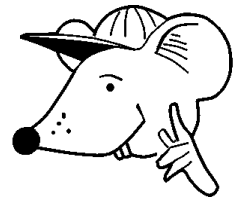


MATHEMATICS



N.S. Yr. 6 P.115

**Collect and organise data.
Use tables, graphs and charts.**

Equipment

Paper, pencil, ruler, squared paper

MathSphere

© MathSphere P.O. Box 1234 Worthing BN13 2UJ www.mathsphere.co.uk

Concepts

Children should understand the meaning of and be able to spell and read these words:

vote, survey, questionnaire, data, statistics, count, tally, sort, classify, set, represent, table, list, graph, chart, diagram, axes, label, title, most/least common or popular, average, mode, median, maximum/minimum value, range, outcome

Children should be able to collect data and be able to discuss the frequencies associated with a bar chart.

They should be able to interpret pie charts and understand percentages when used with pie charts.

They should be able to group data into simple groups (eg group marks in a test into 1 - 20, 21 - 30, 31 - 40 etc).

They should be able to draw bar charts based on class intervals.

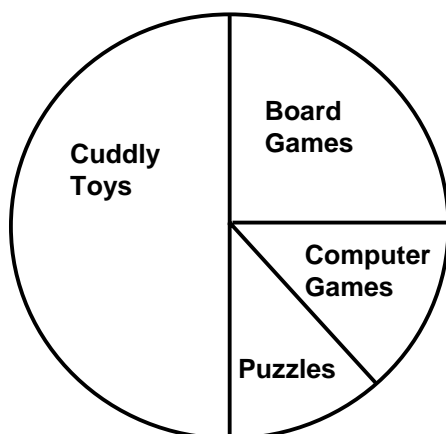
They should be able to predict the probability of an event happening based on the results represented on a bar graph or pie chart.

Extension Work

Pages 9 and 10 give extension work on class intervals. In order to complete this work, children should be able to regroup data with different class intervals.

They should understand class intervals when written with *greater* and *less than* signs. Eg $0 \leq m < 10$.

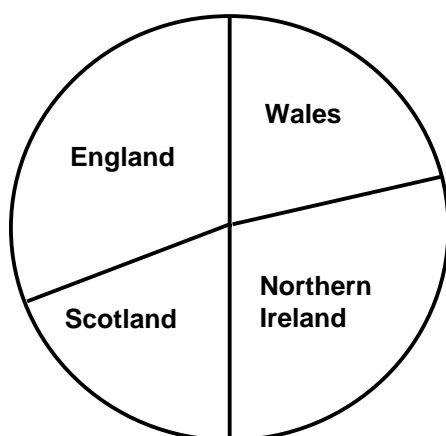
1. A toy shop divides its toys into four groups: *cuddly toys*, *board games*, *computer games* and *puzzles*. The pie chart shows the percentage of each sold in one day.



Type of toy	Percentage sold
Cuddly toys	50%
Board games	25%
Computer games	14%
Puzzles	11%

- a) If 200 toys were sold altogether, how many were cuddly toys?
- b) If 200 toys were sold altogether, how many were board games?
- c) If one of the toys sold on that day were picked at random, what is the probability it would be a board game?

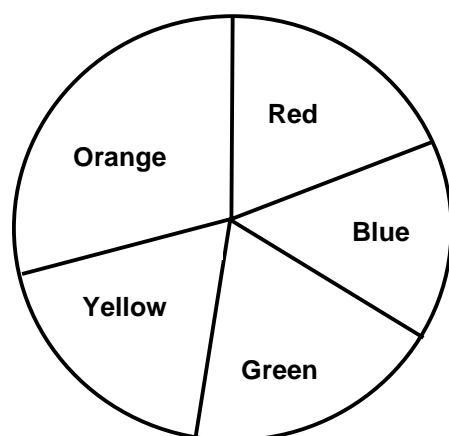
2. Folk singers at a festival came from *England*, *Wales*, *Northern Ireland* and *Scotland*. The pie chart shows the percentage that came from each area.



Area	Percentage
England	31%
Wales	22%
Northern Ireland	28%
Scotland	19%

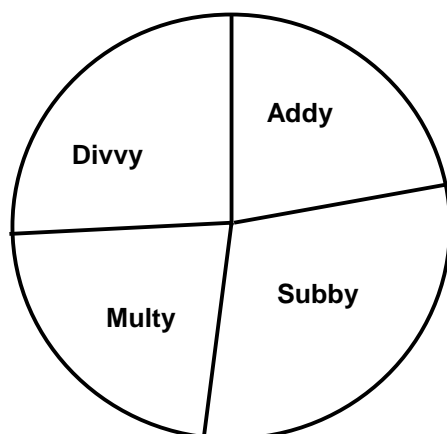
- a) If 500 singers attended the festival, how many were from Northern Ireland?
- b) If 500 singers attended the festival, how many were from Wales?

1. Front doors in a street are painted either *red*, *blue*, *green*, *yellow* or *orange*. The pie chart shows the percentage of each colour in the street.



Colour	Percentage
Red	19%
Blue	14%
Green	19%
Yellow	18%
Orange	30%

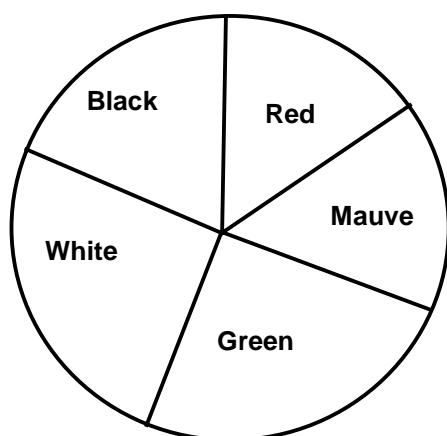
- a) If 300 doors are painted, how many were painted yellow?
- b) If 300 doors are painted, how many were painted red or green altogether?
- c) If one of the doors had woodworm, what is the probability it would be an orange door?
2. The four Maths Rats (*Addy*, *Subby*, *Multy* and *Divvy*) sold copies of their photographs at a school fete. The pie chart shows the percentage of each picture sold.



Maths Rat	Percentage sold
Addy	23%
Subby	29%
Multy	22%
Divvy	26%

- a) If the Maths Rats sold 400 pictures altogether, how many were pictures of Subby?
- b) If the Maths Rats sold 400 pictures altogether, how many were pictures of Addy?

1. Toy cars are sold in these colours: *red, mauve, green, white* or *black*.
The pie chart shows as a percentage the frequency of each colour sold.



Colour	Percentage
Red	16%
Mauve	16%
Green	24%
White	24%
Black	20%

- a) Complete the table below. Show how many cars of each colour were sold if there were 100, 400 or 50 cars altogether.

Colour	Total Number of Cars		
	100	400	50
Red			
Mauve			
Green			
White			
Black			

Don't forget:

100% means all the cars.

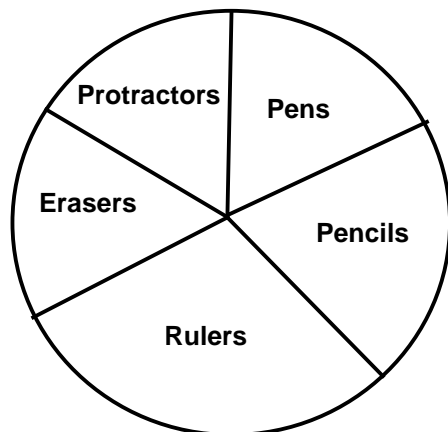
Use your answers for 100 cars to work out the answers for 400 and 50 cars.

- b) One car is picked at random. What is the probability that it is mauve?
- c) One car is picked at random. What is the probability that it is red or green?
- d) One car is picked at random. What is the probability that it is **not** red?



1. A school shop sold the following items: *pens, pencils, rulers, erasers* and *protractors*.

The pie chart shows as a percentage the frequency of each item sold.



Item	Percentage
Pens	18%
Pencils	20%
Rulers	30%
Erasers	16%
Protractors	16%

- a) Complete the table below. Show how many cars of each item were sold if 100, 200 or 50 items were sold altogether.

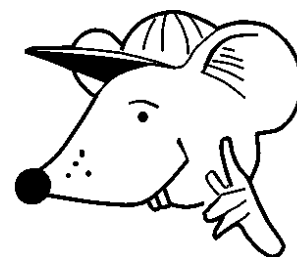
Item	Total Number of Cars		
	100	200	50
Pens			
Pencils			
Rulers			
Erasers			
Protractors			

Don't forget:

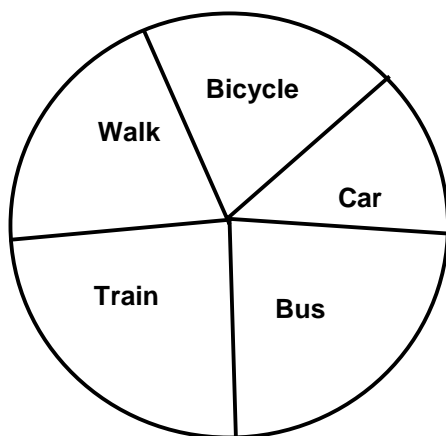
100% means all the items.

Use your answers for 100 items to work out the answers for 200 and 50 items.

- b) One item is picked at random. What is the probability that it is a ruler?
- c) One item is picked at random. What is the probability that it is a pen or a pencil?
- d) One item is picked at random. What is the probability that it is **not** an eraser?



1. Children come to school either on a *bicycle*, in a *car*, on a *bus*, by *train* or by *walking*. The pie chart shows as a percentage the number of children that use each method of transport.



Transport	Percentage
Bicycle	20%
Car	12%
Bus	24%
Train	24%
Walk	20%

- a) Complete the table below. Show how many pupils used each method of transport if there were 200, 800 or 500 pupils altogether.

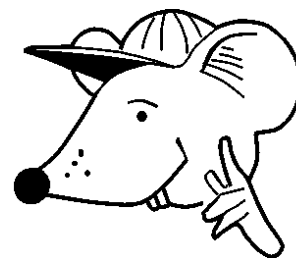
	Total Number of Pupils		
Transport	200	800	500
Bicycle			
Car			
Bus			
Train			
Walk			

Don't forget:

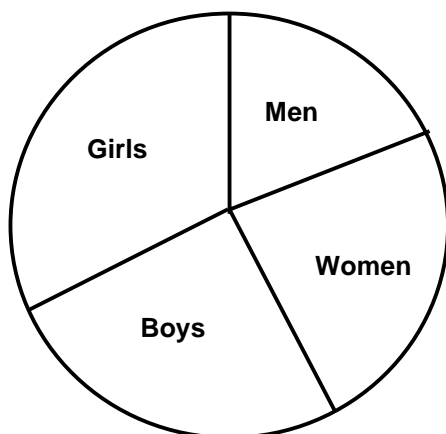
100% means all the pupils.

Think about 100 children first to help you work out the answers.

- b) One pupil is picked at random. What is the probability that she walks to school?
- c) One pupil is picked at random. What is the probability that he comes by car or by bus?
- d) One pupil is picked at random. What is the probability that she does **not** walk to school?



1. The pie chart shows as a percentage the number of *men, women, boys* and *girls* that see a film in the cinema.



	Percentage
Men	19%
Women	24%
Boys	25%
Girls	32%

- a) Complete the table below. Show how many men, women, boys and girls went to the cinema if there were 600, 1 000 or 300 people altogether.

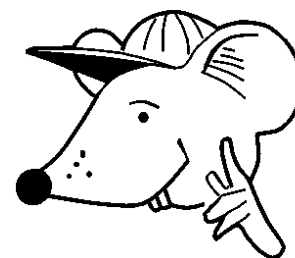
	Total Number of People		
	600	1 000	300
Men			
Women			
Boys			
Girls			

Don't forget:

100% means all the people.

Think about 100 people first to help you work out the answers.

- b) One person is picked at random. What is the probability the chosen person is a boy?
- c) One person is picked at random. What is the probability that the chosen person is an adult?
- d) One person is picked at random. What is the probability that the chosen person is **not** a girl?



Extension Work

Measure the pulse rate of everyone in the class when at rest. Record the results carefully.

Now do some vigorous exercise and measure everyone's pulse rate again. Record the results carefully.

Put everyone's results in a table like the one below. You will need to count the number of people in each interval of 20 beats per minute. (*You may need to extend the intervals at the low end or the high end if you have very low or very high pulse rates.*)

Remember:

$50 \leq p < 60$ means pulse rates **more than or equal to 50** and **less than 60**.

Eg. **50** and **56** would be included in this range, but **60** would be in the next higher range.

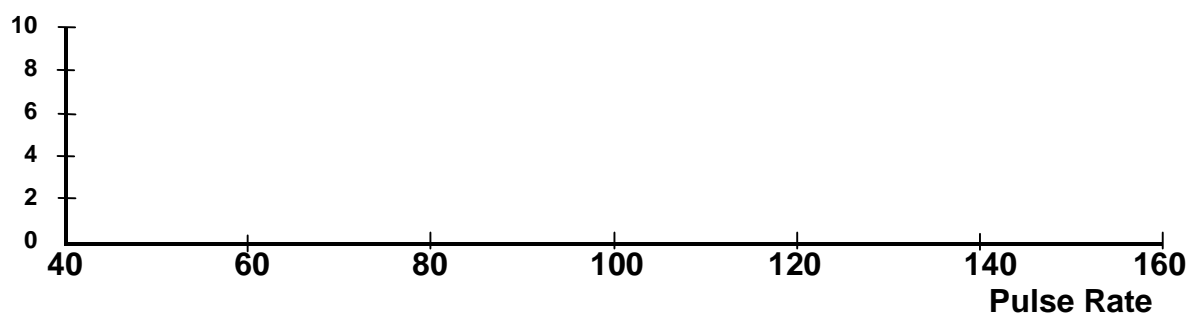


Pulse Rate	$40 \leq p < 60$	$60 \leq p < 80$	$80 \leq p < 100$	$100 \leq p < 120$	$120 \leq p < 140$	$140 \leq p < 160$
Before Exercise						
After Exercise						

Draw two frequency block graphs, one for before exercise and one for after exercise.

Use axes like the ones below.

Freq



Extension Work

Measure the weight in Kg of all the pupils in your class. Record your results carefully.

Group the results in intervals of 5Kg and put the results in a frequency table like the one below.

Weight in Kg.	$25 \leq p < 30$	$30 \leq p < 35$	$35 \leq p < 40$	$40 \leq p < 45$	$45 \leq p < 50$	$50 \leq p < 55$	$55 \leq p < 60$
Frequency							

Draw a frequency block graph of your results and answer these questions:

- What was the mode (the most common weight interval)?
- What was the range of weights for the whole class?

Now regroup your results in 10Kg intervals and draw another frequency block graph with the new intervals.

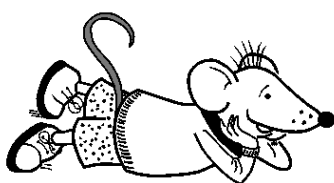
- What was the mode from the new graph?
- What was the range from the new graph?
- Which graph was more useful, the one with 5Kg intervals or the one with 10Kg intervals? Why?

Can you now think of your own experiment? Collect the data, put it into class intervals and draw a frequency block graph.

Find the mode and the range of your data.

Re-arrange the data with new class intervals and draw another frequency block graph.

Which interval is the more useful?



Answers**Page 3**

1. a) 100 b) 50 c) $\frac{25}{100}$ or $\frac{1}{4}$ or equivalent 2. a) 140 b) 110

Page 4

1. a) 54 b) 114 c) $\frac{30}{100}$ or $\frac{3}{10}$ or equivalent 2. a) 116 b) 92

Page 5

1. a) Red 16 64 8
 Mauve 16 64 8
 Green 24 96 12
 White 24 96 12
 Black 20 80 10

b) $\frac{16}{100}$ or $\frac{4}{25}$ or equivalent

c) $\frac{40}{100}$ or $\frac{2}{5}$ or equivalent

d) $\frac{84}{100}$ or $\frac{21}{25}$ or equivalent

Page 6

1. a) Pens 18 36 9
 Pencils 20 40 10
 Rulers 30 60 15
 Erasers 16 32 8
 Protractors 16 32 8

b) $\frac{30}{100}$ or $\frac{3}{10}$ or equivalent

c) $\frac{38}{100}$ or $\frac{19}{50}$ or equivalent

d) $\frac{84}{100}$ or $\frac{21}{25}$ or equivalent

Page 7

1. a) Bicycle 40 160 100
 Car 24 96 60
 Bus 48 192 120
 Train 48 192 120
 Walk 40 160 100

b) $\frac{20}{100}$ or $\frac{1}{5}$ or equivalent

c) $\frac{36}{100}$ or $\frac{9}{25}$ or equivalent

d) $\frac{80}{100}$ or $\frac{4}{5}$ or equivalent

Page 8

1. a)	Men	114	190	57
	Women	144	240	72
	Boys	150	250	75
	Girls	192	320	96

b) $\frac{25}{100}$ or $\frac{1}{4}$ or equivalent

c) $\frac{43}{100}$

d) $\frac{68}{100}$ or $\frac{17}{25}$ or equivalent