

White

**Rose
Maths**

Summer - Block 4

Statistics

Year 4

Overview

Small Steps

NC Objectives

- ▶ Interpret charts
- ▶ Comparison, sum & difference
- ▶ Introducing line graphs
- ▶ Line graphs

Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.

Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

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?

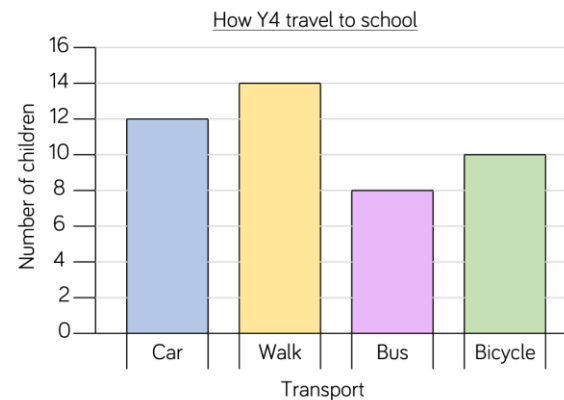
What else does the data tell us?

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.



Transport	Number of children
Car	
Walk	
Bus	
Bicycle	

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.

Team	Number of house points
Sycamore	
Oak	
Beech	
Ash	

= 20 points

Day	Number of tickets sold
Monday	55
Tuesday	30
Wednesday	45
Thursday	75
Friday	85

Interpret Charts

Reasoning and Problem Solving

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.



I will use this image  to represent 5 children.

Explain why this is not a good idea.

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

Here is some information about the number of tickets sold for a concert.

Day	Number of tickets sold
Monday	55
Tuesday	30
Wednesday	45
Thursday	75
Friday	85

Jack starts to create a bar chart to represent the number of concert tickets sold during the week.



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.

Comparison, Sum & Difference

Notes and Guidance

Children solve comparison, sum and difference problems using discrete data with a range of scales.

They use addition and subtraction to answer questions accurately and ask their own questions about the data in pictograms, bar charts and tables.

Although examples of data are given, children should have the opportunity to ask and answer questions relating to data they have collected themselves.

Mathematical Talk

What does a full circle represent in the pictogram?

What does a half/quarter/three quarters of the circle represent?





What other questions could we ask about the pictogram?


What other questions could we ask about the table?

What data could we collect as a class?

What questions could we ask about the data?

Varied Fluency

Team	Number of house points
Sycamore	
Oak	
Beech	
Ash	

 = 20 points

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?

Activity	Number of votes
Bowling	9
Cinema	10
Swimming	7
Ice-skating	14

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.

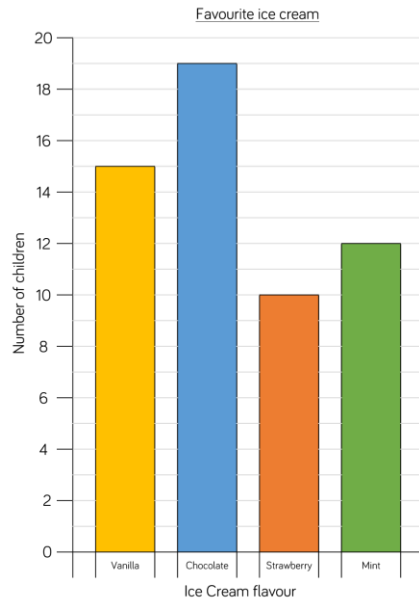
Collect and record the data in a table.

Choose a pictogram or a bar chart to represent your data, giving reasons for your choices.

What questions can you ask about the data?

Comparison, Sum & Difference

Reasoning and Problem Solving



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.

Rosie says,



We asked 54 people altogether.

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

Attraction	Number of visitors on Saturday	Number of visitors on Sunday
Animal World Zoo	1,282	2,564
Maltings Castle	2,045	1,820
Primrose Park	1,952	1,325
Film Land Cinema	2,054	1,595

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.

• 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

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?

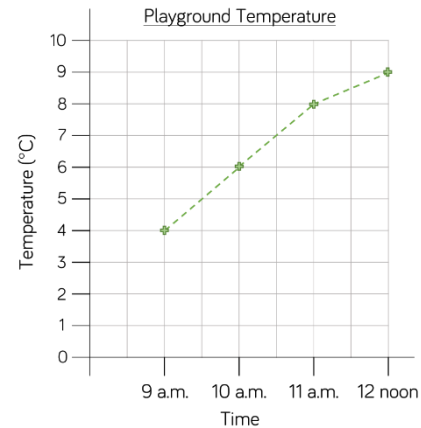
Which is the x and y axis? What do they represent?

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.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
4 cm	7 cm	9 cm	12 cm	14 cm	17 cm



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?

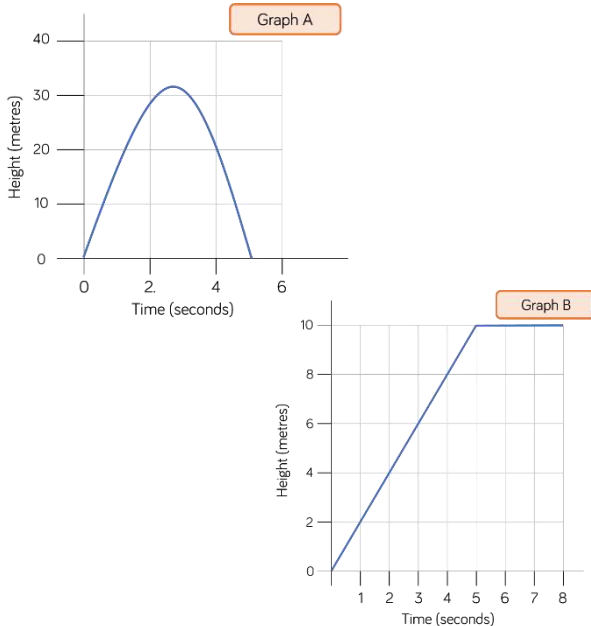
Introducing Line Graphs

Reasoning and Problem Solving

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.



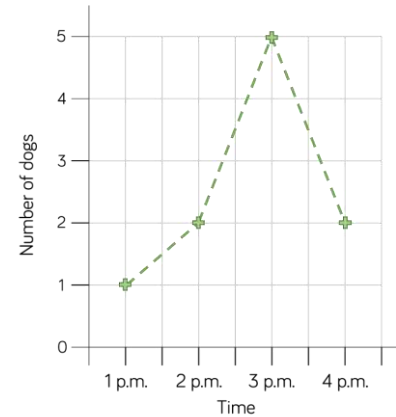
Make up your own story for the other graph.

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?

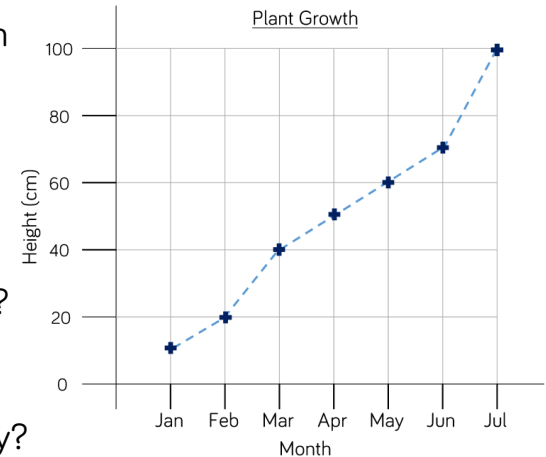
What other questions could you ask about the graph?

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

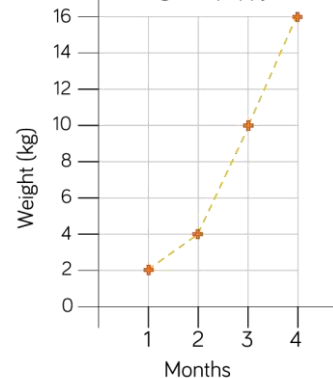
Varied Fluency

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?



Weight of puppy



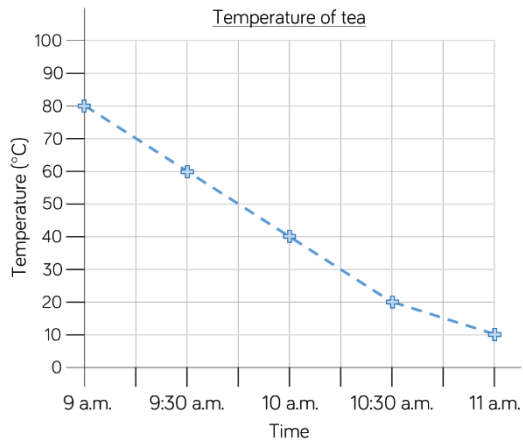
The graph shows the weight of a puppy as it grows.

When the puppy is ___ months old the weight is ___ kg
Between month ___ and month ___ the puppy increased by ___ kg

Line Graphs

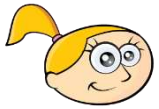
Reasoning and Problem Solving

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.

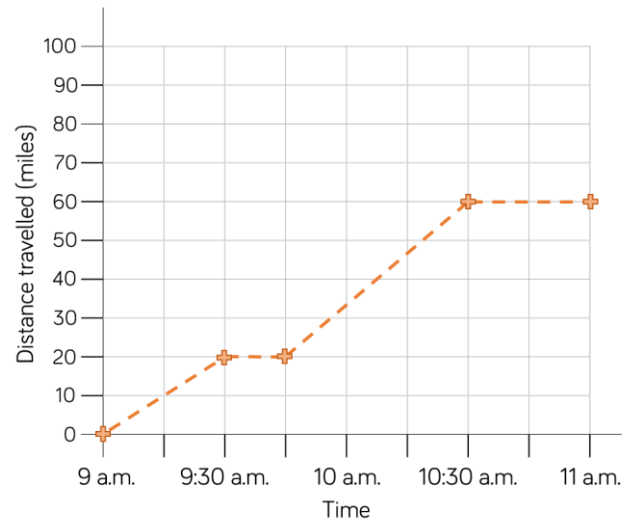
Eva says,



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

Do you agree with Eva?
Explain why.

Write a story to match the graph.



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.