Greenfield Primary School — Year 2 — Knowledge Organiser

COMPUTING: SYSTEMS, NETWORKS AND ONLINE SAFETY- IT Around Us

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

-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!
- If you see something upsetting online, make sure you tell a trusted grown up.

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

-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.

Important Vocabulary

Information Technology | Computer | Barcode | Scan

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COMPUTING: CREATING MEDIA- Digital Photography

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.

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

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 the 'save' button. The first time, we need to choose a file name and a location (folder) to save it in.

If we are using an iPad, we can retrieve our images from the camera roll.

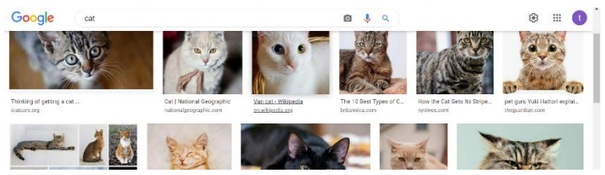
Real or Edited?

-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!



If we are looking at photographs on a website, we can use the scrollbar to move the page up and down.

Important Vocabulary

Device Capture Image Digital Landscape Portrait Filed of view Narrow Wide Format Framing Focal point Subject natter Compose Natura/artificial lighting Flash Focus Background/foreground

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COMPUTING: CREATING MEDIA- Making Music

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

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

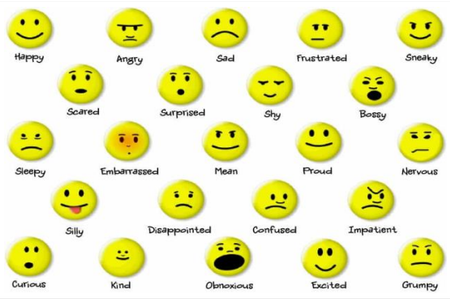
Music can make us feel different emotions.

Some of these emotions may include:

Happy Sad Excited Depressed

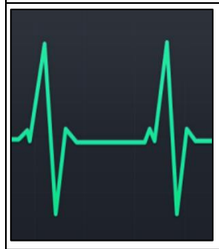
Bored Worried Angry Nervous

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.

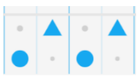
The tempo is how fast or slow the music is. Fast-tempo music can sound energetic or frightening. Slow-pitched music can sound sad.

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

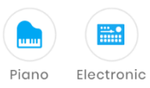
Using Song Maker

-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.

Important Vocabulary

Music Quiet Loud Feelings Emotions Pattern Rhythm Pulse/Beat Pitch Tempo Notes Instrument Create Open Edit

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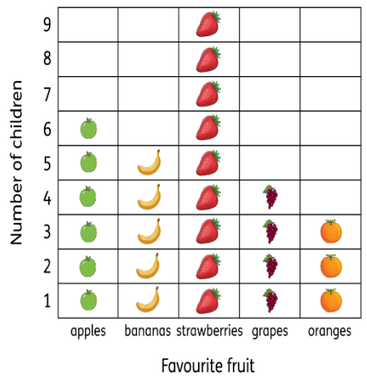
COMPUTING: DATA AND INFORMATION- Pictograms

Overview



Pictograms

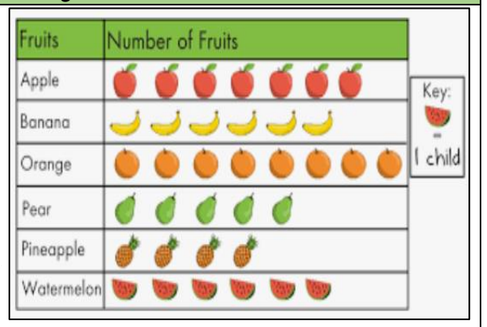
-Data can be numbers, words or figures. Information is what we can understand from looking at data.

-Objects can be organised into groups, based on what they are or their properties (features).

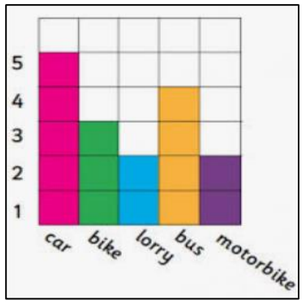
-Data about different groups can be recorded and presented by using pictograms, tally charts and block charts. This data can answer questions and solve problems.

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.



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.

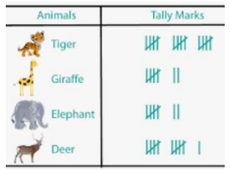
-For example, when your teacher takes the class register, the computer program can count how many ticks and crosses there are. The computer can then tell your teacher how many children are in class.

Jamie	✓
Elizabeth	✓
Ella	✗
Harry	✓
Marcus	✓

In school: 4 Absent: 1

-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.



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

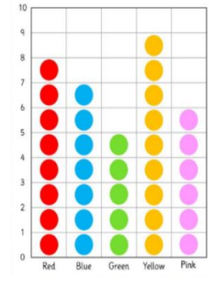
-Pictograms can be used in order to answer questions and solve problems.

-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

Organise Tally chart Votes Total Pictogram Enter Compare Count Explain Attribute Difference Most/least popular Conclusion Block diagram

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COMPUTING: PROGRAMMING- Introduction to Quizzes

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.

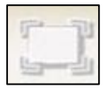
The Basics of Scratch Jr.

-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. We can change the number at the bottom of some blocks to alter distance or size.

-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.

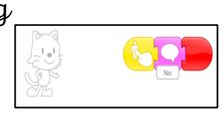
-End Blocks: End blocks are red. These are used to end your program.

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.

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

Start Outcome Predict Blocks Actions Change Build Match Compare Evaluate

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COMPUTING: PROGRAMMING- Robot Algorithms

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.

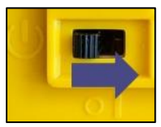
Using a Floor Robot

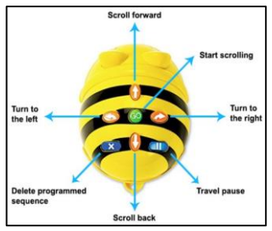
-Robots: Robots are machines that we can program to do human jobs.

-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.



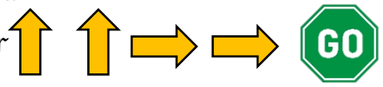


-Buttons: Bee-bots have buttons on the top. They each make the Beebot do something different (see picture).

-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.

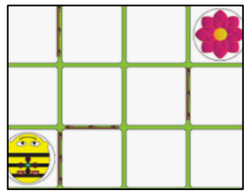
Algorithms and Instructions

-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.

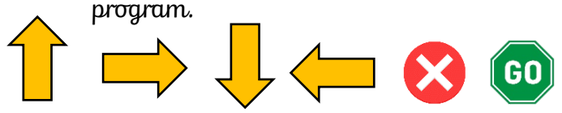


Designing Algorithms

-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

Instruction Sequence Clear Order Commands Prediction Design Route Debugging