Overview

Small Steps

Add and subtract whole numbers
Multiply up to a 4-digit number by 1-digit
Short division
Division using factors
Long division (1)
Long division (2)
Long division (3)
Long division (4)
Common factors
Common multiples
Primes
Squares and cubes
Order of operations
Mental calculations and estimation
Reason from known facts

NC Objectives

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.

Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.

Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.

Perform mental calculations, including with mixed operations and large numbers.

Identify common factors, common multiples and prime numbers.

Use their knowledge of the order of operations to carry out calculations involving the four operations.

Solve problems involving addition, subtraction, multiplication and division.

Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.
Add & Subtract Integers

Notes and Guidance

Children consolidate their knowledge of column addition and subtraction. They use these skills to solve multi step problems in a range of contexts.

Mathematical Talk

What happens when there is more than 10 in a place value column?

Can you make an exchange between columns? How can we find the missing digits? Can we use the inverse?

Is column method always the best method?

When should we use our mental methods?

Varied Fluency

Calculate.

\[
\begin{array}{cccccc}
3 & 4 & 6 & 2 & 1 \\
+ & 2 & 5 & 7 & 3 & 4 \\
\hline
& & & & & \\
\end{array}
\]

\[
\begin{array}{cccccc}
4 & 7 & 6 & 1 & 3 & 2 & 5 \\
- & 9 & 3 & 8 & 0 & 5 & 2 \\
\hline
& & & & & \\
\end{array}
\]

67,832 + 5,258

834,501 − 193,642

A four bedroom house costs £450,000.
A three bedroom house costs £199,000 less.
How much does the three bedroom house cost?
What method did you use to find the answer?

Calculate the missing digits. What do you notice?

<table>
<thead>
<tr>
<th>5</th>
<th>2</th>
<th>2</th>
<th>4</th>
<th>7</th>
<th>?</th>
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<tr>
<td>+</td>
<td>3</td>
<td>?</td>
<td>5</td>
<td>9</td>
<td>0</td>
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<tr>
<td></td>
<td>9</td>
<td>0</td>
<td>?</td>
<td>3</td>
<td>?</td>
</tr>
</tbody>
</table>
Add & Subtract Integers

Reasoning and Problem Solving

Find the difference between A and B.

A = 19,000
B = 50,500

The difference is 31,500

Here is a bar model.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>631,255</td>
</tr>
</tbody>
</table>

Possible answer:

A = 99,255
B = 532,000

A is an odd number which rounds to 100,000 to the nearest ten thousand. It has a digit total of 30

B is an even number which rounds to 500,000 to the nearest hundred thousand. It has a digit total of 10

A and B are both multiples of 5 but end in different digits.

What are possible values of A and B?
### Multiply 4-digits by 2-digits

#### Notes and Guidance
Children consolidate their knowledge of column multiplication, multiplying numbers with up to 4 digits by a 2-digit number. They use these skills to solve multi step problems in a range of contexts.

#### Varied Fluency

**Calculate.**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>×</td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>×</td>
<td></td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

5,734 × 26

**Lauren made cookies for a bake sale.**
She made 345 cookies.
The recipe stated that she should have 17 chocolate chips in each cookie.

How many chocolate chips did she use altogether?

**Work out the missing number.**

\[6 \times 35 = \_ \times 5\]
Multiply 4-digits by 2-digits

Reasoning and Problem Solving

True or False?

- \(5,463 \times 18 = 18 \times 5,463\)
  - True

- I can find the answer to \(1,100 \times 28\) by doing \(1,100 \times 30\) and subtracting 2 lots of 1,100
  - False

- \(70 \times 10 = 700 \times 100\)

Place the digits in the boxes to make the largest product.

\[
\begin{array}{cccc}
2 & 3 & 4 & 5 \\
\times & & & \\
\hline
\end{array}
\]

\[
\begin{array}{cccc}
7 & 8 & \\
\times & & & \\
\hline
8 & 4 & 3 & 2 \\
\times & 7 & 5 \\
\hline
6 & 3 & 2 & 0 & 0 & 0
\end{array}
\]
Short Division

Notes and Guidance

Children build on their understanding of dividing up to 4-digits by 1-digit by now dividing by up to 2-digits. They use the short division method and focus on division as grouping. Teachers may encourage children to list the multiples of the number to help them solve the division more easily.

Varied Fluency

Calculate using short division.

\[
\begin{array}{cccc}
5 & 7 & 2 & 5 \\
3 & 1 & 9 & 3 & 8 \\
12 & 6 & 0 & 3 & 6 \\
\end{array}
\]

\[
3,612 \div 14
\]

List the multiples of the numbers to help you calculate.

A limousine company allows 14 people per limousine.

How many limousines are needed for 230 people?

Year 6 has 2,356 pencil crayons for the year.

They put them in bundles, with 12 in each bundle.

How many complete bundles can be made?

Mathematical Talk

What is different between dividing by 1 digit and 2 digits?

If the number does not divide into the ones, what do we do?

Do we need to round our remainders up or down? Why does the context affect whether we round up or down?
Short Division

Reasoning and Problem Solving

Find the missing digits.

\[
\begin{array}{c}
0 & 4 & 1 & 0 & 3 \\
\underline{\phantom{0} \phantom{0} \phantom{0} \phantom{3}} \\
4 & 1 & 0 & 5 & 9
\end{array}
\]

Here are two calculation cards.

\[
\begin{align*}
A &= 396 \div 11 \\
B &= 832 \div 13
\end{align*}
\]

Find the difference between A and B.

Work out the value of C. (The bar models are not drawn to scale)

\[
\begin{array}{c}
4,950 \\
\underline{\phantom{0} \phantom{0} \phantom{0} \phantom{3}} \\
1,650
\end{array}
\]

\[
\begin{array}{c}
1,650 \\
\underline{\phantom{0} \phantom{0} \phantom{0} \phantom{3}} \\
550
\end{array}
\]

\[
\begin{array}{c}
550 \\
\underline{\phantom{0} \phantom{0} \phantom{0} \phantom{3}} \\
110
\end{array}
\]

396 \div 11 = 36
832 \div 13 = 64
64 - 36 = 28

4,950 \div 3 = 1,650
1,650 \div 3 = 550
550 \div 5 = 110
Division using Factors

Notes and Guidance

Children need to use their number sense, specifically their knowledge of factors to be able to see relationships between the divisor and dividend. Beginning with multiples of 10 and moving on will allow the children to see the relationship before progressing forward.

Varied Fluency

Calculate 780 ÷ 20

Now calculate 780 ÷ 10 ÷ 2

What do you notice? Why does this work?

Use the same method to calculate 480 ÷ 60

Use factors to help you calculate.

4,320 ÷ 15

Eggs are put into boxes. Each box holds a dozen eggs. A farmer has 648 eggs that need to go in boxes.

How many boxes will he fill?

Mathematical Talk

What is a factor?
How does using factor pairs help us to answer division questions?
Do you notice any patterns?
Does using factor pairs always work?
Is there more than one way to solve a calculation using factor pairs?
What methods can be used to check your working out?
| Calculate: | 26  
| 52  
| 104  
| Children should recognise that when dividing by half of the amount the answer is doubled.  
| Calculate: | Class 6 are calculating $7,848 \div 24$  
| The children decide which factor pairs to use. Here are some of their suggestions:  
| • 2 and 12  
| • 4 and 6  
| • 10 and 14  
| Which will not give them the correct answer? Why?  
| Tommy is wrong because he has partitioned 15 when he should have used factor pairs. The correct answer is 288  
| 10 and 14 is incorrect because this is partitioned, they are not factors of 24  
| The correct answer should be 327  
| Children should get the same answer using both methods. |
Long Division (1)

Notes and Guidance

Children are introduced to long division as a different method of dividing by a 2-digit number. They divide 3-digit numbers by a 2-digit number without remainders moving from a more expanded method with multiples shown to the more formal long division method.

Varied Fluency

<table>
<thead>
<tr>
<th>12</th>
<th>4</th>
<th>3</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>−</td>
<td>3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiples to help
12 × 1 = 12
12 × 2 = 24
12 × 5 = 60
12 × 10 = 120

Use this method to calculate:
765 ÷ 17
450 ÷ 15
702 ÷ 18

Mathematical Talk

How can we use our multiples to help us divide by a 2-digit number?

Why are we subtracting the totals from the starting number (seeing division as repeated subtraction)?

In long division, what does the arrow represent? (The movement of the next digit coming down to be divided)
Long Division (1)

Reasoning and Problem Solving

Odd One Out

Which is the odd one out?
Explain your answer.

512 ÷ 16
672 ÷ 21
792 ÷ 24

792 ÷ 24 = 33 so this is the odd one out as the other two give an answer of 32

Spot the Mistake

746 ÷ 16 =

41
16|746
- 64 \(\times 4\)
- 106 \(\times 10\)

They mistakenly thought that 106 divided by 16 was 10
Long Division (2)

Notes and Guidance

Building on using long division with 3-digit numbers, children divide four-digit numbers by 2-digits using the long division method. They use their knowledge of multiples and multiplying and dividing by 10 and 100 to calculate more efficiently.

Varied Fluency

Here is a division method.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>4</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>−</td>
<td>6</td>
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<td>0</td>
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<td></td>
<td></td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>−</td>
<td>1</td>
<td>2</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
<td>5</td>
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<tr>
<td></td>
<td>−</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use this method to calculate:

2,208 ÷ 16   1,755 ÷ 45   1,536 ÷ 16

Mathematical Talk

How can we use our multiples to help us divide by a 2-digit number?

Why are we subtracting the totals from the beginning number? (Seeing division as repeated subtraction)

In long division, what does the arrow represent? (The movement of the next digit coming down to be divided)

There are 2,028 footballers in a tournament. Each team has 11 players and 2 substitutes. How many teams are there in the tournament?
Which question is harder?

1,950 ÷ 13

1,950 ÷ 15

Dividing by 13 is harder as 13 is prime so we can’t divide it in smaller parts, and the 13 times table is harder than the 15 times table.

6,823 ÷ 19 = 359 r2

8,259 ÷ ✓ = 359 r2

✓ is a prime number.

Find the value of ✓
Long Division (3)

Notes and Guidance

Children now divide using long division where their answers have remainders. After dividing, they check that their remainder is smaller than their divisor.

Children start to understand when rounding is appropriate to use for interpreting the remainder and when the context means that this is not applicable.

Mathematical Talk

How can we use our multiples to help us divide?

What happens if we cannot divide our ones exactly by our divisor? How do we show what we have left over?

Why are we subtracting the totals from the starting number? (Seeing division as repeated subtraction)

Does the remainder need to be rounded up or down?

Varied Fluency

- Elijah uses this method to calculate 372 divided by 15. He has used his knowledge of multiples to help.

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>4</th>
<th>r</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>−</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td></td>
<td>7</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>−</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|        | 1 × 15 = 15 |
|        | 2 × 15 = 30 |
|        | 3 × 15 = 45 |
|        | 4 × 15 = 60 |
|        | 5 × 15 = 75 |
|        | 10 × 15 = 150 |

Use this method to calculate:

271 ÷ 17   623 ÷ 21   842 ÷ 32

- A school needs to buy 380 biscuits for parents' evening. They come in packs of 12.

How many packets will the school need to buy?
Here are two calculation cards.

A = $396 \div 11$

B = $832 \div 11$

Sana thinks there won’t be a remainder in either calculation because 396 and 832 are both multiples of 11.

Eve disagrees, she has done the written calculations and says one of them has a remainder.

Who is correct? Explain your answer.

Eve is correct because 832 isn’t a multiple of 11.

The answers are 36 and 75r7.

420 children and 32 adults need transport for a school trip. A coach holds 55 people.

We need 7 coaches.

We need 8 coaches.

We need 9 coaches.

Alex is correct because there are 452 people altogether, 452 divided by 55 is 8r12, so 9 coaches are needed.
Long Division (4)

Notes and Guidance

Children now divide four-digit numbers using long division where their answers have remainders. After dividing, they check that their remainder is smaller than their divisor.

Children start to understand when rounding is appropriate to use for interpreting the remainder and when the context means that it is not applicable.

Varied Fluency

Simon used this method to calculate 1,426 divided by 13

<table>
<thead>
<tr>
<th>1</th>
<th>0</th>
<th>9</th>
<th>r</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>−</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>(×100)</td>
</tr>
<tr>
<td>−</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>(×9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Use this method to calculate:

2,637 ÷ 16    4,321 ÷ 22    4,203 ÷ 18

There are 7,849 people going to a concert via coach. Each coach holds 64 people.

How many coaches are needed to transport all the people?

Mathematical Talk

How can we use our multiples to help us divide?
What happens if we cannot divide our ones exactly by our divisor?
How do we show what we have left over?
Why are we subtracting the totals from the starting amount? (Seeing division as repeated subtraction)
Does the remainder need to be rounded up or down?
**Long Division (4)**

**Reasoning and Problem Solving**

<table>
<thead>
<tr>
<th>Class 6 are calculating three thousand, six hundred and thirty-three divided by twelve.</th>
<th>Whitney is correct because 3,633 is odd and 12 is even.</th>
<th>Using the number 4,236, how many numbers up to 20 does it divide by without a remainder? Is there a pattern?</th>
<th>1, 2, 3, 4, 6, 12</th>
<th>They are all factors of 12</th>
</tr>
</thead>
</table>

Whitney says that she knows there will be a remainder without calculating.

Is she correct? Explain your answer.
Common Factors

Notes and Guidance

Children find the common factors of two numbers. Some children may still need to use arrays and other representations at this stage but mental methods and knowledge of multiples should be encouraged. They can show their results using Venn diagrams and tables.

Mathematical Talk

How do you know you have found all the factors of a given number?
Have you used a system?
Can you explain your system to a partner?
How does a Venn diagram show common factors?
Where are the common factors?

Varied Fluency

- Find the common factors of each pair of numbers.
  - 24 and 36
  - 20 and 30
  - 28 and 45

- Which number is the odd one out?
  - 12, 30, 54, 42, 32, 48

  Can you explain why?

- Two numbers have common factors of 4 and 9
  - What could the numbers be?
There are 49 pears and 56 oranges.

They need to be put into baskets with an equal number in each basket.

Amir says,
There will be 8 pieces of fruit in each basket.

Jack says,
There will be 7 pieces of fruit in each basket.

Who is correct? Explain how you know.

Jack is correct. There will be seven pieces of fruit in each basket because 7 is a common factor of 49 and 56.

Tom has two pieces of string.
One is 160 cm long and the other is 200 cm long.
He cuts them into pieces of equal length.
What are the possible lengths the pieces of string could be?

2, 4, 5, 8, 10, 20 and 40 cm are the possible lengths.

Tahil has 32 football cards that he is giving away to his friends.
He shares them equally.
How many friends could Tahil have?

1, 2, 4, 8, 16 or 32
Common Multiples

Notes and Guidance
Building on knowledge of multiples, children find common multiples of numbers. They should continue to use a visual representation to support their thinking. They also use more abstract methods to calculate the multiples and use numbers outside of times table facts.

Mathematical Talk
Is the lowest common multiple of a pair of numbers always the product of them?

Can you think of any strategies to work out the lowest common multiples of different numbers?

When do numbers have common multiples that are lower than their product?

Varied Fluency

On a 100 square, shade the first 5 multiples of 7 and then the first 8 multiples of 5

What do you notice?

Choose 2 other times tables which you think will have more than 3 common multiples.

List 5 common multiples of 4 and 3

Jim and Nancy play football at the same local football pitches. Jim plays once every 4 days and Nancy plays once every 6 days.

They both played football today.

In a fortnight, how many times will they have played football on the same day?
Common Multiples

Reasoning and Problem Solving

Work out the headings for the Venn diagram.

Multiples of 4
Multiples of 6

144 is a square number that can go in the middle.

Add in one more number to each section.

Can you find a square number that will go in the middle of the Venn diagram?

Nancy is double her sister’s age.
They are both older than 20 but younger than 50.
Their ages are both multiples of 7.
Work out their ages.

A train starts running from Leeds to York at 7am.
The last train leaves at midnight.
Platform 1 has a train leaving from it every 12 minutes.
Platform 2 has one leaving from it every 5 minutes.
How many times in the day would there be a train leaving from both platforms at the same time?

Nancy is 42 and her sister is 21

18 times
Primes to 100

Notes and Guidance

Building on their learning in year 5, children should know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. They should be able to use their understanding of prime numbers to work out whether or not numbers up to 100 are prime. Using primes, they break a number down into its prime factors.

Varied Fluency

- List all of the prime numbers between 10 and 30
- The sum of two prime numbers is 36
  What are the numbers?
- All numbers can be broken down into prime factors. A prime factor tree can help us find them. Complete the prime factor tree for 20

Mathematical Talk

What is a prime number?
What is a composite number?
How many factors does a prime number have?
Are all prime numbers odd?
Why is 1 not a prime number?
Why is 2 a prime number?
Use the clues to work out the number.

- It is greater than 10
- It is an odd number
- It is not a prime number
- It is less than 25
- It is a factor of 60

Shade in the multiples of 6 on a 100 square.

What do you notice about the numbers either side of every multiple of 6?

Eva says,

I noticed there is always a prime number next to a multiple of 6

Is she correct?
Explore this.

Both numbers are always odd.

Yes, Eva is correct because at least one of the numbers either side of a multiple of 6 is always prime.
Square & Cube Numbers

Notes and Guidance
Children have identified square and cube numbers previously and now need to explore the relationship between them and solve problems involving these numbers. They need to experience sorting the numbers into different diagrams and look for patterns and relationships. This step is a good opportunity to practice efficient mental methods of calculation.

Varied Fluency

Use <, > or = to make the statements correct.

- 3 cubed ○ 6 squared
- 8 squared ○ 4 cubed
- 11 squared ○ 5 cubed

This table shows square and cube numbers. Complete the table. Explain the relationships you can see between the numbers.

<table>
<thead>
<tr>
<th></th>
<th>3 × 3</th>
<th>3³</th>
<th>6 × 6 × 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>6²</td>
<td></td>
<td>25</td>
<td>5³</td>
</tr>
<tr>
<td>4 × 4</td>
<td>4³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9²</td>
<td></td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

___ + 35 = 99
210 − ___ = 41

Which square numbers are missing from the calculations?
Square & Cube Numbers

Reasoning and Problem Solving

Place 5 odd and 5 even numbers in the table.

<table>
<thead>
<tr>
<th>Not Cubed</th>
<th>Cubed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 100</td>
<td></td>
</tr>
<tr>
<td>100 or less</td>
<td></td>
</tr>
</tbody>
</table>

Possible cube numbers to use:
8, 27, 64, 125, 216, 343, 512, 729, 1000

Shade in all the square numbers on a 100 square.

Now shade in multiples of 4

What do you notice?

Square numbers are always either a multiple of 4 or 1 more than a multiple of 4.
Order of Operations

Notes and Guidance

Children will look at different operations within a calculation and consider how the order of operations affects the answer. The following image is useful when referring to the order of operations.

Varied Fluency

Sarah has 7 bags with 5 sweets in each bag. She adds one more sweet to each bag. Which calculation will work out how many sweets she now has in total? Explain your answer.

\[ 7 \times (5 + 1) \]
\[ 7 \times 5 + 1 \]

Daniel has completed the calculation and got an answer of 96

\[ 2(30 \div 5) + 14 = 96 \]

Can you explain what he did and where he made the mistake?

Add brackets and missing numbers to make the calculations correct.

\[ 3 + \Box \times 5 = 25 \]
\[ 25 - 6 \times \Box = 38 \]

Mathematical Talk

Does it make a difference if you change the order in a mixed operation calculation?

What would happen if we did not use the brackets?

Would the answer be correct?

Why?
Order of Operations

Reasoning and Problem Solving

Countdown

Big numbers: 25, 50, 75, 100
Small numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Children randomly select 6 numbers.
Reveal a target number.

Children aim to make the target number ensuring they can write it as a single calculation using order of operations.

Write different number sentences using the digits 3, 4, 5 and 8 before the equals sign that use:

- One operation
- Two operations with no brackets
- Two operations with brackets

Possible solutions:
58 − 34 = 14
58 + 3 × 4 = 70
5(8 − 3) + 4 = 29
Mental Calculations

Notes and Guidance

We have included this small step separately to ensure that teachers emphasise this important skill. Discussions around efficient mental calculations and sensible estimations need to run through all steps. Sometimes children are too quick to move to computational methods, when changing the order leads to quick mental methods and solutions.

Varied Fluency

How could you change the order of these calculations to be able to perform them mentally?

- $50 \times 16 \times 2$
- $30 \times 12 \times 2$
- $25 \times 17 \times 4$

Jamie buys a t-shirt for £9.99, socks for £1.49 and a belt for £8.99. He was charged £23.47. How could he quickly check if he was overcharged?

Mathematical Talk

Is there an easy and quick way to do this?

Can you use known facts to answer the problem?

Can you use rounding?

Does the solution need an exact answer?

How does knowing the approximate answer help with the calculation?

What do you estimate B represents when:
- $A = 0$ and $C = 1,000$
- $A = 30$ and $C = 150$
- $A = -7$ and $C = 17$
- $A = 0$ and $C = 1,000$
- $A = 1,000$ and $C = 100,000$
Class 6 are trying to find the total of 3,912 and 3,888

Alex

We just need to double 3,900

Alex is correct because 3,912 is 12 more than 3,900 and 3,888 is 12 less than 3,900

Is Alex correct? Explain.

2,000 – 1,287

Dora

I used the column method.

Tommy

I used my number bonds from 87 to 100 then from 1,300 to 2,000

Jack

I subtracted one from each number and then used the column method.

Whose method is most efficient?

Children share their ideas. Discuss how Dora’s method is inefficient for this question because the multiple exchanges make it difficult.
Reason from Known Facts

Notes and Guidance

Children should use their understanding of known facts from one calculation to work out the answer of another similar calculation without starting afresh. They should use reasoning and apply their knowledge of commutativity and inverse operations.

Varied Fluency

Complete.

70 ÷ ___ = 3.5     ___ × 3.5 = 7

70 ÷ ___ = 7     3.5 × 20 = ___

___ ÷ 2 = 35     70 ÷ ___ = 3.5

Make a similar set of calculations using 90 ÷ 2 = 45

5,138 ÷ 14 = 367

Use this to calculate 15 × 367

14 × 8 = 112

Use this to calculate:

• 1.4 × 8

• 140 × 8
3,565 + 2,250 = 5,815

True or False?
4,565 + 1,250 = 5,815
5,815 – 2,250 = 3,565
4,815 – 2,565 = 2,250
4,065 + 2,750 = 6,315

Which calculations will give an answer that is the same as the product of 12 and 8?

3 × 4 × 8
12 × 4 × 2
2 × 10 × 8

All apart from the third one will give the same answer (96)