























Fractions: Multiply Mixed Number by Integers

Aim: Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. To multiply mixed numbers by an integer.	Success Criteria: I can use repeated addition to multiply a mixed number by an integer. I can convert a mixed number to an improper fraction to multiply it by an integer. I can partition the mixed number into a whole and fraction to multiply it by an integer.	Resources: Lesson Pack
	Key/New Words: Fraction, multiply, integer, mixed number, improper fraction, whole.	Preparation: Multiplying Mixed Numbers by an Integer Activity Sheets – one per child Diving into Mastery Activity Sheets - as required

Prior Learning: Children need to be able to multiply fractions by an integer. Use the second and third lessons in this series to teach multiplication of fractions: [Multiply Unit Fractions by an Integer](#) and [Multiply Non-Unit Fractions by an Integer](#).

Learning Sequence

	Remember It: Children recap their ability to multiply proper fractions by an integer as shown on the Lesson Presentation . They sort the calculations into three categories, based on the size of the answer.		
	Repeated Addition: Use the Lesson Presentation to demonstrate how to multiply a mixed number by an integer. Bar models and repeated addition are used to visualise how to multiply by an integer. Can children use repeated addition to multiply it by an integer?		
	Using Improper Fractions: Use the Lesson Presentation to demonstrate how to multiply a mixed number by an integer by converting the mixed number into an improper fraction first. The multiplication of the improper fraction is completed and then the answer is converted back to a mixed number. Can children convert a mixed number to an improper fraction to multiply it by an integer?		
	Partitioning the Mixed Number: Use the Lesson Presentation to demonstrate how to multiply a mixed number by an integer by partitioning the mixed number. After partitioning, the whole number is multiplied by the integer, then the proper fraction. Finally, the answers are added together. Can children partition the mixed number into a whole and fraction to multiply it by an integer?		
	Which Method? Children identify which methods shown on the Lesson Presentation are used to complete calculations. They discuss with their partner which method they prefer and why. They consider if certain methods may be more efficient to complete certain calculations. Ask children to share their views.		
  Children complete multiplication of mixed number calculations, using the three methods practised in the lesson. Examples of the methods are provided.	 Children choose a method to calculate multiplication of mixed number calculations. They then use an alternative method to check the answer. They calculate the answer to a word problem.	 Children use all three methods to calculate multiplication of mixed number calculations. They decide which method was the best to use for each calculation and why. They solve a reasoning-style problem.	

	<p>Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.</p> <p> Children practise their fluency skills by using the different methods used in the lesson to complete multiplication of mixed numbers by an integer.</p> <p> Children answer a word problem involving multiplication of a mixed number by an integer. They choose the correct inequality symbol to compare calculations.</p> <p> Children show their depth of understanding by completing open-ended questions and following clues to find possible calculations.</p>	
	<p>Who Ran Farther? Children complete a word problem shown on the Lesson Presentation, involving multiplying a mixed number by an integer.</p>	

Exploreit

Playit: Children roll a dice three times and use the numbers rolled to make a mixed number (ensure numerator is smaller than the denominator). Then they roll another number and use this number to multiply the mixed number by. They calculate the answer. Meanwhile, their partner does the same. The person with the greater answer scores a point.

Learnit: Children will find this superb [Knowledge Organiser](#) an excellent tool for strengthening their knowledge of fractions.



Maths

Fractions

Multiply Mixed Numbers by Integers



Aim

- To multiply mixed numbers by an integer.

Success Criteria

- I can use repeated addition to multiply a mixed number by an integer.
- I can convert a mixed number to an improper fraction to multiply it by an integer.
- I can partition the mixed number into a whole and fraction to multiply it by an integer.

Remember It



Calculate and sort. One has been done.

$$\frac{1}{4} \times 3 =$$

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

$$\frac{2}{3} \times 7 =$$

$$\frac{3}{4} \times 7 =$$

$$\frac{2}{9} \times 8 =$$

$$\frac{3}{7} \times 8 =$$

$$\frac{2}{9} \times 11 =$$

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

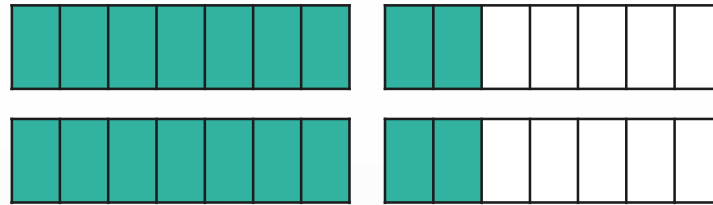
answer less than 1	answer between 1 and 3	answer 3 or greater
$\frac{2}{5} \times 2 = \frac{4}{5}$		

Repeated Addition



There are different methods to multiply a mixed number by a whole number. One method is to use repeated addition.

$$1\frac{2}{7} \times 2$$



We have $1\frac{2}{7}$ two times.

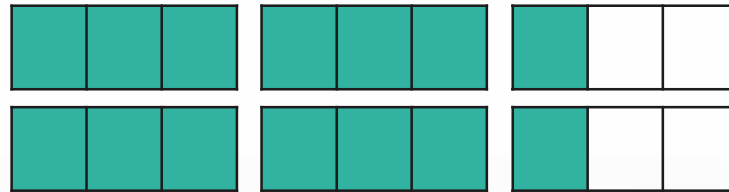
$$1\frac{2}{7} + 1\frac{2}{7} = 2\frac{4}{7}$$



Repeated Addition

Use repeated addition. Draw your own diagrams to help calculate the answer.

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



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

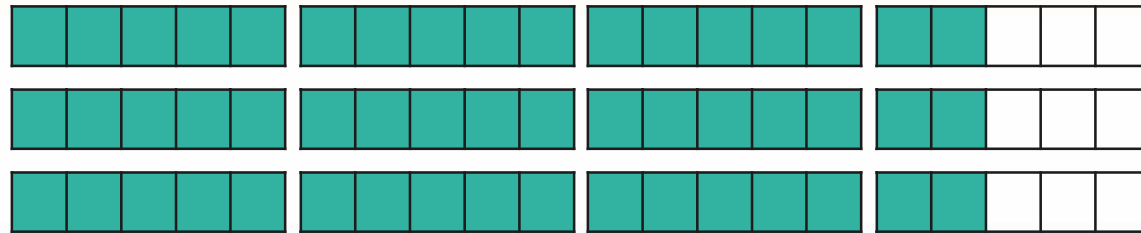


Repeated Addition



Use repeated addition. Draw your own diagrams to help calculate the answer.

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



$$3\frac{2}{5} + 3\frac{2}{5} + 3\frac{2}{5} = 10\frac{1}{5}$$

There are 9 wholes and 3 two-fifths which is $\frac{6}{5} = 1\frac{1}{5}$.

$$9 + 1\frac{1}{5} = 10\frac{1}{5}$$

Using Improper Fractions



Another method to multiply a mixed number by an integer is to change the mixed number into an improper fraction.

What is $2\frac{1}{4}$ written as an improper fraction?

$\frac{9}{4}$

The numerator
is multiplied by
the integer.
 $9 \times 2 = 18$

$$2\frac{1}{4} \times 2 = \frac{9}{4} \times 2 = \frac{18}{4} = 4\frac{2}{4}$$

The denominator
remains the same

This answer is an
improper fraction.
We need to change it
to a mixed number.



Using Improper Fractions



Change the mixed numbers into an improper fraction to calculate the answer.



$$2\frac{3}{7} \times 3 =$$

$$\frac{17}{7} \times 3 =$$

$$\frac{51}{7} =$$

$$7\frac{2}{7}$$

$$1\frac{5}{8} \times 5 =$$

$$\frac{13}{8} \times 5 =$$

$$\frac{65}{8} =$$

$$8\frac{1}{8}$$

Partitioning the Mixed Number

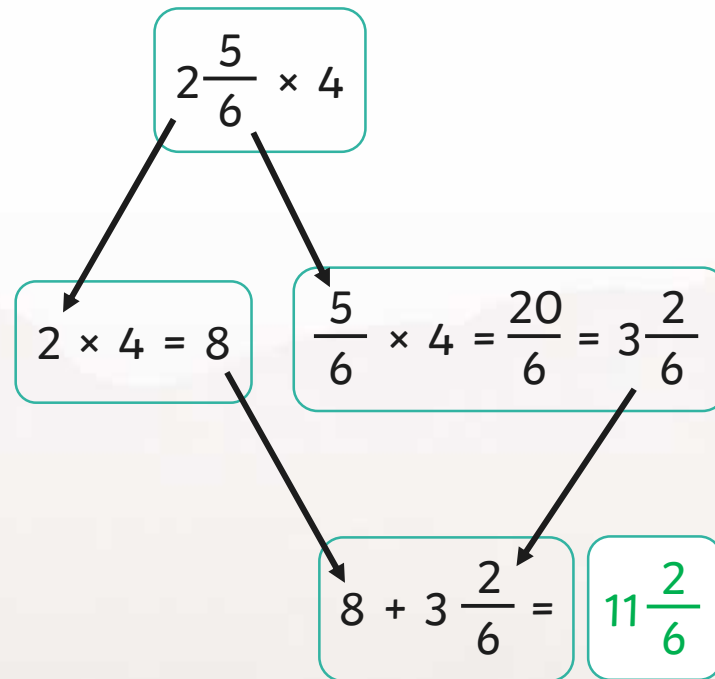


Another method to multiply a mixed number by an integer is to partition the whole and the fraction.

Partition the mixed number into a whole and a fraction.

Multiply the whole.
Then multiply the fraction.
If the fraction answer is an improper fraction, convert it to a mixed number.

Add the answers together to find the total.



Partitioning the Mixed Number



Partition the mixed number to calculate the answer.

$$1\frac{3}{4} \times 5$$

$$1 \times 5 = 5$$

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

$$5 + 3\frac{3}{4} = 8\frac{3}{4}$$



Partitioning the Mixed Number



Partition the mixed number to calculate the answer.

$$2\frac{4}{5} \times 3$$

$$2 \times 3 = 6$$

$$\frac{4}{5} \times 3 = \frac{12}{5} = 2\frac{2}{5}$$

$$6 + 2\frac{2}{5} = 8\frac{2}{5}$$



Partitioning the Mixed Number



Partition the mixed number to calculate the answer.

$$5\frac{1}{6} \times 6$$

$$5 \times 6 = 30$$

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

$$30 + 1 =$$

31





Which Method?

Which method is being used in these calculations?

$$1\frac{3}{4} \times 5 = \frac{7}{4} \times 5 = \frac{35}{4} = 8\frac{3}{4}$$

$$2\frac{5}{7} \times 6 =$$
$$2 \times 6 = 12 \quad \frac{5}{7} \times 6 = \frac{30}{7} = 4\frac{2}{7}$$
$$12 + 4\frac{2}{7} = 16\frac{2}{7}$$

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

repeated addition

change to an improper fraction

partitioning the mixed number



Which Method?

Which method do you prefer to use?
Why?

Change to an
improper fraction

Partitioning the
mixed number

Repeated addition

Choose a method to calculate the answer:

$$3\frac{2}{3} \times 10 = 36\frac{2}{3}$$

Which method did you use?

Do you think this was the best method for this calculation?



Multiplying Mixed Numbers by an Integer



Use the skills you have learnt to complete the activity sheets.

2) Is one method always better than the other? Can you identify why?

3) Do you agree? Explain how. Hint: Partitioning the number.

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer:

1) For each calculation, use two methods and explain why.

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

Repeated addition

Which method was best and why?

$7\frac{1}{2} \times 3 =$

Repeated addition

Which method was best and why?

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

Repeated addition

Which method was best and why?

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer:

Repeated addition

1) For each calculation, choose a method and check your answer. Make sure you explain why.

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

Method 1:

$7\frac{1}{2} \times 3 =$

Method 1:

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

Method 1:

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer:

2) Change each fraction to an improper fraction. An example has been provided.

a) $2\frac{1}{2} \times 4 = 4 \times \frac{5}{2} = 4 \times \frac{5}{2} = 10\frac{0}{2}$

b) $3\frac{1}{2} \times 3 =$

c) $1\frac{1}{2} \times 3 =$

3) Partition the mixed number into a whole number and a fraction.

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

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

b) $2\frac{1}{2} \times 5 =$

c) $4\frac{1}{2} \times 4 =$

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer:

1) Use repeated addition to calculate the answers. Draw models to help you if you need to. An example has been provided.

a) $1\frac{1}{2} \times 4 = 3\frac{1}{2}$

$1\frac{1}{2} \times 4 = 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} =$

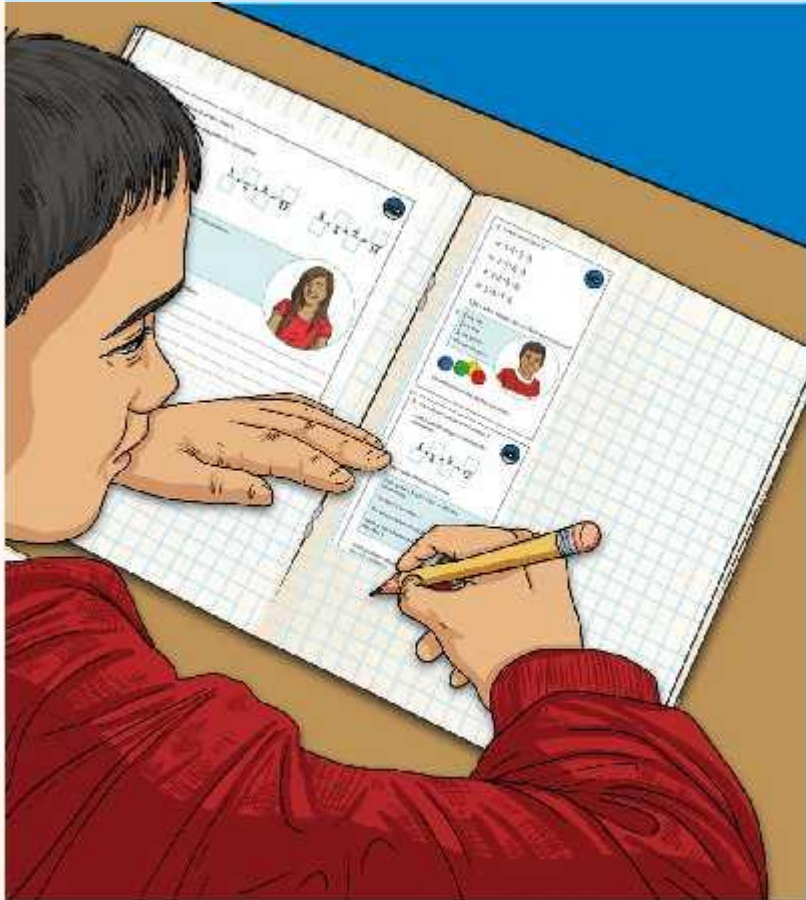
4 wholes (4) and 4 thirds ($\frac{4}{3}$) = $3\frac{1}{2}$

b) $2\frac{1}{2} \times 6 =$

c) $2\frac{1}{2} \times 4 =$

Diving into Mastery

Dive in by completing your own activity!



20 What is adding 3 fractions together?
Here are the workings.

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

$\frac{1}{2} + \frac{1}{3} + \frac{1}{6} = \frac{6}{6} + \frac{4}{6} + \frac{1}{6} = \frac{11}{6}$

This is the same as $1\frac{5}{6}$

Use Efraim's method to add the following fractions.

21 $\frac{1}{2} + \frac{1}{3} =$

22 $\frac{1}{3} + \frac{1}{6} =$

23 Match the calculations to the correct answer:

$\frac{1}{2} + \frac{1}{3}$	$\frac{11}{6}$
$\frac{1}{3} + \frac{1}{6}$	$\frac{5}{6}$
$\frac{1}{2} + \frac{1}{6}$	$\frac{2}{3}$

Show your working here:

Who Ran Farther?



Two friends have been running. Both say they ran the farthest.
Who is correct?

I ran $2\frac{2}{3}$ km on
3 days.

I ran $1\frac{3}{4}$ km
on 5 days.

Jas:

$$2\frac{2}{3} \times 3 =$$
$$2 \times 3 = 6 \quad \frac{2}{3} \times 3 = \frac{6}{3} = 2$$
$$6 + 2 = 8 \text{ km}$$

Roberto:

$$1\frac{3}{4} \times 5 = \frac{7}{4} \times 5 = \frac{35}{4} = 8\frac{3}{4} \text{ km}$$

Roberto ran $\frac{3}{4}$ km farther than Jas.

You may have used a different
method to calculate the answers.

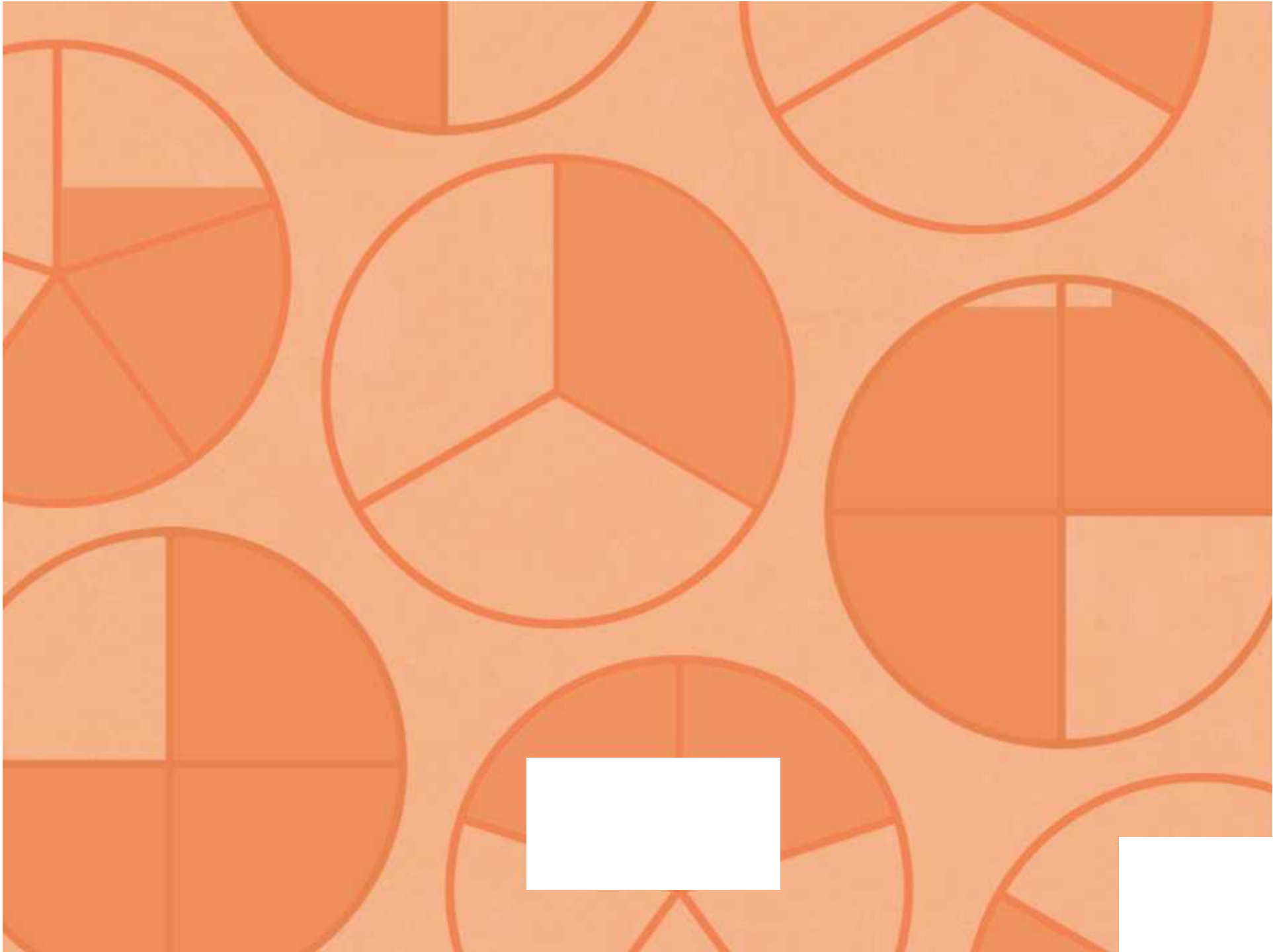
Aim



- To multiply mixed numbers by an integer.

Success Criteria

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- I can partition the mixed number into a whole and fraction to multiply it by an integer.

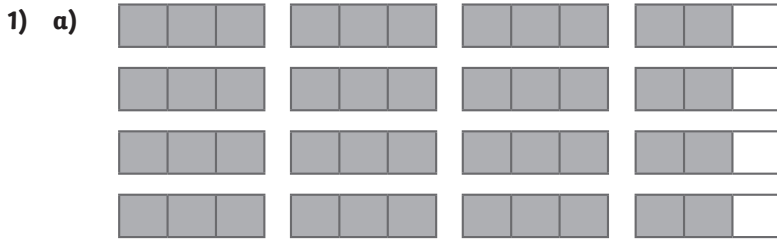


Aim: To multiply mixed numbers by an integer				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can use repeated addition to multiply a mixed number by an integer.				Notes/Evidence					
I can convert a mixed number to an improper fraction to multiply it by an integer.									
I can partition the mixed number into a whole and fraction to multiply it by an integer.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

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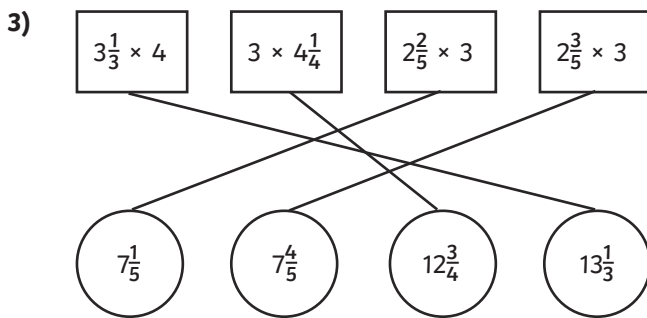
b) $3\frac{2}{3} \times 4 = 3\frac{2}{3} + 3\frac{2}{3} + 3\frac{2}{3} + 3\frac{2}{3} = 12 + \frac{8}{3} = 14\frac{2}{3}$

c) $3 \times 4 = 12$
 $\frac{2}{3} \times 4 = \frac{8}{3}$
 $12 + \frac{8}{3} = 14\frac{2}{3}$

d) $3\frac{2}{3} \times 4 = \frac{11}{3} \times 4 = \frac{44}{3} = 14\frac{2}{3}$

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

b) 7



1) Accept any methods that children have correctly used to find the answer. Here is one method that they could have used:



a) $2\frac{1}{4} \times 4 =$
 $2 \times 4 = 8$
 $\frac{1}{4} \times 4 = 1$
 $8 + 1 = 9$ litres of water

b) $4\frac{2}{3} \times 4 =$
 $4 \times 4 = 16$
 $\frac{2}{3} \times 4 = \frac{8}{3} = 2\frac{2}{3}$
 $16 + 2\frac{2}{3} = 18\frac{2}{3}$ tablespoons of bubble mixture

2) a) $2\frac{3}{5} \times 3 < 2\frac{5}{10} \times 4$
 $7\frac{4}{5} < 10$

b) $4\frac{3}{4} \times 2 < 3\frac{5}{6} \times 3$
 $9\frac{1}{2} < 11\frac{1}{2}$

c) $2\frac{3}{4} \times 4 > 5\frac{1}{4} \times 2$
 $11 > 10\frac{1}{2}$



1) Here are two possible solutions:

$$3\frac{3}{4} \times 3 = 2\frac{3}{12} \times 5$$

$$1\frac{3}{4} \times 3 = 2\frac{5}{8} \times 2$$

2) A mixed number is multiplied by an even integer and has an answer less than 8. The denominator in the mixed number is 5. The numerator is greater than 2.

a) Which of these calculations could it be? Tick the possibilities.

$1\frac{3}{5} \times 2$ ✓	$4\frac{3}{5} \times 1$	$1\frac{3}{5} \times 6$	$1\frac{3}{5} \times 4$ ✓
$2\frac{3}{5} \times 2$ ✓	$1\frac{4}{5} \times 2$ ✓	$1\frac{4}{5} \times 5$	$2\frac{1}{5} \times 4$

b) Write a different calculation that it could be. Accept answers that meet the criteria, for example,

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

$$2\frac{4}{5} \times 2$$

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

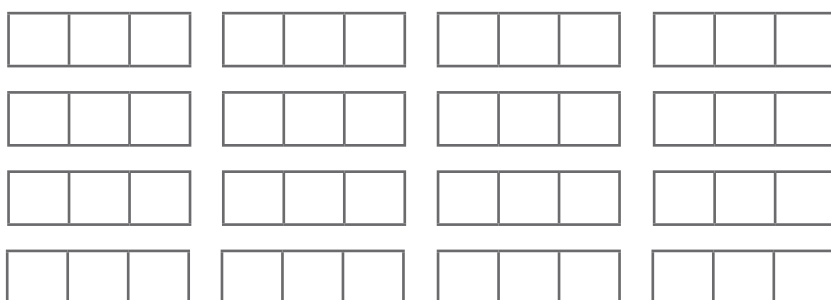
$$3\frac{4}{5} \times 2$$

3) Children should create their own word problems for a partner to solve.



1) Class 5 are exploring different methods of multiplying mixed numbers.

a) Shade the bar models to represent $3\frac{2}{3} \times 4$.



b) Complete Theo's repeated addition calculation.

$$3\frac{2}{3} \times 4 = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad} = \underline{\quad}$$

c) Isha is using a different method. She has partitioned the whole and the fraction to multiply them separately. Complete her calculation.

$$3 \times 4 = \underline{\quad}$$

$$\frac{2}{3} \times 4 = \underline{\quad}$$

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

d) Vicky converted the mixed number to an improper fraction to multiply. Show her calculation.

2) Now choose a method to answer each question.

a) $2\frac{3}{5} \times 2 =$

b) $4 \times 1\frac{3}{4} =$

3) Match the calculation to the correct answer.

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

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

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

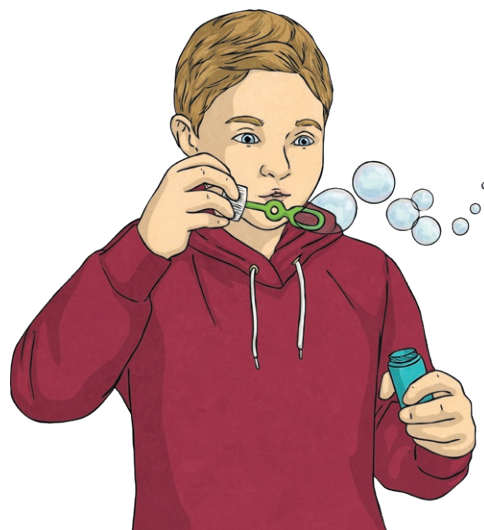
$$2\frac{3}{5} \times 3$$

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

$$\frac{4}{5}$$

$$12\frac{3}{4}$$

$$13\frac{1}{3}$$





- 1) Ted is making bubble mixture for his bubble machine. To make one portion, he mixes $2\frac{1}{4}$ litres of water with $4\frac{2}{3}$ tablespoons of washing-up liquid.

Ted makes one portion of bubble mixture for himself and one each for his three friends.

- a) How much water will he need?

- b) How many tablespoons of washing-up liquid will he need?

- 2) Complete the statements using the symbols $<$, $>$ or $=$.

a) $2\frac{3}{5} \times 3$ $2\frac{5}{10} \times 4$

b) $4\frac{3}{4} \times 2$ $3\frac{5}{6} \times 3$

c) $2\frac{3}{4} \times 4$ $5\frac{1}{4} \times 2$





1) What could the value of the missing digits be? Find two possible solutions.

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

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

2) A mixed number is multiplied by an even integer and has an answer less than 8. The denominator in the mixed number is 5. The numerator is greater than 2.

a) Which of these calculations could it be? Tick the possibilities.

$1\frac{3}{5} \times 2$	$4\frac{3}{5} \times 1$	$1\frac{3}{5} \times 6$	$1\frac{3}{5} \times 4$
$2\frac{3}{5} \times 2$	$1\frac{4}{5} \times 2$	$1\frac{4}{5} \times 5$	$2\frac{1}{5} \times 4$

b) Write a different calculation that it could be.

3) Write a problem that involves multiplying mixed numbers for your partner to solve.

1) Class 5 are exploring different methods of multiplying mixed numbers.



a) Shade the bar models to represent $3\frac{2}{3} \times 4$.

b) Complete Theo's repeated addition calculation.

$$3\frac{2}{3} \times 4 = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad}$$

$$\underline{\quad} = \underline{\quad} = \underline{\quad}$$

c) Isha is using a different method. She has partitioned the whole and the fraction to multiply them separately. Complete her calculation.

$$3 \times 4 = \underline{\quad} \qquad \frac{2}{3} \times 4 = \underline{\quad}$$

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

d) Vicky converted the mixed number to an improper fraction to multiply. Show her calculation.

2) Now choose a method to answer each question.

- a) $2\frac{3}{5} \times 2 =$
 b) $4 \times 1\frac{3}{4} =$

3) Match the calculation to the correct answer.

$3\frac{1}{3} \times 4$	$3 \times 4\frac{1}{4}$	$2\frac{2}{5} \times 3$	$2\frac{3}{5} \times 3$
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-------------------------	-------------------------	-------------------------	-------------------------



- 1) Ted is making bubble mixture for his bubble machine. To make one portion, he mixes $2\frac{1}{4}$ litres of water with $4\frac{2}{3}$ tablespoons of washing-up liquid.



Ted makes one portion of bubble mixture for himself and one each for his three friends.

- a) How much water will he need?
b) How many tablespoons of washing-up liquid will he need?

- 2) Complete the statements using the symbols $<$, $>$ or $=$.

a) $2\frac{3}{5} \times 3$ $2\frac{5}{10} \times 4$

b) $4\frac{3}{4} \times 2$ $3\frac{5}{6} \times 3$

c) $2\frac{3}{4} \times 4$ $5\frac{1}{4} \times 2$



- 1) Ted is making bubble mixture for his bubble machine. To make one portion, he mixes $2\frac{1}{4}$ litres of water with $4\frac{2}{3}$ tablespoons of washing-up liquid.



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- 1) What could the value of the missing digits be? Find two possible solutions.



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

- 2) A mixed number is multiplied by an even integer and has an answer less than 8. The denominator in the mixed number is 5. The numerator is greater than 2.

- a) Which of these calculations could it be?
Tick the possibilities.

$1\frac{3}{5} \times 2$	$4\frac{3}{5} \times 1$
$2\frac{3}{5} \times 2$	$1\frac{4}{5} \times 2$
$1\frac{3}{5} \times 6$	$1\frac{3}{5} \times 4$
$1\frac{4}{5} \times 5$	$2\frac{1}{5} \times 4$

- b) Write a different calculation that it could be.
3) Write a problem that involves multiplying a mixed number for your partner to solve.

- 1) What could the value of the missing digits be? Find two possible solutions.



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

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$1\frac{4}{5} \times 5$	$2\frac{1}{5} \times 4$

- b) Write a different calculation that it could be.
3) Write a problem that involves multiplying a mixed number for your partner to solve.

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer.



1) Use repeated addition to calculate the answers. Draw models to help you if you need to.
An example has been provided.

a) $1\frac{1}{3} \times 4 = 5\frac{1}{3}$



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

$$4 \text{ wholes (4) and 4 thirds } (1\frac{1}{3}) = 5\frac{1}{3}$$



b) $2\frac{1}{5} \times 6 =$

c) $2\frac{2}{7} \times 4 =$

2) Change each fraction to an improper fraction to calculate the answers.

An example has been provided.

a) $2\frac{2}{3} \times 4 = \frac{8}{3} \times 4 = \frac{32}{3} = 10\frac{2}{3}$

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

c) $1\frac{1}{6} \times 5 =$

3) Partition the mixed number to calculate the answer. An example has been provided.

a) $2\frac{3}{4} \times 3 = 8\frac{1}{4}$

$2 \times 3 = 6$

$\frac{3}{4} \times 3 = \frac{9}{4} = 2\frac{1}{4}$

$6 + 2\frac{1}{4} = 8\frac{1}{4}$

b) $2\frac{2}{3} \times 5 =$

c) $4\frac{2}{5} \times 4 =$

Multiplying Mixed Numbers by an Integer **Answers**

1)

b) $2\frac{1}{5} \times 6 = 13\frac{1}{5}$

c) $2\frac{2}{7} \times 4 = 9\frac{1}{7}$

2)

b) $3\frac{1}{5} \times 3 = 9\frac{3}{5}$

c) $1\frac{1}{6} \times 5 = 5\frac{5}{6}$

3)

b) $2\frac{2}{3} \times 5 = 13\frac{1}{3}$

c) $4\frac{2}{5} \times 4 = 17\frac{3}{5}$

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer.



Repeated
addition

Change to an
improper fraction

Partitioning the
mixed number

1) For each calculation, choose one of the methods to calculate the answer and another to check your answer. Make sure you use each method at least once.

$3\frac{1}{5} \times 4 =$	
Method 1	Check using another method
$5\frac{3}{8} \times 3 =$	
Method 1	Check
$2\frac{7}{8} \times 8 =$	
Method 1	Check

- 2) Six friends took part in a sponsored swim. They each swam $1\frac{5}{8}$ km.
How many kilometres did they swim in total?

- 3) To answer a problem, this calculation needs to be completed: $2\frac{3}{4} \times 5$
Write a problem to match the calculation. Answer your problem.

Multiplying Mixed Numbers by an Integer **Answers**

1) Two different methods used to obtain the correct answer.

a) $3\frac{1}{5} \times 4 = 12\frac{1}{5}$

b) $5\frac{3}{8} \times 3 = 16\frac{1}{8}$

c) $2\frac{7}{8} \times 8 = 23$

2) $9\frac{6}{8}$ or $9\frac{3}{4}$

3) Multiple answers possible. The answer to the problem is $13\frac{3}{4}$

Multiplying Mixed Numbers by an Integer

To multiply mixed numbers by an integer.



1) For each calculation, use every method and then decide which method was best for that calculation and why.

$5\frac{1}{5} \times 4 =$		
Repeated addition	Change to improper fraction	Partition mixed number
Which method was best and why?		
$7\frac{6}{8} \times 3 =$		
Repeated addition	Change to improper fraction	Partition mixed number
Which method was best and why?		
$4\frac{5}{6} \times 8 =$		
Repeated addition	Change to improper fraction	Partition mixed number
Which method was best and why?		

- 2) Is one method always better for you. If so, which do you prefer and why?
If not, can you identify why some questions are most suited to a particular method?

If I calculate $4 \times 2\frac{2}{5}$ and $2 \times 4\frac{2}{5}$,
I will have the same answer



- 3) Do you agree? Explain how you know.

Hint: Partitioning the mixed numbers may help your explanation.

Multiplying Mixed Numbers by an Integer **Answers**

1) Each method is used to calculate the answers. Children will have a variety of answers to explain which method is best. Example of the possible reasons:

Repeated addition is efficient if the fraction multiplication doesn't go over one whole.

Changing to an improper fraction is efficient as you only have to deal with one fraction.

Changing to an improper fraction gives a large number to multiply which can be difficult and time consuming.

Partitioning the mixed number gives a smaller number to multiply which can make it more efficient.

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

b) $7\frac{6}{8} \times 3 = 23\frac{2}{8}$

c) $4\frac{5}{6} \times 8 = 38\frac{4}{6}$

2) Children may prefer to always use one method. Give them credit when children identify that repeated addition could be quicker for smaller numbers, partitioning will make it easier to calculate larger multiplications and changing to an improper fraction will need less steps. Some methods can be done mentally which could make them more efficient.

3) Disagree. If you partitioned the mixed numbers:

$$4 \times 2 \text{ and } 4 \times \frac{2}{5}$$

$$2 \times 4 \text{ and } 2 \times \frac{2}{5}$$

The whole number multiplication answers would be the same, but the fraction multiplication would not. $4 \times \frac{2}{5}$ is greater than $2 \times \frac{2}{5}$.

$$4 \times 2\frac{2}{5} = 9\frac{3}{5}$$

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

Fractions | Multiply Mixed Numbers by Integers

To multiply mixed numbers by an integer.		
I can use repeated addition to multiply a mixed number by an integer.		
I can convert a mixed number to an improper fraction to multiply it by an integer.		
I can partition the mixed number into a whole and fraction to multiply it by an integer.		

Fractions | Multiply Mixed Numbers by Integers

To multiply mixed numbers by an integer.		
I can use repeated addition to multiply a mixed number by an integer.		
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