Year 8 - Half-Term 4 & 5 – Python Programming – Knowledge Organiser

Lesson 1: Algorithms & Flowcharts

Algorithm: a plan, a set of step-by-step instructions to resolve a problem.

Flowchart: a visualisation of an algorithm using symbols and arrows

Shape	Name	Meaning
(rounded rectangle)	Terminal	Start / Stop
(rectangle)	Rectangle	Process
(diamond)	Diamond	Decision / Question
(parallelogram)	Parallelogram	Input / Output
(arrow)	Arrow	Connector

Lesson 2: Syntax & Logic Errors

A **syntax** error occurs when the program has been written incorrectly, for example with incorrect; spellings, upper case letters, punctuation or indents that cause the program to output 'invalid syntax' when it runs.

A **logic** error is a mistake in a program's code that results in incorrect or unexpected behaviour. The program runs, however it does not do what it was intended to, it may simply produce the wrong output

Lesson 3: Variables

A **variable** is a named memory address that holds a value. Variables usually follows certain rules:

- It can contain letters and numbers but must start with a letter and it must contain at least one letter
- Spaces are not allowed so underscores _ must be used to link more than one word together.
- It should contain lowercase letters. However, uppercase letters can be used if a variable name comprises more than one word joined together.
- The name should be meaningful and it should represent the value it is holding.

Lesson 4: Sequence

A **sequence** is a set of instructions and statements, performed by a computer, one after another

```
1  print ("Hello Year 8")
2  print ("This half term you are learning how to code")
3  print ("You will be using Python via MU Editor")
4  print ("Let's learn together")
```

Lesson 5: Selection

Selection refers to a decision/ question and allows us to include more than one path through an algorithm.

```
1  print ("What do the letters CPU stand for?")
2  answer = input ()
3  if answer == "Central Processing Unit":
4      print ("Correct, well done")
5  else:
6      print ("Incorrect")
```

Lesson 6/7: Iteration – FOR & While Loop

A **FOR loop** is used in Python to show count-controlled iteration, where a section of code is repeated a set number of times.

```
1  number = 0
2  for number in range (0, 5):
3      print (number)
4      number = number + 1
5  print ("there has been", number , "loops")
```

```
1  cpu = input ("What does the CPU stand for? ")
2  while cpu != "Central Processing Unit":
3      print ("Incorrect, try again")
4      cpu = input ("What does the CPU stand for? ")
5  print ("Well done")
```

A **WHILE loop** is used in Python when a section of code is repeated until a condition has been met or until a computer receives the desired, intended outcome

Lesson 8: Data Types

- **String** (or str or text). Used for a combination of any characters on a keyboard.
- **Integer** (or int). Used for whole numbers.
- **Float** (or Real). Used for decimal points numbers.
- **Boolean** (or bool). Used where data is restricted to True/False or yes/no options.

Lesson 9/10: Cyberbullying & Online Identities

Perpetrator: the person that carries out and is responsible for the abuse

The following strategies can be used to **protect online identities**: 1: Promote and spread positivity. 2: Live the reputation you want to see online. 3:Use social media for positive change.

Year 8 - Half-Term 6 - Design Principles – Vector Graphics - Knowledge Organiser

Lesson 1: Tidal Energy

Tidal energy is a renewable energy powered by the natural rise and fall of ocean tides and currents. Turbines are placed in bodies of water where the tide comes in and then goes out. The turbine spins due to the force of the water, collecting energy from the flow of fluid. As water is much more dense than air, tidal energy is more powerful than wind energy. Unlike wind, tides are predictable and stable. Where tidal generators are used, they produce a steady, reliable stream of electricity. Turbines are most effective in shallow water. This produces more energy and allows ships to navigate around the turbines.

A tidal generator's turbine blades also turn slowly, which helps marine life avoid getting caught in the system.

Lesson 2: Target Audiences

The **target audience,** also known as demographic, is defined as the main group which a product is designed to appeal towards. Target audiences can be categorised in many ways, but a key focus for producers and designers is the age, gender and interests of the target audience. Developing a good understanding of what type of person is going to engage with a product is important when ensuring that it successfully appeals to them and meets their needs. Different products, based on the content, layout and design will appeal to different target audiences. Products that fail to meet the needs of their target audiences are considered to be unsuccessful.

Lesson 3: Bitmap & vector

Images are either **bitmaps** or **vectors**. Bitmap images are made out of small parts called pixels. The more pixels an image contains, the higher the quality, the pixel count is referred to as the PPI, pixels per image, or DPI, which stands for dots per inch. Bitmap images are organised as a grid of coloured squares. When zooming in or enlarging a bitmap image, the pixels are stretched and made into larger blocks, if stretched too far, the image can lose its quality. Digital cameras can be used to collect bitmap images as they are often 'real life' images. A vector image on the other hand uses scalable shapes to define the parts of the image, they do not contain pixels Logo's, cartoons and digital art are common examples of vector graphics. Vector graphics can be scaled without losing quality. They can be enlarged or reduced in size - but the file size will stay almost exactly the same, as will the resolution and quality

Lesson 4: Composition

Composition is defined as the way in which parts of something, for example a media product, are arranged and laid out, this can also be described as the formatting of a product. The composition or layout of a product is used to create meaning for the audience through **visual hierarchy**. Visual hierarchy is used by producers to establish an order of importance on a media product. Elements included on a media product, including images and text, may be: larger, bolder, higher up, more eye catching through the use of colour or in front of other conventions, making them appear more dominant and therefore more important. Visual hierarchy is used to allow the audience to focus on the most important part of the media product first.

Lesson 5: Contrast

The design principle **contrast** refers to the use of visually different elements. In addition to capturing attention, contrast can guide the viewer's eye to a focal point, highlight important information and add variety, or even drama, to a design. In theory, applying contrast is simple. All you need to do is use opposite or different elements: colour, size, shape and fonts. Contrast helps you get the message of your design across. It draws the eye to the most important visual element in a design — making it clear what readers should pay attention to first and foremost. Contrast makes for a visually appealing design, if everything was the same on a media product or digital graphic, the design would be monotonous and repetitive which could disengage the audience.

Lesson 6: Digital Footprint

Your **digital footprint** is the record of all your interactions online. Once something is posted or shared online, it can be there forever.

- When shortlisting and interviewing candidates, potential **employers** will complete social media and google checks to see what digital footprint you have left behind.
- Your **reputation** can similarly be ruined by a negative digital footprint. Posts that may have once been accepted may become politically incorrect or socially unacceptable.
- Sharing too much personal information online could make you a victim of cyber criminals. Posting sensitive information could bring about the threat of **identity thieves** who can use this information to access personal accounts, including your bank accounts.