

Week 1: Introducing the Pixel

Class 1	Class 2
→ What are Pictures for? → Visual Language → Simple Design Activity	→ Preparing Images for web/print → DPI/file types → Data and file size on disc → Pixel/Vector Graphics → Reproduction of images in MS Paint → Introduce basic tools → Introduce basic Keyboard Shortcuts → Save work appropriately

Class 1:

→ What are Pictures for?

This could be approached in the form of an open class discussion, asking learners to share their ideas as the teacher facilitates the discussion and writes them on the board. Don't discourage any suggestions but be clear that the discussion eventually swings round to the fact that images are primarily used for **Communication**. Students must be clear that the picture must be appropriate for the purpose, just like we choose our words carefully to make sure we correctly communicate our meaning when speaking. Encourage learners to think of examples where images are used for communication (emoticons/emojis, warning signs, road signs, packets, posters, advertising, scientific diagrams, instructions in products, weather forecasts, etc, etc, etc...) Students should be aware that the main platforms for visual communication are **web** and **print** formats.

→ Visual Language

Continue the discussion. Once we realise that images are forms of communication, we can introduce the term **Visual Language**. Ask the group to suggest different visual elements that make up this language, just like a verbal language is built using letters, words, sentences and paragraphs. There are many of these but the five basic formal elements that students must learn are:

- Line
- Colour
- Tone
- Shape
- Texture

Make sure students take notes of these.

Other visual devices may include: Pattern, Proportion, Scale, Form, Composition, etc.

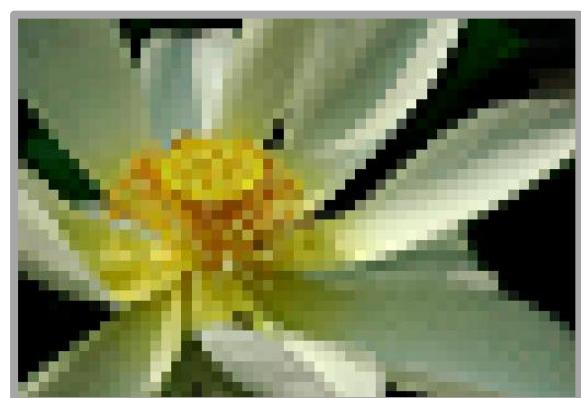
→ Simple Design Activity

Introduce this practical activity by asking students if they know how most digital images are formed. What can you see if you zoom in too closely on a picture? **The pixels**

Example Pixelation: (Images available in PDF)



3508 x 2480 pixels, 300 dpi

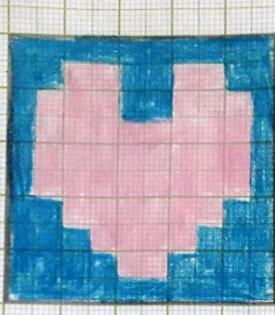


592 x 344 pixels, 96 dpi

Distribute sheets of graph paper and ask students to design small images (not more than 10 x 10) that communicates three given ideas (examples below) by shading in whole squares, as if they were pixels. Use colours if possible as it allows them to practice using all the visual language previously discussed, but use normal pen/pencil if not are available.

- Joy
- Love
- Anger
- Cold
- Heat
- Nature

Ask students to share their designs with the group and point out how they have used visual language. Ask them to discuss strengths and weaknesses in their designs.

		
<p>Love</p> <p>Shape : Heart (symbol of love)</p> <p>Colour : Pink (soft and romantic)</p>	<p>Joy</p> <p>Shape : Smiling face</p> <p>Colour: Bright & Sunny</p>	<p>Nature</p> <p>Shape: A leaf</p> <p>Colour: Green/brown (earthy)</p>

Class 2:

→ Preparing Images for web/print

Introduce the session with a quick recap. Continue the group discussion format and ask learners to identify the two main platforms for visual communication (web and print) they must be clear that there is an important difference in the way we prepare files for each of these purposes in industry.

WEB: *Small files* for fast up and download times, (most monitors don't display very high quality images anyway and people will get frustrated with a website that takes a long time to load files)

PRINT: *Large files* for best possible quality and to avoid pixelation. Remember that you can always reduce file sizes further if needed but once the data is removed, it cannot be put back in!

→ DPI and File Types

The main ways students should be aware of for adjusting the quality and file size of an image are resolution and file format. You can ask if the group knows about this but it will probably need to be presented in a lecture style delivery. Make sure they take notes.

The **resolution** of an image, also known as dpi or Dots Per Inch, tells us how many pixels there are in the image. *Compare this to how many squares they could use on their graph paper in the design activity and return to the picture of the lotus, with examples of 300 and 96 dpi.* Students should be taught to work at a **minimum of 300 dpi** as standard and that images should always be at least this resolution for **print**. For **web**, images can be saved to as few as **72 dpi**, rendering them much smaller files and quicker for download to consumer screens.

Images size (the physical width and height) and the **colour depth** (bits of data per pixel) can also affect the file size.

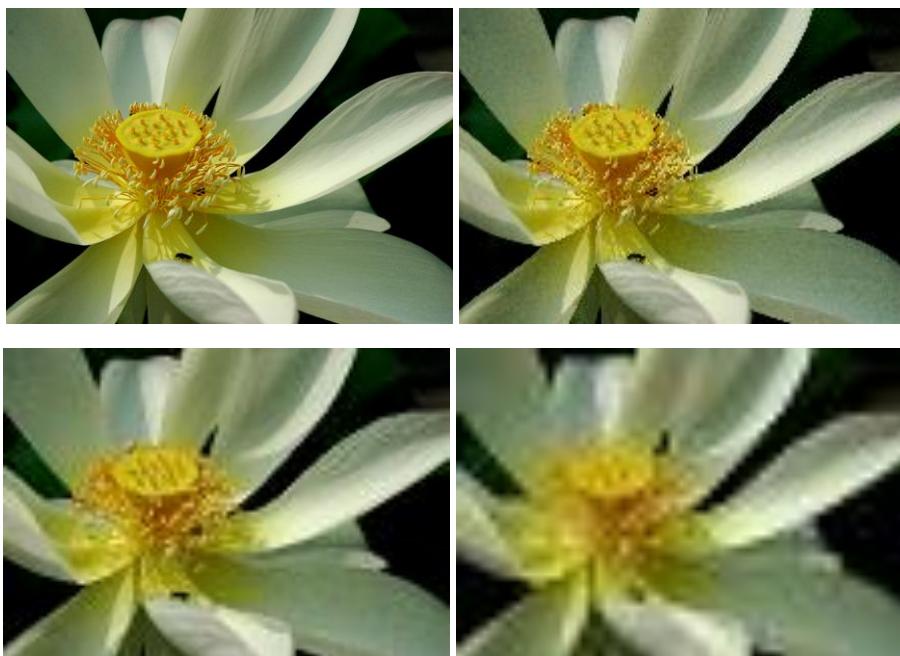
File formats also affect the quality and size of the image. Some formats compress images by removing data. These are called 'lossy' as they 'lose' quality and this can be a big problem with progressive saves. It is called 'generational degradation' when an image file loses quality over time following multiple saves. Some file formats are more widely compatible than others.

There are a great many different file formats but students should be basically aware of the following:

- ➔ **JPG or JPEG** (Joint Photographic Experts Group) lossy compression and generation degradation. Very widely compatible. (JPEG 2000 uses lossy and lossless compression but is mostly used in cinematography)
- ➔ **TIFFs** (Tagged Image File Format) can be lossy or lossless, depending on the technique chosen for storing the pixel data. Some offer relatively good lossless compression. Not always widely compatible.
- ➔ **GIF** (Graphics Interchange Format) is most suitable for storing graphics with few colours, such as diagrams, shapes, logos, and cartoons because the compression is more effective when large areas have a single colour, and less effective for photographic images. Due to its animation capabilities, it is still widely used to provide image animation effects.
- ➔ **BMP** (Windows bitmap) handles graphic files in the Microsoft Windows OS. BMP files are normally uncompressed, so large and lossless. They are widely accepted in Windows programs.

- **PNG** (Portable Network Graphic) PNG is still well-suited to storing images during the editing process because of its lossless compression.
- **PSD** (Photoshop Document) Always use this when you are saving work in stages during editing in Photoshop. It is Adobe's own file format expressly developed for use in the Adobe Suite; you only need to think of other file formats when making a final save. Some publishers will request PSD file formats. You will not be able to use it on web.

Example Generation Degradation: (Images available in PDF)



→ **Data and file size on disc**

Students should be made aware that large, high quality file sizes, though necessary for many applications, take up a lot of space on file. Hard discs getting full can slow PC processing time and prevent work being saved at all. It's good to get in the habit of backing up data to an external hard drive and to delete files that are no longer required (e.g. working stages of finished projects)

→ **Raster/Vector Graphics**

We will not be introducing vector graphics just yet, but now is a good time to inform students that there is an alternative to pixels when working in digital graphics. Vectors (as opposed to Rasters – the name for files using pixels) allow the computer to store images as a series of equations, as opposed to fixed blocks of colour. This means they can be expanded and reduced with a great deal more flexibility as the computer can calculate the relationship between different points and generate a smooth line. The Pen and Shape tools in Photoshop use vectors and we will use them in week 5.

→ **MicroSoft Paint Activity**

Return to the design activity of the last class and ask students to recreate their designs digitally. They might work freehand or using the shape tools. Use this to demonstrate the basic tools and keyboard shortcuts (outlined below) as well as to make an appropriate save.

→ **Introduce basic tools:** Brush, Pencil, Eraser, Select, Colour picker, Shape, Transform

→ **Introduce basic Keyboard Shortcuts:** cut (ctrl x), copy (ctrl c), paste (ctrl v), save (ctrl s)

→ **Save work appropriately:** to correct folder, with clear file name, as correct file type



Extension: Students can go on to complete other communications from the list given.

Encourage them to share and discuss their work when they have finished.