frac{3}{4}$ of the class voted for the museum
- $\frac{1}{8}$ of the class voted for the zoo

The rest of the class voted for the nature park.

What fraction of the class voted for the nature park?

A $\frac{1}{8}$

B $\frac{1}{2}$

C $\frac{5}{8}$

D $\frac{7}{8}$

52 Andy has a collection of movie DVDs. In Andy's collection,

- $\frac{3}{5}$ of the DVDs are "Action," and
- $\frac{1}{4}$ of the DVDs are "Comedy."

Andy said that $\frac{4}{9}$ of his collection is "Action" or "Comedy." Cynthia said that Andy made an error. Explain whether Andy is correct or incorrect and why.

What fraction of the DVDs in Andy's collection is not "Action" or "Comedy?"

Show your work.

2 What is the value of the expression below?

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

A $1\frac{1}{4}$

B $1\frac{3}{8}$

C $2\frac{3}{8}$

D $3\frac{1}{2}$

NYS 2015

45 In a shipment of new books for a library, $\frac{5}{12}$ of the books were poetry and $\frac{2}{5}$ were biographies. The remainder of the books in the shipment were mysteries. What fraction of the books in the shipment were mysteries?

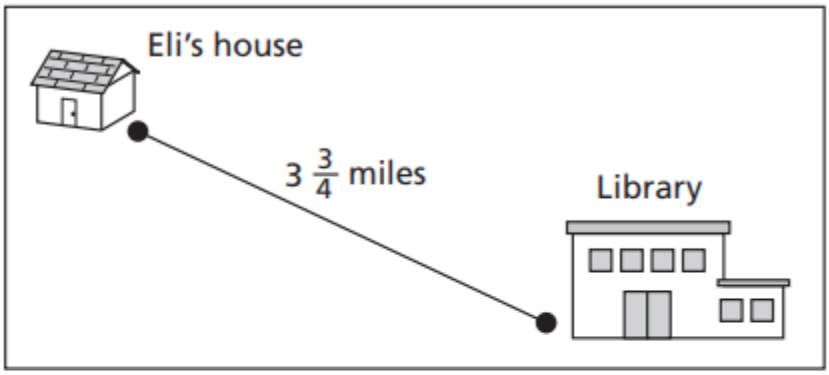
A $\frac{2}{12}$

B $\frac{11}{60}$

C $\frac{7}{17}$

D $\frac{49}{60}$

55 Eli lives $3\frac{3}{4}$ miles from the library.



He decided to bike from his home to the library to return some books. Eli biked $1\frac{1}{10}$ miles when he remembered that he had left a book at home, so he biked back home to get it. After getting the book from home, he biked to the library. What was the total distance, in miles, Eli had biked when he finally reached the library?

Show your work.

59 Hank and Debra each own two milking cows. One day, they milked their cows and compared the amount of milk the cows produced in that one day.

COW MILK PRODUCED

	Type of Cow	
	Jersey	**Holstein**
Hank's Cows (gallons of milk)	$4\frac{3}{4}$	$4\frac{1}{8}$
Debra's Cows (gallons of milk)	$5\frac{1}{2}$	$5\frac{2}{3}$

How many more gallons of milk did Debra's two cows produce on that day compared to Hank's two cows?

Show your work.

NYS 2014

Brittany needs a total of $12\frac{3}{4}$ yards of yarn for an art project. She needs $1\frac{3}{8}$ yards of blue yarn and $5\frac{1}{2}$ yards of green yarn. The rest of the yarn she needs is red. How much red yarn does Brittany need?

Show your work.

Ann and Margie had a total of 3 gallons of paint to share for a project. They had 1 gallon each of red paint, blue paint, and yellow paint.

- To complete the project, Ann used $\frac{3}{8}$ of the red paint, $\frac{1}{4}$ of the blue paint, and $\frac{1}{2}$ of the yellow paint.
- To complete the project, Margie used $\frac{1}{2}$ of the red paint, $\frac{5}{8}$ of the blue paint, and $\frac{1}{8}$ of the yellow paint.

How many total gallons of each color of paint were left after both girls had finished the project?

Show your work.

Answer Red:_____ gallons Blue:_____ gallons Yellow:_____ gallons

Using the leftover paint, Ann and Margie decide to make green paint. They mix the yellow and blue paint together to make the green paint. How many gallons of green paint can they make?

Answer _____ gallons

134050001_4

What is the value of $\frac{2}{5} + \frac{3}{7}$?

A $\frac{6}{35}$

B $\frac{5}{12}$

C $\frac{6}{12}$

D $\frac{29}{35}$

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NYS 2013

Mr. Morris built a fence to enclose his yard. He put up $\frac{3}{4}$ of the fence on Monday. On Tuesday, he put up $\frac{1}{6}$ of the fence, and on Wednesday, he put up the rest of the fence. What portion of the fence did he put up on Wednesday?

A $\frac{11}{12}$

B $\frac{3}{5}$

C $\frac{2}{5}$

D $\frac{1}{12}$

NYS Alignment: NYS assesses 5.NF.2 in problems with the following characteristics:

- in multiple choice and OER question types
- using tables, bulleted lists, and diagrams as means of accessing information
- in problems where students need to explain their answers
- as one-step story problems and within multi-step story problems
- incorporating standards 5.NF.1and 5.NF.6 as supplementary standards

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PARCC 2018

6.

A plumber worked at a house on two different days. On the first day, the plumber worked for $\frac{5}{6}$ of an hour. On the second day, the plumber worked for $\frac{1}{4}$ of an hour. What is the total amount of time, in hours, the plumber worked?

Enter your fraction in the space provided. Enter **only** your fraction.

9. **0110-M00573**

Part A

Robin and Josie shared a bottle of green paint for an art project. Robin used $\frac{3}{5}$ of the bottle of green paint. Together they used $\frac{17}{20}$ of the bottle of green paint.

What fractional part of the bottle of green paint did Josie use?

Enter your answer as a fraction in the space provided. Enter **only** your answer.

2.

Which of these fractions correctly completes the equation?

$$\frac{3}{4} + \frac{11}{6} = \square$$

- A. $\frac{14}{10}$
- B. $\frac{17}{6}$
- C. $\frac{31}{12}$
- D. $\frac{62}{48}$

17.

Solve.

Enter your answer as a fraction in the boxes.

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

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PARCC 2017

13. **VH029438**

Matt went running on four days. The table shows the distance he ran on each day.

Day	Distance (miles)
Sunday	$2\frac{1}{2}$
Monday	$1\frac{5}{6}$
Tuesday	$\frac{5}{8}$
Wednesday	$1\frac{2}{3}$

On which two days did Matt run an estimated total distance that was closest to 3 miles?

- A. Sunday and Tuesday
- B. Monday and Tuesday
- C. Monday and Wednesday
- D. Sunday and Wednesday

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1.

Which sets of equivalent fractions can be used when adding $\frac{7}{8}$ and $\frac{5}{12}$?

Select the **three** correct answers.

- ☐ A. $\frac{12}{20}, \frac{12}{20}$
- ☐ B. $\frac{10}{24}, \frac{7}{24}$
- ☐ C. $\frac{21}{24}, \frac{10}{24}$
- ☐ D. $\frac{13}{48}, \frac{9}{48}$
- ☐ E. $\frac{42}{48}, \frac{20}{48}$
- ☐ F. $\frac{84}{96}, \frac{40}{96}$

22.

Solve.

Enter your answer as a fraction in the boxes.

$$\frac{1}{4} + \frac{1}{5} + \frac{1}{6} = \frac{\square}{\square}$$

PARCC Alignment: PARCC assesses 5.NF.2 in problems with the following characteristics:

- in multiple choice, multiple select, drag and drop, and fill in the blank question types
- using tables and bulleted lists as means of accessing information
- as one-step story problems and within multi-step story problems
- incorporating standards 5.NF.1and 5.NF.6 as supplementary standards

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PARCC 2015

7. **Part A**

On Friday, $\frac{3}{10}$ of the students at a school were wearing white shirts and $\frac{5}{12}$ of the students were wearing blue shirts. What fraction of students were wearing either a white shirt or a blue shirt?

- A. $\frac{4}{5}$
- B. $\frac{4}{11}$
- C. $\frac{7}{60}$
- D. $\frac{43}{60}$

Part B

On the same day at the school, $\frac{1}{6}$ of the students were wearing skirts and $\frac{5}{8}$ of the students were wearing pants. The rest of the students were wearing shorts. What fraction of the students were wearing shorts?

- A. $\frac{3}{7}$
- B. $\frac{4}{7}$
- C. $\frac{5}{24}$
- D. $\frac{19}{24}$

4. Stella mixed $\frac{1}{2}$ gallon of blue paint with $\frac{3}{16}$ gallon of white paint.

Show whether each fraction is a reasonable estimate or not a reasonable estimate of the total amount of paint after Stella mixed the two colors.

Select four correct boxes in the table.

	$\frac{5}{8}$	$\frac{2}{9}$	$\frac{11}{10}$	$\frac{3}{14}$
Reasonable Estimate	○	○	○	○
Not a Reasonable Estimate	○	○	○	○

18. Stan's lawn mower had $\frac{1}{8}$ of a gallon of gasoline in the tank. Stan started mowing and used all of the gasoline. He put $\frac{6}{10}$ of a gallon of gasoline in the tank. After he mowed, $\frac{1}{4}$ of a gallon was left in the tank. What was the total amount of gasoline Stan used?

- A. $\frac{14}{40}$ gallon
- B. $\frac{19}{40}$ gallon
- C. $\frac{34}{40}$ gallon
- D. $\frac{39}{40}$ gallon

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MCAS

6 A student will estimate the value of this expression.

$$\frac{491}{972} + \frac{101}{299}$$

Which of the following is **closest** to the value of the expression?

Ⓐ $\frac{1}{2} + \frac{1}{2}$

Ⓑ $\frac{1}{2} + \frac{1}{3}$

Ⓒ $\frac{4}{9} + \frac{1}{2}$

Ⓓ $\frac{4}{9} + \frac{1}{3}$

Phil spent $\frac{2}{5}$ of an hour riding his bicycle and $\frac{1}{3}$ of an hour practicing the piano. What is the total amount of time, in hours, Phil spent riding his bicycle and practicing the piano?

A. $\frac{3}{8}$

B. $\frac{3}{15}$

C. $\frac{8}{15}$

D. $\frac{11}{15}$

13 Ms. Montano asked her students to solve the equation shown in the box below.

$$\frac{6}{7} + \frac{5}{6} = n$$

Which of the following is **closest** to the value of n?

A. $\frac{1}{4}$

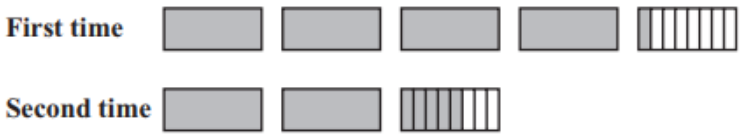
B. $\frac{3}{4}$

C. $1\frac{1}{2}$

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

8 Judy spent $\frac{1}{2}$ of her savings on a bicycle and $\frac{2}{5}$ of her savings on a helmet. What is the total fraction of her savings that Judy spent on a bicycle **and** a helmet?

9 Jodi measured the length of an icicle two times. The first time Jodi measured the icicle, it was $4\frac{1}{8}$ inches long. The second time Jodi measured the icicle, it had partly melted and was $2\frac{5}{8}$ inches long. The diagram below models the length of the icicle, in inches, each time Jodi measured it.



How many inches shorter was the icicle the second time Jodi measured it compared to the first time she measured it?

A. $1\frac{1}{4}$ inches

B. $1\frac{1}{2}$ inches

C. $2\frac{3}{8}$ inches

D. $2\frac{1}{2}$ inches

MCAS Alignment: MCAS assesses 5.NF.2 in problems with the following characteristics:

- using tables and bulleted lists as means of accessing information
- as one-step story problems and within multi-step story problems
- using estimation and equations
- incorporating standards 5.NF.1and 5.NF.6 as supplementary standards

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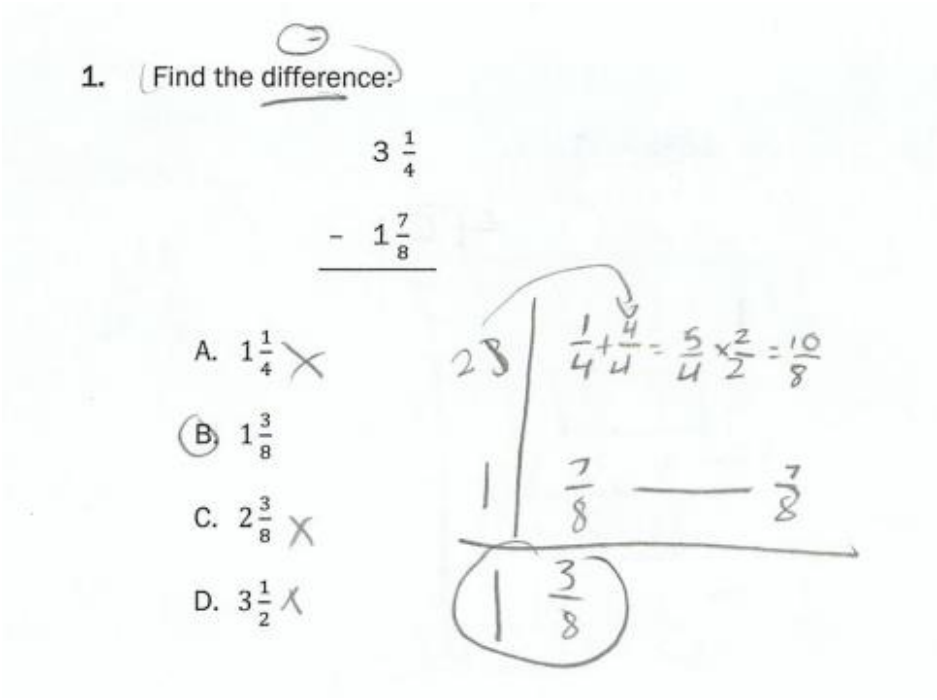
Exemplar Work & MOLE Habits



1. Find the difference:

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

A. $1\frac{1}{4}$ X

B. $1\frac{3}{8}$

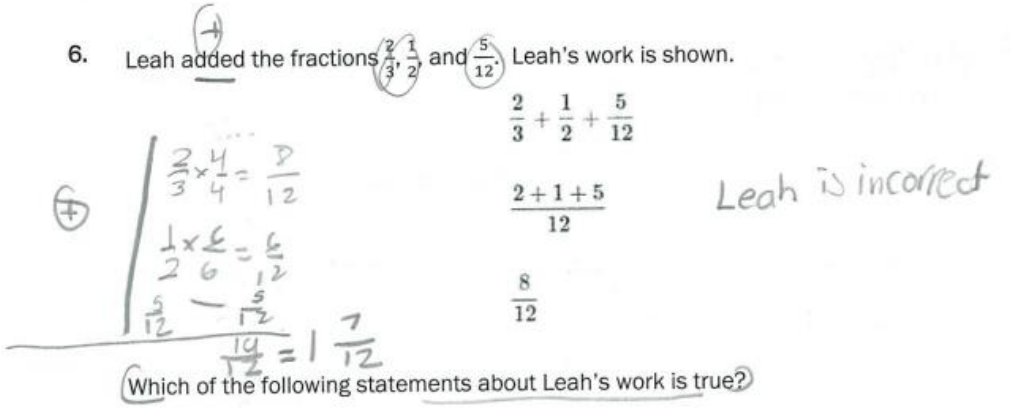
C. $2\frac{3}{8}$ X

D. $3\frac{1}{2}$ X

28 | $\frac{1}{4}+\frac{4}{4}=\frac{5}{4}\times\frac{2}{2}=\frac{10}{8}$

1 | $\frac{7}{8}$ — $\frac{7}{8}$

1 | $\frac{3}{8}$



6. Leah added the fractions $\frac{2}{3}$, $\frac{1}{2}$, and $\frac{5}{12}$. Leah's work is shown.

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

$$\frac{2+1+5}{12}$$

$$\frac{8}{12}$$

Leah is incorrect

$\frac{2}{3}\times\frac{4}{4}=\frac{8}{12}$

$\frac{1}{2}\times\frac{6}{6}=\frac{6}{12}$

$\frac{8}{12}-\frac{5}{12}$

$\frac{19}{12}=1\frac{7}{12}$

Which of the following statements about Leah's work is true?

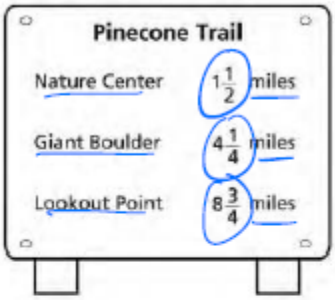
A. Leah is incorrect because she should have added the denominators 3 + 2 + 12 for an answer of $\frac{8}{17}$. X

B. Leah is correct because she used a common denominator of 12 and then added 2 + 1 + 5 for an answer of $\frac{8}{12}$ X

C. Leah is incorrect because she had to find equivalent fractions with a common denominator of 12 before adding her numerators.

D. Leah is correct because when adding fractions with a common denominator, you only add the numerators, not the denominators. X

14. The sign below is located at the start of Pinecone Trail and shows the distances from the sign to different points of interest along the trail.



Sage hiked from the start of the trail to Lookout Point. She then hiked back to Giant Boulder to camp for the night. What was the total distance, in miles, that Sage hiked?

A. $21\frac{3}{4}$

B. $13\frac{1}{4}$

C. $4\frac{1}{2}$

D. $4\frac{1}{4}$

Start → Lookout Point: $8\frac{3}{4}$

Lookout → Giant Boulder: $8\frac{3}{4} - 4\frac{1}{4} = 4\frac{2}{4}$

Total: $8\frac{3}{4} + 4\frac{2}{4} = 12\frac{5}{4} = 13\frac{1}{4}$

Sage hiked $13\frac{1}{4}$ miles.

23. Rodney bought a 25-pound bag of dog food. His dog ate $10\frac{2}{5}$ pounds of the food in the first month and $10\frac{4}{5}$ pounds of the food in the second month. How much dog food, in pounds, was remaining in the bag at the end of the two months?

A. $3\frac{4}{5}$
B. $4\frac{4}{5}$
C. $5\frac{2}{5}$
D. $21\frac{1}{5}$

Total − Eaten = Remaining

25

$10\frac{2}{5} + 10\frac{4}{5}$

$20\frac{6}{5} = 21\frac{1}{5}$

$24\frac{5}{5} - 21\frac{1}{5} = 3\frac{4}{5}$

He had $3\frac{4}{5}$ pounds remaining.

24. Jessie set up a lemonade stand for three days.

- On Saturday, she sold $10\frac{2}{3}$ gallons of lemonade.
- On Sunday, she sold $3\frac{1}{3}$ gallons more than she sold on Saturday.
- On Monday, she sold $2\frac{2}{3}$ gallons less than she sold on Sunday.

How many gallons of lemonade did Jessie sell on Monday?

A. 8 gallons
B. $11\frac{1}{3}$ gallons
C. 14 gallons
D. $16\frac{2}{3}$ gallons

Sunday

$10\frac{2}{3} + 3\frac{1}{3}$

$13\frac{3}{3} = 14$

Monday

$14\frac{3}{3} - 2\frac{2}{3}$

$11\frac{1}{3}$

Saturday = $10\frac{2}{3}$
Sunday = 14
Monday = $11\frac{1}{3}$

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26. For 4 weeks in June, Cameron biked $3\frac{1}{4}$ miles each week and swam $2\frac{1}{2}$ miles each week. For 3 weeks in July, he biked $4\frac{3}{4}$ miles each week and swam $3\frac{1}{2}$ miles each week.

How much greater was the total distance Cameron biked and swam in July compared to the total distance he biked and swam in June?

A. 23 miles
B. $24\frac{3}{4}$ miles
C. $1\frac{3}{4}$ miles
D. 2 ½ miles

July miles − June miles = Difference

Weekly total:
$3\frac{1}{4} + 2\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$
$5\frac{3}{4}$

Monthly:
$5\frac{3}{4} \times 4 = \frac{23}{4} \times \frac{4}{1}$
$= \frac{92}{4} = 23$

Weekly total:
$4\frac{3}{4} + 3\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$
$7\frac{5}{4} = 8\frac{1}{4}$

Monthly total:
$8\frac{1}{4} \times 3 = \frac{33}{4} \times \frac{3}{1} = \frac{99}{4} = 24\frac{3}{4}$

$24\frac{3}{4} - 23 = 1\frac{3}{4}$

Cameron biked and swam $1\frac{3}{4}$ more miles in July.

15. Kado spent $1\frac{2}{3}$ hours painting a fence. Then he spent $\frac{4}{5}$ of an hour walking his dog.

How much longer did he spend painting than walking? (subtract)

A $\frac{2}{15}$ hour
B $\frac{13}{15}$ hour
C $1\frac{2}{15}$ hours
D $1\frac{13}{15}$ hours

Painting − Walking = Difference

$\frac{2}{3} \times \frac{5}{5} = \frac{10}{15} + \frac{15}{15} = \frac{25}{15}$

$-\ \frac{4}{5} \times \frac{3}{3} = \frac{12}{15}$

$\frac{13}{15}$

He spent $\frac{13}{15}$ hours longer painting.

38. Hank and Debra each own two milking cows. One day, they milked their cows and compared the amount of milk the cows produced in that one day.

COW MILK PRODUCED

	Type of Cow	
	Jersey	**Holstein**
Hank's Cows (gallons of milk)	$4\frac{3}{4}$	$4\frac{1}{8}$
Debra's Cows (gallons of milk)	$5\frac{1}{2}$	$5\frac{2}{3}$

How many more gallons of milk did Debra's two cows produce on that day compared to Hank's two cows?

Hank vs. Debra

Show your work.

Debra's gallons − Hank's gallons = Difference

Debra

$5\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$

$+\ 5\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$

$10\frac{7}{6} = 11\frac{1}{6}$ gallons

Hank

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

$+\ 4\frac{1}{8}$

$8\frac{7}{8}$ gallons

Difference

$10\ 11\frac{1}{6} \times \frac{8}{8} = \frac{8}{48} + \frac{48}{48} = \frac{56}{48}$

$-\ 8\frac{7}{8} \times \frac{6}{6} = \frac{42}{48}$

$2\frac{14}{48} = 2\frac{7}{24}$

Answer _____ gallons

Debra's cows produced $2\frac{7}{24}$ more gallons than Hank's.

What is this? This section shows actual exemplar student work samples from previous year's Interim Assessments.
What should I consider? Consider all the habits and evidence of understandings shown in the work, not just the correct answer.
How should I use this? Use these exemplars as the bar in order to train your eye for the vision of what excellence looks like for this standard in order to prepare your own monitoring keys.

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MOLE Habits

What are the procedural habits and conceptual understandings a student needs to master the standard?

MOLE Habits
1. IM notes to identify key words related to operational identification
2. Answer sentence with correct units
3. Each step segmented by a line and labeled with a header
4. All mixed numbers are stacked (never converted into improper fractions)
5. Showing any steps required for converting improper fractions to mixed numbers or creating equivalent fractions with common denominators
6. All answers in all steps are simplified

Naming Laps During Monitoring: When preparing your monitoring key, use the habits named above as the language with which to Name Your Lap. Say the words, "I'm coming around to see that you are…" and then the language of each habit during your procedural laps.

Responding to Data: When students are missing a procedural habit named above, Stop the Show to address the gap. If students have a conceptual error aligned to the understandings named above, chart and lead discourse.

What is this? This chart shows the work habits and big ideas learned throughout the lessons in which this standard is taught.
What should I consider? The procedural habits and the big ideas are sequenced in order of rigor – from the most foundational ideas/habits to the most complex.
How should I use this? Use this chart as a resource when unpacking the standard in a data meeting and use these ideas/habits as a guide for what to show in your exemplars as you prepare for lessons.

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Key Vocabulary

What is this? This list of key vocabulary are the terms taught during the lessons aligned to this standard.
What should I consider? Identify the conceptual understandings to which each of these vocabulary terms are aligned.
How should I use this? Plan how you will introduce these vocabulary terms when prompting during discourse towards an aligned conceptual understanding.

Fraction: A part to whole relationship. The fraction $\frac{a}{b}$ is equivalent to the division expression $a \div b$. A fraction represents a part of a whole.

Mixed Number: A numerical value with a fractional part and a whole number, such as $3\frac{1}{4}$

Improper Fraction: A fraction with a numerator greater than a denominator

Equivalent Fraction: Two fractions that have the same value, but have different numerators and denominators. For example, $\frac{2}{3}$ is equivalent to $\frac{4}{6}$

Common Denominator: A shared multiple of the denominators of several fractions.

Simplest Form: When a fraction cannot be simplified any more. For an improper fraction to be in simplest form, it should be converted to a mixed number.

Numerator: The number above the line in a fraction showing how many of the parts indicated by the denominator are taken, for example, 2 in $\frac{2}{3}$.

Denominator: The number below the line in a fraction that indicates the number of equal parts into which the unit is divided, for example, the 3 in $\frac{2}{3}$

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EXECUTE

What is this? These are all the lessons from the curriculum map that teach this standard.
What should I consider? Analyze how the standard is broken down across the days.
How should I use this? Identify upcoming lessons to scope out necessary discourse needed.

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Lesson Trajectory

IA	L #	Unit	CCSS	Lesson Type	Topic	Objective
IA2	37	Fraction Operations	5.NF.1/ 5.NF.2	Explore	Add/Sub Fractions (Unlike Denominators)	SWBAT add and subtractions with unlike denominators.
IA2	38	Fraction Operations	5.NF.1/ 5.NF.2	Explore	Add/Sub Fractions (Unlike Denominators)	SWBAT solve real world problems by adding and subtracting fractions with unlike denominators.
IA2	39	Fraction Operations	5.NF.1/ 5.NF.2	Direct	Mixed Numbers and Improper Fractions	SWBAT convert between mixed numbers and improper fractions.
IA2	40	Fraction Operations	5.NF.1/ 5.NF.2	Explore	Add/Sub Mixed Numbers (Unlike Denominators)	SWBAT add and subtract mixed numbers with unlike denominators. SWBAT rewrite the sum of mixed numbers with an improper fraction as an equivalent mixed numbers with a proper fraction.
IA2	41	Fraction Operations	5.NF.1/ 5.NF.2	Explore	Add/Sub Fractions/ Mixed Numbers (Like Denominators)	SWBAT subtract mixed numbers with like denominators by regrouping.
IA2	42	Fraction Operations	5.NF.1/ 5.NF.2	Explore	Add/Sub Fractions /Mixed Numbers (Unlike Denominators)	SWBAT subtract mixed numbers with unlike denominators by regrouping.
IA2	43	Fraction Operations	5.NF.1/ 5.NF.3	Direct	Add/Sub Fractions /Mixed Numbers (Unlike Denominators)	SWBAT solve real world problems by adding and subtracting mixed numbers.
IA2	44	Fraction Operations	5.NF.2	Direct	Fractions on a Number Line	SWBAT plot proper and improper fractions on a number
IA2	45	Fraction Operations	5.NF.2	Explore	Benchmark Fractions	SWBAT the sum or difference of two fractions by using benchmark fractions to determine reasonableness.

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Exit Ticket Exemplars

IA 2, L37

Adding & Subtracting Fractions with Unlike Denominators

Exit Ticket

1. Which of the following can be used to evaluate $\frac{1}{5}+\frac{2}{3}$?

   A. $\frac{3}{10}+\frac{10}{10}$

   B. $\frac{3}{15}+\frac{10}{15}$

   C. $\frac{1}{15}+\frac{2}{15}$

   D. $\frac{3}{8}+\frac{7}{8}$

$\frac{1}{5}\times\frac{3}{3}=\frac{3}{15}$

$+\ \frac{2}{3}\times\frac{5}{5}=\frac{10}{15}$

5, 10, (15), 20, 25

3, 6, 9, 12, (5)

2. Solve using the algorithm.

$$\begin{array}{r} \frac{4}{15} \\ +\ \frac{1}{5}\times\frac{3}{3}=\frac{3}{15} \\ \hline \end{array} \rightarrow \frac{4}{15}$$

$\frac{7}{15}$

$$\begin{array}{r} \frac{7}{10}\times\frac{2}{2}=\frac{14}{20} \\ -\ \frac{1}{4}\times\frac{5}{5}=\frac{5}{20} \\ \hline \end{array}$$

$\frac{9}{20}$

IA 2, L 38

Adding & Subtracting Fractions with Unlike Denominators - Part 2

Exit Ticket

Read and solve. Remember to use MOLE steps!

1) So far Joseph has spent $\frac{1}{3}$ of an hour on his math homework, $\frac{1}{4}$ of an hour on his science homework and $\frac{3}{8}$ of an hour on his history homework. What fraction of an hour has he spent on his homework in all?

+ all 3

$\frac{1}{3} \times \frac{8}{8} = \frac{8}{24}$

$+ \frac{1}{4} \times \frac{6}{6} = \frac{6}{24}$

$+ \frac{3}{8} \times \frac{3}{3} = \frac{9}{24}$

$\frac{23}{24}$

Joseph has spent $\frac{23}{24}$ hrs working on his HW in all.

2) Colette had some candy. $\frac{2}{5}$ of her candy were lollipops, $\frac{1}{4}$ were chocolate, and the rest were gummy bears. What fraction of her candy were gummy bears?

(-)

left over

① lollipops & choc together

$\frac{2}{5} \times \frac{4}{4} = \frac{8}{20}$

$+ \frac{1}{4} \times \frac{5}{5} = \frac{5}{20}$

$\frac{13}{20}$ are lollipop & choc

② gummy bears

$1 = \frac{20}{20}$

$- \frac{13}{20} - \frac{13}{20}$

$\frac{7}{20}$ are gummy bears

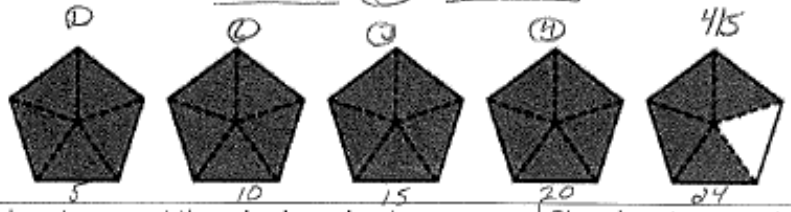
$\frac{7}{20}$ of her candies are gummy bears

IA 2, L 39

Converting Mixed Numbers & Improper Fractions

Exit Ticket

1. Write an equivalent mixed number and improper fraction for the model below.



$4\frac{4}{5} = \frac{24}{5}$

Show how to convert the mixed number to an improper fraction without the model.	Show how to convert the improper fraction to a mixed number without the model.
$4\frac{+4}{\times 5}$ $4 \times 5 = 20$ $20 + 4 = 24$ $\frac{24}{5}$	$\frac{24}{5} \rightarrow 5\overline{)24}$ -20 4 $= 4\frac{4}{5}$

2. Convert $\frac{37}{4}$ into a mixed number. Show your work.

$4\overline{)37}$
 -36
 1

$9\frac{1}{4}$

3. Convert $5\frac{+1}{\times 3}$ into an improper fraction. Show all of your work.

$5 \times 3 = 15$
 $15 + 1 = 16$
 $5\frac{1}{3} = \frac{16}{3}$

OR

$\frac{5}{1} \times \frac{3}{3} = \frac{15}{3}$

$\frac{15}{3} + \frac{1}{3} = \frac{16}{3}$

IA 2, L 40

Adding & Subtracting Mixed Numbers – Day 1
Exit Ticket

1) Evaluate using the algorithm:

a) $4\frac{5}{6} - 3\frac{7}{12}$

$4\left|\frac{5}{6} \times \frac{2}{2} = \frac{10}{12}\right.$

$-3\left|\frac{7}{12} \rightarrow \frac{-7}{12}\right.$

$1\left|\frac{3}{12}\right.$

$1\frac{3}{12} \div \frac{9}{3} = 1\frac{1}{4}$

b) $4\frac{3}{4} + 3\frac{5}{8}$

$4\left|\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}\right.$

$+3\left|\frac{5}{8} \rightarrow \frac{5}{8}\right.$

$7\left|\frac{11}{8}\right.$

$\frac{11}{8} = 1\frac{3}{8}$

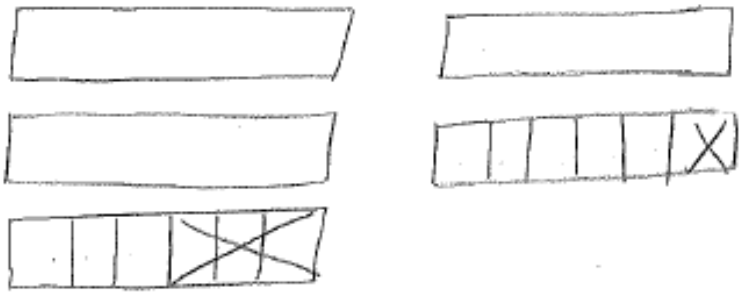
$8\overline{)11}$ 1 remainder 3

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

2) Model and solve: $2\frac{1}{2} + 1\frac{5}{6}$. (Start by finding the LCD. Be sure to circle any new wholes that are formed.)

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

$2\frac{3}{6} + 1\frac{5}{6}$



$3 + \frac{8}{6}$ wholes

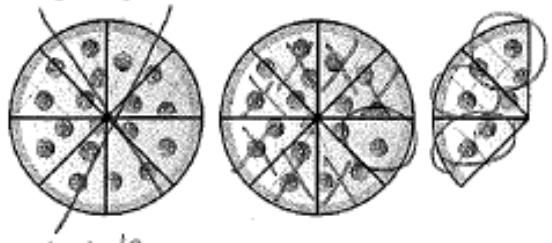
$= 3 + 1\frac{2}{6}$

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

IA 2, L 41

Adding & Subtracting Mixed Numbers – Day 2
Exit Ticket

1) Solve $2\frac{3}{8} - 1\frac{7}{8}$ by using the model.



$2\frac{3}{8}$ – 1 whole $-\frac{7}{8}$ $= \frac{4}{8} = \frac{1}{2}$

2) Subtract using the algorithm.

a) $6\frac{2}{6} - 3\frac{5}{6}$

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

$-\ 3\frac{5}{6} \rightarrow -\frac{5}{6}$

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

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

b) $4\frac{1}{5} - 2\frac{4}{5}$

$3\ \ 4\frac{1}{5} + \frac{5}{5} = \frac{6}{5}$

$-\ 2\frac{4}{5} \rightarrow -\frac{4}{5}$

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

$1\frac{2}{5}$

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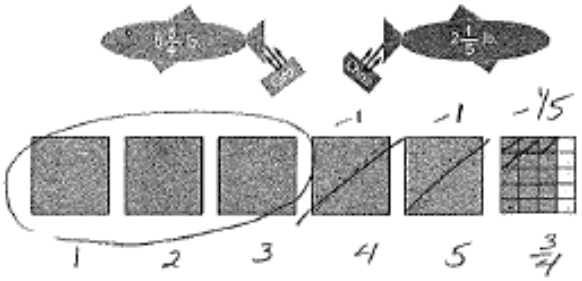
IA2, L42

Adding & Subtracting Mixed Numbers – Day 3
Exit Ticket

1) Two friends, Ciro and Chris, went fishing. What is the difference in weight between Ciro's fish and Chris's fish? Show the math steps to solve this problem. Be sure that your math steps match the model.



$3\frac{11}{20}$

$5\frac{3}{4} \times \frac{5}{5} = 5\frac{15}{20}$

$-\ 2\frac{1}{5} \times \frac{4}{4} = -2\frac{4}{20}$

$3\frac{11}{20}$ ✓

2) Solve each problem below by using the algorithm.

a) $6\frac{3}{10} - 3\frac{4}{5}$

5 | 6 | $\frac{3}{10} \rightarrow \frac{3}{10} + \frac{10}{10} = \frac{13}{10}$

− 3 | $\frac{4}{5} \times \frac{2}{2} = \frac{8}{10} \rightarrow \frac{-8}{10}$

2 | $\frac{5}{10}$

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

b) $3\frac{1}{3} - 2\frac{5}{7}$

2 | 3 | $\frac{1}{3} \times \frac{7}{7} = \frac{7}{21} + \frac{21}{21} = \frac{28}{21}$

− 2 | $\frac{5}{7} \times \frac{3}{3} = \frac{15}{21} \rightarrow \frac{15}{21}$

0 | $\frac{13}{21}$

$\frac{13}{21}$

IA2, L43

1. Christian ran $4\frac{1}{4}$ miles on Monday and $2\frac{2}{3}$ miles on Tuesday. On Wednesday, he ran $1\frac{1}{3}$ fewer miles than he ran on Monday. How many miles did he run in all?

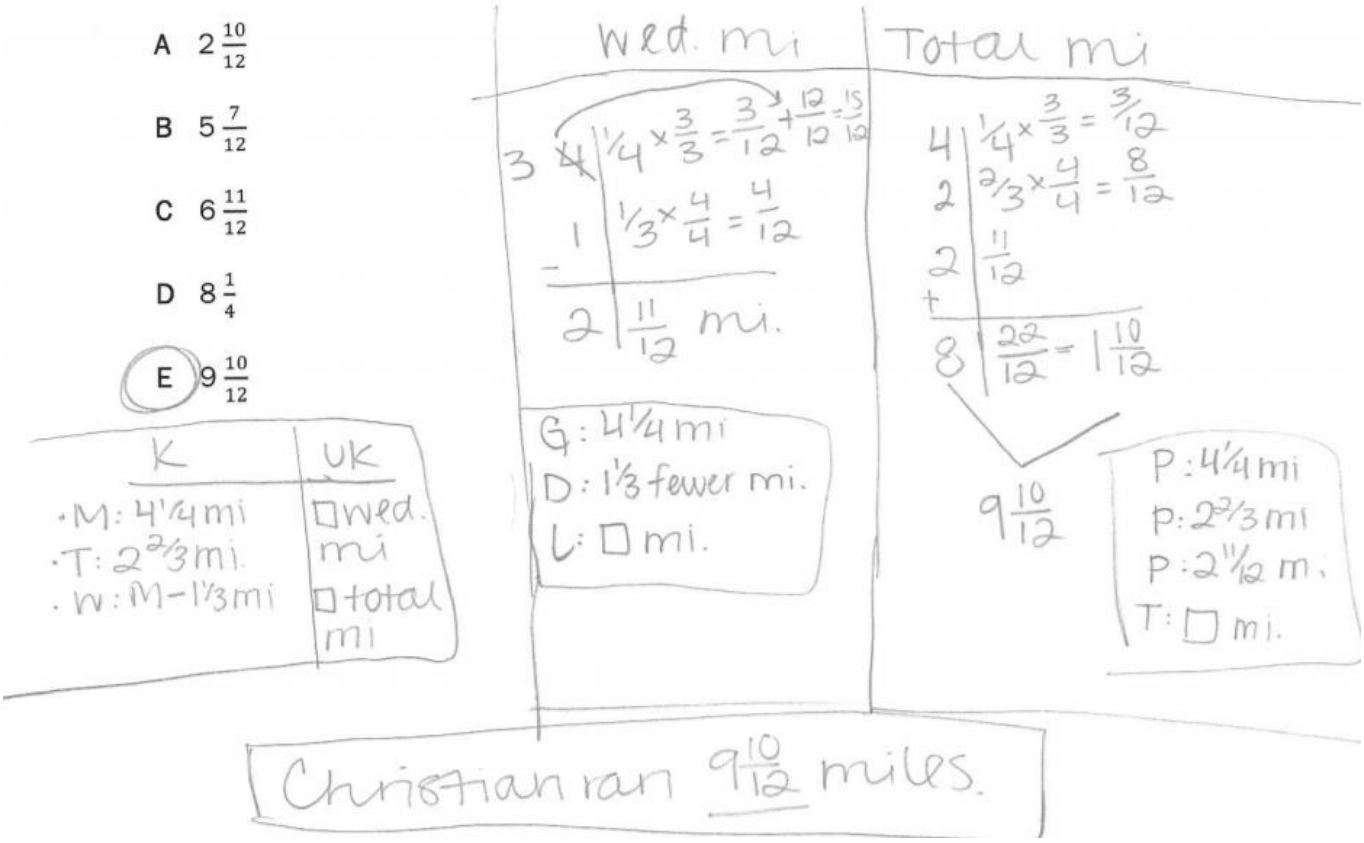
A $2\frac{10}{12}$

B $5\frac{7}{12}$

C $6\frac{11}{12}$

D $8\frac{1}{4}$

E $9\frac{10}{12}$

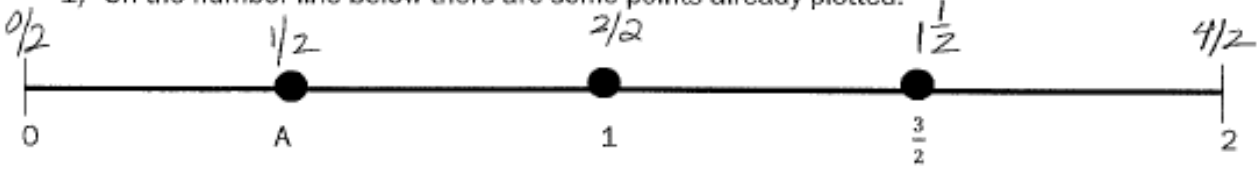


Uncommon Schools | Change History.

IA2, L44

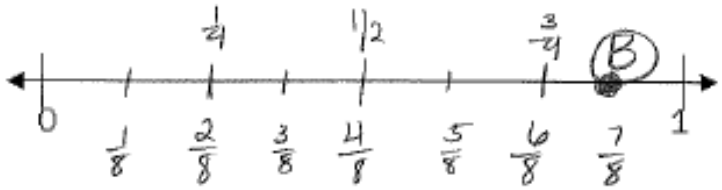
Fractions on a Number Line
Exit Ticket

1) On the number line below there are some points already plotted.



What is the value of A? 1/2

2) On the number line below, put a point labeled B to represent $\frac{7}{8}$.



3) Explain how you determined where to plot $\frac{7}{8}$.

I knew that the # line needed to be split into eighths. I started with halves ($\frac{4}{8}$), then split each half in half to find $\frac{1}{4}$ and $\frac{3}{4}$. Then, I split each quarter in half to get eighths, and counted to 7/8.

Uncommon Schools | Change History.

IA2, L45

Benchmark Fractions
Exit Ticket

1) The sum of $1\frac{5}{6}$ and $1\frac{5}{8}$ would be closest to:

A $2\frac{1}{2}$
B 3
C $3\frac{1}{2}$
D 4

$1\frac{5}{6} \approx 2$

$+ \quad 1\frac{5}{8} \approx 1\frac{1}{2}$

$3\frac{1}{2}$

2) Ashley is making a cake. The cake requires $\frac{3}{5}$ cups of flour and $\frac{7}{8}$ cup of sugar. Ashley thinks she needs about 1 total cup of ingredients. Is her estimate reasonable? Use benchmark fractions to explain how you know.

$\frac{3}{5} \approx \frac{1}{2}$

$+ \quad \frac{7}{8} \approx 1$

$1\frac{1}{2}$

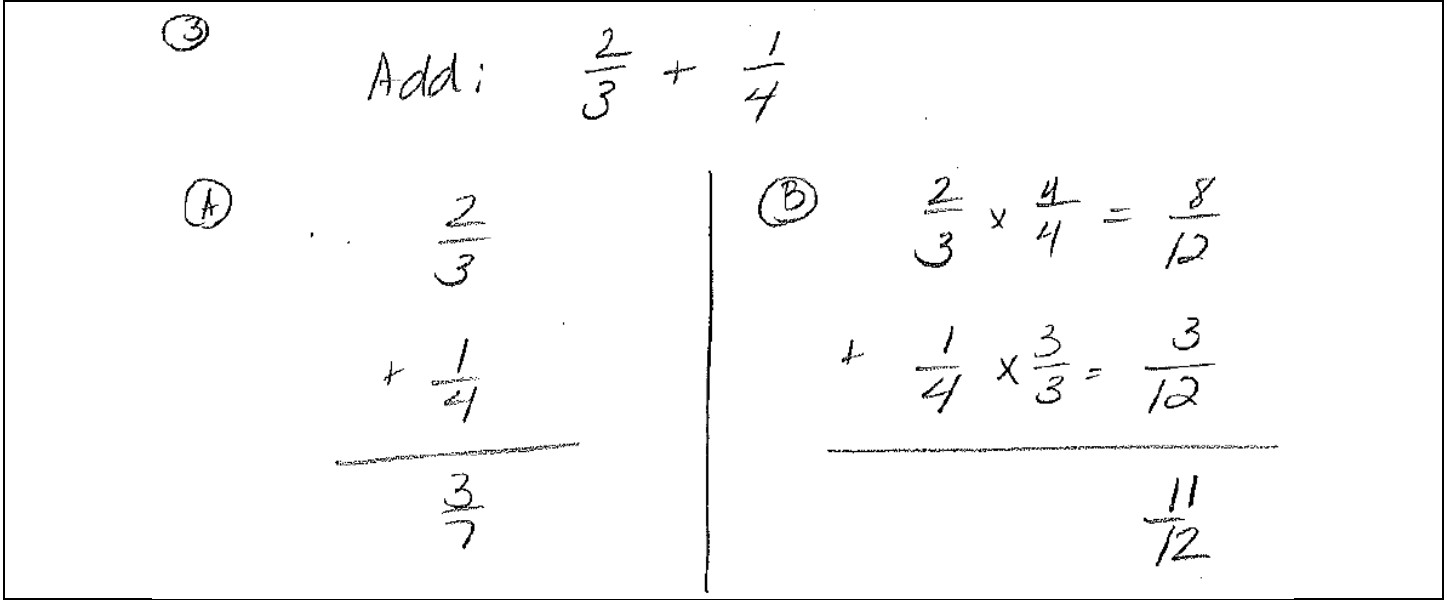
No, Ashley's estimate is not reasonable, it is too low. She needs about $1\frac{1}{2}$ cups of ingredients. $\frac{3}{5}$ cup of flour is close to $\frac{1}{2}$ cup, and $\frac{7}{8}$ cup of sugar is close to 1 cup. 1 cup + $\frac{1}{2}$ cup = $1\frac{1}{2}$ cups.

Uncommon Schools | Change History.

Most Common Errors and Charting

Name the Error	Monitoring Prompts	Close the Gap
Not finding a common denominator before adding or subtracting: Student adds the numerators and adds the denominators.	• What do we need check with fractions before we add or subtract? • What's the common denominator of ___ and ___? • Find your equivalent fractions.	To add and subtract fractions, they must have a common denominator so that we are adding/subtracting same size units.

Exemplar Chart

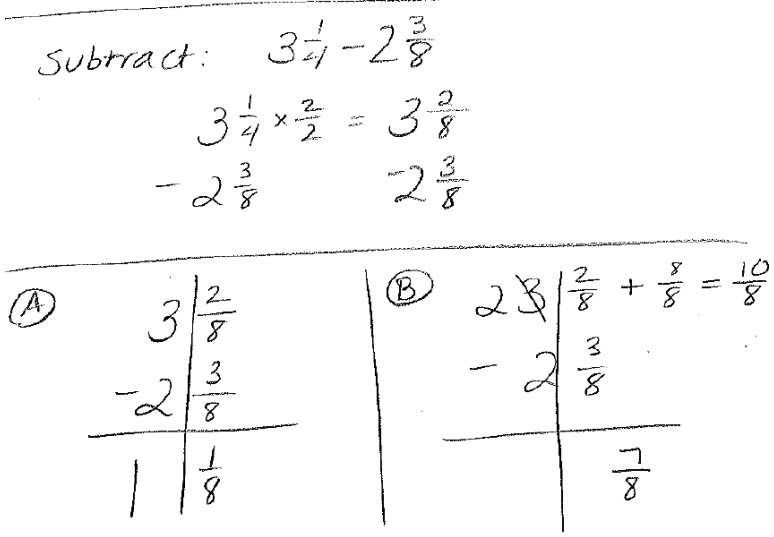


What is this? This chart shows the 2 or 3 most frequently seen errors or points of sophistication observed as struggles for students year after year.
What should I consider? Consider how the big ideas and the aligned Chart for Misconception or Chart for Sophistication show the error and lead students to deeper understanding.
How should I use this? Analyze the student work samples to train your eye for how to spot the error when monitoring in order to quickly name the error and identify trends. Use the exemplar Charts for Misconception or Sophistication as exemplars to help you plan the "must have" charts that should come from discourse over the course of the lesson trajectory.

Uncommon Schools | Change History.

Name the Error	Monitoring Prompts	Close the Gap
Regrouping Mixed Numbers: Student doesn't regroup before subtracting fraction. Instead subtracts in the opposite order.	• What do you notice when you try to subtract these numerators? • We need to regroup. Where can you take one whole from? • What does that one whole become? • Where do you show that?	When subtracting mixed numbers, the fraction in the total must be greater that the fraction it's being subtracted by (subtrahend). If it isn't, regroup the total by subtracting a whole and adding it to the fraction

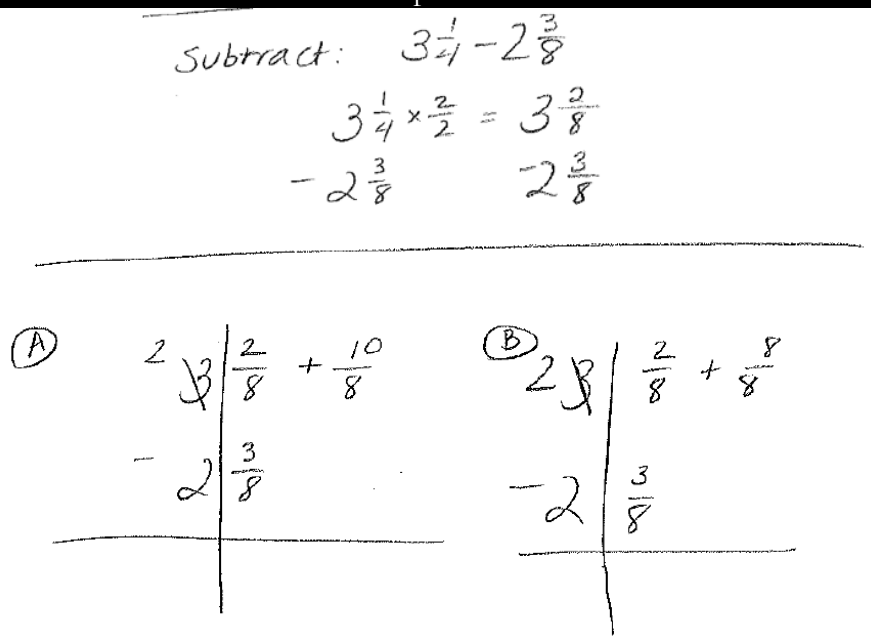
Exemplar Chart



Uncommon Schools | Change History.

Name the Error	Monitoring Prompts	Close the Gap
Regrouping whole: Regroups by adding ten to numerator instead of equivalent of a whole	• I see that you are regrouping from the 3. • How many pieces is that whole split into? • If we have a whole, how many of those pieces do we have? • So 8/8 is the number you should be adding here.	When the fraction in the total is less than the other fraction, we need to regroup. We regroup by adding the equivalent of a whole, not ten, to the new fraction.

Exemplar Chart



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Instructional Signage

How do we write **a whole number** as a fraction?

$5 = \frac{5}{1}$	$10 = \frac{10}{1}$	$359 = \frac{359}{1}$

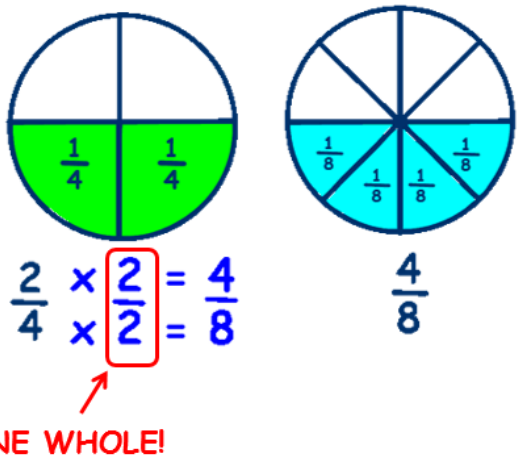
$$x = \frac{x}{1}$$

How do we write **one whole** as a fraction?

$1 = \frac{5}{5}$	$1 = \frac{10}{10}$	$1 = \frac{359}{359}$

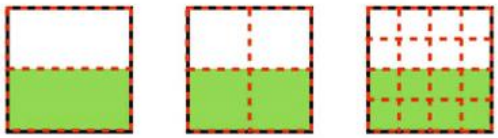
$$1 = \frac{n}{n}$$

Equivalent Fractions



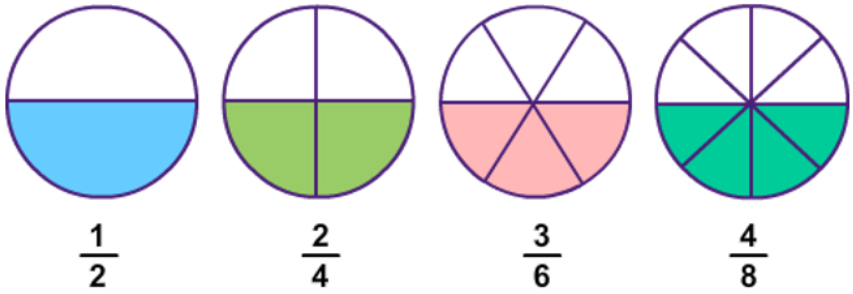
Equivalent Fractions…

Have the same value!



1/2	2/4	8/16
1÷2	2÷4	8÷16
=0.5	=0.5	=0.5

Equivalent Fractions



$\frac{1}{2}$ $\frac{2}{4}$ $\frac{3}{6}$ $\frac{4}{8}$

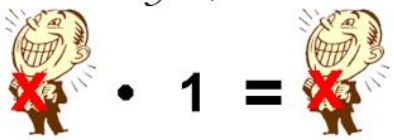
Same value;
different number of pieces!

Identity Property of Multiplication

$$1 \times 1 = 1$$
$$1 \times 2 = 2$$
$$1 \times 3 = 3$$
$$1 \times 4 = 4$$
$$\vdots$$
$$1 \times 10 = 10$$
$$1 \times 11 = 11$$
$$\vdots$$

$$1 \times a = a$$

If you multiply a number by 1, its value will stay the same.



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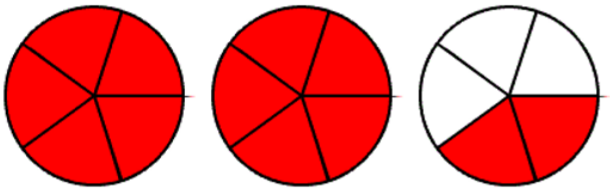
Mixed Number → Improper Fraction



$$2\frac{2}{5} = \frac{2X5+2}{5} = \frac{12}{5}$$

- Multiply whole by denominator
- Add numerator
- Denominator stays the same

What is this? These are the anchor charts used in the lessons after the standard has been taught that serve as a visual anchor to remind students of the concepts and habits learned.
What should I consider? Identify which of these charts should serve as anchor during the unit in which the standard is first taught and which would live in the classroom for the entire year.
How should I use this? Use the charts to identify the big ideas, habits, and vocabulary that must be mastered by the end of the teaching of this standard in order for these charts to then be put up in the classroom.