CHAPTER 9

Syllabus outcomes

5.2.1 Describes and applies problem-solving processes when creating solutions.
5.2.2 Designs, produces and evaluates appropriate solutions to a range of challenging problems.
5.2.3 Critically analyses decision-making processes in a range of information and software solutions.

Overview

The chapter examines multimedia and develops skills in using authoring software. First we describe the types of multimedia products and recognise the features of data types for multimedia products. Multimedia software and the design principles used in multimedia products are examined.
9.1 Multimedia products

Multimedia is the presentation of information using text, graphics, animation, audio and video. It uses at least three different data types. Multimedia has the potential to provide a better experience than any other information medium. It can combine the best of television, film, graphics, animation, books, magazines and radio. The result of using authoring software is called a multimedia product or a multimedia presentation.

A key feature of multimedia is interactivity. It allows the user to choose the sequence and content of information. A multimedia product is often judged on the quantity of interactivity. The Internet is an example of an interactive environment. The expression ‘surfing the Net’ or ‘browsing’ refers to the experience of jumping from one page to another using interactivity. Interactive multimedia accepts input from a mouse, touch screen or keyboard and performs some action. Hypertext is used to navigate through a multimedia product.

Hypertext is a system that allows documents to be cross-linked in such a way that the user can move from one document to another by clicking on text. Hypertext links—or hyperlinks—are usually identified using an underlined text and/or a different text colour. The author of the hypertext must specify the destination of that
link. In a multimedia product the link may be to another screen, audio, animation or video. When you click on a link you move from one document to another, even if they contain different data types. Hypertext provides the interactivity in the multimedia product.

The developments in information technology have allowed people to create multimedia products that were once only developed by film professionals. Multimedia products are very demanding and require the latest technology, such as a fast processor, large memory, high-resolution screen, quality speakers and the latest in storage devices. Advances in information technology are influencing multimedia development. For example, improvements in communication speed and capacity on the Internet have turned it into a medium to deliver multimedia (see Figure 9.1). Multimedia is extensively used in education, entertainment and information.

**Education**

Multimedia is very effective at helping people to learn. A good multimedia product that uses different data types maintains the user’s interest. The interactive nature of multimedia allows the user to control the learning. It addresses each user’s particular needs. Multimedia also allows training to be carried out at convenient times and is developed to cater for a wide range of abilities. It is a cost effective method of teaching people.

Computer based training (CBT) is a type of multimedia product used for education and training. A person uses CBT at their own pace. Information is presented using different types of media and the user has the opportunity to review misunderstood concepts. CBT is designed by experts in their field to cater for different rates of learning. Interactivity in CBT is the basis for an individual to progress through the system. CBT usually contains some form of assessment to determine whether an individual is ready for the next level.

**Entertainment**

Multimedia designed for entertainment is generally classified as computer games. Computer games provide a high level of interactivity. The responses of the user determine the game being played. The sequence of actions is determined by the game designer. Games tend to be time restricted and contain complex animation. The level and amount of text is limited. Depending on the type of game the navigation may be deliberately hidden until the user reaches a certain level. Computer games feature high-
resolution images, audio, animation and video. They often use some form of alternative to the keyboard for input such as a joystick. Developments in technology have resulted in computer games that are more realistic. Games are increasingly being played over the Internet (see Figure 9.2).

**Information**

Multimedia provides users with an easy way to display information. The user controls when, how and what information will be displayed. The interactive nature of multimedia allows the user to search using related keywords to find specific information. This is a distinct advantage over printed forms of the same material. A multimedia encyclopaedia is a good example of multimedia being used to store information. It displays information using text, graphics, audio, animation and video. This makes it easier for people to understand the information.

Multimedia kiosks allow people to use a touch screen and select information about an organisation or service. Information displayed depends on the selections of the user. Multimedia kiosks commonly provide information about items, the location of items or a map to a particular product or service. They use large navigation buttons with few options. Kiosks can also be used to provide information to the organisation. The selections made by the user are a source of information about the interest in a product or service.
Exercise 9.1

1 Copy and complete the following sentences:
   a The result of multimedia is called a _______
   b _______ is a key feature of multimedia.
   c Hypertext links are usually identified by an _______.
   d A multimedia _______ is a good example of multimedia being used to store information.

2 True or false?
   a Multimedia requires at least four data types.
   b Multimedia products are very demanding and require the latest technology.
   c CBT is designed by experts in their field to cater for different rates of learning.
   d Computer games provide a low level of interactivity.

3 What am I?
   a The presentation of information using text, graphics, animation, audio and video.
   b It is used to navigate through a multimedia product.
   c A type of multimedia product used for education.
   d A multimedia product that allows people to use a touch screen and select information about an organisation or service.

4 a Why is the Internet an example of an interactive environment?
   b What is hypertext?
   c How are developments in information technology affecting multimedia?
   d Why is multimedia very effective at helping people to learn?
   e Describe some of the features of computer games.
   f Why is multimedia used to display information?

Development

5 Games have been a driving force for improvements in information technology. Do research into the latest computer games for the PC. What are the system requirements for these games? Describe the multimedia features of these games. Write a report that summarises your investigation.

6 Compare and contrast a multimedia encyclopaedia with a print encyclopaedia. Describe the data types used in both multimedia and print encyclopaedias. What navigation methods were used in the multimedia encyclopaedia?
When creating a multimedia product the data is acquired from another application or imported using an appropriate file format. The features of the different data types are described below.

**Text**

*Text* is data in the form of letters, numbers and other special characters. Text is written using a word processor or within the authoring software. It is edited in many different ways, such as deleting, inserting, moving and copying. Some common file formats for text include:

- DOC (document) is the format used by Microsoft Word. DOC files maintain their formatting and can contain other data types.
- TXT (text) files or ASCII is a standard format to store text and numeric data. It is essentially raw text without any formatting. Each byte in the file contains one character that conforms to the standard ASCII code.
- RTF (rich text format) is a standard developed by Microsoft for specifying the format of text documents. RTF files are actually ASCII files with special commands to indicate the formatting of characters and paragraphs.
- PDF (portable document format) is a file format developed by Adobe Systems. A PDF file contains a combination of text and graphics. Documents downloaded from the Internet are often in PDF format.

**Graphics**

*Graphics* are pictures such as drawings, paintings or photographs. Graphics are used to create interest and provide information. They can be stored, edited and transferred in similar ways to text. Graphics are created using graphics programs or captured using a scanner, digital camera or video camera. All graphics are displayed using tiny dots called pixels. A pixel (picture element) is the smallest part of the screen that can be controlled by the computer. The total number of pixels on the screen is called its resolution. There are two types of graphics: bit-mapped graphics and vector graphics.

*Bit-mapped graphics* (raster graphics) store and manipulate each pixel. They produce good quality images where shading and fine detail are needed. However, when resized bit-mapped graphics become ragged and suffer loss of resolution. Enlarging the graphic
enlarges each pixel and creates a staircase pattern along a diagonal or curved line called jaggies. Bit-mapped graphics are created and edited using a painting program (see Figure 9.3). Some common file formats for bit-mapped graphics include:

- **BMP (bit-map)** is the native bit-mapped graphic format for Microsoft Windows. It stores information about each pixel used in an image. This results in large file sizes.

- **JPEG (JPG, Joint Photographic Experts Group, pronounced ‘jay-peg’) compresses a bit-mapped graphic using lossy compression. JPEG files use 24-bit colour (16.7 million colours) and are commonly used for photographs on the Web.

- **GIF (Graphics Interchange Format)** is a popular format for web graphics. GIF files are compressed without loss of quality using lossless compression. They are good for line art drawings, logos and simple graphics. GIF format compresses graphics files using 8-bit colour (256 colours).

- **TIFF (Tagged Image File Format)** is widely supported by applications on both Windows and Macintosh platforms. There are several different versions of TIFF files, some of which involve compression.

- **PICT (picture)** stores bit-mapped or vector graphics. It is the standard file format on Macintosh computers. PICT files are encoded in QuickDraw commands.

*Vector graphics* (object-oriented graphics) store pictures as a collection of objects such as shapes and lines. Each object is defined by its characteristics such as position, line width and pattern. These characteristics are stored as mathematical expressions and displayed on the screen as pixels. Vector graphics are created and edited using a drawing program. A hardcopy of a vector graphic appears smoother.
than a bit-mapped graphic when enlarged. Some common file formats for vector graphics include:

- **CDR (CorelDraw)** is a file created by CorelDraw. CorelDraw is a powerful drawing program used by professional artists and designers.
- **WMF (Windows Metafile Format)** stores bit-mapped or vector graphics. WMF is a file format commonly used by Microsoft Windows applications. WMF is used to exchange images between Windows applications.
- **EPS (encapsulated postscript)** is a common format for output on high-resolution devices. It stores images using Postscript. Postscript is a page-description language for describing fonts, illustrations and other elements of the printed page.
- **PICT (picture)** stores bit-mapped or vector graphics (see above).

### Audio

Sound travels through the air in waves with a particular amplitude (volume) and wavelength (pitch or note). **Audio** is sound that has been digitised or represented in the form of digits. Audio is used to explain concepts, reinforce selections and for special effects. Audio signals from a computer are converted into analog sound waves for transmission through speakers. Sounds are edited in many different ways, such as deleting, changing the speed, adding an echo, overlaying (mixing) sound files and altering the quality of the sound file. Some common file formats for audio include:

- **WAV** (pronounced ‘wave’) is a format that stores either 8-bit, 16-bit or 32-bit sound. It has no compression so there is no loss of quality. One disadvantage with WAV sound files is that they result in large file sizes.
- **MP3** (MPEG audio layer 3) compresses a sound file by removing the high and low frequencies out of our hearing range. MP3 has made it possible to download quality audio from the Internet. However, it can be compressed too much and result in low quality audio.
- **WMA** (Windows Media Audio) is a compressed audio format used for Windows Media Player.
- **MIDI** (Musical Instrument Digital Interface, pronounced ‘middy’) is a standard connection for computers and electronic musical instruments. MIDI files require less storage as they only contain the note information. The quality of the sound in MIDI files is dependent on the synthesiser.
Animation

*Animation* is the apparent movement of an object. It is the result of a series of graphics or frames presented in rapid succession. Animations often direct the attention of the user to an area of the screen or an interesting feature. They are usually started automatically when a frame is viewed or by the user clicking a button. When creating an animation the user needs to consider the size of the graphic and the speed of the movement. Some common file formats for animation include:

- **SWF** (ShockWave Flash object) is a popular animation format created by Macromedia (see Figure 9.4). It is vector-based and compresses to very small file sizes. It is used extensively on the Web.
- **Animated GIF** (Graphics Interchange Format) is a type of GIF image that can be animated. Animated GIF does not give the same level of control as other animation formats.
- **MOV** (Movie) is a video and animation format developed for Apple QuickTime. It is built into the Macintosh operating system and used with most Macintosh applications.

Animation is created using path-based and cel-based animation. **Cel-based animation** creates an animation by using a sequence of individual still images, each displayed in a frame or cell. It is possible to have a fixed background, however, the shape of the animated objects and their position must be changed. **Path-based animation** creates an animation by displaying the movement of an animated object onto a fixed background in a particular sequence or path. The shape of the animated object remains the same.

![Figure 9.4 Macromedia Swish](image)
Animation is achieved by drawing the object, wiping it, and then drawing the object in a new position. This process is made easier because animation software can generate the intermediate frames between two objects. This is called *tweening* (short for in-betweening).

**Video**

A *video* is made up of frames that contain individual images. When the video is played, the frames are displayed in sequence. The number of frames per second is the frame rate. Video has a frame rate ranging from 15 to 60 frames per second (fps). Some common file formats for video are:

- MPEG (MPG, Motion Picture Expert Group) is a family of formats for compressed video that has become a standard. MPEG-1 is a suitable standard to create a video CD at the quality of VHS tape. MPEG-2 is a higher quality standard at the level of a DVD. MPEG-4 is a format designed for transmission over the Internet.
- AVI (audio/video interleaved) is a video and audio format developed by Microsoft. It is limited to 320 by 240 resolution and 30 frames per second.
- DivX is a compressed format based on MPEG-4 technology. DivX can be quickly downloaded from the Internet without loss of quality.
- WMV (Windows Media Video) is a compressed video format used for Windows Movie Maker (see Figure 9.5). It is based on MPEG-4 technology.
- MOV (Movie) is a video and animation format developed for Apple QuickTime (see above).
Exercise 9.2

1 Explain the difference between:
   a a bit-mapped graphic and a vector graphic
   b a JPEG and a GIF file
   c cel-based animation and path-based animation.

2 True or false?
   a Vector graphics are created and edited in a drawing program.
   b GIF files are bit-mapped graphics.
   c An MP3 file is a much larger file size compared to WAV.
   d MPEG-1 is a suitable standard to create a video CD.

3 What am I?
   a File format that is essentially raw text without any formatting.
   b The staircase pattern caused by enlarging each pixel in a bit-mapped graphic.
   c Sound that has been digitised.
   d A family of file formats for compressed video.

4 a List common file formats for text.
   b What is a pixel?
   c What is the main advantage of a vector graphic compared to a bit-mapped graphic?
   d How are sounds edited?
   e What is an animation?
   f What is the frame rate?

Development

5 File formats for the different data types are constantly changing. Do research into the most popular file formats for text, graphics, audio, animation and video. List software that could be used to create or edit these formats. Construct a table to summarise your results using three headings: Data type; Software application; File format.

6 Your school wants to create a multimedia product for a kiosk in the foyer of the school. The multimedia product aims to display information about the school for the community. Describe the information that could be displayed by each data type. Design a home page for the kiosk.
9.3 Authoring software systems

Multimedia is created and displayed using a range of multimedia software such as presentation software, multimedia authoring and web authoring.

Presentation software

Presentation software is used to make a multimedia presentation to a group of people. A presentation consists of a series of slides. A slide is an individual screen or page of the presentation. Each slide may contain text, graphics, animation, audio and video. Each of these elements is treated as an object. A presentation is a group of objects positioned on one or more slides. Some popular presentation software includes Microsoft PowerPoint, Lotus Freelance and Aldus Persuasion (see Figure 9.6).

Presentation software often allows you to create several different types of documents such as:

- Onscreen presentations—slides displayed on a monitor or projected onto a screen. The timing of the presentation is controlled either automatically or manually. Automatic requires the user to set the timings for each slide so that the slides advance by themselves. Slides advance manually by clicking the mouse button.

![Microsoft PowerPoint](image-url)
• Audience handouts—content of one or more slides on a page. Handouts are given to people who attend the presentation.
• Overhead transparencies—slides printed on transparent film for use with an overhead projector. They can be in black and white or colour, and in portrait or landscape orientation.
• Speaker’s notes—notes the speaker may need to refer to when discussing the slides.

**Multimedia authoring**

*Multimedia authoring software* is used to create and edit a multimedia product. It allows the user to combine the different data types such as text, graphics, audio, animation and video. Multimedia authoring software is designed to produce self-contained applications for a CD or DVD, as a part of an information kiosk or to run on the Internet. Multimedia authoring software provides a much greater level of interactivity than presentation software. A multimedia product is created by first developing each of the data types. It is often completed by a group of people, each of them specialising in a data type such as video or audio. They create their part of the project using separate applications and import files into the authoring software. Authoring software also allows the user to create the interactivity.

Most authoring software shares similar features. Some popular authoring software includes:

• *Macromedia Director*—uses a movie to create the multimedia product. It treats each file as a cast member of a production. These files will appear at a particular time, position and appear for a certain length of time. A cast window is used to store different data types and a store window is used to synchronise the different elements.

• *Macromedia Authorware*—uses a flowchart to create the multimedia product. A flowchart consists of a number of icons that represent a specific programming task such as a selection. Macromedia Authorware specialises in creating multimedia training courses.

• *HyperStudio*—uses a card-and-stack user interface that was originally introduced with Apple’s HyperCard. A multimedia product is constructed as a stack of cards. A card represents a screen and contains different data types. Buttons are placed on the cards to provide the interactivity.

• *Asymetrix ToolBook*—uses a similar interface to HyperStudio except a book replaces a stack and a page replaces a card. It uses OpenScript as a programming language.
Web authoring

Web authoring software is used to create and manage a multimedia website. Websites contain a range of data types, such as text, graphics, animation, audio and streamed video. The web authoring software will position and display objects, as they would be viewed through a web browser. Many programs allow the user to manage entire websites using tools that automate repetitive tasks. Some popular web authoring software includes:

• **Macromedia Dreamweaver**—is the industry standard used by professional designers (see Figure 9.7). It creates HTML (hypertext markup language) code that is efficient and compatible with any browser or platform.
• **Microsoft FrontPage**—is used by small business and home users. It has an intuitive layout with easy to use templates. Users have the ability to view and edit the HTML code.

Web animation software such as Macromedia Flash has developed into a multimedia program. In addition to creating animations such programs now include text, graphics, audio and video. Macromedia Flash also contains programming languages for creating interactive applications.

![Figure 9.7 Macromedia Dreamweaver](image-url)
Project: Total Music

Total Music is a local band that would like to create a multimedia product of their material. The multimedia product is to include their music, video clips of the band and interviews with the band members. Imran from MediaCom was chosen by Total Music to develop the product. The problem was solved using the four stages in project development.

• **Define and analyse the problem:** A meeting with the band was arranged to discuss the selection of songs, opportunities to video a live performance, appropriate topics for the interviews and any ideas for design of the product. A project plan was written and submitted for approval to the band.

• **Design possible solutions:** Imran investigated the features of similar multimedia products. He decided on three possible solutions and created a storyboard for each solution. A feasibility report was written and presented to the band. The recommendation from the feasibility report was accepted by the band.

• **Produce the solution:** The multimedia product was constructed using Macromedia Director. Each screen had the same layout, format and style. Photographs taken of the band at their last concert were used to create interest. A music session was used to record the band’s music and film the interviews with the band members. Each piece of data was imported into Director and the final product tested.

• **Evaluate the solution:** The multimedia product was presented to the band. The band was pleased with the final product and is using it for promotion outside the local area.

**Tasks**

1. Construct a storyboard that would be appropriate for this project.

2. Do research into the features of the latest multimedia authoring software. Write a brief report that summarises your investigation.
Exercise 9.3

1 Copy and complete the following by replacing the letter in brackets with a suitable term:
   Multimedia authoring software is used to (a) and (b) a multimedia product. It is designed to produce self-contained (c) for a CD or DVD, as a part of an information (d) or to run on the Internet.

2 True or false?
   a Microsoft PowerPoint is a popular web authoring program.
   b Presentation software allows you to create audience handouts.
   c Macromedia Director uses a card-and-stack user interface.
   d Web authoring software will position and display objects, as they would be viewed through a web browser.

3 Unjumble these words:
   a etasenoptirn wsaroft
   b gaouthrin

4 a What is the purpose of presentation software?
   b List some different types of documents that can be created by presentation software.
   c How is a multimedia product created using multimedia authoring software?
   d What is web authoring software?
   e Describe Macromedia Dreamweaver.

Development

5 Create a multimedia presentation on a multimedia product. The product could be a software application such as an educational program or a computer game. Your presentation should use different data types.

6 Investigate the authoring software that you have available in your school. Write a report that outlines the steps taken to construct a multimedia product. Share your investigation with the class.

9.4 Multimedia design

A multimedia product needs to be carefully designed. It involves conforming to certain design principles.

Design principles

The different data types must be combined into one effective multimedia product. The design of each screen should be based on the three basic design principles:

- Consistent: Layout, format and style should be the same throughout the multimedia product unless different data types demand a change. Readability is improved when similar items
are grouped. Grouping is achieved by spacing, use of colour for the text and changing the backgrounds or borders.

- **Navigation:** Users need to understand the structure of the multimedia product and be able to find information they want easily. The time taken to respond to a user’s action is important. People become frustrated if they have to wait more than a few seconds for the next screen or a video clip to load.

- **Simple:** Do not overuse design elements as this will create visual clutter and confuse the user. The overuse of colour, sound and animations can be distracting.

Text should be short, simple and relevant. It is better to provide text in concise bursts using short paragraphs (see Figure 9.8). For longer sections of text, consider providing a brief introduction and then include a link to the full version on another page. Design principles to format text include:

- **Fonts:** Use at most three different fonts. Both sans serif typefaces (such as Arial, Verdana or Georgia) and serif typefaces (such as Times Roman) can be used for text. Care should be taken using font variations such as bold and italic. Use different size headings to reflect their importance.

- **Screen layout:** Appropriate conventions exist for column width, alignment, line spacing, character spacing, indentation, hyphenation and kerning. Long lines of text are difficult to read. Double spacing improves readability. Bullets and numbering are common ways to organise text in a multimedia product.

![Figure 9.8 Multimedia website using good design](image-url)
• Colour scheme: This contributes to the style and theme of a multimedia product. Colour draws attention to the text. Some colours should not be used together as they produce poor contrast and reduce readability. For example, blue text on a red background. Too many different colours can be distracting and reduce readability. Use colour in a consistent way so users easily recognise the different elements.

Graphics and animations are used to create interest and provide information. However, they place extra demands on the multimedia product, so need to be used carefully. The position and size of a graphic or animation is dependent on its importance and balance with the other design elements. It can support or weaken a multimedia product. If too many images are used the product loses its impact. The same goes for animations. Animations should be used sparingly, such as to introduce a new section within the multimedia product. Images and animations are edited and adjusted to suit the screen resolution. The resolution of a graphic is dependent on the screen and the number of colours that can be displayed. The intention of a graphic must be easily understood. For example, a graphic might guide the user to another section of a multimedia product. Titling is the placement of a caption to accompany the graphic.

Audio and video are also used to create interest and provide information. An occasional burst of sound for special effect will focus the audience on the multimedia. However, the frequent use of sound effects can draw attention away from the main information. Audio and video can be excellent media to explain concepts, however, they place extra demands on the user’s computer system. A decision on the use of sounds and video is often made in terms of providing exciting additional elements and ensuring the multimedia product will function effectively. Audio and video files are usually very large and this factor must be taken into account before including them in the multimedia product.

Script and storyboard

A script and a storyboard are two tools used to organise a multimedia product. A script is a printout of all the text, graphics, animation, audio and video used in the production. It outlines the interactivity in the project. A script gives directions for the construction of the multimedia product. It is a textual method of representing ideas and actions. On the other hand, a storyboard is a
series of frames each representing a different action or screen image. It is a visual method of representing ideas and actions. Storyboards are drawn on paper or involve the use of storyboarding tools. They are frequently edited. Multimedia storyboards define each screen and the specific data types used. They consist of navigation paths, information and graphics. There are four basic storyboard layouts (see Figure 9.9):

- Linear—a simple sequential path that is set up quickly. It is an appropriate layout when users are expected to examine each frame before moving to the next frame.
- Hierarchical—a sequential path in a top-down design. It starts at the beginning and moves down through the multimedia product. This layout allows users to choose their direction and explore a particular topic in greater depth.
- Non-linear (random)—no particular structure. It moves between different layouts in any direction. This layout is often used in multimedia encyclopaedias as it gives users the opportunity to explore.
- Combination—a blending of the all these layout types.
Exercise 9.4

1 What am I?
   a A storyboard layout that has no particular structure.
   b A serif typeface commonly used for text.
   c A series of frames each representing a different action or screen image.

2 Copy and complete the following by replacing the letter in brackets with a suitable term:
The position and (a) of a graphic or animation is dependent on its (b) and balance with the other design elements. Graphics and animations are edited and adjusted to suit the screen (c). Titling is the placement of a (d) to accompany a graphic.

3 Copy and complete the following sentences:
a The layout, format and style should be the ______ throughout the multimedia product.
b Bullets and ______ are common ways to organise text in a multimedia product.
c Audio and video place extra ______ on the user’s computer system.
d A ______ is a printout of all the text, graphics, animation, audio and video used in the production.

4 a List the three basic design principles.
b Describe the design principles for using fonts.
c What is the purpose of a colour scheme?
d How should audio and video be used in a multimedia product?
e Describe multimedia storyboards.
f List the four basic storyboard layouts.

Development

5 Do research into at least three websites that offer advice on design principles for multimedia. Write a report that summarises your investigation.

6 Create a multimedia product for a kiosk for the foyer of your school. The multimedia product aims to display information about the school for the community (Exercise 9.2, Question 6):
a Construct a storyboard for the multimedia product.
b Describe the design features used in the product.
c Outline any issues that have been raised in developing the product, such as privacy and copyright.
d Display your multimedia product to the class.
Part A: Multiple choice questions

Select the alternative (a), (b), (c) or (d) that best answers each question.

1. Which of the following statements is incorrect?
   a. Multimedia uses at least three data types
   b. Data types of the multimedia product are created within the authoring software
   c. Interactivity is a key feature of multimedia
   d. Multimedia products are very demanding and require the latest technology

2. Which of the following describes hypertext?
   a. Allows documents to be cross-linked in such a way that the user can move from one document to another
   b. Data in the form of letters, numbers and other special characters
   c. Used to create and manage a multimedia website
   d. Popular multimedia authoring software

3. Which of the following is a common file format used for bit-mapped graphics?
   a. PDF
   b. DOC
   c. MPG
   d. JPG

4. Which of the following describes vector graphics?
   a. Store pictures as a collection of objects such as shapes and lines
   b. Are created using a painting program
   c. Is the movement of an object
   d. Store and manipulate each pixel rather than as shapes and lines

5. Which of the following is not a common file format for video?
   a. MPG
   b. SWF
   c. AVI
   d. WMV

6. Which of the following is an example of web authoring software?
   a. Microsoft PowerPoint
   b. HyperStudio
   c. Asymetrix ToolBook
   d. Macromedia Dreamweaver

7. Which of the following statements is incorrect?
   a. Presentation software provides a much greater level of interactivity than multimedia authoring software
   b. A presentation consists of a series of slides that may contain text, graphics, animations, audio and video
   c. Multimedia authoring software is designed to create self-contained applications for a CD
   d. Web authoring software will position and display objects as they would be viewed through a web browser

8. Design principles to format text involve which of the following?
   a. More than three different fonts
   b. Either a sans serif typeface or a serif typeface
   c. Font variations freely to improve readability
   d. The same size headings
9. A series of frames each representing a different action or screen image is known as which of the following?
   - a. Storyboard
   - b. Script
   - c. Screen layout
   - d. Navigation

10. Which of the following design principles is incorrect?
   - a. Layout, format and style should be consistent throughout the multimedia product
   - b. Do not overuse design elements as this will create visual clutter and confuse the user
   - c. Simple navigation through the multimedia product is an important design principle
   - d. Readability is improved by using a range of different colours

**Part B: Matching the term**

For each of the following statements (1 to 10), select from the list of terms (a to j) the one that most closely fits the statement.

**Statements**

1. The presentation of information using text, graphics, animation, audio and video.
2. A key feature of multimedia. It allows the user to choose the sequence and content of information.
3. Graphic file format to store and manipulate each pixel rather than as shapes and lines.
4. Graphic file format to store pictures as a collection of objects such as shapes and lines.
5. Animation process of generating the intermediate frames between two objects.
6. Software used to make a multimedia presentation to a group of people.
7. Software used to create and edit a multimedia product.
8. Software used to create and manage a multimedia website.
9. A printout of all the text, graphics, animation, audio and video used in the production.
10. A series of frames each representing a different action or screen image.

**Terms**

- a. Bit-mapped graphic
- b. Interactivity
- c. Multimedia
- d. Multimedia authoring software
- e. Presentation software
- f. Script
- g. Storyboard
- h. Tweening
- i. Vector graphic
- j. Web authoring software
Part C: Extended response questions

Write at least one paragraph for each of the following:

1 Define multimedia. What makes multimedia different to other information media such as newspapers and radio?

2 What are the three areas of use for multimedia products? Briefly describe those areas.

3 Multimedia products use a compressed file format for graphic, audio and video. Name and describe two compressed file formats for each of these data types.

4 There is a range of authoring software for multimedia. This software is constantly being upgraded with new features. Describe three popular software packages that are available for multimedia.

5 Outline the three basic design principles for an effective multimedia product. Illustrate your answer with sketches.

6 Creating a multimedia product requires a logical approach. Describe two tools used to organise a multimedia product.

Project: Electronic yearbook

Create a multimedia product that is a snapshot of your cohort for this year. Suggested material could include features of your school, issues, aspirations of students, famous quotes, embarrassing moments, poems, photographs, current music and movies, cultural events, excursions, videos or results of surveys. This is a group project that requires each member of the group to create a separate section. Your solution is to be developed using the four stages in project development.