



# Graphics

## *Basic Concepts*



**ExplorNet CareerTech**

*from The Centers for Quality Teaching and Learning*





# What do graphics look like?

## A graphic can be a:

- ✓ Chart
- ✓ Drawing
- ✓ Painting
- ✓ Photograph
- ✓ Logo
- ✓ Navigation button
- ✓ Diagram





# What do graphics look like?

## Graphics can be:

- ✓ **Black and White** – developed with a single hue
- ✓ **Grayscale** – shade of gray from black to white
- ✓ **Color** – full spectrum of color
- ✓ **Still**
- ✓ **Animated** – images have movement





# Graphics

## Evolution of Computer Graphics:

- ✓ The first PC with graphics was the Apple II, introduced in the late 1970s.
- ✓ It was not until the mid 1980s that other computers running Microsoft Windows began to catch up with Apple's graphic features.





# Computer Graphics Technology

**Images created or edited on computers are either:**

- ✓ Bitmapped graphics
- ✓ Vector graphics





# Graphics

## What are bitmapped graphics?

- ✓ Bitmapped graphics, also known as raster graphics, consist of grids of tiny dots called pixels. Each pixel is assigned a color.
- ✓ Can be continuous-tone image, such as photograph (full shades of color or gray)
- ✓ Bitmap graphic editors are called **paint programs**





# Graphics

## What are bitmapped graphics?

- ✓ Enlarging a bitmap graphic may cause the image to lose crispness and clarity (pixilated, blurry)
- ✓ Examples include newspaper photos.





# Graphics

## Paint Programs:

- ✓ Bitmapped/Raster graphics editing programs are called paint programs
- ✓ Adobe Photoshop is the standard tool for graphic artists







# Graphics

## What are vector graphics?

- ✓ Vector graphics use mathematical formulas to define points, lines, curves, and other attributes
- ✓ Vector graphic editors are called **draw programs**
- ✓ Resolution-independent – do not lose clarity as you enlarge them or decrease their size.
- ✓ Appear as bitmaps on computer monitors because computer monitors consist of pixel
- ✓ Examples include printed signs, logos and banner designs





# Graphics

## Draw programs:

- ✓ Vector graphics editing programs are called draw programs.
- ✓ Draw programs are the standard tool used for desktop publishing of graphics and illustrations.
- ✓ Adobe Illustrator & InDesign are commonly used.





# Graphics

## Graphics Quality:

- ✓ The two factors that determine graphics quality are resolution and color depth.
- ✓ Resolution is determined by the number of pixels per inch (PPI).
- ✓ Color depth refers to the number of distinct colors an image can contain. It can range from 2-bit (black and white) to 24-bit (16.7 million colors).





# Graphics

## Resolution:

Resolution is how clear or sharp the image appears.

- ✓ **Low Resolution** – image is smaller in file size, but may have some blurriness or pixilation in appearance.
- ✓ **High Resolution** – image is larger in file size, but the appearance is clear and sharp.





# Graphics

## Color Depth:

- ✓ Color depth refers to the number of distinct colors an image can contain.
  - 1-bit (black and white)
  - 8-bit (indexed color) – 256 colors
  - 24-bit (full-color) – 16.7 million colors





# Graphic File Formats

**A computer can save and interpret graphic images in a variety of formats:**

Some of the most common formats include:

- ✓ **GIF** (Graphics Interchange Format)
- ✓ **JPEG** (Joint Photographic Experts Group)
- ✓ **TIFF** (Tagged Information File Format)
- ✓ **PIC** (PICTure)
- ✓ **RAW** (Raw image)
- ✓ **BMP** (bitmap)
- ✓ **TGA** (Targa)
- ✓ **PNG** (Portable Network Graphics)





# Graphics

## Graphic File Formats:

Graphic files are often so large that they need to be compressed when saved.

- ✓ **Lossless compression** – no data is lost in compression, but file sizes are not greatly reduced.
- ✓ **Lossy compression** – file size is reduced significantly, but some data is lost in the process.





# Graphic File Formats

## GIF:

- ✓ Pronounced je-if
- ✓ .gif file extension
- ✓ First graphics format to be accepted by the World Wide Web (standard format for the Internet)
- ✓ Supports Web animation
- ✓ Indexed color format (256 colors)
- ✓ Lossless compression







# Graphic File Formats

## JPEG:

- ✓ Pronounced jay-peg
- ✓ .jpg file extension
- ✓ Preferred graphic format for digital photographs and pictures on the Web and for email
- ✓ Full-color format (16.7 million colors)
- ✓ Lossy compression





# Graphic File Formats

## TIFF:

- ✓ Pronounced tif
- ✓ .tif file extension
- ✓ Standard graphic format for desktop publishing images into documents. Best for print work. Best for storing documents.
- ✓ Any resolution and all color formats (2-bit to 24-bit color depths)
- ✓ Lossless compression





# Graphic File Formats

## RAW:

- ✓ Pronounced raw
- ✓ .ra or raw file extension
- ✓ Standard graphic format photographers that want to capture as closest to actual visual picture use.
- ✓ Unprocessed files.
- ✓ Files are very large.
- ✓ Not used with a bitmap organizer
- ✓ Lossless compression





# Graphic File Formats

## **BMP:**

- ✓ Pronounced bitmap
- ✓ .bmp file extension
- ✓ Commonly used for creating icons and wallpaper for PCs
- ✓ Full color format
- ✓ Files are large
- ✓ Lossless compression





# Graphic File Formats

## TGA:

- ✓ Pronounced tar-ga
- ✓ .tga file extension
- ✓ First high quality graphics file format
- ✓ Used for full color format.
- ✓ Files are large
- ✓ Lossless compression





# Graphic File Formats

## **PNG:**

- ✓ Pronounced ping
- ✓ .png file extension
- ✓ Graphic format was designed to replace the GIF on the Web
- ✓ Large file
- ✓ Full-color formats (16.7 million colors)
- ✓ Lossless compression

