Spring Scheme of Learning

Year 4/5

#MathsEveryoneCan

2019-20
How to use the mixed-age SOL

In this document, you will find suggestions of how you may structure a progression in learning for a mixed-age class.

Firstly, we have created a yearly overview.

For each block of learning, we have grouped the small steps into themes that have similar content. Within these themes, we list the corresponding small steps from one or both year groups. Teachers can then use the single-age schemes to access the guidance on each small step listed within each theme.

The themes are organised into common content (above the line) and year specific content (below the line). Moving from left to right, the arrows on the line suggest the order to teach the themes.

Each term has 12 weeks of learning. We are aware that some terms are longer and shorter than others, so teachers may adapt the overview to fit their term dates.

The overview shows how the content has been matched up over the year to support teachers in teaching similar concepts to both year groups. Where this is not possible, it is clearly indicated on the overview with 2 separate blocks.
How to use the mixed-age SOL

Here is an example of one of the themes from the Year 1/2 mixed-age guidance.

**Subtraction**

Year 1 (Aut B2, Spr B1)
- How many left? (1)
- How many left? (2)
- Counting back
- Subtraction - not crossing 10
- Subtraction - crossing 10 (1)
- Subtraction - crossing 10 (2)

Year 2 (Aut B2, B3)
- Subtract 1-digit from 2-digits
- Subtract with 2-digits (1)
- Subtract with 2-digits (2)
- Find change - money

In order to create a more coherent journey for mixed-age classes, we have re-ordered some of the single-age steps and combined some blocks of learning e.g. Money is covered within Addition and Subtraction.

The bullet points are the names of the small steps from the single-age SOL. We have referenced where the steps are from at the top of each theme e.g. Aut B2 means Autumn term, Block 2. Teachers will need to access both of the single-age SOLs from our website together with this mixed-age guidance in order to plan their learning.

**Points to consider**

- Use the mixed-age schemes to see where similar skills from both year groups can be taught together. Learning can then be differentiated through the questions on the single-age small steps so both year groups are focusing on their year group content.
- When there is year group specific content, consider teaching in split inputs to classes. This will depend on support in class and may need to be done through focus groups.
- On each of the block overview pages, we have described the key learning in each block and have given suggestions as to how the themes could be approached for each year group.
- We are fully aware that every class is different and the logistics of mixed-age classes can be tricky. We hope that our mixed-age SOL can help teachers to start to draw learning together.
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
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<td></td>
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<td></td>
<td>Measurement: Length, Perimeter and Area</td>
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<tr>
<td></td>
<td>Number: Place Value</td>
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<td>Number: Addition and Subtraction</td>
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<td>Number: Multiplication and Division</td>
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<td>Number: Decimals (including Y5 Percentages)</td>
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<tr>
<td></td>
<td>Number: Multiplication and Division</td>
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<td>Number: Fractions</td>
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<td>Summer</td>
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</tbody>
</table>

| WRM – Year 4/5 – Scheme of Learning 2.0s |

<table>
<thead>
<tr>
<th>Number: Place Value</th>
<th>Number: Addition and Subtraction</th>
<th>Number: Multiplication and Division</th>
<th>Measurement: Length, Perimeter and Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number: Multiplication and Division</td>
<td>Number: Fractions</td>
<td>Number: Decimals (including Y5 Percentages)</td>
<td>Spring</td>
</tr>
</tbody>
</table>
In this section, content from single-age blocks are matched together to show teachers where there are clear links across the year groups.

Teachers may decide to teach the lower year’s content to the whole class before moving the higher year on to their age-related expectations.

The lower year group is not expected to cover the higher year group’s content as they should focus on their own age-related expectations.

In this section, content that is discrete to one year group is outlined. Teachers may need to consider a split input with lessons or working with children in focus groups to ensure they have full coverage of their year’s curriculum. Guidance is given on each page to support the planning of each block.

The themes should be taught in order from left to right.
Decimals (including Money)

Common Content

**Order and compare decimals**
- Year 4 (Sum B1, Sum B2)
  - Compare decimals
  - Order decimals
  - Ordering money
- Year 5 (Spr B3)
  - Order and compare decimals

**Round decimals**
- Year 4 (Sum B1, Sum B2)
  - Round decimals
  - Estimating money
- Year 5 (Spr B3)
  - Rounding decimals

**Calculating with decimals**
- Year 4 (Sum B2)
  - Four operations
- Year 5 (Sum B1)
  - Adding - same decimal places
  - Subtracting - same decimal places
  - Adding – different decimal places
  - Subtracting - different decimal places
  - Wholes and decimals

**Pounds and Pence**
- Year 4 (Sum B2)
  - Pounds and pence

In this block, Year 4 start by converting between pounds and pence. They then apply their learning in decimals in the context of money.

Both year groups order, compare and round decimals. Year 4 look at decimals with up to 2 d.p. whilst Year 5 look at decimals with up to 3 d.p.

Year 4 add and subtract decimals in the context of money whilst Year 5 add and subtract decimals in a series of small steps.

**Decimal sequences**
- Year 5 (Sum B1)
  - Decimal sequences
How much money is in each purse?

Complete the part-whole models to show how many pounds and pence there are.

Convert these amounts to pounds and pence:

- 357 p
- 307 p
- 57 p
- 370 p

Children develop their understanding of pounds and pence. This is the first time they are introduced to decimal notation for money. Once children are confident with this, they can move on to convert between different units of money.

Children can use models, such as the part-whole model, to recognise the total of an amount being partitioned in pounds and pence.

**Mathematical Talk**

- How many pence make a pound?
- Why do we write a decimal point between the pounds and pence?
- How would we write 343 p using a pound sign?
- How can the amounts be partitioned in to pounds and pence?
- Is there only one way to complete the part-whole model?
- How can these amounts be converted into pounds and pence?
Some children are converting 1206 p into pounds.

Who is correct?

**Whitney**

1206 p = £12.6

**Rosie**

1206 p = £12.06

**Teddy**

1206 p = £120.6

What have the others done wrong?

Rosie is correct. Whitney has not written the 6 p in the correct column. Teddy has not understood how many pence there are in a pound, therefore his place value is incorrect.

Eva has these coins:

She picks three coins at a time. Decide whether the statements will be always, sometimes or never true.

- She can make a total which ends in 2
- She can make an odd amount.
- She can make an amount greater than £6
- She can make a total which is a multiple of 5 pence

Can you think of your own always, sometimes, never statements?

- Never
- Sometimes e.g. £3.05
- Never – she can only choose three coins so the largest amount she can make is £5
- Always, because every coin is a multiple of 5 pence
Block 1 – Decimals

Theme 2- Order and compare decimals
Draw counters in the place value chart to make the statement correct.

Children apply their understanding of place value to compare numbers with decimals with up to two decimal places. They will consolidate and deepen their understanding of 0 as a place holder when making a comparison.

How many tenths does it have?

There are ___ tenths and ___ hundredths.

The number is ___ . ___ ___

___ . ___ ___ is greater/less than ___ . ___ ___ because …

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Write the numbers shown and compare using < or >

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

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</tr>
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<tbody>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Complete.

5.5  5.7
0.37 < 0_.7
0.14 0.29
2.22 > 2_.2
1 0.64
1_.1 > 1_.1
3.32 3.23
9.9_ < 9.9_
Use each digit card **once** to make the statement correct.

Some possible solutions:

- $3.12 > 0.45$
- $3.24 > 1.05$
- $3.45 > 1.02$
- $3.01 > 2.45$
- $3.42 > 2.01$
- $3.45 > 0.12$
- $3.02 > 1.45$
- $3.24 > 1.05$

Can you find eight different possible solutions?

Use three digit cards to make the greatest possible number.

The greatest: $7.54$

Use three digit cards to make the smallest possible number.

The smallest: $0.45$
Children apply their understanding of place value to order numbers with decimals with up to two decimal places. They will consolidate and deepen their understanding of 0 as a place holder, the inequality symbols and language such as ascending and descending.

Which digit can we use to compare these decimals? Will this always be the case?

Do we always use the digit furthest left to compare decimals?

___ . ___ ___ is _________ than ___ . ___ ___  because …

Complete.

1.11  1.12  1.13  0.1_ <  0.1_ <  0.15
3.32  3.23  2.32  1.9_ <  1.9_ <  2.01
4.44  4.34  4.04  6.67 >  6._7 >  6.37
Spot the Mistake

Rosie is ordering some numbers in ascending order:

0.09 < 0.99 < 10.01 < 1.35 < 9.09

Can you explain her mistake?

Rosie hasn’t considered the place value of the digits in the numbers and has just ordered by comparing individual digits left to right.

Some children have planted sunflowers and have measured their heights.

<table>
<thead>
<tr>
<th>Child</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beth</td>
<td>1.23 m</td>
</tr>
<tr>
<td>Tony</td>
<td>0.95 m</td>
</tr>
<tr>
<td>Rachel</td>
<td>1.02 m</td>
</tr>
<tr>
<td>Kate</td>
<td>1.2 m</td>
</tr>
<tr>
<td>Faye</td>
<td>99 cm</td>
</tr>
<tr>
<td>Emma</td>
<td>0.97 m</td>
</tr>
</tbody>
</table>

Order the children based on the heights of their sunflowers in both ascending and descending order.

Ascending: Tony, Emma, Faye, Rachel, Kate, Beth

Descending: Beth, Kate, Rachel, Faye, Emma, Tony
Two classes save their pennies for a year.

Class A saves 3,589 pennies.

Class B saves 3,859 pennies.

Which class saves the most money?

Write the amounts as pence, then compare using <, > or =

6,209 p  £60.09  £0.54  54 p

Write the amounts as pounds, then compare using <, > or =

62 p  £6.02  £5,010  5,010 p

Order the amounts in ascending order.

130 p  £0.32  132 p  £13.20

Order the amounts in descending order.

257 p  £2.50  2,057 p  £25.07
Teddy, Dora and Jack are buying toys.

**Teddy**
- I have £5.43

**Dora**
- I have 534p

**Jack**
- I have more money than Dora but less than Teddy.

How much money could Jack have? Is there only one answer?

What would you rather have, five 50p coins or twelve 20p coins? Explain your answer fully.

I would rather have five 50p coins because 
\[ 50 \times 5 = 250p \]
but 
\[ 20 \times 12 = 240p \]

Jack could have anything from £5.35 to £5.42
Children may record this as 535p to 542p

**Amir has these digits cards.**

He uses them to fill the frame below:

He makes a total that is more than three pounds but less than six pounds.

How many amounts can he make?

Order your amounts in ascending order.

- £3.24, £3.26
- £3.42, £3.46
- £3.62, £3.64
- £4.23, £4.26
- £4.32, £4.36
- £4.62, £4.63

I have £5.43
I have 534p
I have more money than Dora but less than Teddy.
Order & Compare Decimals

Notes and Guidance

Children order and compare numbers with up to three decimal places.

They use place value counters to represent the numbers they are comparing.

Number lines support children to understand where numbers appear in relation to other numbers.

Mathematical Talk

What number is represented by the place value counters?

_____ is greater/less than _____ because...

Explain how you know.

Can you build the numbers using place value counters?

How can you use these concrete representations to compare sizes?

Varied Fluency

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

Place the numbers in ascending order on the number line.

Place in descending order.

Check your answers using place value chart.
Alex says,

3.105 is greater than 3.2 because 105 is greater than 2.

Do you agree? Explain your answer.

Alex is wrong because 2 tenths is larger than 105 thousandths.

Tommy says,

I have put some numbers into ascending order:

3.015
3\frac{51}{1000}
3.105
3\frac{51}{100}

Tommy has missed one number out. It should go in the middle of this list. What could his number be? What can’t his number be?

Could be:

3.052
3.053
3.054
3.104 etc.

It can't be a number below 3.051 or above 3.105.
Children round numbers with 1 decimal place to the nearest whole number. They look at the digit in the tenths column to understand whether to round a number up or not. It is best to avoid the phrase ‘round down’ as this can sometimes lead to misconceptions. Children need to be taught that if a number is exactly half-way, then by convention we round up to the next integer.

Which whole numbers does the decimal lie between? Which whole number is the decimal closer to on the number line? Which column do we focus on when rounding to the nearest whole number? Which digits in the tenths column do not round up to the nearest whole number? Which digits in the tenths column round up to the nearest whole number?

### Varied Fluency

- **Which integers do the decimals lie between?**
  - 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
  - 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9
  - 3.1 3.2 3.3 3.4 3.5 3.6 3.7
  - 4.1 4.2 4.3 4.4 4.5 4.6 4.7
  - 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9

- **Complete the sentences to describe each decimal.**
  - ___ is closer to ___ than ___
  - ___ rounds to ___ to the nearest whole number.

- **Circle the numbers that round up to the nearest whole number.**
  - 4.5 3.7 2.3 4.2 16.8 1.9
Mo says 0.4 rounded to the nearest whole number is zero.

Whitney says 0.4 rounded to the nearest whole number is one.

Who is correct? Why?

Mo is correct. 0.4 lies between 0 and 1, as there are only four tenths, the number rounds to zero.

A number with one decimal place rounded to the nearest whole number is 45

What could the number be?

The number could be:
44.5, 44.6, 44.7, 44.8, 44.9, 45.1, 45.2, 45.3 or 45.4
Estimating Money

Notes and Guidance

Children round amounts of money written in decimal notation to the nearest pound. They estimate the total of two amounts and move on to estimating with more than two amounts.

Children discuss underestimating and overestimating and link this to rounding down or up and apply it to real life scenarios such as buying food in the supermarket.

Mathematical Talk

If we have ____, what whole numbers/pounds does this come in between? Where will it go on the number line? Which pound is it nearer to?

What does estimate mean? What does approximately mean? Where would be a sensible place to start labelling the number line?

What will each amount round to? How much will they total altogether?

If you had ____, would you have enough to buy the items?

Varied Fluency

Place the amounts on the number line and round to the nearest pound.

£3.67
£3.21
£3.87
£7.54
£7.45
701 p

Complete the table by rounding each amount and finding the total.

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
<th>Approximate Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>£5.63</td>
<td>£1.76</td>
<td>£7.39</td>
</tr>
<tr>
<td>£3.05</td>
<td>£11.54</td>
<td>£14.59</td>
</tr>
</tbody>
</table>

Annie has £15 to spend at the theme park. She rides on the roller coaster which costs £4.34. Then she rides on the big wheel which costs £3.85. Approximately how much money will she have left?
Three children buy toys.

Can you work out who buys what?

Tommy buys a toy which rounds to £5 but gets change from £5

Amir buys two toys which total approximately £25

Eva’s toy costs 5 p more than the number the cost rounds to.

If you had £30, what combinations could you buy and what change would you approximately get?

Tommy – car
Amira – computer game and rugby ball
Eve – panda

Mo buys some socks and gloves. He estimates how much he’ll spend.

£4 + £5 = £9

What could the actual price of the socks and gloves have been?

Mo has £12
He says he has enough money to buy three pairs of socks.

Do you agree?
Explain why.

The socks could cost between £3.50 and £4.49
The gloves could cost between £4.50 and £5.49

It depends. If the socks costs £3.50 to £4, he will.
If the socks cost £4.01 to £4.49, he will not.
Children develop their understanding of rounding to the nearest whole number and to the nearest tenth.

Number lines support children to understand where numbers appear in relation to other numbers and are important in developing conceptual understanding of rounding.

What number do the ones and tenths counters represent?
How many decimal places does it have?
When rounding to the nearest one decimal place, how many digits will there be after the decimal point?
Where would 3.25 appear on both number lines?
What is the same and what is different about the two number lines?
### Round Decimals

#### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Dexter is measuring a box of chocolates with a ruler that measures in centimetres and millimetres. He measures it to the nearest cm and writes the answer 28 cm. What is the smallest length the box of chocolates could be?</th>
<th>Smallest: 27.5 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitney is thinking of a number. Rounded to the nearest whole her number is 4. Rounded to the nearest tenth her number is 3.8. Write down at least 4 different numbers that she could be thinking of.</td>
<td>Possible answers: 3.84, 3.83, 3.82 etc. Some children might include answers such as 3.845</td>
</tr>
<tr>
<td>A number between 11 and 20 with 2 decimal places rounds to the same number when rounded to one decimal place and when rounded to the nearest whole number? What could this be? Is there more than one option? Explain why.</td>
<td>The whole number can range from 11 to 19 and the decimal places can range from ___ .95 to ___ .99. Can children explain why this works?</td>
</tr>
</tbody>
</table>
Block 1 - Decimals

Theme 4- Calculating with decimals
Children solve simple problems with money, involving all four operations. Children are not expected to formally add with decimals in Year 4 but could explore other methods, such as partitioning and recombining to add money. They could use prior knowledge of converting, as well as number bonds, to help them.

Bar modelling could also be used as a strategy when solving problems.

**Mathematical Talk**

- How can we label the bar model?
- What other questions could we ask?
- What operation will we use?
- How can we partition pounds and pence to help add two amounts?
- Is there an alternative way to answer this question?

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### Varied Fluency

**Ron has £48. He spends one quarter of his money.**

How much does he have left?

Use the bar model to help.

**A family is going bowling.**

- How much does it cost for 1 child and 1 adult at peak time?
- How much does it cost for 1 adult and 2 children off peak?

<table>
<thead>
<tr>
<th>Tickets</th>
<th>Peak</th>
<th>Off Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>£8</td>
<td>£6</td>
</tr>
<tr>
<td>Child</td>
<td>£4.20</td>
<td>£5.30</td>
</tr>
</tbody>
</table>

**Amir buys some clothes in a half price sale.**

- Jumper £14
- Scarf £7
- Hat £2.50
- T-shirt £6.50

What would the full price of each item be?

How much would he have paid altogether if they were full price?

How much does he pay in the sale?

How much does he save?
A class has £100 to spend on books.

How many books could they buy for £100?
How many different ways can this be done?

Dexter buys a teddy bear for £6.00, a board game for £4.00, a CD for £5.50 and a box of chocolates for £2.50. He has some discount vouchers. He can either get £10.00 off or pay half price for his items. Which voucher would save him more? Explain your thinking.

Here is Dora’s receipt.

Use the information to complete the receipt:
- The sandwich costs £2.15 more than the crisps.
- The orange juice is the same price as the crisps and banana together.
- The banana is half the price of the crisps.

<table>
<thead>
<tr>
<th>Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandwich</td>
</tr>
<tr>
<td>Orange juice</td>
</tr>
<tr>
<td>Crisps</td>
</tr>
<tr>
<td>Banana</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

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<tr>
<td>Banana</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>
Adding – Same Decimal Places

Notes and Guidance

Children add numbers greater than one with the same number of decimal places.

Place value grids and counters are extremely helpful in ensuring children are understanding the value of each digit and understanding when to exchange.

Ensure children see the formal written method (column addition) alongside the place value chart.

Mathematical Talk

Why is it important to line up the columns?

What happens when there are a total of ten counters in a place value column?

Why is the position of the decimal point important?

Varied Fluency

Use the place value chart to add 3.45 and 4.14

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 1</td>
<td>0 5</td>
<td>0 0 1</td>
</tr>
<tr>
<td>4 1</td>
<td>0 1</td>
<td>0 0 1</td>
</tr>
</tbody>
</table>

\[ 3.45 + 4.14 = 7.59 \]

Use the column method to solve these additions.

\[ 4.42 + 7.63 = 12.05 \]

\[ 4.55 + 3.07 = 7.62 \]

Ron goes to the shops. He buys 3 items. What is the most he could pay? What is the least he could pay?

£4.45 £5.59 £3.99 £4.05
Using these strategies, can you find more number sentences which have the same total as $3 + 3$

- $3.2 + 2.8 = 3 + 3$
  - $-0.2$

- $3.18 + 2.82 = 3 + 3$
  - $-0.18$

Children may find a range of answers. The important teaching point is to highlight that you have added the same to one number as you have taken away from the other.

Using the digits 0 – 9 only once in each of the spaces above, what is:
- The largest sum possible
- The smallest sum possible

Is there more than one way of creating each total?

<table>
<thead>
<tr>
<th>Largest</th>
<th>Smallest</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.75 + 8.64</td>
<td>0.24 + 1.35</td>
</tr>
<tr>
<td>9.65 + 8.74</td>
<td>0.25 + 1.34</td>
</tr>
<tr>
<td>9.64 + 8.75</td>
<td>0.34 + 1.25</td>
</tr>
<tr>
<td>9.74 + 8.65</td>
<td>0.35 + 1.24</td>
</tr>
</tbody>
</table>
Children subtract numbers with the same number of decimal places. They use place value counters and a place value grid to support them with exchanging.

Children should be given opportunities to apply subtraction to real life contexts which could involve measures. Bar models can be a useful representation of the problems.

**Notes and Guidance**

**Mathematical Talk**

What happens when you need to subtract a greater digit from a smaller digit e.g. 3 hundredths subtract 4 hundredths?

How many tenths are equivalent to one hundredth?

Do we only ever make one exchange in a subtraction calculation?

Which of these numbers will need exchanging?

Can you predict what the answer might be?

How could you check your answer?

---

**Subtract – Same Decimal Places**

**Varied Fluency**

Use the place value chart to find the to answer 4.33 − 2.14

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.01</td>
</tr>
</tbody>
</table>

4 . 3 3

− 2 . 1 4

________

Use the column method to answer these questions.

6 . 4

− 3 . 8

5 . 0 5

− 2 . 1 5

Jack has £12.54 in his wallet.

He buys a football which costs £5.82

How much money does he have left?
Dexter and Annie have some money. Dexter has £3.45 more than Annie. They have £12.45 altogether.

How much money does Annie have?

Annie has £4.50

In this number pyramid, each number is calculated by adding the two numbers underneath.
Adding – Different D.P.

Notes and Guidance

Children add numbers with different numbers of decimal places. They focus on the importance of lining up the decimal point in order to ensure correct place value.

Children should be encouraged to think about whether their answers are sensible. For example, when adding 1.3 to 1.32 and getting an answer 1.45, how do we know it is not a sensible answer? Discuss the importance of estimation.

Mathematical Talk

Why is the decimal point important when we are reading and writing a number?

What would a sensible estimate be?

Is this a sensible answer? Why/why not?

What advice would you give to someone that is struggling with recording their numbers in the correct place?

Varied Fluency

Use the place value grid to add 1.3 and 3.52

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.01</td>
</tr>
</tbody>
</table>

1.3  
+ 3.52
_______

Use the column method to answer these questions.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

4.42

4.42

Whitney is cycling in a race. She has cycled 3.145 km so far and has 4.1 km left to go. What is the total distance of the race?
Eva is trying to find the answer to \(4.144 + 1.4\).

Here is her working out.

\[
\begin{array}{c}
4.144 \\
+ \quad 1.4 \\
\hline
4.248 \\
\end{array}
\]

Can you spot and explain her error?

The digits are lined up incorrectly.

Eva needs to line up the decimal point.

The correct answer is 5.544.

Place the calculations in the correct column in the table.

<table>
<thead>
<tr>
<th>No exchange</th>
<th>Exchange in the ones column</th>
<th>Exchange in the tenths column</th>
<th>Exchange in the hundredths column</th>
<th>Exchange in the thousandths column</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.99 + 0.1</td>
<td>9.99 + 1</td>
<td>9.99 + 0.01</td>
<td>9.99 + 0.001</td>
<td></td>
</tr>
</tbody>
</table>

Some calculations might need to go in more than one place.

Add 2 more calculations to each column.

- No exchange: 9.99 + 0.001
- Exchange in the ones column: 9.99 + 1
- Exchange in the tenths column: 9.99 + 0.1
- Exchange in the hundredths column: 9.99 + 0.01
Subtracting – Different D.P.

Children subtract decimals with different numbers of decimal places.

They continue to focus on the importance of lining up the decimal point in order to ensure correct place value.

Children identify the importance of zero as a place holder.

Mathematical Talk

What does it mean if there is nothing in a place value column? How can we represent this in the formal written method?

What do you notice about 4.7 – 3.825 and 4.699 – 3.824? Is one of them more difficult than the other? Why?

Are there more efficient methods for this question?

Varied Fluency

Use the place value grid to help subtract 1.4 from 4.54

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5 4</td>
</tr>
</tbody>
</table>

- 1 . 4

Use the column method to work out the following.

6 . 0 6
- 3 . 7

3 . 8 2 5

3.3 – 1.34 = 14.41 – 1.43 = 3 – 1.87 =

How much change would I get from £10 if I bought a bag of apples costing £4.27?
Subtracting – Different D.P.

Reasoning and Problem Solving

Whitney is not correct. She needs to use zero as a place value holder in the hundredths column of 4.9 and then exchange.

Encourage children to explore more efficient mental strategies as well as correcting the formal method.

The correct answer is 1.05

Teddy used a calculator to solve:

31.4 - 1.408

When he looked at his answer of 17.32 he realised he’d made a mistake.

He had typed all the correct digits in.

Can you spot his mistake?

What should the correct answer be?

Teddy placed the decimal point after the 4 making 14.08 instead of 1.408

The correct answer is 29.992
Children add and subtract numbers with decimals from whole numbers. Highlight that whole numbers are written without a decimal point.

There may be a misconception when recording integers, link this to the place value grid. Emphasise prior understanding that the decimal point is to the right of the ones place.

**Mathematical Talk**

What is a whole number/integer?

Where can we add a decimal point to the number 143 so that its value stays the same?

What’s the same and what’s different about 10 and 10.0?

Can you use different methods? (Number line, column subtraction, mentally).

Which is most efficient for this calculation? Explain why.

**Varied Fluency**

Use the place value grid to help add 143 and 1.45

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>10</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Use the place value grid to help work out 12 − 1.2

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Find the most efficient method to solve this calculation.

\[
43 - 2.14 + 0.86 =
\]

\[
19 - 0.25 =
\]

\[
23 + 4.105 =
\]

\[
19 - 17.37 =
\]
What are the missing digits in the calculation?

31.00
− 1.37

31.00
− 1.37

29.63

Two envelopes contain two different numbers.

• The sum of the numbers is 9.92
• The difference between the numbers is 2.32

What numbers are inside the envelopes?

How can this bar model help?

3.8 and 6.12
Block 1 - Decimals

Theme 5 - Decimal sequences
Children look at decimal sequences and create simple rules, for example: adding 0.5 every time.

It is important to note that they are not expected to generate algebraic expressions for the sequences, but the use of the word ‘term’ could be used to predict the next number in the sequence. For example, what would be the value of the 10th term in the sequence?

**Notes and Guidance**

**Decimal Sequences**

- Children look at decimal sequences and create simple rules, for example: adding 0.5 every time.

- It is important to note that they are not expected to generate algebraic expressions for the sequences, but the use of the word ‘term’ could be used to predict the next number in the sequence. For example, what would be the value of the 10th term in the sequence?

**Mathematical Talk**

- What do increasing and decreasing mean?

- Is the sequence increasing by the same amount each time? By how much?

- What is the same about each term? What is changing in each term?

- What will the next term in the sequence be?

**Varied Fluency**

- Complete the sequence.

- Write the rules for each sequence.
  - 0.45, 0.6, 0.75, 0.9
  - 1.25, 2.5, 3.75, 5, 6.25

- Generate the first 5 terms of this sequence.
  - The 1st term is 1.74
  - The sequence decreases by 0.24 each time.
Do you agree with Jack? Explain your answer.

Jack is incorrect, 9.68 and 9.72 will be in the sequence but not 9.7
The terms are increasing by 0.04 therefore 9.7 will not be in the sequence.

The number 9.7 will be in this sequence.

Eva compared the two sequences above. What do you notice about the differences between the terms in the two sequences?
Investigate Eva’s sequences below and explain your thinking.

The difference between the terms is increasing by 0.9 each time e.g.
1\(^{st}\) + 0.9
2\(^{nd}\) + 1.8
3\(^{rd}\) + 2.7
4\(^{th}\) + 3.6

Children may also notice that the terms in the 2\(^{nd}\) sequence are ten times larger than in the first.
The differences would increase by 0.99 each time.