Activity 1

The most traditional way to interact and connect with a computer is through the use of a keyboard and a mouse.

In the table below, identify and pros and cons of using a keyboard and mouse.

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| **Keyboard** | | **Mouse** | |
| Pros | Cons | Pros | Cons |
| Most computers come with a keyboard supplied.  People are used to using keyboards to enter data, they need very little training  A skilled typist can enter data very quickly  Specialist keyboards are available e.g. ergonomic, gaming keyboards | It is easy to make mistakes when typing in data.  If you can't touch type, it can be time consuming to enter data.  Keyboards are not suitable for creating diagrams.  Disabled people often find keyboards difficult to use.  Excessive use can lead to health problems such as repetitive strain injury (R.S.I.) | Ideal for use with desktop computers.  Usually supplied as part of a new computer system.  Most computer users are familiar with them and requires little training.  Works well in conjunction with a keyboard for data entry. | They need a flat space close to the computer.  Older style mice which have roller balls can become clogged with grease and grime and lose their accuracy until cleaned.  Excessive use can lead to health problems such as repetitive strain injury (R.S.I.)  If the battery wears out in a wireless mouse, it cannot be used until it has been replaced. |

Activity 2

Using the table below, identify the method of interaction used for each device, how it works and at least one advantage and one disadvantage of using them.

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| **Device** | **Method of interaction and how does it work?** | **Advantage(s)** | **Disadvantage(s)** |
| Amazon Alexa | Speech recognition  It works by breaking down the audio of a speech recording into individual sounds, analysing each sound, using algorithms to find the most probable word fit in that language, and converting those sounds into text. | Access – for writers with physical disabilities that prevent them from using a keyboard and mouse, being able to issue voice commands and dictate words into a text document is a significant advantage.  Spelling – you will have access to the same editing tools as a standard word processing solution. Of course, nothing is 100 percent accurate (yet), but the software will catch the majority of spelling and grammatical errors.  Speed – the software can capture your speech at a faster rate than you might normally type. So it is now possible to get your thoughts onto electronic paper faster than waiting for your fingers to catch up. | Limited Vocabulary –lots of delays while the software stumbles on different words.  Frequent Pauses because changes in voice tone or speech clarity can cause glitches, as unrecognised words or acronyms. |
| Nintendo Wii | Gesture recognition  A type of user interface that allows computers to capture and interpret human gestures as commands. (e.g. use of motion sensor controllers) | Replaces mouse and keyboard  No physical contact with the computer.  Communicate at a distance. | Obstruction from other objects  If the distance between the device and user becomes greater then performance will decrease.  Lighting could affect detection. |
| XP-PEN Artist22R Pro Pen Display | Touch recognition  It allows you to write with a pen, erase with your palm and move objects around with your finger without having to access other tools, buttons or on-screen menus. | Easy to use - intuitive, don't need much training.  No extra peripherals such as a mouse are needed  Software can alter the screen while it is being used, making it more flexible than a concept keyboard which has a permanent overlay.  Touch screen is the main interface on smart phones and tablet computers.  Can make use of finger gestures to make sophisticated actions such as zooming and selecting.  Excellent for selecting and controlling 'apps' (applications) that have been designed with a touch screen in mind. | Not suitable for inputting large amounts of data.  Not very accurate - selecting detailed objects can be difficult with fingers  Tiring to use for long periods.  More expensive than alternatives such as a mouse (unless it is part of the computer \ smartphone in any case)  Less useful as a control input to a standard computer that makes use of the mouse \ keyboard combination e.g. laptop, desktop pc |
| Oculus VR headset. | Virtual reality  A computer-generated simulation in which a person can interact within an artificial three-dimensional environment. | Changes the way in which people can communication by expanding it from people you known in real life to anyone connected to the internet.  Those who are not able to fully experience reality, such as disabled people, could explore the Virtual World and still experience a full life.  VR provides a chance to experience things that are impossible in real life | Those who do not have access or cannot afford this technology will be left out.  Some people have been known to have motion sickness due to using the VR headset.  Many people may become addicted to living in these virtual worlds, and as a result forget or neglect their responsibilities in real life. |
| Pokémon Go! | Augmented reality  Allows the user experience the real world, which has been digitally augmented or enhanced in some way. | It enhances the experience of the user with the natural environment by embedding virtual elements.  Easy to use  Interacting with more users and can be seen to reduce stress, anxiety and depression.  Many smartphone applications are accustomed to AR such as filters on the camera app. | Expensive which means it isn’t accessible to all users.  Concerns of the data captured in real-time which could create some privacy issues.  The augmented reality technology is known to be addictive as players remain captive to the game for numerous hours. |
| Face ID | Facial recognition  Face is captured with a photo or video and then measures a variety of facial features such as width of mouth and distance between the eyes to help create a unique facial signature. | Can improve security because every individual who enters your premise will be accounted for.  High degree of accuracy in being able to successfully identify people.  Fully automated and becoming a ready-made feature on today’s smartphones. | The system must be accurate enough to detect faces correctly.  Even if it is accurate, there are issues surrounding people’s right to privacy.  Potential psychological effects of monitoring people all the time.  Systems be misused by people with bad ideas. |

Activity 3

Interaction through biometrics can take up many different forms. Use the internet to research the different types of biometrics and identify how they work.

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| **Biometric type** | **How does it work?** |
| Ear | The identification of an individual using the shape of the ear. |
| Iris | The use of the features found in the iris to identify an individual. |
| Retina | The use of patterns of veins in the back of the eye to accomplish recognition. |
| Fingerprint | The use of the ridges and valleys (minutiae) found on the surface tips of a human finger to identify an individual. |
| Finger geometry | The use of 3D geometry of the finger to determine identity. |
| Hand geometry | The use of the geometric features of the hand such as the lengths of fingers and the width of the hand to identify an individual. |