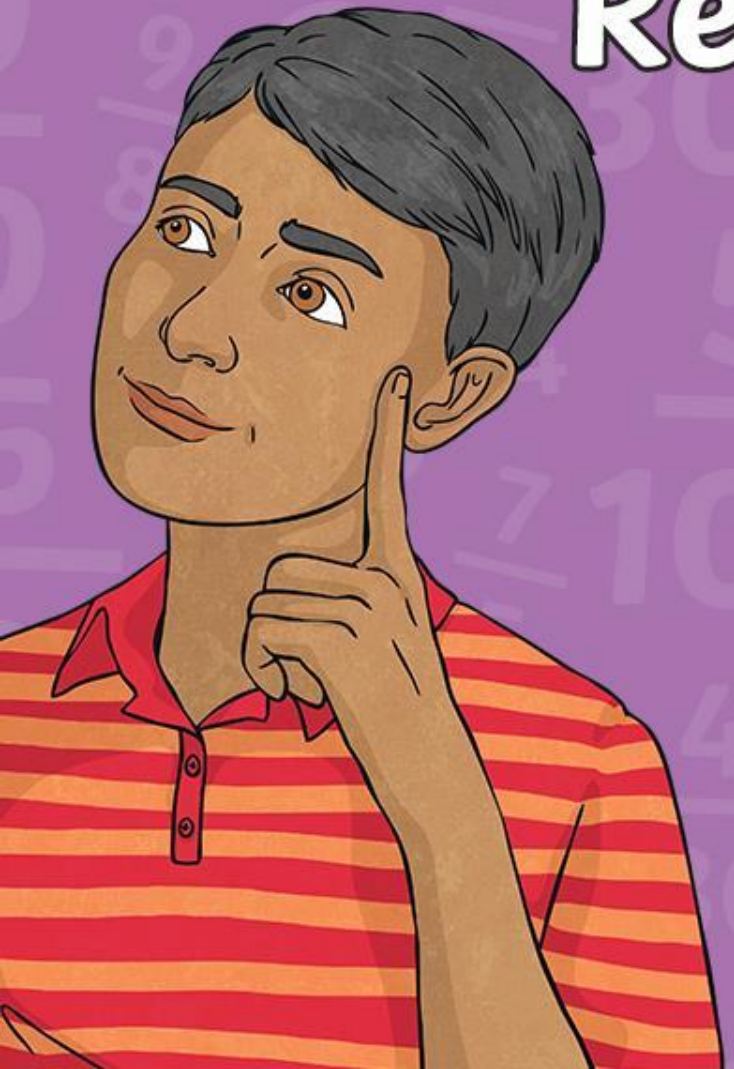
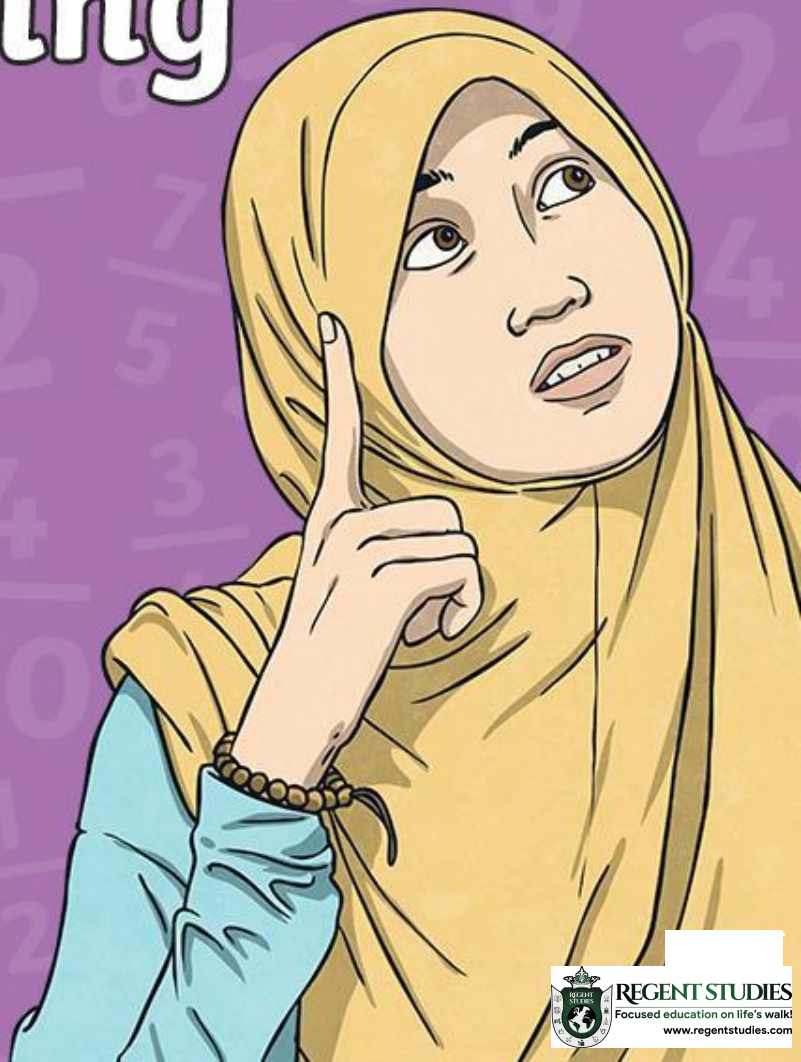
Maths

Fractions

Multiplying Fractions Reasoning





Aim

- I can solve reasoning questions involving multiplying proper fractions.

Success Criteria

- I can break down complex problems into smaller steps.
- I can use mathematical language to explain solutions to problems.

Guided Maths Question 1

Read this reasoning question carefully.

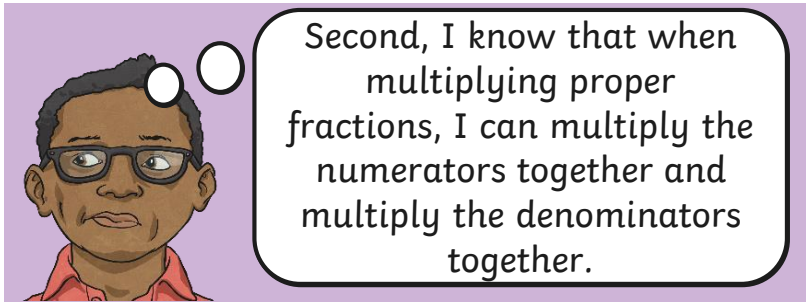
Shade the fraction bar to show the answer to the calculation:

$$\frac{1}{5} \times \frac{5}{7} =$$

Let's highlight the important information and key vocabulary to show we understand the question.

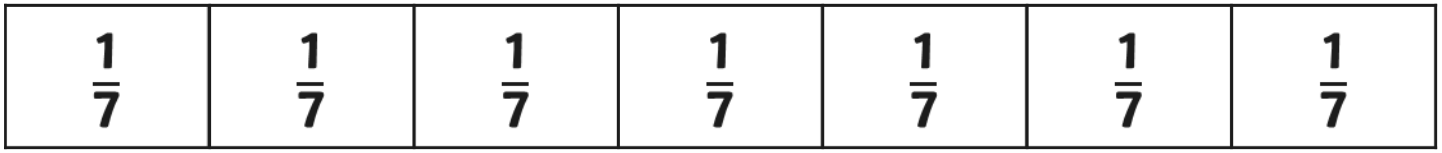
Guided Maths Question 1

Next, let's think about what we **already know** in order to help us answer the question correctly.



Shade the fraction bar to show the answer to the calculation:

$$\frac{1}{5} \times \frac{5}{7}$$



$$\frac{\text{numerator}}{\text{denominator}} \times \frac{\text{numerator}}{\text{denominator}}$$

Guided Maths Question 1

We are now ready to **apply our learning** to solve the question.

I have calculated that the answer in its simplest form is $\frac{1}{7}$. I can now shade this on the fraction bar.

Shade the fraction bar to show the answer to the calculation:

$$\frac{1}{5} \times \frac{5}{7}$$

$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$

$$\frac{1}{5} \times \frac{5}{7} = \frac{5}{35} = \frac{1}{7}$$

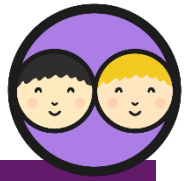
Guided Maths Question 1

Finally, let's **check our answer**.

Shade the fraction bar to show the answer to the calculation:

$$\frac{1}{5} \times \frac{5}{7} = \frac{1}{7}$$

Partner Maths Question 1



Working with a partner, use your reasoning skills to answer this question.

Shade the fraction bar to show the answer to the calculation:

$$\frac{3}{4} \times \frac{2}{5} = \frac{6}{20} = \frac{3}{10}$$

Show Answer

Guided Maths Question 2

Read this reasoning question carefully.

Give four different pairs of proper fractions that equal one third when multiplied together:

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{3}$$

Let's highlight the important information and key vocabulary to show we understand the question.

Guided Maths Question 2

Whole Class

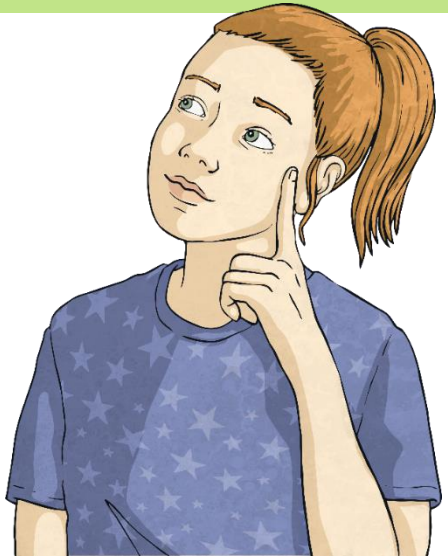
Next, let's think about what we **already know** in order to help us answer the question correctly.

I know that, in a proper fraction, the numerator must be less than the denominator.

Give four different pairs of proper fractions that equal one third when multiplied together:

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{3}$$

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{4}{12}$$



Guided Maths Question 2

Now we are ready to **apply our learning** to solve the question.

Finally, I will find two fractions whose product equals $\frac{6}{18}$, which is equivalent to $\frac{1}{3}$.

Give four different pairs of proper fractions that equal one third when multiplied together:

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{3}$$

$$\frac{1}{2} \times \frac{2}{3} = \frac{2}{6} \qquad \frac{4}{6} \times \frac{1}{2} = \frac{4}{12}$$

$$\frac{2}{3} \times \frac{2}{4} = \frac{4}{12} \qquad \frac{3}{6} \times \frac{2}{3} = \frac{6}{18}$$

Guided Maths Question 2

Finally, let's **check our answer** with the information and key vocabulary in the question.

Give four different pairs of proper fractions that equal one third when multiplied together:

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{3}$$

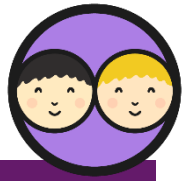
$\frac{1}{2} \times \frac{2}{3}$

$\frac{2}{3} \times \frac{2}{4}$

$\frac{4}{6} \times \frac{1}{2}$

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

Partner Maths Question 2



Working with a partner, use your reasoning skills to answer this question.

Give four different pairs of proper fractions that equal one fifth when multiplied together:

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{5}$$

Show Answer

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

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

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

$\frac{1}{2} \times \frac{4}{10}$

Guided Maths Question 3

Whole Class

Read this reasoning question carefully.

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{1}{2} + \frac{2}{5}\right] \times \frac{2}{3} = \frac{\square}{\square}$$

Let's highlight the important information and key vocabulary to show we understand the question.

Guided Maths Question 3

Next, let's think about what we **already know** in order to help us answer the question correctly.

I know that I may need to simplify the answer.

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{1}{2}+\frac{2}{5}\right]\times\frac{2}{3}=\frac{\square}{\square}$$

$$\left[\frac{1}{2}+\frac{2}{5}\right]\times\frac{2}{3}=$$

Guided Maths Question 3

Now we are ready to **apply our learning** to solve the question.

Now the calculation inside the brackets has become $\frac{5}{10} + \frac{4}{10}$, which I can easily calculate.

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{1}{2} + \frac{2}{5}\right] \times \frac{2}{3} = \frac{\square}{\square}$$

$$\left[\frac{1 \times 5}{2 \times 5} + \frac{2 \times 2}{5 \times 2}\right] \left[\frac{5}{10} + \frac{4}{10}\right] = \frac{9}{10}$$

Both of the denominators can change to 10.

$2 \times 5 = 10$

$5 \times 2 = 10$

Remember, what you do to the bottom, you must also do to the top!

Guided Maths Question 3

Whole Class

Now we are ready to **apply our learning** to solve the question.

Finally, I need to simplify the answer.

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{1}{2}+\frac{2}{5}\right]\times\frac{2}{3}=\frac{\square}{\square}$$

$$\frac{9}{10}\times\frac{2}{3}=\frac{18}{30}=\frac{3}{5}$$

The greatest common factor of 18 and 30 is 6:

$3 \times 6 = 18$

$5 \times 6 = 30$

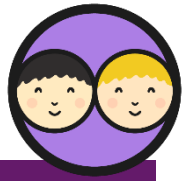
Guided Maths Question 3

Finally, let's **check our answer** with the information and key vocabulary in the question.

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{1}{2} + \frac{2}{5}\right] \times \frac{2}{3} = \frac{3}{5}$$

Partner Maths Question 3



Working with a partner, use your reasoning skills to answer this question.

What is the answer to this fraction calculation in its simplest form?

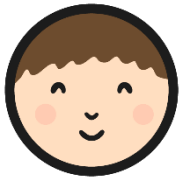
$$\left[\frac{2}{5} + \frac{1}{3}\right] \times \frac{3}{4} = \frac{11}{20}$$

Show Answer

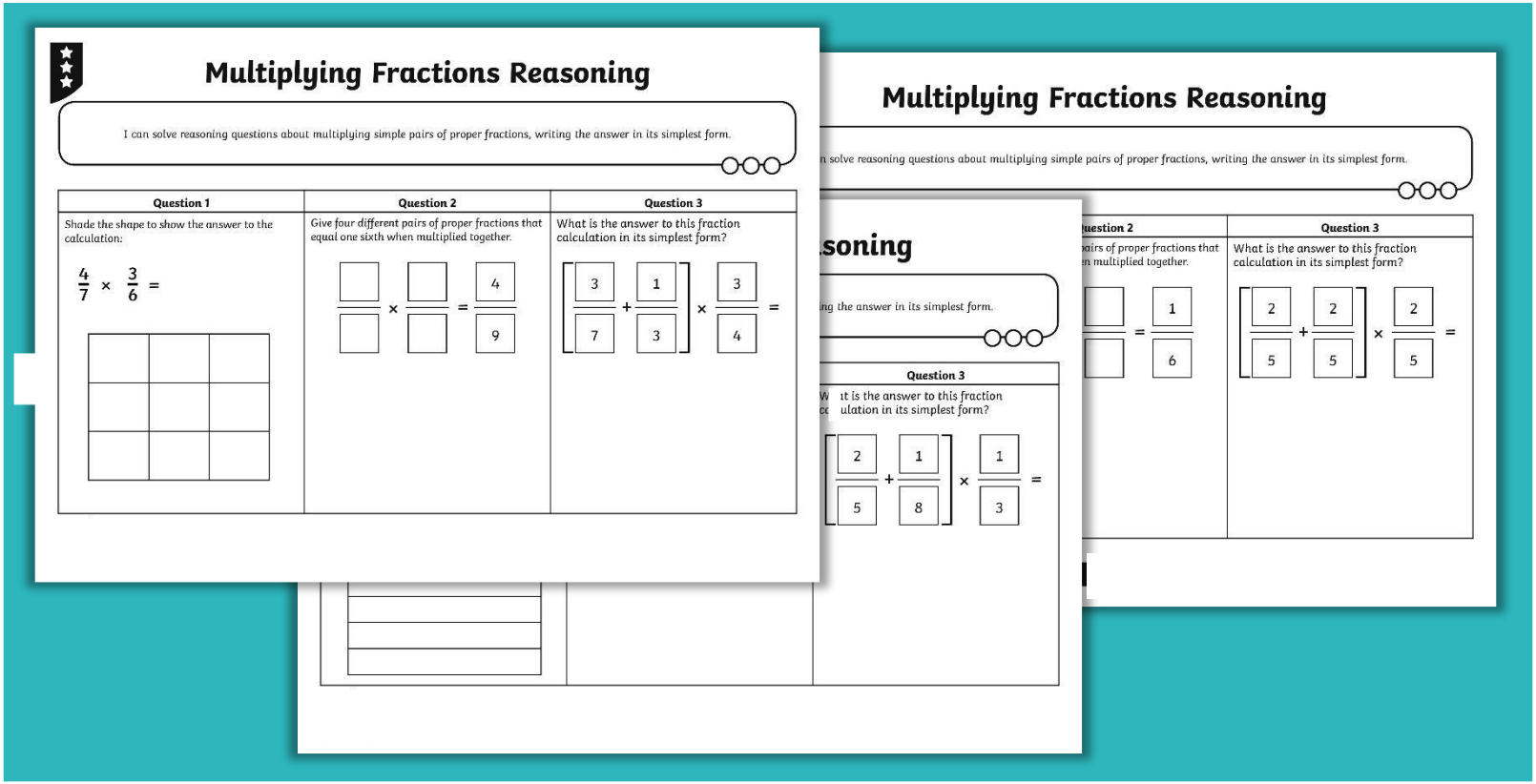
$$\frac{6}{15} + \frac{5}{15} = \frac{11}{15}$$

$$\frac{11}{15} \times \frac{3}{4} = \frac{33}{60} = \frac{11}{20}$$

Reasoning Practice



Have a go at **independently** solving the reasoning questions on your activity sheet.



Reasoning Practice Answers

Whole Class

Did you correctly answer the **first** reasoning question?

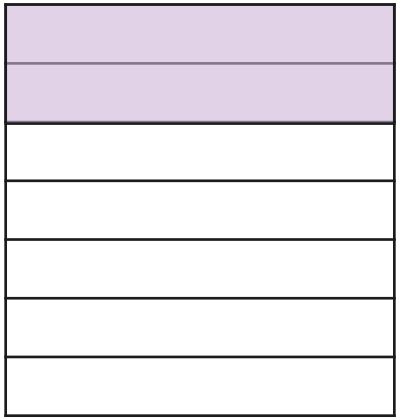
★ **Shade the shape to show the answer to the calculation:**

$\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$

Show Answer

★★ **Shade the shape to show the answer to the calculation:**

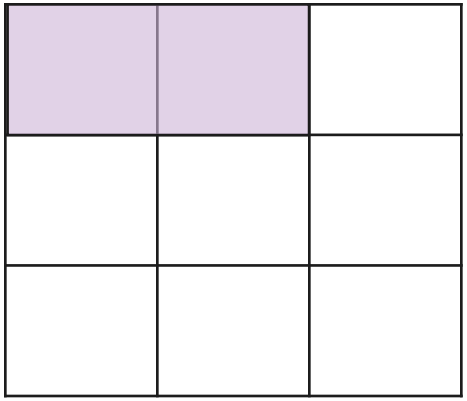
$\frac{4}{7} \times \frac{3}{6} = \frac{12}{42} = \frac{2}{7}$



Show Answer

★★★ **Shade the shape to show the answer to the calculation:**

$\frac{4}{6} \times \frac{2}{4} \times \frac{6}{9} = \frac{6}{27} = \frac{2}{9}$



Show Answer

Reasoning Practice Answers

Did you correctly answer the **second** reasoning question?

★

Give four different pairs of proper fractions that equal one sixth when multiplied together:

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{6}$

$\frac{1}{2} \times \frac{2}{6}$ $\quad$ $\frac{1}{2} \times \frac{3}{9}$

$\frac{2}{3} \times \frac{1}{4}$ $\quad$ $\frac{1}{3} \times \frac{3}{6}$

Show Answer

★★

Give four different pairs of proper fractions that equal two sevenths when multiplied together:

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{2}{7}$

$\frac{1}{2} \times \frac{4}{7}$ $\quad$ $\frac{1}{3} \times \frac{6}{7}$

$\frac{2}{3} \times \frac{3}{7}$ $\quad$ $\frac{2}{4} \times \frac{4}{7}$

Show Answer

★★★

Give four different pairs of proper fractions that equal four ninths when multiplied together:

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{4}{9}$

$\frac{2}{3} \times \frac{2}{3}$ $\quad$ $\frac{2}{3} \times \frac{4}{6}$

$\frac{8}{9} \times \frac{1}{2}$ $\quad$ $\frac{2}{3} \times \frac{6}{9}$

Show Answer

Reasoning Practice Answers

Did you correctly answer the **third** reasoning question?

★

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{3}{8}+\frac{1}{8}\right]\times\frac{2}{5}=$$

$$\frac{4}{8}\times\frac{2}{5}=\frac{8}{40}=\frac{1}{5}$$

Show Answer

★★

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{2}{5}+\frac{1}{8}\right]\times\frac{1}{3}=$$

$$\frac{16}{40}+\frac{5}{40}=\frac{21}{40}$$

$$\frac{21}{40}\times\frac{1}{3}=\frac{21}{120}=\frac{7}{40}$$

Show Answer

★★★

What is the answer to this fraction calculation in its simplest form?

$$\left[\frac{3}{7}+\frac{1}{3}\right]\times\frac{3}{4}=$$

$$\frac{9}{21}+\frac{7}{21}=\frac{16}{21}$$

$$\frac{16}{21}\times\frac{3}{4}=\frac{48}{84}=\frac{4}{7}$$

Show Answer

Reasoning Practice

How confident do you feel about the types of question that we have worked on today?

Show me using a silent signal:

Aim

- I can solve reasoning questions involving multiplying proper fractions.

Success Criteria

- I can break down complex problems into smaller steps.
- I can use mathematical language to explain solutions to problems.