Computing Year 9 Unit:
Media— Vector graphics

Threshold concept—

- Understand what a real-world problem is.
- Understand digital mediums can be used to communicate to a range of people
- Understand the role of Photoshop to be used to create digital mediums

Keyword	Definition
Manipulate	To change
Path	A connecting line between two paths
Node	A point that can be changed in a shape
Vector	Mathematically based pictures. Made up of lines, shapes etc (objects). Easily scalable (as they are not pixel based).
Graphic	A graphic is an image or visual representation of an object. Therefore, computer graphics are simply images displayed on a computer screen.

Vector Drawing

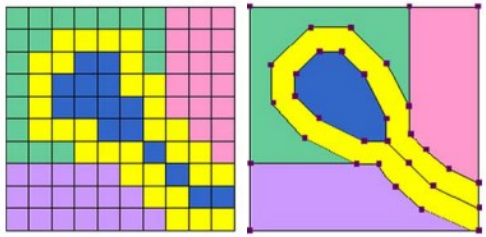
-Vector drawings are computer graphic images that are made using 2-D shapes.

-The drawings are connected by lines and curves to form polygons and other shapes, forming a complete picture.

-There are lots of different apps and programs that can help us to complete vector drawings, including Google Drawings and Adobe Illustrator.

-Many techniques, e.g. zooming, rotating, resizing & duplicating, can help to create accurate images.

Bitmap vs Vector



Bitmap or Vector image?

- Will the image need to be resized?
- Will the image need to be drawn to scale?
- Will the image need to be realistic?
- Are there any restrictions on file size?

Common **vector image** file types

File Type	Advantages	Disadvantages
.EPS (vector)	Most common vector type Standard for sharing in print publishing industry	Not widely supported in editing software Generally Adobe only software
.SVG (vector)	Scalable without image quality reduction International standard for vector graphics High quality printing possible	Not widely supported in software Files sizes can be large wit many elements
.PDF (vector)	Widely supported by many devices Free to view PDF files Small file size	Not free to edit PDF files Text difficult to edit, text is treated as images

Types of compression

LOSSY Lossy compression removes some of the detail. The quality of the digital image will be reduced. Great for digital images you intend to post online, but no so great if you intend to print your digital image to put in a photo album or photo frame.

LOSSLESS Lossless compression doesn't remove any of the detail. The quality of the digital image will be really good. Great for digital images you intend to print, to put in a photo album or photo frame, but no so great if you intend to post your digital image online.

Editing tools

Zoom in/out
Allows you to enlarge an area of the graphic (*zoom in*) to see it more clearly. Zoom out to see the whole graphic.

Layers
Allows you to separate parts of a graphic into different layers, making it much easier to edit the graphic.

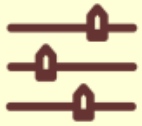
Brightness/Contrast
Brightness will lighten/darken the image. Contrast makes the lights lighter and darks darker.

Desaturate
Desaturation turns colour photos black & white. Try 'colour splash' to enhance a desaturated photo.

Crop
Allows you to chop off parts of an image you don't want to see. This will also change the dimensions of the image.

Resize
Allows you to change the dimensions of an image. You can also resize parts of the image if layers are used.

Rotate
Allows you to turn your images clockwise/anti-clockwise by a certain degrees.



Filters
You can apply different filters to your photo, such as Mosaic Tiles, Stained Glass and Chalk & Charcoal.

Computing Year 9 Unit:

Python programming with sequences of data Part 1

Threshold concept—

- Can understand the fundamental principles of computer science, including abstraction, logic, algorithms, and data representation
- Can analyse problems in computational terms

Keyword	Definition
Sequence	One of the three basic programming constructs. Instructions that are carried one after the other in order.
Variable	A storage location with a name. The data in a variable can be changed after being initially set
Selection	One of the three basic programming constructs. Instructions that can evaluate a Boolean expression and branch off to one or more alternative paths.
Operators	Used to compare two expressions
Iteration	One of the three basic programming constructs. A selection of code that can be repeated either a set number of times (count-controlled) or a variable number of times based on the evaluation of a Boolean expression (condition-controlled).
Syntax error	An error that has occurred because the programmer has not followed the rules of the programming language they're using

Output

The **print** function is used to write output to the screen. print takes one or more arguments (strings or variables between the brackets) and writes the data to the screen.

Output Examples

```
print("Hello World!")

print("Hello", name, "nice to meet you")
```

Variable Assignment

Variable assignments **are not** equations. Variable assignments are instructions for the computer. This means that the data stored in a variable can change throughout the runtime of the program.

Assignment examples

```
# Example 1

name = "Bob"

# Example 2
```

Input

The **input** function is used to prompt the user to enter some data using the keyboard. **input** can take a string argument which is used as a prompt to the user to tell them what data the computer is expecting.

Type Casting

When inputting a number, the **int** function can be used to convert the number to an integer so that your program can perform mathematical operations on it. This is a form of type casting. Look at **Example 2** below to see this being done.

Input Examples

```
# Example 1

name = input("What is your name?")

# Example 2

age = int(input("What is your age?"))
```

Selection

An **if** statement can be used to implement selection in Python. It is optionally followed by an **elif** and/or and **else** statement.

Selection Examples

```
# Example 1

if age >= 18:
        print("You can watch the film")
else:
        print("You can't watch the film")
```