Year 9 – Cyber Security | *Knowledge Organiser*

Hacking
The technique used to gain unauthorized access to data in a system or on a computer. There are two types of hacking that you need to be aware of:

Black Hat – This type of hacking is illegal; it is done with malicious intentions for the hackers own financial gain. It is none ethical.
White Hat - This type of hacking is legal; these types of hackers are also known as penetration testers. They are paid by companies to hack their network to test whether it is secure, if not they can fix the issues with the network. These types of hackers do it as a job.

Malware
Malware is also known as malicious code. It is a type of software that is specifically designed to disrupt, damage, or gain unauthorised access to a computer system. There are many examples of malware including:
- Virus - A computer virus is a type of computer program that, when executed, replicates itself.
- Worm – The software self replicates spreading around the system
- Trojan – disguises itself as a legitimate pieces of software
  - Spyware - software that is installed in a computer or mobile device without the user's knowledge, it sits in the background gathering information
- Ransomware – denies access to files on, by encrypting these files and demanding a ransom payment in return

Social Engineering
Social engineering is the art of manipulating people, so they give up confidential information. It does not require any technical skills to do so it is easier than malware. There are many examples of social engineering including:
- Phishing – creating fake emails to entice someone to enter their details
- Shoulder Surfing – looking over someones shoulder to steal the details they are entering into their devices.
- Blagging – fabricating a scenario, pretending to be someone else, usually done in person or over the phone.
- Pharming- Creating a fake website that mimics the appearance of a real one

Digital Footprint -
The information about a particular person that exists on the internet as a result of their online activity. Your digital footprint can be seen by anyone.

Sexting-
Sexting is when someone shares sexual, naked or semi-naked images or videos of themselves or others, or sends sexually explicit messages using a digital device. It is against the law for a child to sext including; take the picture, share and posses poses, even if it is of yourself.

CEOP-
An online platform where you can go to make reports about online abuse. It stands for child exploitation and online protection command. You can make a report as an individual, or you can report to an adult who can support you to make the report or make the report on your behalf.

Other Threats: Brute Force -
a brute-force attack consists of an attacker submitting many passwords or passphrases with the hope of eventually guessing correctly. DDOS- Flooding a server with pretend traffic to prevent legitimate users. Denial of service of attack

Prevention
Cyber attacks can be prevented by training staff to make them aware of the different attacks so they know what to look out for. Antimalware software can also be installed. Strong passwords using a combination of upper case, lower case, numbers and characters. Turning on automatic updates to ensure that the hackers cannot exploit any backdoors in the systems.

Year 9 – Python programming | *Knowledge Organiser*

Programming Basics

Below are the basic programming techniques that are required to create programs:

Variable – A location in computer memory that stores a value that can change. E.g score = score + 1

Constant - A location in computer memory that stores a value that does not change e.g. pi = 3.14

Output – A method of giving feedback from a program e.g. print("Hello world")

Input – A method used to enter data into a computer system. E.g name = input("enter your name")

Data types and operators

There are many different data types and operators that we need to use when programming:

String – this is a data type for sequences of text e.g animal = "Horse"

Integer – data type for whole numbers e.g. age = 12

Float – data type for decimal numbers e.g. price = 3.99

Boolean – two responses. gameOver = True

< means less than

> Means greater than

<= less than or equal to

>= greater than or equal to

== equal to

!= not equal to

AND – two options true

OR – one option true

Selection

Selection is the programming technique that we use to ask questions/make decisions. Selection check whether a condition is true or false. If it is true it will execute the line underneath. If false it will move onto elif or else:

```python
colour = input("Enter colour")
if colour == "red":
    print("sad")
elif colour == "amber":
    print("okay")
elif colour == "green":
    print("Good")
else:
    print("Invalid Colour")
```

Iteration

Iteration is the concept of repeating code. Iteration makes code more efficient as it saves the programmer time and reduces the number of lines required, therefore saving on storage:

There are two types of iteration you need to know of

```python
for i in range(0,5):
    print("this is a count controlled loop")
    print("0 is the start value")
    print("5 is one after the end value")
    print("i is the iterative variable")
    print(i)
```

```python
password = ""
while password != "arrowsmith":
    password = input("Enter password")
    # this is condition controlled
    #it will repeat until arrowsmith is entered
```

Some loops are infinite, which means they will repeat forever

Advanced programming techniques

Arrays – are data structures that can be used to store multiple items of data in the computer memory. The program below would display Mr Webster as indexing starts at 0

```python
names = ["Miss Lee", "Mr Webster", "Mrs Bond"]
print(names[1])
```

Sub-programs – Are programs within another program , these can be used to make programs more efficient and easier to maintain. There are two types of sub-programs, functions and procedures.

```python
def add(a,b):
    total = a + b
    return total

print(add(10,5))
```