

# What to Look for in a New Portable Computing Device

## Form Factor

There are many variations of portable computing devices. They include laptop, 2 in 1, detachable, tablet and Chromebook. Each has advantages and disadvantages. Which is best for you will depend on how you intend to use the device.

## Portability

Different devices will have different sizes and weights. Consider your intended use when deciding. The difference between 3 pounds and 6 pounds doesn't sound like much until you are trying to get to the other end of the airport with all your luggage.

## CPU

CPUs (Central Processing Unit) are the brains within your device. For laptop style devices the CPU generally comes from Intel or AMD. Intel offers multiple families of chips. The standard is the Core family with the m3, i3, i5, i7 and new i9. They offer different processing power speeds and features. Within each family there are multiple variants offering different speeds and features. Generally home users will be well served with the i5 or the i7 for those who do lots of processor intensive work. The m3 is a version designed for portables that is less powerful but uses less energy, thus extending battery life. While the greater battery life is good, the limitations of the chip don't make it as desirable as the regular products. The most recent version of their chip family is 9<sup>th</sup> Generation but many devices currently on the market will come with 8<sup>th</sup> Generation.

Chips from AMD generally are competitive with Intel chips but they cost slightly less so manufacturers may use them to hold down prices. Their FX series chips are similar to the i5 and the Ryzen series are comparable to the i7.

For devices such as tablets and Chromebooks the manufacturers tend to use lower end CPUs such as the older Celeron or Pentium models from Intel or chips such as the Snapdragon from Qualcomm. These provide longer battery life but less processing power since these devices are designed more for viewing than productive work.

## Memory

For laptop style devices the minimum memory for Windows 10 is 4 GB. However, 6 GB or 8 GB is preferable if you have multiple programs running at once.

For Chromebooks or tablets 4 GB is common and sufficient.

## Storage

Storage on a laptop is one of three types, either hard drive, SSD drive or NVMe.

The standard hard drive is a mechanical device with spinning platters and moving heads. Their advantage is that they are large and inexpensive. Generally, a laptop will have 500 GB or 1TB capacity. This is far more than most users will ever need unless you

have a lot of music, photos or videos stored on your computer. The disadvantage is that they are slower and subject to damage if dropped.

SSD (Solid State Drive) is basically just a memory chip that continues to hold what is in memory even with no power unlike RAM which disappears when the device is turned off. The advantage to SSD is that it is much faster than a hard drive and is not subject to damage if jarred. The disadvantage is that it is more expensive than a hard drive although prices have come down considerably in the last few years. Until recently their capacity was smaller, topping out at about 256 GB. That problem has been solved and they are now available in capacities up to 1Tb.

NVMe (Non Volatile Memory express) is similar to an SSD drive but they have removed the case and just use a chip. Because it uses the M.2 specification it is even faster than an SSD (up to 8 times). These are usually used in higher end devices as they are slightly more expensive.

Tablets and Chromebooks tend to have very little storage as they are not designed to do local work. They provide enough storage to install apps and some files. Chromebooks are web based so all saved files are stored in the cloud.

SD (Secure Digital) and Micro SD (Micro Secure Digital) slot. Having an SD slot on the device will allow you to add extra storage should you need it. They are available in capacities from 16 MB up to 512GB (with a 1TB version announced). These are the same cards used in phones and cameras so you can use them to transfer your pictures to your device. Micro SD cards usually come with an adapter that allows you to plug them into an SD slot.

Additional storage can also be done with a USB memory stick.

## **Screens- Size, Resolution, and Touch**

Screen sizes on portable devices can range from 8" to 17 1/2". The larger the screen the heavier the device will be and the shorter the battery life. Having a larger screen tends to add significantly to the cost.

Screen resolution is how many of the tiny lighted dots (called pixels) can fit on the screen. There is a wide range of resolutions available but it only tends to make a difference if you want to watch movies or do other high resolution activities. High def (as used on your TV) comes in two standards, 720 and 1080. The 1080 standard is true high def. In order to watch a 1080 movie on your screen you need a resolution of 1920x1080 or higher. You won't find that high of a resolution on a tablet or smaller laptop. You can still watch a movie on a smaller screen, it just won't be as sharp.

A touch screen is a necessity for a tablet because it has no keyboard (although a keyboard can be added). Having the ability to manipulate your screen with a finger or stylus can be very useful. With a touchscreen that is in tablet mode you have an onscreen keyboard for input, but you wouldn't want to write anything very lengthy with it.

## **Ports**

There are a large number of potential ports that your new device may have.

USB is a well-established standard for adding things to your computer. With USB you can add external devices such as a hard drive, keyboard, mouse, optical drive, printer and more. It has been updated several times and the latest version is USB 3.1. Each update has improved speed. It is backward compatible so you can use a USB 2 device with a USB 3.1 port. How many USB or USB C ports you need will depend on what you will want to plug in to them. USB 2 uses a black port and USB 3 uses a blue port.



USB C is the next generation of USB. It is much faster, can be used for charging a device and (my personal favorite) cables can be inserted with either side up.

Thunderbolt is a port used only by Apple. It is similar to USB C but just different enough that they are not compatible.



VGA or Digital. These connectors will allow you to attach your device to an external monitor. If you want to do this, you should check your monitor to see which type of cable it uses. There are 3 types of connector, VGA, DVI and Display Port.



VGA



DVI



Display Port

HDMI is the latest connector to video. It is being used to connect to monitors and TV's. If you want to connect to an older style monitor, you can get an HDMI to VGA or digital adapter.



Network. Your device may include an Ethernet connector for wired networking. With the growth of wireless they are becoming less common but if you need that connectivity and your device doesn't include it, there are inexpensive USB to Ethernet adapters.



## Wireless Networking

Wireless networking is an ever changing standard. Currently you will find 802.11n, 802.11ac and, soon, the newest standard 802.11ax. Each standard update improved

range and speed. While devices are backwardly compatible you won't get the most out of your new laptop if your wireless router is several generations old. An 802.AC laptop connected to a wireless router that only supports 802.11g will not give you the benefit of the faster wireless card. Generally, you will not have a choice of which standard to get.

## **Bluetooth**

Bluetooth is a short range wireless technology usually limited to 100 meters or less. Having a Bluetooth radio in the device allows you to connect to a wide variety of devices wirelessly. These include headphones, speakers, keyboards, mice and your car entertainment system. Most devices include Bluetooth but it is not a major deal breaker for most people if it isn't there.

## **Keyboard and Touchpad**

Your keypad and touchpad experience is totally subjective. The keyboard you like may not be the one someone else likes, so try to use the keyboard on the models you are interested in to see how they feel to you. Touchpads are fairly standard, but transitioning to one from a mouse can take some getting used to. You can add an external keyboard and mouse to almost any device if you wish.

## **Webcam**

Most portable devices come with a webcam and tablets may also come with a camera lens on the back. If you intend to use the webcam for things such as Skype you should compare the resolution of the device. There is a trade off between higher resolution and lower web speeds. The higher the resolution the more data that must be transmitted. Most manufacturers take a middle of the road approach.

## **Battery Life**

As mentioned above, there are many factors which can affect battery life. The manufacturer will probably make a claim about expected battery life. As with the MPG sticker on your car, your mileage may vary, always less. It does give you some basis for comparison. What you are doing with your device will affect how long the battery lasts. For example, watching a movie on a DVD drive uses much more power than typing in Word.

## **Optical Drive**

Optical Drives (CD and DVD) are disappearing from portables. Since most things are downloaded, the need for them is far less. They add weight, thickness and cost to portable devices so they are disappearing. Should you need an optical drive for your device they are available as an external USB device.

Tablets and Chromebooks will never have an optical drive.

## **Construction**

Manufacturers use a wide range of materials from all plastic to metals such as aluminum. The higher end materials have an upward effect on price.

## **Pricing**

There is something for every budget. Laptops go from a low of around \$350 to almost \$4000. Generally, you can find a decent system in the \$500 to \$700 range. You can save yourself some money by buying a closeout. When new systems come on the market the old ones may be discounted by up to several hundred dollars to clear them out. Since most change is incremental you won't be losing a lot by getting last year's model. Tablets and Chromebooks start at around \$200 and go as high as \$1000. \$250 to \$400 should get you a decent device.

## **Tablet operating systems**

Tablets use either IOS from Apple or more commonly Android from Google. Because Apple provides both the device and the operating system they tend to provide updates for quite some time, as long as the hardware will support it. Android on the other hand is licensed to the tablet manufacturers so whether it gets updated is totally within their discretion. As a general rule you will get between none and 2 updates for your tablet. Without the updates your tablet will continue to operate with all the functionality it had but it won't ever gain the new functionality that an updated software may have.

## **Other Features**

Some manufacturers include additional features such as fingerprint reader, face recognition and cellular network connection.