Year 7 – Binary and Security | *Knowledge Organiser*

What is Binary?

Binary is the number systems used by computers. It consists of only two digits (0 and 1). All data processed by computers is in the form of a sequence of 1's and 0's. Therefore all data used by computers needs to be converted into binary. Binary is also known as base 2.

What is Denary?

Denary is the number system used by humans. It consists of ten digits (0, 1 , 2, 3, 4, 5, 6, 7, 8, 9), we can use these 10 digitals to make up any number in our number systems. This is the number system we use every day, in particular when we do maths. Denary is also known as base 10

What is Hexadecimal?

Hexadecimal is the number system used be computer programmers. It consists of 16 digits; 0 to 9 then A to F. The number system is used by programmers to identity colours when creating software Hexadecimal is easier for programmers to use because it has fewer digits that binary making it quicker to write and easier to remember.

Binary to denary

Write down the headers in green and write the binary number underneath, wherever there is a number 1 the numbers on the green background should be added together

128	64	32	16	8	4	2	1
1	0	0	0	0	1	1	1

E.G 128 + 4 + 2 + 1 = 135

Denary to binary

To convert from denary to binary the same table is required. You then need to work from left to right adding a one under the numbers that can be added together to make the denary number

Binary to Hexadecimal

Remember the following

Den	10	11	12	13	14	15
Hex	A	B	C	D	E	F

Use the table below and write in the binary number, wherever there is a one add the numbers in green together a nibble at a time(each half of the red line). If the number is greater than 9 it should be converted to a letter using the table above

8	4	2	1	8	4	2	1	Answer
128	64	32	16	8	4	2	1	
1	0	1	0	0	1	1	1	167
A				7				A7

What is Cryptography?

It is the art of converting ordinary plain text into unintelligible text and vice-versa for security purposes. There are a range of different techniques that can be used. When doing cryptography challenges you need to used your logical problem-solving skills. If the message does not make sense, then try another technique.

What is Authentication?

Authentication is the process of determining whether someone or something is, in fact, who or what it says. Authentication is used in computing to keep our data safe on our digital devices. There are lots of techniques such as:
- Physical – Lock, key, blinds, passport
- Biometric – Face recognition, DNA, fingprint
- Other – Username and password, pin, pattern, 2-factor

Year 7 – eSafety | *Knowledge Organiser*

Cyber Bullying

Cyber bullying is a form of bullying or harassment which is committed on a range of digital devices and online.

If the bullying is happening at school - Talk to your parents or carers and your teacher. If you feel you can't speak to your teacher, maybe a friend can do it for you.

If the bullying is happening online - Tell a trusted adult – your parents or carers, or a teacher. You can report abusive posts on social media platforms. You can also report abuse to CEOP (Child Exploitation and Online Protection Centre)

Privacy

Every time we share something online we add a bit more information about ourselves to the online world, including posting a photo or liking someone's video.

The trail of information we create when we share things online is called our 'digital footprint'. People we know, and don't know, can see our digital footprint and use it to learn more about us, meaning people can see things online or learn things about us we don't want them to see or know.

How can I protect my privacy online? - You can take control of your digital footprint by using privacy settings. Privacy settings help you to choose who can see what you post and share. Privacy settings are usually located under 'Settings' or 'My Account' on devices, apps and websites.

Exploitation

Most young people have online lives, just as real as their offline lives. They chat on WhatsApp, share pics on Shapchat, post on Instagram. A post can go viral and reach millions overnight. The appeal of the online world is also what makes it dangerous. Any post, no matter what it is, is open to bullying, abuse and threats.

Online exploitation is when someone uses their power to make a child do sexual or criminal things online. It's never OK for someone to make you uncomfortable. If someone is doing things that make you feel uncomfortable or if someone tries to force you to do something, you could be experiencing sexual exploitation and abuse.

Strong Password-
A strong password should be at least 10 characters long. Complex. Strong passwords use a combination of letters, numbers, cases, and symbols to form an unpredictable string of characters that doesn't resemble words or names.

Phishing-
Phishing is a form of social engineering where attackers deceive people into revealing sensitive information or installing malware such as ransomware.

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.

Grooming-
is when someone builds a relationship with a child so they can sexually abuse, exploit or traffic them. Children and young people can be groomed online by a stranger or by someone they know

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 7 – Make Code Arcade | *Knowledge Organiser*

Input
An input is when data is entered into a computer system to be processed, this can be done manually or automatically

Output
That some sort of feedback is being given from the system, this is as a result of process

Process
Process is the stage between input and output, anything that is entered into a computer system must be processed, so that the next steps can be decided, this often resulting in an output

Sequence
A set of logical steps carried out in order.

Selection
This is an important programming technique that is used when we want to ask questions in our code and determine the output based on the condition. Selection is represented in code in the form of IF, ElseIf and Else

Iteration
Iteration is the programming technique used to make programs more efficient

There are two different types of loops that you need to be aware of: condition controlled and counter controlled

Variable
A variable is an area of computer memory that stores data, the data can change throughout a program

Constant
A constant is an area of computer memory that stores data, the data remains the same throughout a program

Assign
Used to set a value to a variable name

Array
A variable which can hold multiple values, often known as a list

Logical Operators- a symbol or word used to connect two or more expressions such that the value of the compound expression produced depends only on that of the original expressions and on the meaning of the operator.

Commonly used logical operators:-
< - less than
> - greater than
<= less than or equal to
>= greater than or equal to
== equal to
!= not equal to

Make Code Arcade
Codes are written in blocks
Each block is colour coded
Loops surround other blocks of code
A variable is red and allows the programmer to create areas that can store new values within the program.
Many of the functions are build in, but some of them need adding as extensions.