

Planning Overview

Year 5 Statistics

Solve comparison, sum and difference problems using information presented in a line graph

Complete, read and interpret information in tables, including timetables

Objectives	Teaching and Learning
Introduction	Present children with a range of different graphs, charts and tables and ready-made labels to match these images to • list • tally • tally chart • table • frequency table • pictogram • block graph • Carroll diagram • line graph • bar chart • bar line chart • Venn diagram Children to label each image to the name of that type of chart or graph. Children to discuss what they know about that type of chart or graph. What type of data can be collected, what they need to remember when they are creating or reading that type of chart or graph. Children choose 2 images and complete a 'What's the same what's different?' activity
Solve comparison, sum and difference problems using information presented in a line graph	Ensure that children can give examples of discrete and continuous data and explain the difference between the two, for example shoe sizes (discrete) versus the growth of a plant over time (continuous). NCETM definitions Discrete data are counted and have fixed values, for example the number of children who chose red as their favourite colour (this has to be a whole number and cannot be anything in between). Continuous data are measured, for example at what time did each child finish the race? (Theoretically this could be any time: 67.3 seconds, 67.33 seconds or 67.333 seconds, depending on the degree of accuracy that is applied.) Continuous data are best represented with a line graph where every point on the line has a potential value. Children to sort images of graphs, chart and tables into discrete data and continuous data piles

Children to take one of the continuous data graphs and discuss what information the graph is displaying.

Encourage children to label the following parts of a line graph before answering any questions: title, labels on the axes, scales on the axes.

Show children line graphs with one of these elements missing to encourage children to predict what the missing element could be based on the information children have been given. For example, if it is a time–distance line graph about a bicycle journey, what would be an appropriate choice of scales?

Explore data where intermediate points do and don't have meaning. Ensure that children understand that line graphs should only be used to represent data where intermediate points do have meaning.

Look at line graphs with no title or labelled axes and suggest stories that they could represent.

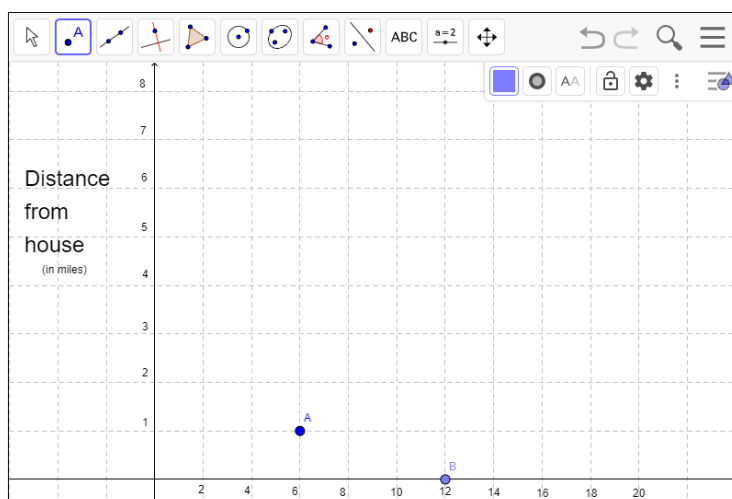


Give children opportunities to complete unfinished line graphs. Such as this interactive one on [geogebra.org](https://www.geogebra.org)

Andrew jogs 2 miles to work everyday.

Here is a description of his trip on a recent day:

1. He jogged halfway in 4 minutes and then realized he forgot his lunch
2. He jogged back home at the same speed
3. He took 2 minutes getting his lunch
4. He ran to work moving twice as fast as his original speed



Use prompts to guide pupils in drawing conclusions and considering extensions, for example,

I have noticed that ... and the graph tells me this because ...

This agrees/disagrees with my interpretation because ...

I was surprised that ...

This might be because ...

Because the graph gives the information that ... , I would expect that ...

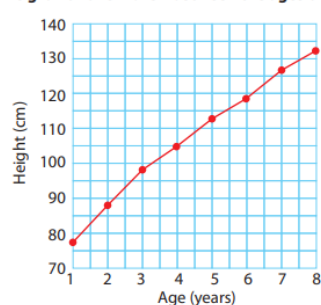
Mastery

Use the line graph to answer the following questions:

Approximately how much does the average child grow between the ages of 1 and 2?

Do they grow more between the ages of 1 and 2 or 7 and 8?

The growth of children between the ages of 1 and 8



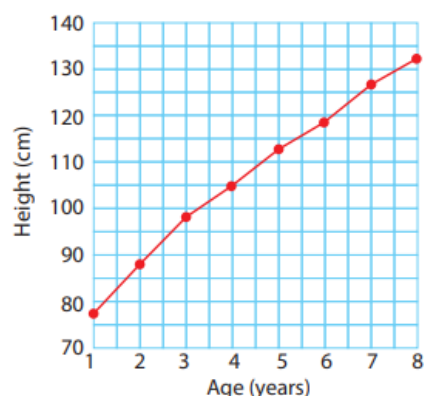
Mastery with Greater Depth

Use the line graph to answer the following questions:

From the graph can you predict the approximate height of an average 10 year old? Explain how.

Consider what might be the similarities and differences between this graph and a graph of the average height of teenagers.

The growth of children between the ages of 1 and 8



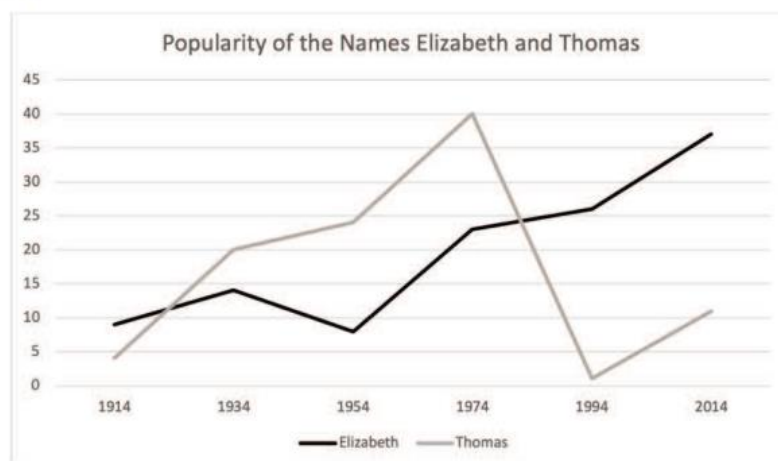
Children can consolidate their understanding of line graphs through other areas of the curriculum e.g. science and topic

Substantial problem – line graph

Digging Deeper – First4Maths

EXPLORE

What does this graph show us? This graph shows the ranking of names given to children called Elizabeth and Thomas, born in the UK, in different years. When names are ranked, the most popular name is ranked at Number 1, the next most popular is Number 2 and so on. What do you notice?



Can you give a value for each name for each year?

Compare the popularity of each name in different years? When was the name Elizabeth most and least popular? What is the difference between the rankings?

Children to look at creating a line graph to show the popularity of their own name (or the most current popular girl/boys name) over the last 10 years.

Complete,
read and
interpret
information
in tables,
including
timetables

Share a selection of tables and ask the children what information is shown on the table.

Day	Number of School Dinners
Monday	11
Tuesday	13
Wednesday	17
Thursday	8
Friday	13

Transport	Tally	Frequency
Bus	III	3
Bike	II	2
Car		12
Walk	III	

The following table shows the data of the temperature of cities at midday and midnight.

City	Temperature	
	At midnight	At Midday
Warsaw	- 7°C	- 4°C
Rome	2°C	- 2°C
Paris	3°C	- 6°C
Oslo	10°C	- 13°C

At midday, how many degrees colder was Oslo than Warsaw?

Degrees

1 mark

Which city was **coldest** at midnight?

The **table** below shows the opening times of the park

Park timings	
Monday	7am to 2pm 4pm to 7pm
Tuesday	7am to 2pm 4pm to 7pm
Wednesday	7am to 2pm 4pm to 7pm
Thursday	7am to 9pm
Friday	7am to 9pm
Saturday	6am to 10pm
Sunday	6am to 10pm

How many **hours** is the park open on **Wednesday**?

hours 1 mark

On which days is the park open for **longest hours**?

1 mark

The following table shows four types of birds and where they are found in various parts of the world.

	Central America	Asia	Mexico	Middle East
Swift	✓	✓	✓	✓
Humming bird	X	✓	X	✓
Columbidae	✓	X	✓	X
Hornbill	✓	✓	✓	X

Use this table to answer a few questions.

Which type of bird is **not found** only in the Middle east?

1 mark

Which type of bird is found in **all** the parts?

1 mark

How are the tables presented?

Get the children to collect data relating to another topic in your curriculum e.g. Space. How can they use a table to show the information that they have collected?

How might certain information be more suited to one table type over another?

Examine a two-way table. How are these tables read? What do we need to consider when reading these tables?

22. There are 25 pupils in a class.

The table shows information about their test results in maths and English.

		English		
		Level 5	Level 6	Level 7
maths	Level 5	0	1	1
	Level 6	2	7	0
	Level 7	2	1	4
	Level 8	0	1	6

(a) How many pupils had the same level in both maths and English?



1 mark

(b) How many pupils had a higher level in maths than in English?

Children to create their own two-way table e.g. eye colour and hair colour

	Brown hair	Blonde hair	Red hair	Black hair
Blue eyes				
Brown eyes				
Green eyes				
Hazel eyes				
Other				

Real Statistics – NRICH

Real Statistics

Age 7 to 11
Challenge Level ★

Census at School is an international project which collects data from children in participating countries all around the world, and makes it available for anyone to look at.

The table below contains data that was collected from the first questionnaires in Autumn 2000 and includes responses from children in England, Wales and Northern Ireland. It shows how pupils travel to school:

Travel to school percentage table			
All data	Percentage of all pupils	Percentage of primary school pupils	Percentage of secondary school pupils
Total	100.00	100.00	100.00
Walk	37.90	43.31	33.60
Bus	22.55	8.05	34.10
Car	34.87	46.72	25.43
Cycle	1.89	1.17	2.47
Train/tube/tram/metro	1.79	0.21	3.06
Other	0.99	0.54	1.35
Excludes non responses			

Which is the most popular way of getting to school for primary pupils?
How about for secondary pupils?
Can you think of any reasons why these might be different?
Which is the most common way of travelling to school overall?
Can you explain why this answer is different again?
What do you think the 'Other' category means?

What questions would you like to ask about the data?

Conduct your own survey on how everyone usually gets to school, perhaps in your class or year group.
Present your results in a table, chart or graph and please send it in to us.

Compare your findings to those in the table (you might want to look just at the primary school or secondary school data, depending on how old you are).
How are your results different?
Are there any similarities?
Can you think of any reasons why your findings might be different or similar?

Complete, read and interpret information in tables, including timetables

Timetables are also included within the Year 5 time plan. You may choose to cover this as part of statistics or time.

Look at the timetable for one train. Transfer it onto a number line. Ask interpretation questions about the timetable/number line e.g. How long did it take to get from Crewe to Sandbach?

Given the start time of a bus and how long it takes to get to each stop children to create a timetable for passengers showing what time the bus will be expected to pick them up from each stop.

Children to interpret a timetable to solve problems – Use your local bus routes and ask questions linked to the routes they may encounter in everyday life e.g. If I wanted to be in Chester by 10am what is the latest bus I could get from Tarporley?

I want to be back in Tarporley by 17:00. What is the latest bus I can get back from Chester?

Mastery

	Bus Timetable					
Highway Rd	06:50		07:25	08:45	09:10	09:45
Rain Rd	07:00	07:25	07:41	08:55	09:19	09:53
Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02
Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11
Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16
Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21
Long Rd	07:45	08:30	08:30		10:05	10:40

Use the bus timetable to answer the following questions:

On the 6:50 bus how long does it take to get from Highway Rd to Westland Rd?

Can you travel to Long Rd on the 8:45 bus?

Which journey between Rain Rd and Kingswell Rd takes the longest time, the bus that leaves Rain Rd at 7:25 or the bus that leaves Rain Rd at 7:41?

Explain your reasoning.

Develop problems into 2 step problems e.g.

If I needed to leave Chester to get to Nantwich for 11.30 but I had to stop off for a 15-minute appointment in Tarporley on the way how could I do this and not be late? Is there more than one way of doing this? Which way is most efficient?

Mastery with Greater Depth

	Bus Timetable					
Highway Rd	06:50		07:25	08:45	09:10	09:45
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Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02
Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11
Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16
Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21
Long Rd	07:45	08:30	08:30		10:05	10:40

Use the bus timetable to answer the following questions:

If you needed to travel from Coldcot Rd and arrive at Kingswell Rd by 8:20, which would be the best bus to catch?

Explain why.

Which journey takes the longest time?

Consider other types of timetables e.g. TV listings, school timetable.

Children to read, create and problem solve with these timetables in the same progression as above.

Rebecca's favourite school day

Monday	Maths	Literacy	Lunchtime	Science	ICT in the ICT room
Tuesday	Science	Literacy		Maths	Art
Wednesday	Literacy	Maths		Swimming	History
Thursday	RE	PE		Literacy	Music
Friday	Literacy	Maths		Geography in Mr Singh's room	PE

Rebecca's clues

- ◆ Maths is her favourite subject.
- ◆ She prefers to do maths in the morning.
- ◆ She doesn't like PE other than swimming.
- ◆ She prefers to be in her own classroom at the end of the day.

Logic problem from National Strategy Archive– Rebecca's favourite day