Summer Scheme of Learning

Year 3/4

#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.

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.

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.
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>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number: Place Value</td>
<td>Number: Addition and Subtraction</td>
<td>Number: Multiplication and Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Spring</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number: Multiplication and Division</td>
<td>Measurement: Length, Perimeter and Area</td>
<td>Number: Fractions</td>
<td>Y3: Measurement: Mass and Capacity</td>
<td>Y4: Number: Decimals</td>
<td>Consolidation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td></td>
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<td></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.
Statistics

Common Content

In this block, teachers may decide to teach pictograms to the whole class in order to recap learning with Year 4.

Both year groups look at bar charts and answer questions relating to them.

Year 4 then move on to interpreting line graphs whilst Year 3 focus on tables.

Year Specific

Bar Charts
Year 3 (Spr B3)
• Bar Charts
Year 4 (Sum B4)
• Interpreting Charts
• Comparison, Sum and Difference

Pictograms
Year 3 (Spr B3)
• Pictograms

Tables
Year 3 (Spr B3)
• Tables

Line graphs
Year 4 (Sum B4)
• Introducing line graphs
• Line graphs

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Block 3 – Statistics

Theme 1 - Pictograms
4 classes are recording how many books they read in a week. Here are the results of how many books they read last week.

- Which class read the most books?
- Which class read the least books?
- How many more books did Class 4 read than Class 2?

Complete the pictogram using the information.
- Group 2 collected 40 apples.
- Group 4 collected half as many apples as Group 1.
- Group 5 collected 20 more apples than Group 3.

How many apples did each group collect?

Class 3 are counting the colour of cars that pass the school.

Draw a pictogram to represent their findings.
Ron, Amir and Alex record the scores of six football matches. Unfortunately, Ron spilled paint on them. Record the results based on what the children remember.

<table>
<thead>
<tr>
<th>Match</th>
<th>Number of goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Possible answer:

Whitney and Teddy are making pictograms to show how many chocolate eggs each class won at the school fair.

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
</tr>
</tbody>
</table>

What’s the same and what’s different about their pictograms? Whose pictogram do you prefer and why?

Possible answer:

Same image/symbol for key, same total of eggs, different values for the key...
Bar Charts

Notes and Guidance

Children interpret information in pictograms and tally charts in order to construct bar charts. They interpret information from bar charts and answer questions relating to the data.

Children read and interpret bar charts with scales of 1, 2, 5 and 10. They decide which scale will be the most appropriate when drawing their own bar charts.

Mathematical Talk

What’s the same and what's different about the pictogram and the bar chart?

How does the bar chart help you understand the information?

Which scale should we use? How can we decide whether to have a scale going up in intervals of 1, 2, 5 or 10?

What other questions could you ask about the bar chart?

Varied Fluency

Use the information from the pictogram to complete the bar chart.

The bar chart shows how many children attend after school clubs.
Which day is the most popular?
Which day is the least popular?
What is the difference between the number of children attending on Tuesday and on Thursday?
What information is missing from the bar chart?

Here is a tally chart showing the number of children in each sports club.
Draw a bar chart to represent the data.
Which would be more suitable to represent this information, a bar chart or a pictogram? Explain why.

Possible answer:
I think a bar chart would be more suitable because in a pictogram you would need to draw symbols representing 1 or 2 which would make it less efficient. Children may draw both to experiment which representation is clearer.

<table>
<thead>
<tr>
<th>Child</th>
<th>Number of Skips in 30 Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teddy</td>
<td>12</td>
</tr>
<tr>
<td>Annie</td>
<td>15</td>
</tr>
<tr>
<td>Whitney</td>
<td>17</td>
</tr>
<tr>
<td>Ron</td>
<td>8</td>
</tr>
</tbody>
</table>

Rosie and Jack have drawn bar charts to show how many people have pets

Rosie says, I asked more people because my scale goes up in larger jumps.

Jack says, I asked more people because my bars are taller.

Who is correct? Explain why.

Possible answer:
They are both incorrect as they asked the same amount of people but they have just used different scales on their bar charts. Children could discuss which scale is more efficient.
Interpret Charts

Notes and Guidance

Children revisit how to use bar charts, pictograms and tables to interpret and present discrete data. They decide which scale will be the most appropriate when drawing their own bar charts. Children gather their own data using tally charts and then present the information in a bar chart. Questions about the data they have gathered should also be explored so the focus is on interpreting rather than drawing.

Mathematical Talk

What are the different ways to present data?
What do you notice about the different axes?
What do you notice about the scale of the bar chart?
What other way could you present the data shown in the bar chart?
What else does the data tell us?
What is the same and what is different about the way in which the data is presented?
What scale will you use for your own bar chart? Why?

Varied Fluency

Complete the table using the information in the bar chart.

<table>
<thead>
<tr>
<th>Transport</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td></td>
</tr>
<tr>
<td>Walk</td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td></td>
</tr>
<tr>
<td>Bicycle</td>
<td></td>
</tr>
</tbody>
</table>

What is the most/least popular way to get to school?
How many children walk to school?

Produce your own table, bar chart or pictogram showing how the children in your class travel to school.

Represent the data in each table as a bar chart.

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of tickets sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>55</td>
</tr>
<tr>
<td>Tuesday</td>
<td>30</td>
</tr>
<tr>
<td>Wednesday</td>
<td>45</td>
</tr>
<tr>
<td>Thursday</td>
<td>75</td>
</tr>
<tr>
<td>Friday</td>
<td>85</td>
</tr>
</tbody>
</table>
Halifax City Football Club sold the following number of season tickets:
• Male adults – 6,382
• Female adults – 5,850
• Boys – 3,209
• Girls – 5,057

Would you use a bar chart, table or pictogram to represent this data? Explain why.

Possible answer: I would represent the data in a table because it would be difficult to show the exact numbers accurately in a pictogram or bar chart.

Alex wants to use a pictogram to represent the favourite drinks of everyone in her class.

It is not a good idea, because it would be difficult to show amounts which are not multiples of 5.

I will use this image 🍹 to represent 5 children.

What advice would you give Jack about the scale he has chosen? What would be a better scale to use? Is there anything else missing from the bar chart?

Possible response: I would tell Jack to use a different scale for his bar chart because the numbers in the table are quite large. The scale could go up in 5s because the numbers are all multiples of 5. Jack needs to record the title and he needs to label the axes.
How many more points does the Sycamore team have than the Ash team?

How many points do Beech and Oak teams have altogether?

How many more points do Ash need to be equal to Oak?

How many people voted in total?

$$\frac{1}{4}$$ of the votes were for ________.

7 more people voted for _________ than __________.

As a class, decide on some data that you would like to collect, for example: favourite books, films, food. Collect and record the data in a table. Choose a pictogram or a bar chart to represent your data, giving reasons for your choices.

What questions can you ask about the data?
Rosie says,

We asked 54 people altogether.

Can you spot Rosie's mistake? How many people were asked altogether?

Rosie has read the bar chart incorrectly. 15 people chose vanilla, 19 people chose chocolate, 10 chose strawberry and 12 chose mint. That means 56 people were asked altogether.

**True or false?**

- The same number of people visited Maltings Castle as Film Land Cinema on Saturday.
- Double the number of people visited Animal World Zoo on Sunday than Saturday.
- The least popular attraction of the weekend was Primrose Park.

<table>
<thead>
<tr>
<th>Attraction</th>
<th>Number of visitors on Saturday</th>
<th>Number of visitors on Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal World Zoo</td>
<td>1,282</td>
<td>2,564</td>
</tr>
<tr>
<td>Maltings Castle</td>
<td>2,045</td>
<td>1,820</td>
</tr>
<tr>
<td>Primrose Park</td>
<td>1,952</td>
<td>1,325</td>
</tr>
<tr>
<td>Film Land Cinema</td>
<td>2,054</td>
<td>1,595</td>
</tr>
</tbody>
</table>

- False
  The Film Land Cinema had 9 more visitors than Maltings Castle

- True
  1,282 doubled is 2,564

- True
  Animal World Zoo - 3,846
  Maltings Castle - 3,865
  Primrose Park - 3,277
  Film Land Cinema - 3,649
### Tables

**Notes and Guidance**

Children interpret information from tables to answer one and two-step problems.

They use their addition and subtraction skills to answer questions accurately and ask their own questions about the data in tables.

### Mathematical Talk

- What information can we gather from the table?
- Can you explain to a friend how to read the table?
- Where do we need to use tables in real life?
- What other questions could I ask and answer using the information in the table?

### Varied Fluency

The table shows which sports children play.

<table>
<thead>
<tr>
<th></th>
<th>Whitney</th>
<th>Jack</th>
<th>Eva</th>
<th>Mo</th>
<th>Teddy</th>
<th>Annie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Rugby</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Tennis</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Cricket</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Basketball</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

How many children play tennis? Which sports does Mo play? Which children play football and tennis? Which child plays the most sport?

The table shows the increase in bus ticket prices.

- The cost of Ron’s new ticket is 60p. How much was his ticket last year? How much has the price increased by?
- Which ticket price has increased the most from 2016 to 2017? Which ticket price has increased the least?
Tables
Reasoning and Problem Solving

How many questions can you create for your partner about this table?

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of hours shop is open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8</td>
</tr>
<tr>
<td>Tuesday</td>
<td>8</td>
</tr>
<tr>
<td>Wednesday</td>
<td>4</td>
</tr>
<tr>
<td>Thursday</td>
<td>10</td>
</tr>
<tr>
<td>Friday</td>
<td>7</td>
</tr>
<tr>
<td>Saturday</td>
<td>12</td>
</tr>
</tbody>
</table>

Possible answers:
- How many hours does the shop open for in total?
- Which day does it open the longest?
- How many more hours does the shop open for on Saturday than Thursday?
- Which day was the shop open the shortest amount of time?

Eva has created a table to show how many boys and girls took part in after school clubs last week.

<table>
<thead>
<tr>
<th>Day</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Tuesday</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Wednesday</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Thursday</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Friday</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

Eva says, 106 boys took part in after school clubs last week.

Is Eva correct?

Explain why.

Possible answer:
Eva is incorrect. She has counted all the children rather than just the boys. 59 boys took part in after school clubs last week.
Introducing Line Graphs

Notes and Guidance

Children are introduced to line graphs in the context of time. They use their knowledge of scales to read a time graph accurately and create their own graphs to represent continuous data.

It is important that children understand that continuous data can be measured (for example, time, temperature, and height) but as values are changing all the time, the values we read off between actual measurements are only estimates.

Mathematical Talk

How is the line graph different to a bar chart?

Which is the $x$ and $y$ axis? What do they represent?

How would you estimate the temperature at 9:30 a.m.?

How would you estimate the time it was when the temperature was 7 degrees?

Varied Fluency

The graph shows the temperature in the playground during a morning in April.

The temperature at 9 a.m. is ______ degrees.

The warmest time of the morning is ________.

Class 4 grew a plant. They measured the height of the plant every week for 6 weeks.

The table shows the height of the plant each week.

Create a line graph to represent this information.

What scale would you use on the $x$ and $y$ axes?

Between which two weeks did the plant reach a height of 10 cm?
Jack launched a toy rocket into the sky. After 5 seconds the rocket fell to the ground. Which graph shows this? Explain how you know.

Graph A
The height of the rocket increases then decreases quickly again, returning to a height of 0 at 5 seconds.

Example story:
A bird flew up from the ground. It continued to fly upwards for 5 seconds then flew at the same height for another 3 seconds.

Tommy created a line graph to show the number of dogs walking in the park one afternoon.

Tommy says,
At half past one there are 1.5 dogs in the park.

Why is Tommy incorrect?
What would be a better way of presenting this data?

Tommy is incorrect because you cannot have 1.5 dogs.
A better way of presenting this data would be using a bar chart, pictogram or table because the data is discrete.
Line Graphs

Notes and Guidance

Building from the last step, children continue to solve comparison, sum and difference problems using continuous data with a range of scales. They use addition and subtraction to answer questions accurately and ask their own questions about the data in line graphs. Although examples of data are given, children need to have the opportunity to ask and answer questions relating to data they have collected themselves.

Mathematical Talk

Is this discrete or continuous data? How do you know?

What do you notice about the scale of the graph?

How could you make sure you read the graph accurately?

What other questions could you ask about the graph?

How many different ways can you fill in the stem sentences?

Varied Fluency

The graph shows the growth of a plant over 6 months.
- How tall was the plant when it was measured in May?
- In what month did the plant first reach 50 cm?
- How many centimetres did the plant grow between March and July?
- What was the difference between the height of the plant in February and the height of the plant in April?

The graph shows the weight of a puppy as it grows.
When the puppy is ____ months old the weight is ____kg 
Between month ____ and month ____ the puppy increased by ____ kg
Eva measured the temperature of a cup of tea every 30 minutes for 2 hours. The graph shows Eva’s results.

I do not agree with Eva. At 9 a.m. the temperature was 80 degrees and at 9.45 a.m. the temperature was 50 degrees, so it had dropped 30 degrees not 20 degrees.

Eva says, In the first 45 minutes the temperature of the tea had dropped by 20 degrees.

Do you agree with Eva? Explain why.

Example story: Mo drove 20 miles in his lorry. At half past 9 he had a 15 minute rest then drove for another 30 miles until he reached his destination at 10:30 a.m.

Write a story to match the graph.

Mo drove 20 miles in his lorry. At half past 9 he had a 15 minute rest then drove for another 30 miles until he reached his destination at 10:30 a.m.