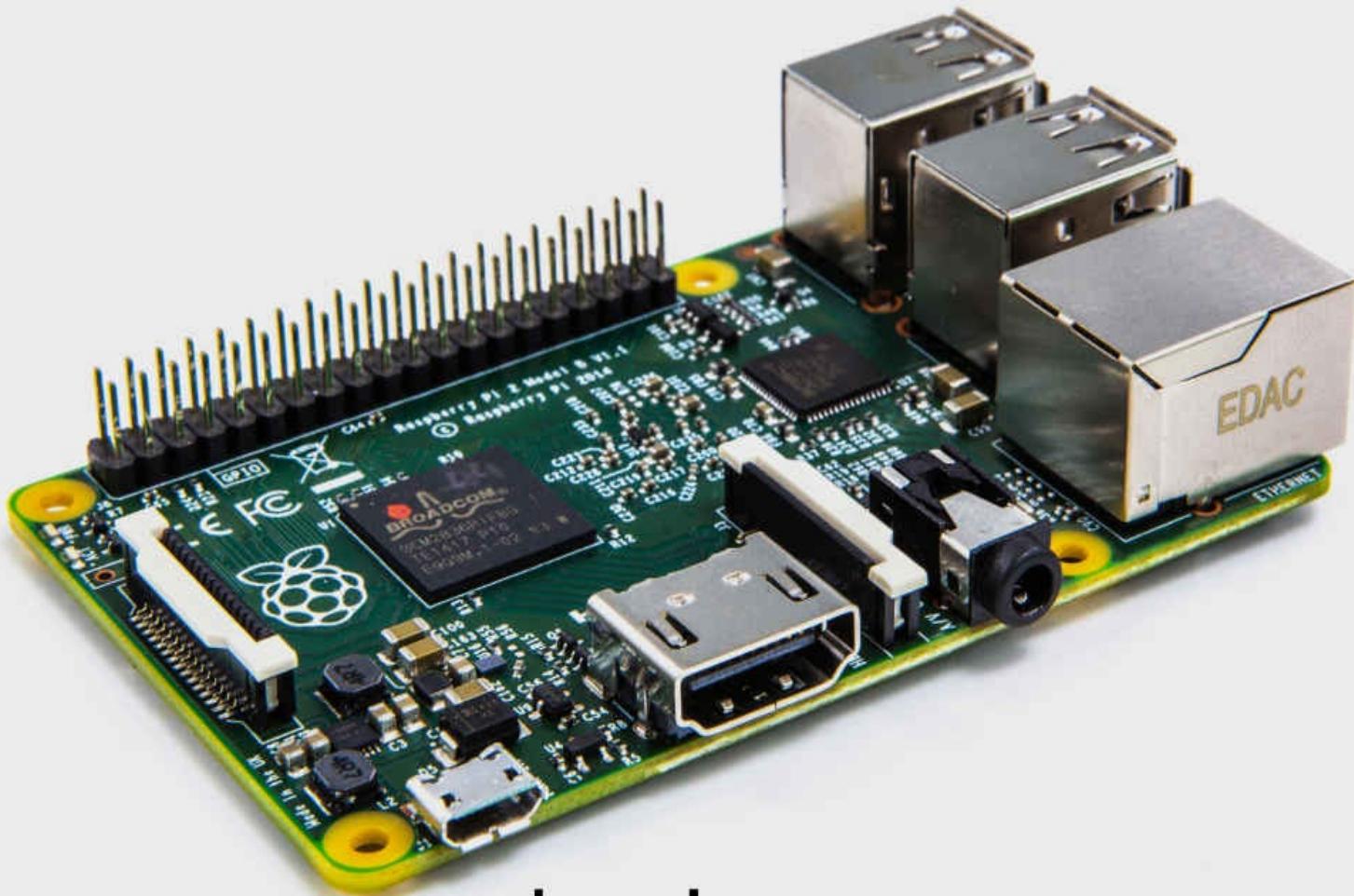


# Raspberry Pi

Amazing Beginners Guide on How  
to Start Using Raspberry Pi



Irma Lyons

# **Raspberry Pi**

## Amazing Beginners Guide on How to Start Using Raspberry Pi

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# Introduction

The world of computing has taken a Quantum Leap forward in the past 20 years. When I was starting to learn about this new technology I didn't have all of the resources like the Internet, Google, Facebook, YouTube and Wikipedia. No all we had were ugly grey boxes that required floppy disk after floppy disk in order to even turn on.

Now 15 years after the Y2K Bug was supposed to wipe out everything that we knew and drive us back into the Stone Age we stand before you stronger than ever with newer technology and concepts that weren't even dreamed of in Star Trek.

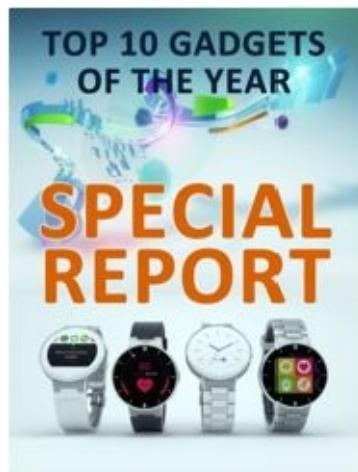
In this book I will be exploring a new piece of technology that has been released to give children and adults a fundamental grasp of technology. Developed as a non-profit project this little device has the power of a computer but fits in the palm of your hand.

What is this piece of technology? The Raspberry Pi.

In the pages that follow I will give you the story of how the Raspberry Pi came about, what it is, how you get one, what it can do and what people are using it for. At the end of this book you will know everything you need to know in order to get started using it as well as a head filled with ideas on what to do when you get one.

So without any more delay, dive right in and enjoy your Raspberry Pi.

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<http://bit.ly/1AiwLLM>





# Chapter 1 – Introduction to Raspberry Pi

One day around Christmas a young boy approaches his father and asks him for a Raspberry pie for Christmas. The father looked at the boy in puzzlement and smiled. Turning his head towards his wife his eyes widened, returned to normal and then with a smile replied to his son, “No problem” The father then patted his son on the head and sent him off to play.

A few weeks later the father went to the local bakery and asked the baker to make a Raspberry pie for his son for Christmas. The baker not trying to be rude to the father gave a puzzling gaze?

“Is there something wrong?” asked the father.

The baker scratched his chin and passed a moment. Turning his gaze towards his assistant he mumbled, “I will be right back.” The baker then walked the father to the other side of the store and started to explain what his son really wanted for Christmas.

The father with a stunned look on his face thanked the baker and walked out of the store.

## ***So What Exactly Is This Thing There Calling A Raspberry Pi?***

Well in its simplest form the Raspberry pi is the realization of a dream. It is a piece of equipment the size of a credit card that allows you to build your very own computers and other electronic devices. It was developed initially for kids to learn programming and other basic computer skills. But like many things that have come before it the raspberry pi is turning in to something much more than was intended by its creator.

Now this isn't what you are thinking. In fact this device was originally conceived as a teaching tool to show children how technology works and allows them to develop amazing projects.

When we talk about the Raspberry pi we are talking about a teaching tool. This computer motherboard for all intents and purposes allows anyone to build their own creations.

Now if you are from my generation this concept isn't anything new. When I was young I remember getting these electronic kits from the hobby store that would allow you to create a light board or make some cool little gadget that for its time was pretty cool. Well now with the introduction of the raspberry pi the toys that we used as kids looks like a caveman bashing a coconut against a rock.

## ***What Makes Up A Raspberry Pi***

Well first off you can go and learn more about Raspberry Pi from the creator's web site. You can do that by visiting <http://www.raspberrypi.org>. Here you can find out more information, resources and can even purchase your own Raspberry pi device.

Well to start off there are several versions of the Raspberry pi for you to choose from. There is an A version, B version and B+ version. Now personally if I were to purchase one or were considering purchasing one I would go with the top of the line the B+ since it has all of the features. In this book I will be talking about the B+ mostly since it has all of the features.

The Raspberry Pi is a device with the power of a computer that is about the size of mints can or credit card and can fit comfortably in the palm of your hand. It doesn't have all of the features of a typical computer like a case, floppy drive, CD-ROM, DVD, Blu-Ray or even a hard drive. What it does have is everything built onboard that allows it to run.



## **CPU / RAM**

First off the CPU – (Central Processing Unit) or the brain of the computer as well as the RAM (Random Access Memory) or the part of the computer that temporarily moves the information between the CPU and your storage medium are all built into one chip. This allows the device to save on space.

Next the device does not have a hard drive. The way you store your programs and information is through a SD card similar to what you use for our digital cameras. Now it is recommended that you have an 8 to 16 gig SD card but it can also work with 32 to 64.

## ***Video***

The Video is HDMI which allows you to connect to more modern HDMI monitors and televisions. It also has an RCA jack that allows you to connect to older computer monitors and televisions. There is no connection for VGA since putting on a VGA port would be counterproductive since this technology is being phased out.

## ***Network Adaptor***

A network adaptor is also included on the board so that you can connect your Raspberry Pi to the internet. Now the device doesn't support native Wi-Fi nor will it support it in the foreseeable future. If you want to make your Raspberry Pi wireless you can easily do so by adding a USB wireless device.

## ***USB Devices***

Now this is where the versions of the Raspberry pi begin to differ. With the B+ version of the device you are given 4 USB ports. In the A and B versions of the device you are given 2.

Just like any other computer you can add additional USB ports to your device by using a US Hub. Now it is recommended that you get a USB Hub that is self-powered so that you don't drain the systems power usage.

## ***Camera Connection***

Now one of the cool things is that the Raspberry Pi has a dedicated camera port. Now there is a specific camera attachment that was designed for the Raspberry pi the quality of the camera is that you would see on a cell phone. With the camera you can take high quality photos and semi-quality video.

## ***GPIO***

The GPIO stands for General Purpose Input and Output. What this basically means that you can add on additional devices such as led lights, switches and an assortment of other devices. Now beware if you decide to use the GPIO connection since the pins may break off and the voltage levels are lower so if you do things wring you could burn out or do other damage to your Raspberry Pi.

## ***SD Card***

Instead of a hard drive the Raspberry Pi requires a SD or Micro SD card in order to operate. The operating system for the Raspberry Pi needs to be installed on the SD card and the Pi will not operate without the card.

## ***Power***

The Raspberry Pi is powered by a standard min USB connection. This is a standard connection that is used by most people to power their cell phones. Now it is recommended that you get a wall powered USB cable instead of connecting your Raspberry pi to a computer or a powered hub.

When turning on your device make sure that everything is connected to your devices such as the camera, SD Card, Keyboard and Mouse. You can add additional USB devices while the device is on but to prevent damage and power surges try to have everything attached before turning the device on.

To turn on the device just plug in the USB charger to the device and the wall. There is no on off switch. To power off the device you will want to shut down through the operating system like you would with any other computer.

## ***The Operating System***

Now that we have talked about all of the hardware components of the Raspberry Pi it is time to talk about the operating system. The operating system if you have never used a computer before is the software or instructions that tell the hardware what to do and allows the end user to work on the device to perform specific tasks.

Now the most common operating system people can relate to is Microsoft Windows. Now unfortunately the Raspberry Pi does not support Windows. In the Version 2 of the Raspberry Pi it is rumored that Windows 10 or some version of Windows 10 will work on the device but at the time of this writing Windows is not an option.

The next popular operating system people can relate to is Google's Android Operating System. This too is also not supported by the Raspberry Pi.

The operating system that is supported is based on Linux. The software is developed using Python. With these two foundational programs the Raspberry pi is great for kids as well as making the Raspberry pi a development and learning environment which was its original intention.

## ***Moving Forward***

Okay, now that you have a basic foundation of what makes up the Raspberry pi it is now time to talk about setting up your pi as well as other accessories so that you can get to do cool things. In the next chapter we will go about how to purchase your Raspberry Pi, Setting it up, purchasing accessories and getting it up and running so you can start making use of it.



## Chapter 2 – Setting Up And Using Your Raspberry Pi

Now that you have the technical stuff floating in your head let's jump into getting and setting up your Raspberry Pi so you can start using it and start doing some cool stuff.

First off you need to purchase your Raspberry Pi. If you haven't already done so you can get it from several different places. The first place is from the manufacturer's web site. You can go and visit [raspberrypi.org/products/](http://raspberrypi.org/products/) and review which version of the Pi you want. From there you will be presented with several different retailers and resellers that will ship you your raspberry pi. When you find yourself on these sites you will also be presented with the options to purchase additional add-ons. I highly suggest that you take a look at them and consider purchasing the following items.

### ***Item #1 – A Case***

When working with the Raspberry pi it is going to be a lot easier and not to mention safer if you work with it in a case. Depending on the version of the pi you decide to purchase there are several different cases you can purchase. The standard cases come in black, white and clear. Additional cases are available online if you do some research as well as you can either 3D print your own case or build it out of whatever you want. The case is a personal thing and when I show you projects others have done you can see the types of cases they use.

## ***Item #2 – Power Charger***

When connecting your Raspberry pi you want to have a strong power source. Attacking it to a computer or a powered hub will get you through but if you want to get the most performance you want to purchase a dedicated power supply.

### **Item #3 – Preinstalled SD Card with OS on It**

Now for many of you just starting out who don't have a lot of technical know how getting an operating system onto the SD card may be a challenge. You will need a pc running windows or another operating system, a SD Card reader installed in your computer or have an external equivalent, SD Formatting software to prepare the card, a connection to the internet to download the software and basic skills in order to do it.

Now I am not saying that you can't do all that I am just saying for \$10.00 you can get an 8 gig Micro SD Card that you just plug into the Raspberry pi, add power and you are up and running.

#### ***Item #4 - Wireless Adaptor***

If you plan on going on the Internet you will want to get a wireless adaptor. With this adaptor you will be able to connect your Raspberry Pi to the Internet. If you are creative in what you build with your Raspberry pi you can have creations like a Wi-Fi remote control car, wireless robot and even a remote control plane that takes pictures and send them to a web server. The ideas are endless.

### ***Item #5 - Wireless Bluetooth Adaptor***

There are many Bluetooth devices that you can connect to. Adding a Bluetooth adaptor to your device will enable you to utilize these devices.

## ***Item #6 – Pi Camera Board***

When it comes to cameras the Pi has a specific camera that works with the board. Now I am not sure nor has it been stated that the Pi will use a USB camera but if you want a camera you want to purchase the Raspberry Pi Camera Board.



5 megapixel camera

£16.20 as of this writing

Now these are just some of the basic add-ons that you may want to consider purchasing in order to get the most out of your Raspberry Pi. As I talk about different projects that you can do with the Pi I will introduce additional add-ons and kits that may interest you.

## ***Starting Your Raspberry Pi For The First Time No Preinstalled Card***

Okay, so you have your pi, all your accessories and are ready to get started. Okay if you have purchased a case go ahead and put the pi in your case and close it up. Now the first thing that you need to do is plug your HDMI cable into your television or monitor. From there attach your keyboard, mouse, Wi-Fi adaptor to your device.

Now before you plug in the power we will need to make sure that your SD card has the operating system on it. If you purchased the SD card with the operating system preinstalled you can skip this section and move on to turning on your device.

## ***Installing Your OS***

To install your operating system you will want to visit the following page. [raspberrypi.org/downloads](http://raspberrypi.org/downloads). There you will be presented with a list of different operating systems.

If this is the first time that you have ever used or owned a Raspberry Pi it is suggested that you download and install the Noobs. Now there are two versions of Noobs on the site. The first is Noobs and the other is Noobs Lite. The version you will want to download is Noobs since it also contains Raspbian which is the actual operating system.

So connect to your Windows or Mac computer and format your SD card so that there is noting on it. You can download a formatting program from <https://www.sdcard.org/> or via Windows. Read up on formatting SD cards for more info.

Okay, now that you have formatted your SD card it is time to unzip the Noobs software onto the SD card. To do this, use your computers unzipping software. If you have never unzipped a file before google the process or just right mouse click on the zip file and look for “Extract”.

Once the files are extracted open your SD card and copy the files from the Noobs folder onto the card. Once everything is copied over you can unmounts the SD card from your computer (Eject it) and then put it into the SD Slot of your Raspberry pi.

## ***Turning on your Device***

Now that you have everything connected and your operating system installed on the SD card it is time to turn this baby on and see what we can do. When you are ready plug in the power charger and your Raspberry Pi will turn on.

At first your pi will run through a lot of operations getting ready to start up. After a few minutes you will be presented with your setup screen. All you will need to do is follow the onscreen instructions. You will be asked to select your language, global region and a lot of other questions. Most of the questions will be self explanatory.

The main question that you will need to answer is what operation system version you want to install. For beginners it is recommended to select Caspian. The reason you want to select this OS is that it is user friendly and will give you all the options needed to get up and running.

After the software is installed you will be presented with a graphical interface similar to Windows. You will have icons and a start menu. If you have ever used Microsoft Windows before then you will have a foundation on how to use your device.

## ***Other Software Platforms***

Now you can feel free to install any of the other possible platforms onto your Raspberry Pi. You are not limited to the Raspbian operating system it is just the one we suggest you start with. After playing with it you can swap out SD cards and install different operating systems to play with. The rest of what you do is all up to you.

In the next chapter we will start talking about what you can do with the Raspberry pi as well as a bunch of other cool stuff.

Congratulations all of the hard work is done. Now it is time for you to get your hands dirty and start learning what your device can do and then make it go farther with your imagination.





## Chapter 3 – Playing with Raspberry Pie

Now that your raspberry pi is up and running what in the world can we do with it. Well at its core the raspberry pi is a development device. As such what you can do with it is limited only by your imagination. With that being said here are a few software programs, games and tools that other developers have used in the development of their raspberry pi experience. You can begin your journey from this page.

<http://store.raspberrypi.com/projects>

## ***Applications***

When starting off with your Raspberry pi you may want to know if you can perform some basic computing tasks. Well it is a computer so you can do anything you can think of. Here are a few cool applications that you may find of interest.

## ***LibreOffice***

Everyone has probably heard of Microsoft Office. This is the program that has Microsoft Word, Excel, Access, PowerPoint and Publisher. It is probably the number one program people use in their day to day lives. So what if I were to tell you that you could read and write Microsoft document files with your Raspberry Pi.

Well you can. There is an open source (free) software equivalent for Microsoft Office called LibreOffice. With this program you can do almost everything that you can do in Microsoft Office. This is pretty cool and saves you a lot of money on purchasing the office suite.

## ***GrafX2***

GrafX2 is a drawing program that you use on the Raspberry Pi. Now this isn't a Photoshop replacement but if you have some artistic talent and need to get some simple graphics done or maybe even some complicated graphics you can use this program to get the job done. And again it is FREE.

## ***Raspberry Pi x86 emulator***

Now are you a techie geek like me? Do you remember when computers ran on Dos? Well if you have no idea what I am talking about you are in for a treat. If you like playing those dos games you can relive them on your Raspberry pi. Download and install this emulator and you can be reliving the glorious 80's

## ***Netpi***

Have you ever wanted to try your hand at web design? Well now you can with the Netpi app. With this program you can teach yourself basic html coding techniques and start developing skills to be a powerful web programmer.

## ***PXDrum***

Are you someone who wants to beat on the drums all day? Well if you are then PXDrum is the perfect software program you can get. It allows you to play the drums on your Raspberry Pi.

## **WEBIOPi**

They say that everything that we do will soon be on the Internet. Well this is true when it comes to the WEBIOPi application. With this application you can control the functions and features of your Raspberry Pie from over the Internet. Just think of the possibilities.

With this you can control your raspberry camera over the Internet. You can create a video conferencing system where you can preform tasks from a remote location. You can create a virtual robot or remote control car that you and others can control from a remote location. Add this feature into a plane tied into a remote control system or anything you want to control. It is a virtual presence device on steroids.

## *pyLauncher*

PyLauncher is a python program that allows you to launch applications using your Android phone.

## ***ZXTune***

This is a unique little program that allows you to download and rip chiptune music.

## ***Lightput***

This is a cool piece of software if you want to control different types of lights and create different types of lighting effects for your home or if you are an entertainer.

## ***Asterisks for Raspberry pi and FreePBX***

With the asterisks and the Raspberry pi and the FreePBX system you can create your very own VIOP communications network. You will have a wide variety of tools for video conferencing, one on one calls, faxing and tons of other amazing features all powered by tour Raspberry Pi.

## ***Pi Cars Toolkit***

Now this is where the fun begins. If you are someone who loves to make remote control cars, boats, planes or whatever other creations are rolling around in your head the Pi Cars Toolkit is exactly what you need in order to get started.

## ***Games***

Now applications are great and there is a bunch more that you can find but as they say all work and no play make Jack a dull boy. So with that being said the raspberry pi also allows you to play hundreds of thousands of games.

When it comes to games there are several options that you can go for. First off you can go to the pi store and download some games. Some of the games that are currently available are as followed.

## ***Pong Single Player***

Do you remember this Atari classic? Well it is alive and well when it comes to the raspberry pi. This single player game can be played to pass the time or just give you a quick kick of nostalgia.

## ***Open Arena***

Now if you are a fan of multi-player games or games that you can play over a network then open arena is a fantastic option for you. Now when you go to this page you will get an adult warning. I didn't see any questionable material as far as adult content was concerned but the games do depict a violent nature so keep this in mind if you are accessing this content or if you have children using the raspberry pi without adult supervision.

## **Atari800**

This is an Atari emulator that allows you to play all of those classic Atari video games we all grew up on. This is only one of the many emulators that the raspberry pi can support.

## ***Starflite***

Starflite is a retro Star Trek game. If you are a lover of the original version of the original star trek series then you will love this game. You will play Captain James T. Kirk of the starship Enterprise as you battle Klingons, do on way missions and explore strange new worlds in this old style video game.

## ***Solitaire***

Now what computer or operating system would be complete without some form of solitaire on it. Well the raspberry pi is no exception. You can download a cool copy of solitaire that you can play on your pi when you should be working creating some cool projects.

## ***Dune Legacy***

Now the raspberry pi isn't just for some old style games. It does have the power to play more advanced games such as Dune Legacy. This graphic intense game will show you the capabilities of the raspberry pi as a gaming engine.

## ***Minecraft***

Now if you are someone who is addicted to Minecraft you will love that you can play this 3D block puzzle game via your raspberry pi. The raspberry pi will work with the free version of the game and the graphics and animation will run as if it were on a typical pc.

## **Game Emulators**

Now downloading and playing some games off the Internet is just the beginning. The next cool thing that the raspberry pi will do is it will allow you to play console games from the late 1990's. These emulators are the Atari, Sega Genesis, Nintendo and many others.

To get started doing this you will need to install a version of Raspbian known as Retro pi. Now this is similar to the way that you installed the existing operating system on your raspberry pi device. You need a clean SD card and you need to download the software onto that card and boot the system with it. To get started you will need to get the Retro pi software.

You can get your copy from this web site

<http://blog.petrockblock.com/retropie/retropie-downloads/>

Once you downloaded the file review the section at the start of the book that talked about copying the files over to the SD card.

Once you have retro pi installed and up and running it will come with a few emulators already installed on the card. Now some of these will be what you are looking for but the raspberry pie is capable of running about 30 emulators. So to get more emulators you can go to Google and type in "game emulators" without the quotes or you can visit this page that has several of the post popular emulators already listed.

<http://www.emulator-zone.com/>

## ***Copying over Emulators and Games***

Once you find the emulators that you want you will want to copy them over to your raspberry pi. To do this you will need to connect your SD card to your computer and transfer the files over that way and then do a restart on your raspberry pi or you can connect to your raspberry pi through the network. Either way the process is the same.

The process in doing this is a little technical and will take more time than I have in this book but here is a web site that gives you step by step instructions that you can use in order to get the process completed. <http://www.mrvestek.com/>

The gentleman has no affiliation with me or this book but as I was doing my research for this book he had the best video that showed how to do it. So I highly recommend you watching his videos.

## ***Making Your Own Games***

When it comes to the raspberry pi developing your own games was one of its original functions. It was the developers desire to have children and adults use this device to develop their own games. So why not give it a try.

## ***Python***

To develop games and applications for your raspberry pi you will need to use a programming language known as python. Python is an open source programming language that will allow you to create anything that you can possibly imagine. You can download your copy of Python and learn more about it from this web site.

<https://www.python.org/>

## ***Python Add-ons***

When developing applications no one platform no matter what it is will allow you to do everything right out of the box. The same goes for Python. So in order to assist you in the development of your raspberry applications the raspberry store has a lot of tools and resources that you can use to develop your software.

## **Pi3D**

With Pi3D you now have the power to create amazing 3D games for your raspberry pi. You can create first person adventure games, 2D, 3D, simulations and anything you can envision.

## ***GLG Toolkit***

The GLG Toolkit is a great resource and tool for creating graphics and animated graphics for your raspberry pi. The software can be run on a Windows machine or on a Raspberry pi. When you create the graphics you have the ability to make use of a wide array of gauges, pre-made sprites and much more. When you use this tool making graphics for your games has just gotten a lot easier.

## ***Sprite Packs***

I don't know about you but when I develop games I am looking to get something up and running quick and fast. One of the ways I do this is to look for sprite packs or royalty free game graphics and sprites. When it comes to the raspberry pi you get an amazing set of free to use sprite graphics.

In the sprite packs you get graphics of coins in many different directions. Combined together you can have a coin that rotates flips and does other cool animated tricks.

Other graphics in the pack are 1 ups, 2 ups, that you can use to indicate your character gained an extra life. There are items like fruit, tools, characters and much more. Now the selection is limited but you can easily search Google for free sprite packs or hire a graphic artist to develop your sprites for you.

## ***Special Effect Sprite Packs***

When it comes to making your games you will need to have cool stuff like explosions and visual effects. Raspberry pi gives you several effects that you can apply to your game like explosions and star bursts.

## ***Audio Effects***

No game is complete without some type of audio effects. You can include explosion sounds, opening theme music, background music and much more. After going through these you can add in your own music creations to make your games really shine.

When it comes to applications, games and tools to work with your raspberry pi there is a huge list of them that we can't go over in a single book. The foundation behind the raspberry pi is to take an idea or a concept and think outside the box. You have all of the basic components of a super computer in the palm of your hand. With access to all of the major connections such as SD Memory Cards for storage, USB devices to hook up external devices, Network connectivity to search and work with the Internet and other online services and so much more.

What can be done with the raspberry pi is really only limited by your desire to try and play with it. For only \$25 - \$30 dollars you can pick up three or four of them and use them in different ways. You can use one for your standard computing needs such as writing documents, surfing the Internet and playing games.

You can get a second raspberry pi that you can use to test ideas and theories on how to get different equipment to work. And you can get another pi to turn into a mobile device or game station.

When it comes to the raspberry pi you can't be afraid to try. For a \$100.00 investment you can get two or three of them and let your creativity run wild.

In the next chapter we will talk about what other people have been using their raspberry pis for and maybe it will give you some creative energy to go out there and find your passions.

Have fun and try different things. That is why the raspberry pi was made in the first place.



## **Chapter 4 – The World Seen Through the Eyes of Raspberry Pi**

When it comes to the world of Raspberry pi the options are truly limitless. In my research I came across some amazing things that people have done and are planning on doing with their raspberry pis. Now I hope that what is presented here will give you a boost in the capabilities of the raspberry pi and hopefully inspire you to get out there and start creating.

## ***Idea #1 – OTTO***

Now Otto is a program that was developed to create a new way of taking animated videos. The creators of Otto are using the raspberry pi and the camera attachment to develop their own camera. Now I know you are probably thinking why this is so cool. Well it is cool because it doesn't take videos in the traditional sense. What their project is designed to do is create a camera that takes still shots in rapid succession and turns those into an animated gif.

## ***Idea #2 – Pi Glasses***

Now I am not sure if you have heard about this but Google as come out with a pair of glasses that they call Google Glass. What these glasses do is allow you to surf the Internet and do other tasks with your eye movement and their special pair of glasses.

Well a company called Adafruit is doing the same thing but they are doing it with a pair of glasses that cost \$100.00 and the raspberry pi. What the glasses are designed to do is to send images from the glasses to the raspberry pi via composite video. Now these glasses don't have the bells and whistles as Google Glass but it just goes to show you that with a little creativity you can create anything the big boys can create and do it with your own style.

### ***Idea #3 – Build A Super Computer***

Now as I searched the Internet for ideas people have been using their raspberry pi's for I discovered that several people have done this. What they have done was connect several of the raspberry pi's together so that they could share their computing power. When connected together they discovered that they had the computing power of high end graphic engines that were capable of doing high end video production such as special effects seen in movies like the Matrix. Granted it took 64 of them but just think of the possibilities. For \$2000.00 you can have a video editing system that belongs in the movies.

#### ***Idea #4 – A Raspberry pi Cell Phone***

Using a raspberry pi, touch screen and some off the shelf components you too can create your very own raspberry pi cell phone. A gentleman known as David Hunt did just such a thing. What was lacking in design and style was overpowered by his accomplishment. Check him out on YouTube for complete details and instructions on how you too can create your very own Raspberry Cell Phone.

## ***Idea #5 – Hand Held Game Systems***

As I was researching this book I came across a ton of people making gaming systems out of their raspberry pi systems. These systems are built into custom game machines that fit in the palm of their hands or were made into full standing arcade game versions. Using game emulators, old controller components, 3 inch, 5 inch, 10 inch screens as well as rear view facing camera monitors for cars these creative DIY enthusiasts took their electronic skills, 3D printers, hand made cases out of wood, plastic and anything else they could find and made some really cool units to play these vintage games.

## ***Idea #6 – Weather Stations***

Now this is a little geeky for me since I don't even bother to look out the window most of the time but for some people developing a little scientific gadget like this is fun. Using a raspberry pi and some other sensor equipment several people have made their own weather stations and forecasting devices to measure rain fall, ambient temperature and much more.

## ***Idea #7 – Braille Teacher***

When it comes to specialized equipment and tools for the disabled prices for these tools is sky high and is getting higher every day. With the introduction of the raspberry pi people with disabilities are starting to have a light at the end of the tunnel with tools that will some day be affordable.

A dicta-teacher is being developed via a group known as project mudra and can be found here - <http://www.projectmudra.com/>

The goal of the project is to use technology such as Raspberry Pi + Python + Android Devices + an assortment of hardware in order to help blind individuals to use technology like the rest of us.

## ***Idea #8 – Controlling Lighting Displays***

One of the components that I really didn't go into detail on was the GPIO pins. With these pins you can control devices with switches. Now what you can also do is connect these switches to a lighting display that is controlled by a music program. This is how it works. You have a preset display of lights be it for Christmas, a show or whatever. Each of these lights is on a separate circuit. You will tie each circuit into one of the controls of the raspberry pi. When a certain note is hit a circuit turns on. When that note is over the circuit closes turning the light off. With python you write a script or program that controls all of this. Then when note music is playing the lights will do their things. And depending on what is programmed will determine the show. So be creative and paint the town red with your light show.

## ***Idea #9 – Tablet Computer***

Now this is a great one. With the prices of tablets like the Surface 2 and 3 ranging anywhere from \$400 - \$2000 the average student or child can't really afford one. But with a few piece and parts you can make your very own tablet for under \$100.00.

The main components are already supplied by the raspberry pi. The only thing really missing is the touch screen and the case. Well these are surprising inexpensive to purchase. You can get a case for about \$30.00 and a touch screen for about \$50 - \$90 depending on where you get it and the size that you want. All you really need to do is install the raspberry pi into the case, attach the touch screen to the front, tighten it down with some screws and away you go. In my research I found a lot of different people on YouTube who created a wide variety of touch screen tablets, laptops and portable game systems. Going there and typing in raspberry pi tablet will give you many different versions and ideas to work from.

### ***Ideal #10 – Plotter Or Drawing Tool***

With the raspberry pi and a cad drawing device or automatic pencil you can write some code in Python to control the mechanics components. How this will work is an image would be called from the SD card on the pi. It can be a face or anima or whatever you want. The machine would interpret the image and with the automatic pencil draw the picture on a piece of paper using whatever medium you would like.

## ***Idea #11 – Security System***

We live in a dangerous world and people want to get what we have. So in order to protect ourselves we need to add in some form of security. There are many options we can look at when putting together a security system.

First off we need the Pi Camera. With the pi camera we can set up some code to develop a facial recognition system. This system can plot specific areas of a person features and if they match up in the system then they are gained access. This can also be accomplished using a fingerprint scanner or other input devices.

Other options for the security camera is to take still shots every thirty seconds or so and then uploads the images to a web server in the cloud. This way if the system ever goes down or if someone unhooks it the images will be stored in an offsite location. Another feature you can add to the device is a portable battery. This way if the power is ever cut or the device is taken the battery will kick in but the device will continue to take pictures.



## ***Idea #12 – Home Entertainment System***

With the Raspberry Pi you can connect it to your television via the HDMI port. From there you can attach an external hard drive or other storage devices that have video and movie files on them. You can then use the raspberry pi to stream the video from your SD card to the television being able to watch whatever you want.

With a service like Playon.tv you can connect your raspberry pi to services like Netflix, Amazon TV, Hulu.com and a wide range of other media streaming services. For only \$40.00 you can create your very own raspberry pi media center and pay just \$8.00 a month for Netflix or another service and get rid of all those high monthly television programs.

### ***Idea #13 – Surf The Net From Your TV***

IF you setup your device for a home entertainment center why not add the net to your television. You will wan tot install a raspberry version of chrome known as chromium but with a wireless keyboard, mouse and even a remote control you an easily be surfing the internet from the comfort of your couch on a huge flat screen television.

## ***Idea #14 – Turn Your Raspberry Pi Into A Windows System***

What? I thought you said raspberry pi can't run windows? Well you're right it can't at least any version of Windows that you would get any use out of. You will need to run windows 3.0. You will need to run a virtual box on the system as well as find an image file of windows 3.0 but with some luck and some creative design work you can create a raspberry pi running windows. Talk retro.

### ***Idea #15 – Build Robots***

Okay now this is cool. With the raspberry pi and different kits and tools you can make yourself your very own personal robot. You can have them clean your house, mow the lawn, cook your dinner, babysit the kids. Well maybe I am getting ahead of myself here.

You can build some simple robots though. You can create robots that will do some simple tasks and through some scripting do some cool stuff. Now these robots won't take over the world, well at least not yet maybe with the Raspberry 5 but with the current version of raspberry pi I think we are safe. So go out there and be creative and see if you can create a robot that will clean your house or one that will fight in a killer robot war.

## ***Idea #16 – Cloud Server***

With your raspberry pi and a connection to the Internet you can create your very own cloud server. You will need to download and install a software program called Owncloud but from there the rest is easy.

## ***Idea #17 – Development Box***

With all of the tools at your disposal there is no reason why you can develop something that fills a need. Go through all of the resources that I have presented to you so far. Look at all of the projects others have done with the raspberry pi and imagine what can be done in the future.

When you are given a barebones system that works like nothing before then it is time to take advantage of it and see exactly what it can do. When developing your projects come up with a problem and see if you can discover a solution. You need to think outside the box and then realize that there is no box.

When it comes to the raspberry pi there really are no rules. You are just working with a set of tools that function and work. So if you are a creative person, interested in how the world works and want to make your mark in technology take advantage or what we have presented to you today. Tomorrow is never promised to anyone so take advantage of today.

## ***Taking It To The Next Level***

Now you can see that the raspberry pi is a power piece of technology. Designed for creativity in mind those who choose to take the foundation and run with it will take the raspberry pi to new heights.

In this chapter I have reveled 17 great options that others have been using to work with the raspberry pi. Now it is your turn. It is your turn to go out there and dream the unspoken dream. Go out there and let your curiosity get the better of you and ask the question, “What if I did this?” You will be amazed at the answers you get when you go looking for them.

# Conclusion

First off I want to personally thank you for taking the time to learn about the raspberry pi. When I first learned about this cool device I was mad that I haven't discovered it earlier. For years I have been wanting to know of a way to create my own laptop or tablet system but just couldn't find all of the pieces and parts to do it.

With the release of the raspberry pi 2 talks have been opened with Microsoft to create a stripped down version of their new Windows 10 operating system that will work on the Raspberry pi. Other companies such as Firefox are also working on their own version of an operating system.

With big companies like Microsoft and Mozilla taking an interest in this new technology don't you think it may be a good idea to get your feet wet while you are still on the ground floor? When these big players jump into the space there will be no telling in which direction it will travel.

If you are a child reading this book all I can say to you is you are at the forefront of a new era in computer technology. When I was a child and early teen when the first generation of computers hit the market I took advantage of what was coming and began to learn all that I could. You should do the same thing.

So take your head out of the fancy IPads, Xboxes and all the other fancy gadgets that do everything for you and get your hands on a piece of technology that allows you to be creative and create the worlds of tomorrow.

And to the parents and adults reading this book. I encourage you to get one of these devices for your children. When it comes to learning how technology works they are getting an edge. Sure anyone can click on a few buttons on a controller or slide their finger across the screen but to really know how this all works will be what gives your

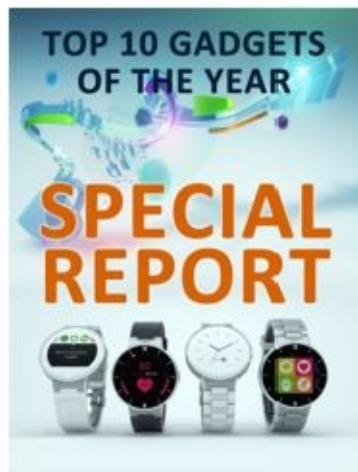
child the edge.

To continue your education from this book I suggest that you visit YouTube.com and type in Raspberry Pi. There you will find hundreds of videos that give you tons ideas that you can implement using your raspberry pi for.

In my research for this book I used that as one of my main resources and after every video I was to find out more and more of the raspberries capabilities. I have tried to give you everything that I could but I know it is not enough. So go to these sites and learn everything you can. Then get one or two of these great devices and begin your own personal journey.

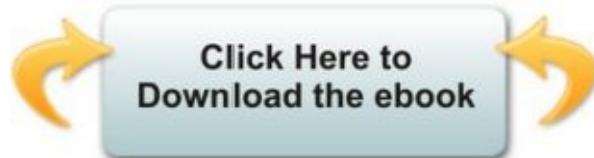
Thank you again for taking this journey and as always good luck, good health and may you have success in everything that you do.

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