Day 3 Starter

$a = 4 \quad b = 6 \quad c = 11$

$a + b$		$a + 2b + 3c$	
$a + c$		$a - 10b$	
$2b$		$4a + 5b - 3c$	
$3a + 2b$		$-2a - 8b + 6c$	
$c - a$		b^2	
$4a + 4c$		$a^2 + c^2$	
$10b - a$		$a^2 + 5b - 2c$	

Day 3 – Converting Mixed & Improper

Video Link: https://vimeo.com/467394996 Improper to Mixed

Video Link: https://vimeo.com/468942374 Mixed to Improper

 Aim to complete both fluency tasks.

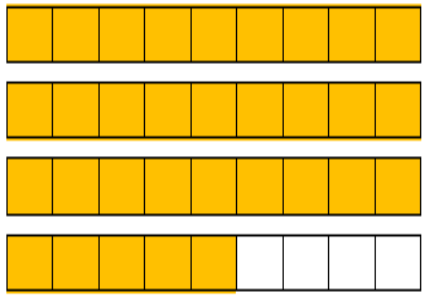
 Aim to complete both fluency tasks and at least one of the reasoning tasks.

 Aim to complete both reasoning tasks and have a go at at least one of the problem solving tasks.

Fluency Tasks

FLUENCY 1

Use the bar model to help you write the improper fraction and mixed number that it represents.



There are ____ equal parts.

____ equal parts make a whole.

____ ÷ ____ = ____ wholes and ____ ninths.

NOW...

Draw your own bar models to help you change the improper fractions to mixed numbers.

$\frac{10}{3}$ $\frac{12}{5}$ $\frac{16}{9}$ $\frac{21}{10}$

FLUENCY 2

Use cubes to help you complete the sentences.

$\frac{11}{4}$ is the same as ___

$\frac{19}{6}$ is the same as ___

$\frac{22}{8}$ is the same as ___

FLUENCY 3

Asha has a number of chocolate bars in her cupboard.

She eats $\frac{18}{8}$ of the bars this week.

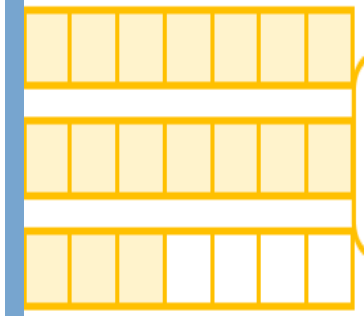
FLUENCY 1

Complete the stem sentence.

To convert from mixed numbers to improper fractions, we can ____ the ____ number by the ____ then add the ____.

FLUENCY 2

Use the bar model to help you complete the sentences.



$2\frac{3}{7}$ is the same as ___

Draw your own bar model to represent $5\frac{7}{10}$ as an improper fraction.

FLUENCY 3

Use bar models to help you convert these mixed numbers.

$2\frac{6}{8}$ $4\frac{1}{6}$ $5\frac{3}{4}$ $6\frac{2}{9}$ $8\frac{4}{5}$

FLUENCY 4

Jerry took 9 cakes, which were cut into eighths, and $\frac{7}{8}$ of a cake with him to a party.

How many pieces of cake were there all together?

Reasoning Tasks

REASONING 1

Rate the Advice

To convert improper fractions, you divide the numerator by the denominator.

Help Jane to improve her advice.

REASONING 2

Odd one out!

Convert each fraction to a mixed number to find out which one is the odd one out.

$$\frac{35}{7} \quad \frac{12}{3} \quad \frac{30}{5} \quad \frac{29}{9}$$

Explain your reasoning.

REASONING 3

Always, Sometimes or Never?

When you convert an improper fraction to a mixed number there will <u>always</u> be a whole number.

Convince me!

REASONING 4

Prove it!

$$\frac{32}{12} < \frac{26}{8}$$

Use diagrams to help you prove it.

REASONING 1

True or False?

To convert from mixed numbers, you just multiply the whole number by the numerator and denominator.

Convince me!

REASONING 2

Describe where Jane has made a mistake and correct it.

$$4\frac{5}{6} = \frac{20}{6}$$

REASONING 3

Always, Sometimes or Never?

The denominator of a mixed number will be the same as the denominator of its equivalent improper fraction.

Back up your choice with mathematical evidence.

REASONING 4

Find the missing numbers...

$$3\frac{\square}{7} = \frac{25}{\square}$$

Explain how you know.

Problem Solving Tasks

PROBLEM SOLVING 1

Alfie is using the digit cards below to create improper fractions.

9 4 8 10

$\square\!\!\square$ = $\square$ $\square$

7 15 45 23

Which ones should he choose to solve each challenge?

Are there any that have more than one possibility?

Challenge 1

Make the highest whole number when converted to a mixed number

Challenge 2

Create a whole number with no remaining fraction when converted to a mixed number

Challenge 3

Find the improper fraction closest to 4 when converted to a mixed number

PROBLEM SOLVING 1

Find the value of the ★, the ✿ and the ⬢.

$$3\frac{\bigstar}{12} = \frac{39}{12}$$

$$6\frac{✿}{\bigstar} = \frac{20}{\bigstar}$$

$$✿\frac{7}{8} = \frac{⬢}{8}$$

The next slides contains the answers, so please make sure you are finished before checking the next slides.

Fluency 1

There are 32 equal parts.

9 equal parts make a whole.

32 ÷ 9 = 3 wholes and 5 ninths.

Now.... 10/3 = 3 1/3 12/5 = 2 2/5 16/9 = 1 7/9 21/10 = 2 1/10

Fluency 2

11/4 is the same as 2 3/4.

19/6 is the same as 3 1/6.

22/8 is the same as 2 6/8 or 2 3/4

Fluency 3

Asha ate 2 whole bars and 6 chunks so 2 2/8 or 2 1/4.

Reasoning 1

Jane's advice is correct but it is not detailed enough. First, you do need to divide the numerator by the denominator to give you the number of wholes. The remainder is the fraction that is left over. The fraction will have the same denominator as the improper fraction, unless it can be simplified.

Reasoning 2

Modelled DAB Reasoning Responses

D – One of the fractions is the odd one out.

A – 29/9 is the odd one out

B – All of the others are a whole number when converted to a mixed number.

35/7 = 35 ÷ 7 = 5, 12 ÷ 3 = 4 and 30 ÷ 5 = 6. 29 ÷ 9 = 3 r2 so 3 2/9

Reasoning 3

Modelled DAB Reasoning Responses

D – It is always true.

A – When you convert an improper fraction to a mixed number, there will always be a whole number.

B – There has to be a whole number to create an improper fraction.

Any improper fraction is more than one whole.

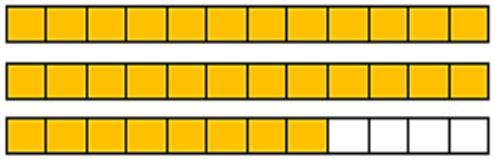
Reasoning 4

Modelled DAB Reasoning Responses

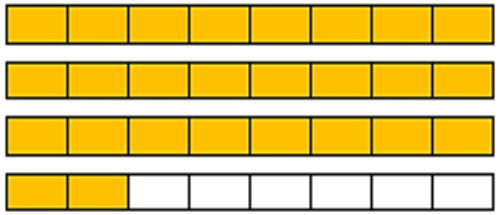
D – It is correct

A – 32/12 < 26/8

B – 32/12



26/8



Problem Solving 1

Challenge 1: 45/4 = 11 1/4 which is the largest whole number possible

Challenge 2: 8/4 = 2 45/9 = 5 45/15 = 3

Challenge 3: 15/4 = 3 3/4 is the closest to 4.

Fluency 1

To convert from mixed numbers to improper fractions, we can multiply the whole number by the denominator then add the numerator.

3 2/5 = **17/5**

There are **3** wholes of **5** equal parts.

There is a remainder of **2** fifths.

3 x **5** + **2** = **17** fifths

Fluency 2

2 3/7 is the same as 17/7.

5 7/10 is the same as 57/10.

Fluency 3

2 6/8 = 22/8

4 1/6 = 25/6

5 3/4 = 23/4

6 2/9 = 56/9

8 4/5 = 44/5

Fluency 4

There were 79 pieces of cake altogether.

Reasoning 1

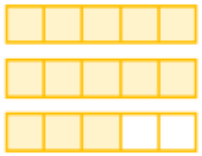
Modelled DAB Reasoning Responses

D – False

A – To convert from mixed numbers, you do not just multiply the whole number by the numerator and denominator.

B – To convert from mixed numbers, you multiply the whole number by the denominator to work out the number of parts in the wholes, then you add the numerator to find the total. For example…

2 3/5 = 2 wholes x 5 fifths + 3 fifths = 13/5 as you can see in the diagram:



If you use Darcey's method and multiply the whole (2) by the denominator (5) then multiply this by the numerator (3), you get the incorrect improper fraction 30/5.

Reasoning 2

Modelled DAB Reasoning Response

D – Jane has made a mistake.

A – 4 5/6 is not equal to 20/6

B – Jane has multiplied the whole number (4) by the numerator (5). She should have multiplied the whole number (4) by the denominator (6) and added the numerator (5) to get the correct improper fraction 29/6.

Reasoning 3

Modelled DAB Reasoning Response

D – Sometimes

A – The denominator of a mixed number will sometimes be the same as the denominator of its equivalent improper fraction.

B – The mixed number 3 1/3 could be represented as the improper fraction 10/3 but this is also equivalent to 3 2/6 and 20/6 so you could come across the statement 3 2/6 = 10/3 where the denominators would be different.

Reasoning 4

Modelled DAB Reasoning Response

D – I can find the missing numbers.

A – The missing numerator is 4 and the missing denominator is 7.

B – The denominator in the first fraction is 7 so the denominator in the equivalent fraction is 7. To find the numerator for an improper fraction you first multiply the whole number by the denominator. 3 x 7 = 21 and the new numerator is 25. The difference between 21 and 25 is 4 so the numerator in the mixed number must be 4. 3 4/7 = 25/7

Download our 'DAB' posters to support reasoning in your classroom:

https://www.deepeningunderstanding.co.uk/product/dab-reasoning-posters/

Problem Solving 1

 = 3

 = 2

 = 23