



COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER

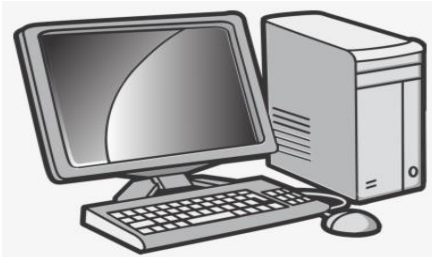


Overview



Technology Around Us

- Technology is something that has been made by people to help us.
- Technology is 'man-made' and not 'natural.' Examples include computers, phones, cars, bikes, and even pencils!
- Computers are a type of digital technology.
- Some of the different parts of a computer include the monitor, mouse and keyboard.
- There are a number of important rules to help us use computers safely.



Technology

- Technology is the name for man-made things that help us.
- Technology is all around us, and helps to make our lives easier.



-Digital technology is the name for electronic items that create and store information, e.g. computers, mobile phones, and televisions.



-Non-digital technology is the name for non-electronic items that do not create and store information.



Using Technology Safely

- When using technology, we should:
- Hold the device carefully and use it gently.
 - Not have food and drink around the device.
 - Only use the programs that we are supposed to be using.
 - Take turns with our partner, and stop using the device when we are being spoken to.



Important Vocabulary

Computers

Screen/ Monitor



Keyboard

Mouse

- Desktop computers need to be placed on a surface, e.g. a table or desk. Laptop computers are portable – they can be moved to different places.
- The screen (or monitor) displays what the computer is doing.
- The mouse lets you select and move objects (some computers have a trackpad instead).
- The keyboard lets you type letters and numbers.
- Computers can run different programs. Programs do different tasks on the computer. E.g. Microsoft Word, Microsoft PowerPoint and Paint.
- When we are using a program, we can save our work by pressing Ctrl + S or by clicking on this icon.



Using a Mouse



- The mouse can be used to click and drag.
- Clicking the left button lets us select something. Clicking twice quickly lets us open files and programs.
- Clicking the right button gives us options.
- Holding the left button down allows us to drag things.



Using a Keyboard



- Writing on a computer is called typing. We do this on a keyboard.
- Holding the shift key, or pressing caps lock, helps us to type a capital letter.
- Delete and backspace buttons can help us to remove typing.

Technology

Man-made

Digital

Screen

Mouse

Keyboard

Program

Click/ Drag

Cursor

E-Safety



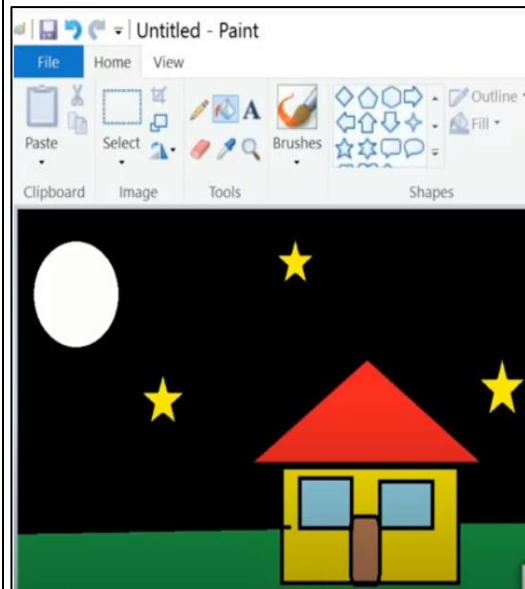
COMPUTING: CREATING MEDIA

KNOWLEDGE ORGANISER

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Overview

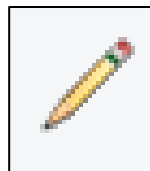


Digital Painting

- We can use digital devices to help us to draw and paint pictures.
- Some of the programs that we can use to do this are Microsoft Paint, Paintz and Sketches (for iOS).
- When we use paint programs, we can use tools to create different effects.
- We can draw in different ways, using freehand, lines and shapes in our drawings.
- We can also change sizes and colours for effect.

Simple Tools

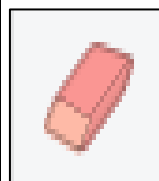
- The buttons at the top/side of the page are called tools, and they all have different jobs.
- By clicking on a tool (with the left button on our mouse) we can select to use it.



This is the pencil tool. It draws freehand. As we click and hold the left mouse button, it draws on the page. As we hold and move the mouse, the pencil follows on the page!



This is the paintbrush tool. It works freehand, in much the same way as the pencil does. However, we can choose a number of different colours (by clicking on them) to paint with!



The eraser tool lets us rub out parts of our drawing when we have made a mistake. It works by clicking and holding the left mouse button over the areas to erase.



The undo tool reverses the last thing that you did. If you make a mistake, the undo tool can help you to get your drawing back to how it was beforehand!

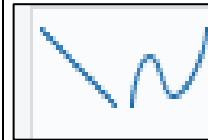
More Complex Tools



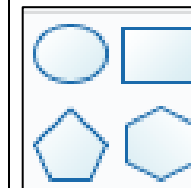
This is the fill tool. It let us fill a shape with a colour of our choice. Be careful though, if the shape has any gaps in it, the fill tool will colour everything else!



This is the spray-paint tool. When you hold down the left button on the mouse, it is like you are spraying a can of spray-paint. With this tool, it is more difficult to colour neatly.



The line tools are useful when we need to draw a line more neatly than we can do with freehand. You can select the start and end points of your line, and choose if you want it to be straight or curvy.



The shape tools draw perfectly formed shapes! There are many different shapes to choose from. As we click and drag using the left mouse button, we make the shape bigger and smaller.



When we want to save our painting, we should click on this icon. The first time that we save, we need to choose a file name and a location (folder) to save it in.

Making Careful Choices



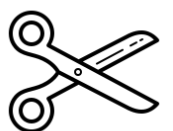
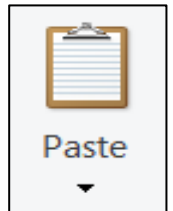
Be clicking on this icon, we are able to choose the size of the lines that we draw with.

We can choose thick, bold lines, or thin, feinter lines for effect.

These tools mean that we don't have to draw the same things over and over again if we need to repeat them.

The copy tool makes a copy of the line, shape, drawing features that are selected. By pressing paste, the copy will then appear on the page.

The cut tool also makes a copy of the line, shape, or drawing, but removes the original. The paste option places the copy in the new location.



Important Vocabulary

Paint Program

Tool

Paintbrush

Erase

Fill

Undo

Click

Drag

Save

icon

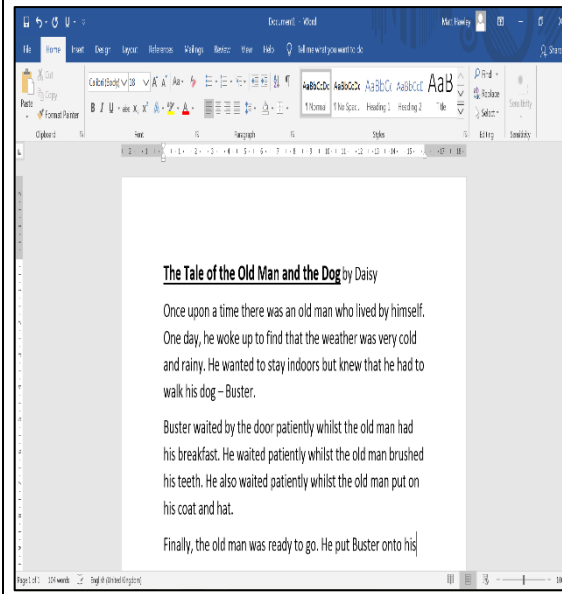


COMPUTING: CREATING MEDIA

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Overview



Digital Writing

- We can use digital devices to help us to write.
- The programs that we do this on are called word processors. Examples of word processors include Microsoft Word and Google Docs.
- When we use word processors, we can use a keyboard and a mouse to enter and remove text.
- We can also change the look of the text by changing things like the font and the size.
- Writing digitally has the benefit that it is neat and tidy, and it can be easily edited.

The Toolbar

The toolbar is the set of icons and buttons that are at the top of the page in a word processor. Below are some of the most common tools.

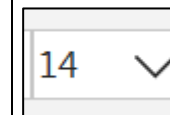
These tools can change the text.



The B makes the text **Bold**.

The I writes the text in *Italics*.

The U underlines the text.



Clicking on this icon allows you to change the size of the text. After pressing the icon, you will see a list of numbers. The larger the number selected, the bigger your text will be.



Clicking on this icon allows you to change the font (style) of the text. Most word processors have many styles to choose from.



Clicking on this icon opens the text colour tool. It allows you to change the colour of the text. There are often many colours to choose from.



When we want to save our writing, we should click on this icon. The first time that we save, we need to choose a file name and a location (folder) to save it in.

Using a Keyboard

- A keyboard is an input device that lets a person enter letters, numbers and symbols.
- Most keyboards are laid out in the same way. This is often called the QWERTY layout.
- The buttons on a keyboard are called keys.
- You can choose where to write by moving the cursor (the arrow) over the page. When you click a flashing line will appear. This is the text cursor. It allows you to type in letters.



Caps key, press this for capital letters.

Space bar, for leaving spaces.

Backspace key, removes the letter on the left of the text cursor.

Enter key, moves everything after the text cursor down one line.

Arrow keys, can move the text cursor.

Making Careful Choices



The undo tool reverses the last thing that you did. If you make a mistake, the undo tool can help you to get it back to how it was.

The redo button re-does something that you have undone!



Hand writing or Digital writing?

- Hand writing is often seen as more personal. For many people, it is a bit quicker than typing.
- Digital writing is often neat, tidy and easy to read. It can be more easily edited (changed).

Important Vocabulary

Word Processor

Text

Font

Keyboard

Text Cursor

Enter

Spacebar

Toolbar

Font

icon

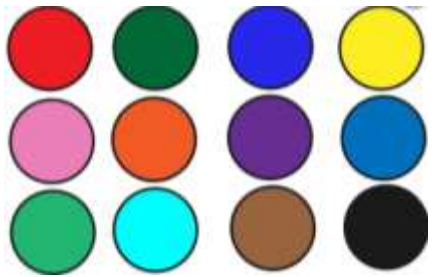


COMPUTING: DATA AND INFORMATION KNOWLEDGE ORGANISER



Overview

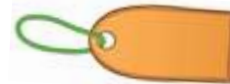
Grouping Data



- Data can be numbers, words or figures. Information is what we can understand from looking at data.
- Objects can be labelled using either their names or describing their properties.
- Labels can be used to place objects into groups. This helps us to count and compare data easily, through looking at similarities and differences.

Labels and Properties

- **Labelling:** Labels are all around us!
- Labels are the names that we give to things so that we can easily identify them.
- On computers, we can label different objects so that the computer knows what they are.



- **Properties:** Objects have different properties (features) that we can choose to label them by.

- Some examples of the properties of an object include its size, its colour and shape.

- We can use properties to tell computers what objects are and how to sort them.

- **Describing:** Objects can be described by their name labels and their properties.

- E.g. the picture here could be correctly labelled as 'dog', 'Labrador' or 'animal.'

Use describing adjectives for accuracy, e.g. big, circular, blue, old, thin, long, heavy etc.



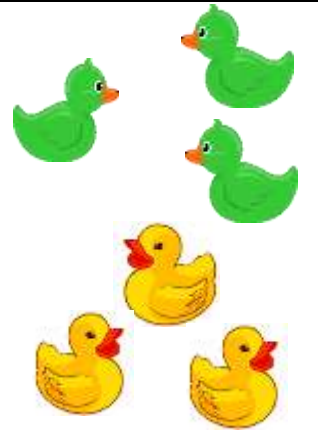
Grouping and Counting

- **Grouping:** The same objects can be put into different groups, depending upon their properties. Computers can help us by allowing us to put different objects into groups.

- For example, a computer can be asked to group all of the pictures that have a certain name label, e.g. 'duck', or property, e.g. yellow.

- **Counting:** Computers can be programmed to count the amounts in each group.

- For example, when your teacher takes the class register, the computer program can count how many ticks and crosses there are, to tell the teacher how many children are in school.



Jamie	✓
Elizabeth	✓
Ella	✗
Harry	✓
Marcus	✓
In school: 4 Absent: 1	

Comparing

- **Comparing** is when we look at what is similar (the same) and what is different between objects. You can compare objects or groups of objects.

Examples of comparing words

- more than, less than, the same as, least, most, bigger, smaller, older, younger, longer, shorter, wider, thinner.



Answering Questions

- Objects can be grouped in order to **answer questions and solve problems**.

- For example, if asked how many orange items there are below, you could group them into 'orange' and 'not orange.' To find out if there is more fruit than vegetables, you could group them into 'fruit' and 'vegetables.'



Important Vocabulary

Information

Data

Search

Label

Group

Describe

Program

Properties

Similar

Different



COMPUTING: PROGRAMMING

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Overview



Animations in Scratch Jr.

- Programming is when we make a set of instructions for computers to follow.
- Scratch jr. is a program that we can use in order to code our own stories and animations. It involves sprites (characters on the screen).
- We use algorithms (a set of instructions to perform a task) to program the sprite to do different things.

The Basics of Scratch Jr.

- **What is Scratch Jr?** Scratch is a website/ app that lets us code our own stories, games and animations.

- **Sprites:** Scratch Jr. uses characters called sprites. The main sprite is a cat called Scratch.

- **Home:** Clicking on the house takes you 'home' to your project screen.



Getting Started

- The + (right) starts a new project.



- These (right) are the **programming blocks**. We drag them into the **programming area** (right). Clicking the block in the area makes the sprite perform on the stage.



- **Background:** Backgrounds are added by clicking this icon (right).



- **Start Blocks:** Start blocks are yellow. These are used to start/run programs.



- **End Blocks:** End blocks are red. These show what happens at the end of your program.



Sequencing

- **Sequences:** -A sequence is a pattern or process in which one thing follows another. In Scratch Jr. we can stack blocks together side by side in order to create programs made up of sequences.



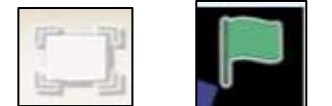
- **Deleting Blocks:** Blocks can be removed from programs by dragging them from the programming area back into the blocks palette.



- **Repeating Blocks:** For something to happen more than once, we can change the number underneath the block.



- **Running the Code:** Run your animation by tapping the full screen icon, and then the green flag.



Algorithms and Programming

- An **algorithm** is a set of instructions for performing a task. Designing an algorithm can help us to make the sprite do the things that we want it to do.



- **Programming** is when we move the blocks into the position (based on our algorithm design). Our programming codes the sprite to perform the actions.



Debugging

- Sometimes, things don't work exactly how we want them to the first time. This may be a problem with our algorithm, or we could have made a mistake in our programming.



- If the animation does not work correctly the first time, remember to **debug** it. This means finding and fixing the problems.



Important Vocabulary

Programming

Scratch Jr.

Sprite

Home

Command

Block

Stage

Background

Algorithm

App



COMPUTING: PROGRAMMING

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Overview

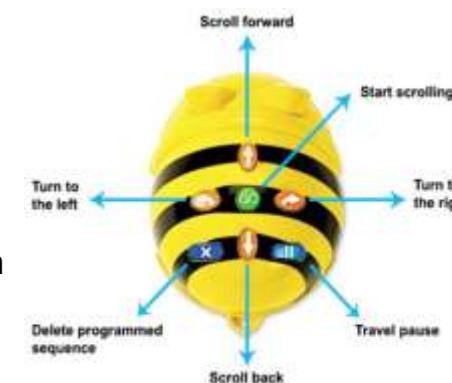
Moving a Robot

- Programming is when we make a set of instructions for computers to follow.
- Robots are one type of machine that can follow programs. Floor robots include Bee-bots and Blue-bots.
- Floor robots have buttons which help us to direct them. We can use algorithms (a set of guidelines to perform a task) to program floor robots along routes.



Buttons and Programs

- **Buttons:** Bee-bots have buttons on the top. They each make the Beebot do something different (see picture).
- The arrows move the Bee-bot in different directions.
- The GO button makes the Bee-bot start its program. (on some models, it also pauses the Beebot in-program).
- **Programs:** A program is a series of instructions. We can program the Bee-bot by pressing the direction buttons (in order) that we want it to move in, followed by GO.
- The X button makes the Bee-bot delete the program and make a new program. Switching the Bee-bot off and on again also deletes the program.



Robots and Floor Robots

- **Robots:** Robots are machines that we can program to do human jobs.
- Robots help us to do things, for example to help us clean, mow and learn!
- Robots in factories make things, and in hospitals they help make us better.



- **Bee-bots:** Bee-bots are a type of floor robot.
- We can programme Bee-bots to move around.



Bee-bots should only be used on the floor, and not tables etc. They can be damaged if they fall from high surfaces. (Other floor robots, e.g. Blue-bot, can also be used).

- **Turning on a Bee-bot:** Before we use a Beebot, we need to make sure it is charged.

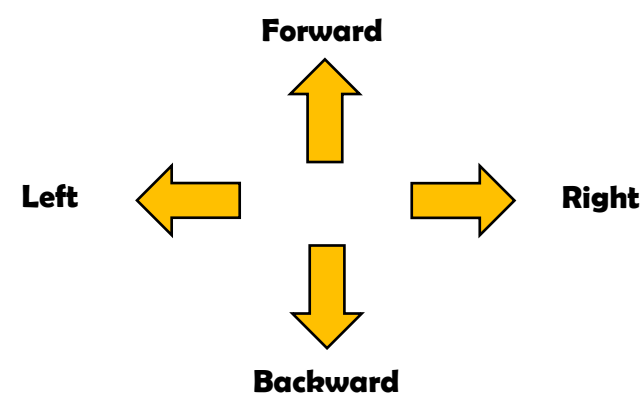


To turn it on, using the switch underneath. You can tell that the Bee-bot is on because its eyes light up. Switch it back off again after you have finished using it.



Directions

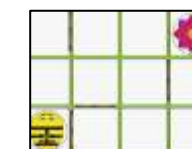
- In order create clear routes for our Bee-bots, we need to be sure of our directions.



Make sure that you stand behind Bee-bot.

Routes and Algorithms

- A route is the course that we travel to get somewhere. We use algorithms (a set of guidelines to complete a task) to program our floor robot to take a route to where we want it to go.



- We should think carefully about how to avoid obstacles. We should also consider how many times we need to press each button to travel the correct distance.

Important Vocabulary

Programmed

Robot

Algorithm

Button

Direction

Forward

Backward

Left

Right

Route



COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER



Overview

Technology Around Us



- You should already know that Technology is something that has been made by people to help us.
- Technology is 'man-made' and not 'natural.'
- Information technology (I.T.) includes computers and things that work with computers.
- Information technology is in lots of important items in our homes and around the world.
- It is important that we understand how to use information technology safely.

Information Technology

- Technology is the name for man-made things that help us.
- Information technology is made up of computers and things that work with computers.

-Information technology includes computers, for example desktop computers, laptops, games consoles, smart phones and tablet.



-Information technology also includes devices that work with computers, e.g. USB sticks, SMART boards and digital cameras.



Using Technology Safely

- We can create and follow a number of rules to use technology safely, e.g.:
- Make sure that the games and apps that we access are age-appropriate.
 - Always sit down when using devices. They can be broken if dropped!
 - Do not use devices at social times, e.g. at the table. It is bad manners.
 - Stick to using technology at agreed times. Too much screen time is not good for us!



I.T. in the Home

There is lots of information technology in our homes. I.T. is used to:

- Control the tools and appliances that we use in the home, e.g. the panel for the heating, setting the washing machine, and programming the microwave.
- Help us to communicate with one another, e.g. the internet router and the telephone.
- Entertain us, e.g. the information technology in toys, consoles and computer games.



I.T. in the World

There is also lots of information technology in the wider world

- I.T. can be found in shops, e.g. the barcode, barcode scanner and till all work together to scan your shopping items.
- I.T. can be found in ATMs, e.g. the bank card, chip and PIN card reader help you to access your bank account.
- I.T. can be found outside, e.g. traffic lights, buttons, and signals work together to tell you when to cross the road.



How I.T. Improves Our World

-Information Technology helps us in lots of different ways in our daily lives.

-I.T. can help to make things quicker and easier. E.g. at the supermarket, the barcodes/ scanners quickly add up the product numbers and costs of the things that we want to buy.



-I.T. can also help us to stay safe. E.g. The traffic lights, buttons and signals help us to avoid traffic when crossing the road.

-I.T. also helps us to communicate with one another and have fun! E.g. it can connect us to the internet, and can allow us to play games, share and receive information.



Important Vocabulary

Information
Technology

Computer

Device

Barcode

Scanner

Communication

Entertainment

Appliances

Signal

E-Safety



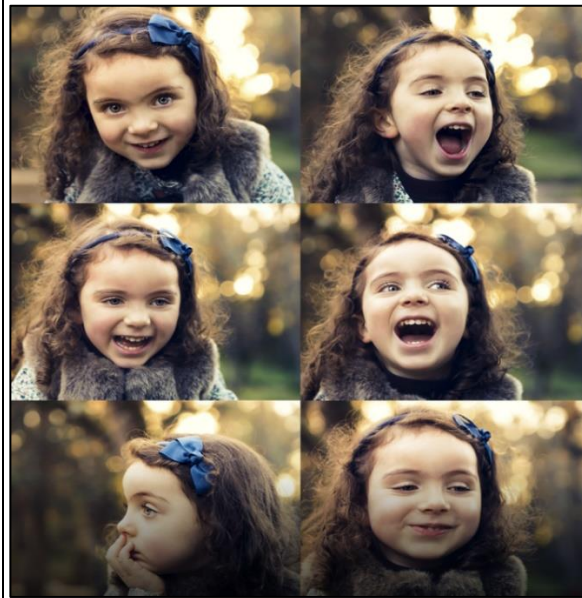
COMPUTING: CREATING MEDIA

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Y2



Overview



Digital Photography

- We can use digital devices to help us to take and edit photographs.
- Many different devices can be used to take photographs, for example digital cameras, phones, tablets and webcams.
- We can also use lots of different apps and programs to edit and improve photos, for example Photoshop, Luminar and Pixlr.
- We should understand the not all photographs that we see are real – they may have been edited.

Taking Photographs

Photography is a way of making a picture using a camera.

- There are lots of different photography devices (things that we can take photographs on).

e.g. smartphones, digital cameras and tablets.

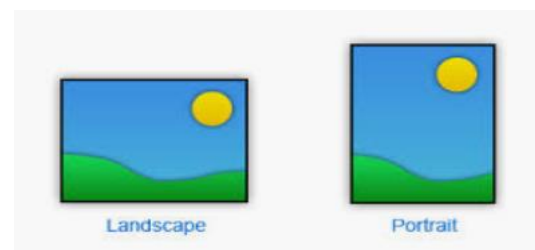


- There are also lots of different subjects we can take photos of: e.g. a selfie, an action shot, or a beautiful scene.

How to take a photograph

1. Hold the device firmly with both hands
2. Point the camera at the subject.
3. Look at the viewing screen.
4. Move the device to get the shot that you want.
5. Press the capture button.

Choose landscape or portrait.



Editing Techniques

Editing is when we add, change and remove things to get the result that we want.
Many things can be edited in photographs to create different effects.



Photograph editing programs often have filters. These can change the colours in a photograph. Different colours can give us different feelings.



You can also change the contrast of a photograph. This can make the subjects become clearer or more blurry.



When the lighting of the photograph is not quite right, we can change the brightness of the photograph.



There are features that we can add or remove from the photograph whilst editing. E.g. removing red eyes.



When we want to save our edit, we should click on this icon or the 'save' button. The first time, we need to choose a file name and a location (folder) to save it in.

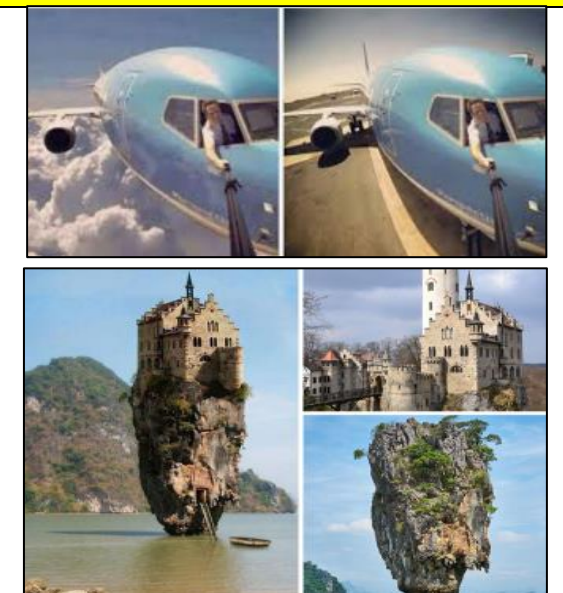
Real or Edited?

- There are lots of different ways that images can be changed. Sometimes it is hard to tell whether a photograph is real or has been changed.

- The software for editing photographs is becoming better, and people are getting more skilled at using it.

- People may change a photograph to make it look as though it is real, but in fact it is edited

- They may do this to try and advertise a product or present something in a different way. Do not always believe what you see!



Important Vocabulary

Photography

Editing

Software

Digital

Portrait

Landscape

Scene

Subject

Lighting

Colour



COMPUTING: CREATING MEDIA

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Y2



Overview

Making Music



- We can use digital devices to help us to create, edit and listen to music.
- Music can make us think and feel different things.
- Rhythm, pitch and tempo can be used to change the sound and emotion of music.
- We can also use lots of different apps and programs to edit and improve photos, for example Chrome Music Lab, Magic, and Music Maker.
- We should understand the advantages of creating both digital and non-digital music.

Describing Music

Music is a type of art that can be heard. It can make us feel different emotions.

Some words to describe music:

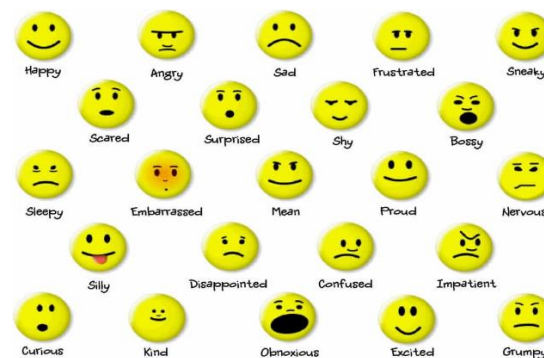
Loud	Soft	Gentle	Fast	Slow
Catchy	Boring	Interesting	Noisy	
Smooth	Modern	Old-fashioned	Scary	



Music can make us feel different emotions.

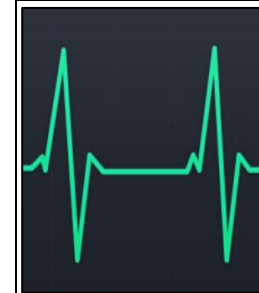
Some of these emotions may include:

Happy	Sad	Excited	Depressed
Bored	Worried	Angry	Nervous
Scared	Surprised	Motivated	Tired

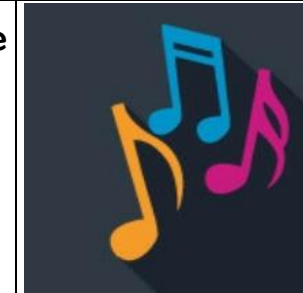


Music Vocabulary

There are lots of different things to consider when we are making and listening to music. Some of the most important words that you should know are below.



Pulse is the steady beat, like a ticking clock or a heartbeat. Music has a pulse. Sometimes, we can clap or move in time to the pulse of music.



Rhythm is the pattern of long and short sounds in music. In lots of music, a rhythm is repeated throughout the song.



The pitch is how high or low a sound is. An example of a high-pitched sound is a whistle, a low-pitched sound is a drum.



The tempo is how fast or slow the music is. Fast-tempo music can sound energetic or frightening. Slow-pitched music can sound sad.



Volume is how loud or quiet something is. When making music, we can use loud and quiet sounds to show different ideas and emotions.

Using Song Maker

-On Chrome Music Lab, click on the multi-coloured smiley face for Song Maker.

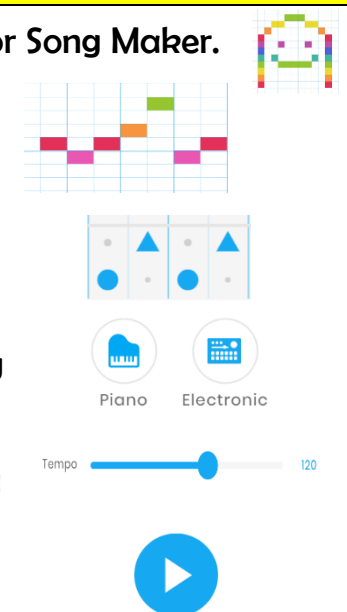
-By clicking on the different squares, you can make different musical notes. The higher up you click, the higher the pitch!

-Clicking on the shapes below the notes allows you to add in percussion, e.g. drums and symbols.

-You can change the instruments that make the sounds, by clicking on the different options in the bottom left.

-By moving the dot along this bar (at the bottom of the page) you can change the tempo, making it faster or slower.

-This symbol lets you listen to the music that you have made!



Important Vocabulary

Music

Emotions

Pulse

Rhythm

Patterns

Pitch

Tempo

Instrument

Sound

Note

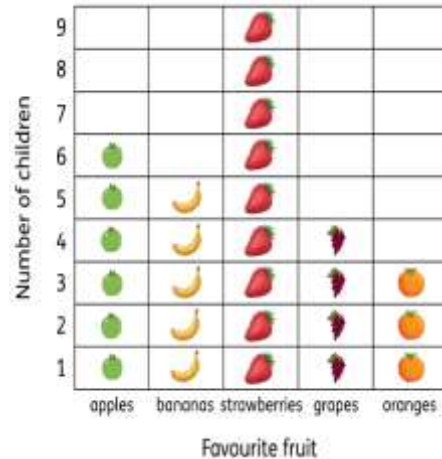


COMPUTING: DATA AND INFORMATION KNOWLEDGE ORGANISER



Overview

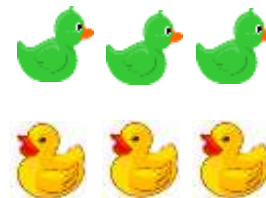
Pictograms



- Data can be numbers, words or figures. Information is what we can understand from looking at data.
- Objects can be organised into groups, based on what they are or their properties (features).
- Data about different groups can be recorded and presented by using pictograms, tally charts and block charts. This data can answer questions and solve problems.

Grouping, Counting and Tallying

-Grouping: Objects can be put into different groups. These groups can be made up of objects that are the same, or objects that have the same properties (features).



Computers can help us by allowing us to put different objects into groups.

-Counting: Computers can be programmed to count the amounts in each group.

Jamie	✓
Elizabeth	✓
Ella	✗
Harry	✓
Marcus	✓
In school: 4 Absent: 1	

-For example, when your teacher takes the class register, the computer program can count how many ticks and crosses there are. The computer can then tell your teacher how many children are in class.

-Tallying: Tallying helps us to record as we count. We chunk into groups of five, with the first four counts looking like sticks, and the fifth count making the 'gate.'

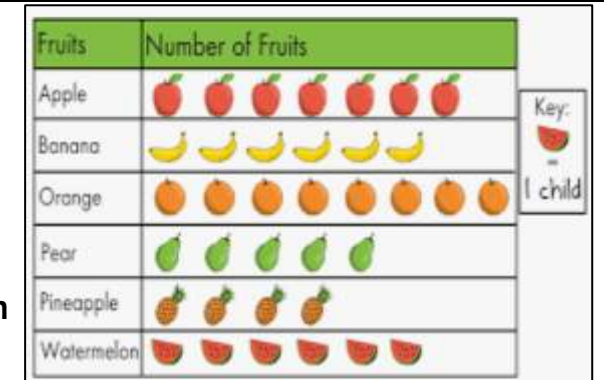


-Tally Charts: Tally charts are used to collect data about the number in each group quickly.

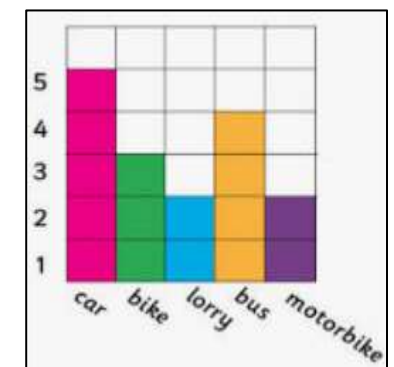
Animals	Tally Marks
Tiger	
Giraffe	
Elephant	
Deer	

Pictograms and Block Diagrams

-Pictograms: A pictogram is a chart that uses pictures to display data. They can be made using pens or paper, or they can be made using a computer. The pictogram on the right shows the favourite fruits of a group of school children. Each piece of fruit shows what each child selected.



-Block Charts: Block charts work in a similar way to pictograms, except each object is presented as a block. The block diagram on the right presents how different children get into school.



Presenting and Using Information

-Computer programs such as *j2data* can help us to create pictograms and block charts. Clicking the + and - icons add and subtract pictures from our diagram.

-Using Data: There should be a reason to collect data, and so it should be easy to read. E.g. this data could help someone know which fruits to buy if they are hosting a party, or help the school chef know which fruit to order in.



Answering Questions

-Pictograms can be used in order to **answer questions and solve problems.**

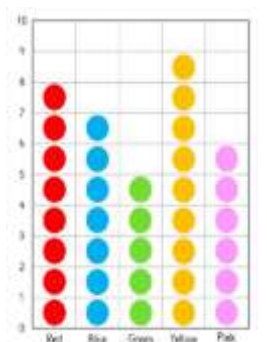
-Examples may include:

-Which colour was the most popular?

Which colour was least popular?

-How many more chose yellow than chose pink?

-What is the total of red and blue combined?



Important Vocabulary

Information

Data

Pictogram

Group

Tally

Tally Chart

Program

Properties

Present

Problem



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Overview



Quizzes in Scratch Jr.

- Programming is when we make a set of instructions for computers to follow.
- Scratch jr. is a program that we can use to code programs using a series of command blocks. This can be used to design quizzes.
- We use algorithms (a set of instructions to perform a task) to program the sprite to do different things.

Creating Quizzes

-**Outcomes:** An outcome is something that happens as a result of us doing something. E.g. in cookery, we can mix and cook ingredients to make an outcome of food! In Scratch Jr. a sequence of commands is followed and this results in an outcome.



-**Quizzes in Scratch:** We can create simple quizzes in Scratch jr. where the user can select an answer by clicking on a sprite. An outcome occurs when the sprite is clicked.



-**Adding and Programming Sprites:** We need multiple sprites for the user to select from. To add new sprites, we choose the + option (see right). We can program multiple sprites. The sprite we are programming is the picture in the programming area.



-**Programming Sequences:** Consider what question to ask your users, e.g. Who lives here? Program each sprite with a command sequence, so that they know if they are right or not when clicking on the sprite.



The Basics of Scratch Jr.

-**What is Scratch Jr?** Scratch is a website/ app that lets us code our own stories, games and animations.

-**Sprites:** Scratch Jr. uses characters called sprites. The main sprite is a cat called Scratch.

-**Home:** Clicking on the house takes you 'home' to your project screen.



-These (right) are the **programming blocks**. We drag them into the **programming area** (right). Clicking the block in the area makes the sprite perform on the stage.



-**Background:** Backgrounds are added by clicking this icon (right).



-**Running the Code:** Run your animation by tapping the full screen icon, and then the green flag.



-**Sequences:** -A sequence is a pattern or process in which one thing follows another. In Scratch Jr. we can stack blocks together side by side in order to create sequences.



-**Start Blocks:** Start blocks are yellow & are used to start/ run programs. The second block on the right starts the program when the sprite is clicked on.



-**End Blocks:** End blocks are red. These are used to end your program.

Algorithms and Programming

-An **algorithm** is a set of instructions for performing a task. Designing an algorithm can help us to make the quiz work in the way that we want it to.



-**Programming** is when we move the blocks into the position (based on our algorithm design). Programming uses a code that the computer can understand. In Scratch jr. this makes our quiz animation do the things we want it to.



Debugging

-Sometimes, things don't work exactly how we want them to the first time. This may be a problem with our algorithm, or we could have made a mistake in our programming.



-If the animation does not work correctly the first time, remember to **debug** it. This means finding and fixing the problems.



Important Vocabulary

Programming

Scratch Jr.

Sprite

Quiz

Command

Block

Debugging

Sequence

Algorithm

Outcome



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Overview

Robot Algorithms



- Programming is when we make a set of instructions for computers to follow.



- Robots are one type of machine that can follow programs - they follow what we instruct them to do.



- We use algorithms (a set of instructions to perform a task) to help robots to do things that we want them to. Debugging can help to correct algorithms and programs.

Using a Floor Robot

- **Robots:** Robots are machines that we can program to do human jobs.

- Robots help us to do things, for example to help us clean, mow and learn!

- Robots in factories make things, and in hospitals they help make us better.



-Turning on a Bee-bot:

Before we use a Bee-bot, we need to make sure it is charged.

To turn it on, using the switch

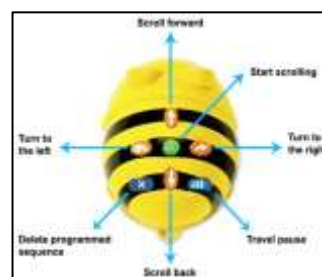
underneath. You can tell that the Bee-bot is on because its eyes light up.

Remember to switch it back off again after you have finished using it.



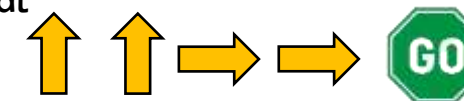
- **Buttons:** Bee-bots have buttons on the top. They each make the Beebot do something different (see picture).

- The arrows move the Bee-bot in different directions. The GO button makes the Bee-bot start its program. The X button makes the Bee-bot forget the last set of instructions.



Algorithms and Instructions

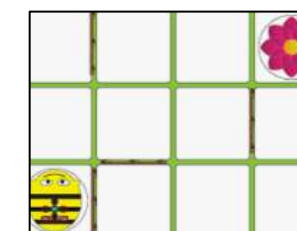
- **Algorithms:** Algorithms are precise set of instructions, that a computer can turn into a code. A floor robot has a computer inside of it.



- **Programs:** When we press the buttons of our floor robot, we are creating a program for it to follow. The program is how the algorithm is run as code on the robot.



- **Instructions:** It is important that our instructions to the floor robot are clear. If our sequence of instructions is in the wrong order, has anything missing, or has anything additional, the floor robot will end up in a different place! Plan the route to avoid obstacles and get to the right place.



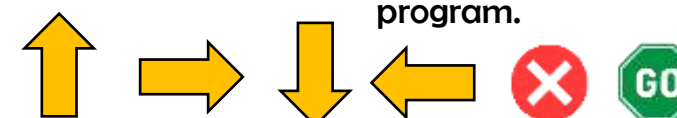
Designing Algorithms

- We can buy or create mats for floor robots. We then need to design our algorithms so that the robot follows the given route.



- We should carefully consider the start point & end point that we want the robot to reach.

- Use symbols (e.g. arrows, crosses) to indicate the commands that will be inputted as a program.



Chunking and Debugging

- **Chunking:** With larger programs, we can break the task into chunks and create algorithms for each chunk.

- **Debugging:** Debugging is finding and fixing errors in our algorithms and programs. These errors can include:

- Sequence errors: An instruction in the sequence is wrong or in the wrong place.

- Keying errors: Typing in the wrong code.

- Logical errors: Mistakes in plan/thinking.

Important Vocabulary

Program

Robot

Algorithm

Direction

Route

Obstacle

Design

Error

Chunking

Debugging