

Knowledge Organiser -Micro:Bits

Key vocab	
Micro:bit	A small computer designed by the BBC for use in computer education in the UK.
Processor	Receives inputs from the computer and produces outputs.
USB	The form of power supply used by the Micro:bit - power is transmitted from the computer via a micro-USB cable.
Buttons	Input devices used within the Micro:bit to control or alter programs whilst running.
LED (Light emitting diodes)	(LEDs) - used on the Micro:bit as a screen in a 5x5 grid to display information.
Accelerometer	An input device within the Micro:bit to control or alter programs by tilting or moving the device.
Microsoft Block Editor	The visual programming language used to create
Algorithm	A set of instructions to be followed to complete a given task or solve a problem.
Program	A sequence of instructions used by a computer.
Sequence	The order which the computer will run code in, one line at a time.
Selection	A decision made by a computer, choosing what code should be run only when certain conditions are met.
Condition	Checking to see whether a statement or sum is true or false.
Iteration	When a section of code is repeated several times - also known as looping.
Variable	Something which can be changed in a computer. Made up of a name and some data to be saved.

<https://makecode.microbit.org/>

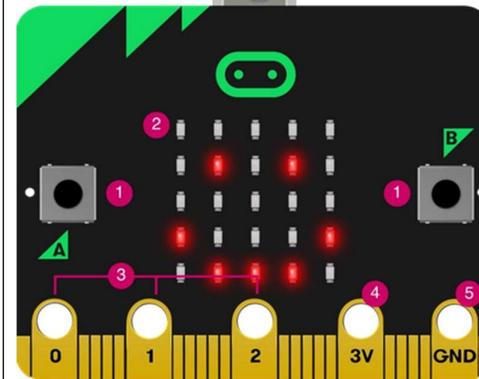
Key features of the micro:bit

On-board motion detector or "accelerometer" that can detect movement and tell other devices you're on the go. Featured actions include shake, tilt and freefall.

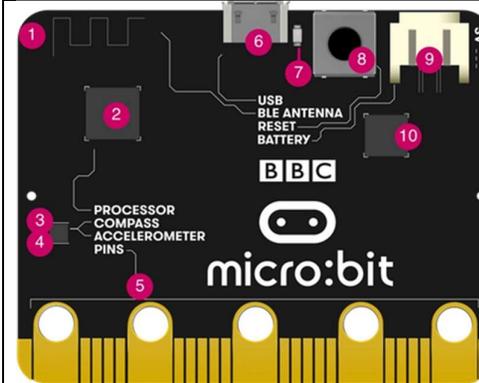
A built-in compass or "magnetometer" to sense which direction you're facing, your movement in degrees, and where you are.

Bluetooth Smart Technology to connect to the internet and interact with the world around you.

Five Input and Output (I/O) rings to connect the micro:bit to devices or sensors using crocodile clips or 4mm banana plugs.



1. Buttons
2. LED display & light sensor
3. Pins - GPIO
4. Pin - 3 volt power
5. Pin - Ground



1. Radio & Bluetooth antenna
2. Processor & temperature sensor
3. Compass
4. Accelerometer
5. Pins
6. Micro USB socket
7. Single LED
8. Reset button
9. Battery socket
10. USB interface chip

Key blocks

For



Repeat



While



Forever



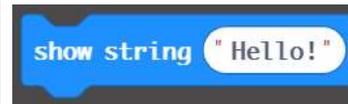
On button pressed



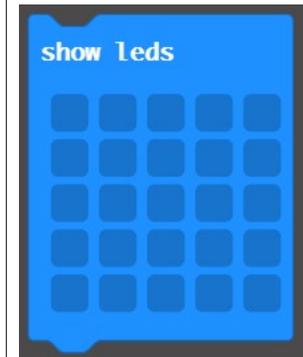
On Shake



Show string



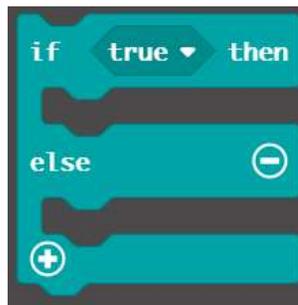
Show LED's



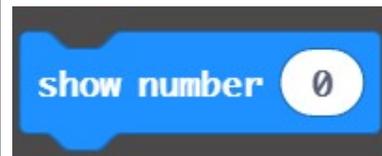
If



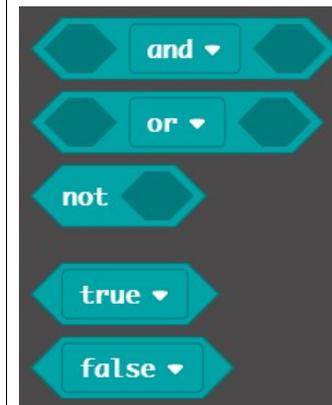
If - Else



Show Number



Boolean



Knowledge Organiser -Flowol

Key vocab	
Flowol	Flowol is a piece of software that allows you to control a number of different situations using flow diagrams
Algorithm	A set of instructions which is followed to solve a given problem. Can be represented using a flowchart
Flowchart	A diagram that shows an algorithm or process, made up of boxes representing steps, decision, inputs and outputs.
Computational Thinking	The thought process of taking a problem, working out how it can be calculated by a computer, and finding a solution.
Program	A sequence of instructions used by a computer.
Sequence	The order which the computer will run code in, one line at a time.
Selection	A decision made by a computer, choosing what code should be run only when certain conditions are met.
Condition	Checking to see whether a statement or sum is true or false.
Iteration	When a section of code is repeated several times - also known as looping.
Input	Entering data or information into an algorithm.
Output	Displaying data or information as a result of an algorithm.
Simulation	A model that produces an output, either visual or physical, as it runs
Flow	How data moves through a program, explained using arrows in a flowchart.
Comparative Operators	Symbols used to compare one value to another (see below table for examples) and return a True/False.
Execute	Means 'running' the instruction or program
Sub-routine	Sequences of instructions that can be called and used when required, this is called sub-routine
Sensor	an object whose purpose is to detect events or changes in its environment, and then provide a corresponding output
Variable	A value where data is stored and can be changed when used in a program.

Key vocab	
	Start/Stop symbol. This must be used to start the flow diagram, and also to stop it when it's finished.
	Output symbol. This controls if the outputs are on. For example, a motor or a light.
	Process symbol. This allows you to put a delay or a repeat in your flow diagram
	Decision symbol. This lets you add a decision or a condition to your flow diagram
	Label. This allows you to add text to your diagram
	Edit. This allows you edit parts of your diagram
	This links all the symbols together and completes the flow diagram.
	Play/Stop. This runs/stops the program

Comparative Operators	
==	Equal to (It is equal to)
!=	Not equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
=	Is it equal (question?)

New, Open, Save and Print buttons **Cut, Copy, Paste and Delete buttons** **Undo and Redo buttons**

Click to connect to an **Interface**, use a **Mimic** or use **Variables**. Or click **More...** for more features.

Drag new **flowchart symbols** from here

Add a **Label**

Select mode

Add connecting **line** between symbols

The **Workspace** is where your flowchart is constructed

The **Mimic Window** is a two or three dimensional graphical representation of a control system or robot.
 Move the mouse pointer over the mimic window to reveal the **Show** icon in the top left and click there to toggle the mimic labels.
 Then click on inputs/outputs in the mimic to toggle their state.
 Drag the corner of the mimic window to resize it.

The **Status Panel** shows the current status of all inputs, outputs and variables in use.
 When the flowchart is not running, click to toggle the state of outputs to test their effect.
 When no interface is connected, click on the inputs to simulate a state change.

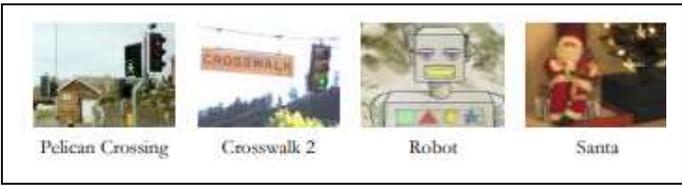
Drag the divider left and right to adjust the size of the Status Panel

Run/Stop the flowchart, adjust flowchart **Speed Pause** and **Single Step**

Zoom buttons


 To adjust the speed that the flowchart runs, drag the speed slider to the left to slow the flowchart down, and to the right to speed it up. Return the slider to the middle for normal speed.

Some of the mimics available



Knowledge Organiser - Webpages

Key words	
Web design	The process of designing and making web pages for a particular audience.
Web page	Any single page on the internet used to display media such as text, images, sounds, podcasts or movies.
Website map	A diagram used to represent the architecture of a website
Homepage	The main page of a website where users first arrive when they visit a website.
Hyperlink	An image or piece of text which can be clicked to navigate to another page on a website.
Hotspot	A particular type of hyperlink where the user can click on a certain position of an image to navigate to a certain page. A single image can have several hotspots on it.
Anchor	A HTML anchor link is a web link that allows users to leapfrog to a specific point on a website page to save on scrolling.
Source tables	A table which contains all the media used on a website, where they were obtained and the associated copyright rules.
Target audience	The particular type of people a website is aimed at. This will effect issues such as colour scheme, images used and text used.
Web Browsers	The purpose of a web browser (Chrome, Edge, Firefox, Safari) is to read HTML documents and display them. The browser does not display the HTML tags, but uses them to determine how to display the document.
HTML	Hyper Text Markup Language is the standard markup language for creating Web pages.
Wireframe	is a layout of a web page that demonstrates where media will be placed such as text and images. It is an important part of the design process.
Sitemap	is plan of how the pages on your website are interlinked, below is an example for the Brine leas website

Html Explained

- The `<!DOCTYPE html>` declaration defines this document to be HTML5
- The `<html>` element is the root element of an HTML page
- The `<head>` element contains meta information about the document
- The `<title>` element specifies a title for the document
- The `<body>` element contains the visible page content
- The `<h1>` element defines a large heading
- The `<p>` element defines a paragraph

Html Tags

- HTML tags normally come in pairs like `<p>` and `</p>`
- The first tag in a pair is the **start tag**, the second tag is the **end tag**
- The end tag is written like the start tag, but with a **forward slash** inserted before the tag name

Tip: The start tag is also called the **opening tag**, and the end tag the **closing tag**.

Html Headings

HTML headings are defined with the `<h1>` to `<h6>` tags.

`<h1>` defines the most important heading, `<h6>` defines the least important heading.

Example

Heading 1

Heading 2

Heading 3

Heading 4

Heading 5

Heading 6

Html Paragraphs

HTML paragraphs are defined with the `<p>` tag.

HTML Links

HTML links are defined with the `<a>` tag

Example

```
<a href="https://www.w3schools.com">This is a link</a>
```

The link's destination is specified in the `href` attribute. Attributes are used to provide additional information about HTML elements.

HTML Images

HTML images are defined with the `` tag.

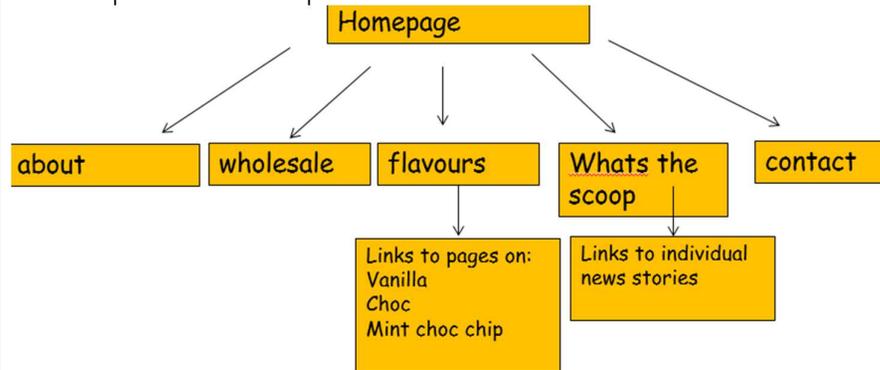
The source file (`src`), alternative text (`alt`), `width`, and `height` are provided as attributes

Example

```

```

Example Sitemap



HTML Lists

HTML lists are defined with the `` (unordered/bullet list) or the `` (ordered/numbered list) tag, followed by `` tags (list items)

HTML Tag Reference

Tag reference contains additional information about these tags and their attributes.

Tag	Description
<code><html></code>	Defines the root of an HTML document
<code><body></code>	Defines the document's body
<code><head></code>	A container for all the head elements (title, scripts, styles, meta information, and more)
<code><h1></code> to <code><h6></code>	Defines HTML headings

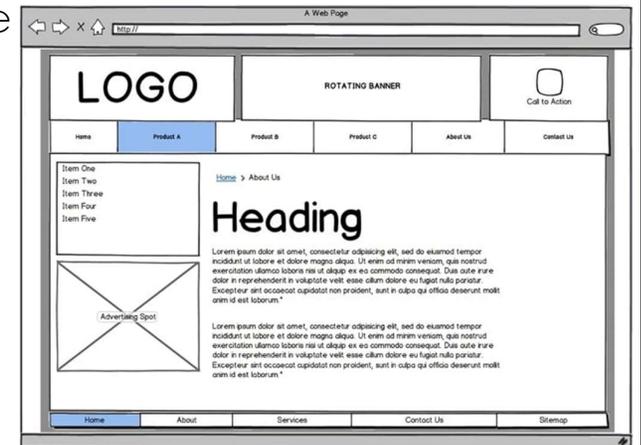
HTML Buttons

HTML buttons are defined with the `<button>` tag

Example

```
<button>Click me</button>
```

Example Wireframe

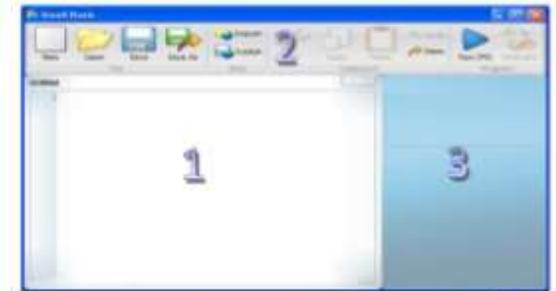


Knowledge Organiser - Small Basic

Key words	
Instruction	A single line of programming code
Execute	Means 'running' the instruction or program to see what it does
Sequence	A programming structure that means instructions are all executed in order (line by line, one after the other)
Selection	A programming structure which allows the program 'flow' to branch off. I.e. using an IF statement - you can execute lines of code depending on a condition / test.
Iteration	A programming structure that refers to repeatedly executing a line or block of code a set number of times, or until a condition is met. (FOR loop / WHILE loop)
IntelliSense	The autocomplete prompt which explains the code keywords in Small Basic
TextWindow	The black-background window which displays your outputted data.
Method	A word used to describe a programming key term which performs a specific function. E.g. Write() Read() WriteLine() are all methods.
Parameter	The value which you put in brackets after most methods. A bit like the 'setting' for the method. E.g. WriteLine("Hello World!")
Infinite Loop	A situation where a condition-controlled loop executes forever unless you end the program.
Condition	The 'test' used in IF statements and loops to determine whether the code inside the block (the IF block or the LOOP) should run (again) or not. Conditions evaluate as True or False.
Boolean	A data type which can either be True or False
String	A sequence of characters. A data type which in programming is always surrounded by " quote marks to show it is a string.
Integer	A whole number (positive or negative)
Float / Real	Both terms used to describe a number with a decimal point.

1. You write your Small Basic programs in the Editor.

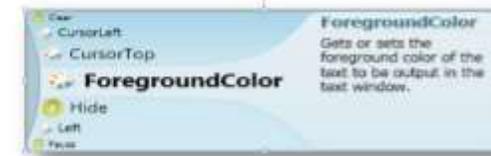
2. You can run various commands by clicking buttons on the Toolbar.



3. As you write code, you can find information about commands in the Help window.

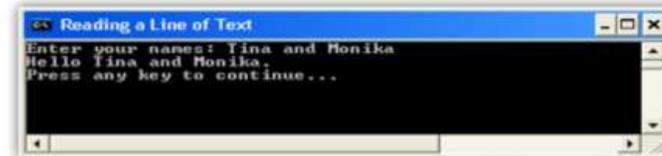
These items are part of an "IntelliSense" list, which you can use to type your programs faster.

An IntelliSense list contains commands that you can type. You can scroll through the list by pressing the UP and DOWN arrows on your keyboard, and you can press ENTER to insert the highlighted command into your code.



```
TextWindow.Write("Enter your names: ")
name = TextWindow.Read()
TextWindow.WriteLine("Hello " + name + ".")
```

entering code



what is displayed when you run the code.

- ✓ You should always start variable names with a letter.
- ✓ You can use letters, digits, and underscores in the names of your variables.
- ✓ You should name your variables so that they describe the values that they store.
- ✓ When you name your variables, you should not include certain reserved words, such as If, For, and Then.

CONDITIONS- IF THEN/ELSE

```
1 TextWindow.WriteLine("Good morning, is it a weekday? enter Y/N")
2 weekday = TextWindow.Read()
3 If weekday = "Y" Or weekday = "y" Then
4   TextWindow.WriteLine("Sorry it's a school day, time to get up")
5 Else
6   TextWindow.WriteLine("It's the weekend, stay in bed")
7 EndIf
```

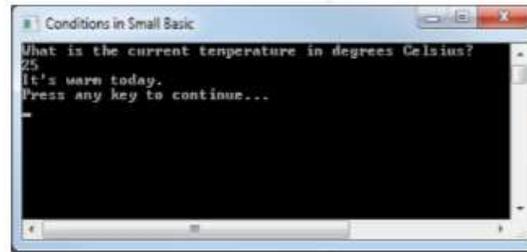
To create code where the program chooses which option to follow we use an IF statement to check a condition:

IF Condition to be checked **THEN**
Do this Statement if true
ELSE
Do this statement if false
ENDIF

When you write a program, you can specify as many conditions as you want by using the ElseIf keyword. You check through a set of options and the program will carry out the first one it comes to that is True

```
TextWindow.WriteLine("What is the current temperature in degrees Celsius?")
temp = TextWindow.Read()
```

```
If temp <= 5 Then
  TextWindow.WriteLine("It's very cold today.")
ElseIf temp <= 15 Then
  TextWindow.WriteLine("It's cool today.")
ElseIf temp <= 25 Then
  TextWindow.WriteLine("It's warm today.")
Else
  TextWindow.WriteLine("It's quite hot today.")
EndIf
```



In this example, when the computer evaluates a statement as true, the computer performs the operation for that condition and then proceeds to the end.

NOTE: They have to be in a LOGICAL sequence for it to work (Low - High or High - Low)

LOOPS

In general, you use a For..EndFor loop to run code a specific number of times. To manage this type of loop, you create a variable that tracks how many times the loop has to run.

If you don't know the loop count before you write a program you can use a **WHILE** loop instead of a **FOR** loop.

```
11 While answer <> "Computing"
12   TextWindow.WriteLine("Sorry, try again. What is the best subject in school?")
13   answer = TextWindow.Read()
14 EndWhile
15
16 TextWindow.WriteLine("Well done, you were right")
17
```

```
7 TextWindow.WriteLine ("Thanks " + UserName + ", how many times should I say your name?")
8 repeats = TextWindow.ReadNumber()
9
10 'create a For loop that prints out the name, the number of times they asked for
11 For a = 1 To repeats
12   TextWindow.WriteLine(" HI " + UserName)
13 EndFor
14
15 TextWindow.WriteLine("Thanks for trying my program")
```

BRANCHING

Sometimes, you may want the computer to break the flow and jump to another line of code while the program is running.

```
3 = 1
lineQ:
TextWindow.WriteLine(3)
3 = 3 + 1
If 3 < 10 Then
  Goto lineQ
EndIf
```

You can also use the Goto statement to make a program run forever.

```
1 TextWindow.Title = "Area and Perimeter with Goto"
2 Goto START
3 TextWindow.WriteLine("How long is the rectangle? ")
4 length = TextWindow.ReadNumber()
5 TextWindow.WriteLine("How wide is the rectangle? ")
6 width = TextWindow.ReadNumber()
7 area = length * width
8 perimeter = 2 * length + 2 * width
9 TextWindow.WriteLine("The area of the rectangle is " + area + ".")
10 TextWindow.WriteLine("The perimeter of the rectangle is " + perimeter + ".")
11 Goto START
```

Knowledge Organiser - Spreadsheets

Key Words	
Absolute referencing	A cell reference within a spreadsheet which remains the same when copied (replicated) to another cell.
Alignment.	The way that text is set out, for example, right, left, centred or justified.
AutoSum	This feature will add up the numbers you have entered in your sheet and displays the total in a cell of your choosing.
Cell	A box on a spreadsheet that can contain text numbers or a formulae.
Cell attributes	The way the spreadsheet cell displays data such as numbers or dates.
Cell format	The way the spreadsheet cell looks, for example changing the column width or alignment.
Cell protection	Locking the contents of the cell to prevent them from being changed.
Charting	Drawing a graph from a set of numerical data, usually from a spreadsheet program.
Columns	Vertical parts of a spreadsheet.
Complex formulae	Complicated formulae's used in a spreadsheet.
COUNTA	Count the number of non-blank cells
COUNTBLANK	Count cells that are blank
Data	A general term used for numbers, characters, symbols, graphics and sound which are accepted and processed by a computer system.
Delete	To remove data
File	Information held on backing storage or in memory.
Formulae	A calculation involving one or more cell references in a spreadsheet.
Hard Copy	A printed copy of your work, usually on paper.
Insert	To put Information.
Insert column	To add a column .
Insert row	To add a row.
Integer	A whole number, with no fractional part or decimal point.
Merged Cell	When two or more cells are combined, it's become what is known as a merged cell.

Key Words	
Print file	To obtain hard copy.
Relative Referencing	When a formulae in a spreadsheet is changed relative to its position, during copying or replication.
Replicate	To duplicate
Rows	Horizontal parts of a spreadsheet.
Ribbon	Above the workbook is a section of command tabs called the Ribbon.
Spreadsheet	A program used mainly for dealing with number data. It divides the screen into rows and columns. The cells can contain text, numbers and formulae.
Table	A table is made up of data arranged in rows and columns like a spreadsheet and data is placed in the cells.
Workbook	The workbook refers to an Excel spreadsheet file.
Worksheet	Within the workbook is where you will find documents called worksheets.

Functions	
SUM	adds values in selected cells
MINIMUM(..) or MIN(..)	A function used to find a minimum value in a range.
MAXIMUM(..) or MAX(..)	A function used to find a maximum value in a range.
AVERAGE(..)	A function used to find the average value in a range.
COUNT	counts how many of the selected cells have numbers in them
IF	change the value of a cell if something is true, eg if a customer's total bill is over £100, deduct 10% from their bill.
COUNTIF	adds up cells that meet a certain rule, eg count the number of students that achieved level 6.
VLOOKUP	is an Excel function to lookup and retrieve data from a specific column in table.

Symbols used in formulas			
+	add	*	multiply
-	subtract	/	divide

Column

Row

Cell

	A	B	C	D	E	F	G	H
1	Surname	Forename	Year of Birth	House	Form	Birth Place	Behaviour Points	Reward Points
2	Anderson	Brian	2001	Mason	M1	Hull	0	30
3	Banks	Peter	2000	Mason	M2	York	1	67
4	Delta	Simon	2000	Hockney	H7	Hull	0	54
5	Carrington	Frank	2000	Palin	P3	Hull	1	30
6	Ellis	James	2000	Mason	M3	Beverley	0	3
7	James	Martin	2001	Hockney	H3	Selby	3	25
8	Hughes	Jake	2000	Garrett	G2	Hull	0	30
9	Reed	Ben	2001	Garrett	G1	Hull	5	15
10	Bassett	James	2002	Palin	P3	York	0	30
11	Williams	Jordan	2003	Hockney	H3	Hull	1	35
12	Robinson	Sam	2004	Hockney	H3	York	1	30
13	Green	Alex	2005	Mason	M4	Selby	1	67
14	Dean	Mark	2006	Mason	M9	Hull	0	30
15	Griffiths	Tom	2007	Hockney	H7	Hull	1	23
16	Rose	Thomas	2008	Garrett	G8	Selby	0	30
17	Senior	William	2009	Garrett	G3	Hull	10	24

Every cell has a unique name called a Cell Reference.
The cell reference for this cell is D12

	A	B	C	D	E
1	Surname	Forename	Year of Birth	House	Form
2	Anderson	Brian	2001	Mason	M1
3	Banks	Peter	2000	Mason	M2
4	Delta	Simon	2000	Hockney	H7
5	Carrington	Frank	2000	Palin	P3
6	Ellis	James	2000	Mason	M3
7	James	Martin	2001	Hockney	H3
8	Hughes	Jake	2000	Garrett	G2
9	Reed	Ben	2001	Garrett	G1
10	Bassett	James	2002	Palin	P3
11	Williams	Jordan	2003	Hockney	H3
12	Robinson	Sam	2004	Hockney	H9
13	Green	Alex	2005	Mason	M4

Charts and graphs

line graph	to show a change over time
pie chart	show the individual parts that make up a whole
bar chart	compare things that aren't directly related
scatter graph	look for a pattern or link between two sets of data

