

ALL ABOUT
GRAPHS

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Graphs are a key component of maths. They can help us make sense of potentially complicated information, and have practical applications in our everyday lives. Join Arlo the dog and his canine friends as they learn *All About Graphs!*

Maths Mutts: All About Graphs has been designed with the needs of early readers and math-phobics in mind. The text is clear and concise, and on most pages combines primary text with smaller-sized captions and inset boxes. Special care is also taken to reduce a potentially complex subject to its barest essence. The information conveyed by the text has a natural and understandable flow, and the variously-sized images relate directly to the text, so readers have multiple entry points to engaging with the information. There are also numerous questions and try-it-yourself sections immediately after each key concept is discussed, giving the reader ample opportunity to practice and reflect on what they have just read.

The *Maths Mutts* series uses an artful layout that alternates clean white pages with full-colour spreads. It also makes use of colour photographs, diagrams, graphs and vector illustrations, along with a series of cute puppies to further draw in reluctant readers. All images have been carefully chosen according to a specific colour palette, while also having the advantage of being static, giving the reader the opportunity to explore the image and look at the subject matter and its features in detail. The photographs are strongly composed and clearly printed with bright strong colours to increase the appeal to visual readers. Readers can explore how images are used to convey messages.

Author	Lorna Hendry
ISBN	9781742035765
Format	260mm x 250mm
Extent	32pp + cover
Binding	Paperback
Reading level	5+
Interest level	5+
Category	Junior Non-Fiction



TRY IT YOURSELF

Alio loves playing in the park, chasing balls or the football and going for walks around the block, but his favourite place is the beach.

The table shows how often Alio went to each place last week. You are going to use this data to make a picture graph on the empty grid below.

Place	Died	Beach	Block
W	3	6	2

Key

☐ = Parks

☐ = Club

☐ = Blocks

☐ = Beach

- 1 Design a symbol for each place that Alio goes and complete the key.
- 2 Draw the right number of symbols on the grid. Only put one symbol in each square.

C

How many times did Alio go to the beach last week?

Illustration: iStockphoto Ltd

Picture graphs are like dot graphs, but instead of dots they use pictures or symbols or icons that look like the ideas the graph is describing. This makes the information much easier to understand.

The pictures can also be used to represent large numbers.

For example, 1 picture of a person on a picture graph about the population of a town could represent 1,000 people.

 = 1,000 people
 = 2,000 people
 = 3,000 people

Ancient Egyptians

Pictures have been used to represent ideas and numbers for thousands of years.

The ancient Egyptians used pictures called **hieroglyphics** instead of words.

They also had special symbols for numbers. This meant they could record large numbers accurately and helped them to work out complicated sums.

The table below shows some of the Ancient Egyptian symbols and the numbers they represent

1	10	100	1,000	10,000
𐪎	𐪏	𐪐	𐪑	𐪒
single stroke	heel bone	loop of rope	lotus flower	bird feather

The local vets wanted to tell their clients how many animals they saw in their surgery and what kind of animals they were.

They collected all the data for a year and created a picture graph. They made a poster and put it up in the waiting room.

The picture graph meant that people could understand the information quickly without having to read a lot of words.

The **key** at the bottom of the poster explains what each picture represents.

Q How many rabbits did the vets look after last year?



Arlo and his friends love bones but dog should eat lots of different foods. Arlo'vet asked people what kind of meals they fed their dogs last week.

They recorded the answers in the table on the right. You are going to use this data to make a column graph that shows what Arlo and his friends eat.

Food Type	Number of friends
Bones	9
Fresh meat	3
Canned food	2
Bones food	1

Food	Number of meals
Breakfast	20
Fresh meat	5
Canned food	15
Bones	10

- 1 Work out the best way to divide the y-axis and write the labels in the boxes.
- 2 Colour in the columns to show the number of meals

Q What meal do the dogs eat twice as much as bones?



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Study notes: Themes

- Maths
- Graphs
- Survey questions
- Data
- Dot plots
- Picture graphs
- Column graphs
- Pie charts
- Line graphs
- Side-by-side graphs
- Stacked column graphs
- The language and labels of graphs

Curriculum link: Literacy

Before reading All About Graphs:

- Brainstorm what students know about graphs.
- Can they think of any examples of graphs?
- Do they ever use graphs in their day-to-day lives?

While reading All About Graphs:

- Ask the students to take turns reading a paragraph aloud to the rest of the class. Where appropriate, ask the students what they think certain words may mean.

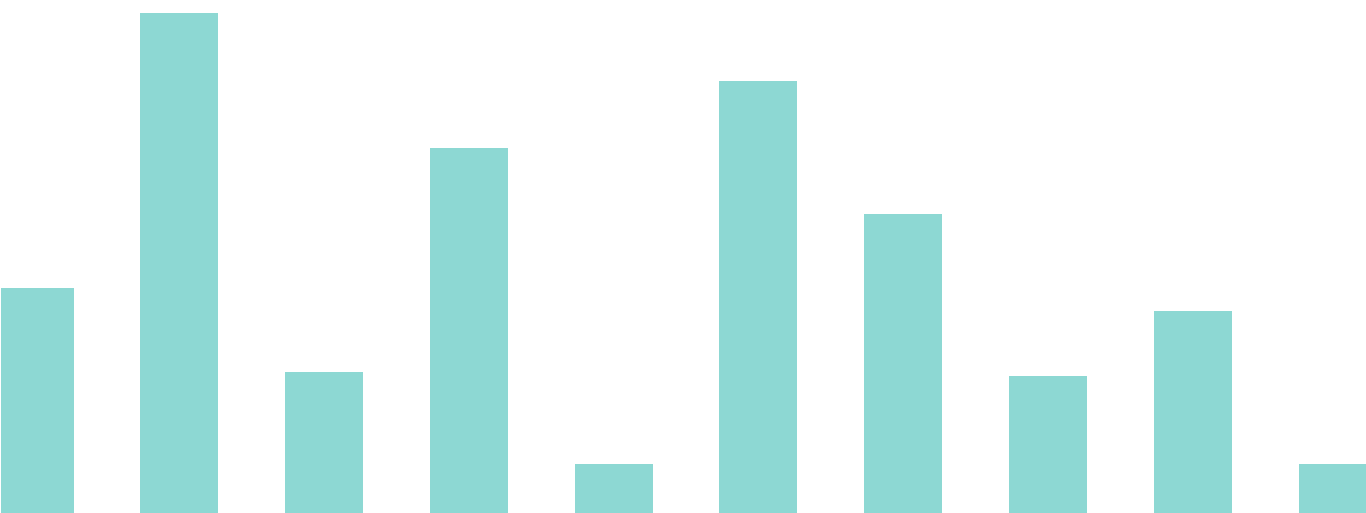
After reading All About Graphs:

- Ask the students to reflect on the words they would use to describe graphs and the words that were used in the book. Ask them to draw up a list of words that can be used to describe graphs.

Curriculum Theme: Critical and Creative Thinking

After reading All About Graphs, ask the students the following questions:

- What are graphs?
- What do they do? Do they all do the same thing?
- Why are they important and/or useful?
- Give some examples of different types of graphs.
- What are the key elements or information needed to make them?
- What are some possible uses of graphs in the real world?



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Curriculum link: ICT Capability

After reading All About Graphs:

ACTIVITY:

- Organise the class into small groups. Ask each group to come up with a survey question (or questions). All groups then share their results with the class. (Bonus points for creative answers.)
- Assign each group a different type of graph found in the book. Ask each group to settle on their favourite survey question, then each group takes turns collecting data for their survey question from the rest of the class. Once all the data has been collected, each group has to translate their data into their chosen graph. All groups then present their graphs to the rest of the class.
- Ask each group to consider their graph i.e. what are its strengths and weaknesses? What type of question or information might it be best suited to? Did it show information clearly and quickly? Does their graph influence how they would come up with a survey question? Each group then shares their findings with the rest of the class.

ACTIVITY:

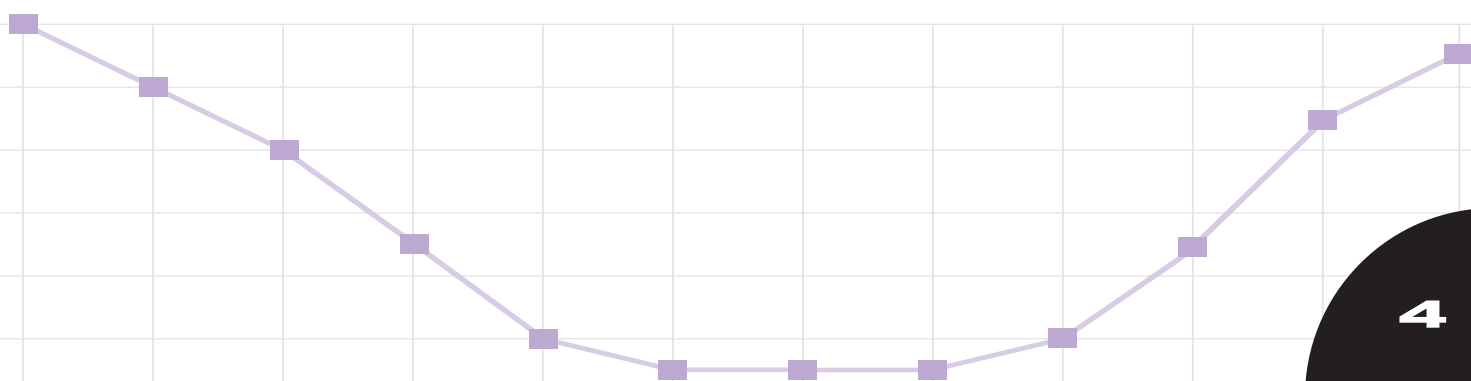
- Ask each group to come up with ideas for survey questions they can either 1) ask their family at home or 2) easily collect data on their own. If 1), place extra emphasis on questions that can have a variety of answers and can generate data over a longer period of time. For example, what does each family member do for fun after dinner i.e. read a book, watch TV, listen to music, play video games, exercise, etc. If 2), it could be the colour or make of cars that pass their house, how long they go out and play after school, etc. Ask them to collect data for one week, and then turn their data into a graph of their choosing. Each student then presents their findings to the rest of the class.

Curriculum Theme: Personal and Social Capability

After reading All About Graphs:

ACTIVITY:

- Organise the class into two groups. In one group, ask the students to work as a team to construct a word finder puzzle. Ask each student to suggest an appropriate word about graphs using words they have learned from the book (e.g. column, data, tally etc.). Once completed, print copies for the other group to complete.



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Curriculum Theme: Personal and Social Capability (continued)

After reading *All About Graphs*:

ACTIVITY:

- In the second group, students should work as a team to create a trivia bingo game. Ask them to suggest facts they found surprising or interesting and combine them into a game for the whole class.

Find out more

NB: the age range for these links varies, and some are about maths in general

- <https://www.brainpop.com/>
- <https://www.mathgames.com/graphing>
- https://ed.ted.com/lessons?student_level=1&category=mathematics
- <http://www.kidsmathgamesonline.com/numbers/mathdata.html>
- <https://nces.ed.gov/nceskids/graphing/classic/>
- <https://www.mathsisfun.com/data/graphs-index.html>
- <https://www.splashmath.com/math-vocabulary/geometry/graph>
- <https://www.youtube.com/user/mathantics>
- <https://www.youtube.com/user/Vihart>
- <https://www.youtube.com/user/Vsauce>
- <https://www.youtube.com/user/minutephysics/videos>
- <https://www.youtube.com/user/videomathtutor>
- <https://www.youtube.com/user/crashcoursekids>
- <https://www.youtube.com/channel/UCoxcj-q8xIDTYp3uz647V5A>

Marketing and promotion

All About Graphs is the first title in an engaging new series that takes a look at key mathematical concepts, and how they can be easily and enjoyably applied to our everyday lives. Planned titles include *Angles*, *Time*, *Chance*, *Dimensions* and *Money*, among others.

