



MATHEMATICS



N.S. Yr. 4 P.116

**Collect and organise data.
Use tables, graphs and charts (contd.).**

Equipment

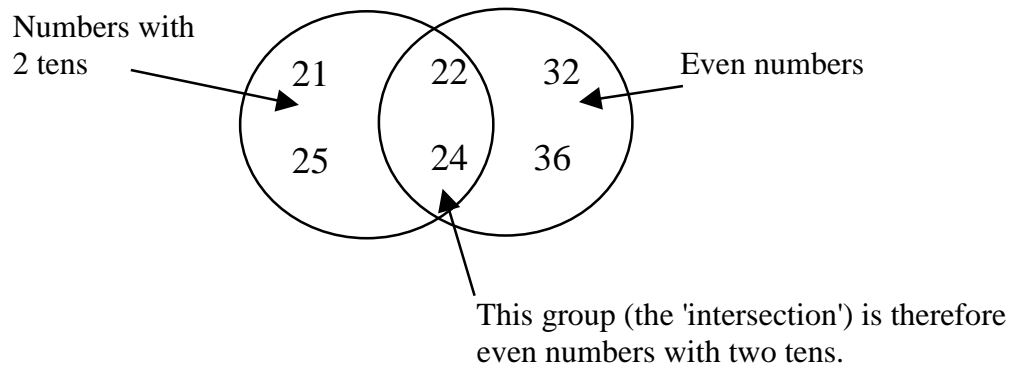
Paper, pencil, ruler, squared paper, computer with database program.

MathSphere

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Concepts

A Venn diagram is a way of sorting information, usually at this age into three groups.



A Carroll diagram is another way of sorting, into four groups.

	odd	even
Numbers With one ten	17 15	18 12
Numbers with 2 tens	23 29	22 28

Extension Work

It is good practice at this age for children to become familiar with the following skills and those that are able enough should be encouraged to use these ideas.

Children should be able to collect data and record their results systematically.

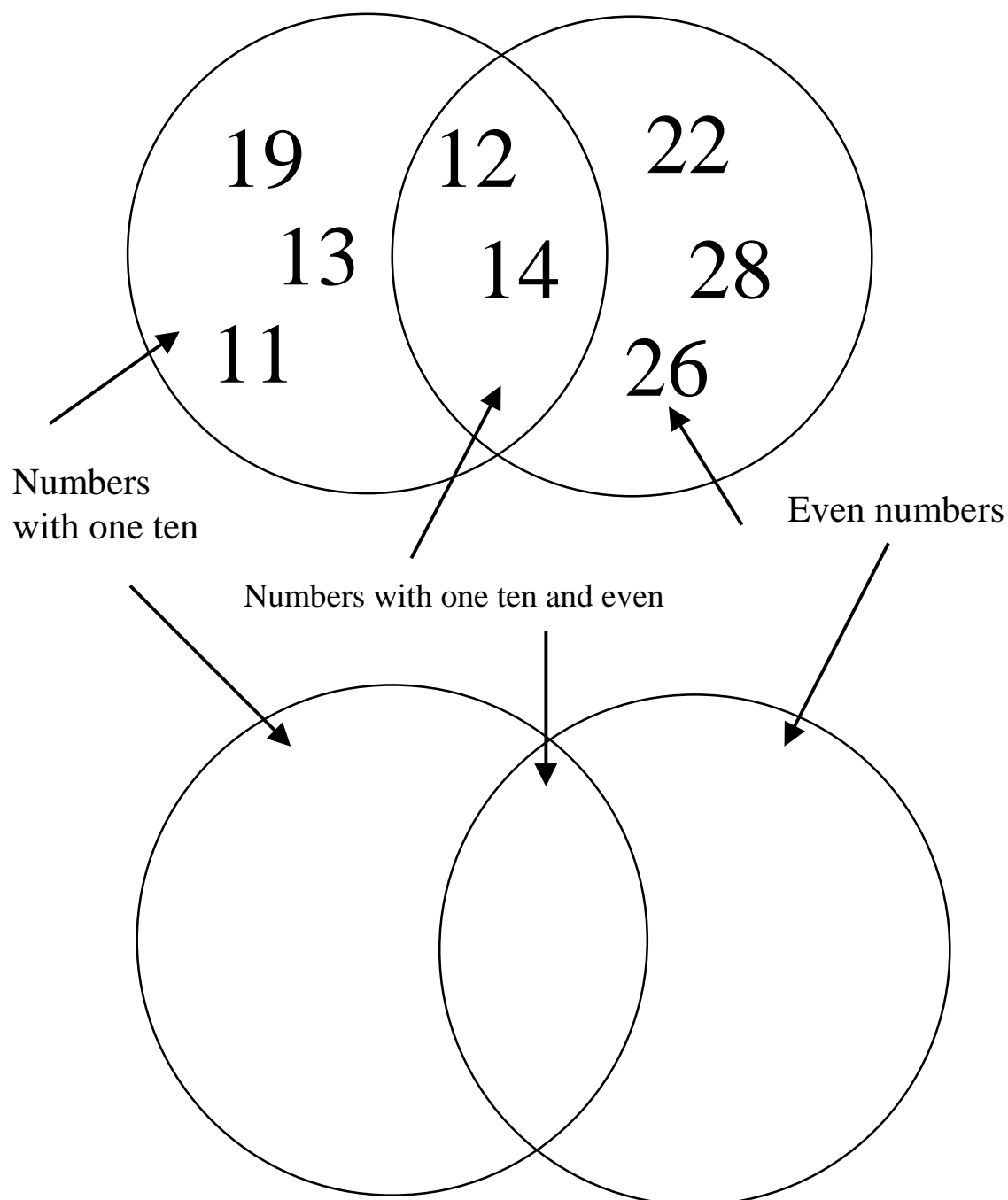
They should be able to use an increasing range of tables, charts, graphs and diagrams.

They should be able to make predictions based on data collected and be able to discuss their results and predictions.

They should be able to make a simple database on paper and find the mode (most common) and the median (middle result when placed in order of size) of a set of results.

They should be able to transfer data to a simple computer database program and be able to sort lists into numerical and alphabetical order and print them out.

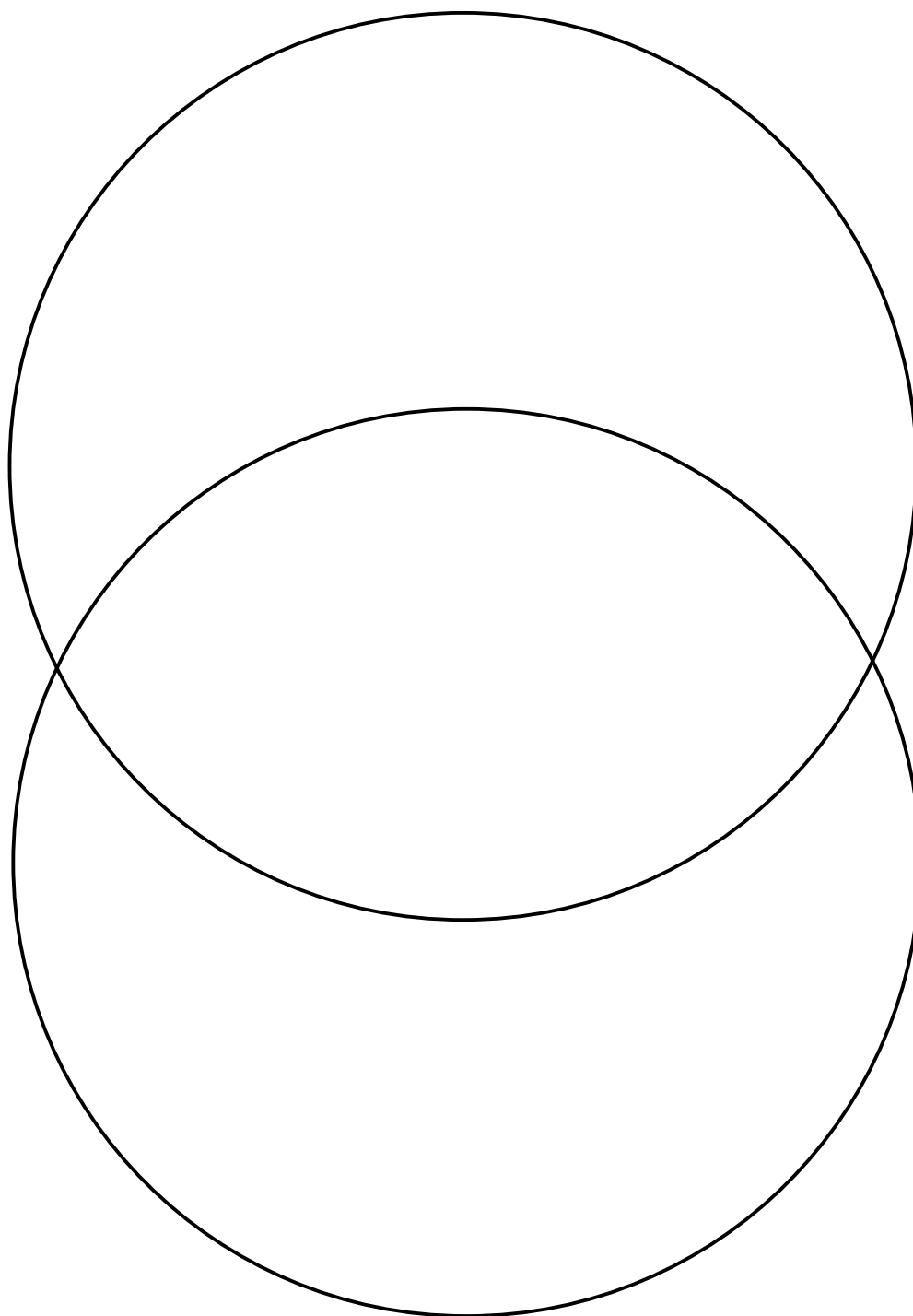
This Venn diagram shows how some numbers were sorted out.



Choose some numbers and put them on the diagram.

Sorting using a Venn diagram

Use the diagram below to sort numbers, shapes etc.



Carroll diagrams

This Carroll diagram sorts numbers:

	odd	even
Numbers with one ten	<div>11</div> <div>13</div>	<div>18</div> <div>14</div>
Numbers with two tens	<div>25</div> <div>21</div>	<div>26</div> <div>20</div>

Put these numbers on the diagram:

22 12 15 17 16 27

29 10 19 23 24 28

Carroll diagrams

This Carroll diagram sorts numbers:

	odd	even
Numbers with two tens	<div>23</div> <div>29</div>	<div>22</div> <div>26</div>
Numbers with five tens	<div>51</div> <div>55</div>	<div>54</div> <div>50</div>

Put these numbers on the diagram:

52 21 59 20 57 28

53 27 56 24 58 25

Carroll diagrams



Use this empty box to make up your own Carroll diagram.

1. Ask your friends to count to 100 and time them to see how many seconds it takes them. Record your results in a table like this:

Name	Time (Seconds)
Mabel	56
Frederick	76
Michael	45

Draw the table out again, this time putting the results in order of time, with the shortest time first.

Which time is the median?

What is the range of times?

Now put the results in your first table onto a computer database program (you may need help with this).

Tell the computer to arrange the results in alphabetical order. Print out the alphabetical order on paper.

Tell the computer to arrange the results in numerical order of the times. Do this twice, once with the lowest time first and once with the highest time first. Print out the results.

Try to think of your own experiment. Record the results in a table and then ask yourself questions similar to those above.

Put your results on a computer database and sort them in number order.



1. Here are the results of a tables test taken by fifteen children. The marks are out of 20.

Name	Mark
Harriette	12
Mary	16
Kelly	9
John	10
Samuel	12
Joseph	5
Moses	18
Jennifer	20
Karen	18
Omee	20
Terry	13
Peter	9
Marianne	11
David	12
Janice	7

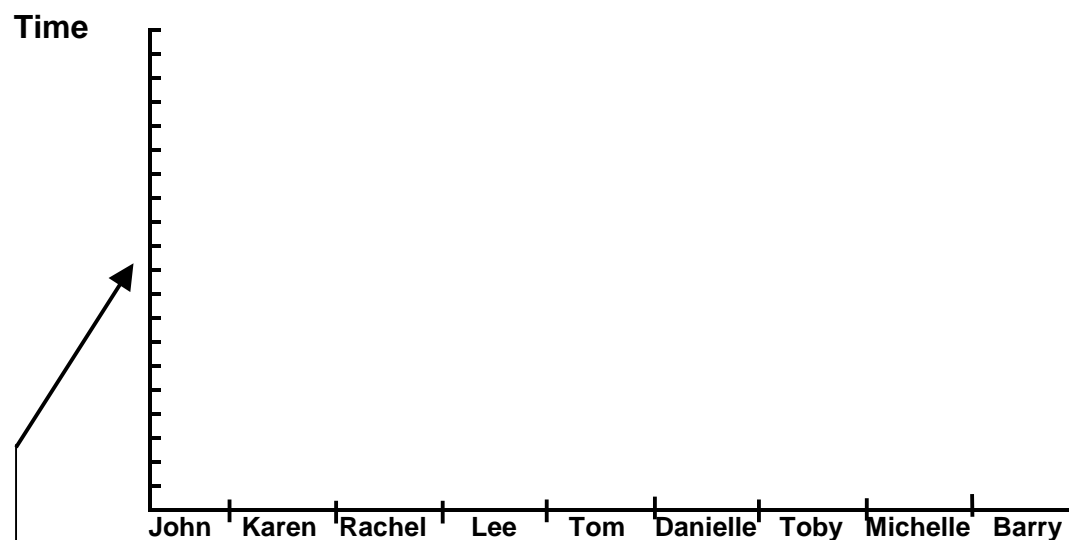
Put this information onto a computer database and sort it into the order of the marks with the smallest mark first. Now answer these questions:

- a) What is the range of the marks?
- b) What is the mode mark (most common)?
- c) What is the median mark?
- d) Who scored the lowest mark?
- e) Who scored the highest mark?
- f) If the class were to do the same test again in a week's time, is it likely that Omee would score twenty again?
- g) If the class were to do the same test again in two years' time, is it very likely that almost everyone would obtain a higher score than now?

1. Here are the results of a 100m race, measured to the nearest second.

Name	Time (secs)
John	15
Karen	17
Rachel	15
Lee	16
Tom	18
Danielle	17
Toby	19
Michelle	20
Barry	17

Draw a graph to show the time of each person. You will need to draw axes like these:



You will have to label this axis yourself.



Lastly, put the information onto a computer database and tell the computer to draw the same graph.

How does it compare with yours?

1. Throw a 1 to 6 die sixty times and record the numbers that appear.
You can do this in a tally chart:

Number on Die	Frequency
One	
Two	
Three	### ## / ←
Four	
Five	
Six	

Here is an example of a tally.



Put this information onto a computer database and tell the computer to draw a block graph of the frequencies of each number on the die.

Now answer these questions:

- Which number on the die is the mode?
- If you repeated the experiment, would you expect the same results as the first time?
- What is the probability of obtaining each number on the dice?
- If you threw the die sixty times, how many of each number would you expect?
- Which numbers on your die came up more than you would have expected?
- Which numbers on your die came up less than you would have expected?
- Which numbers on your die came up the same number of times you would have expected?
- Can you obtain more of a particular number (say six) by practising throwing the dice?

Happy Throwing!



Answers**Page 6**

11 13	10 12
15 17	14 16
19	18
21 23	20 22
25 27	24 26
29	28

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21 23	20 22
25 27	24 26
29	28
51 53	50 52
55 57	54 56
59	58

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1. Answers to questions depend on the results obtained in the experiment.

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1. a) 15 b) 12 c) 12 d) Joseph e) Jennifer and Omee
f) Quite likely as he is obviously very good at his tables.
g) Yes - children will be much older and will have had much more practice.

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1. Simple block graph of results. Computer graph should be essentially the same as child's, but may differ in detail such as scaling of the axes. Make sure child's graph has title and that the axes are labelled correctly.

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1.
 - a) Depends on results obtained.
 - b) Different results expected. The probability of obtaining exactly the same again is extremely small.
 - c) Each number has a probability of $\frac{1}{6}$.
 - d) You would expect 10 of each number.
 - e) Depends on results of experiment.
 - f) Depends on results of experiment.
 - g) Depends on results of experiment.
 - h) No. As this is a random event experiment, you should not be able to improve by practicing.