The rainbow sparkle unicorn computer was designed around the concept of reusability when you have finished with the board in your project, if you have glued your board or is inaccessible in an easy way, you can simply remove the chips from it and obtain a new board at a very low cost.

The board has been designed in England and has been printed in China

using load free components a tour of the factory where the board has made

is available on YouTube. The board is designed to work with both micro bits version one and version two.

The current series of boards is printed on black PCB. However, future versions of the board may change that colour. However, the functionality will remain the same.

The board solves many problems when trying to build projects for school aged students. How do I make available all the fun things I know what to see flashing lights flashing fancy buttons, touch sensitive areas. Lots of sound effects spinny dials, and knobs and leavers.

One of the other problems that the board solves is how to power all of these components. As you make your project more and more sophisticated, they require more and more power. The board is powered very easily via a USB C connection. This can either be powered via a wall socket, with a USB adapter or via a USB battery. The USB battery should be capable of delivering approximately two amps of power. If you are using multiple servers. If you take the chips off the board, or look into the chips, you'll see the different areas that each of the boards is

is allowing. The board has a very future proof design. And so don't expect all of the holes to be filled or available to you.

An expert guide to the additional functionality and expansion capabilities for the board will be made available in the future.

If you flip the board over so you can see where the chips go. You will see on the top left hand corner it says

the word switch. This bright red board allows you to connect 16 switches to your project. These switches could be momentary I you just press them quickly with your finger or they can be latching This means that they click on and off like a light switch. Those 16 switches can be used to control other things on the board. Moving along now to the right, it says movement. This is a very long blue board. And this long blue board allows you to control the movement of 12 servos. The servo is a small motor which has an arm or a wheel attached to it, the arm and the wheel or the wheel can move in a clockwise or anti clockwise direction. So those can be very strong if they are very big. And this board allows

a proxy approximately eight high strength servos However, most of the servers that you'll be using in your projects will

be much smaller. And therefore you can drive the full board of all 16 servos.

Moving on to the right, you will see the next board is a blue board and that board is labelled touch. This is where the touch sensors can be detected. You will be familiar from touchscreens from your mobile phone. However, do you know that lots and lots of things can be made to work with this board. materials such as electric dough, which is playdough with a special ingredient can conduct electricity and can be used to mould funny buttons or buttons that fit into small or tight spaces.

Putting tin foil on your project and then adding a wire to that file can also be used as the file also conducts electricity. We have found that using Lego bricks with tin foil underneath them can respond to very hard tapping, but will not respond to very light tapping. This could be quite an interesting development on your project. And of course has the added fun of using Lego.

Next to the touch just above the rainbow sparkle unicorn logo is a whole series of pins. These pins provide power and allow you to add rotary dials to your project as well as sliders to your projects. The sliders look like volume controls on mixing desks. There is also the ability to drive two analogue dials up to three volts. These can be purchased very cheaply from AliExpress or other UK based vendors.

It can be quite fun to turn a dial and watch a watch the gauge go up or down depending on what you do. To the right, you'll see the words brain This is the brain of your computer. And that brain is called a BBC Micro bit. The BBC Micro bit is one of the biggest selling computers in the UK over the last decade. Almost every school child In the UK, and many schoolchildren all over the world have learned how to programme computers and have fun making projects using a BBC Micro bit the BBC Micro bit it's very special, because it can be programmed or taught how to perform your project tasks. So when I click on a button, make a spinny wheel and lights move the micro bit in this version with the black PCB should have the LED is facing inwards towards the unicorn.

The micro bit takes a standard USB micro adapter and then it plugs into your computer or you can programme it wirelessly using Bluetooth with your iPad by downloading the BBC Micro bit app how to programme a basic programme how to create a basic programme will be details further on in this guide. To the bottom right underneath the unicorn, you will see the word sound. This is a sound card, which takes micro SD cards with the music or sounds that you want to play. On the black version of the board. There are two sets of pins plus a terminal block. In order to attach your speakers to you can drive two sets of speakers using this sound card. However, there is no stereo as we envisage most projects will be fairly small in size. You can play up to 4000 tracks on your SD card or micro SD card

to the left of the sound card and to the left of the unicorn, you will see a large box with lots and lots of writing on this is the control computer or microprocessor, which is at the heart of the rainbow sparkle unicorn board.

The brain of your computer, your micro bit, talks and can listen to the control microprocessor. Together they share the responsibility to make your programme run and all of the things that you want to happen like lights and sound.

Work together. You can connect your microcontroller to the internet to a special computer called A Message Broker. A Message Broker allows the micro bit to send a message for other people to listen to.

It can also listen for messages that other people send to the micro bit. This would allow you to build a programme that could control or display on an iPad videos or photographs. By On actions that you made in your project

in order for the internet connectivity to work, the micro bit must know the Wi Fi username and password. As well as having a an account on a Message Broker platform such as shifter.io. To the left of the control is the power this is where you would plug in your USB C.

When you plug in your micro bit it will have a jumper already built into it, which will mean it will automatically turn on the minute you connect the power. If you don't want this to happen, you can take the jumper out and put in a normal latching power switch. This would give you the ability to have the board hidden away with a battery or near a wall powered by USB power supply and have the on off switch built into your project or nearby your project. To the left of the power is the last board. That last board controls the lights, you can pair a 16 LED these LEDs have all been marked with black wires for negative and red wires for positive. You'll see there on the board that there is a mix of colours, two bags of yellow, two bags of red, the yellow are very special is they can be used to make an LED fade up and fade down a bit like a heartbeat. You can also make the other banks the red banks flashed on and off. You don't have to have the lights flashing on and off, you can just turn them on or off at different times. Maybe you want to light different rooms at different times or highlight different parts of a diorama as your soundtrack plays along. That concludes the tour of the board in terms of its electronics. In each corner of the board, you will see a hole drilled in right at the edge. This allows you to put some mounting points either very small tie wraps or some screws or some nails or even some pipe cleaners. The board does not get heart nor do the components don't get heart. So feel free to touch different parts of the board. When even when it's running. There's only five volts running through the entire circuit. So where to start the first thing you need to do is to understand where you're going to place your rainbow sparkle unicorn board it needs to be in a place that can get power to it. And as you will normally be programming your compute your micro bit using a cable, you will need some way of connecting the micro bit to your computer. This will not be a problem if you've connected wirelessly using an iPad and we don't require power using the link below add the extension to the micro bit as seen on the diagram below. Once the Extension has been found, you will see the pink rainbow sparkle unicorn set of controls. These controls match the name of the controls match the different functionality on each chip, switch lights movement touch and sound

hello

you should be familiar already with the micro bits programming environment which is called make code in your start block, you should add the start rainbow sparkle unicorn brick as soon as possible.

This will tell the brain if this will send a message from the brain of the computer to the control which will then get the board ready for your project.

expand out each of the areas and you will see the normal blocks that you would use to drag and drop to make your programme Have a look through and read all of the different blocks to understand what they do.

The next thing you need to do after this is to go find a very big piece of paper as the firm is about to start as the phone is about to start fun fun draw out your project on a piece of paper. And then draw all of the switches, the touch panels or touch areas.

Draw any switches that you want. Draw any dials or spinners or sliders that you want to include on your project. And also include anything that you want to move on your project. Do you want it to spin Do you want it to go up and down.

Finally, think about where you want your speakers to be for the sound. You want them close enough so that people can hear, especially if it has voices that you're trying to use. If it's background music, and you could just put the speakers anywhere really try not to cover your speakers over with your project, because you'll be using quite small speakers, which won't be very very loud.

Next, try and work out how long the cables are between where the rainbow sparkle unicorn board is going to be placed and all the different things that you want. You don't want to be putting things too far away, where you don't have a cable long enough to connect them to the board.

cables can be quite long, up to 30 centimetres each. It may be possible to connect cables to cables to create longer lengths. The next thing to do is to label all of your switches, all of your touch areas, all of your lights, and all of your movements that you want. Put the labels on the diagrams, label them 12345 according to how many you have. The next thing to do is write an Action List. Your Action List will help you remember and help to understand what will happen when someone comes along to your project and presses a button or touches something. What will you want to happen? Will you want a light to come on? Would you want the light to flash Would you like some sounds to be played? Would you like to make the spin around for each action you need to write down all of the things that are going to happen. This is called an Action List. Having it written down makes it much easier when it comes to writing your programme because you will already have the basic instructions written out on your piece of paper. In essence, your piece of paper is the instructions to programme the brain of your project. Using your micro bit it's probably time to start building your project. Over here at the sweet sweet science cave

we

often use cardboard boxes. plastic bottle tops, lots of tin foil and pipe cleaners is the basis of our project. But yours your imagination is infinite. I will leave it up to you to make the best project in the world. As you build your project, keep checking the things that you want incorporating will fit. Is there space for the buttons? Is there

some way for the speaker to go with the lights be visible? Are you going to put your lights inside a building or a structure

are they going to be on display shining out it can be fun to try different touch areas using different materials. In the examples you will find a simple demonstration of how to play different sounds when you touch different objects. If you want to make things move, you will need to make sure that your project has some way to glue or screw the servos servers can be quite strong and they are very fast.

When used to set angles. Rainbow sparkle unicorn has the ability to control 12 servos in three different motions and linear motion, which is the same speed between two points

in a bouncing motion. This rep this you can have a lot of fun with this because it looks like your

thing that you are moving is wriggling and then slowly coming to a bouncing stop as it finishes moving. There is also a smooth motion. The smooth motion starts off very slowly and gets faster and faster and faster and then slows down at the end.

This can be quite nice to watch. Your servos can be programmed to move over a period of minutes. So you could make something like a cloud moving over the sky or have a fairy a ferris wheel slowly spinning around the back of your diorama

or a ferris wheel. Moving at the back of your diorama. LEDs come in lots of different colours. orange ones, red ones, yellow ones, green ones, white ones, blue ones. Try the different colours and see which one fits your project. Best.

So you have your action list and you have your project made with your light switches servos sound and touch built into it. This is great. Now it is time to write your programme use the diagram below to match the numbers on your action list to the different numbers corresponding to the pins on each of the boards, so if in your action list you have said, use switch zero. Then find switch zero on the switchboard and plugging your switch if you've specified touch number 11 and find touch number 11 pin and add your single cable to that pin. Go around the board and add all the different wires to the different parts of the board corresponding to your action list and the numbers you've put on that. Finally, find your speakers and plug them in. You are now ready to programme with rainbow sparkle unicorn with the make code editor rainbow sparkle unicorn

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