Reasoning and Problem Solving
Step 11: Multiply Fractions by Fractions

National Curriculum Objectives:

Mathematics Year 6: (6F2) Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
Mathematics Year 6: (6F5a) Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 x 1/2 = 1/8

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Identify whether a given calculation is correct, using knowledge of multiplying fractions by fractions. All numerators are 1, pictorial support is given and the answer is less than 1.
Expected Identify whether a given calculation is correct, using knowledge of multiplying fractions by fractions. Numerators are any number, some pictorial support is given and the answer is less than 1.
Greater Depth Identify whether a given calculation is correct, using knowledge of multiplying fractions by fractions. Mixed numbers and improper fractions are used.

Questions 2, 5 and 8 (Problem Solving)
Developing Find 3 pairs of fractions which when multiplied give a specified answer. All numerators are 1, pictorial support is given and the answer is less than 1.
Expected Find 3 pairs of fractions which when multiplied give a specified answer. Numerators are any number and the answer is less than 1.
Greater Depth Find 3 pairs of fractions which when multiplied give a specified answer. Improper fractions are used. A diagram is included for support.

Questions 3, 6 and 9 (Reasoning)
Developing Identify whether a statement is correct, using knowledge of multiplying fractions by fractions. All numerators are 1, pictorial support is given and the answer is less than 1.
Expected Identify whether a statement is correct, using knowledge of multiplying fractions by fractions. Numerators are any number and the answer is less than 1.
Greater Depth Identify whether a statement is correct, using knowledge of multiplying fractions by fractions. Mixed numbers and improper fractions are used.

More Year 6 Fractions resources.

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Multiply Fractions by Fractions

1a. Look at the calculation below.

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

Is it correct? Explain how you know.

R

1b. Look at the calculation below.

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

Is it correct? Explain how you know.

R

2a. Marcus is trying to find pairs of proper fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = \frac{1}{24}$$

He finds 3 pairs. What could his pairs be?

PS

2b. Harvey is trying to find pairs of proper fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = \frac{1}{30}$$

He finds 3 pairs. What could his pairs be?

PS

3a. Sian is thinking about multiplying fractions.

> If the answer to a fraction multiplication is $\frac{1}{8}$, one of the fractions which was multiplied could have been $\frac{1}{2}$. The answer has not been simplified.

Sian

Is she correct? Explain how you know.

R

3b. Tanya is thinking about multiplying fractions.

> If the answer to a fraction multiplication is $\frac{1}{4}$, one of the fractions which was multiplied could have been $\frac{1}{3}$. The answer has not been simplified.

Tanya

Is she correct? Explain how you know.

R

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Reasoning and Problem Solving – Multiply Fractions by Fractions – Year 6 Developing

4a. Look at the calculation below.

$$\frac{1}{4} \times \frac{2}{5} = \frac{3}{20}$$

Is it correct? Explain how you know.

R

4b. Look at the calculation below.

$$\frac{2}{3} \times \frac{5}{6} = \frac{10}{18}$$

Is it correct? Explain how you know.

R

5a. Stacy is trying to find pairs of proper fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = \frac{12}{30}$$

She finds 3 pairs. What could her pairs be?

PS

5b. Hattie is trying to find pairs of proper fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = \frac{8}{24}$$

She finds 3 pairs. What could her pairs be?

PS

6a. Rose is thinking about multiplying fractions.

Rose

If the answer to a fraction multiplication is $\frac{4}{16}$, one of the fractions which was multiplied could have been $\frac{2}{7}$. The answer has not been simplified.

R

Is she correct? Explain how you know.

R

6b. Cory is thinking about multiplying fractions.

Cory

If the answer to a fraction multiplication is $\frac{6}{15}$, one of the fractions which was multiplied could have been $\frac{2}{3}$. The answer has not been simplified.

Is he correct? Explain how you know.

R

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Reasoning and Problem Solving – Multiply Fractions by Fractions – Year 6 Expected

7a. Look at the calculation below.

$$\frac{10}{8} \times \frac{9}{7} = 1\frac{34}{56}$$

Is it correct? Explain how you know.

GD

R

7b. Look at the calculation below.

$$\frac{11}{12} \times \frac{8}{5} = 1\frac{41}{55}$$
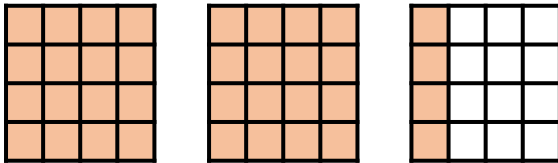
Is it correct? Explain how you know.

GD

R

8a. Titus is trying to find pairs of fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = 2\frac{4}{16}$$

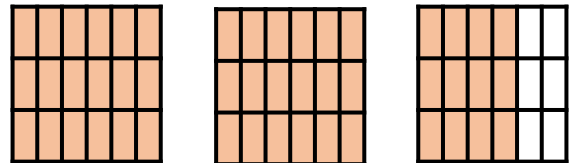He finds 3 pairs so far. What could his pairs be?

GD

PS

8b. Craig is trying to find pairs of fractions which multiply together to make the answer below.

$$\frac{?}{?} \times \frac{?}{?} = 2\frac{12}{18}$$

He finds 3 pairs so far. What could his pairs be?

GD

PS

9a. Hugh is thinking about multiplying fractions.

> If the simplified answer to a fraction multiplication is $1\frac{1}{14}$, one of the fractions which was multiplied could have been $\frac{3}{7}$.

Hugh

Is he correct? Explain how you know.

GD

R

9b. James is thinking about multiplying fractions.

> If the simplified answer to a fraction multiplication is $2\frac{1}{12}$, one of the fractions which was multiplied could have been $\frac{9}{2}$.

James

Is he correct? Explain how you know.

GD

R

Reasoning and Problem Solving – Multiply Fractions by Fractions – Year 6 Greater Depth

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Developing

1a. It is incorrect because 1 x 1 = 1 and 3 x 2 = 6. The answer is $\frac{1}{6}$.

2a. $\frac{1}{2}$ x $\frac{1}{12}$; $\frac{1}{3}$ x $\frac{1}{8}$; $\frac{1}{4}$ x $\frac{1}{6}$

3a. Sian is correct: 1 is a multiple of 1 and 8 is a multiple of 2.

Developing

1b. It is correct because 1 x 1 = 1 and 4 x 5 = 20.

2b. $\frac{1}{2}$ x $\frac{1}{15}$; $\frac{1}{3}$ x $\frac{1}{10}$; $\frac{1}{5}$ x $\frac{1}{6}$

3b. Tanya is incorrect: 1 is a multiple of 1, but 4 is not a multiple of 3.

Expected

4a. It is incorrect because 1 x 2 = 2 and 4 x 5 = 20. The answer is $\frac{2}{20}$.

5a. Various answers, for example:
$\frac{1}{2}$ x $\frac{12}{15}$; $\frac{2}{3}$ x $\frac{6}{10}$; $\frac{3}{5}$ x $\frac{4}{6}$

6a. Rose is incorrect: 4 is a multiple of 2 but 16 is not a multiple of 7.

Expected

4b. It is correct because 2 x 5 = 10 and 3 x 6 = 18.

5b. Various answers, for example:
$\frac{1}{2}$ x $\frac{8}{12}$; $\frac{2}{4}$ x $\frac{4}{6}$; $\frac{2}{3}$ x $\frac{4}{8}$

6b. Cory is correct: 6 is a multiple of 2 and 15 is a multiple of 3.

Greater Depth

7a. It is correct because 10 x 9 = 90 and 8 x 7 = 56 and $\frac{90}{56}$ = $1\frac{34}{56}$.

8a. Various answers, for example:
$\frac{1}{2}$ x $\frac{36}{8}$; $\frac{3}{2}$ x $\frac{12}{8}$; $\frac{3}{4}$ x $\frac{12}{4}$

9a. Hugh is correct: 15 is a multiple of 3 and 14 is a multiple of 7; $\frac{15}{14}$ = $1\frac{1}{14}$

Greater Depth

7b. It is incorrect because 11 x 8 = 88 and 12 x 5 = 60. The answer is $1\frac{28}{60}$.

8b. Various answers, for example:
$\frac{1}{2}$ x $\frac{48}{9}$; $\frac{2}{3}$ x $\frac{24}{6}$; $\frac{4}{9}$ x $\frac{12}{2}$

9b. James is incorrect because 12 is a multiple of 2 but 25 is not a multiple of 9; $\frac{25}{12}$ = $2\frac{1}{12}$

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