Reasoning and Problem Solving
Step 14: Subtract Mixed Numbers 2

National Curriculum Objectives:

Mathematics Year 5: (5F2b) Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
Mathematics Year 5: (5F4) Add and subtract fractions with the same denominator and denominators that are multiples of the same number

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Given a solution as a complete representation of flexible partitioning and given denominator, find the original calculation. Denominators are double or half of the starting fraction (e.g. thirds and sixths).
Expected Given a solution as a complete representation of flexible partitioning and given denominator, find two possibilities for the original calculation. Denominators are direct multiples of each other (e.g. quarters and twelfths).
Greater Depth Given a solution as a partial visual representation of flexible partitioning, find possibilities for the original calculation. Denominators are not direct multiples but have a common factor (e.g. sixths and ninths) and may include the use of partitioning to multiply.

Questions 2, 5 and 8 (Reasoning)
Developing Explain whether a calculation is correct (including equivalent fractions or errors of partitioning) find errors and explain reasoning. Denominators are double or half of the starting fraction (e.g. thirds and sixths).
Expected Explain whether a calculation is correct (including equivalent fractions or errors of partitioning). Denominators are direct multiples of each other (e.g. quarters and twelfths).
Greater Depth Explain whether a calculation is correct (including equivalent fractions or errors of partitioning) find errors and explain reasoning. Denominators are not direct multiples but have a common factor (e.g. sixths and ninths) and may include the use of partitioning to multiply.

Questions 3, 6 and 9 (Problem Solving)
Developing Find the odd one out of three subtractions which break the whole where the denominator is double or half of the starting fraction (e.g. thirds and sixths).
Expected Find the odd one out of three subtractions which break the whole where the denominators are direct multiples of each other (e.g. quarters and twelfths).
Greater Depth Find the odd one out of three subtractions which break the whole where the denominators are not direct multiples but have a common factor (e.g. sixths and ninths) and may include the use of partitioning to multiply.
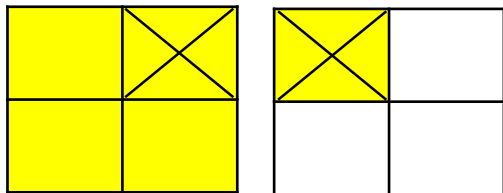
More Year 5 Fractions resources.

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Subtract Mixed Numbers 2	Subtract Mixed Numbers 2

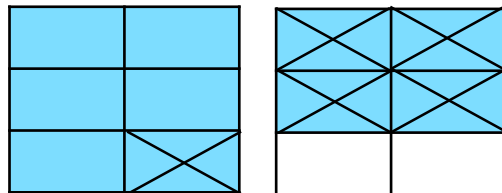**1a.** Find a calculation where the diagram below could be the final step of flexible partitioning.

$$\frac{\boxed{}}{4} - \frac{\boxed{}}{2} = \;?$$

PS

1b. Find a calculation where the diagram below could be the final step of flexible partitioning.

$$\frac{\boxed{}}{3} - \frac{\boxed{}}{6} = \;?$$

PS

2a. The answer page shows the following solution:

$$6\frac{2}{3} - \frac{5}{6} = 5\frac{10}{6} - \frac{5}{6} = 5\frac{5}{6}$$

Lucie's working in her maths book is this:

$$6\frac{2}{3} - \frac{5}{6} = 6\frac{10}{6} - \frac{5}{6} = 6\frac{5}{6}$$

Is Lucie correct? Explain your answer.

R

2b. The answer page shows the following solution:

$$5\frac{1}{8} - \frac{3}{16} = 4\frac{18}{16} - \frac{3}{16} = 4\frac{15}{16}$$

Reese's working in his maths book is this:

$$5\frac{1}{8} - \frac{3}{16} = 4\frac{3}{16} - \frac{3}{16} = 4$$

Is Reese correct? Explain your answer.

R

3a. Find the odd one out.

A. $8\frac{1}{6} - \frac{7}{12}$

B. $8\frac{2}{6} - \frac{9}{12}$

C. $8\frac{2}{12} - \frac{9}{12}$

Explain your choice.

PS

3b. Find the odd one out.

A. $2\frac{2}{5} - \frac{5}{10}$

B. $2\frac{3}{5} - \frac{6}{10}$
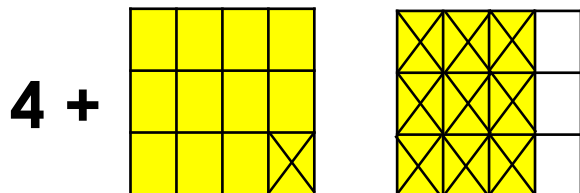
C. $2\frac{3}{5} - \frac{7}{10}$

Explain your choice.

PS

Reasoning and Problem Solving – Subtract Mixed Numbers 2 – Year 5 Developing

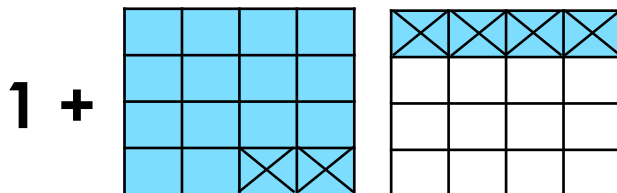**4a.** Find 2 possible calculations where the diagram below could be the final step of flexible partitioning.

$4 +$

$$\frac{\boxed{}}{4} - \frac{\boxed{}}{\boxed{}} = \; ?$$

PS

4b. Find 2 possible calculations where the diagram below could be the final step of flexible partitioning.

$1 +$

$$\frac{\boxed{}}{4} - \frac{\boxed{}}{\boxed{}} = \; ?$$

PS

5a. The answer page shows the following solution:

$$8\frac{1}{3} - \frac{4}{9} = 8\frac{3}{9} - \frac{4}{9} = 7\frac{8}{9}$$

Greg's working in his maths book is this:

$$8\frac{1}{3} - \frac{4}{9} = 8\frac{3}{9} - \frac{4}{9} = 7\frac{7}{9}$$

Is Greg correct? Explain your answer.

R

5b. The answer page shows the following solution:

$$3\frac{1}{4} - \frac{5}{12} = 2\frac{15}{12} - \frac{5}{12} = 2\frac{5}{6}$$

Isla working in her maths book is this:

$$3\frac{1}{4} - \frac{5}{12} = 2\frac{15}{12} - \frac{5}{12} = 2\frac{10}{12}$$

Is Isla correct? Explain your answer.

R

6a. Find the odd one out.

A. $1\frac{3}{4} - \frac{5}{12}$

B. $2\frac{1}{5} - \frac{13}{15}$

C. $2\frac{2}{5} - \frac{13}{15}$

Explain your choice.

PS

6b. Find the odd one out.

A. $5\frac{6}{7} - \frac{11}{21}$

B. $5\frac{3}{5} - \frac{4}{15}$
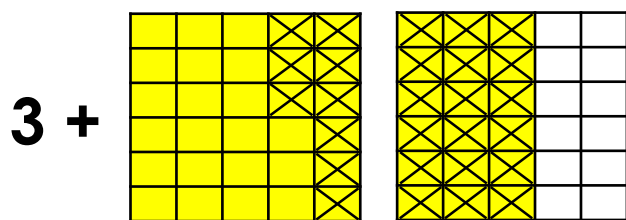
C. $5\frac{1}{5} - \frac{6}{15}$

Explain your choice.

PS

7a. Find possible calculations where the diagram below could be the final step of flexible partitioning.

$3 +$

$$\frac{\Box\Box}{\Box\Box} - \frac{\Box}{\Box} = \ ?$$

GD

PS

7b. Find possible calculations where the diagram below could be the final step of flexible partitioning.

$7 +$

$$\frac{\Box\Box}{\Box\Box} - \frac{\Box}{\Box} = \ ?$$

GD

PS

8a. The answer page shows the following solution:

$$3\frac{7}{15} - \frac{5}{12} = 3\frac{1}{20}$$

Myles' working in his maths book is this:

$$3\frac{7}{15} - \frac{5}{12} = 2\frac{22}{15} - \frac{8}{15} = 2\frac{14}{15}$$

Is Myles correct? Explain your answer.

GD

R

8b. The answer page shows the following solution:

$$7\frac{1}{7} - \frac{3}{4} = 6\frac{6}{14}$$

Stacie's working in her maths book is this:

$$7\frac{1}{7} - \frac{3}{4} = 6\frac{32}{28} - \frac{21}{28} = 6\frac{11}{28}$$

Is Stacie correct? Explain your answer.

GD

R

9a. Find the odd one out.

A. $3\frac{3}{4} - \frac{2}{5}$

B. $4\frac{2}{5} - \frac{3}{4}$

C. $4\frac{3}{20} - \frac{4}{5}$

Explain your choice.

GD

PS

9b. Find the odd one out.

A. $9\frac{3}{8} - \frac{5}{7}$

B. $9\frac{2}{7} - \frac{5}{8}$

C. $9\frac{5}{7} - \frac{3}{8}$

Explain your choice.

GD

PS

Reasoning and Problem Solving – Subtract Mixed Numbers 2 – Year 5 Greater Depth

Developing

1a. $1 \frac{1}{4} - \frac{1}{2} = \frac{3}{4}$

2a. Lucie is incorrect. She has not reduced the whole number by the 1 she has exchanged for sixths.

3a. C is the odd one out. A and B = $7 \frac{7}{12}$, C = $7 \frac{5}{12}$.

Expected

4a. $5 \frac{3}{4} - \frac{10}{12} = 4 \frac{11}{12}$ or $5 \frac{3}{4} - \frac{5}{6} = 4 \frac{11}{12}$

5a. Gregg is incorrect. He has incorrectly subtracted the numerators from one another.

6a. C is the odd one out. A and B = $1 \frac{1}{3}$, C = $1 \frac{8}{15}$

Greater Depth

7a. $4 \frac{3}{5} - \frac{9}{10} = 3 \frac{21}{30}$ or $4 \frac{9}{15} - \frac{18}{20} = 3 \frac{21}{30}$
$4 \frac{18}{30} - \frac{27}{30} = 3 \frac{21}{30}$ or $4 \frac{6}{10} - \frac{9}{10} = 3 \frac{21}{30}$

8a. Myles is incorrect he has added 3 to the denominator and numerator of the 12ths rather than multiplying to find a common factor.

9a. B is the odd one out. A and C = $2 \frac{7}{20}$, C = $3 \frac{13}{20}$.

Developing

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

2b. Reese is incorrect. He has exchanged one whole for only one 16th instead of 16.

3b. B is the odd one out. A and C = $1 \frac{9}{10}$ B = 2.

Expected

4b. $2 \frac{1}{4} - \frac{6}{16} = 1 \frac{14}{16}$ or $2 \frac{1}{4} - \frac{6}{16} = 1 \frac{7}{8}$

5b. Isla is correct. She hasn't simplified her answer.

6b. C is the odd one out. A and B = $5 \frac{1}{3}$, B = $4 \frac{4}{5}$

Greater Depth

7b. $8 \frac{1}{3} - \frac{16}{18} = 7 \frac{8}{18}$ or $8 \frac{1}{3} - \frac{8}{9} = 7 \frac{4}{9}$

8b. Stacie has correctly calculated the subtraction, the answer page is incorrect. They have subtracted the numerator incorrectly and then simplified their answer.

9b. C is the odd one out. A and B = $8 \frac{37}{56}$, C = $9 \frac{19}{56}$.

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