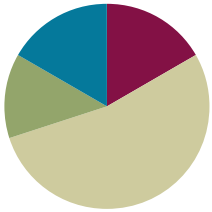
Lesson 6

Objective: Subtract fractions from numbers between 1 and 2.

Suggested Lesson Structure

Fluency Practice	(10 minutes)
Application Problem	(8 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (10 minutes)

- Name the Fraction to Complete the Whole **4.NF.3b** (4 minutes)
- Taking from the Whole **5.NF.7** (3 minutes)
- Fraction Units to Ones and Fractions **5.NF.7** (3 minutes)

Name the Fraction to Complete the Whole (4 minutes)

T: I'll say a fraction, you say the missing part to make one whole. Ready?
T: 1/2.
S: 1/2.
T: 4/5.
S: 1/5.
T: 1/7.
S: 6/7.
T: 4/9.
S: 5/9.
T: 18/20.
S: 2/20.
T: 147/150.
S: 3/150.
T: Share your strategy for making one whole with a partner.
T: With your partner, take turns giving each other problems to solve. You have one minute.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

When students begin to quiz each other, group them in level-alike pairs.

Below Grade Level Performers: Provide a bar diagram template in personal boards so that students can quickly draw each fraction and see the missing part.

Above Grade Level Performers: Give them 1/2 as a target number. Their partner can give them any fraction less than one. They tell how much to add or subtract to get to one half, e.g. 3/7 → add 1/14, 9/10 → subtract 4/10.

Taking from the Whole (3 minutes)

Materials: (S) Personal white boards

T: I'll say a subtraction equation. You say the answer. 1 – 1 half.
S: 1 half.
T: 1 – 1 third.
S: 2 thirds.
T: 1 – 2 thirds.
S: 1 third.
T: 1 – 2 fifths.
S: 3 fifths.
T: 1 – 4 fifths.
S: 1 fifth.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

If students struggle to answer chorally, write the subtraction equations on the board and have them answer on personal white boards.

Continue with possible sequence:

$$1-\frac{1}{3}, \quad 1-\frac{3}{4}, \quad 1-\frac{3}{7}, \quad 1-\frac{5}{9}, \quad 1-\frac{5}{10}$$

Fraction Units to Ones and Fractions (3 minutes)

Materials: (S) Personal white board and markers

T: I'll say a fraction, you say it as ones and fraction units. Three halves.
S: One and one half.
T: Five halves.
S: Two and one half.
T: Seven halves.
S: Three and one half.
T: Eleven halves.
S: Five and one half.

Continue with possible sequence:

$\frac{4}{3}, \frac{5}{3}, \frac{10}{3}, \frac{22}{3}$ and $\frac{5}{4}, \frac{7}{4}, \frac{11}{4}, \frac{39}{4}$.

Application Problem (8 minutes)

The Napoli family combined two bags of dry cat food in a plastic container. One bag had 5/6 kg. The other bag had 3/4 kg. What was the total weight of the container after the bags were combined?

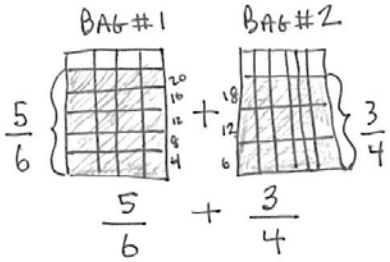
T: Use the RDW process to solve the problem independently. Use your questions to support you in your work. What do you see? Can you draw something? What conclusions can you make from your drawing?

T: We will analyze two solution strategies in four minutes.

After four minutes, lead students through a brief comparison of a more concrete strategy like the one below on the left and the more abstract strategy below on the right. Be sure students realize that both answers, 1 7/12 and 1 14/24, are correct.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

At this point, some students may realize they can combine their drawings onto one model, rather than drawing them separately as in previous lessons.



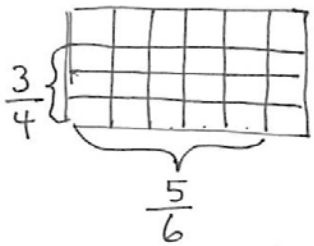
$\frac{5}{6} + \frac{3}{4}$

$\frac{20}{24} + \frac{18}{24} = \frac{38}{24}$

$\frac{24}{24} + \frac{14}{24}$

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

The Napoli's container weighs $1\frac{7}{12}$ kg



1 unit = $\frac{1}{24}$

20 units + 18 units = 38 units

$= \frac{38}{24}$

$= 1\frac{14}{24}$

The container weighs $1\frac{14}{24}$ kg.

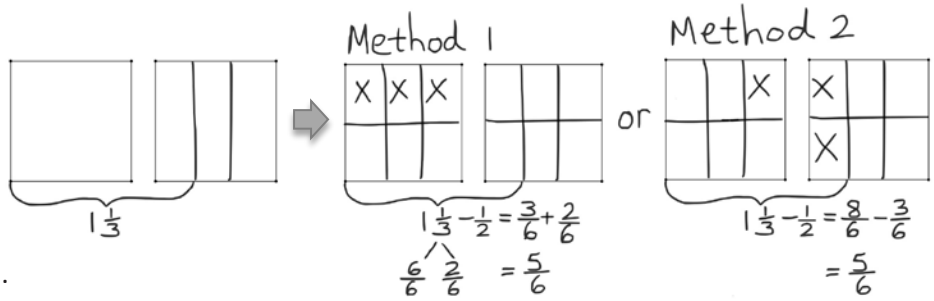
Concept Development (32 minutes)

Pictorial (20 minutes)

Materials: (S) Personal white boards, template (if you choose to use it)

Problem 1

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



T: Read the subtraction expression.

S: 1 and 1 third – 1 half.

T: How many thirds is 1 and 1 third?

S: 4 thirds.

T: (Draw) What should we do now? Turn and talk to your partner.

S: Make like units.

T: How many new smaller units are in each whole?

S: 6 units.

T: 4 thirds is how many sixths?

S: 8 sixths.

T: 1 half is how many sixths?

S: 3 sixths.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Have students draw each step along with you on personal white boards, so that they match your language with the model and the steps of the process. At key moments have them orally label the parts of the model to practice using language.

T: Looking at my drawing, how would you subtract 3 sixths or a half? Discuss this with your partner.

S: You can take the half from the whole and then add back the third. → Then you are adding to subtract? → Yes, you are adding the part you had left after you take away. → It makes it easier because we know really well how to subtract any fraction from a one whole. → Yeah but it's just easier for me to take the 3 sixths from the 8 sixths. → For me, it's easier to take it from the whole and add back the rest.

MP.5

T: It's like subtracting 80 from 130. It's easier for me to take 80 from 100 and add 20 and 30.

S: Can we do it whatever way?

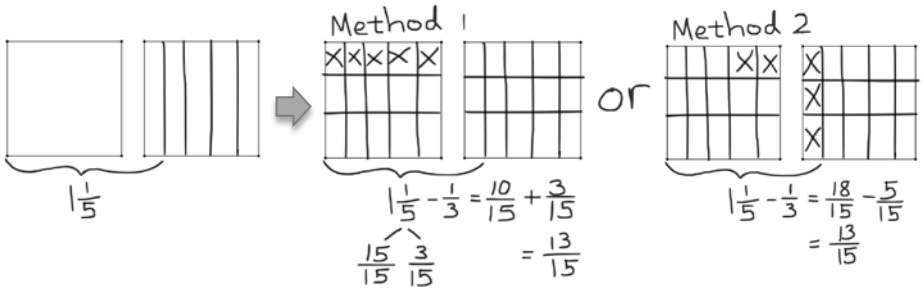
T: Of course. Choose the way that is easiest for you.

T: Let's call the different solution strategies Method 1 and Method 2. If you use method 1, it's good to record it with a number bond.

S: 8 sixths – 3 sixths = 5 sixths. 1 and 1 third – 1 half = 5 sixths.

Problem 2

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



T: I draw one rectangle to show 1 and a second rectangle to show 1 fifth.

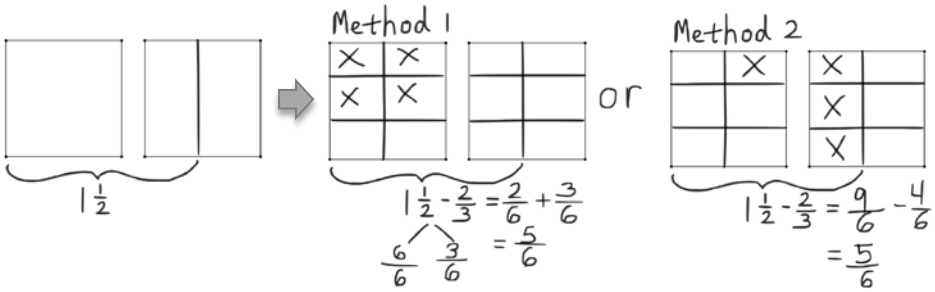
T: Do I have thirds to take away from the 6 fifths?

S: No.

T: Explain to your partner how to solve this problem. Use both methods.

Problem 3

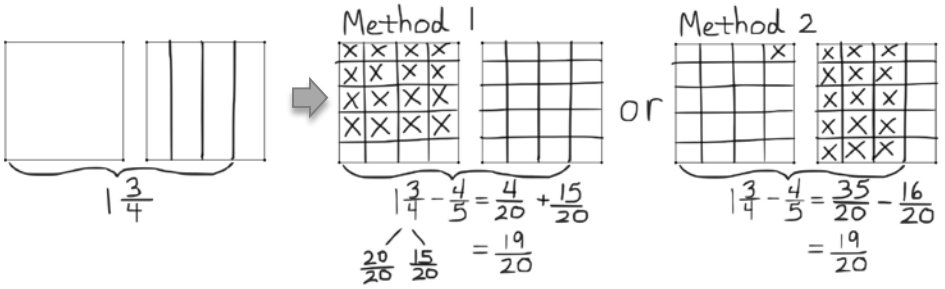
$$1\frac{1}{2}-\frac{2}{3}=$$



The only complexity added on here is that of the subtraction of a non-unit fraction.

Problem 4

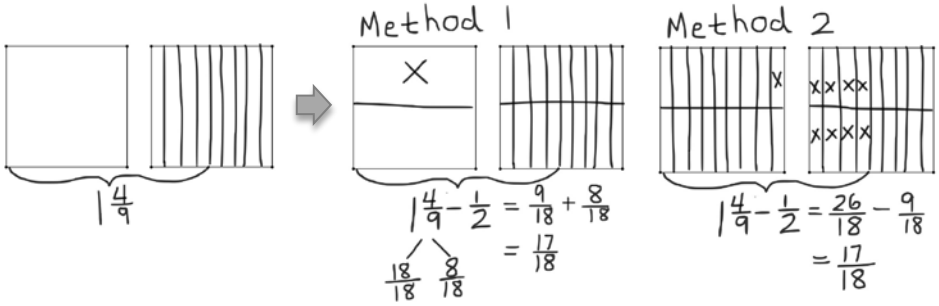
$$1\frac{3}{4}-\frac{4}{5}=$$



In this problem, the new complexity is the choice of two non-unit fractions.

Problem 5

$$1\frac{4}{9}-\frac{1}{2}=$$



T: I really don't want to have to draw all those ninths, so I'm going to do a shortcut for now just to remind myself of what to do.

Problem Set (12 minutes)

Students should do their personal best to complete the Problem Set within the allotted 12 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

As students share out various strategies, use a modified text representation activity. Have the rest of the class demonstrate the ideas their peers orally express on personal white boards.

Student Debrief (10 minutes)

Lesson Objective: Subtract fractions from numbers between 1 and 2.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

T: Take one minute to compare your work with a partner's. (Circulate and look for common errors or student work to use instructionally.)

T: I'll read the answers to numbers 1 and 2 now.

T: (Students correct their work for about 2 minutes.) If you had no errors, I will assign you to support a peer.

T: Compare these problems with a partner:

(a) and (b)

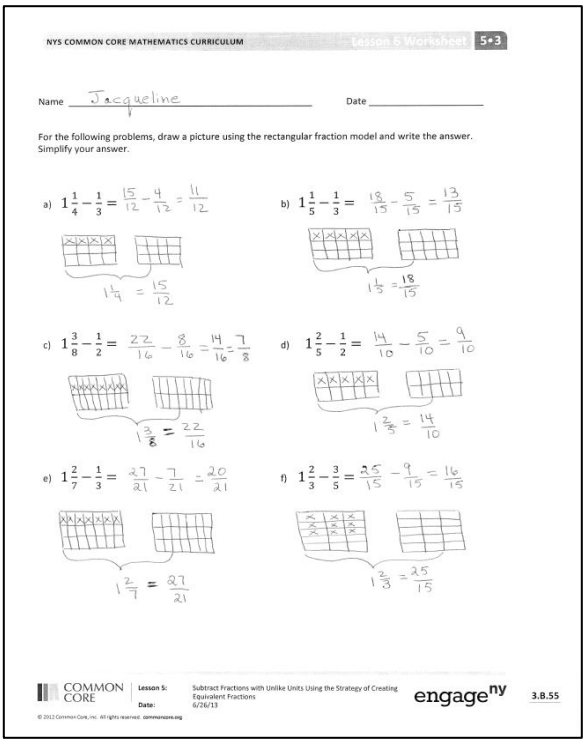
(c) and (d)

(e) and (f)

S: I remember that 1/3 – 1/4 is 1/12 so then 1 1/4 – 1/3 is 1/12 less than 1. → It's the same with 1 1/3 – 1/5. It's 2/15 and so the answer is 2/15 less than 1. → You could use the same strategy on all of them.

T: Jacqueline, can you explain your solution to Problem 2?

S: I realized that the problem was really easy, just subtraction. I could take 5/6 from 1 and add it to 1/4. 1/6 and 1/4 is easy because it's just unit fractions 4/24 and 6/24. So the answer is 10 twenty fourths.



NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 6 Worksheet 5•3

Name Jacqueline Date

For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.

a) $1\frac{1}{4}-\frac{1}{3}=\frac{15}{12}-\frac{4}{12}=\frac{11}{12}$ $1\frac{1}{4}=\frac{15}{12}$

b) $1\frac{1}{5}-\frac{1}{3}=\frac{18}{15}-\frac{5}{15}=\frac{13}{15}$ $1\frac{1}{15}=\frac{18}{15}$

c) $1\frac{3}{8}-\frac{1}{2}=\frac{22}{16}-\frac{8}{16}=\frac{14}{16}=\frac{7}{8}$ $1\frac{3}{8}=\frac{22}{16}$

d) $1\frac{2}{5}-\frac{1}{2}=\frac{14}{10}-\frac{5}{10}=\frac{9}{10}$ $1\frac{2}{5}=\frac{14}{10}$

e) $1\frac{2}{7}-\frac{1}{3}=\frac{27}{21}-\frac{7}{21}=\frac{20}{21}$ $1\frac{2}{7}=\frac{27}{21}$

f) $1\frac{2}{3}-\frac{3}{5}=\frac{25}{15}-\frac{9}{15}=\frac{16}{15}$ $1\frac{2}{3}=\frac{25}{15}$

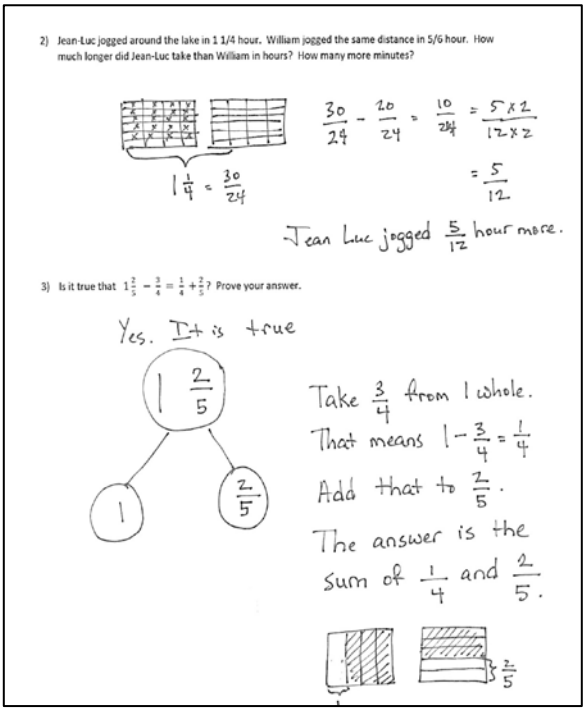
COMMON CORE | Lesson 5: Subtract Fractions with Unlike Units Using the Strategy of Creating Equivalent Fractions | Date: 6/26/13 | engage^ny | 3.B.55

T: Did anyone solve it differently?

S: Yes. I just converted the fractions to like units and subtracted so it was 24 twenty-fourths and 6 twenty-fourths. 30 twenty-fourths – 20 twenty-fourths = 10 twenty-fourths.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.



A

Correct_____

Express as an improper fraction.

1	$1\frac{1}{5}=$	/	23	$2\frac{7}{10}=$	/
2	$2\frac{1}{5}=$	/	24	$4\frac{9}{10}=$	/
3	$3\frac{1}{5}=$	/	25	$1\frac{1}{8}=$	/
4	$4\frac{1}{5}=$	/	26	$1\frac{5}{6}=$	/
5	$1\frac{1}{4}=$	/	27	$4\frac{5}{6}=$	/
6	$1\frac{3}{4}=$	/	28	$4\frac{5}{8}=$	/
7	$1\frac{2}{5}=$	/	29	$1\frac{5}{8}=$	/
8	$1\frac{3}{5}=$	/	30	$2\frac{3}{8}=$	/
9	$1\frac{4}{5}=$	/	31	$3\frac{3}{10}=$	/
10	$2\frac{4}{5}=$	/	32	$4\frac{7}{10}=$	/
11	$3\frac{4}{5}=$	/	33	$4\frac{4}{5}=$	/
12	$2\frac{1}{4}=$	/	34	$4\frac{1}{8}=$	/
13	$2\frac{3}{4}=$	/	35	$4\frac{3}{8}=$	/
14	$3\frac{1}{4}=$	/	36	$4\frac{7}{8}=$	/
15	$3\frac{3}{4}=$	/	37	$1\frac{5}{12}=$	/
16	$4\frac{1}{3}=$	/	38	$1\frac{7}{12}=$	/
17	$4\frac{2}{3}=$	/	39	$2\frac{1}{12}=$	/
18	$2\frac{3}{5}=$	/	40	$3\frac{1}{12}=$	/
19	$3\frac{3}{5}=$	/	41	$2\frac{7}{12}=$	/
20	$4\frac{3}{5}=$	/	42	$3\frac{5}{12}=$	/
21	$2\frac{1}{6}=$	/	43	$3\frac{11}{12}=$	/
22	$3\frac{1}{8}=$	/	44	$4\frac{7}{12}=$	/

B

Correct_____

Express as an improper fraction.

1	$1\frac{1}{2}=$	/	23	$2\frac{3}{10}=$	/
2	$2\frac{1}{2}=$	/	24	$3\frac{1}{10}=$	/
3	$3\frac{1}{2}=$	/	25	$1\frac{1}{6}=$	/
4	$4\frac{1}{2}=$	/	26	$1\frac{3}{8}=$	/
5	$1\frac{1}{3}=$	/	27	$3\frac{5}{6}=$	/
6	$1\frac{2}{3}=$	/	28	$3\frac{5}{8}=$	/
7	$1\frac{3}{10}=$	/	29	$2\frac{5}{8}=$	/
8	$1\frac{7}{10}=$	/	30	$1\frac{7}{8}=$	/
9	$1\frac{9}{10}=$	/	31	$4\frac{3}{10}=$	/
10	$2\frac{9}{10}=$	/	32	$3\frac{7}{10}=$	/
11	$3\frac{9}{10}=$	/	33	$2\frac{5}{6}=$	/
12	$2\frac{1}{3}=$	/	34	$2\frac{7}{8}=$	/
13	$2\frac{2}{3}=$	/	35	$3\frac{7}{8}=$	/
14	$3\frac{1}{3}=$	/	36	$4\frac{1}{6}=$	/
15	$3\frac{2}{3}=$	/	37	$1\frac{1}{12}=$	/
16	$4\frac{1}{4}=$	/	38	$1\frac{11}{12}=$	/
17	$4\frac{3}{4}=$	/	39	$4\frac{1}{12}=$	/
18	$2\frac{2}{5}=$	/	40	$2\frac{5}{12}=$	/
19	$3\frac{2}{5}=$	/	41	$2\frac{11}{12}=$	/
20	$4\frac{2}{5}=$	/	42	$3\frac{7}{12}=$	/
21	$3\frac{1}{6}=$	/	43	$4\frac{5}{12}=$	/
22	$2\frac{1}{8}=$	/	44	$4\frac{11}{12}=$	/

Name _____ Date _____

1. For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.

a) $1\frac{1}{4} - \frac{1}{3} =$

b) $1\frac{1}{5} - \frac{1}{3} =$

c) $1\frac{3}{8} - \frac{1}{2} =$

d) $1\frac{2}{5} - \frac{1}{2} =$

e) $1\frac{2}{7} - \frac{1}{3} =$

f) $1\frac{2}{3} - \frac{3}{5} =$

2. Jean-Luc jogged around the lake in 1 1/4 hour. William jogged the same distance in 5/6 hour. How much longer did Jean-Luc take than William in hours? How many more minutes?

3. Is it true that $1\frac{2}{5} - \frac{3}{4} = \frac{1}{4} + \frac{2}{5}$? Prove your answer.

Name _____ Date _____

For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer.

1. $1\frac{1}{5}-\frac{1}{2}=$

2. $1\frac{1}{3}-\frac{5}{6}=$

Name _____ Date _____

1. Find the difference. Use a rectangular fraction model to show how to convert to fractions with common denominators.

a) $1 - \frac{5}{6} =$

b) $\frac{3}{2} - \frac{5}{6} =$

c) $\frac{4}{3} - \frac{5}{7} =$

d) $1\frac{1}{8} - \frac{3}{5} =$

e) $1\frac{2}{5} - \frac{3}{4} =$

f) $1\frac{5}{6} - \frac{7}{8} =$

g) $1\frac{2}{7} - \frac{3}{4} =$

h) $1\frac{3}{12} - \frac{2}{3} =$

2. Sam had 1 1/2 m of rope. He cut off 5/8 m and used it for a project. How much rope does Sam have left?

3. Jackson had 1 3/8 kg of fertilizer. He used some to fertilize a flower bed andhe only had 2/3 kg left. How much fertilizer was used in the flower bed