Design and Applied Technology
(Secondary 4 - 6)
Learning Resource Materials

Creative Digital Media

Elective Module 2

Media Literacy

Digital Media Design

Digital Media Production

Design and Applied Technology

(Secondary 4 – 6)

Elective Module 2
Creative Digital Media

[Learning Resource Materials]

Resource Materials Series
In Support of the Design and Applied Technology Curriculum
(S4 – 6)

Technology Education Section
Curriculum Development Institute
Education Bureau
The Government of the HKSAR

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PREFACE

A set of curriculum resource materials is developed by the Technology Education Section of Curriculum Development Institute, Education Bureau for the implementation of the Design and Applied Technology (Secondary 4-6) curriculum in schools.

The aim of the resource materials is to provide information on the Compulsory and Elective Part of the DAT (Secondary 4-6) to support the implementation of the curriculum. The resource materials consist of teacher's guides and student's learning resource materials of each Strand and Module of the DAT (Secondary 4-6) arranged in eight folders.

All comments and suggestions related to the resource materials may be sent to:

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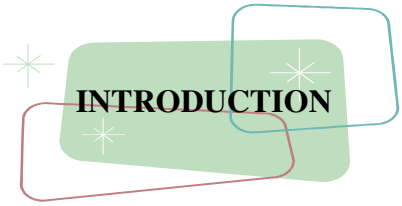


Information technology (IT) has provided artists with many creative options that people could not imagine in the old days. However, IT is more a state-of-the-art tool than a source of the ideas. A creative process in fact relies heavily, if not solely, on the contents.

This module will show students how to create works both traditionally and digitally. While many students are skilled with digital media software, they need to know how to be more creative, and how their concepts and ideas can be realized using digital media professionally.

After studying this module, students will be equipped with solid foundation and conceptual ideas for creating digital media works. Rather than being used mostly in the production processes, digital tools were use in design processes in the recent years. Having said that, the goal of creating best possible works has never changed, regardless of the media used. The approach of this module addresses both practical and theoretical points of view.

CHAPTER 1 – MEDIA LITERACY

Definition

What is media literacy[1]? It is the use of different media forms, modes, types, etc to communicate among people. Communication involves access to analysis, evaluation, and creation of messages. This chapter will discuss media literacy through the following topics:

1.1 Communication via digital media
1.2 Digital media products and relevant businesses
1.3 Social, economic and technological factors

Technological/ Design Concepts

These topics include learning materials and activities that facilitate students to:

(a) Understand various communication modes and stages in different contexts
(b) Identify the features of communication via digital media
(c) Compare different digital media products in the local and global markets
(d) Evaluate the pros and cons of a media-rich society in terms of social (including cultural and historical), economic and technological factors

Technology Development

There will not be any software package training in this chapter. However, students have to understand the processing and outcome of using different media to communicate. Students should conduct some exploration and research to understand these media. Such exploration and research can also help students understand the strengths and limitations of each medium.

[1] http://en.wikipedia.org/wiki/Media_Literacy

1.1 COMMUNICATION VIA DIGITAL MEDIA

This module covers:

1. basic concepts of human-computer interaction
2. design and communication of user interfaces in digital media
3. how humans process information and
4. how humans, machines and systems interact.

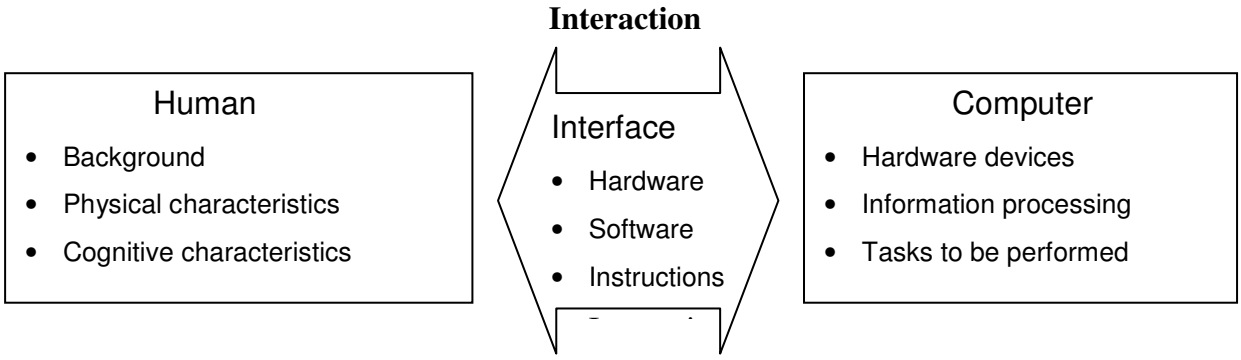
Upon completion of this module, it is expected that students understand how human information processing is done; and how human, machines and systems interface with each other.

1.1.1 Human Computer Interaction

Human Computer Interaction (HCI) in digital media production is an academic discipline for improvement of software products, focusing on the interface between human and computers.

According to Association of Computing Machinery Special Interest Group on Computer-Human Interaction Curriculum Development Group, HCI is 'the discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.'

In addition to the interface between users and computers, HCI caters for more, such as the hardware and the software in the computer side, and the background and characteristics in the user side.



Human Computer Interaction through an interface

Interface is a layer of software or hardware enabling a user to execute tasks on a computer. Examples are :

Software Interface:

An icon that allows a user to delete an object

(Image from Adobe PhotoShop software)

Hardware Interface:

A steering wheel of a computer car race simulator

Motion platform car racing game – Department of Multimedia and Internet Technology, IVE(TY)

Instruction Interface:

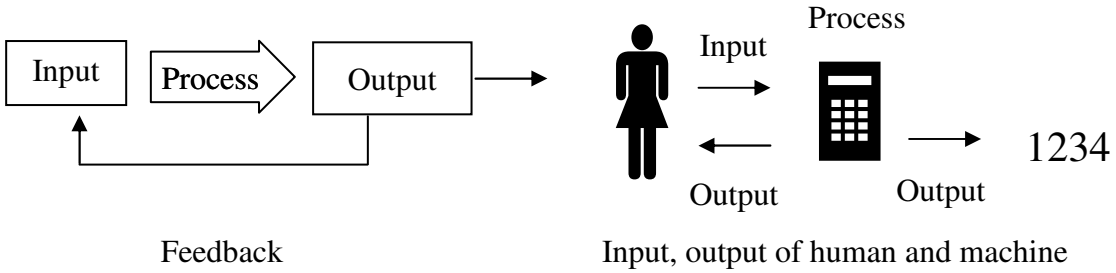
A dialogue box, informing the user of an event or activity, or suggesting the user to reply or react to a request.

(Image from Wintab software)

H I G H L I G H T

Human Machine Interface and Interaction

There are three components, namely Input, Process and Output.
Input can be seen as an entrance while Output as the exit. Process is what is done in between. The following example shows a person using a calculator.



H I G H L I G H T

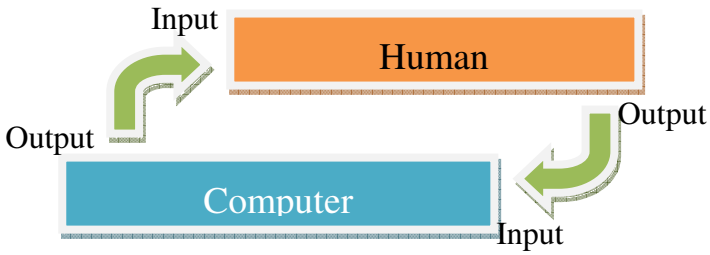
Human Computer Interaction through an interface

The following example illustrates how human and computers interact through interfaces. Explore why and how these interactions occurred.

Human		Interface		Computer
(a) Background: age, education, culture, inclinations, etc (b) Physical characteristics: any bodily deficiency, left- or right-hand bias, health, etc (c) Cognitive characteristics: mental processing of data, learning ability, conceptual skills, etc	⟺ Interaction	(a) Hardware: devices operated by human: keyboard, mouse, monitor, etc (b) Software: programs or display used (c) Instructions: commands and rules to be followed by users	⟺ Interaction	(a) Hardware devices: any hardware (b) Information processing: how data and information are processed in a system (c) Tasks to be performed: what is to be accomplished

Certain items of human or a computer can be both input and output channels, depending on how they perform their functions. For example, an eye, as an item of a person, can receive visual signals or messages, and informs a system to process it. Similarly, a monitor can be both an input device (touch screen) and an output device to a computer.

Further, 'input' and 'output' are relative. As illustrated below, the outputs from a user are inputs to a computer. After processing the user's inputs, the computer generates outputs, which become inputs to the user. This cycle iterates in an interactive fashion.

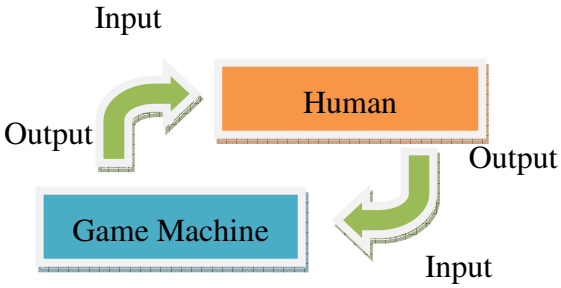


Input / Output Interactivity

S T O P A N D T H I N K

Game Hardware Interfaces and Accessories

A game interface is perhaps one of the most typical examples of HCI nowadays. The game, with hardware and software integrated as a whole, shows a particular scenario to the player(s) [output from the game and input to the player(s)]. As the player(s) react(s) to the scenario [output from the player(s) and input to the game], the game responds and shows another scenario.



Input / Output Interactivity

For better enjoyment, in addition to the traditional input devices for games, such as joysticks, there can be some special accessories as well. For example, drum sticks and drums are used for a drumming game.

Name two HCI examples, in addition to games, with input-output interactivity. For each example, explain how human and computers interact.

1.1.2 Communication among peoples

The interaction between human and their outside world is a typical communication system. Human receives information (input) mainly through six senses, and output through motor control of effectors.

H I G H L I G H T

Human six senses

- Vision - Seeing with eyes and the visual system
- Audition - Hearing with ears and the auditory system
- Cutaneous - Touching with skin
- Olfactory - Smelling with the nostril and nasal airways
- Gustation - Tasting with the mouth and tongue
- Vestibular - Balancing with the vestibular labyrinthine system in the inner ears

Effectors

Effectors are devices (organs) of human bodies, that human use for expression. Common effectors of a typical human are limbs, fingers, eyes, head and vocal system.

Effectors: Outputs from a human

(a) Noise

(b) Movements

H I G H L I G H T

The Vestibular Sense and Entertainment

While visual and audio are two major senses that entertainment targets to satisfy, the vestibular sense is increasingly being developed for enhancement of reality.

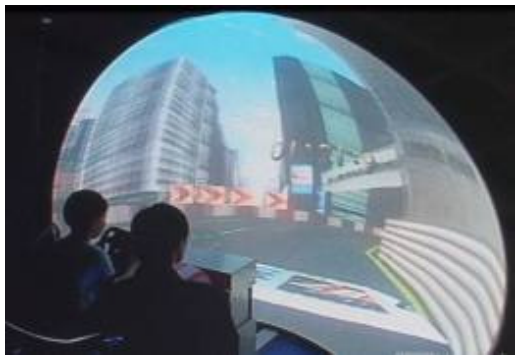
(a) Dynamic cinema

In dynamic cinemas, 3D projection systems with special in-situ effects (so-called '4D') are installed to provide audiences with unique experience that normal theatres cannot. For example, Mickey's PhilharMagic in Hong Kong Disneyland presents a 3D journey with some most memorable moments in Disney's animated films.

(b) A simulator system

A simulator system provides users with 'realistic' experiences artificially through presenting certain key characteristics or behaviours of the systems (or experiences) being simulated.

For example, there is a car game system that was developed by students in IVE (Tsing Yi). This simulator system models the environments of Central and Wan Chai, allowing the users to gain insight into the eventual real effects of alternative conditions and courses of action.



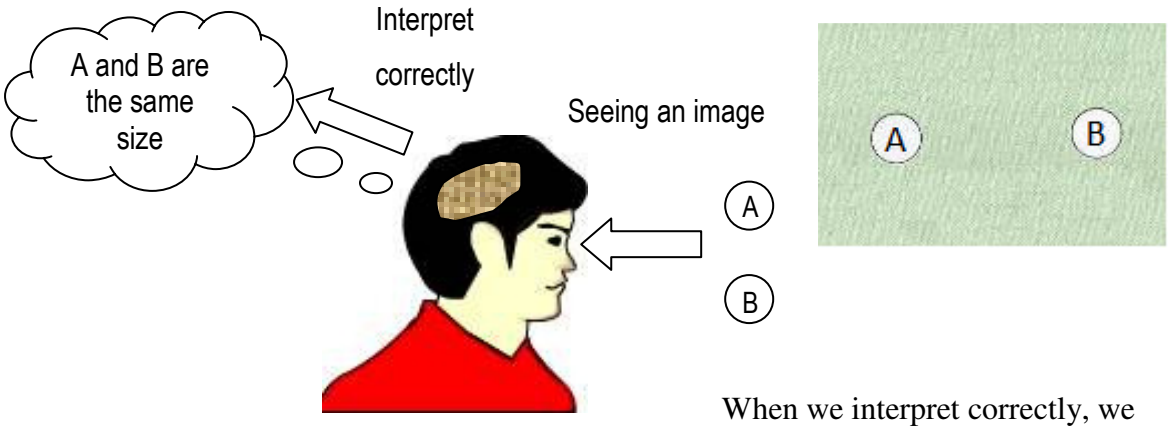
Motion platform car racing game – Department of Multimedia and Internet Technology, IVE (TY)

(c) Vibrating game controller

As its name implies, a vibrating game controller focuses on its motion sensing capability. Through physically moving the accelerometers and pointing on screen (supported by optical sensor technology), users can interact with items in the game.

Perception from Seeing

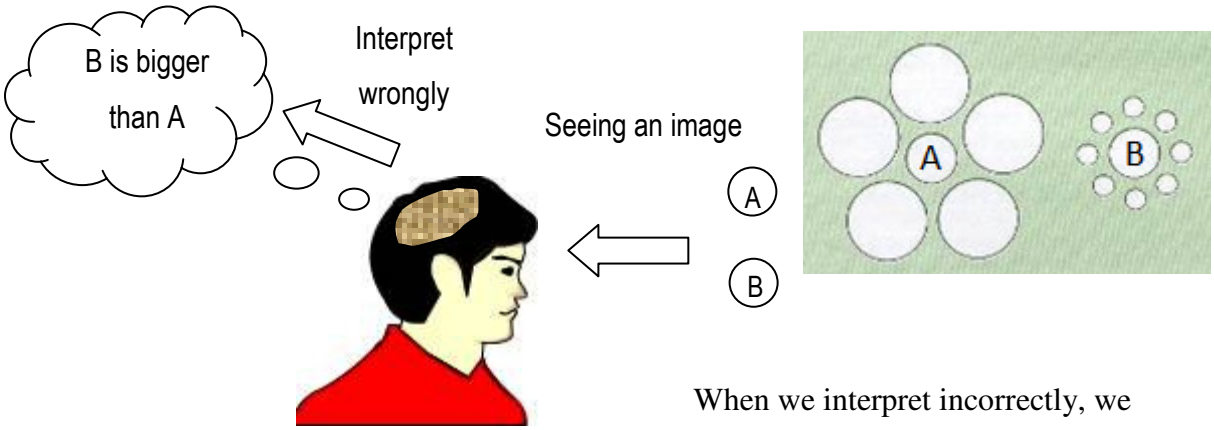
'Seeing' is in fact an interpretation process called 'perception'. When people see things, their eyes capture the image of that 'object' in one form of message. The message is subsequently transmitted to their brain for 'interpretation'. Interpretation by people's brain is a process of adding their own meanings to the message based on their own background, such as knowledge and experience. By then, a person 'understands' what that 'thing' is.



When we interpret correctly, we understand the object correctly.

However, along the line from seeing to understanding, it is possible that the message is mishandled (distorted image, incomplete message transmission, wrong interpretation, etc), making the results interpreted strange or misleading. For example, a kid who has seen only pencils only but never seen ball pens might interpret a ball pen as a pencil.

Similarly, a person may think what it is not, but it actually is. For example, a person sees something is moving, but in fact it remains static. Another example is that an object is dark just because it is surrounded by lighter-coloured objects.



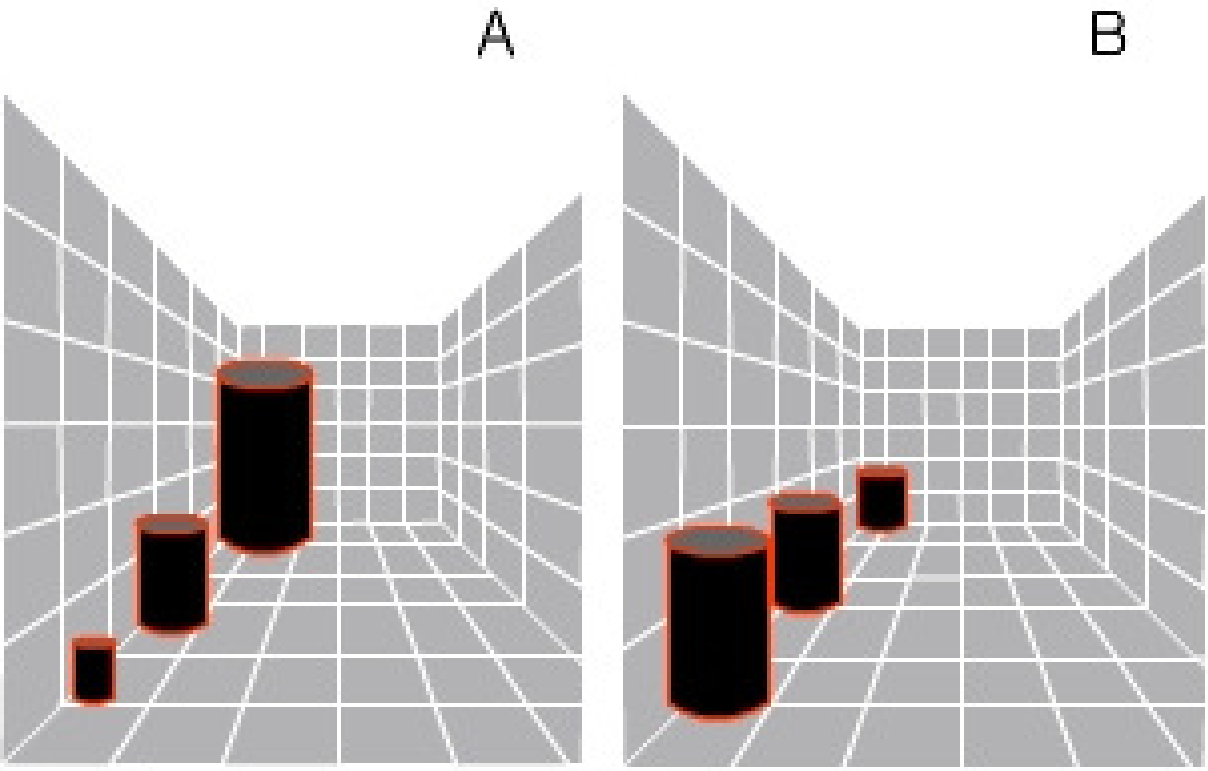
When we interpret incorrectly, we understand the object wrongly.

Such incorrect interpretation is called 'illusion'. Illusion is sometimes a useful tool for expressing certain ideas or concepts in the context of art and animation.

S T O P A N D T H I N K

(a) Explain what human perception is when something is seen through a human eye.

(b) In figure, there are three cylinders in each Group A and Group B. Does Group A or Group B appear to have cylinders of the same sizes? Explain using human visual perception.



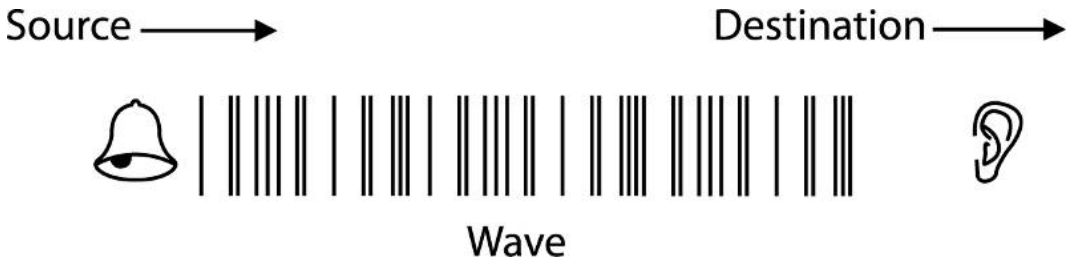
1.1.3 Source vs. Destination

A 'source' is a basic element of a communication or information processing model. It is the origin of a message which will subsequently be encoded and transmitted via a channel to the receiving end, which is a 'destination'.

H I G H L I G H T

Source vs. Destination

A sound source is an example of a source. Human perceive sound by hearing, one of the six senses of human as described in a previous section. The transmission of sound is a series of vibrations (sound wave) that travel with air as a medium. The vibrations 'hit' a person's ear drum(s) which in turn convert(s) the vibrations into messages for the brain to interpret, i.e. becoming audible. In this case, the person (a broader sense), or the ear(s), ear drum(s) or even the brain (a narrower sense) is the destination.



A light source is another example. There are different sources of light. A common one is thermal, such as sunlight. In animation movies, virtual sunlight is used to glow the virtual sense. In this case, the virtual sun is a source, while the objects that the virtual sunlight reaches are the destinations.

1.1.4 Sender vs. Receiver

A sender is the initiator of a message. A source as described in the previous section is the first sender in a communication model. Along the path between the source and the destination, there may be other senders.

A receiver is the receiving end of a transmission. A destination is an ultimate receiver in a communication model. Again, along the path between the source and the destination, there may be other receivers.

H I G H L I G H T

Broadcasting can be considered a sender, while the audience is the receiver. The messages between the sender and receiver are audio or video signals.

A digital media receiver is a device for home entertainment. It connects a home theatre system to a computer network to play music, pictures, videos, etc from media files. Users can use a device to browse 'file trees' and use the metadata there to organize media files.

S T O P A N D T H I N K

iPhone

iPhone is a phone product with multimedia and Internet-access enabled. It has been brought to the market by Apple Inc since 2006. iPhone provides users with the basic communication functions, such as telephoning and text messaging. In addition, it can be a camera, a portable media player, and an Internet access device for e-mail, web browsing, etc. through local Wi-Fi connectivity. With its media player or iPod function, iPhone allows a user to sort its media library on songs, artists, albums, videos, playlists, genres, composers, podcasts, audiobooks and compilations. iPhone's user interface is a multi-touch screen with virtual keyboard and buttons.

Name some media that play both the sender and receiver roles.

1.1.5 Message Carrier/ Channel/ Medium

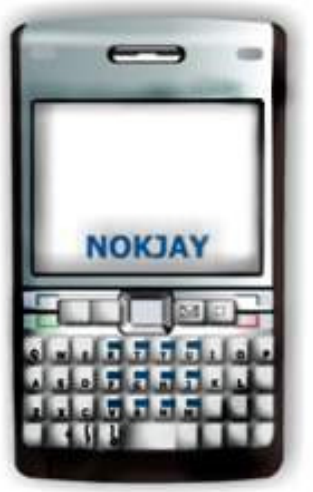
(a) Message Carrier

A message carrier or storage enclosure is a means of sending and holding recorded messages, voicemails, images and videos to and from mobile phones, answering machines and movable computers, such as laptops, personal digital assistants (or 'PDA') and game consoles.

S T O P A N D T H I N K

Short Message Service

Short Message Service (or 'SMS') is a text messaging service mostly used between mobile phones. The SMS standard also supports other types of broadcast messaging.



Name some other services, other than SMS, that are message carriers.

(b) Channel

A channel is the path between a sender and a receiver. It is the medium used to convey information between the sender and the receiver. In the context of digital media, a channel may also be referred to as a communication channel, image channel and media channel.

Each colour digital image is made up of pixels. Each pixel is made up of a combination of primary colours. For example, an image from a standard digital camera has three different channels, namely red, green and blue.

H I G H L I G H T

RGB Channel

An RGB image consists of three channels, namely red, green and blue. RGB channels correspond to human eyes' colour receptors, and are used in computer equipment, such as display screens (as output devices) and scanners (as input devices).

An image can be decomposed into three 8-bit images, representing each red, green and blue. In other words, the RGB image is of 24 bits.

The colour of the red dress in the red channel is much brighter than that in the other two.

Similarly, the green part in the green channel is much brighter than in red and blue.

Since there are few blue parts in the picture, the blue channel does not show particularly brighter objects.

(c) Medium

A medium is either analogue or digital. It is the means that something is communicated on. A medium can be a canvas for painting, a page for printing, a VHS cassette for videotaping, etc.

H I G H L I G H T

Analogue vs. Digital media

An analogue medium carries signals or information by recording the quantity changes of the signal or information. Common analogue signals or information are electric current, water waves, light, sound, etc. A vinyl record is also an analogue medium. The signal or information can be converted back to sound by using a turntable needle to contact the record physically.

Vinyl Record: Analogue medium

H I G H L I G H T

A digital medium carries signals or information through keeping the 0's and 1's that are 'readable' to computers. These values kept in digital media are discrete. Digital signals are very common nowadays due to IT's popularity. For example, sound can be converted back from a compact disc through reading by light beams.

Compact Disc: Digital medium

1.1.6 Encoding vs. Decoding

In the context of communication coding is a conversion rule of a particular piece of information, such as words and phrases, into another form. 'Encoding' refers to the conversion process that is done to facilitate the transmission. After transmission, there is a reverse conversion process called 'decoding' to facilitate the receiver's understanding. Binary coding and ASCII are two widely-known coding systems.

H I G H L I G H T

Binary Coding

Like human brains, a computer consists of millions of 'cells', which are small interconnected circuits and switches for 'thinking' (data processing). Computers' 'thinking method' is known as a binary system. Binary means 'duals' or 'pairs'. Instructions are received in the form of opposites; for example:

(a) On or Off;
(b) Positive or Negative;
(c) Something or Nothing;
(d) Light or Dark; and
(e) Yes or No

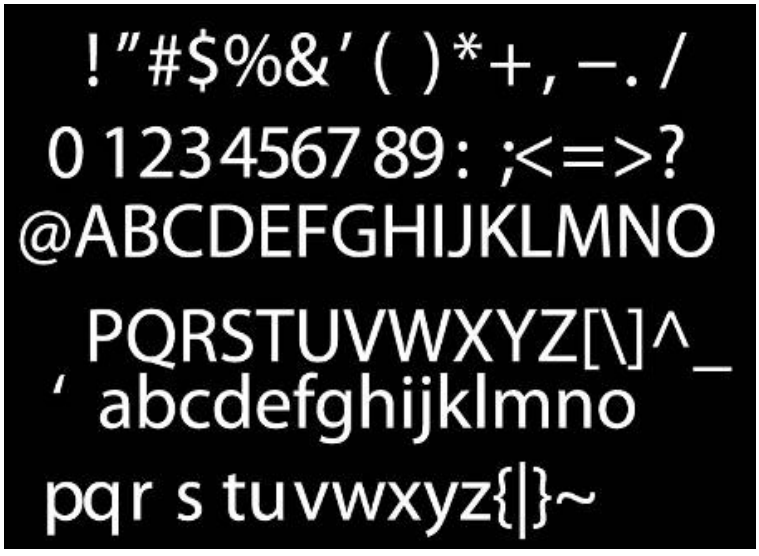
Binary	Decimal
0	0
1	1
10	2
11	3
100	4
101	5
110	6
111	7
1000	8
1001	9
1010	10

Since computers recognize only 0's and 1's, which represent different levels of electrical potentials, such instructions have to be converted into binary digits, or 'bits' in short, accordingly.

ASCII

American Standard Code for Information Interchange (or 'ASCII') is a system converting English alphabets, numbers and symbols into numbers and ultimately binary codes. ASCII codes are used in many computers and IT equipment that work with text. Over the years, ASCII has evolved into many modern character encoding systems.

ASCII's original version represents 128 characters with 7-bit binary numbers from 0000000 to 1111111. For example, an 'a' in ASCII is 1100001, while an 'A' is 1000001. Successors to ASCII can represent more characters with 8-bit binary numbers.



1.2 DIGITAL MEDIA PRODUCTS AND RELEVANT BUSINESS

Digital media products are ubiquitous nowadays. They are no longer luxuries as they were a decade ago; many of them even become necessities. In this section, the following digital media products will be looked into:

(a) Computer and Video games
(b) Digital television
(c) Electronic books (E-books)
(d) Mobile phones
(e) World Wide Web

1.2.1 Computer and Video games

Video games, which may use a TV display, are a subset of computer games. Computer games on the other hand, are a subset of electronic games.

Computer and video games can be classified as follows: PC games, arcade games, console games, handheld games and Internet games.

H I G H L I G H T

PC Games

PC games are those played on personal computers, no matter whether it is an IBM-compatible or Macintosh one. The input devices are often standard keyboards and mice. In some cases, devices like joysticks or trackballs are used. The output devices normally used are display monitors and audio loudspeakers. The outputs can also be directed to TV sets, etc.

Arcade Games

Arcade games are games on standalone devices located in game arcades. They are also known as coin-operated games. The input devices vary and often tailor-made, subject to the theme of a game. For example, the input device of a shooting game is a gun; those of driving games are steering wheels and pedals. The output device is mainly a display monitor embedded in the arcade game unit.

Console Games

Console games are also known as 'box games' because their dedicated hardware is in the form of a box. Console games' input devices are usually standard console controllers, and sometimes designated devices for particular games. Their output devices are typically household TV sets, and sometimes computer monitors and display projectors.

Microsoft Xbox 360 *PlayStation3*

Handheld Games

They refer to the games that can be held in the hands which can be played while moving around, opposed to those that must be connected to a computer or a TV set. The input devices are usually buttons and directional controllers. The output device is usually a small screen on the unit such as a mobile phone or even a digital watch. Unlike others, handheld game units are usually powered by battery for mobility. As a result, their processing power is limited. So they were generally shorter games and, until Nintendo DS and PSP release.

PSP

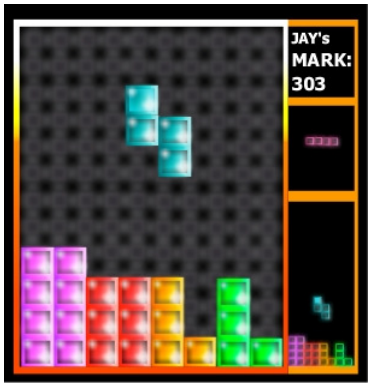
Nintendo DS

Internet Games

Internet Games are games that can be played over the Internet. They can be accessed by personal computers, PlayStation3, Xbox360, PDA, mobile phones, etc. Internet Games are considered an application of technology connecting people over the Internet, instead of a game genre.

Elements Present in a Computer Game Product

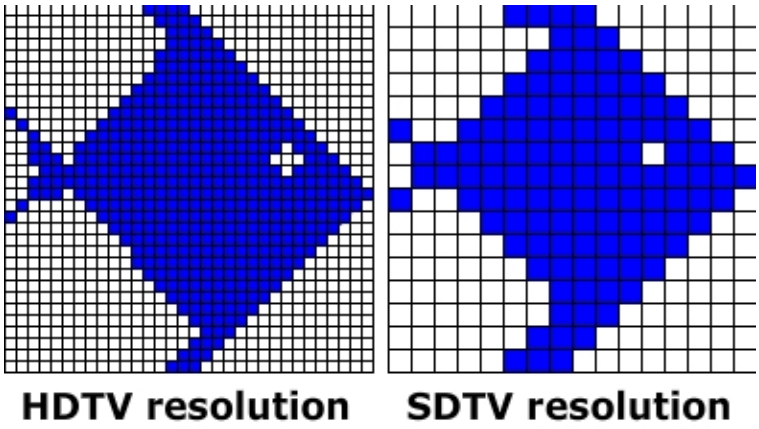
Instead of a physical good or product, computer games are sometimes considered 'virtual products' or services. Computer games usually have four common factors:

Factor	Description
Representation:	The theme of a computer game is related to the reality, in different forms and extents. It can be a simulation for the sake of learning, for example, to drive a car. It can also be simply for fun by participating in the story of a game, such as raising a child or fighting against enemies.
Interaction:	Computer games enable interaction with the players and even among players themselves. A player may compete against the time constraint imposed by the game, answer the difficulty-increasing questions raised by the game, or 'fight' against the enemies played by other players.  Tetris
Conflict:	Similar to the stories of dramas and movies, computer games provide the main characters (the players in this context) with different conflicts. A player has to clear these conflicts or obstacles before achieving the goals.
Safety:	As mentioned previous, computer games are virtual products. The conflicts or obstacles that they present are only psychological experiences, not harming the players direct. Having said that, still there may be some side effects on players. For example, looking at the screen for an overly long period of time or too intensively may harm a player's eye(s).

1.2.2 Digital Television

Standard definition TV (or 'SDTV') makes use of analogue signals for broadcasting. Digital television makes use of digital signals to send and receive image sequences, sound and music. Digital television allows higher-quality images and sound than analogue television does.

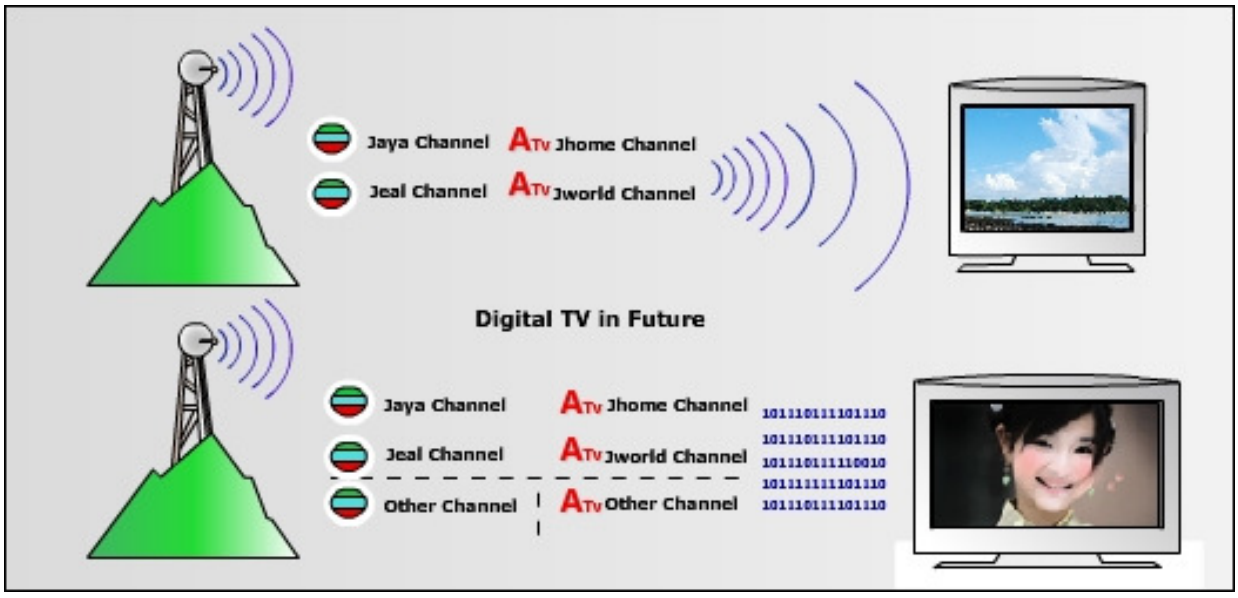
As a member of digital television, high-definition television (or 'HDTV') broadcasting system has been introduced to Hong Kong in December of 2007. HDTV provides Hong Kong audience with double liner resolution of the traditional television systems. Therefore, HDTV display in ages in greater detail than both analogue television and normal DVD. In addition, the technical standards for broadcasting HDTV handles the 16:9 aspect ratio images perfectly as HDTVs are 16 units in width and 9 units in height.



HDTV Source

For the increasing popularity of large screens (LCD displays) and projectors, SDTV's comparative disadvantage in quality becomes obvious. To enhance the quality of TV pictures, HDTV compatible televisions set, as well as HDTV broadcasting signals are required. Typical sources of HD signals are as follows:

(a) In Hong Kong, HDTV is available in major broadcasting networks over the air. To receive HDTV signals, an HDTV tuner is required. It can be a standalone tuner for those HDTV sets without such a tuner, or a built-in one which perform in most recent HDTV sets.



(b) Many cable television companies offer HDTV broadcasts through their digital broadcasting service with tuners (set-top boxes) provided by the companies.

(c) Video game machines (such as Xbox, PlayStation 3 and Xbox 360) and digital media boxes (such as the Apple TV) can output HD signals.

(d) Many computer graphics cards or TV cards in the market already enable image- or video-output to HDTV sets through either HDMI or DVI interface.

o

Computer TV card

(e) Blu-ray, an optical disc standard of storage 25GB to 50GB, can be a large enough storage medium for HD video contents.

u-ray Disc

1.2.3 Electronic Books

An electronic book, or 'e-book', is simply an electronic document with a layout similar to a usual printed book. E-books can be read on personal computers, PDA's or dedicated hardware devices such as e-book readers or e-book devices.

A user viewing an electronic page on an e-book reading device

Advantage of Electronic Books

(a) Writers and publishers may produce e-books in different file formats. Readers, users or viewers can choose e-books in file formats that fit the viewers' own devices.

(b) Readers can search various parts through text strings in e-books. This feature gives e-books a large advantage over traditional printing materials. It facilitating readers' in making cross-reference, dictionaries, reference works, and certain kinds of textbooks etc.

(c) e-books require much less physical storage space. As long as its memory is large enough, a single device can store up to thousands, millions or even more e-books.

(d) The reproduction cost for e-books are usually lower than that for printing books on paper.

(e) Because of their limited requirements for storage space and production costs, e-books can be offered over time without the out-of-print issue. Authors can keep earning through copyrights. Readers can also gain access to older books easily.

(f) e-books can be delivered electronically: downloading an e-book may need only seconds, a lot faster than obtaining a paper book.

S T O P A N D T H I N K
There are many advantages of electronic books. How about disadvantages? Write them down and discuss in groups.

1.2.4 Mobile Phones

Mobile phones are moveable electronic devices for people's voice and data communications. Data communication includes Short Messaging Service (or 'SMS'), email, access to the Internet, etc. In addition to communications, many mobile phones today are equipped with other functions, such as camera and video taking functions.

To most Hong Kong people, communicating with mobile phones is part of their daily life. In many countries, the number of mobile phones is over that of fixed-line phones already. In fact, many families do not install household fixed lines anymore. In the USA and Hong Kong, about half of the children population have mobile phones already.

H I G H L I G H T

3G (Third Generation) Mobile Phones

3G is the short form for 'third generation'. It is a technology standard for mobile phones. 3G is named after its radical change to the mobile industry: providing network operators with a greater network capacity. Network operators can in turn provide their customers, i.e. the end users, with more services, such as wide-area wireless voice telephony, video calls and broadband wireless data.

PDA (Personal Digital Assistant)

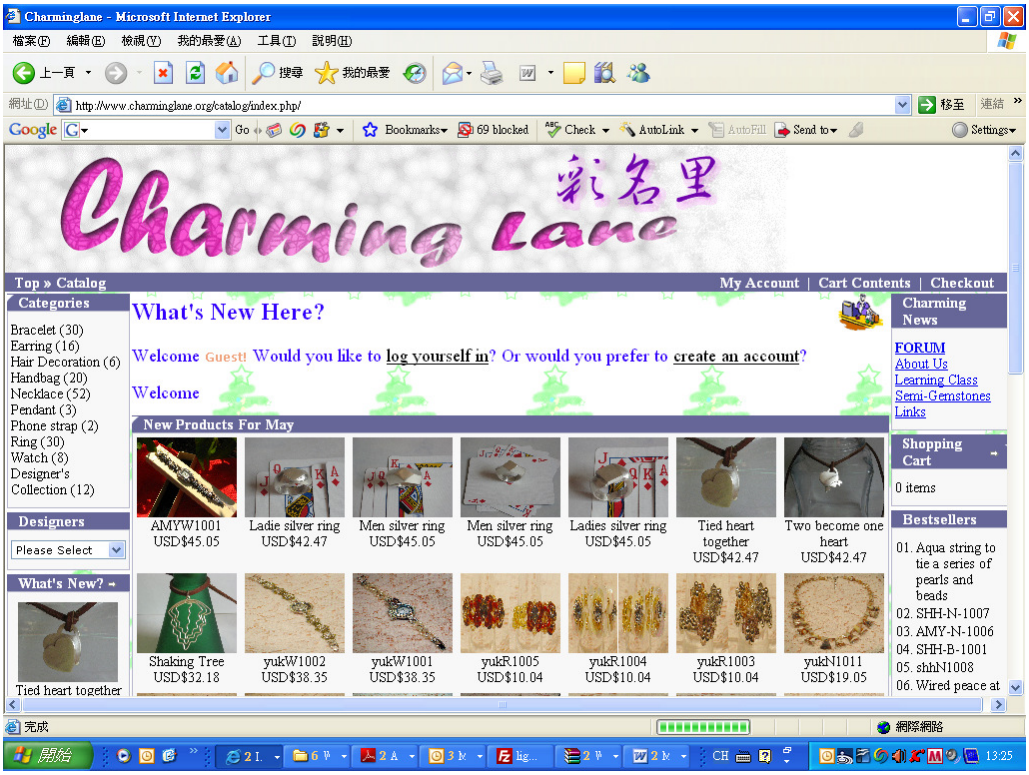
A PDA is a handheld computer. It can act as a mobile phone, calculator, dairy, workstation for gaining access to the Internet, using email, word processing and spreadsheet calculation, video recorder, address book, bar code scanner, radio, etc,

1.2.5 World Wide Web (or 'WWW')

Teenagers today may regret that they missed the chance of witnessing a revolution: the Internet has evolved from a technology distant from ordinary people to a necessity in only less than a score of years. Teenagers have seen but probably seldom use the following methods these days. Communication: Using letters and fixed-line telephones. Research: Using library resources. All the above can be done easily with emails and new software.

Nowadays, people can use web pages to show text, images and other multimedia. In fact WWW is one of the services available under the Internet. Web sites are linked together through hyperlinks. People can 'travel' from one website to another easily, without geographical restrictions. The problem that people face regarding information is no longer unavailability but overflow.

Web pages contain lots of information that we can get from. (www.peak.vtc.edu.hk)



A typical e-shop

(a) Website Design and Prototypes

Designing a website has to take three factors into consideration. Firstly and most importantly, whether or not the contents are what the target readers want. Secondly, how the contents are presented, i.e. the attractiveness of the website's graphics, text, videos, etc. Thirdly, whether or not the website's technology is acceptable – it may not necessarily be a state-of-art one. For example, an excellently designed website may not be popular if it takes ten minutes for the web-surfers to download.

The first factor needs a writer; the second a designer; and the third a technician.

S T O P A N D T H I N K

Designers have to ensure that the objects in websites are of reasonable sizes, so that web-surfers can download the objects within a reasonable time. In addition, similar to printing materials, website contents have to be presented in a clear and logical manner.

Again, similar to the traditional medium, i.e. printing materials, some websites consist of wide range of much information, such as Wikipedia.org and Yahoo.com, while some focus on a certain item, event or person, etc. Examples are photo-sharing websites, music download websites and idol's websites. An example is football star David Backham's personal site.

If you are asked to design a website for your school, what kind of information will you put in it? What is your plan to structure the site?

(b) Web's Yesterday, Today and Tomorrow

Websites are a star in the field of digital design. WWW evolved rapidly in the past decade, it keeps evolving today. Websites showed mainly text and simple graphics in late 1990's. Nowadays, they can contain full frame videos, high quality audios, much easier interaction and navigation systems for downloading and uploading. What can websites do tomorrow? Who can really predict?

H I G H L I G H T
Blog 'Blog' stands for 'weblog', i.e. a logbook in the format of a website. It is a type of website that allows the bloggers (the blog's owners) to express themselves in text, images, voice, etc. Some blogs are the bloggers' personal diaries; some are forums of particular topics. Blog readers can leave comments in the blogs to interact with the bloggers. Reference: www.xanga.com
YouTube 'YouTube' means 'Your Tube (television)'. It is a video sharing website for users to upload video clips for sharing. The variety of videos available in YouTube is diverse. For example, there are movie clips, TV clips, music videos, video-blogging and short original videos. Reference: www.youtube.com
Facebook A face book is a book printed with the faces (photos) and personal information of the members of a group. With the book, the members themselves can easily recognize (if the group is newly formed) or remember (if the group is to be dissolved) each other. The website Facebook is a social networking website that makes use of this idea. Facebook allows new and old friends to appear in a virtual, global meeting place. Reference: www.facebook.com
iTune iTune is a digital media player software. It can manage the contents played in Apple's iPod and iPhone. Customers can purchase and download songs, videos, games and books, etc., to their devices through websites such as iTune Store.

1.3 SOCIAL, ECONOMIC AND TECHNOLOGICAL FACTORS

This section will compare different digital media products in the local and global markets. Given the media-rich society nowadays, its pros and cons of social, economic and technological aspects will be discussed.

1.3.1 Traditional Media

Today, media are can be divided into two means, namely digital and traditional (or legacy). As described in the previous section, digital media refers to computer and video games, digital games, e-books, etc. Traditional medias refer to the communication and expression forms that were the only means before the ubiquitous spread of the Internet. For example, printing press, radio, video, television and telephone. Of course, they are still in use though their impact and profits may not be as large as in the old days.

(a) Printing Press
Examples of printing press can be found almost anywhere: books, newspaper, flyers and posters, etc. They are commonly used for mass communication.

(b) Radio
Radio was also known as 'wireless telegraph' for its transmission of sound signals without wires when it was a new communication medium to the world. Radio is still a popular mass medium today.

(c) Video
Video cameras were widely used for feature films, commercials and short independent films.

(d) Television
Television (or 'TV') broadcasting transmits sound and pictures signals (forming television's suffix: 'vision') over a distance (forming television's prefix: 'tele') without wires. The first generation of TVs showed pictures in only black and white. As the technology evolved, colour broadcasting was enabled afterwards.

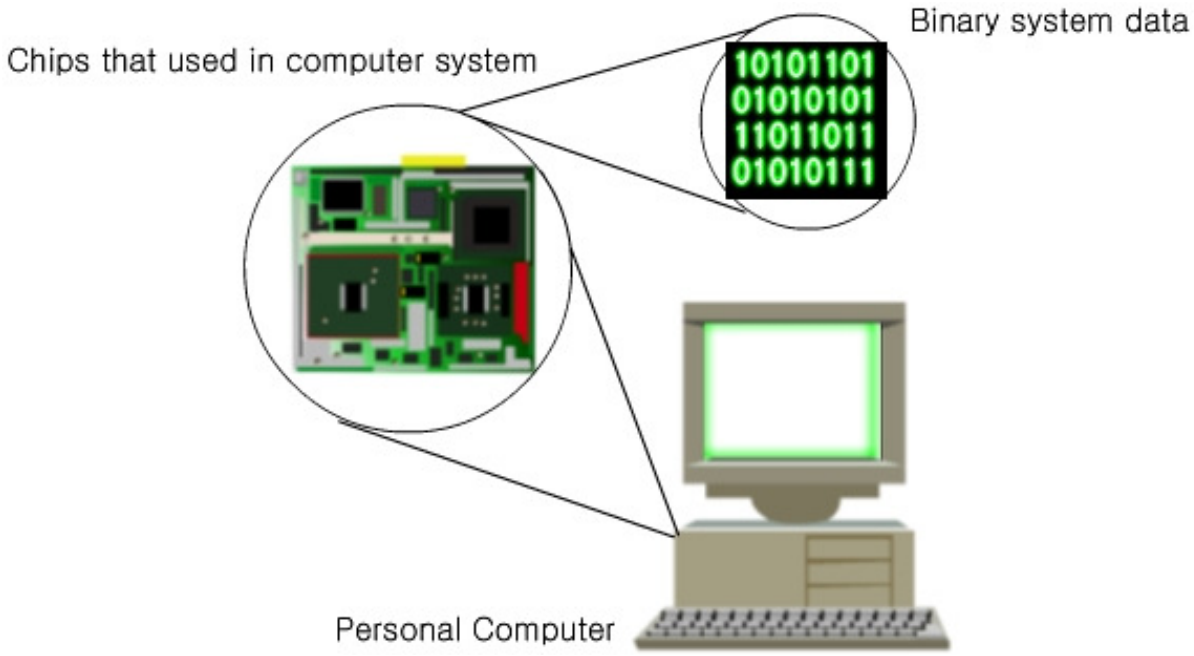
(e) Telephone
Unlike the previous four media, telephone communication enables interaction. It carries sound (voice) over a distance.

S T O P A N D T H I N K
▸ Compare how people capture an image in the old days, say 30 years ago, and today. ▸ Compare, with your group members, how people publish their ideas in the old days, say 20 years ago, and today. Present your group's view briefly.

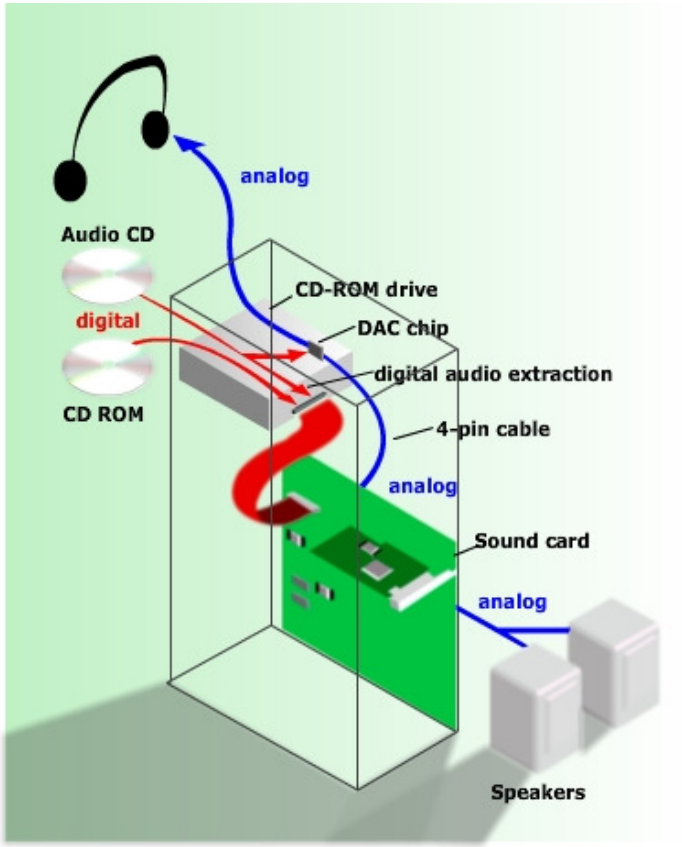
1.3.2 Digital Media

Digital media and modern computing are inseparable. 'Digital' refers to the use of digits '0' and '1' to represent different levels of electrical signals.

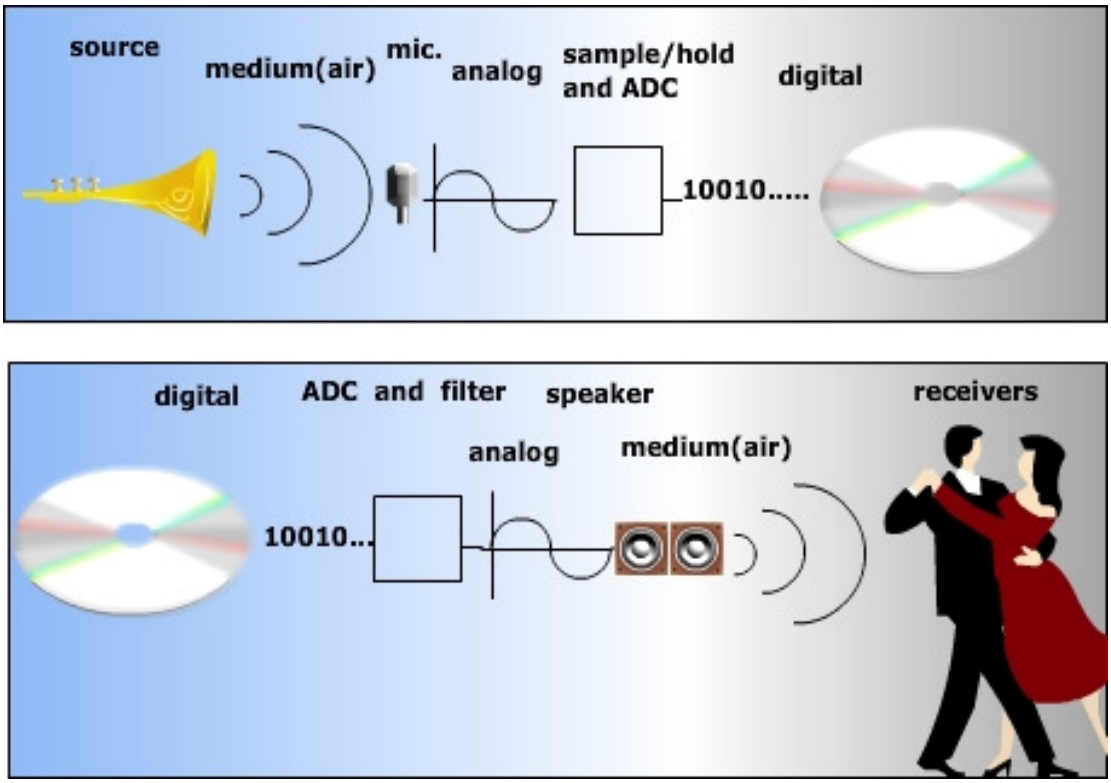
Digital media devices encode signals such as audios and videos into different combinations of 0's and '1's for storage. Digital media players then decode the works to human-friendly forms, such as images and sound.



Main components to identify a new digital media system



Although audio data are stored digitally in audio CD's, CD-ROM's and DVD's, analogue data can still be output ultimately.



Audio signals recorded and played

1.3.3 Traditional Media Against Digital Media

Digital media so far is not a replacement for traditional media. They co-exist. While the Internet, computers and mobile phones are necessities of people's daily life, newspapers, books and fixed-line telephones are still important communication channels to ordinary people.

The traditional mechanic printing machine in a very large size which just appear in printing factory

The consumer digital printer we use at office or home widely nowadays

The 12 inches Black vinyl which usually allow recording music for 12 minutes per side

The digital audio CD commonly used in music industry start from 80's which can record 74 minutes per disc

Digital Media's Advantages

Digital media's advantages can be discussed in technological, economical and social terms.

(i) In technological terms:
  (1) Easy manipulation of and infinite, no-quality loss reproduction of data
  (2) Easy creation, storage, editing and delivery of data, no matter whether it is a complete document or a segment of a document

(3) Greater interactivity. For example, people can watch a goal in a football match on a TV with self-selected camera angles

(ii) In economical terms:

(1) Almost anywhere, anytime and low-cost modification of digital media products and information; and

(2) Almost anywhere, anytime and low-cost access to update information.

(iii) In social terms:

(1) Easy interpersonal communication around the globe through chat rooms, instant messaging, online video games, video conferencing, etc;

(2) Rapid development of knowledge globalization; and

(3) Decentralization of working locations, such as working at remote offices, or simply at home.

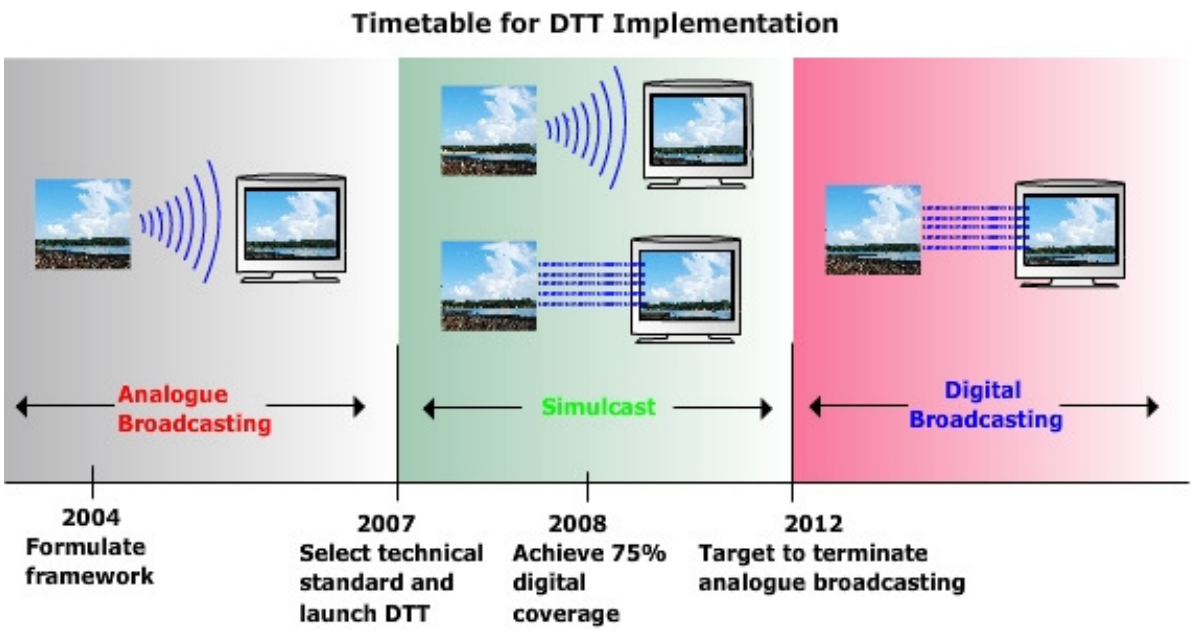
H I G H L I G H T

Digital TV – An Example of Change

Digital TV is the broadcasting of TV signals in digital format through radio communications (i.e., terrestrial), satellite, cable or broadband network. As its name implies, digital TV transmits discrete digital signals (bits of information), while traditional TV transmits continuous analogue signals. Digital TV improves picture quality by eliminating reception problems, such as 'double-imaging' or interference.

The advantages of using digital TV include:

(a) 'Ghost'-free reception;
(b) Widescreen pictures
(c) Standard definition TV (SDTV) and high definition TV (HDTV) programmes
(d) High-quality audio and surround sound
(e) Multi-channel programming
(f) Closed captioning of programmes for the hearing impaired
(g) Electronic programme guide (EPG) with 'now and next' programme information
(h) On-screen programme guide channel with same-day programme information
(i) Multi-angle views and enhancements
(j) Interactive TV services, such as home shopping and computer games
(k) Data casting services, such as financial data, weather updates and traffic news



Timetable for Digital TV Implementation

S T O P A N D T H I N K

In the past, comic artists would sketch a drawing in pencil and then ink with either dip pens or brushes. Nowadays, artists draw digitally.

Analyse and compare the working procedure for producing traditional hand-drawing animation and that for digital animation in terms of costs, equipment, time consumption and delivery formats.

Hand drawn animation

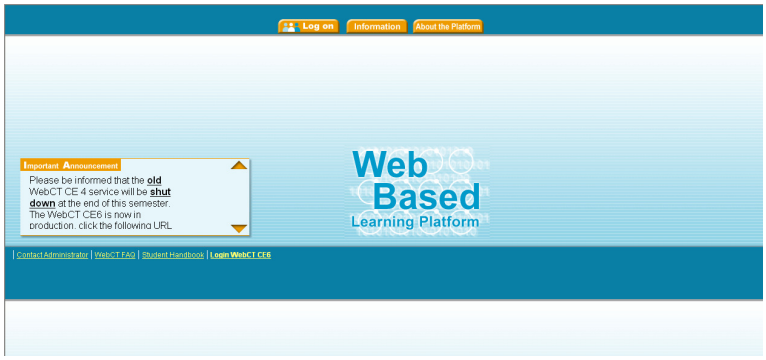
3D animation

(a) New Trend of Digital Publishing through WWW

Publishing is the process of producing literature or information, making it available to the public. In the past, publishing mainly refers to printed matters, such as books and newspapers. Nowadays, the meaning of publishing extends to making literature or information available through websites, blogs, and forums, etc.

Blogs are common communication tools among, especially, the youth. Some artists or even Government officials publish their views, news, etc in their blogs.

Digital media goes into education as well. Globally, there are already many tertiary institutions having their own web-based learning platforms. Students can download learning materials, work on quizzes, discuss and submit assignments through the platforms.

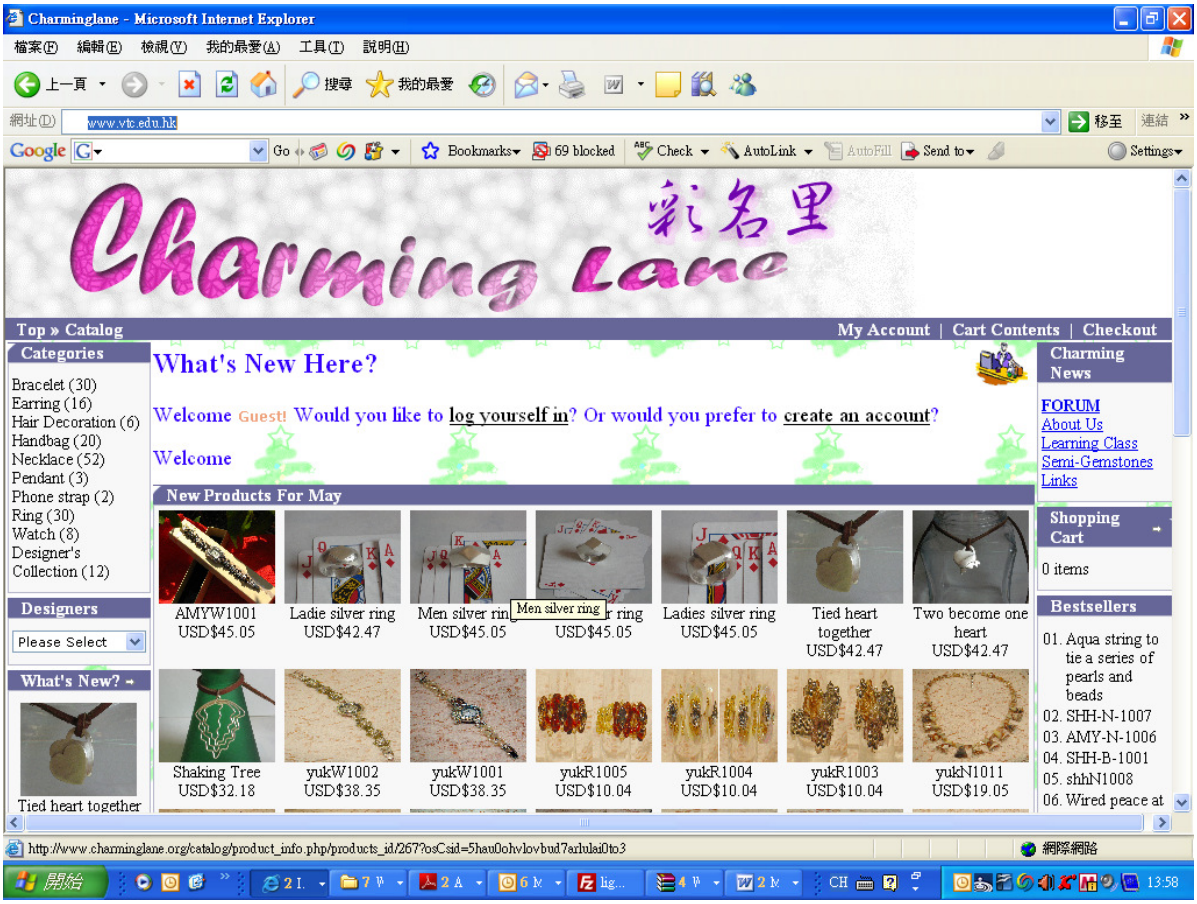


(VTC WebCT learning platform, webct.vtc.edu.hk)

(b) Mobile phone Shopping and Communication

Although mobile phones are common today, mobile phone shopping is more popular among teenagers.

Teenagers communicate with mobile devices in voice and other forms, such as text messaging, picture exchange and social-networking site (e.g. Facebook) visiting.



Visit an e-shop (e.g. http://shopping.yahoo.com) to study the mobile shopping process and compare with the e-commerce process.

(c) Interactive TV

Watch television has been part of Hong Kong people's daily life for about four decades. Traditionally, television broadcasting is only in one direction: viewers are the receivers. Interactive television rewrites the story.

How interactive are interactive television? Viewers can

i. Select programmes (and even part of programmes) among a collection of choices to watch anytime, instead of following preset schedules
ii. Affect the story endings, for example, of programmes that they are watching by voting or other means
iii. Watch programmes over the Internet through computers or even mobile phones, instead of either wireless or cable TV networks

Reference: www.now.com.hk

S T O P A N D T H I N K

Is traditional media outdated?

The popularity of new digital media, such as the Internet, mobile phones and portable TV increased rapidly through the years. Does it imply that traditional media, such as newspapers, magazines and TV broadcasting, are obsolete?

S T O P A N D T H I N K

Case Study – Examine Your Daily Life

To understand the impact of digital media, you may start with examining your daily life by keeping a diary. Use the following sample as a diary template to record your use of both traditional and digital media of a week.

DATE	TIME	MEDIA	MEDIA (D/T)	CONTENTS	COST
23/10 (Sat)	1:00pm-1:30pm	DVD	Digital	Leon Lai's Concert 20xx	HK$199
	1:45pm-2:00pm	Newspaper	Traditional	Economic	HK$6
	3:00pm-5:30pm	Computer	Digital	WWW	HK$0

After the week, summarize the details with respect to the following questions:

(a) Calculate how many hours you spent on each medium on a daily basis.
(b) Calculate how much you spent on traditional media and digital media respectively.
(c) Identify whether you used digital or traditional media more in terms of time and money. Did the result match your expectation?
(d) Identify your media usage patterns in terms of place, attitude, purpose, individual or as a group usage, etc.

1.3.4 Chronology of Major Technological Advances in Digital Media

The speed of technological change in the past two to three decades might be the highest in the history. Perhaps no one can correctly predict whether technology will be developed in the same, a slower or a higher speed in the next two to three decades. One thing for sure is that given the increasing popularity of digital media, many industries, such as the entertainment industry and mass media, are rethinking their business models.

As digital media's rapid development, there has been a so-called 3C integration arising, i.e. the integration of Computer, Communication and Consumer. In addition, there is a trend of integrating the media, communications and broadcasting industries.

New Forms of Computers

(a) Handheld Game Consoles

As its name implies, a handheld game console should be small enough for players to hold and play video games. Thus, it is light in weight, portable and all-in-one (with control screen and speakers integrated in a single device).

The Nintendo DSi

Similar to other handheld electronic devices, handheld game consoles are evolving to incorporate other features and functions, such as photo taking, expandable external storage, larger screens, improved speakers, on-line game purchasing (and downloading) and audio playing.

(b) Wearable Computers

Some computers can be put on users' bodies. Wearable computers have been applied to medical, entertainment, etc different areas. For medical, wearable computers are used for behavioural modelling and health monitoring. For entertainment, head-mounted displays are an example.

(c) Multi-touch Screen Displays

Touch screen technology has existed for long time. A more recent application is Microsoft's Surface, which is a tabletop display that enables several people to work independently or simultaneously without mice or keyboards.

Microsoft Surface

(d) E-paper

Today, e-book, e-magazines and e-newspapers can be read through e-book readers or e-book devices, such as personal computers, PDA's and dedicated hardware devices. As technology advances, a new, very thin hardware device dedicated for 'e-materials' is being developed. It is expected that this initiative will bring a great impact on people's reading habits.

(e) 4G Mobile Phones

While 3G is still an emerging technology in the market, its next generation – 4G (also known as Beyond 3G) is approaching. It is considered as the fourth generation of wireless communications because its higher data transmission rate enables Anytime-Anywhere communication through voice, data and streamed multimedia.

S T O P A N D T H I N K

Digital Media's Impact on Consumer Practice

Digital media enables the development of e-commerce, i.e. trading (products and services) and settling (products and services, and money) via the Internet. Over the years, e-commerce has involved various media, from data, text, web pages to Internet telephony, Internet desktop video, etc.
The following table compares the traditional commerce and e-commerce:

Nature	Traditional Commerce	E-commerce
Product information	Magazines and flyers	Web sites and online catalogues
Business communications	Letter, phone and fax	Emails and websites

Labour required	Salespeople	Computer experts
Payment method	Cash, credit cards and EPS	Credit cards and pay pal
Product	Hard goods and services	Hard goods, services and soft goods
Opening hours	Depends	24 hours 7 days a week

Study Amazon.com's website to see what kinds of digital media this e-commerce-based company has used to set up its online selling business. Examples of digital media includes, but not limited to, compact discs, digital graphics, digital videos, e-book systems, video games, Internet, mobile phones, digital TV and digital audio.

1.3.5 Usability in Media

In the context of communication media, 'usability' refers to suitability of methods used for communication. It can also refer to the efficient use of media to communicate or expose, such as posters or a websites.

Usability is not only a matter of media or technology, but also messages that designers have to deliver to the public. Individuals are different by definition. Therefore, applying differences in perception and attention method is needed. In addition, different combinations of media may be used in multicultural communities, such as Hong Kong to form different usability scenarios.

H I G H L I G H T

PCCW's Advertisement

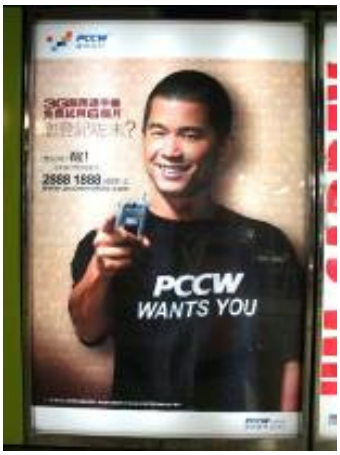
Both traditional and digital media are used widely for advertisement. Examples of advertising through traditional media are: advertising through printed flyers, rack cards, cinema, television, shopping carts, bus stop benches, magazines, newspapers, buses and aeroplanes. Examples of advertising through digital media are: advertising through web banners and mobile telephone screens.

Pacific Century Cyber Works (or 'PCCW') is a good example of using a wide range of advertising media.

Advertising on Buses

Advertising on Main Streets

Advertising on Newspapers



Advertising in MTR

Advertising on TV

Other examples also include advertising on websites of others and their own.

S T O P A N D T H I N K

Every year there are many visitors coming to Hong Kong from around the world. Many of them do not understand the major languages used in Hong Kong, such as traditional and simplified Chinese (written), Cantonese and Putonghua (spoken) and English (written and spoken) at all. How can digital media help these visitors? For example, can a device be developed to help?

Hong Kong International Airport

CHAPTER 2 – DIGITAL MEDIA DESIGN

Definition

If media are considered a tool for communication; good planning should be a critical success factor for media development. Students have to understand the basic concepts and rules of digital media development. This chapter covers the following topics:

2.1 Conceptual development
2.2 General rules of visual composition
2.3 Basic principles of communication design in creating digital media

Technological/ Design Concepts

These topics include learning materials and activities that facilitate students in:

(a) Description of the relationship among text, sounds, static and dynamic images/ graphics and animation/ video in communication via digital media
(b) Creation of ideas for conveying messages and information efficiently and effectively (meaningfully)
(c) Application of general rules of visual composition in digital media design
(d) Evaluation of usability, readability and interactivity of different digital media products by referring to the basic principles of communication design

Technology Development

There are different skills and tools in digital media. Students should understand the basic development and technologies in digital media through appropriate software packages. Students should be able to produce digital images, 2D or 3D animation and video shooting.

2.1 CONCEPTUAL DEVELOPMENT

In simple terms, 'Digital media design' is using computer to design. Computers enable designers to work and produce in an efficient and cost effective manner. Computer and Internet technology also enables designers from around the world to exchange ideas and practice, enlarging the professional network.

In addition to skilful use of technology, a good design requires creativity and innovation.

2.1.1 Design Process and Design Concept

A design process is a problem solving process. During the process, a designer uses her/ his creativity and innovation to develop a solution, which can be a product, a service, a logo or whatsoever, to address the customer's need. A design concept is a preliminary solution, which may not have particular details yet.

A superior design concept takes care of both practical and artistic issues. It provides design and the development process with a feasible framework. The result is a collection of design concepts feasible for further development. Computers can help speed up this time-consuming process.

2.1.2 Semiotics

Semiotics is the use of signs to deliver messages to the audience. A sign is a mark with a certain meaning. There are three types of signs, namely:

- **Symbols**
  A symbol is a sign that represents a physical (e.g. the word of 'apple' for a fruit) or logical (e.g. the word of 'Apple' for an IT company in the US or a newspaper company in both Hong Kong and Taiwan) item. The relationship between the item being represented and the symbol may or may not give people direct association.

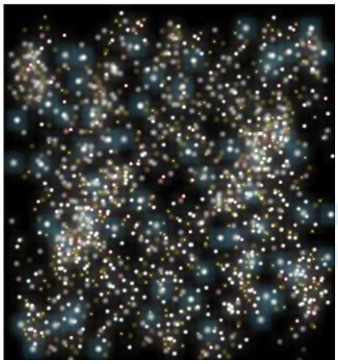
- **Icons**
  An icon is a sign that has similar graphical characteristics to the item that it represents. For example, a painting of an apple carries the major characteristics of an apple.

- **Indexes**
  An index is a sign that indicates a fact or condition. For example: in terms of human health, a chest pain may indicate different health problems, such as heartburn; and a smoke may imply that there is fire from source of the smoke.

H I G H L I G H T

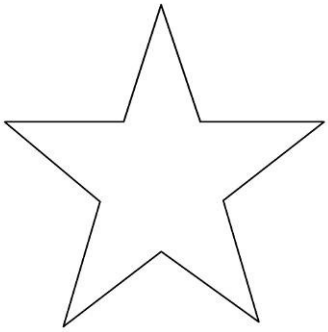
Semiotics

Signs are ubiquitous in daily life. For example, there are many planets or objects in the universe. They reflect light and become visible to human on the Earth. Human refers such planets and objects as 'stars' (symbol), and use some graphics to represent stars (icons) for communication. When there is any change in a star's locus for example, some people may think that such a change hints something (index).



The natural sky photo at night

A cartoon star icon



Hand-draw star icon

Major Principles in Semiotics

(a) The use of signs varies from culture to culture. There is no natural meaning or definition.

(b) Signs can carry more than one level of signification, and thus meanings. Items exist and are described by words, signs, etc, but not 'exist due to the existence of words, signs, etc'.

S T O P A N D T H I N K

Semiotics Helps Communication with Others

Semiotics helps business people communicate and advertise. Consider the following questions with respect to Ribena and Yahoo!

(a) Why is purple used?
(b) What meaning does purple carry?
(c) Does purple make the product prestigious?
(d) Can purple tell people 'our brand is fun'?

2.1.3 Symbols, Icons and Indexes

Semiotics, which is also known as 'semiology', is the study of semiosis, signs and symbols. It deals with the meaning and usage of signs and symbols.

Many people consider semiotics a discipline related to anthropology. It is applied to natural science, such as biosemiotics or zoosemiosis.

(a) Symbols

A symbol is a sign (object or character) that represents a physical or logical item (idea, concept or abstraction). For example, in Hong Kong's traffic system, a red octagon is a symbol for 'stop'. Given Hong Kong's bilingual environment, a Chinese character of '停' and an English word of 'STOP' are attached for elaboration.

STOP" traffic sign

Symbols evolve over time. For example, the rectangular symbol in the left was used in the old Hong Kong to alert drivers to the possible passage of students. Today, a triangular symbol of two running children is used.

H I G H L I G H T

Symbols

A simple example of symbols is the numerical system, which captures the quantity concept into 'numbers'.


The Yin-Yang symbol is well known to Chinese. It summarizes the concept of Yin and Yang's co-existence and their mutual inclusion.


The medicine symbol symbolizes the bacteria genes

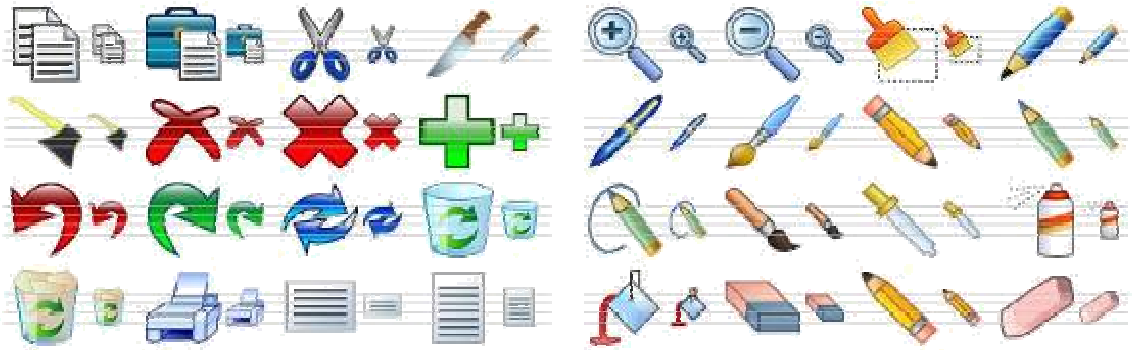

A double-happiness symbol reflects Chinese's concept of wedding is a happy event in double 'quantity'

(b) Icons

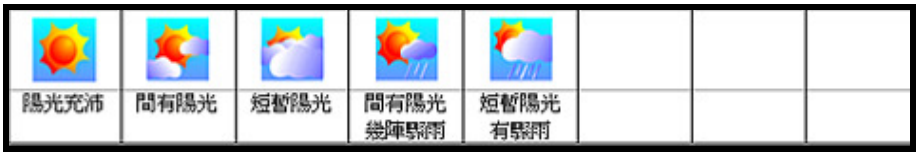
An icon is a sign that has similar graphical characteristics, and thus signifying, to the item (object or action) that it represents. In computer interface, icons are used extensively in those software packages with graphical user interface. For example, a 1.44MB floppy disk represents file saving; and an open folder represents file opening.

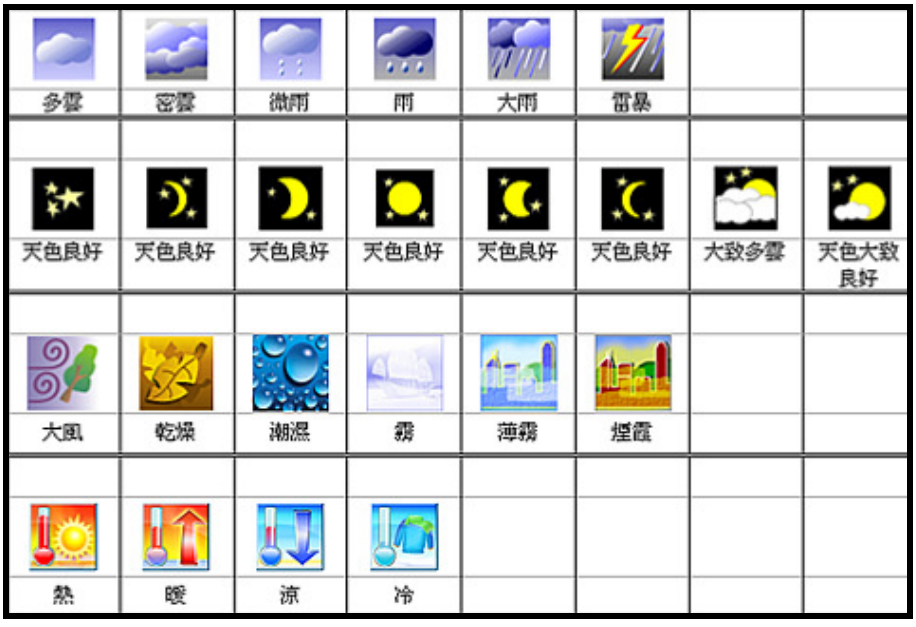
S T O P A N D T H I N K

Describe the function of the following icons.



The Hong Kong Observatory launched a set of weather icons in 2007 to facilitate its communication with the public.





(c) Indexes

An index is a sign that indicates a fact or condition. Unlike iconic signifiers, indexical signifiers communicate in a more indirect or subtle manner.

H I G H L I G H T

Indexical Colour

Colour is an indexical signifier. For example, in many alert systems, 'red' refers to an alert of high severity since it is the most emotionally-intense colour.

2.1.4 Signifier and Signified

(a) Signifier

A signifier is an item that signifies (expresses) another item, i.e. 'signified'. A signifier can be a graphical sign, a word or else.

(b) Signified

A signified is the item that a signifier refers to. It has no absolute meaning by itself; its meaning is subject to where it is, i.e. the context. In other words, a signifier can carry many meanings, or refers to many signifiers. For example, a Stop sign asks a driver who is driving on a road to stop in front of the sign. The same sign can be placed in a classroom to ask students to stop talking.

H I G H L I G H T

Signifier and Signified

The above iPod posters illustrating iPod's original images can be used to elaborate semiotics.

(a) Signifier = Words
  (i) 'iPod' and 'The i stands for…'

(b) Signified = Concept of iPod
  (i) Portable digital audio players designed and marked by Apple, Inc.
  (ii) Simple user interface designed around a central scroll wheel
  (iii) Build-in harddisk for storage of up to 15000 songs or 25000 photo images
  (iv) Simple idea and trendy looking

(c) Symbolic sign
  (i) Haircut, gesture, posture – for young and trendy people
  (ii) Dancing – enjoy music with iPod

(d) Iconic sign
  (i) White colour digital audio players
  (ii) Silhouette – no shadow, no lighting, suitable for everyone

(e) Indexical sign
  (i) High contrast colour: Black (people) and white (iPod) – emphasize iPod as a focus point
  (ii) Sharp colour – represent the disco lighting (fresh, sporty, happy feeling)

S T O P A N D T H I N K

Analyse Hong Kong's visual identity, the 'powerful and energetic dragon' as the government describes, to figure out what semiotics has been used.

Image from HKSAR Government (www.gov.hk)

Team Logo

Logos of sports teams are an important application of signifiers and signifieds. A good combination of symbols and colours gives life to the team as a whole, building up the team's and its fans' sense of belonging. Not to mention the financial rewards that follow: a business of billions of annual income from branded merchandise.

Manchester United Football Club in the United Kingdom is a very good example. Name more examples.

2.1.5 Denotation and Connotation

A signifier and a signified can be connected through denotation or connotation.

Denotation is the exact meaning of a word. For example, 'red' may be defined by a dictionary as a colour with certain attributes.

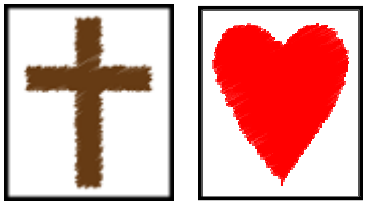
Connotation is the underlying, subtle meaning embedded or suggested by a word, given some personal or social backgrounds. A word's connotative and denotative meanings coexist. For example, 'red' is a colour by nature. Its connotations may cover danger, happiness, blood, etc.

H I G H L I G H T

Denotation and Connotation

Denotation is the most fundamental meaning of a sign. For example, the word 'rose' refers to a kind of flower.

Connotation gives a deeper or derived meaning. For example, 'rose', especially red ones, signifies passion and love.

S T O P A N D T H I N K
Describe the denotation and connotation of the following signs. 

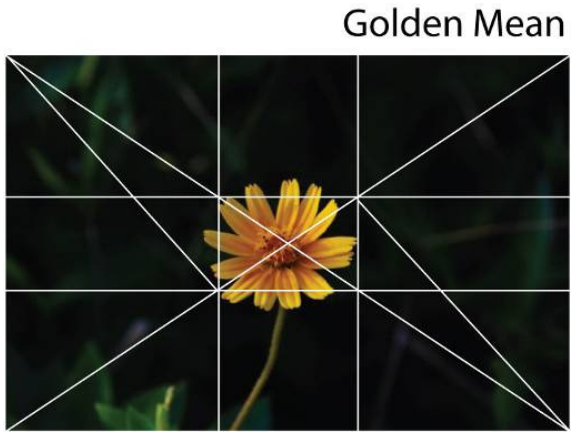
2.2 GENERAL RULES OF VISUAL COMPOSITION

Design is a presentation of organized selected elements for a specific purpose. Following are some general rules of visual composition:

(a) Proportion
(b) Framing
(c) Cross lines
(d) Laws of grouping
(e) Shape recognition
(f) Colour
(g) Texture and pattern

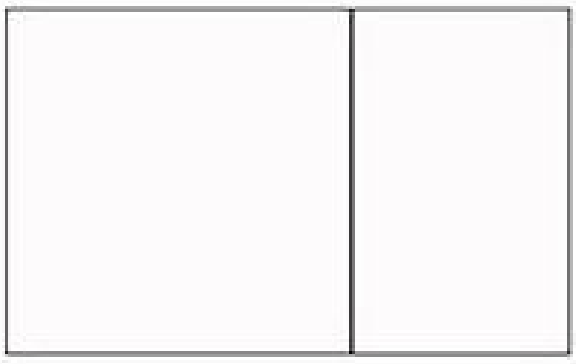
2.2.1 Proportion - Golden Ratio

In the context of design, proportion measures the relative sizes and positions among various visual elements. Golden ratio, or Golden mean, is one of the most commonly known proportion. Golden ratio is mathematically denoted by 'φ'. The value of Golden ratio in art and design is approximately 1.6180339887.

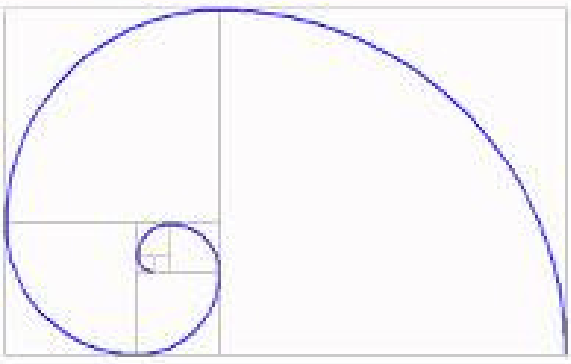


o
lden mean grid applied to a single image

The mathematics of the golden ratio and of the fibonacci sequence are closely interconnected.



The golden ratio

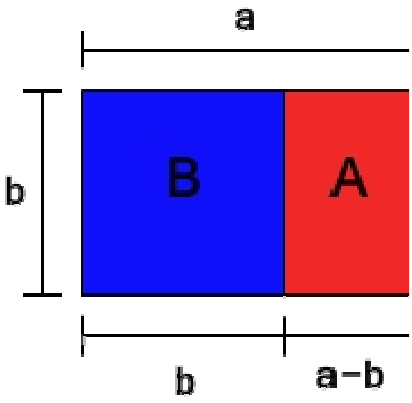


The fibonacci sequence

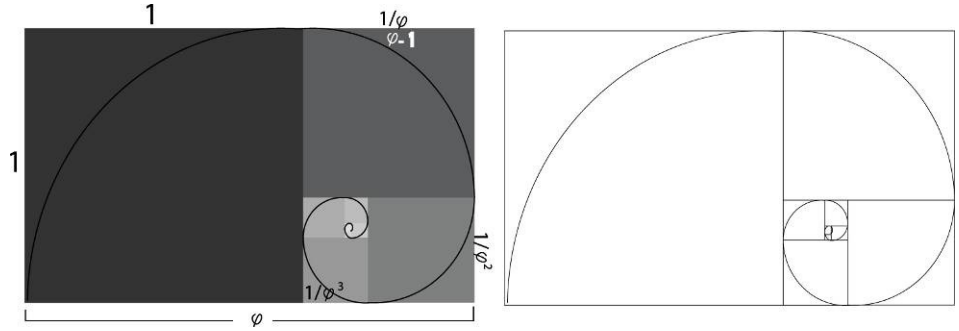
H I G H L I G H T

Golden ratio

The rectangle BA is a golden rectangle. The ratio of b:a is 1:φ. If Square B is removed, the rectangle A becomes another golden rectangle. The ratio is approximately 1.6180339887.



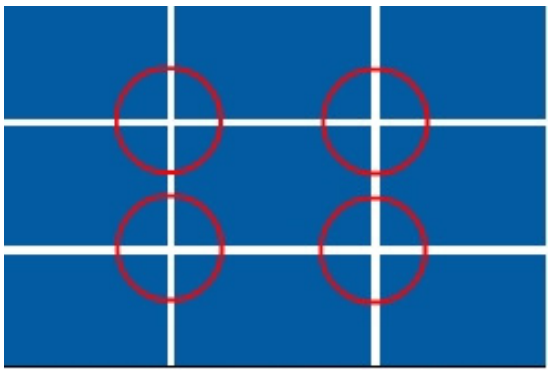
Fibonacci Sequence



A Fibonacci spiral is also known as 'Golden Spiral'. The spiral is constructed with a quarter-circle tangent to the interior of each square. The length of the side of a square to that of the next, smaller square is in Golden ratio.

2.2.2 Proportion - Rule of Thumb

According to Rule of Thumb, each picture concerned should be divided by four grid lines, namely two vertical and two horizontal. Major elements should be placed at the intersection points of these lines. It is a simplified version of Golden ratio.



This photograph of a sunset taken demonstrates the principles of the rule of thumb.

H I G H L I G H T

Rule of Thumb

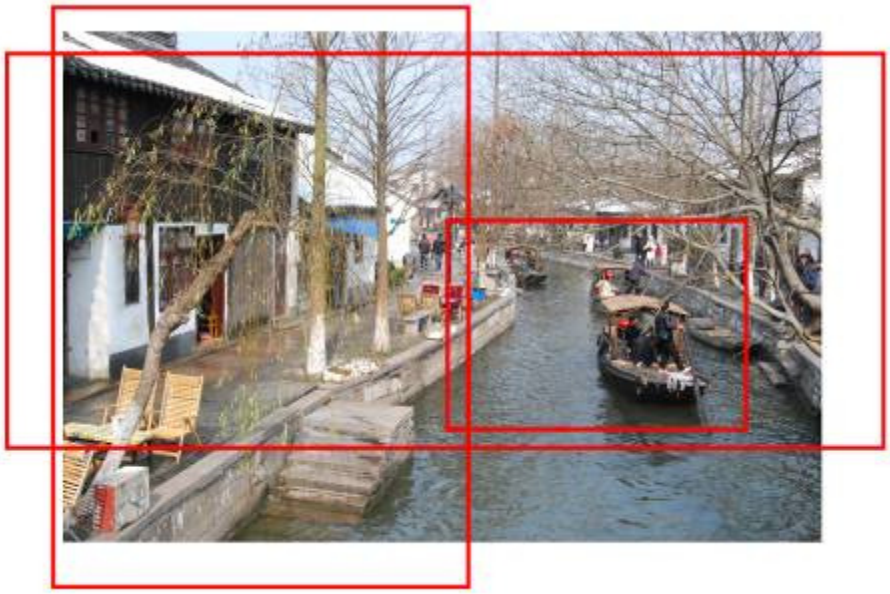
Rule of Thumb promotes asymmetry. It can be applied as follows:

Divide an image into two in a ratio of 1:2.

The left-hand-side picture below gives people a rather static and less interesting impression. With Rule of Thumb applied as shown in the right; the picture becomes more balanced.

2.2.3 Framing

Each image is limited and controlled by a frame. Framing can give an image, no matter whether it is a still one or a video, a totally different meaning from the original ideas.



Framing a picture from different compositing angle

Human brains have an image reassembling function. If a single or a series of still images move quickly in front of a person's eyes, the person's brain will form a moving scene of these moving images. In digital media production, all images are constructed with a series of still frames; each frame itself is a main unit of digital media production.

A frame shows a three dimensional image through two-dimensional media. With proper design for colour, graphics, images, spacing and texts, a sense of depth can be created.

H I G H L I G H T

Framing

Sometimes, the major element of a picture can be framed by the surrounding. For example, the water around the rock in the following picture highlights the rock's central position on which viewers will focus.

In the following picture, the arched door is a natural frame, where viewers will focus on.

S T O P A N D T H I N K

Frame

A picture without a dominant object may not impress its viewers much. A frame in such a case can help draw the viewers' attention to what the author wants the viewers to focus on, minimizing the distraction from those unimportant surrounding objects.
Select some dull pictures, and locate a frame for each of them.

2.2.4 Cross Lines

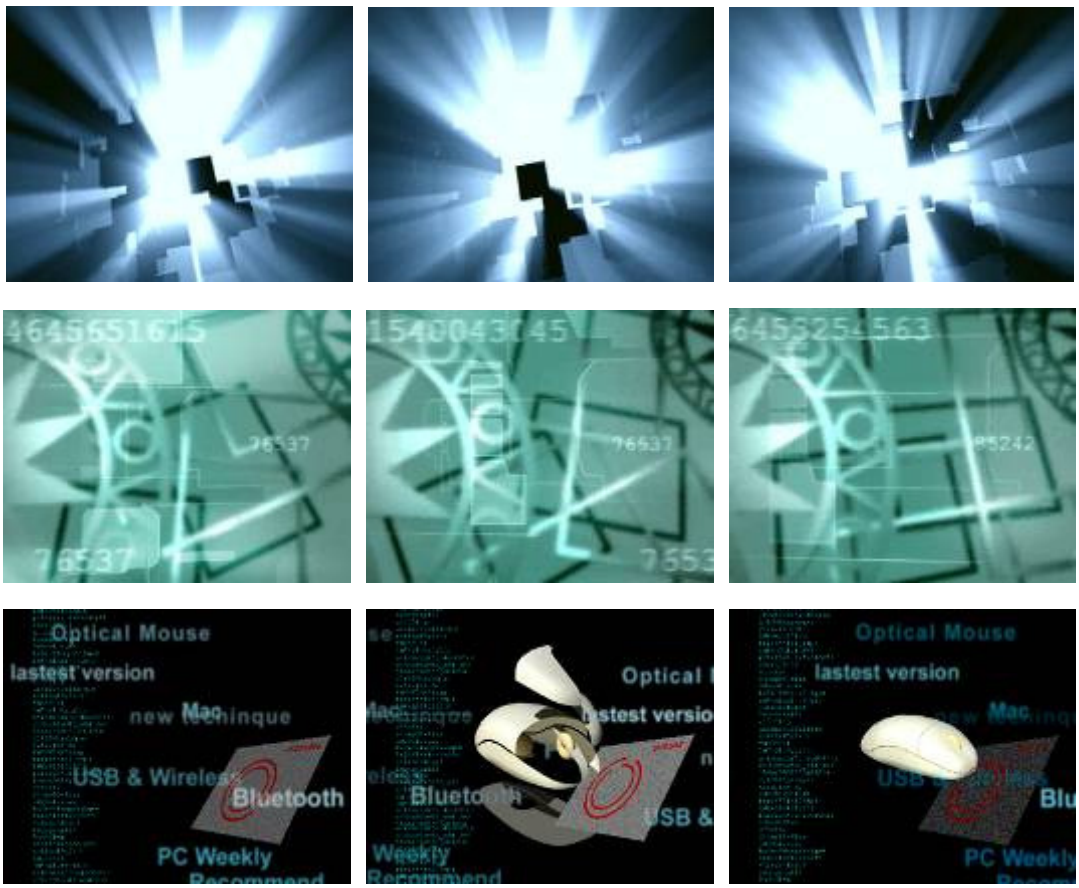
Golden Ratio's another simplified version is 'Cross Lines', which are to guide viewers' attention. A cross line start or end at a far edge of the picture concerned for better attention drawing.

(a) Cross Lines – Horizontal, Vertical, Diagonal, Converging and Curved

Cross lines can be straight (horizontal, vertical, diagonal and converging), or curved lines. With cross lines, pictures can be more dynamic and vivid. They can also arrange rhythmic patterns of movement, create visual focal points, define space, form a visual hierarchy, and suggest direction.

(b) Cross lines – Motion Graphics Sequences

Cross lines are often used in motion graphics design, ranging from films, videos to animations. Instead of pure straight lines, cross lines may be used along with some effects, such as different shapes, colours and dimensions.



H I G H L I G H T

Cross Lines – Motion Graphics Sequences

Asia Television (or 'ATV') News makes use of cross lines in its starting animation.

2.2.5 Laws of Grouping

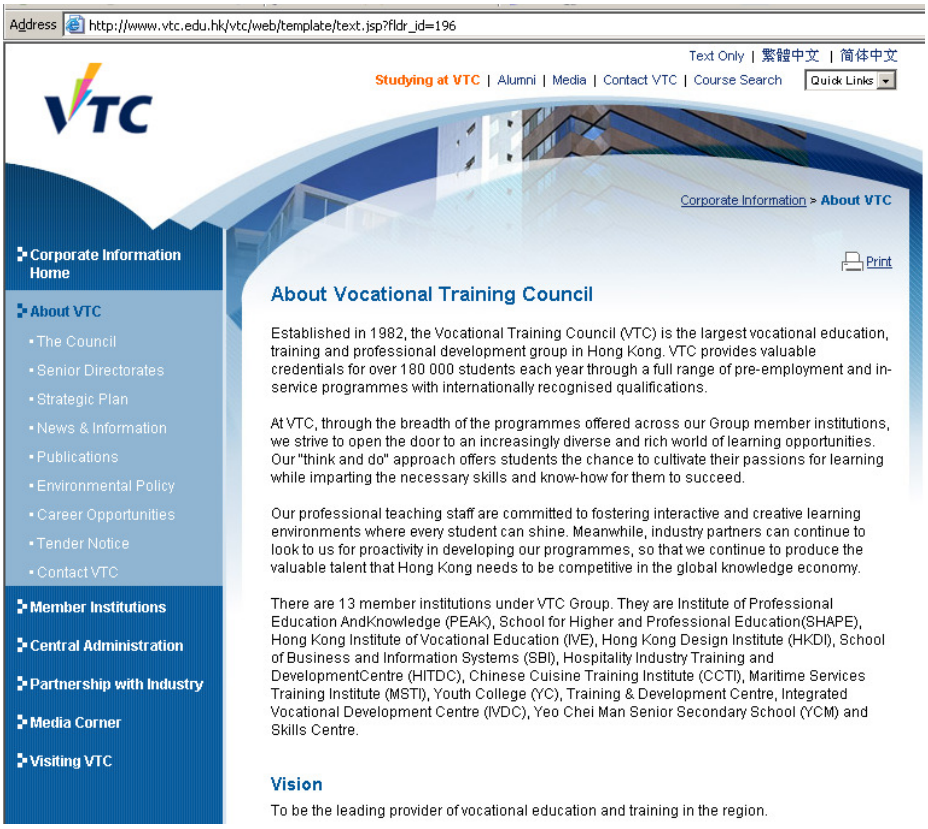
Laws of grouping are often used in printed materials and website layout development. Grouping things together can help readers to relate items in certain logics. Grouping can be achieved by alignment, design, proximity with whitespace, and some other techniques.

H I G H L I G H T

Laws of Grouping – Alignment

The menu at the left-hand side of a webpage of VTC's website (http://www.vtc.edu.hk/vtc/web/template/text.jsp?fldr_id=196) shows how alignment works.

There is an imaginary origin at the top-left corner of the menu, and an imaginary alignment axis along the left. Functions that are near the axis most ('Corporate Information Home', 'About VTC', 'Member Institutions', etc) are of the same group. Functions a step away ('The Council', 'Senior Directorates', etc) belong to another.



Laws of Grouping – Design

Design is a very critical element to all digital media. It is not only related to the outlook, but also the final product as a whole.

ATV News shows an example of presenting different information on a single screen.

Grouping is also applied to role-playing games (or 'RPG') and real-time strategy (or 'RTS') games.

Images from Football Manager 2008 and Command and Conquer, Warcraft

Laws of Grouping – Proximity with Whitespace

Grouping with proximity needs separators between items for contrast effect. Whitespace is often used.

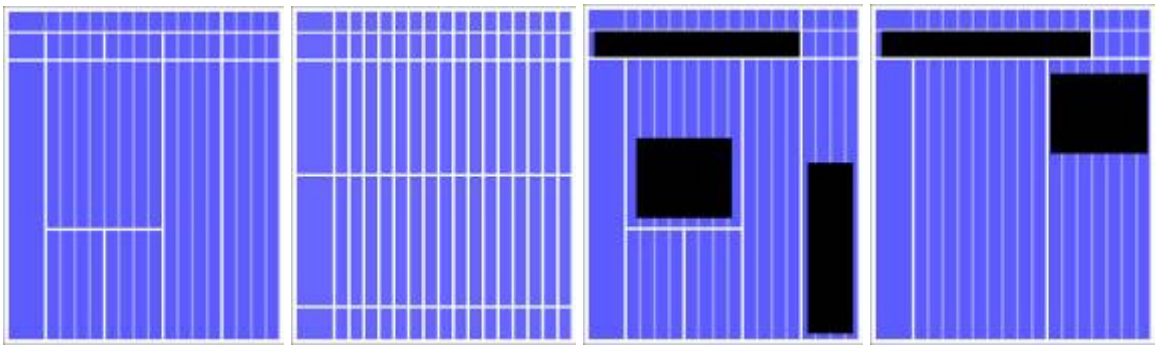
S T O P A N D T H I N K

Business Card Design

Some people want to present their every single detail on their business cards. What is the impact on the cards by doing so? How can a designer solve the problem?

Laws of Grouping – Grid System

The grid system divides the presentation space into grids. Each grid becomes a mini-area for a design. This system is particularly good for designing documents with multiple pages. A typical example is newspapers: different news of a similar nature, such as financial news, are grouped on the same page.



The grid system is suitable for all series of designs

S T O P A N D T H I N K

Alignment

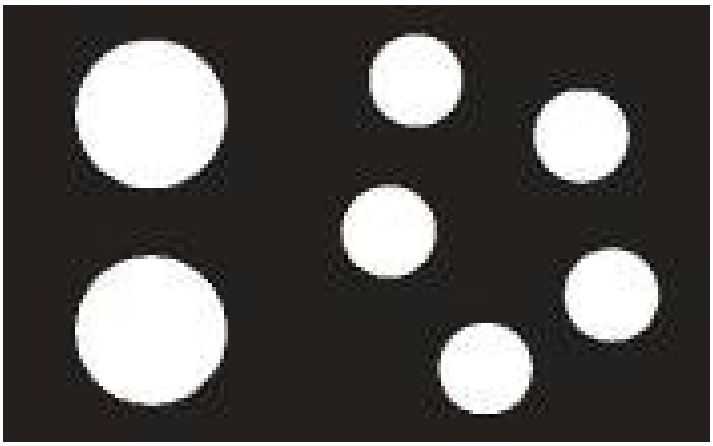
Both the websites of Yahoo Hong Kong and Yahoo China website are full of information: news, links, advertisements, financial market data, etc. To facilitate better user friendliness, both sites apply laws of grouping with different look and feel.

- Explain how the two sites are different.
- Give examples from magazines, commercials or websites that apply the same law of grouping.

2.2.6 Shape Recognition

Shape is a 'carrier' that brings the underlying message or meaning of a 'form' out to the viewers. The form of an object is a tool for human brains to identify or recognize the object.

Shape recognition defines the composition space, enhancing the figure-ground relationship: the sizes of the shape and its surrounding space. This relationship affects the perceived presence of the shape.

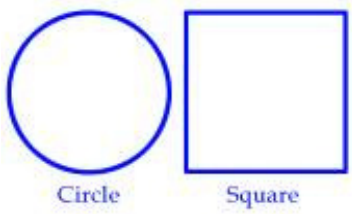


The entry pass of the 3rd Hong Kong Game Fair of 2006 is an example of shape recognition. The shape of the pass is identical to that of the Game Fair's logo, providing the exhibitors and visitors a strong and appealing feel.

H I G H L I G H T

Shape Recognition

When a person comes across a circle, the person's mind will attempt to recognize the shape. A sun? A moon? A coin? On the other hand, a square has corners and four sides equal in length. Such shapes are less common. People's scope for recognition may thus be narrower. In short, a right choice of shape and form facilitate better human communication.

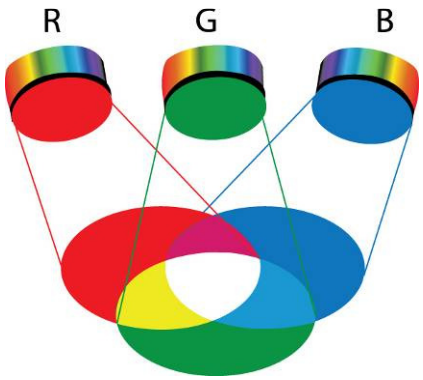


2.2.7 Colour

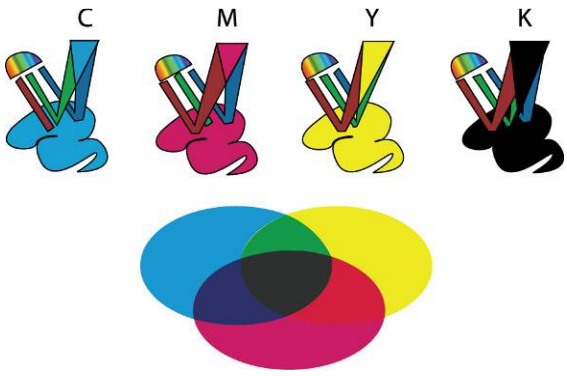
Human eyes can recognize some 7,000,000 colours. Some of these colours and colour relationships are harmonious, and some may be eye irritants. People can make use of the attributes of each colour to achieve objectives of their designs.

There are two types of colour models, namely subtractive and additive. An additive model displays colours by transmitted light. Such colours are called RGB colours. Red, green and blue lights are combined in different ways to reproduce different colours.

A subtractive one displays colours by printing inks with reflected light. Such colours are called CMYK colours. Colours are formed by mixing various colours; in other words, a mixture absorbs some wavelength and reflects the others. It is the principle of mixing paints, dyes, inks, and natural colorants.



Additive colours (RGB) R. Red G. Green B. Blue

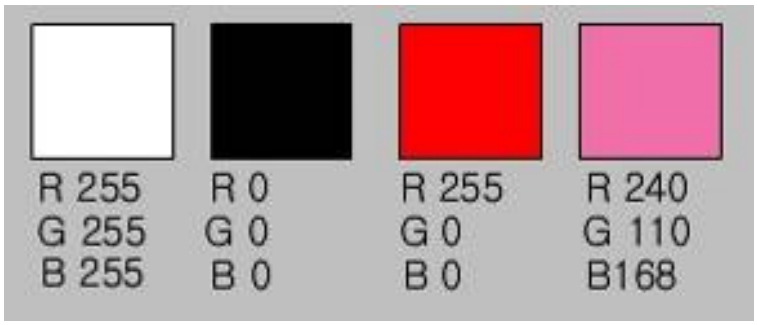


Subtractive colours (CMYK) C. Cyan M. Magenta Y. Yellow K. Black

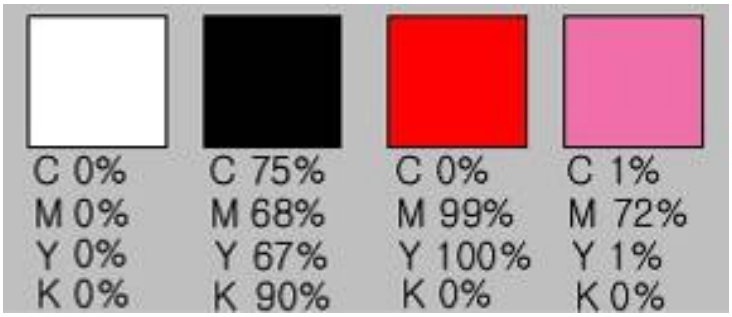
H I G H L I G H T

RGB vs. CMYK Colours

As its name implies, the RGB model bases on its primary additive colours of Red, Green and Blue. The combination result of them in equal intensities is white. With the different intensities of the colours, different colours can be resulted. The intensity of a colour ranges from 0 to 255. The lowest intensity (with no light emitted) is zero, and the highest 255.



Again, as its name implies, the CMYK model bases on its subtractive primary colours, i.e. Cyan, Magenta, Yellow and blacK. Other colours are formed by mixing these four colours with different intensities. The intensities are on a scale from 0% to 100%. CMYK's gamut is different from RGB's, therefore conversion of images between RBG and CMYK (in either direction) might be unacceptable in some cases.



S T O P A N D T H I N K

Digital Images Combined with Channels

Digital images are combined with different channels, such as RGB and CMYK. Decompose the following image into channels, and explain which colour model(s) you are using.

2.2.8 Texture and Pattern

Texture is the details of a surface or 3D model. Pattern is a repetitive shape or a unit of texture on a surface or 3D model. Symmetry, repetition, contrast, afterimages and negative afterimaging are some commonly applied techniques for texture and pattern.

(a) Symmetry

Symmetry or equilibrium refers to the visual balance or opposition of the elements of a composition. It provides the viewers with a sense of balance, stability and order through equal visual 'weighted' forms and/ or colours of elements about an axis.

Symmetry is the oldest known formal arrangement

Radial symmetry in three dimensions

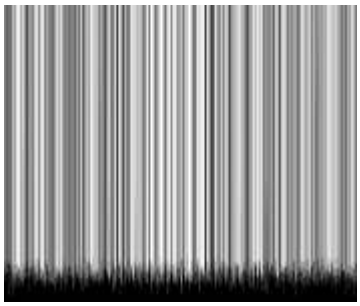
(b) Repetition

Repetition is a recurrence of a design element shown in a planned, uninterrupted and regular fashion. Repetition provides the viewers with a sense of static and stillness.

Repetition is the recurrence of a design element.

Repetition is often applied in animation design and character models. For example, the hair of a character is formed by repeating a reference model.

Reference image

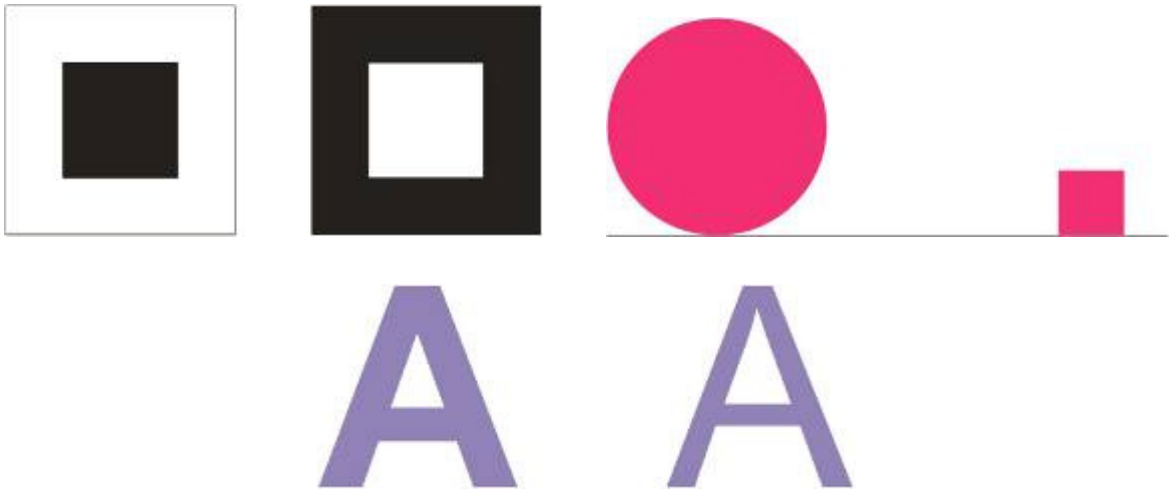


Repetition texture

3D character model

(c) Contrast

Contrast is the use of the effect of difference. Contrast can be created with size, colour, font, etc.



(d) Afterimaging

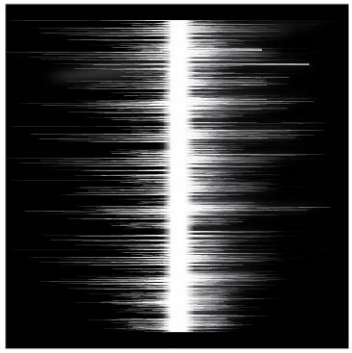
An afterimage, which is also known as 'ghost image', is an image of an object that viewers can still see after they have already moved away their sights from the object. It is an optical illusion. Animation and cinema work with a similar phenomenon, which is called the 'persistence of vision'.

S T O P A N D T H I N K

Afterimage

Follow the steps below to experience 'afterimage':
(a) Look at an object
(b) Close eyes
(c) Open eyes again

Look at the line in the middle and blink. The line should 'become' bigger.



(e) Negative Afterimaging

Negative afterimages are the loss of eyes' sensitivity resulting from over simulation of the eyes.

In many cases, when encountering over-simulating images, eyes move away slightly from the images 'automatically' – the movement is small enough to be unconscious to the viewers. However, if the image is too large such that the slight movement does not matter, the eyes (more exactly, some of the 'cone cells' in the eyes) may feel tired and stop transmitting any

colour signals to the brain.

If the eyes move to look at a white area then, those cone cells concerned may not respond completely while the cells nearby are normal. These normal cells thus send stronger signals to the brain then those cone cells do. As a result, the brain interprets the colours received as opposite colours, forming negative afterimages.

2.3 BASIC PRINCIPLES OF COMMUNICATION DESIGN IN CREATING DIGITAL MEDIA

It is a very common practice for business and even non-business organizations to deliver their corporate messages with graphic design. What designers have to do is to create designs that can convey these messages in a well-organized and impressive manner. To be qualified to do so, designers have to have the basic principles of communication design knowledge, skills and intuition.

2.3.1 Text

Alternation of the outlook of text and letters to draw viewers' attention to the meaning of a message (including words, phrases or sentence) is a common technique. Besides, in a dialogue script, such alternation can hint the speakers where they have to adjust their tones (or any other necessary vocal or gesture actions).

H I G H L I G H T

Working with Type and Image

To most people, a text-full screen or page is equivalent to boredom. In other words, it is an ineffective delivery of messages. One of the many ways to improve such situation is to insert graphics there, giving the viewers a breath, an idea of the messages and time to digest.

All text in poster feel boring

Necessary photograph and images are needed.

S T O P A N D T H I N K

Type as an Image

Type is visual materials. All lines, dots, shapes and textures in a type have to be integrated with all other elements in a design.

For the opposite poster, the type's displacements help the poster's composition.

2.3.2 Sound

Sound can be classified as literal or abstract.

Literal sound carries specific meanings to the audience. It is referential and for supporting daily life. For examples, the sound spoken by people and the sound arisen from the environment are literal.

On the other hand, abstract sound is not as functional. It is used to enhance the messages emotionally. A successful message can make use of abstract sound to evoke audience's mood.

H I G H L I G H T

Audio

Audio is often considered an integral part of a message. Motion graphics designers may be responsible for the design and editing of the audio part, in addition to graphics, of a sequence. Therefore, motion graphics designers have to study and accumulate experience on timing, impact, etc of sound effects.

2.3.3 Image and Graphics

Image can express messages effectively. Graphics and animations are commonly used modes of image.

(a) Conceptual Elements of Images

A basic structure of design is composed of basic elements, i.e. points, line, plane and volume.

The most basic unit of image and graphics are points. A point is zero in length, width and height conceptually; otherwise, it becomes a line, area or volume. A point is often represented by a dot visually.

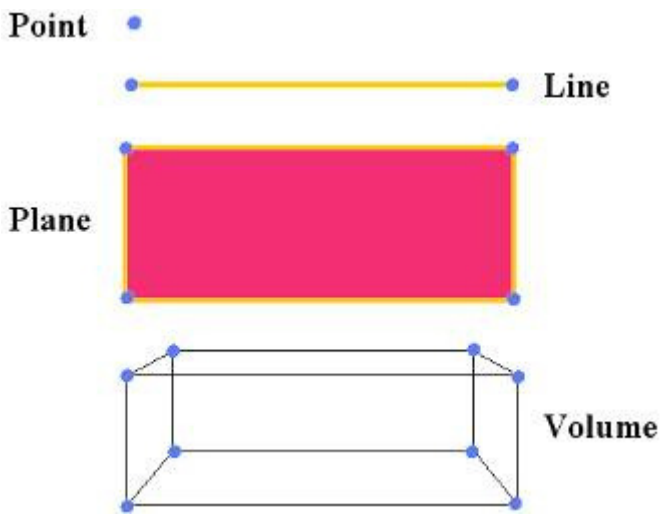
A line is formed by joining countless points. It is zero in width and height conceptually; otherwise, it becomes an area or volume. The simplest form of a line is a straight line. The variations of line forms are countless: a form is created whenever a line is bent a little. If a line has a definite length, it may also be called a 'line segment'.

A plane is a two-dimensional (2D) area. It is zero in height conceptually; otherwise, it becomes a volume. A plane can be opened (without definite dimension) or closed (with definite dimension, i.e. enclosed by one line or more).

A volume is a 3D enclosure.

H I G H L I G H T

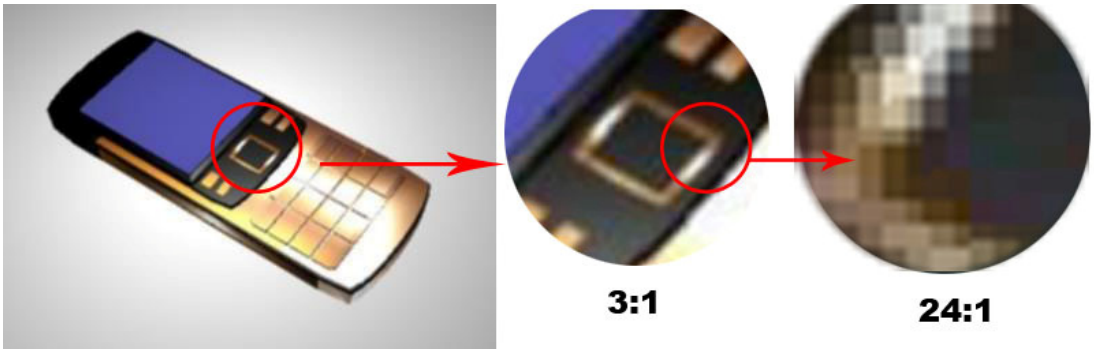
Conceptual Elements of Images from 2D to 3D



(b) Computer Graphics Introduction

(i) Bitmapped Graphics

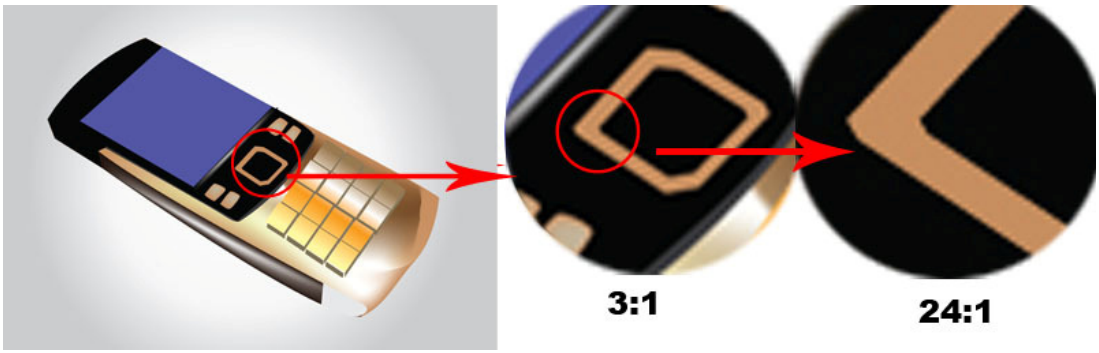
A raster graphic image is a pattern of dots or a bit map, and usually called bitmapped image. It can be viewed through computer screens, paper or other display media. Raster images can be saved in computer files in different formats, such as BMP and JPEG.



A bitmap image at different levels of magnification

(ii) Vector Graphics

Vector graphic images cover lines, squares, rectangles, circles, etc. They are represented as mathematical formulae. Graphic elements can be combined, while keeping each element's own integrity and identity in computer databases. Thus, they can be selected, modified and resized independently.



A vector image at different levels of magnification

(c) Computer Graphics Manipulation

(i) Image Cropping and Tweaking

An image can be presented as it is, or adjusted through cropping or tweaking for specific purposes.

H I G H L I G H T

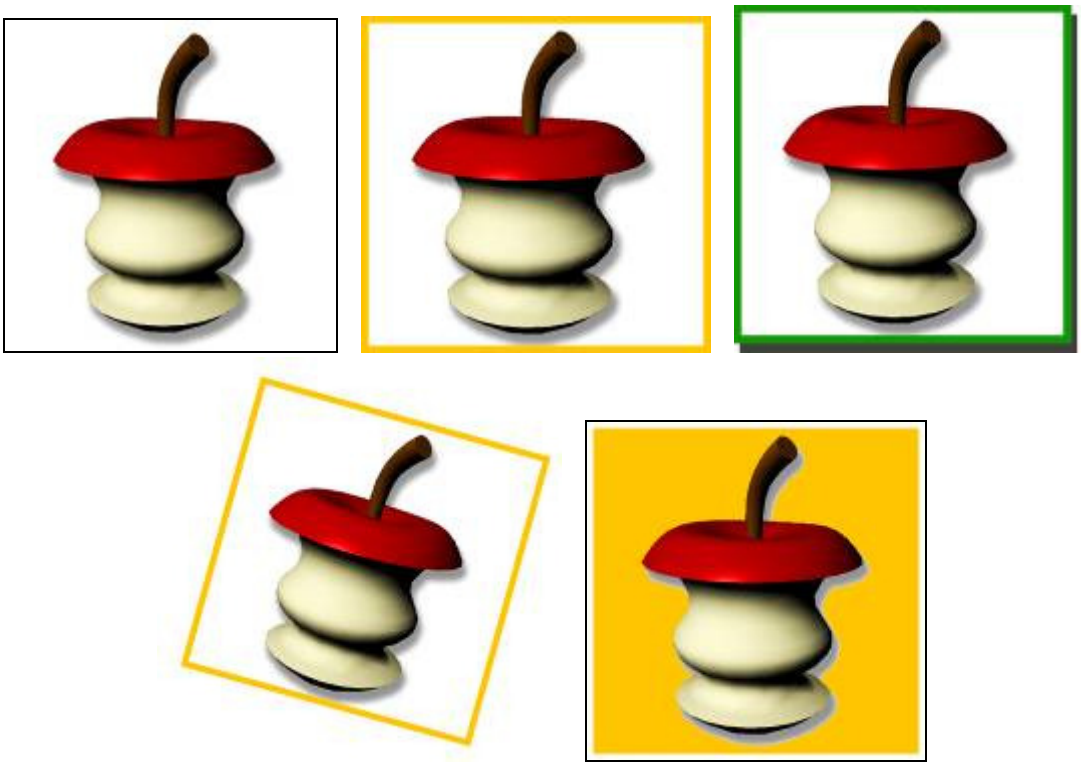
Image Cropping

A designer may wish to crop an image into different forms, such as rectangle, circle, square and triangle, with different sizes, edges and zooming treatments for presentation.

The original photo

Image Tweaking

A "to-the-point" tweaking can enhance the value of an image or graphic and brings life to the whole design, no matter it is a page, website, video or animation. For example, a designer can add a border to the picture, add a shadow to the object in the picture, colour the background or tilt the picture.



(ii) Surface and Dimensionality

Images can also be manipulated by shadowing, extruding and simulating. Harder shadows can simulate a direct light, while softer shadows simulate a bounced or filled light. An extruded object provides viewers with a floating effect. The effect can vary with different directions of the light source.

H I G H L I G H T

Logo of the Hong Kong Cable Television Limited

The logo of the Hong Kong Cable Television Limited has been manipulated below to show different effects.

Flat

Shadowed

Extruded

S T O P A N D T H I N K

A corporate identity or logo exists for the whole company, instead of solely a single product. Some companies may use different surface patterns on the same logo design. But the designs of these variations must align with the corporate identity.

Identify other corporate identities in Hong Kong.

An example of logo design

2.3.4 Video

Video technology in the context of digital media refers to the digital technology of making a sequence of pictures that show motions dynamically by capturing, recording, processing, storing, transmitting, and reconstructing. Television systems are the first generation of video technology. As digital media becomes popular, video recording also becomes a household activity.

(a) Standard Definition Vs High Definition

Traditionally, there are two common standards for Standard Definition (or 'SD') video signals, namely NTSC and PAL.

NTSC stands for National Television System Committee. It is a popular analogue television broadcast system across North America, Japan and most of Latin America. NTSC enables 487-line display with a frame rate of 30 frames per second (or 'FPS'). Its pixel ratio is 1:0.9.

PAL is the acronym for Phase Alternating Line. It is another common analogue television broadcast systems. It is used mainly in Europe and the rest of the world. PAL enables 576-line display, with a frame rate of 25 FPS. Its pixel ratio is 1:1.067.

The aspect ratio for both systems is 4:3. Their maximum width resolutions are 720 pixels.

High Definition (or 'HD') is a newer digital video format than SD. HD's native aspect ratio is 16:9, with 1920 x 1080 pixels. HD's recording can be done at 24 or 60 FPS.

(b) Video Editing

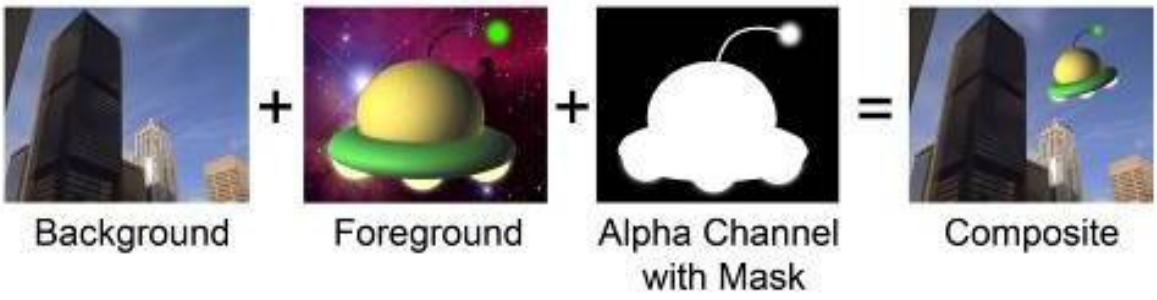
Video editing is the activities of cutting, rearranging and consolidating pictures of one video source or more into one video. It involves the re-organization of the pictures, story, music, etc. It is an art, at least an important process, where the fate of the final video relies on.

Refer to Chapter 3.3.4 for detailed editing skills and technology.

(c) Video in Compositing and Blending

Compositing, or 'matting' in the film industry's terminology, is to combine two images or more into a single frame.

Traditionally, compositing is done through masks or mattes. A mask is a stencil-like, grey-scale image. It protects part of an image from compositing. Combining images without masks is 'image blending'. There are different types of blending, such as addition and difference.



H I G H L I G H T

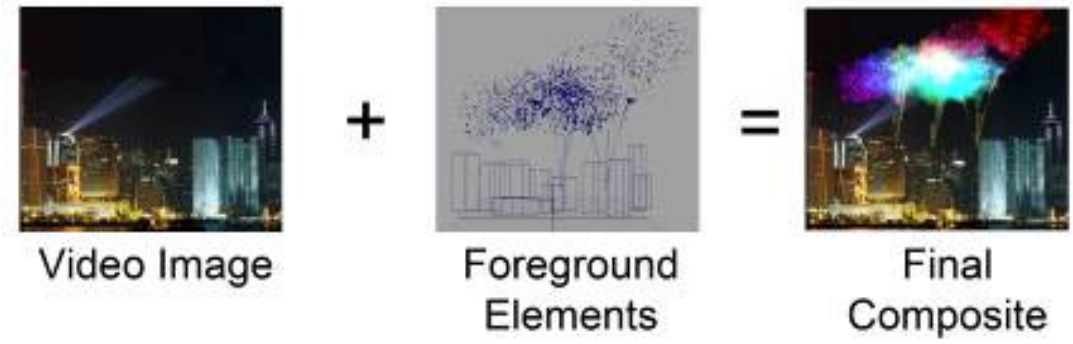
The Secret of the Magic Gourd

The movie was produced by Centro and Disney in 2007. It mixes the magic gourd and other characters with real-life actions.

Reference: Centro (www.centro.com.hk)

(d) Video with Special Effects

Special effects in videos usually involve computer generated images, particularly 3D computer-generated elements. Videos with good special effects have to consider the object scale, lighting quality, atmosphere or mood and, camera's point of view, etc. Similar to any other successful activities, good planning, which means at least a detailed storyboard in this context, is mandatory for successful special effects.



(e) Video Colour Correction

Colour correction is to adjust the colour (or 'colour temperature') of a work in order to

enhance the quality of the video or for specific purposes. It can be applied to photography, television, cinematography and other digital media.

Many post-production software packages provide users with filters for adjusting the colour balance, saturation and hue of an image. Major colour problems include highlights, mid-tones and shadows.

Before colour correction

After colour correction

(f) Blue Screen Shooting

Blue Screen Shooting, or 'chroma key' in technical terms, is a technique for mixing two images or more. It is done through inserting, or 'keying' in technical terms, a background image over a flat coloured background.

Sometimes a green screen is used.

Blue Screen shot

Composite with virtual image

2.3.5 Animation

(a) Animation Introduction

Animation is ubiquitous in everyday life. It appears on television, commercials and movies. It also brings joy to children and adults.

How does animation work? It thanks to Persistence of Vision. Persistence of Vision is

a physiological phenomenon that 'connects' a series of static images together, making human eyes perceive motion. Human eyes focus on images for a slightly longer duration of time than the images actually projected on the retina. As a result, fast moving images are projected on the retina in an almost continuous manner. This phenomenon builds a perceptual foundation for all sequential media.

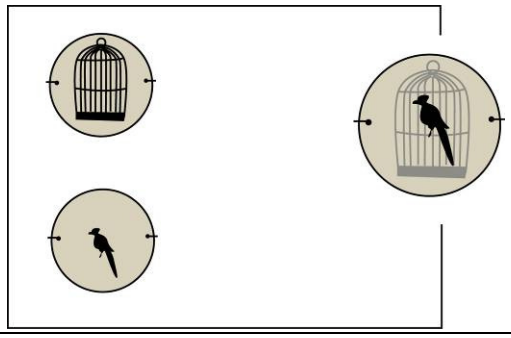
Like many arts, animated films or images were handmade with the help of thaumatropes, flip books, and also line and cell animation. Today, digital technology helps a lot.

Refer to Chapter 3.3.5 for more animation skills and technology.

H I G H L I G H T

Thaumatrope

A thaumatrope is a toy making use of string spinning and Persistence of Vision. The first two pictures are on two sides of a card, each showing a bird and cage. If the card is spun around a vertical axis, a combined image can be seen as the third picture shows.



Flip Book

A flip book is a book of a series of pictures. The pictures differ from their next ones gradually. When the book is flipped rapidly, the pictures on the pages appear to animate.

By John Barnes Linnet from the kineograph in 1886.

Line and Cell Animation

Line and Cell Animation is a well-known but time consuming animation method. Pictures are drawn on papers, or transparent sheets of celluloid (or 'cell') frame after frame. Each picture is then photographed onto films.

Mr Bug Goes to Town, Anton Leob, by Fleischer in 1941.

(b) Different kinds of Animation Production

(i) Stop-motion Animation

Stop-motion animation is to take pictures on manipulated objects frame by frame. Each frame captures a gesture of the object with minor differences from its preceding frame. Stop-motion animation can be applied to clay animation, cut-out animation, object animation, etc. For example, King Kong - a film made by Willis O'Brien in 1933.

H I G H L I G H T

Clay Animation

Clay animation, or 'claymation', is one kind of stop-motion animation. The objects photographed are figures made of clay or similar malleable materials. For example, The Wallace and Gromit shorts (1989-1995) of the United Kingdom.

Cut-out Animation

Cut-out animation is another type of stop-motion animation. The objects of this type are 2D pieces made of paper, cloth, etc. Nowadays, objects of cut-out animation can be made digitally with scanned images or vector graphics. The South Park TV series (1992-present) is an example of cut-out animation.

Object Animation

Object animation is produced with inanimate objects. The Brickfilm is made by plastic toy building objects. LEGO is an example.

(ii) 2D animation

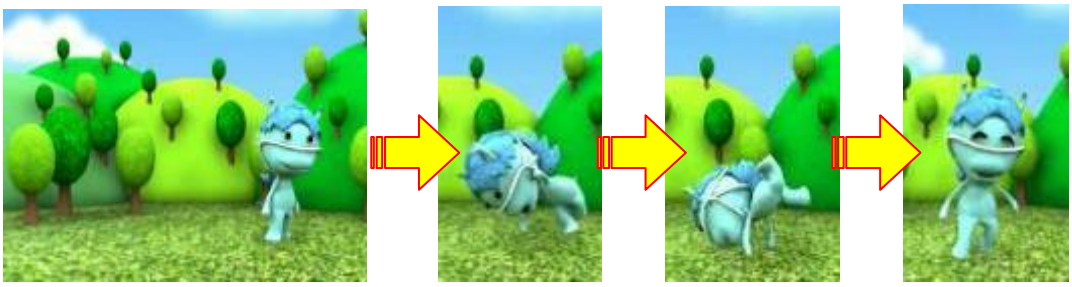
Like stop-motion animation, 2D animation was handmade frame by frame traditionally but now can be done with computer technology. There are two types of animation software packages, namely bit-mapped animation and vector-based animation.

Refer to Appendix – 2D animation for a production tutorial.

Sequences of 2D animation

(iii) 3D animation

3D animation has been rapidly developed for the last few decades. It has been used extensively in feature films, video, computer games and TV commercials.

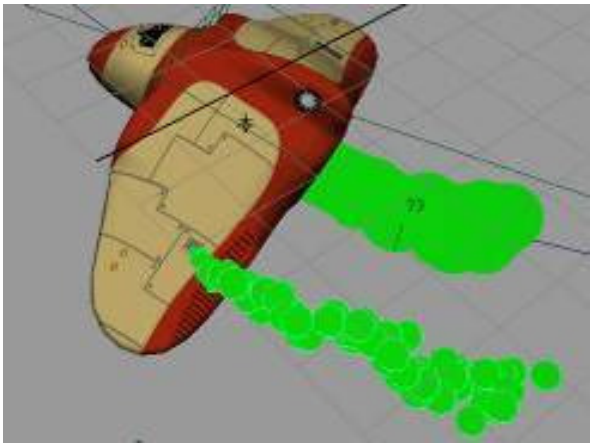


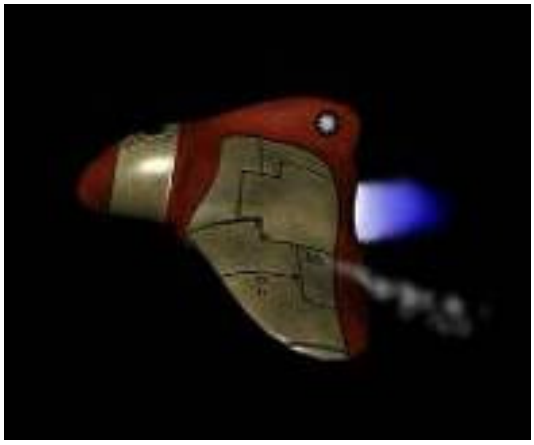
Sequences of 3D animation

(c) Advanced 3D Animation Technology

(i) Animation in Motion Dynamics

3D animation systems produce animation by simulating object motions. Firstly, the physical properties, such as mass and density, of an object have to be defined in the software. The simulation software then simulates the required animation by applying external forces, such as wind and gravity.



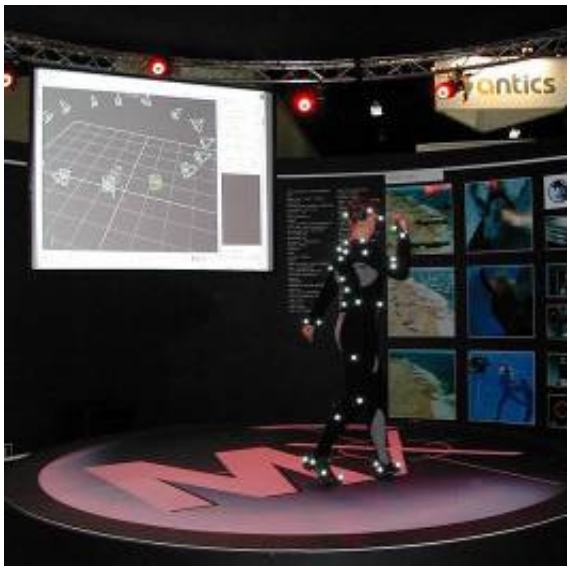


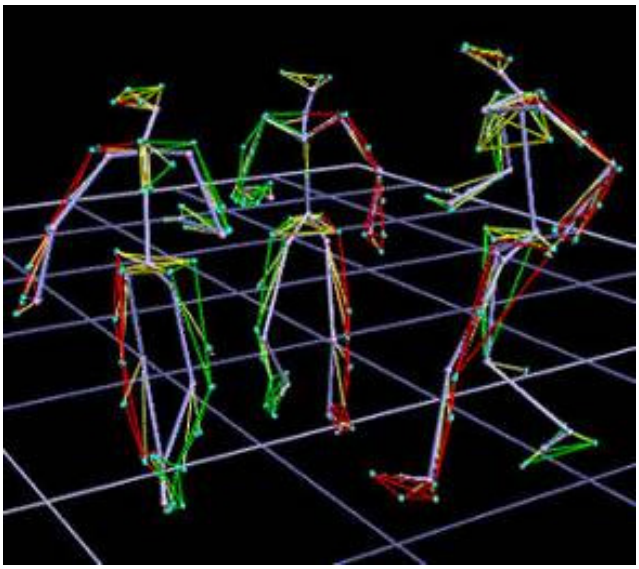
For example, the scenario that a ball falls downstairs can be simulated as a type of collision. Motion dynamics technology can also be used for 'soft body'. For example, how the shapes of clothing and hair will change in response to the changes of their physical properties can be simulated. In Monsters, Inc, produced by Pixar, there was more than 2 million of computer-animated hair on a single character.

(ii) Motion Capture

Motion capture, or 'mocap', is to capture or record the motions of objects, usually the actors, for later animation. They have to put on suits with sensory devices attached. As they move within a designated area where sensors are installed, their movement with 3D coordinates can be captured or recorded.

A sensory device can be a magnetic device that emits magnetic pulses, or an optical one that makes use of reflection. Motion capture systems capture every frame without key frames or interpolation input from the animator. As a result, the data sizes are very big.





H I G H L I G H T

Motion Capture Movie: The Polar Express

The Polar Express was produced by Sony Pictures Imageworks and launched in 2005. Its production combined full digital animation with highly advanced motion capture technology. Actors had to perform in a studio with many optical cameras attached. Data captured from the actors were restored to the virtual characters.

Reference: http://polarexpressmovie.warnerbros.com/index.html

S T O P A N D T H I N K

Both 2D and 3D animations have been developed rapidly, especially in feature films, video games and commercials for the past few years.

Prepare a presentation of 3 to 5 minutes with one of the following topics:

(a) Your favourite Short Animation; or
(b) Your favourite Game Opening.

The presentation should be

(a) Short
(b) With one focus
(c) Practical

In addition, state what kind of special effects and editing methods are used in the animation.

CHAPTER 3– DIGITAL MEDIA PRODUCTION

Definition

This chapter introduces the process, development and the workflow of digital media production through the following topics:

3.1 Project planning and idea presentation methods
3.2 Manipulation of visual and audio equipment
3.3 Application software

Technological/ Design Concepts

These topics facilitate students':

(a) Identifying the needs for digital media production
(b) Outlining and distinguishing different building blocks in digital media production
(c) Managing the activities of digital media production
(d) Producing simple digital media works with appropriate visual and audio equipment and application software

Technology Development

There are different types of visual and audio software packages equipments in the market. After the Chapter, students are expected to have

(a) Basic operating skills of these software packages and equipments
(b) Basic knowledge of capturing media products in different environments

3.1 PROJECT PLANNING AND IDEA PRESENTATION METHODS

Before starting a multimedia project, the designers should have, at least, a rough idea about the project scope and contents. They should consider what methods available are the best for conveying messages across to the target audience.

3.1.1 Production Timeline

The designer should develop a Production Timeline, which shows project milestones and deliverables with due dates. The following is an example for a website development project:

Production Timeline of Website development project

Due Date	Action
30 May 20xx	Circulate Contact Methods of Project Team Members
26 Sep 20xx	Arrange Project Execution Office
17 Jun 20xx	Schedule Project Meetings with Client and/ or Team, and Collect High-level User Requirements
03 Jul 20xx	Compile Strategic Brief and Work Chart
03 Jul 20xx	Compile Timeline
15 Jul 20xx	Analyse User Requirements
15 Jul 20xx	Produce Storyboard
16 Jul 20xx	Identify Deliverables Required
20 Jul 20xx	Develop Project Production Standards and Compile Technology Brief
22 Jul 20xx	Draft Contract, Compile Cover Sheet and Website Proposal
24 Jul 20xx	Submit Proposal to Client for Review and Arrange Proposal Sign-off with Client
25 Jul 20xx	Compile Template Explanation
10 Aug 20xx	Convert Templates into Web Pages
15 Aug 20xx	Discuss Compatibility Concerns with Creative Director
20 Aug 20xx	Write Programs
20 Aug 20xx	Write Screens
28 Aug 20xx	Conduct System Test
05 Sep 20xx	Conduct User Acceptance Test
08 Sep 20xx	Submit Testing Reports
20 Sep 20xx	Submit Training Documents
20 Sep 20xx	Submit User Manual
30 Sep 20xx	Launch Website
01 Oct 20xx	Celebrate Product Launch

3.1.2 Gantt Chart

A Gantt Chart is a graphical project schedule. It provides project stakeholders with the start date, end date and task dependencies. The following is an example for a game development project:

Week No.	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
Literature Research															
Design															
Level															
Character															
Scene															
Tool															
Modelling															
Animation															
Programming															
Testing															
Project Presentation															

3.1.3 Project Resources Plan

A project resources plan documents what resources are required in project execution. The following is an example:

Equipment	4 PC's with Game Engines and Development Kits and environment
Tools	(a) Maya for Modelling (b) Virtools for Game Design (c) C++ and Virtools SDK for Game Development (d) Body Scanners for 3D Model Digitalization (e) Motion Capture System for Animation Design and Development

3.1.4 Logbook

A logbook is to facilitate the project manager to monitor and manage the project's progress. Project team members have to complete their own sheets regularly, such as weekly or fortnightly.

A logbook may contain the following information:

(a) Tasks completed in the last reporting period
(b) Tasks to be completed, or 'To-do List'
(c) Findings in background research information (optional)
(d) Documents and reference materials collected (optional)
(e) Ideas generated (optional)

PROJECT LOG SHEET

Project Title	:	
Project Supervisor	:	
Team Members	:	
Week Number	:	
Date	:	

Activities and Progress Made:

Sample Logbook

3.1.5 Scriptwriting

According to digital media production, a script is as important as to drama production. A good script gives readers a thorough understanding about the production. In addition, scriptwriting is a detailed plan that combines visual and text elements (for video production), or sound effects and text (for audio production). As a result, in order to achieve its maximum benefits, the format and language of scripts have to be reader-centric and reader friendly.

S T O P A N D T H I N K
(i) Write a five-minute script for a five-character role play (either a short video documentary or a comedy) about your school's open day, with a scene list and planning; and (ii) Produce the video accordingly.

(a) How to do Research

Research is the process of information collection. It could be a document or a real-life research. Document research means that information is collected from documents, such as books, magazines, newspapers and newsletter. Real-life research refers to daily observations, interview, etc.

A good research can enrich the story and the production as a whole.

The following are some common terminologies:

Shot	A continuous sequence of images
Scene	A single part of a film for a particular place and time
Act	A series of scenes of a film, comprising a major part of which
Plot Point	A turning point of a film's story, affecting the fates of the characters

The following example of scriptwriting comes from a movie:

Name of movie：南海十三郎
Original work/Screenwriter：杜國威
Director：高志森
According to the Best Hong Kong Movie Script Collection of 1997-98 —「南海十三郎」
(Script Publisher：Hong Kong Movie Screenwriter Association)

Item	Content	Scene
ACT 1	(i) 南海才子江譽鏐自少聰明過人, 性格自我。 (ii) 年青時入讀香港大學醫學院, 舞會上遇見女同學 Lily, 驚為天人, 一見鍾情, 不惜從香港追求致上海。 (iii) Lily 父母反對兩人交往, 江譽鏐失意流落上海街頭。 (iv) 江譽鏐回到廣州, 著迷粵劇, 認識名伶薛覺先。 (v) 江譽鏐送上作品【寒江釣雪】。	Scene1 to 16
Plot Point 1	薛覺先到訪江譽鏐及其父江太史一家, 受到熱情款待, 大讚江譽鏐文才, 邀請撰辭, 江譽鏐欣然接受, 改藝名南海十三郎。	Scene 16
ACT 2	(i) 十三郎為薛覺先撰辭, 大受歡迎, 一鳴驚人, 紅遍省港澳。 (ii) 十三郎發現侄女江少儀在夜總會當舞女, 出手相助, 介紹她當上電影明星。 (iii) 十三郎脾氣古怪, 難找助手, 得遇青年唐滌生, 相交相知, 結為師徒。 (iv) 二戰爆發, 十三郎用激將法令唐滌生到香港發展, 成就一代著名粵劇編劇。 (v) 十三郎到軍隊後援勞軍, 與人結怨, 受人排擠, 工作日少。 (vi) 梅仙介紹他當電影編劇, 十三郎不滿作品被人亂改, 發生衝突, 事業每下愈況, 失敗連連, 十三郎窮途末路。	Scene 17-36
Plot Point 2	(i) 十三郎失意潦倒, 再遇初戀情人 Lily, 見她嫁給富商, 大受刺激。 (ii) 十三郎似瘋非瘋, 從正在開行中火車跳下, 頭部受創, 身受重傷。 (iii) 傷癒的十三郎, 神智不清, 精神時好時壞。	Scene 37 to 39
ACT 3	(i) 十三郎父母年老無力照顧瘋癲的十三郎, 送他落香港生活。 (ii) 十三郎重遇薛覺先, 卻不願受他恩惠。 (iii) 十三郎重遇唐滌生, 唐願意照顧, 不料唐突然瘁死, 十三郎受刺激被送入精神醫院 (iv) 出院後掛單寺院, 得悉父母死去 (v) 十三郎更加瘋癲, 終日流浪街頭, 最後老死街頭	Scene 40 to 56

Organised according to the script in 「南海十三郎」

(b) How to do an interview

(i) Stages of the Interview

(1) Define the purpose of the interview
- What information do I need?
- Who is the most suitable person to provide such information?

(2) Conduct background research
- Look for a NEW angle

(3) Plan the interview
- Plan how to initiate a conversation with someone you just met
- Plan how to break the ice
- Write down to-be-asked questions

(4) Use small talk
- Use small talk to make the conversation atmosphere humane and warm
- Avoid robotic conversation, like a Q&A session

(5) Ask questions with mutual interest

(6) Building mutual trust, which is a pre-requisite requirement for a good interview

(7) Ask no personal questions, which may embarrass the interviewee; and

(8) Seek approval if audio or video recording is required

(ii) Types of Questions

(1) Open-end versus close-end questions
- Open-end question: Can you tell me about yourself?
- Close-end question: What type of prize did you win in the competition?

(2) Opening questions
- Be easy to answer; and
- Reinforce the respondent's self-esteem

(3) Follow-up questions
- Be passive probe, e.g. 'Hmmmm… I see'
- Be responsive, e.g. 'Really… how interesting!'
- Mirror by repeating the respondent's answers in own words

(4) Factual questions
- 'How old are you?'

(5) Numerical Questions

(6) Reflective Questions
- Comments/ ego-reinforcing manner
- 'You seem to enjoy teaching.'

(iii) More things to do

(1) Learn from the interview;

(2) Consider moral issues;

(3) Pay attention to body language;

(4) Maintain eye contact; and

(5) Conduct the interview in a suitable environment

3.1.6 Storyboarding

Designers and directors use films and/ or animations as a visual language to illustrate the project objectives. Thus, they have to know how to make use of each individual shot within a scene.

(a) Basic Structure of a Single Frame Storyboard

A storyboard has to be clearly introduced the following elements:

(i) Camera Framing, Angles and Movements [Refer to Section 3.2.3 ('Video shooting') for details]
(ii) Shot Duration
(iii) Audio and Dialogues

Image	Shot description Describe actions, as well as Camera angles and movement
	Sound Indicate ideas for key effects, such as ambient sound narration and music
	Shot Duration How long will the action, movement phrase or shot be?

(b) Basic Structure of a Storyboard Sheet

A single frame of storyboard cannot tell the whole story, but a storyboard sheet containing many frames does. Such a sheet describes the flow of the story. The following template is an example of a storyboard sheet for project production.

Project title: _____ Page: _____

Shot: _____

Sound

Duration

Shot :_____

Sound

Duration

Shot :_____

Sound

Duration

H I G H L I G H T

Monsters, Inc: from Storyboard to Outcome

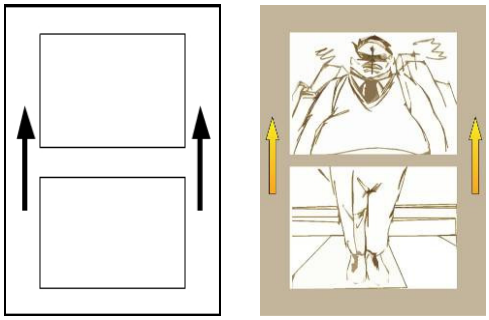
A storyboard is a simple graphical presentation, by sketching, for example, of the script that shows the key actions of the story.

(c) Indication of camera movement

Using storyboard in movie making and animation production can facilitate design teams to prototype making and the final product conversion. Storyboards can be drawn from left to right or vice versa. In many cases, in order to facilitate the communication within a design team, directional arrows are used to show the expected camera movement in storyboards.

H I G H L I G H T

Tilt Shot (Vertical Pan)
A tilt shot refers to the movement of a fixed camera along a vertical axis.

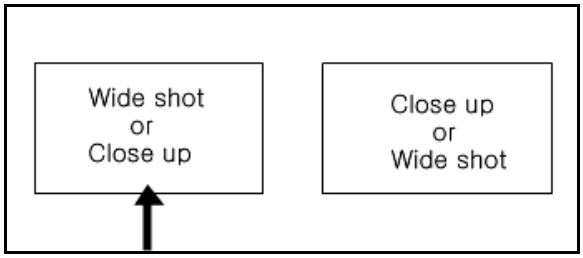


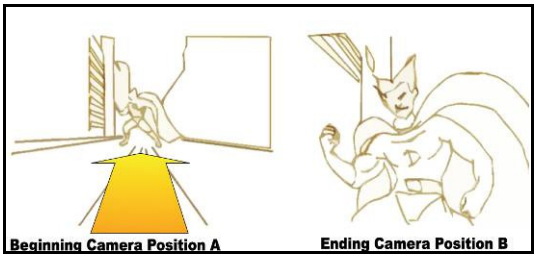
Pan Shot (Horizontal Pan)

A pan shot refers to the movement of a fixed camera along a horizontal axis.

Dolly Shot

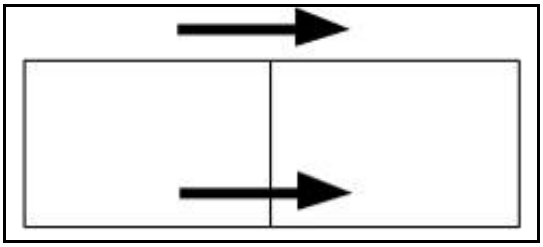
A dolly shot refers to the movement of a camera of either moving towards (dolly in) or away (dolly out) from a subject.

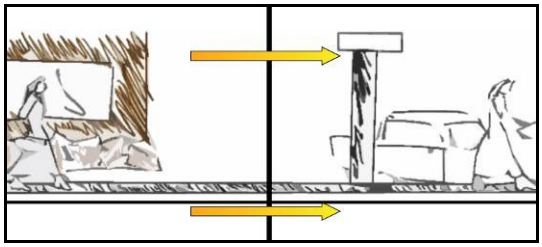




Track Shot

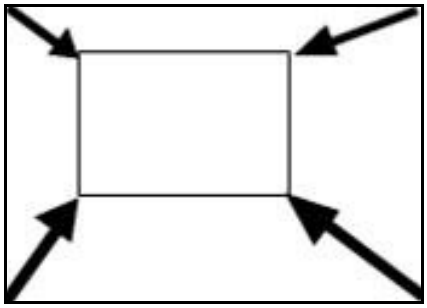
A track shot refers to the movement of an object or person.

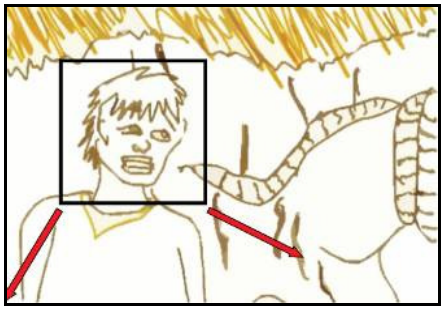




Zoom-in/ out

A zoom-in shot narrows the area shown on a shot (a wider area) to a particular part (focus). A zoom-out shot does the opposite.





S T O P A N D T H I N K

Production Procedure

(a) Partner with two or three classmates
(b) Write down the theme of your production
(c) Express your ideas using storyboards
(d) Present your ideas to your class

3.1.7 Scenic Design

(a) What is scenic design?

Scenic design, 'stage design', 'set design' or 'production design' is the process that creates theatrical scenery.

A 'stage picture' refers to the decoration of the stage for a play. It is not stand alone but rather a combination of props, actors, shapes and colours being used. It should be able to express the ideas of a play or a scene, and appeal to the audience.

(b) What is the importance of scenic design?

A scenic design can provide a play with suitable performance environment, and a pleasant atmosphere for audience to enjoy the play.

H I G H L I G H T

Purposes of A Scenic Design

(a) To provide audience with a visual clue, a historical backdrop and hints of events happening
(b) To reflect actors' mental status or minds through geographical location
(c) To smooth over the transitions between scenes
(d) To reflect the characters' social status
(e) To supple information of a play

(c) How scenic design is being made?

(i) Visual Research

In order to ensure the art integrity of a play, research should be done on the play's theme and style before the scenic design.

In Divergence (2005), the assassin's house was decorated with old-fashioned furnishings. The nostalgic style used was to reflect his primitive and drifting life.

Reference movie: Divergence (2005)

S T O P A N D T H I N K

Which of the following pre-design research methods is most suitable for designing a ballroom with old Shanghai feel? Why?

(a) Internet searching
(b) A journey to Shanghai
(c) Documentary searching
(d) Library searching

(ii) Scenic Visualization

Scenic visualization is a type of prototyping. It facilitates the project team's mutual understanding before the actual production. There are four methods of scenic visualization, namely freehand sketch, photo collage, miniature and computer generated imagery (or 'CGI'). Each has its own benefits and drawbacks.

H I G H L I G H T

Benefit and Drawback of Different Scenic Visualization Methods:

(a) Freehand sketch: It is the most flexible method, and suits designers with good drawing skills.

Reference movie: The Fifth Element, (1997)

Benefit and Drawback of Different Scenic Visualization Methods:

(b) Freehand sketch: It is the most flexible method, and suits designers with good drawing skills.

Reference movie: The Fifth Element, (1997)

Benefit and Drawback of Different Scenic Visualization Methods:

(c) Freehand sketch: It is the most flexible method, and suits designers with good drawing skills.

Reference movie: The Fifth Element, (1997)

(d) Photo collage: It can save much time on production when all furnishings are ready. Today, it is common to use software packages like Photoshop to handle image collage.

Reference movie: Maybe, (2003)

(e) Miniature: It is a time-consuming method therefore not so popular to use. However, it is still a cost-effective way to present scenes of natural disasters for live shooting.

Reference movie: Independence Day, (1996)

(f) CGI (Computer Generated Imagery): It is the most powerful and multi-functional method. It provides three dimensional virtual scenes that enable neat and clear visualization. For it supports precise proportion and detailed textures, it can highly reduce the confusion and misunderstanding that may occur during parallel production. It is suitable for large scale production that involves many action scenes.

Reference movie: Star Wars, (1986)

(iii) Lighting

Use of lighting colour is important in scenic design since it can stimulate human emotions. Designers can create different dramatic atmosphere by using different colour tone. For example, horrific stories often use green tone lighting.

S T O P A N D T H I N K

(a) Explain why PTU (2003) used blue tone lighting to show the night scenes.
(b) Explain whether or not a yellowish lighting can be used. Why or why not?

Reference movie: PTU (2003)

(iv) Mise-en-Scéne

Mise-en-Scéne is a French word. It refers to 'arranging scenes' or 'design and arranging frames'. It covers locations design, props, actors' clothing design, and additional props of supplementary information for characters.

Reference movie: Election (2005)

H I G H L I G H T
Mise-en-Scéne Mise-en-Scéne is an important scenic design skill. Election (2005) is an example showing a good practice of furnishing arrangement. **Mise-en-Scéne helps to provide** (a) Sufficient camera angles for shooting (b) Sufficient room for shooting equipment (c) Visual layers for composition (d) Foreground and background for depth of field effect

3.1.8 Props Set-up

(a) What are props?
Props are items on the stage for a play. In general, props refer to small objects used by the characters, like glasses and books. Larger objects, such as chairs and tables, are considered as part of the set.

(b) Why is prop design important?
Props are considered as silent actors. It helps an actor to deliver extra meaning to the audience. For example, a pistol in a cop's hand is representing justice. On the contrary, if it is in a robber's hand, it symbolizes crime. Such complicated implications on props make prop design work challenging. For example, guns played a heavy role in Infernal affairs (2002).

Reference movie: Infernal affairs (2002)

(c) How props are being designed?

(i) Ergonomics

According to International Ergonomics Association (definition as of 2007), ergonomics is a biological science used to design objects and systems, which study the relation between humans and their environments.

Ergonomics is an applied science that maximizes human productivity by minimizing operators' fatigue and discomfort through specially designed equipment. Ergonomics is also known as biotechnology, human engineering and human factors engineering. Details can be found from http://en.wikipedia.org/wiki/Ergonomic.

Reference movie: Twins effect (2003)

(ii) Colour and Texture

Colour and texture are two important elements to prop design. Props should look like what they are supposed to be. For example, in A Chinese Tall Story (2005), the Buddha statue was made of Styrofoam! By using the effects of colour and texture, a piece of foam was turned into an old and weathered bronze statue.

Reference movie: A Chinese Tall Story (2005)

(iii) Materials

For safety purpose, dangerous weapons are usually replaced by dummies in films or plays. For example, knifes are made of EVA foam. This kind of material is lightweight and shockproof, but rigid enough to be shaped.

H I G H L I G H T

Materials

There are different kinds of materials suitable for making props. Consider the following questions before making a decision:

(a) Is the material light enough for transportation?
(b) Can the material transformed into desired shapes easily?
(c) Is the material durable?
(d) Is the material waterproof?
(e) Is the material heatproof?
(f) Is the material shockproof?

(iv) Simplification

Making props too fancy and meticulous may delay the production process. In order to find balance between quality and time, the following tips may help:

- Make props with ready-made products;
- Apply modular design concept to simplify the workflow; and
- Separate props into various parts and assign to craftsmen with different expertise

In Purple Storm (1999), there was a protective tank for biochemical weapon. The tank was made of modular pieces that were sprayed with silvery paint.

Reference movie: Purple Storm (1999)

3.2 MANIPULATION OF VISUAL AND AUDIO EQUIPMENT

There are various types of visual and audio equipments available in the market. A good designer is expected to have basic skills to master these equipments and have basic knowledge of capturing media products from different environments.

3.2.1 Sound Recording

Sound and voice have indispensable effects to every film, movie, animation or even in presentation of a sequence of still images. Sound and voice provide audience with atmospheres that producers establish, and leading moods of audience towards desired directions.

Sound and voice can be added to works using computer software or from well-prepared sound libraries after production. However, in many cases, sound and voice are captured live.

During sound recording, it is very important that the loudness (sound pressure level), sampling rate and resolution (bit depth) of sound are properly set.

Different kinds of digital recorder

H I G H L I G H T

Sound Recording

Sound Pressure Level is measured in decibels, or 'dB'. It is a logarithmic measure of the sound pressure with respect to a reference value.

Sampling rate or frequency is the number of samples taken per second. The accuracy of the digital representation of the sound recorded is higher if higher sample rates (more samples are taken per second) is used. For example, the sampling rate for CD-quality audio is 44,100 samples per second, accurately reproducing audio frequencies up to 20,500 Hz. The frequency range of human hearing lies between 18 Hz and 20,000 Hz.

(a) Sound Recording Equipment

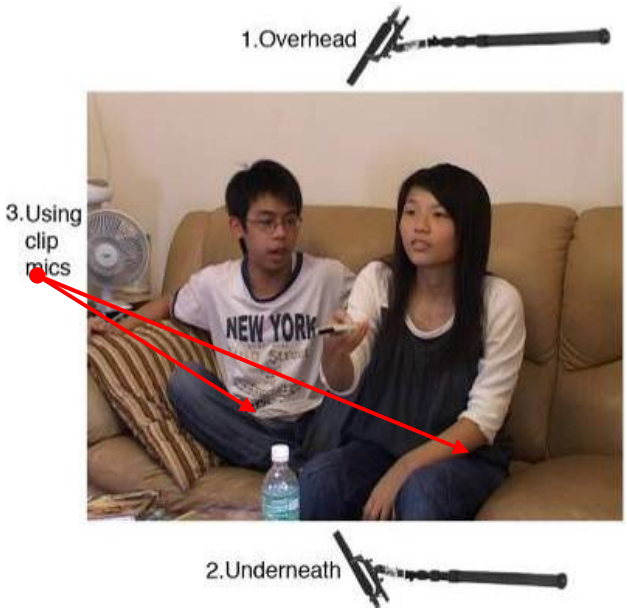
The quality of location sound captured determines how good a footage can be. To capture location sound properly, certain basic audio equipment is required.

Recording microphones used in Beijing Olympia Games 2008

S T O P A N D T H I N K
Sound Recording ▸ Name some professional sound recording equipment. ▸ Name some audio equipment which is commonly used in news broadcasting.

(b) Microphone Placement

Microphones, or "mics", should be placed in the right position to obtain the best recording input. For example,



1. Mics are placed overhead in most occasions, enabling easy and quick movements of the mics.
2. Another common position for mics is 'underneath'. However, there will be limited position to place the mics if actors tend to move around.
3. Microphones can also be hidden in actors' clothes.

H I G H L I G H T
Sound Level During recording, the sound level should be monitored continuously to make sure recorded sound will not be overloaded or distorted. Desired sound level should be surfing close to the maximum level but never beyond.
Tips: Mobile phones may interfere with sound signals. All Mobile phones on site should be switched off when recording.

3.2.2 Photography

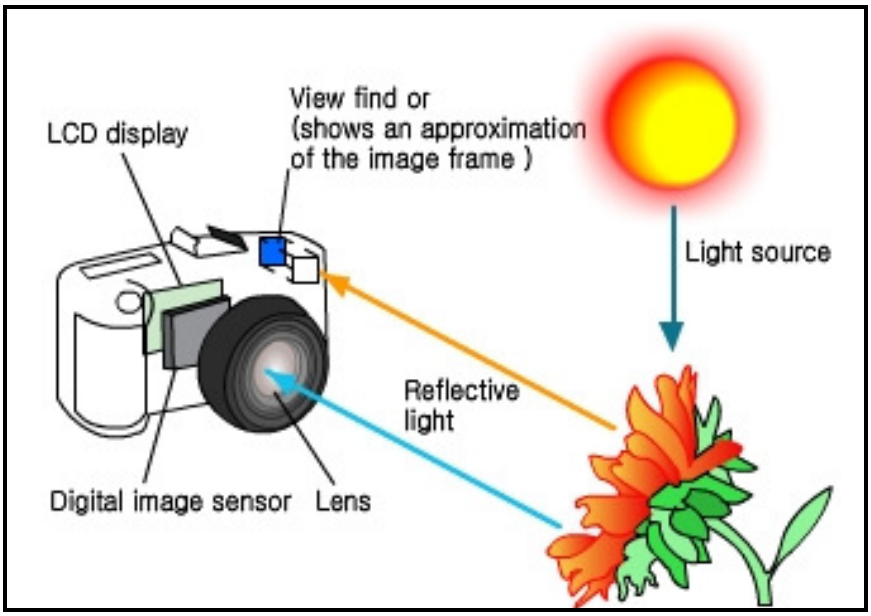
The word 'Photography' came from two Greek words, namely phos (light) and graphis (stylus or paintbrush). In other words, it means 'drawing with light'.

The product of photography is photographs, 'photos' in short or simply 'pictures'. The term 'image' is gradually replacing 'photos' since the introduction of digital photography.

- **Compact Digital Camera**

  'Compact cameras', or 'compact digital cameras' are initially designed for easy to use and higher portability.. The smallest of them are even called 'subcompacts'.

  The trade-offs for these compact digital cameras against traditional cameras are the deficiency of certain advanced features and lower picture quality. For example, in many cases, digital photos are stored in JPEG compression mode. Although some compact digital cameras have built-in flashlights, the flashlight power is low and is only sufficient for nearby subjects.



Camera Operations

(i) Shooting Mode

There are many camera shooting modes. The fundamental two are automatic and manual. Nowadays, compact digital cameras provide a wide range of shooting modes, such as 'close up', 'night', 'party', and 'sport' etc.

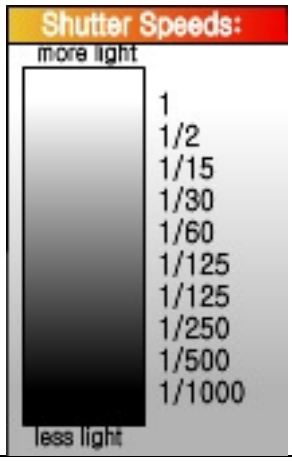
(ii) Shutter (Shutter Speed)

Shutter speed measures how long a shutter is held open when taking a photograph. Through an open shutter, light can reach the film (in traditional cameras) or imaging sensors (in digital cameras).

H I G H L I G H T

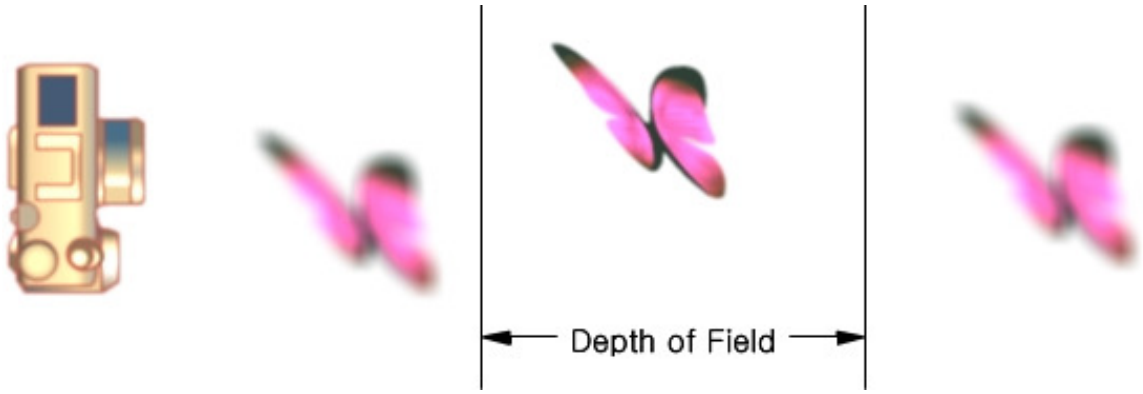
Shutter Speed

Shutter speed is measured in seconds.



(iii) Aperture/ Depth of Field

Depth of Field (DOF) is the total distance, within the picture, from the foremost point of the subject to the farthest point of the subject. The area within the DOF range appears sharp (in focus), while those beyond this range became blurry.



(iv) Exposure

Exposure refers to the total amount of light falling on the film or image sensors when a photograph is being taken.

How much exposure is required is subject to the sensitivity of the medium in use. For traditional films, sensitivity refers to film speed, which is measured on a scale published by the International Organization for Standardization (ISO). Exposure is a result of the time and level of photosensitive materials exposed to illumination. The former is controlled by the shutter speed, while the latter by the lens aperture.

Aperture + Shutter Speed = Exposure Value

(v) White Balance

To humans, white is white. To digital cameras, 'white' is a value with reference to a value, with which other colours are calculated (recognized). To some digital cameras, white balancing is automatic, while some require manual settings.

(vi) Colour Temperature

Colour temperature is a measurement of the quality of a light source using the ratio of the amount of blue light to the amount of red light, with green light ignored. The measurement unit used is Kelvin (K). A light with a higher colour temperature has 'more' blue than green, and hence is referred as a cooler light.

3.2.3 Video Shooting

The variety of digital camcorders is wide. Most of these camcorders support High Definition Video (HDV). In terms of storage methodology, 8cm recordable DVD's, MiniDV videotapes, MicroMV videotapes, memory cards and hard-disk are available in the market.

For home users

For advance users

For business videographers

For professional users

Camcorders for different users

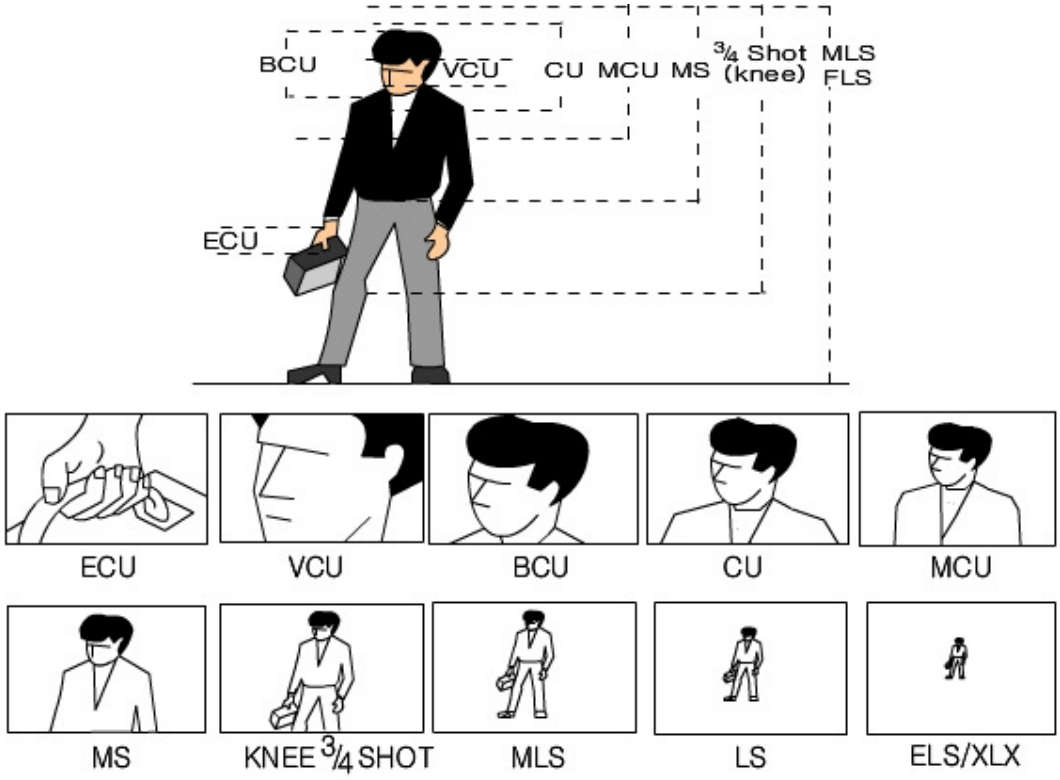
(a) Storytelling in Video Shooting

A single video shot is sufficient to tell a wonderful story. Successful storytelling relies heavily on the size and placement of the shots. In addition, well- composed shots can create a logical and dynamic sequence, paving the way for later video editing.

(b) Size of Shots

The following six stationary camera shots have their respective inherent narratives and psychological effects.

- Extreme Long Shot (ELS)
- Long Shot (LS)
- Medium Long Shot (MLS)
- Medium Close-up (MCU)
- Close-up (CU)
- Extreme Close-up (ECU)



H I G H L I G H T

Extreme Long Shot (ELS)

A screen using ELS is usually full of buildings, landscapes or people, which are all very small in scale. ELS is often used as the first or last shots of a sequence, acting as establishing shots.

Long Shot (LS)

Objects in an LS screen are small. The height of a person in an LS screen is about that of the screen. The shots are relatively stable, enabling accommodation of movement without reframing. As a result, LS is commonly used when a full body action is to be seen.

Medium Long Shot (MLS)

An MLS framing is usually able to show objects of four or five feet high with a little space left.

Medium Close-up (MCU)

Objects in an MCU framing are fairly large: for example, a person's chest up can fill most area of a screen. It is a common shot scale.

Close-up (CU)

Objects in a CU framing are relatively large. Human heads or objects of similar size can fill the frame. The scales for CU are established with reference to other frames of the same film, without a designated definition.

Extreme Close-up (ECU)

Objects in an ECU framing are very large. In many such shots; small objects or part of a human body, especially faces, fill the whole screen.

(c) Camera Angle

Shots can be taken from levels similar to, lower or higher than the subjects. The latter two are called 'low angle' and 'high angle' respectively. Often, the relationship between the subject and the object that the camera represents can be revealed through such angle of framing. Angle of framing can also be used to create striking visual compositions.

H I G H L I G H T	
Normal/ Eyelevel The camera is placed at the eyelevel of the observer.	
High Angle The camera is at a significantly higher level than the subject.	
Low Angle The camera is at a slightly lower level than the subject.	

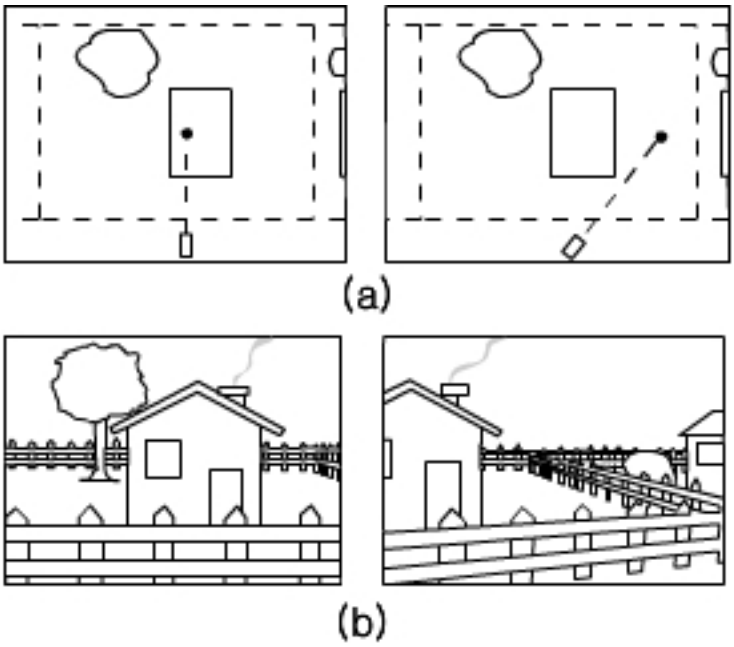
(d) Camera Movements

Camera movements change the observer's angle of view. Such movements can represent the movement of the subject or the movement of the observer. Camera movements can also be interpreted as the change of distance and position between the camera and the object, such as pan, tilt, tacking shot and zooming.

H I G H L I G H T

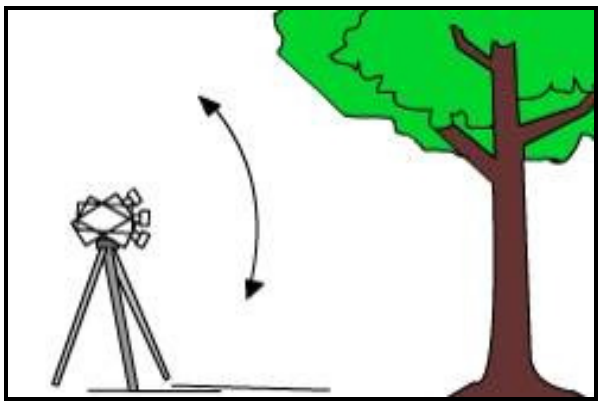
Pan

For a 'pan', a position-fixed camera rotates around horizontally.



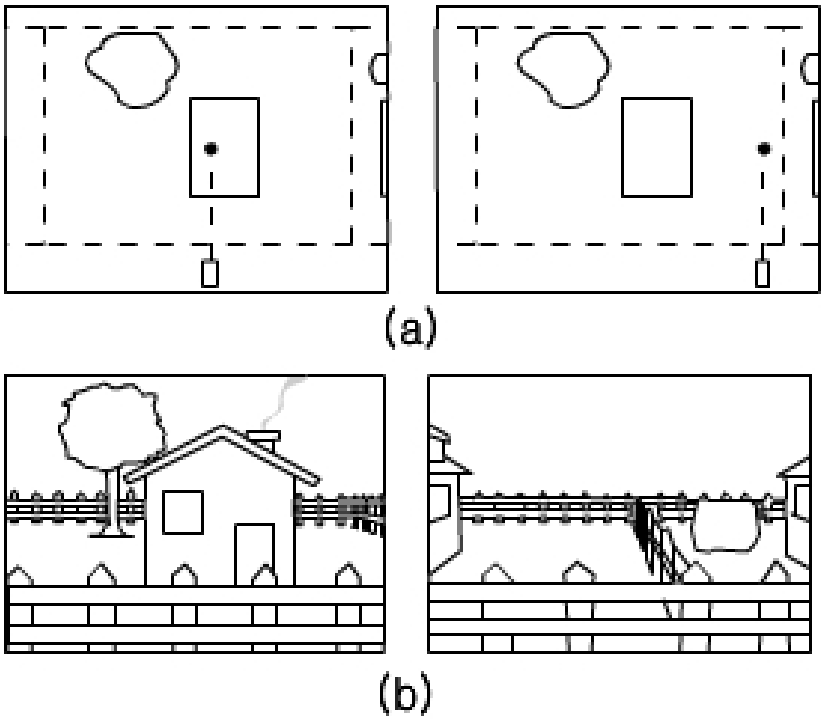
Tilt

For a 'tilt', or 'camera rolling', a position-fixed camera moves up and down.



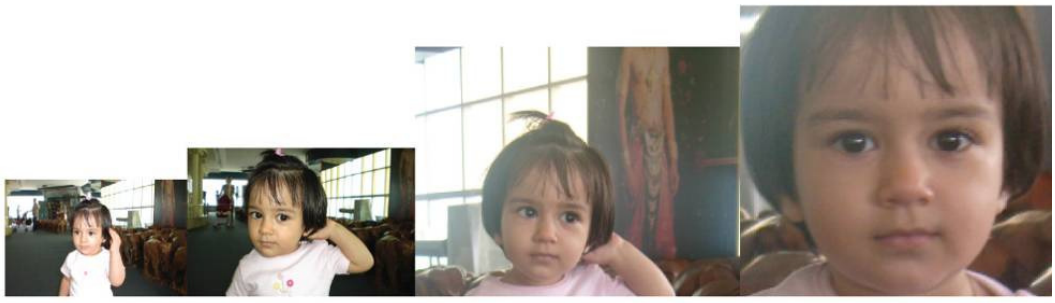
Track

For a 'track', a camera moves as the subject moves.



Zooming

Zooming brings objects from far positions to near (zoom in), or vice versa (zoom out). Zooming also enables exaggeration of a scene. A zoom-in shot maximize perspective distortion effect, and zoom-out minimizes it.



S T O P A N D T H I N K

Imagine that a lady is riding a bicycle for work in a morning – a sequence which is made up of several shots: the lady

1. arrives at the building she works
2. gets off the bicycle
3. chains the bicycle to a bicycle stand
4. takes off her gloves

5. takes off her helmet
6. tucks her gloves into the helmet
7. walks into the building

Every single minor detail is critical to the sequence as a whole.

Literally, a well allocated shoot size combination should be:

1. 50 percent close-ups and extreme close-ups
2. 25 percent medium shots
3. 25 percent wide shots

As such, the sequence of the lady can be broken down as follows:

1. A wide shot: arriving at the building
2. A medium shot: getting off the bicycle
3. A close-up: parking and chaining the bicycle to the stand
4. An extreme close-up: taking off her gloves
5. An extreme close-up: looking at her hands, taking off her gloves, and tucking the gloves into the helmet
6. A close-up: straightening her hair, looking at the building
7. Medium and wide shots: walking into the building with the helmet tucked under her arm.

(e) Composition and Framing

Composition is to arrange elements of a scene in a desired fashion to convey messages and meanings.

(f) Headroom

Headroom is the space between the top of the head of model and the upper edge of the frame.


(g) Looking Space

A looking or talking space is the space between the head of model and the edge that the head facing to. The space should be large enough so that the model seems to look at something or someone, or talk to someone.

(h) Reverse Shots

A reverse shot is taken from the back of the previous shot. It is commonly used to present the situations of two people in conversation.


(i) Point of View

A Point of View (POV) shot is taken from the character's point of view. It puts viewers' into the character's shoes, creating a subjective viewpoint.

S T O P A N D T H I N K

(a) Pair up with a classmate

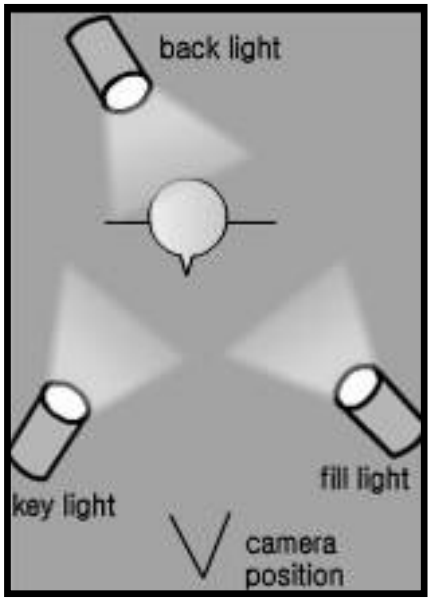
(b) Work in pairs and film your partner to show who he/she is, using a video camera and use those camera techniques you have learned

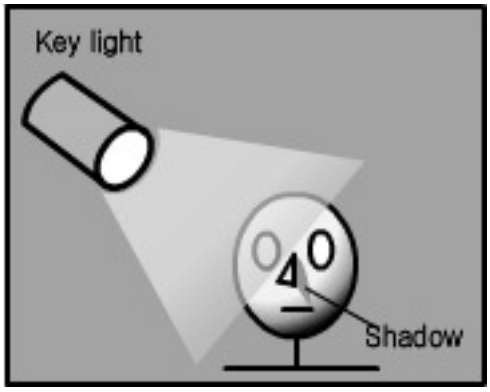
3.2.4 Lighting Equipment

Lighting not only enables cameras and video recorders to work properly, it can also create desirable atmosphere or mood.

Three-point Lighting

Three-point light is the standard lighting scheme for classical narrative cinemas. It makes use of three light sources to create a sense of depth. Backlight differentiates the subject from its background, creating depth. Key light accentuates the subject. Fill light minimizes the faint shadows created by the key light.



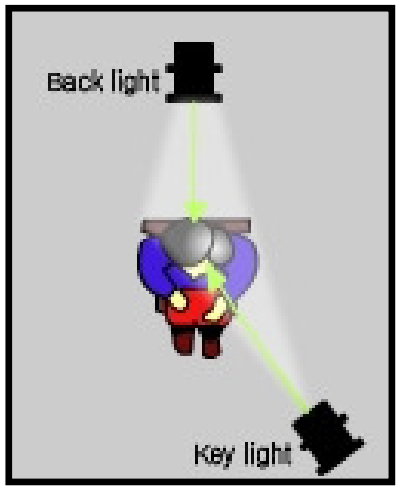


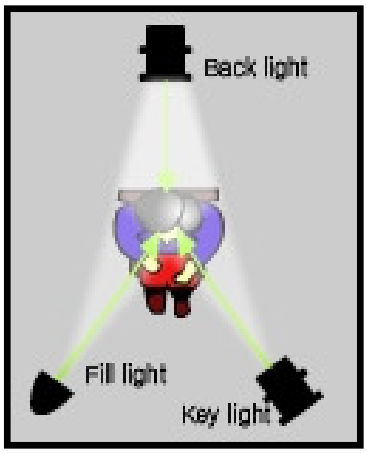
Key Light

A key light is the key or primary light source that draws viewer's attention.

Back Light

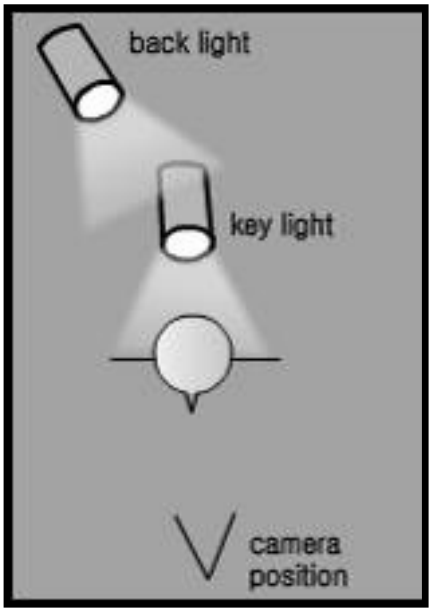
A back light is a light source from the back. It brings up the subject from the background to the audience.





Fill Light

A fill light source fills light in, and thus softens, the shadows that the key light creates. It should be more diffuse, less intense and less focused than the key light is.



Rim Light

A rim light is a member of the back light family. It outlines the object, and emphasizes the edges.

(a) Lighting Contrast

'Contrast' the proportion, difference or effect observed when light and dark areas are put together. 'High contrast', i.e. larger difference, can be created by using a low key lighting in a dark scene. It is often used horror films. 'Low contrast', i.e. smaller difference, is often used for a more naturalistic lighting.

H I G H L I G H T

High Key Lighting

'High key lighting' is a lighting scheme that the fill light is of almost the same intensity as the key light is. The images concerned are usually very bright with few shadows on the subjects.

Low Key Lighting

'Low key lighting' is a lighting scheme with very little fill light, creating high contrast images.

Overexposed

If the light hitting on a camera CCD chip is excessive, overexposure will be observed. Overexposed images on video may be un-saveable because of no details in complete white areas.

(b) Lighting Colour - Meaning of Colours

Logos of many financial institutions and hospitals are in blue. Logos of many fast-food restaurants are in orange. Why? It is due to the subtle impressions and different feelings that the colours represent. Coloured light are often used to express time of scenes. For example, blue is used for a cold winter, and yellow for a hot summer. It can also create desired atmospheres, triggering audiences' emotions as the story develops.
(Refer to Section 3.2.2 – Photograph – Colour Temperature)

(c) Colour Temperature

Colour temperature, whose measurement unit is Kelvin (°K), is an attribute or characteristic of visible light. It can be used in photography, video production, publishing and other fields. Colours of lower colour temperature are more reddish; those of higher colour temperature are more bluish.

H I G H L I G H T

It is interesting that colours of lower colour temperature are referred to as 'warm colours', such as red and yellow for their associations with fire and sun. In reality, fire and sun mean higher temperature. Similarly, colours of higher temperature are called 'cool colours', such as blue and green for their linkage with water and ice. In reality, water and ice represent lower temperature.

H I G H L I G H T

Shooting Tips

(a) Ask the interviewee to look at the interviewer, not at the camera
(b) Shoot the interviewee from a slight angle to either left or right, without straight-on shots
(c) Move the camera to the interviewee for larger image, instead of using the zoom feature for close-up shots
(d) Arrange the interviewee to sit in a chair without wheels, avoiding squeaky noise
(e) Ask everyone around to keep silent while shooting, avoiding creating noise, for example, jangling changes or keys in pockets
(f) Give the interviewee some general ideas about the topics to be discussed, but not pre-interview at all, before the interview – pre-interviews make the responses stilted in the real interviews
(g) Allow the camera rolls for several seconds before the first question is asked
(h) Relax and listen in the interview, without nodding or any other gestures

3.2.5 Storage and Formats

Images and videos captured digitally have to be stored digitally. That's why the storage formats and devices matter.

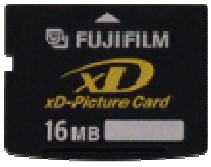
(a) Image Storage Device

Portable storage devices are used to store images taken by compact digital cameras. As technology advances, the physical sizes of storage devices become smaller and smaller, while the storage sizes become larger and larger.

CompactFlash (CF-I)


Memory Stick


Secure Digital card (SD)



xD-Picture Card (xD)

MiniSD Card

microSD (right)

Mini CD (left)

USB flash Drive

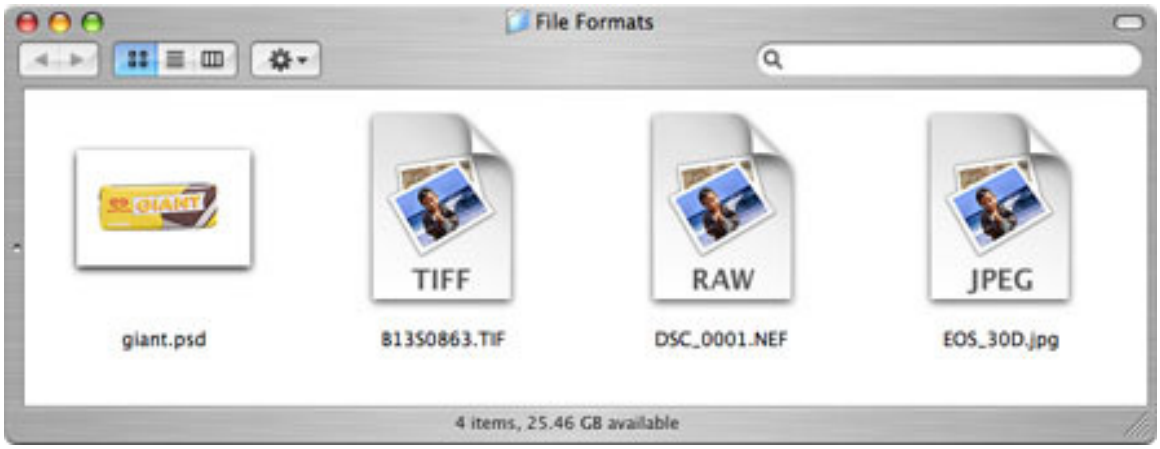
Multimedia Card (MMC)

Microdrive (CF-II)

SmartMedia

(b) File Format and Resolution

There are many commonly-used lossless file formats. Most digital cameras support more than such formats to keep captured images. Users can view them through PCs or even television sets, whose screens are made up of pixels. The maximum number of pixels of an image that a camera can capture is called ‘resolution’.



(c) Video Storage Device

There are many kinds of digital camcorders in the market. Most of them support High Definition Video (HDV), with various storage methods, such as 8cm recordable DVD’s, MiniDV videotapes, MicroMV videotapes, memory cards or hard-disks.

(d) Video Format

Videos captured by digital camcorders can be saved as different formats, such as Quicktime (.MOV), Window Media Player (.AVI), RealNetworks (rm) and MPEG2 (.mpg2).

MOV and AVI files are supported by many players and over the Internet. rm files are a streaming video format that can be played and at the same time downloading the contents. MPEG2 (.mpg2) files are of high quality and suitable for high resolution displays, such as DVD format.

3.3 APPLICATION SOFTWARE

Executing multimedia projects require different software for authoring, editing (images, sounds, animation, motion videos, etc), capturing images from screens; and translating file formats. This section will go through several techniques used in image and sound editing, animation and video software.

3.3.1 Image Editing

Photoshop, PhotoImpact, Fireworks and Paint Brush are examples of raster image software. They are for production of crafted bitmap images. CorelDraw, Illustrator, FreeHand and Designer are examples of vector image software. They are for production of vector-based images. Refer to the appendices for operations of common graphic design software, such as Adobe PhotoShop.

(a) Image File Format

Image file formats are standards for organizing and storing image data, especially photographic images. Most image files are raster data, others vector (geometric). Vector images have to be rasterized to pixels when displayed.

(b) Image File Size

The size of image files are measured in bytes. In general, the size increases as the number of pixels and the colour depth increase. An 8-bit (1 byte) pixel can store up to 256 colours, and a 24-bit (3 bytes) 16 million. A 24-bit colour image is of 'true colour'.

H I G H L I G H T

Relationship between Image File Format and Size

Joint Photographic Experts Group ('JPEG' or 'JPG') is a lossy format. Almost all digital cameras support JPEG. which enables 24 bits: 8 bits for each red, green and blue. The sizes of JPEG files are relatively small.

A flower image compressed with successively more lossy compression ratios (from left to right)

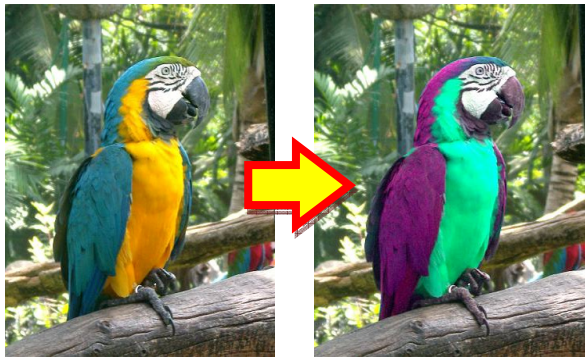
(c) Image Manipulation

Image editing is to edit or alter the images of digital photographs, traditional analogue photographs and or illustrations. Specifically, editing traditional analogue images is called 'photo retouching'. It uses airbrush to modify photographs, or edits illustrations with traditional art media.

Editing digital images is performed in computers. Digital images do not only mean the photos taken by digital cameras, it also include digital images of transparencies, negatives and printed photographs that are captured through scanners.

(d) Selective Colour Change

Images can also be edited with colour change. Some image editors enable colour swapping for specific items in an image.



Selective colour change; original on the left

(e) Colour Adjustment

Change of colour can also create fade-in and out effects, or change of tones with curves or other tools. Improvement on the colour balance can be achieved, especially for pictures taken indoors with daylight films, or those taken with incorrect adjustment of white balance.

Colour adjustment

(f) Contrast Correction and Brightening

The contrast of an image can be altered as well, brightening or darkening the image. Technology even enables pixels below a particular luminosity threshold to be brightened automatically, without affecting the rest of the image concerned.

An example of contrast correction

(g) Special Effects

Special effects can also be implanted in images, in forms of distortion, artistic effects, geometric and texture effects, and combinations thereof.

Special effects added to a picture

3.3.2 Graphic Design and Desktop Publishing

Desktop publishing (or 'DTP') makes use of personal computer-based page layout software to compile publication documents, regardless of the publishing scale. Refer to the appendices for operations of common graphic design software, such as Adobe PhotoShop.

(a) Layout Design

1. Page
   A page in layout design is a predefined size of area that enables editing and view in a WYSIWYG manner in editing software. A4 and Letter are two popular paper sizes.

2. Printing Components
   Text, Natural Scanned Images, and Artificial or Creative Images are three major components laid out on a page.

3. Layout
   The process that lays elements on the page aesthetically and precisely is called 'layout'.

4. Graphic Design
   Each single piece of art is a combination of images, typography or motion graphics. Graphic designers are primarily responsible for creation of graphics for publishing to printed or electronic media, such as brochures and advertising. They may also take care of typesetting, illustration and web design.

5. Typesetting

Typesetting is to present textual material in graphic forms on paper or other media. Before desktop publishing becomes popular, printed materials were typeset in print shops by compositors manually with or without help from machines.

(b) Digital Media

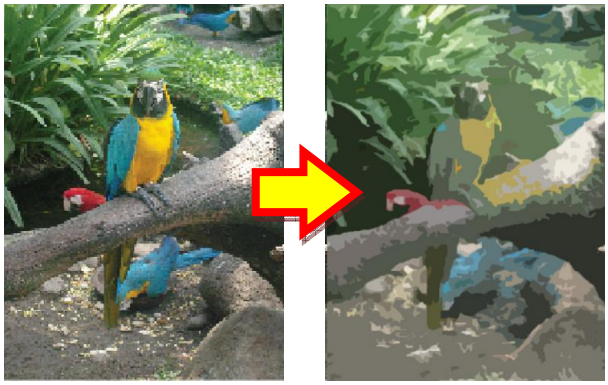
Digital media are media in electronic or electromechanical formats for audience or end users to gain access to. On the contrary, access to traditional printed media does not need electronic means, though traditional materials may be created electronically.

(c) Web Design

Web design refers to a series of processes, from conceptualization and planning to modelling and execution. In short, it displays the whole life cycle of presenting ideas in web pages.

(d) Trace Artwork

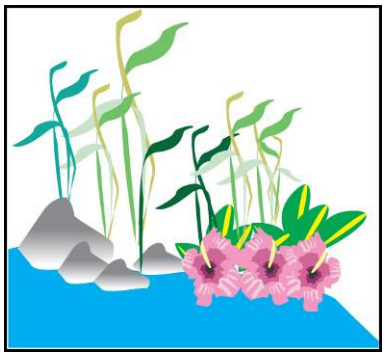
It is a function of Illustrator. It is to create graphics by tracing pencil sketch drawings or electronic raster images.



Images of before and after tracing

(e) Symbol Creation

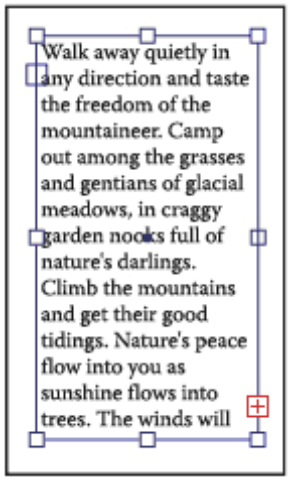
Illustrator allows users to create symbols from its objects, such as paths, compound paths, text objects, raster images, mesh objects and any combinations thereof.



Artwork created with symbolism tools

(f) Text

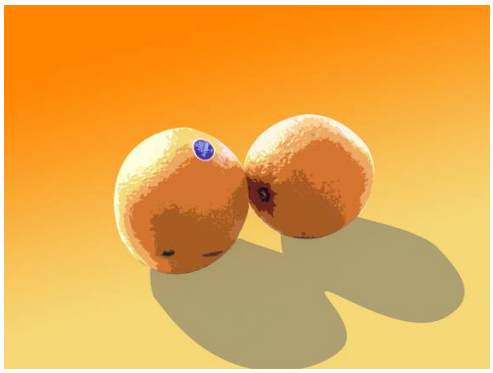
Text can be handled in many ways in desktop publishing. For example, columns and rows of text can be created; text can be created within a shape or along a path; and text can be manipulated as graphic objects. The fonts and spacing of text can be also chosen.



Overflow text

S T O P A N D T H I N K

Identify what tools in Adobe Photoshop have been used to create the following two pictures.



Digital image Creation

Digital Painting

3.3.3 Video Software

Video software is for editing video sequences. It allows users to import and export videos, cut and paste video clip segments, and add special effects and transitions. Certain software even enables users to encode videos for creation of DVD, web videos, mobile phone videos and video podcast. Refer to the index of user guides of, for example, Ulead Video Studio and Microsoft MovieMaker for more functions.

Traditional methods, such as A/B roll editing, are 'linear editing'. Digital methods are also known as 'nonlinear editing'. Adding transition effects, through Cut, Dissolve, Wipe, etc, is a basic video editing technique.

H I G H L I G H T

Cut

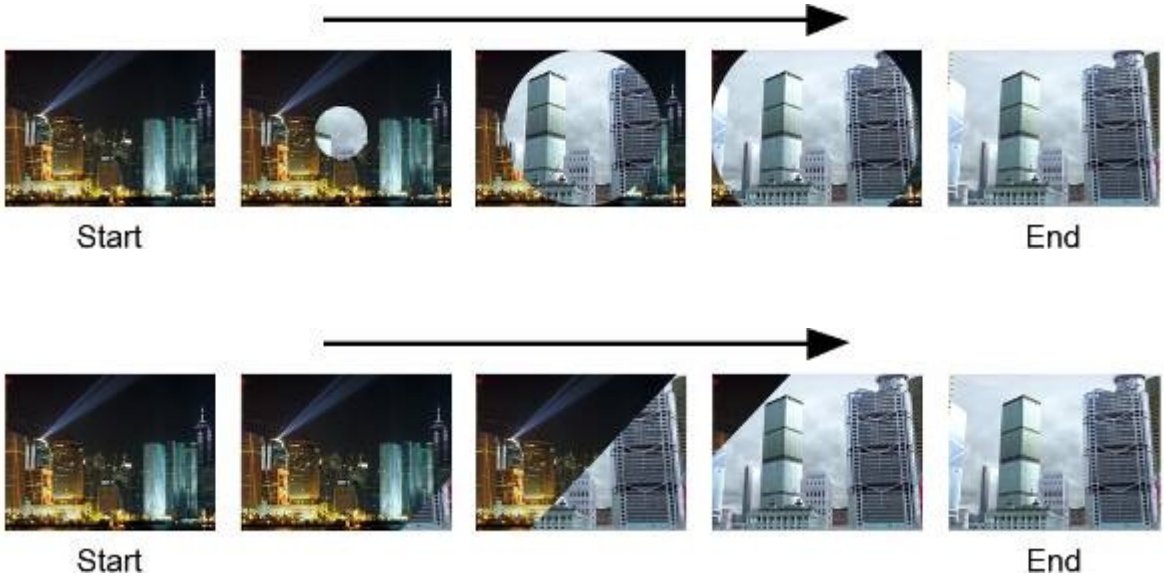
Cut is to remove those unnecessary segments of a sequence.

Dissolve

Dissolve is to transit one image to another gradually by controlling the exposure of start and end images.

Wipe

Wipe is to spatially transit one image to another gradually with a distinct edge. Expanding circles are commonly used.

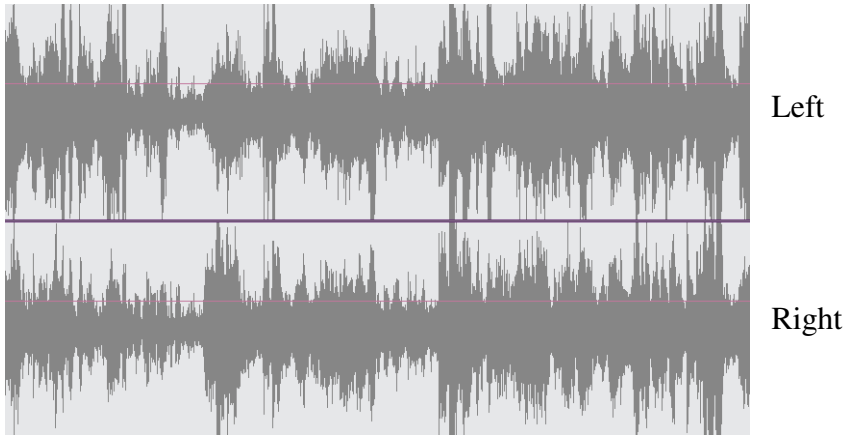


(a) Sound Editing

Sound editing is to edit music, voice and other audio recordings, including but not limited to addition of echo, amplification and noise reduction.

(b) Waveform

Sound can be represented visually as 'waveform': the louder the sound, the higher the wave. Waveform helps editors to locate which segments are to be edited.



3.3.4 Animation Software

Animation software is for creation of moving images or animation. Broadly speaking, there

are two types of computer animation, namely 'stop motion animation of 3D models' and 'frame-by-frame animation of 2D illustrations'.

Objects or models of 3D animations are created on screen. We start by creating objects or illustrations of 2D animations on separate transparent layers. The starting appearance of the limbs, body, eyes, nose, mouth, etc of the 2D figure concerned is determined by the animator, and shown on a key frame, while the ending is on another key frame. Then the transition between the two appearances (or key frames) is handled by the software. The process is called 'tweening' or 'morphing'. Refer to the appendices for operations of common animation software, such as Autodesk 3D Max and Adobe Flash.

(a) Animation – 3D Workflow

The prerequisite of creating 3D animation is to create 3D models of the characters, pops or objects. Assign the models with materials, textures and surface properties, such as colour. They were then placed in an environment with a camera and lighting effect, forming a 'scene'.
For each desired motion, the animator or designer fixes the starting and ending appearances each in a key frame, and let animation software to process the transition in between. After refinement and testing, the images are finalized.


Step 1: 3D mathematical models are designed

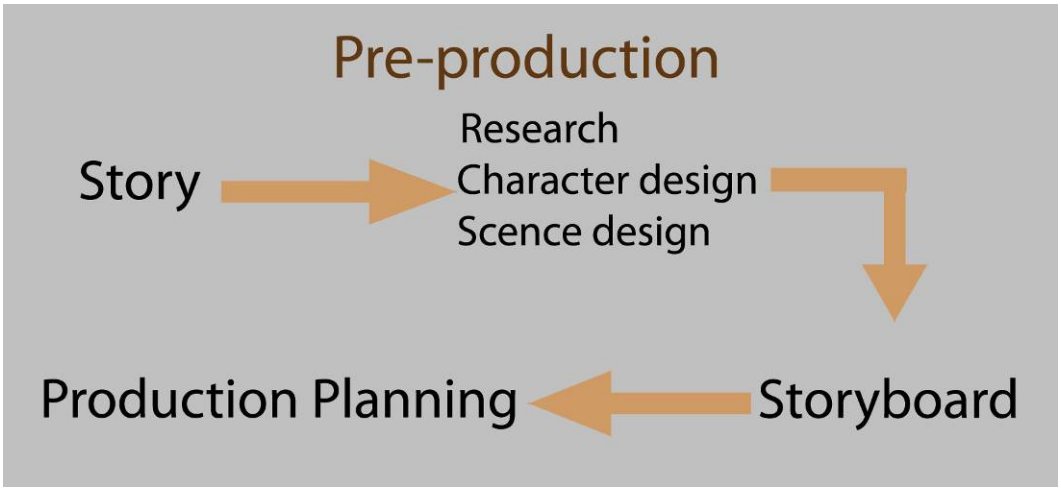

Step 2: Add basic colour


Step 3: Add materials and textures on models


Step 4: Create an environment with a camera and lights

(i) Preproduction Stage

The preproduction stage gives a project a foundation. It includes conceptualization, planning, research, script writing, project planning (cost, scope and time), storyboarding, initial design for scenes and characters, etc.

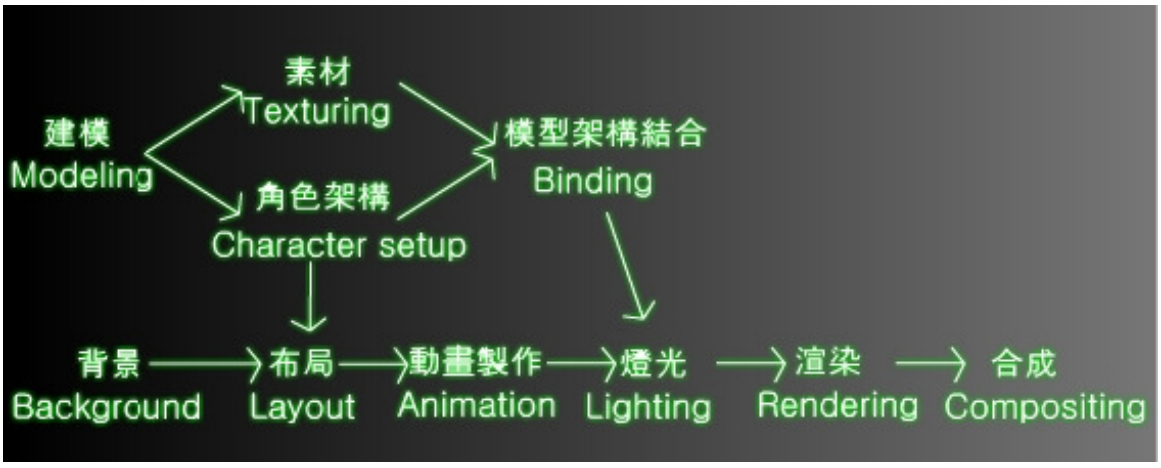


Pre-production process

(ii) Production Stage

The production stage consists of modelling, rigging, animation, shading and rendering. Modelling is to model the characters, objects, scenes and environments. Virtual modelling tools may be used to sculpt objects; and 3D digitizers may be used to capture the shapes of physical objects.

After modelling, 3D characters are rigged with virtual skeletons for animation. 'Skeletal animation' or 'rigging' is a technique in computer animation.



Production workflow

(iii) Postproduction Stage

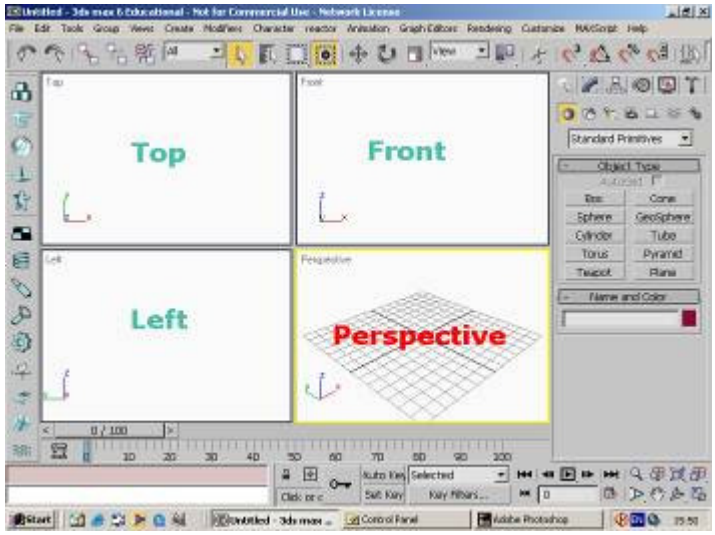
After rendering and before shown to audience, images have to be manipulated through several postproduction techniques, such as retouching, distortion and colour

correction. In addition, the sequences have to be edited, for example, by adding sound and voice.

(b) Production methods

(i) 3D Animation Working Environment

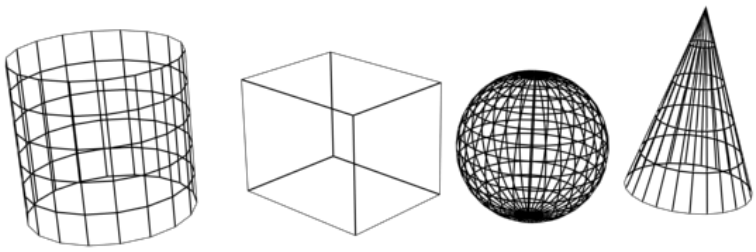
A fundamental difference between 3D and 2D animation production is their working environments. For 3D animation, it works in a three dimensional space; for 2D, it is a two dimensional space.



To create 3D animation, we have to move, rotate and scale the object by changing scales in the X, Y and Z axes

(ii) Geometric Primitives

The creation of 3D animation starts with modelling. All 3D animation software enable users to create simple shapes with geometric primitives. Primitives are basic modelling objects such as cubes, spheres, cylinders and cones.

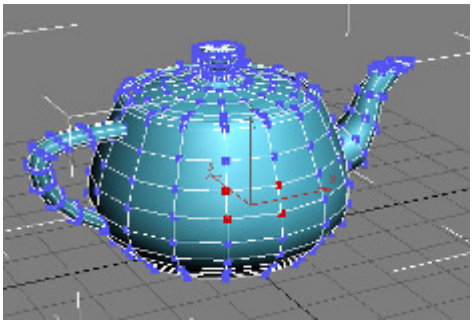


Geometric Primitives: cylinder, cube, sphere and cone

(iii) Polygonal Modelling

Polygonal Modelling is one of the most common techniques provided by 3D animation software for modelling surfaces.

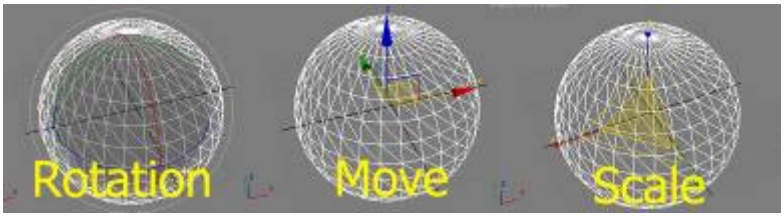
Polygonal modelling defines an object by applying polygons on the object's surface for representation or approximation. Vertex is a point in the 3D space. Two vertices will form an edge. Three edges can form a triangle which is the simplest polygon.



Polygon Modelling: Polygon defined by vertices and edges

(iv) Transformation in 3D

In a 3D coordinate system, X and Y axes form a plane, to which the Z axis is perpendicular to. Translation, Rotation and Scaling are 3 operations which you can change the 3D object.

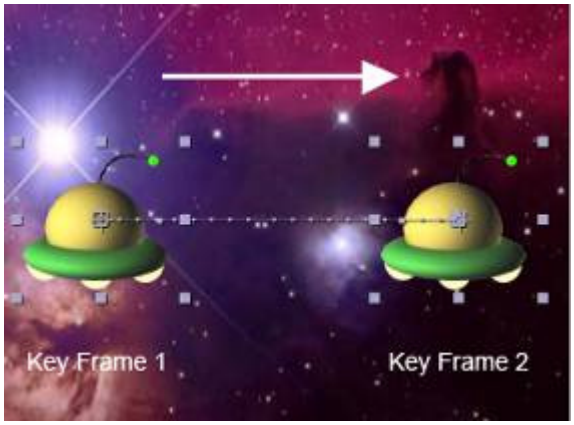


Basic 3D transformation

H I G H L I G H T
Move Translation or 'move' is the location change of an object. Users have to provide the software with the distance and direction of change for implementing such an instruction.
Rotate Rotation is the direction change of the face of an object. Most software requires users to provide a rotation axis for implementing such an instruction. This requirement uses the Euler's Rotation Theorem.
Scale Scaling is the size change of an object. Scaling an object is done along the three axes, i.e. X, Y and Z. If the changes of size along the axes are multiplied by the same factor, it is a uniform scaling. If the scaling factor is zero, the object becomes a point.

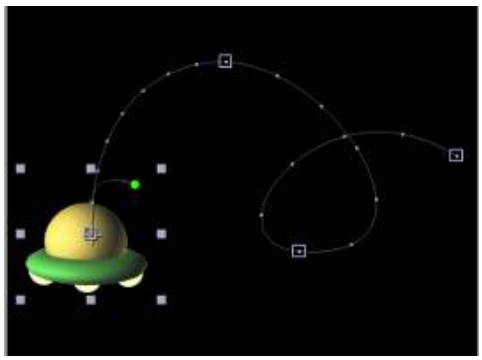
(1) Transformation in 3D - Key frames and In-between

Key frames are the beginning and end frames of an action or change. In-betweens are the frames between key frames. Many digital animation software packages, such as Flash, 3D Max and Maya, can complete an action by supplementing in-betweens between the key frames provided by users. A sequence is composed of numerous actions or change, and thus has many key frames.



(2) Transformation in 3D - Motion path and Frame rate

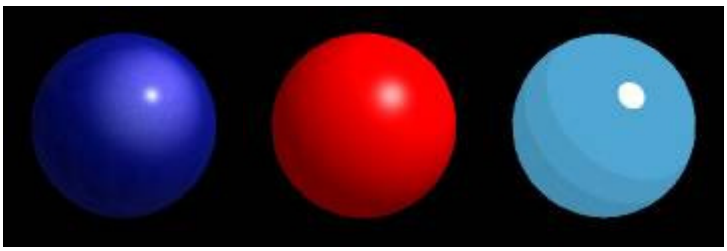
An animation can be as simple as moving an object along a path, i.e. a linear 'motion path'. A frame rate is the number of frames used within an assigned period of time.



Path animation

(v) Shading: Material and Texturing

Shading is to apply materials and textures to an object, making it realistic. Materials refer to properties that are used for shading object surfaces, such as colour, reflection, refraction, transparency and specular highlight.



Three different materials applied to the same 3D model

Sometimes, for more realistic appearance, photos or other patterns are applied to materials, i.e. 'texture mapping'.

Three different materials and texture mappings applied to the same 3D model

(vi) Lighting

Lighting is an important component in 3D scene. It enables people to see the objects in the 3D world, and sets the desired mood of the scene.

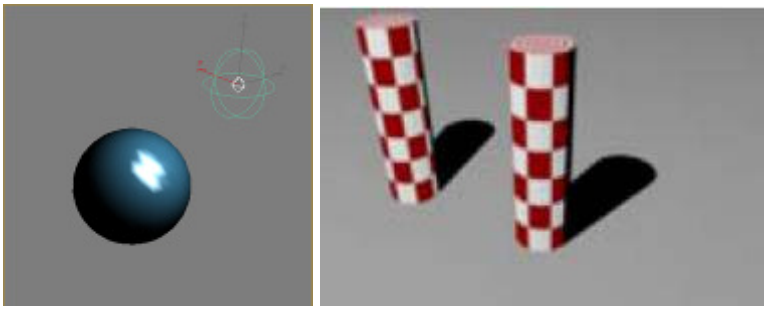
Lighting makes the animation scene more realistic.

Lighting in 3D can be classified as point, distant and spot. Point or Omni light is a bulk-like light source. It shines radially. Distant, parallel or directional light are light rays beaming to the same direction, working like the sun or a very distant light source. A spotlight is similar to a point light but its light rays form a cone to a particular direction.

H I G H L I G H T

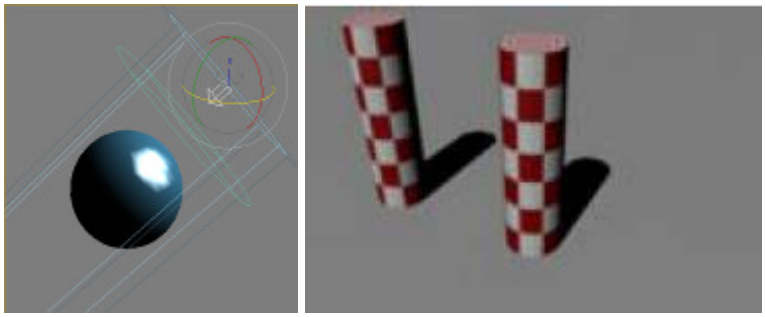
Omni Light

Light rays go to all directions.



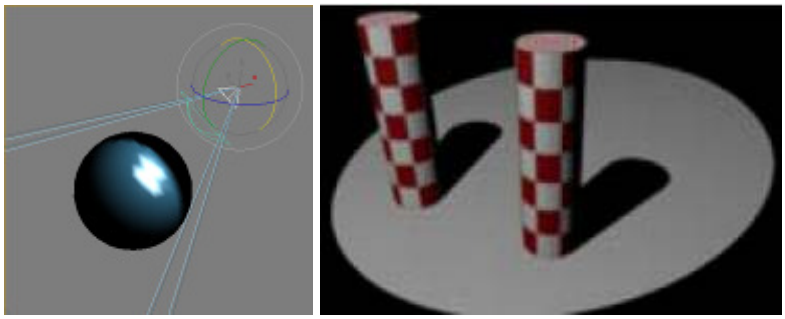
Directional Light

Parallel light rays go to a single direction.



Spotlight

Light rays form a cone.



(vii) Rendering

Rendering is a major topic in 3D animation. It refers to the creation process of finishing an artwork or animation by turning wireframe views of 3D models into shaded 2D images. Practically, rendering is often used along with other techniques.

Rendering is the last major step in animation production. It finalizes the appearance of the models and animation. Rendering can be used in movie and TV production for special effects and design for visualization.

The production process starts with idea concept, model making, lighting and animation setup; and ends with rendering.

THEME-BASED LEARNING TASKS

Theme-based learning tasks are learning activities that focuses on the technological and design contexts of authentic problems. Through exploration, students can bring in their own experience, and develop capacity in innovation and entrepreneurship.

Both design projects and case studies are used in this module. Design projects are problem-solving activities. Case studies invite students to investigate valuable design issues. Both approaches rely heavily on practical activities. Students are also given opportunities to conduct research in technology through reading, product analysis, interviews, observation and discussion.

Students are more likely to start serious exploration of possibilities when facing authentic challenges. While learning activities provide students with meaningful context to learn, at the same time they provide students with enjoyment as well as developing a sense of ownership and commitment.

Activities of theme-based learning in this module may be inter-connected, such as case studies, design tasks and practical exercises. For example,

- Investigative and experimental work
- Individual and group activities
- Evaluation of existing media productions
- Thinking to deal with problems
- Direct instruction, demonstration and discussion

The amount of academic activities arranged in theme-based learning are at teachers' discretion depending on students' individual capabilities. More capable students can be given more demanding activities. The expectation on less capable students will be relatively adjusted.

The Design Project Approach

It is common that design projects require more time to complete since students take time to apply their knowledge and experience. It is a good opportunity for students to produce outputs that meet real needs and wants.

Projects should be a challenge without pre-defined frame. It should challenge current ways of thinking and behaving, and should be open enough without being confined to any particular area or context. Students can gain experience of genuine technological thoughts and activities through working along the design cycle.

There should be different difficulty levels set for design projects. Students should be assigned to an appropriate level of projects according to their abilities and previous experience.

The Case Study Approach

The objective of case studies in this module is to develop students' innovation as well as research and communication skills. Students may present their projects by submitting reports or through oral presentation. Students are encouraged to apply the processes of each case study to develop innovation and design their own projects.

Both report writing and oral presentation are critical activities.

Design Project – Global Warming

Students are required to study a poster example to facilitate production of their own posters by using the multimedia software they learnt in class. The main theme of the poster is to bring out the global warming message to the readers.

Expected Learning Outcome

Students should be able to:

- Learn fundamental computer graphics theories and techniques
- Learn basic image generation techniques
- Know some computer graphics applications

Students are recommended to use the following tools to complete the project:
Software: PhotoShop, Illustrator, Painter

Example study:

(Sample poster illustrating the concept of the 2005 Asia Game Show poster)

Mr Andrew Lee, who is working in the UK now. designed a poster to promote the 2005 Asia Game Show. His creation processes are presented as follows:

1) Creative thinking

Firstly, Andrew was thinking of turning Hong Kong into a future city in order to present the high technology show to be held in Hong Kong. Therefore, he chose Central as the background of the design for its fullness of modern city high-rise buildings. Furthermore, he planned to add some cyber and game elements into the design to display the central idea of the game.

Hints for your project :
Brainstorm as many elements as you can in global warming;
Figure out what aspect you want to show about the harm of global warming, e.g. the environment, human lives or the death of animals; and
Use your imagination to incorporate the key elements to a poster.

2) Research

To get a clearer picture about what style and tone the poster will use, Andrew has done research about human perception of a future city and game development. Moreover he has decided to use Photoshop and Maya as the production software.

Hints for your project:
Looking into other designs is probably a good way to start your creative process. You should start by collecting photos and posters about global warming, or similar topics, such as environmental preservation.

3) Drafting

Andrew used the photos he collected and made a simple draft of his poster design to figure out the pros and cons. Moreover a draft is good for designers to communicate ideas to customers.

Hints for your project:
Other than matching the photos chosen, some space should be left to introduce a character to catch the audience's attention. The poster size will be A4, either portrait or landscape. Photoshop, Firework or other similar graphic software can help to draft the poster.

4) Character design

The singer Mr. Leo Koo was the poster model. Andrew gave him a special, game character-like image as sketched below:

Hints for your project :
Design a cartoon character for your poster to highlight the theme, i.e. global warming. Past examples, such as the family of the Dragon of Cleanliness, may give you some insights. Draw out your character using graphic software.

5) Photo retouch

A fantasy world of a future city was required. Andrew fine tuned a picture of Central, Hong Kong, making Central looked different.

Hints for your project:
Various digital filters can be added to your photos. Changing its Hue and Saturation may also help. Don't forget to use separate layers for different image components in order to facilitate your further editing.

6) Typography

A title was added to show the topic, i.e. 2005 Asia Game Show. Shading and growing effects were added to the typography to draw viewers' attention. Big captions are often placed at the upper part of posters.

Hints for your project:
Add the topic title "Global warming harm our world" into the poster. Don't forget to select suitable font(s) and font sizes.

7) Compositing

Finally, export all output to a JPGE file.

Design Project – School Logo Animation

A) Introduction

Many companies design logos for image and brand building. A logo design is successful if it can help to advertise. Nike's 'swoosh' logo is a good example. Some companies may use animation to promote their logos. For example, Pixar uses two lamps (***Luxo Jr.)***.

This project leads students to go through the design and production processes of logo animation.

Expected Learning Outcome

Students should be able to:

- Better understand the design concept of logo animation production
- Create funny and interesting animation with 3D animation software
- Understand basic workflows of 3D animation production, such as modelling, animation and rendering

The following software may help students complete the project: Flash, 3Ds max, Maya and HexaSuper5.

Corporate logo animation of Pixar Animation Studios

The small hopping desk lamp of Pixar Animation Studios, US is a good example of logo animation. The lamp can please audience because it is funny.

The idea of the logo came from Luxo Jr, a short, computer-animated film produced in 1986 by Pixar. It demonstrated that the newly-established company was capable of producing animations.

Reference: www.pixar.com

B) Production

Project Brief

Students will need to produce a 10-seconds 3D logo animation to promote their school with the help of 3D animation software.

Each project has its own unique demand. Designers can choose their own workflows. But in general, all workflows are common in certain aspects: ideas are developed and are then drafted on paper initially. Creation of 3D models and addition of colours and textures are next. Finally, animations are applied and rendering is done.

0	1	2	3	4	5	6	7	8	9	10
❶ Preproduction			❷ Create resource			❸ Animation and refine			❹ Final Render	
Get project brief Brainstorm Idea Develop storyboard			Create 3D models			Work on Animation Refine and fine tune			Final Movie render	

Workflow in Animation production

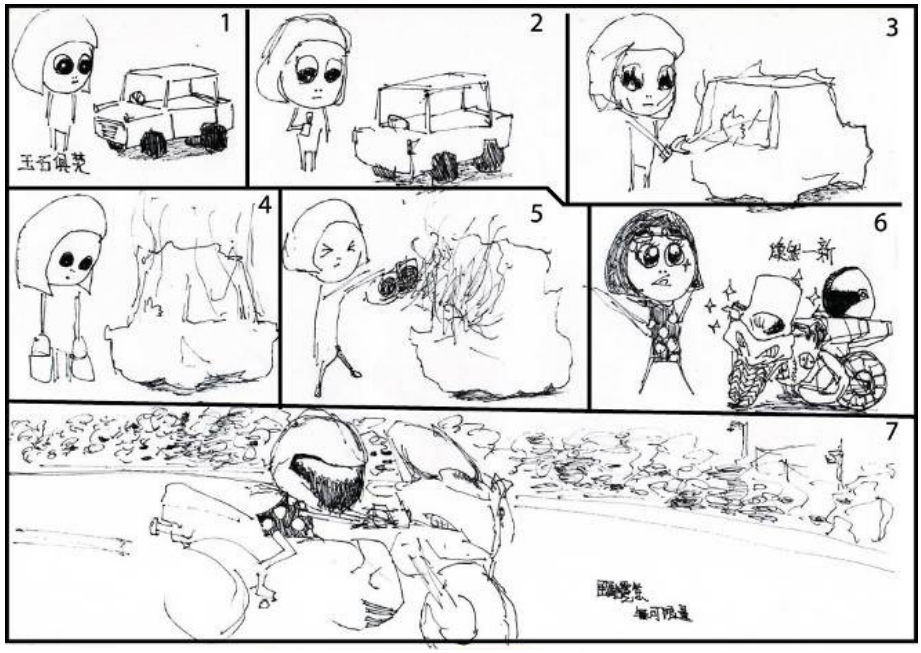
Stage ❶ – Pre production

- **Idea development**
  Students should plan and design before starting production. Background research and fact finding should be done to gather information on, for example:

1) design concept of the school logo
2) school history and its relationship with the logo
3) school spirit

After collecting the information, students have to decide **the message** to communicate to the audiences in the animation.

- **Storyboard**
  Storyboards arrange ideas into a story format, showing the overall structure and message development at a glance.



You can use a pencil sketch to create your storyboard for the animation.

Stage ❷ – Create Resources

Students will use 3D computer animation software to create a 3D model for the animation. Students may use popular software, such as 3ds Max, Maya, XSI and Blender. Refer to Appendix (3D Animation to learn the step-by-step operation in 3D animation software) for helpful production techniques.

- **Logo and Type**

  In the 3D context, logos and types are very important topics. It is as simple as extruding the logo and text concerned, and giving them depth.

  1) Create logo outline
     Students can use the shape tools in 3D software to create a logo outline, and text tools to create text.

  2) Import Adobe Illustrator files into the 3D software
     Alternatively, students can create a logo outline by importing an Adobe Illustrator file (AI file).

  3) Extrude the outline into a 3D logo
     Creation of a 3D logo can be achieved by extruding the logo outline.

- **Create 3D objects**

  Other models can also be created for animation assembling **Geometric Primitives**, or using **Polygon Modelling**.

- **Create Camera**

  Cameras can be created for further camera animation processes.

Stage ❸ – Create Animation

Animations for 3D models can be achieved through 'keyframing', i.e. recording a 3D object onto keyframes with in-betweens filled by software. Students can animate the logo as follows:

- **Camera Animation**
  Camera Animation is commonly used in animation. Students can adjust the camera position, rotate the camera and use other attributes including **lens size** and **focal length**.

- **3D Model Transformation**
  Transformation animations, such as object position, rotation and scale, can be applied to 3D models.

- **Others**
  Students can apply animation to their 3D models by changing various parameters; for example, the Extrude or Bevel features.

Stage ❹ – Rendering and output

Before becoming a finished artwork for exhibition, the sequence of pictures has to be rendered to form a 3D scene. The following items have to be defined in the final render process:

- **Time output**
  It is the sequence's duration that is to be rendered. The longer the duration, the bigger the file size, and the longer the rendering time is required.

- **Output size (Resolution)**
  The output size or resolution is subject to the purpose of the sequence. For example, an animation for standard Hong Kong TV broadcasting may need an output size suitable for PAL, i.e. 768 x 576 pixels.

- **Output format**
  The choice of output formats depend on the rendering stage. Movie outputs may use window media format (avi) or QuickTime format (mov). Regardless of the format, each file should be specified with a compression option for reduction of file size.

Design Project: School Life Video

This project attempts to create a school life video to be played at school or on the web.

Video creation is easy nowadays. With an inexpensive digital video camera, a computer and editing software, you can create anything from a five-minute drama club trailer to a feature length film. Video is not only a kind of entertainment, it is also a medium of communication that brings messages to audience. Some people may use it for educational purposes; others for artistic expression.

You can use digital pictures, video, music, sound effects, voice-overs, titles, and special video effects to deliver messages through your own movies. There are many types of movies, and each one is made differently. However, they all go through the same process: preproduction, production and postproduction.

Students are suggested to use the following tools to complete the project:

- Software: Movie Maker, Video Studio, iMovie and Premiere.
- Hardware: Digital Video

Expected Learning Outcome

Students should be able to:

- Acquire basic knowledge in handling photography, filming, video and audio production, together with a brief understanding of the industries' workflow
- Understand the chemical reaction and techniques of combining sound and vision

Phase 1: Preproduction

The preproduction stage of a movie refers to the formation of ideas and initial planning. There is no concrete or scientific definition. It could be simply a collection of impressions or attractive insights or shots that the project team can think of. On the other hand, there may already be a complete **script**, a detail **storyboards**, **casting**, etc. Idea is the heart of every movie. Without basic ideas, the movie can never succeed.

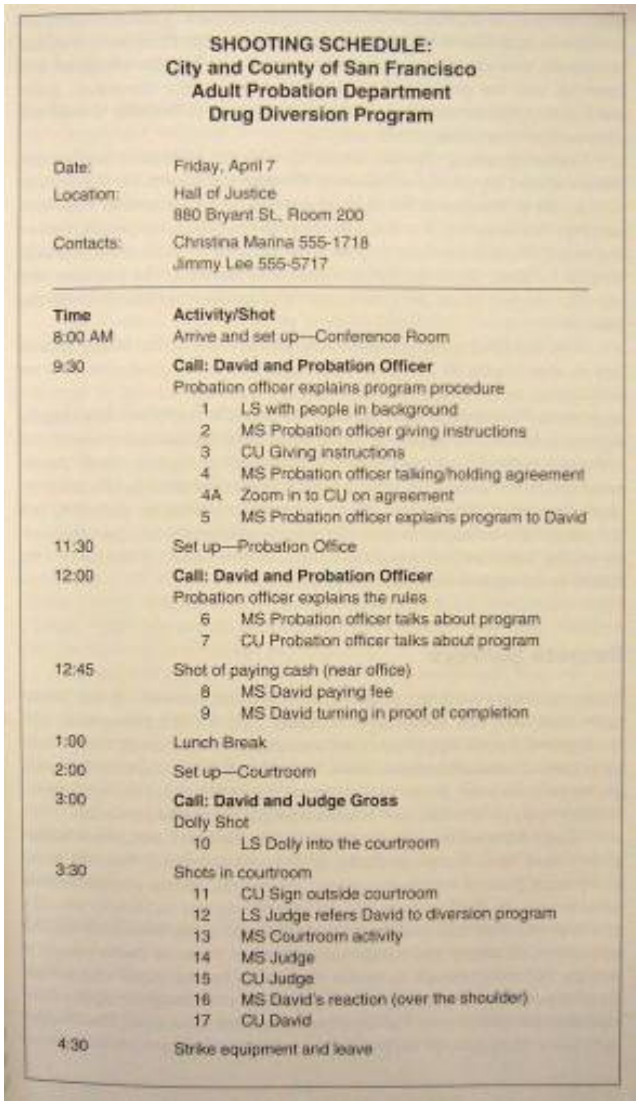
- A **script** is a written plan for a video. Its author is called a 'screenwriter'.
- A **storyboard** is a graphic presentation of the story. It is an initial, primitive visualization or imagination of the final product.
- **Casting** is the selection of actors for the video.

Three Types of Cast

- A primary character is the main character of the story.
- A secondary character plays a significant role in the video despite not being the focus.
- A tertiary character or extra may even have no dialogues at all.

Shooting Schedule

A shooting schedule is a project schedule stating a detail shooting arrangement.



SHOOTING SCHEDULE:
City and County of San Francisco
Adult Probation Department
Drug Diversion Program

Date: Friday, April 7
Location: Hall of Justice, 880 Bryant St., Room 200
Contacts: Christina Marina 555-1718, Jimmy Lee 555-5717

Time	Activity/Shot
8:00 AM	Arrive and set up—Conference Room
9:30	**Call: David and Probation Officer**
	Probation officer explains program procedure
	1 LS with people in background
	2 MS Probation officer giving instructions
	3 CU Giving instructions
	4 MS Probation officer talking/holding agreement
	4A Zoom in to CU on agreement
	5 MS Probation officer explains program to David
11:30	Set up—Probation Office
12:00	**Call: David and Probation Officer**
	Probation officer explains the rules
	6 MS Probation officer talks about program
	7 CU Probation officer talks about program
12:45	Shot of paying cash (near office)
	8 MS David paying fee
	9 MS David turning in proof of completion
1:00	Lunch Break
2:00	Set up—Courtroom
3:00	**Call: David and Judge Gross**
	Dolly Shot
	10 LS Dolly into the courtroom
3:30	Shots in courtroom
	11 CU Sign outside courtroom
	12 LS Judge refers David to diversion program
	13 MS Courtroom activity
	14 MS Judge
	15 CU Judge
	16 MS David's reaction (over the shoulder)
	17 CU David
4:30	Strike equipment and leave

In many cases, the quality of a movie is directly proportional to the time spent in the movie's preproduction. Having a concrete objective before shooting can save the project team much time and effort, such as shooting exactly what the team wants instead of shooting excessive shots for later editing.

Developing Idea

There are several mandatory components when developing initial program ideas. The first one is the program's subject. What messages will the program communicate? Who are the target audience? How can ideas be best communicated to the audience? Without program design and conceptualization, i.e. subject, treatment, visual potential, and feasibility, program ideas can never be executed.

Subject

A subject should be considered from at least two perspectives, namely content and structure. It is very important to address the questions of what message will be communicated and why it is important to the audience.

Treatment

Upon identification of a subject, the next question follows: How should the program idea be presented.

Visual Potential

Visual potential of the subject is an integrated part of production. Subjects with more visuals are often better received than those with less.

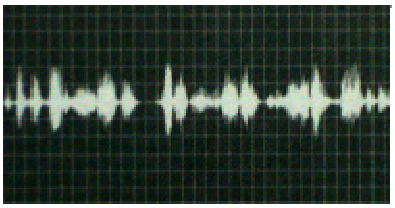
Feasibility

Feasibility dictates the fate of a program proposal: infeasible programs should never be born. An initial feasibility study should emphasize the ability of gaining access to the subject, and the resources available to support the production.

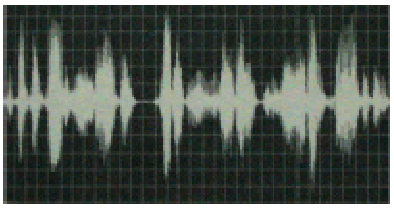
Phase 2: Production

A visualized concept is a permit for the project team to enter into the **Production** stage. Today's digital video cameras are already good enough to capture images and sound, and to produce movie-standard works.

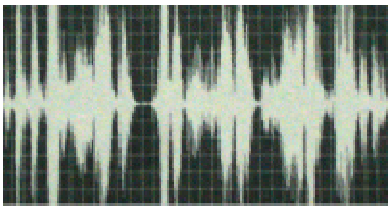
Sound Recording Level



Under-recorded
The problem here is that there is a low level of signal which means any inherent noise could be increased when the signal is boosted.



Correct recording
The waveform peaks high but not over the limit so there is good dynmaic range



Over recorder
This is complete disaster as the signal will distort. This recording will more than likely be unusable

Imaging capturing is an art. Camera operators have to analyse, when taping, what should be include in the picture and what should not be; whether or not there is enough light; and whether or not the camera is recording sound.

Composition through Framing

Bad
Coincident lines are distracting

Better
No distraction between figure and backdrop

Bad
No headroom

Bad
Excessive headroom

Better
Right-spacing headroom

Pre-filming planning can help the project team to decide what the important part of event to be recorded is and what is not. Otherwise, the whole event may have to be recorded in order not to miss any critical moments. Formal production with scripts marks the starting point of a movie migrating from abstraction to reality.

Phase 3: Postproduction

Postproduction, or 'post', is the tasks done after shooting. It is the final stage before a masterpiece goes life. Postproduction includes different tasks, such as downloading footage onto a computer, and editing it using Movie Maker, Ulead Video Studio, iMovie, etc. These software packages allow users to trim video clips; add transitions between keyframes; sequence the clips; add music, sound effects and voice-overs; add titles; apply special effects; etc.

It should be noted that

(a) Downloading footage is a real-time activity, requiring the same length of time as the video lasts for

(b) Saving video in hard-disk is space consuming. It needs about one gigabyte of storage for every five minutes of video

Case Study – A Promotion Campaign for Hong Kong

The major study of this project is to let students analyse the usage of multimedia products in the Hong Kong economical market. Then they need to do a research project themselves using multimedia tools and products from a website to develop a promotion campaign. This time we have chosen Hong Kong Tourism Board's website as an example. The aim of this student project campaign is to promote Hong Kong tourism.

Expected Learning Outcome

Students should be able to:

- Understand the nature of and experience creative activities
- Develop creative thinking and attitudes to be used in their project activities
- Work in teams in project work that requires creative thinking and input
- Participate in creative activities and acquire experience from them
- Enhance their ability to communicate ideas effectively

Students are recommended to use multimedia tools to complete and present the project.

Background

The Hong Kong Tourism Board (HKTB) is a government-subvented body. It was founded on 1 April 2001 under the HKTB Ordinance. It was reconstituted from and replaced the Hong Kong Tourist Association (HKTA), which was established by Government Ordinance in 1957.

The primary responsibilities of the HKTB are to market and promote Hong Kong as a worldclass tourist destination, as well as enhance travel experiences of its visitors once they have arrived.

The HKTB's mission is to maximize the social and economic contribution that tourism can make to the community of Hong Kong, and to consolidate Hong Kong's position as a unique, world-class and most desired place to visit.

Information provided by The Hong Kong Tourism Board website

The website of The Hong Kong Tourism Board keeps surfers informed of all main events, activities and milestones in Hong Kong's fast-developing tourism sector. It uses different colours for different sections and linking the information step by step, which include words, graphic, photography, video and animation.

Reference website: http://www.discoverhongkong.com/login.html

It starts from providing basic information about Hong Kong, such as the visa services and transportation facilities. The linkage of different pages are clearly arranged to show the details graphically.

Following the territory's label of 'the heaven of shopping', the website points out various shopping centres in Hong Kong, maps are shown in the web page for visitors to know the locations.

The website also introduces places to visit and eat, where to join heritage tours, and where festivals are held. Many photos are used to show the scenery and tourism spots in Hong Kong, inviting foreigners to come. In addition, it provides visitors, such as business travellers, family travellers and couple travellers, with different itinerary / travel plans / visit plans.

Brand Advertising

Multimedia technologies have been adopted for promoting Hong Kong. Both traditional and digital ones have been used since each of them has it own specialties and characteristics.

- Television Commercials
  Television commercial (TVC) is a very useful and effective tool for drawing public's attention.

- Video
  Making use of YouTube movies is a rather new move to promote Hong Kong (http://hk.youtube.com/hongkongtc). Some of the clips are advertisements done by Hong Kong Tourism Board; some are documentary of special events in Hong Kong; and some are programs to introduce special attractions. Video is an effective tool to provide full visual view of Hong Kong for web browsers. People may view Hong Kong through different angles in the clips.

- Photography
  There is a Photo gallery in the interactive section of the promotional website. People may appreciate the best scenery of Hong Kong through the pictures. They provide views of the places taking at different times and angles.

- Printing Press

  Printing press graphics, such as posters, leaflets and banners, are a traditional but are still an effective choice. Tourists can see these printing press graphics in their local newspapers and magazines.

- Sponsorship

  This is an advertising method to promote goods, products and events through traditional and digital media. The main purpose is to get more exposure to the public. Asian Aerospace Exhibition, Standard Chartered Marathon and the Little League Asia Pacific Tournament are typical examples.

- Animation E-card

  People can send e-cards in this section. With different card designs to choose from, people can send greetings and messages to their friends and family around the world. Of course, the cards can have motion graphics showing the spectacular themes of Hong Kong, such as the Chinese New Year festival, or other attractive items to promote Hong Kong.

ASSESSMENT TASKS

There are two main purposes of assessment, namely 'assessment *for* learning' and 'assessment of learning'.

'Assessment for learning' involves using feedback on learning and teaching to make learning more effective, and improve teaching strategies. It is a formative assessment since it forms or shapes learning and teaching. Formative assessment should be performed on a daily basis. Attention should be paid to every detail of learning.

'Assessment of learning' emphasizes the determination of learning progress. It is a summative assessment because it summarizes how much the learners have learnt. Summative assessment requires periodic reviews, such as on a yearly basis, to see how much has been learnt.

Formative assessment is different from continuous assessment. It is considered more preferable than summative assessment, which was mostly used by many schools in the past. Formative assessment is especially useful for refining instructional decision-making in teaching and generating feedback to improve learning.

While formative assessment encourages students to learn from practice and experience, summative assessment, which includes both external public examinations and moderate school-based assessments (SBA), is still part of the whole assessments framework.

At the same time, internal assessment and public assessment should be differentiated.

Internal assessments are assessments used by the teachers of a school to evaluate the learning and teaching process throughout a period of three years' senior secondary studies. Public assessments are assessments conducted for all students of the same academic level in the community.

Under the framework of Hong Kong Diploma of Secondary Education (or 'HKDSE'), the Hong Kong Examinations and Assessment Authority (or 'HKEAA') supervises internal assessments and conducts public assessments. Internal assessments are tend to be formative, while public assessments are summative. Meanwhile, school-base assessment (SBA) has been incorporated into public assessment in order to enhance formative assessment or 'assessment for learning' within the context of the HKDSE.

QUIZ

(1) Which of the following does 'interaction' refer to in a computer game?

(a) The game player and the computer hardware.
(b) The game player and the game software.
(c) The game player and the game content, i.e. the story.
(d) All of (a), (b) and (c)

(2) Which item shown is considered an interface?

(a) (A)
(b) (B)
(c) (C)
(d) All of (a), (b) and (c).

(A) An icon

(B) A joystick

(C) The graphics of a chess game

(3) A dialog box as shown is used:

(a) As a form of Facebook.
(b) To inform the user about something.
(c) To start a dialog between the computer and the user.
(d) All of (a), (b) and (c)

A dialog box

(4) A digital signal is recorded in terms of?

(a) 0 and 1
(b) 1 and 2
(c) 2, 4, 8, 64, 128…
(d) Frame by frame

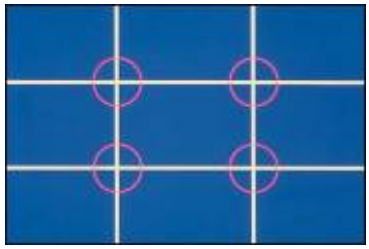
(5) Which of the following is NOT a traditional media?

(a) Telephone
(b) Radio
(c) Cable Television
(d) Newspaper

(6) Which of the following are the three primary electronic colours?

(a) Green, Yellow & Red
(b) Red, Yellow & Blue
(c) Blue, Red & Green
(d) Green, Blue & Yellow

(7) When a frame is divided with four spots where the lines intersect, it is:



(a) Rule of Thirds.
(b) Golden Mean.
(c) Grouping.
(d) The grid system.

(8) An icon is:
(a) A sign that carries out an arbitrary relationship to which it stands for.
(b) A sign that is an indicator of a fact or condition.
(c) A Sign resembling to which it stands for.
(d) None of the above.

(9) What is the different between denotation and connotation?
(a) Denotation is the most basic or literal meaning of a sign. Connotation has a deeper meaning of signs.
(b) Denotation has a deeper meaning of signs. Connotation is the most basic or literal meaning of a sign.
(c) Denotation and connotation are signifiers.
(d) Denotation and connotation are symbols.

(10) Which of the following is not a conceptual element of design?
(a) Line
(b) Point
(c) Plane
(d) Pattern

(11) In order to maintain visual continuity of two shots in the same scene, which of the following rules should be applied?
(a) Rule of Thirds
(b) 180 Degree Imaginary Line
(c) Both of the above
(d) None of the above

(12) The function of back Light is to
(a) Pick out the subject from the background.
(b) Draw the viewer's attention.
(c) Eliminate the shadows of the principal subjects.
(d) Enrich the atmosphere.

(13) A camera movement with the camera body turning from left to right is called
- (a) Tilt.
- (b) Pan.
- (c) Tracking.
- (d) Zoom in.

(14) Which of the following refers to the visual drawings and sketches of shots needed in a movie?
- (a) Storyboarding
- (b) Etch-A-Sketch
- (c) Visualising
- (d) Script

(15) Which of the following makes a soft transition between two scenes whereby the first one gradually disappears as the second one gradually appears?
- (a) Fade-out
- (b) Wipe
- (c) Dissolve
- (d) Cut

SHORT QUESTION

(1) Explain briefly what human perception is when we see things with our eyes.

(2) There are three cylinders in each of Group A and Group B. See Figure B1. Does Group A or Group B appear to have cylinders that are the *same* size?

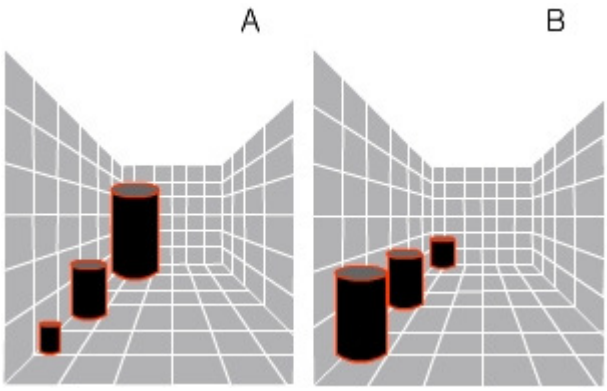


Figure B1

Explain, using human visual perception, why you think so.

(3) There are different groups of base colours from different backgrounds: the RGB and the CMYK. Use a table similar to the one below to explain what the letters stand for and where each group is used.

Group	What does it stand for?	Where is it used?
RGB		
CMYK		

(4) What is a human vestibular sense? Show examples of applications of how vestibular senses can be applied to a digital multimedia environment.

(5) Over the last thirty years, as computer and video games have become more popular, an entire sub-culture has arisen. Explain why the game culture and marketing have been growth rapidly.

DESIGN PROJECT

(1) Video Shooting and Editing Project: Photo Storytelling

Each student should create a photo sequence to present story by shooting with a digital camera. The sequence should contain 5 to 7 photos. All pictures must be original and no made-up or compositional ready. The photo format should be JPEG files (size 640x480).

(2) Video Shooting and Editing Project: Abstractions

(i) Shoot a three-minute video in your everyday environment;

(ii) Capture the abstracting elements from their contexts so that they lose their normal representational value;

(iii) Edit in the camera to make a sequence of shots describing your living environment without revealing the context;

(iv) Include a title at the head of the sequence and your name at the end.

(3) Photography Project 1: The frame

In this project, you are asked to produce a set of six photographs investigating natural or man-made forms. Your work should demonstrate how the frame could be used to create compositions of shape, line and pattern. You should consider not only the shapes of your subject, but also those formed between the subject and the frame.

You can choose one of the following themes:

(i) Patterns in nature

(ii) Rhythms of life

(iii) Urban patterns

(4) Photography Project 2: Photomontage

In this project, you are asked to produce a photomontage in response to one of the following titles:

(i) Phobia – an abnormal or morbid fear of something

(ii) Metamorphosis – a change of form, character or conditions

(iii) Decay – decompose

(iv) Strange but true

(5) Prop and Scene: An office after 10 years

(i) Form a group with 3-4 members;

(ii) Make a research of modern office setting;

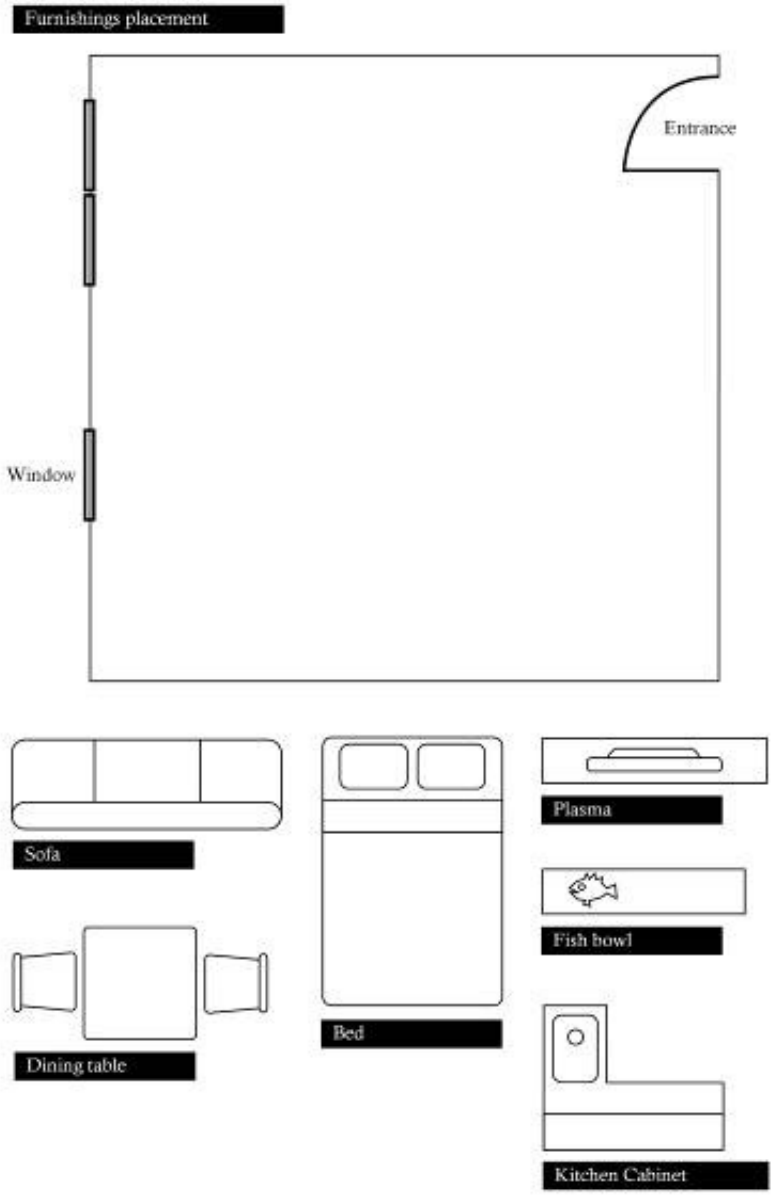
(iii) Base on the information found, hold a discussion about a prediction of an office setting 10 years later;

(iv) State your group discussion result in point form;

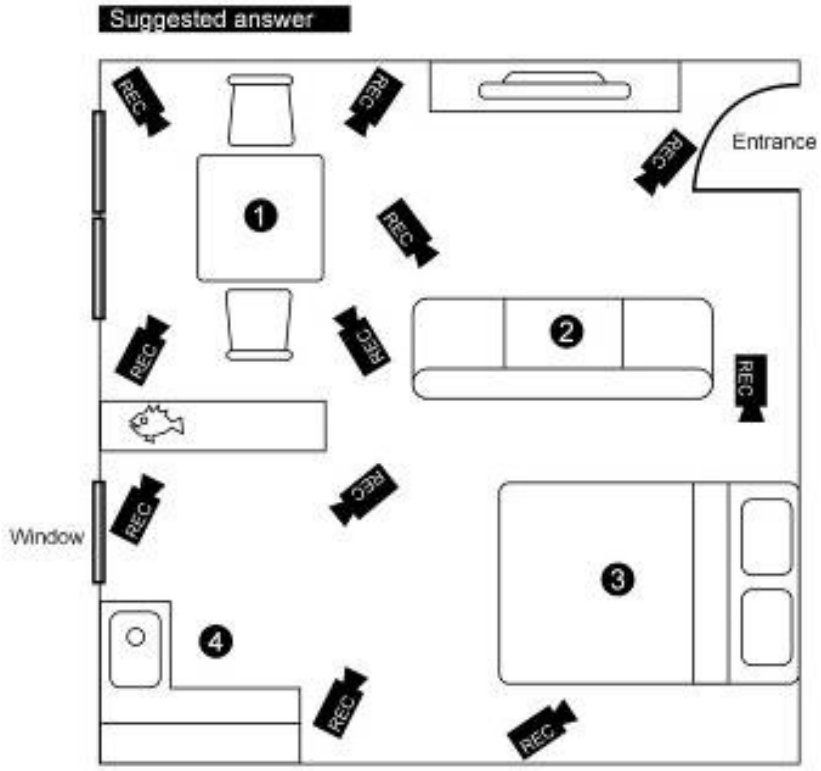
(v) Visualize the office setting in the space provided

HANDS-ON ASSIGNMENT

Imagine that you are the art director of a film. Now you have to design a room for a couple. How would you arrange the furnishings so that there are sufficient shooting angles for the camera operator?



Suggested answer



Mise-en-scéne

There are many possible arrangements, and the picture above is one of the best. Most films are character-centred. The characters should be given the most comfortable activity to act with during the play. It could be cooking in the kitchen, sitting on the sofa, or chatting on the bed. In most cases, there is more than one camera to ensure sufficient camera angles for retaining audience attention.

In addition, depth of field is an important storytelling technique with cameras. This can be achieved with a foreground object. For a close inspection on the set, some interesting foreground to background relationships among the four numbered drama area can be found.

USEFUL WEBSITES

Title	URL	Explanatory Note
數位學園	http://www.ulead.com.tw/learning/video4/page1.htm	Explain digital video production.
淺談數碼影像(一) - 何謂數碼影像	http://big5.cgan.net/science/publish/others/FIGURE1.HTM	解釋數碼影像, 從而講解由圖像轉變為數字的過程.
網上短片 DIY	http://www.hkedcity.net/article/mediaed_learning/030612-003/note.phtml?type=	講解製作短片的步驟,例如由策劃,拍攝,剪接,音響加工到壓縮上載等等
香港需要怎樣的媒體(藝術)教育？	http://res.hkedcity.net/general/0003/46/88/1307625114.htm#IIa	陳智達先生對香港媒體教育發展作一番討論.
透視媒體威力	http://www.hkedcity.net/article/mediaed_learning/030123-009/index.phtml?type=mediaed	內文作多角度探討媒體對社會的影響, 深入淺出.
推動傳媒教育	http://swik.socialnet.org.hk/swikportal/DesktopDefault.aspx?tabIndex=3&tabid=50&ItemID=545	由 張志儉博士撰寫, 對傳媒教育及其在港發展的一篇文章.
人機介面與互動入門	http://proton.phys.tku.edu.tw/UNIX/Dm/rdh02.html	引導讀者進入「人機互動」領域的入門性讀物.
人機互動 /工業設計的另一個發展點	http://xocial.free.fr/research/hci.htm	網頁專題文章.
人機互動	http://www.nsc.gov.tw/_newfiles/popular_science.asp?add_year=2003&popsc_aid=267	唐國豪先生撰寫的專題報導
攝影造景- 實戰篇	http://www.cau-aqua.net/index.php?option=com_content&task=view&id=17&Itemid=38	文章透過水族攝影, 講構圖造景技巧
文化符碼在創意生活產業上的應用	http://www.creativelife.org.tw/creative/creat_artist.php?article_id=46	雲林科技大學工業設計系講師 王清良教授所撰寫的文章
黃金比例	http://ihome.cuhk.edu.hk/%7Eb105713/article/goldenratio.html?s2	由香港中文大學物理系本科生 - 龐宇軒同學撰寫
黃金數 0.618	http://www.lktmc.edu.hk/%7Emathematics/history/golden.htm	以故事和歷史講解黃金比例

商業三維動畫短片製作揭秘	http://www.pconline.com.cn	由短片製作者講解製作動畫短片的步驟及附圖介紹
Animation Production	http://www.suite101.com/	Explain the process of animation production
Camera Angle	http://www.hippasus.com/resources/viscomp/index.html	Introduce camera angle for shooting
Digital Media Production	http://www.suite101.com/	Explain an idea of digital media production
CAD 3D rendering	http://www.rhino3d.com/	Explain the process of 3D production
CAD 3D rendering	http://www.tutorialized.com/tutorials/3DS-MAX/1	Explain the process of 3D production
Composition and the elements of visual design	http://www.scienceandart.org/	Define the composition and the elements of visual design
Cross line	http://www.photozone.de	Cross lines introduction
Digital Storytelling, Basic Thoughts about Visual Composition	http://www.hippasus.com/resources/viscomp/index.html	Define the digital storytelling, basic thoughts about visual composition
Framing	http://www.photozone.de	Introduce framing technologies
Human Computer Interaction Resources	http://www.hcibib.org/	Explain Human Computer Interaction
Image balancing	http://photoinf.com/	Introduce the general rules in visual composition
Interactive artwork: DIGITI	http://www.kenjiko.com/	Introduce the interactive artwork - DIGITI by Hong Kong digital artist, Kenji Ko
iPhone technologies	http://www.apple.com	Introduce iPhone technologies
Lode's Computer Graphics	http://student.kuleuven.be	Explain computer graphics
The Golden Ration	http://photoinf.com/	Introduce the golden ratio
The Hong Kong Observatory	http://www.hko.gov.hk	Illustrate how simple and elegant graphics are used to communicate abstract weather information

Media Influence	http://www.aber.ac.uk/media/	Semiotics for Beginners Daniel Chandler, Denotation, Connotation and Myth
Photo Contest	http://contests.fotki.com/	Introduce the photo contest
Planning a multimedia project	http://alex.eled.duth.gr/ipml/multi/project/project.html	Explain a planning of a digital media project
Professional Communication	http://digitalmedia.oreilly.com/	Introduce the communication in digital media
Ray's Introduction to Literature	http://www.eng.fju.edu.tw/English_Literature/terms/denotation.htm	Introduce the study of American and British literature
Recording History	http://www.recording-history.org/HTML/tech.php	Introduce the technologies of sound recording
Semiotics and Signified	http://web.aiweb.cn/info/1/246.html	Define semiotics and signified
Signifier and Signified	http://changingminds.org/explanations/critical_theory/concepts/signifier_signified.htm	Define signifier and signified
Story from Start to Finish	http://multimedia.journalism.berkeley.edu/tutorials/reporting/starttofinish/	Explain a story from beginning to complete
Taking digital pictures	http://www.imphotorepair.com/digitalcameratips.html	Explain the technologies of taking digital pictures
The Rule of Thirds	http://www.hippasus.com/resources/viscomp/index.html	Introduce the basic concept of rule of third
Video Shooting	http://www.medialab.tv/services/production/vidshoot.htm	Explain the technologies of video shooting
Visualization Game System	http://mit.vtc.edu.hk/	Introduce the visualization system in the Department of Multimedia and Internet Technology in IVE (Tsing Yi)
Wii system	http://www.wii.com	Introduce Will technologies

Useful Reference Websites

1. 媒體教育資源網 http://www.hkedcity.net
2. 香港數碼港數碼媒體中心 http://www.cyberport.hk
3. Amazon.com http://www.amazon.com/
4. Cgvisual.com http://www.cgvisual.com/
5. Digital Media news & Views http://www.digitalmediathoughts.com/
6. Hong Kong Education City http://www.hkedcity.net/
7. Inside digital media http://www.insidedigitalmedia.com/index.php
8. The answer .com http://www.answers.com/
9. The Digital Media Association http://www.digmedia.org/
10. Wikipedia http://en.wikipedia.org/

REFERENCES

Alex Fung, Alice Lo & Mamata N. Rao (2005). *Creative Tools*. The Hong Kong Polytechnic University.

Fernando Ferri (2007). *Visual Languages for Interactive Computing: Definitions and Formalizations*. IGI Global: August 10, 2007.

J.P Telotte. (1995). *The Seductive Text of Metropolis*. University of Illinois Press.

Jim Krause (2001). *Idea Index*. How Design Books.

Jim Krause (2001). *Layout index*. How Design Books.

Marc Davis (2000). *Readings in Human-Computer Interaction: Toward the Year 2000.* Media Streams: An Iconic Visual Language for Video Representation.

Rayport, Jeffrey F., Bernard J. Jaworski (2002). *Cases in e-commerce*. Boston : McGraw-Hill/Irwin Marketspace U.

Robert Klanten, Mika Mischler and Silja Bilz (2007). *The Little Know-It-All Common Sense for Designers*. Berlin: Die Gestalten Verlag.

Roger Fidler (1997). *Mediamorphosis: Understanding New Media (Journalism and Communication for a New Century Ser*. Pine Forge Press.

Steve Curran (2000). *Motion Graphics, Graphics Design for Broadcast and Film.* Rockport Publishers.

Timothy Samara (2007). *Design Elements – A Graphics Style Manual*. Pageone.

Vaughan, Tay (2001). *Multimedia: Making It Work*. Osborne: McGraw-Hill.

Wen-Ching Su (蘇文清), Jen Yen (嚴貞); Chang-Franw Lee (李傳房) (2007). *Application of Semiotics and Cognitive Psychology to Visual Design*.人文暨社會科學期刊.

GLOSSARY OF TERMS

Term	Description
Alignment	Alignment is the setting of text flow or image placement relative to a page, column, table cell or tab. The type alignment setting is sometimes referred to as text alignment, text justification or type justification.
Alpha Channel	Alpha channel is the process of combining an image with a background to create the appearance of partial transparency.
Animatics	Animated storyboards used for testing commercials, previewing scenes of films and laying out rough templates for video game industry
Annotations	The act or process of furnishing critical commentary or explanatory notes
Compositing	In the film industry, compositing refers to the artificial combination of two images or more in the same frame.
Connotation	It refers to signs that are used as signifiers for a secondary meaning. It contains also a cultural meaning of signs, e.g. the word 'rose' signifies passion.
Decoding	A reverse process of encoding: convert those code symbols back into information understandable by a receiver.
Denotation	The most basic or literal meaning of a sign, e.g. the word 'rose' signifies a particular kind of flower.
Dissolve	A dissolve is a transition of one image to another gradually by controlling the exposure of the two images.
DSLRs	DSLRs are Digital single-lens reflex cameras based on film single-lens reflex cameras (SLRs), both types are characterized by the existence of a mirror and reflex system.
Effector	The physical output from a human body, such as noise and movement
Encoding	A process to convert information from a source into symbols
Equilibrium	Equilibrium and symmetry in design means the elements of composition are in visual balance.
Even field	In a SD video signal, the display device actually does it in 2 passes; the second pass displays the information of the even-numbered lines of the frame is the 'even field'.
Film editing	Film or video editing is the activities of cutting, rearranging and consolidating pictures of one source or more into one film or video.

Form	Forms are presented in everything that is visible. In digital media, forms include 2D images, 3D images and typography.
Frame	It is a measurement unit of pictures.
Golden Ratio	Golden ratio, or Golden mean, is one of the most commonly known proportion. Golden radio is mathematically denoted by 'φ'. The value of Golden ratio in art and design is approximately 1.6180339887.
Hertz	Hertz is a unit of frequency of one cycle per second.
High Definition (HD)	High Definition (or 'HD') is newer digital video format than SD. HD's native aspect ratio is 16:9, with 1920 x 1080 pixels. HD's recording can be done at 24 or 60 FPS.
Icon	An icon is a sign that has similar graphical characteristics to the item that it represents.
Indexes	An index is a sign that indicates a fact or condition.
Interactivity	The extent to which something is interactive; the extent to which a computer program and human being may have a dialogue.
Interface	The interface is an additional layer of software or hardware that allows the user to perform a task on the computer
Interlaced Scan	The interlaced scan pattern in a CRT (cathode ray tube) display is carried out from the top left corner to the bottom right corner. This process is repeated again, only this time starting at the second row, in order to fill in those particular gaps left behind while performing the first progressive scan on alternate rows only.
Key frames	Key frames are the beginning and end frames of an action or change.
Mise en scènes	Mise-en-Scéne is French with different meanings but no unique definition. For example, it can mean 'arranging scenes', or 'designing and arranging frames'. It covers locations design, props, design of actors' clothing, and additional props for supplementary information about the characters.
Motion capture	Motion capture (mocap) is a technique of digitally recording movements for 3D animation.
Motion path	An animation involves an object moving through space. This movement can be defined along a linear "motion path".
National Television System Committee (NTSC)	NTSC stands for National Television System Committee. It is a popular analogue television broadcast system across North America, Japan and most of Latin America.

Odd field	In a SD video signal, the display device actually does it in 2 passes; the first pass displays the information of the odd-numbered lines of the frame is the 'odd field'.
Phase Alternating Line (PAL)	PAL is the acronym for Phase Alternating Line. It is a common analogue television broadcast systems used mainly in Europe and the rest of the world.
Perspective	A technique of depicting volumes and spatial relationships on a flat surface.
Production timeline	An organized outline and a plan.
Progressive Scan	Progressive scan is any method for displaying, storing or transmitting moving images in which all the lines of each frame are drawn in sequence.
RGB	RGB consists of three channels, namely red, green and blue. They roughly align with the colour receptors of human eyes, and are used in computer output (displays) and input (scanners).
Semiotics	Semiotics is the use of signs to deliver messages to the audience.
Sequence	A sequence is a collection of continues images.
Sign	A sign is a mark with a certain meaning.
Signified	A signified is the item that a signifier refers to.
Signifier	A signifier is an item that signifies (expresses) another item, i.e. 'signified'. A signifier can be a graphical sign, a word or else.
Standard Definition (SD)	Standard definition TV (or 'SDTV') makes use of analogue signals for broadcasting. There are two common standards for SD video signals, namely NTSC and PAL.
Steadicam	A hand-held film camera that has built-in shock absorbers, and which has a harness device so that the camera operator can attach it to their bodies allowing them to move around and yet still produce steady shots
Storyboarding	A storyboard is a simple graphical presentation, by sketching for example, of the script that shows the key actions of the story.
Symbol	A symbol is a sign that represents a physical or logical item. The relationship between the item being represented and the symbol may or may not give people direct association.
Synopsis	A synopsis is an in-depth summary of major points of a subject matter. It often refers to the facts of a film.
Text	A written passage consisting of multiple glyphs, characters, symbols or sentences.

The rule of thirds	According to Rule of Thirds, each picture concerned should be divided by four grid lines, namely two vertical and two horizontal. Major elements should be placed at the intersection points of these lines. It is a simplified version of Golden ratio.
Transitions	Transition effects, through Cut, Dissolve, Wipe, etc, are basic video editing techniques.
Typography	Typography is the art and techniques of type design. The arrangement of type is the selection of typefaces, point size, line length, leading and letter spacing.
Video	Video is a technology of capturing, recording, processing, storing, transmitting, and reconstructing images in motion.
Visualization	To recall or form mental images or pictures.
Whitespace	Whitespace is often referred to as negative space. It is that portion of a page left unmarked: the free space between elements like graphics, margins, gutters, columns, lines of type or figures and objects drawn or depicted.
Wipe	A wipe is a gradual spatial transition from one video to another. One video is replaced by another with a distinct edge that forms a shape.

ACKNOWLEDGEMENTS

The authors wish to thank the following organisations/companies for permission to use their photographs in this resource package:

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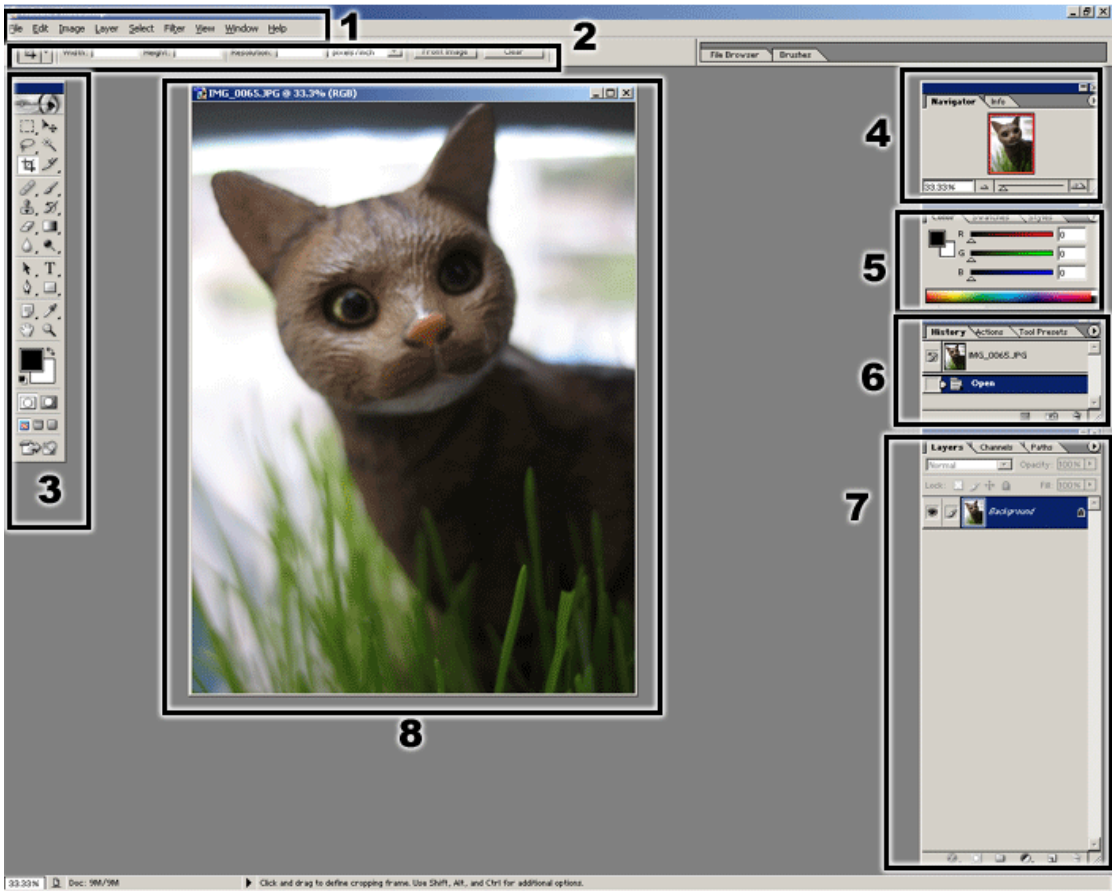
APPENDICES

Appendix - Basic function of PhotoShop

A. Photoshop Interface:



1) **Menu bar:** The menu bar contains menus for performing tasks. The menus are organized by topic. For example, the Layers menu contains commands for working with layers.

2) **Options bar:** The options bar provides options for using a tool.

3) **Toolbox:** The toolbox holds tools for creating and editing images.

Palettes: Palettes help you monitor and modify images.

4) **Info palette:** The Info palette displays information about the colour values beneath the pointer and, depending on the tool in use, other useful measurements.

5) **Colour palette:** The Colour palette displays the colour values for the current foreground and background colours. Using the sliders in the Colour palette, you can edit the foreground and background colours according to several different colour models. You can also choose a foreground or background colour from the spectrum of colours displayed in the colour ramp at the bottom of the palette.

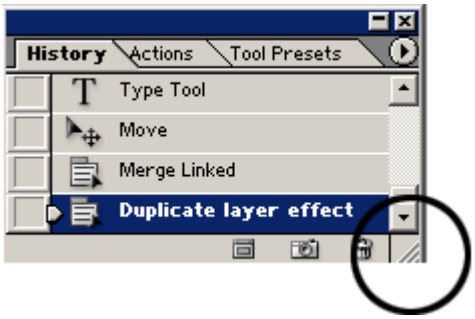
6) **History palette:** You can use the History palette to revert to a previous state of an image, to delete an image's states, and in Photoshop, to create a document from a state or snapshot.

7) **Layers palette:** The Layers palette lists all layers, layer sets, and layer effects in an image. You can accomplish many tasks--such as creating, hiding, displaying, copying, and deleting layers--using the buttons in the Layers palette. You can access additional commands and options in the Layers palette menu and the Layers menu.

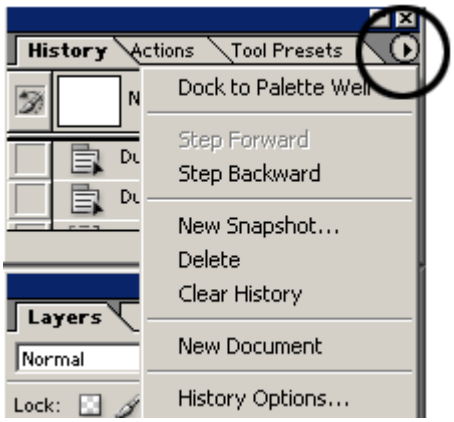
8) **Document window:** The document window is where your image appears. Depending on the screen display mode, the document window may include a title bar and scroll bar.

B. PALETTE DISPLAY:

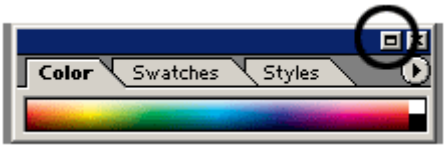
1) To change the size of a palette, drag any corner of the palette. Not all palettes can be resized.



2) To display a palette menu, position the pointer on the triangle in the upper right corner of the palette, and press the mouse button.

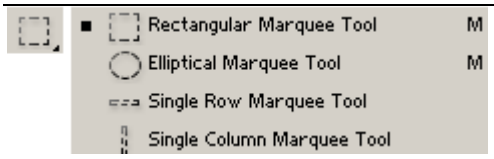


3) To collapse a group to palette titles only, click the Minimize/Maximize box, or double-click a palette's tab. You can still access the menu of a collapsed palette.



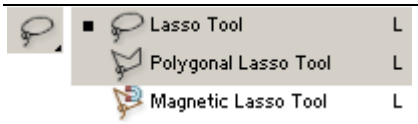
C. Tool Box:

The first time you start the application, the toolbox appears on the left side of the screen. Some tools in the toolbox have options that appear in the context-sensitive tool options bar. These include the tools that let you use type, select, paint, draw, sample, edit, move, annotate, and view images. Other tools in the toolbox allow you to change foreground/background colours, go to Adobe Online, work in different modes, and jump between Photoshop and ImageReady applications.



The marquee tools make rectangular, elliptical, single row, and single column selections.

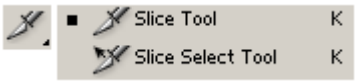
The move tool moves selections, layers, and guides.



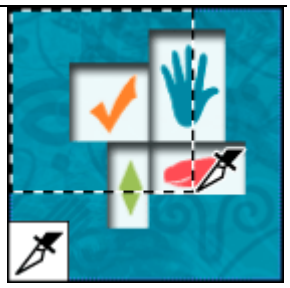
The lasso tools make freehand, polygonal (straight-edged), and magnetic * (snap-to) selections.

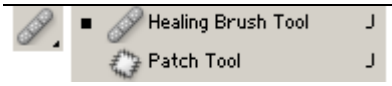
The magic wand tool selects similarly coloured areas.

The crop tool trims images.

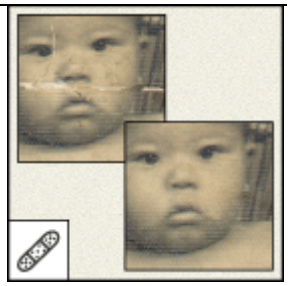


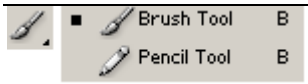
The slice tool creates slices.





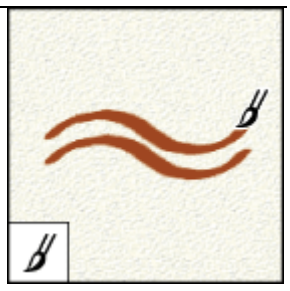
The healing brush tool * paints with a sample or pattern to repairs imperfections in a image.

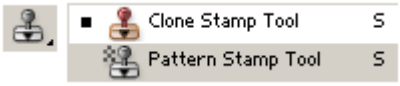




The brush tool paints brush strokes.

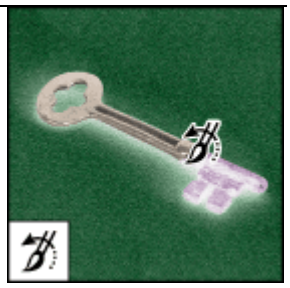
The pencil tool paints hard-edged strokes.

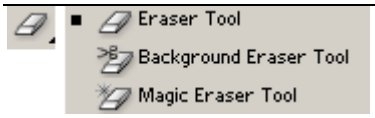




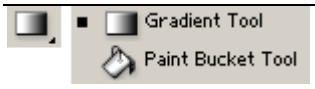
The clone stamp tool paints with a sample of an image.

The history brush tool * paints a copy of the selected state or snapshot into the current image window.



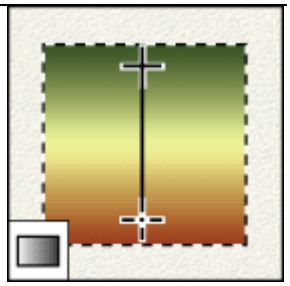


The magic eraser tool erases solid-coloured areas to transparency with a single click.



The gradient tools create straight-line, radial *, angle *, reflected *, and diamond *, blends between colours.

The paint bucket tool fills similarly coloured areas with the foreground colour.



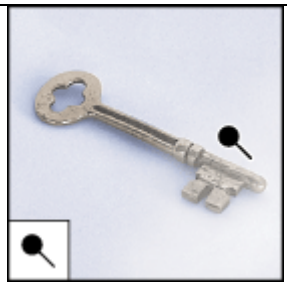
The blur tool blurs hard edges in an image.
The sharpen tool sharpens soft edges in an image.

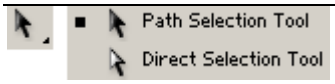
The smudge tool smudges data in an image.

The dodge tool lightens areas in an image.

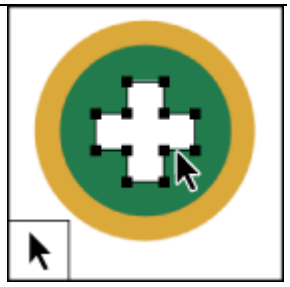
The burn tool darkens areas in an image.

The sponge tool changes the colour saturation of an area.



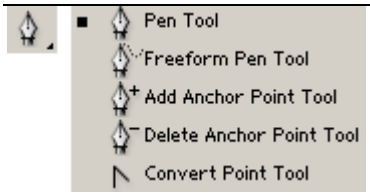


The path selection tools * make shape or segment selections showing anchor points, direction lines, and direction points.

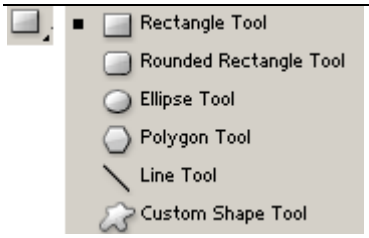


The type tools create type on an image.

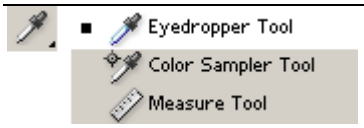
The type mask tools * create a selection in the shape of type.



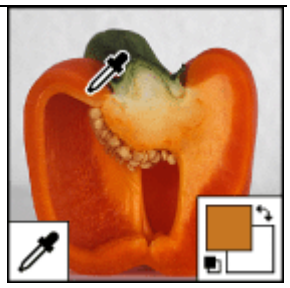
The pen tools * let you draw smooth-edged paths.



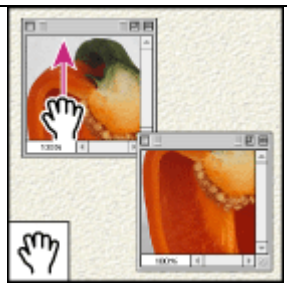
The custom shape tool * makes customized shapes selected from a custom shape list.



The eyedropper tool samples colours in an image.



The hand tool moves an image within its window.



The zoom tool magnifies and reduces the view of an image.

Colour settings

The current foreground colour appears in the upper colour selection box in the toolbox; the current background colour appears in the lower box.

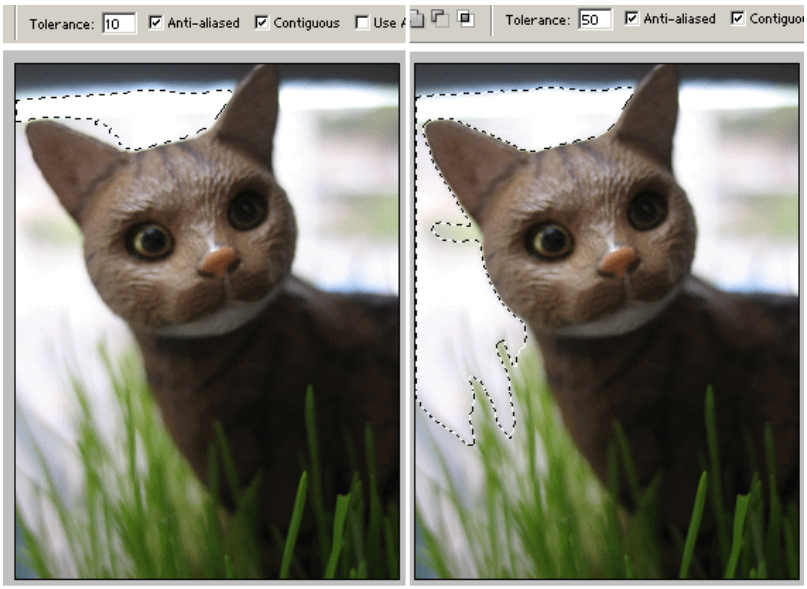
Quick Mask mode

Quick Mask mode lets you edit any selection as a mask without using the Channels palette and while viewing your image.

D. Making selections:

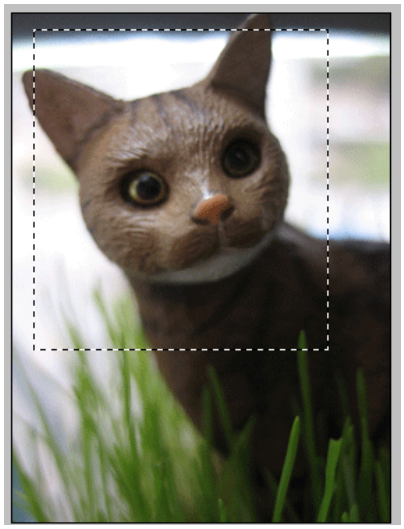
Method 1: Using Magic Wand Tool

The magic wand tool lets you select a **consistently coloured area** (for example, a red flower) without having to trace its outline. You specify the colour range, or *tolerance*, for the magic wand tool's selection.



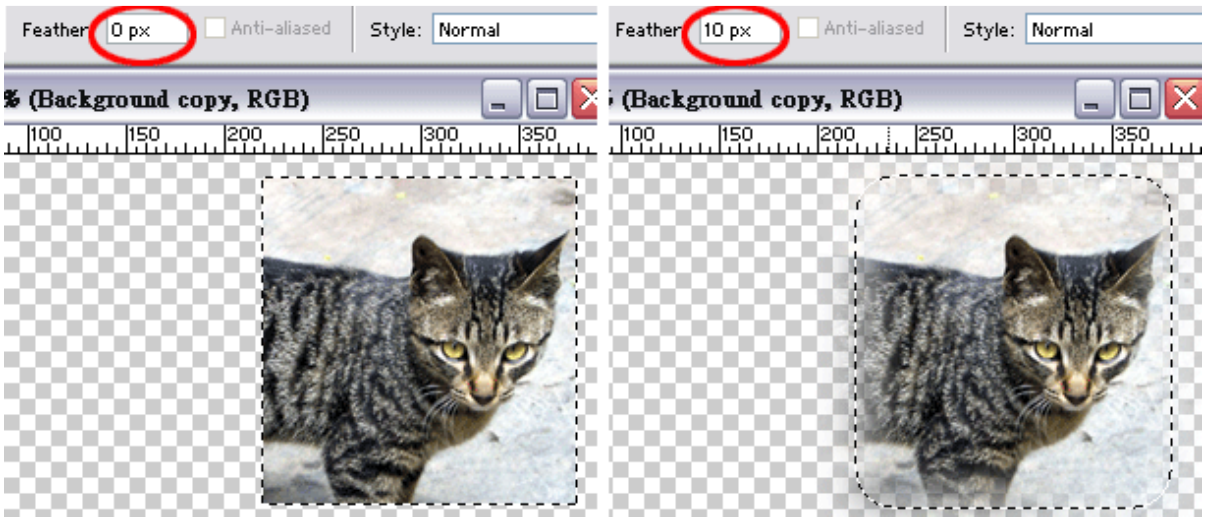
Method 2: Using Marquee Tool

The marquee tools let you select rectangles, ellipses, and 1-pixel rows and columns. By default, a selection border is dragged from its corner.



Rectangle marquee to make a rectangular selection.
Elliptical marquee to make an elliptical selection.
Single row or single column marquee to define the border as a 1-pixel-wide row or column.

You can smooth the hard edges of a selection by anti-aliasing and by feathering. Specify a feathering setting in the options bar. Turn anti-aliasing on or off for the rounded rectangle or elliptical marquee.



Method 3: Using Lasso Tool

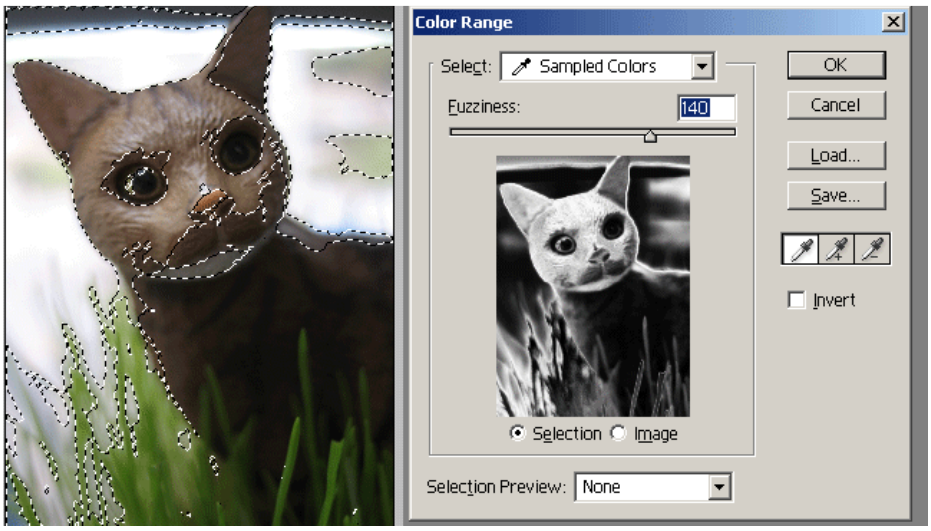
The lasso and polygonal lasso tools let you draw both straight-edged and freehand segments of a selection border. With the magnetic lasso tool (Photoshop), the border snaps to the edges of defined areas in the image.

The magnetic lasso tool is especially useful for quickly selecting objects with complex edges set **against high-contrast backgrounds**.

Method 4: Using Select > Colour Range…

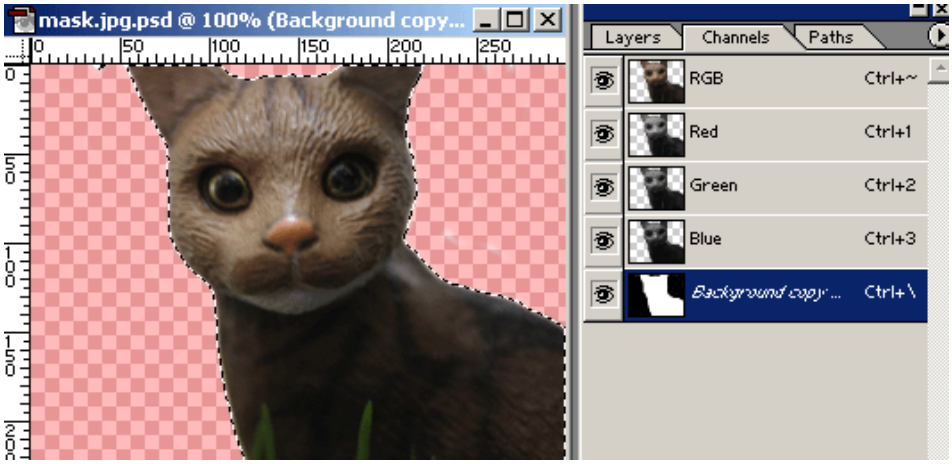
The Colour Range command selects a specified colour or colour subset within an existing selection or an entire image. If you want to replace a selection, be sure to deselect everything before applying this command.

To refine an existing selection, use the Colour Range command repeatedly to select a subset of colours. For example, to select the green areas in a cyan selection, select Cyans in the Colour Range dialog box, and click OK. Then reopen the Colour Range dialog box, and select Greens. (The results are subtle because the technique selects parts of colours within a colour mix.)



Method 5: Using Alpha Channel

Masks control how different areas within a layer or layer set are hidden and revealed. By making changes to the mask, you can apply a variety of special effects to the layer without actually affecting the pixels on that layer. You can then apply the mask and make the changes permanent or remove the mask without applying the changes



E. Filtering

1. About layers

Layers allow you to work on one element of an image without disturbing the others. Think of layers as sheets of acetate stacked one on top of the other. Where there is no image on a layer, you can see through to the layers below. You can change the composition of an image by **changing the order and attributes of layers**. In addition, special features such as adjustment layers, fill layers, and layer styles let you create sophisticated effects.

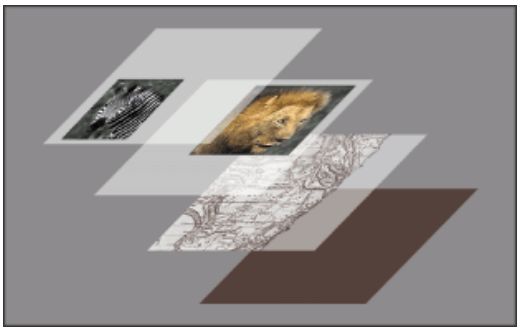
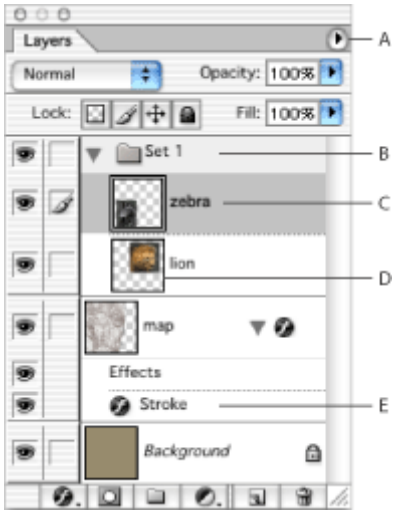


Illustration of how transparent areas on a layer let you see through to the layers below

2. Layer palette

The Layers palette lists all layers, layer sets, and layer effects in an image. You can accomplish many tasks--such as **creating, hiding, displaying, copying, and deleting layers**--using the buttons in the Layers palette. You can access additional commands and options in the Layers palette menu and the Layers menu.



Photoshop Layers palette: **A.** Layers palette menu **B.** Layer set **C.** Layer **D.** Layer thumbnail **E.** Layer effect

3. About the background layer

When you create a new image with a white background or a coloured background, the **bottommost image** in the Layers palette is ***Background***. An image can have only one background. You **cannot change the stacking order of a background**, its blending mode, or its opacity. However, you can convert a background to a regular layer.

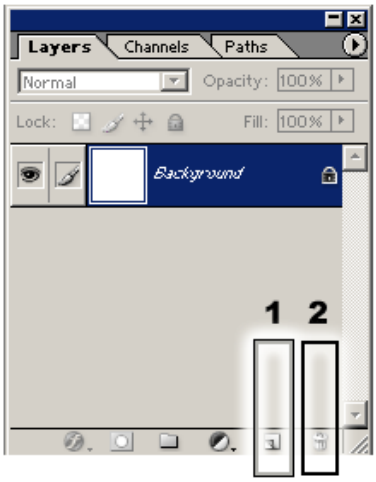
When you create a new image with transparent content, the image does not have a

background layer. The bottommost layer is not constrained like the background layer; you can move it anywhere in the Layers palette, and change its opacity and blending mode.

4. Adding layers and layer sets

You can create **empty layers** and add content to them, or you can create new layers from existing content. When you create a new layer, it appears either above the selected layer or within the selected layer set in the Layers palette.

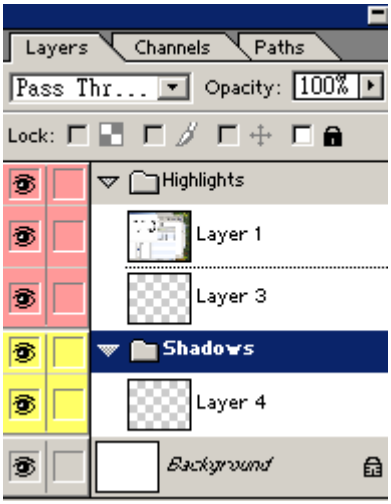
Layer sets help you **organize and manage layers**. You can use layer sets to easily move layers as a **group**, to apply attributes and masks to groups of layers, and to reduce clutter in the Layers palette. You cannot create a new layer set within an existing layer set.



1: Create a new layer
2. Delete layer

5. Displaying the contents of layers

You can use the Layers palette to selectively hide and display the contents of layers, layer sets, and layer effects. You can also specify how transparent areas are displayed in the image. In the Layers palette, click the eye icon next to a layer, layer set, or layer effect to hide its content in the document window. Click in the column again to redisplay the content.



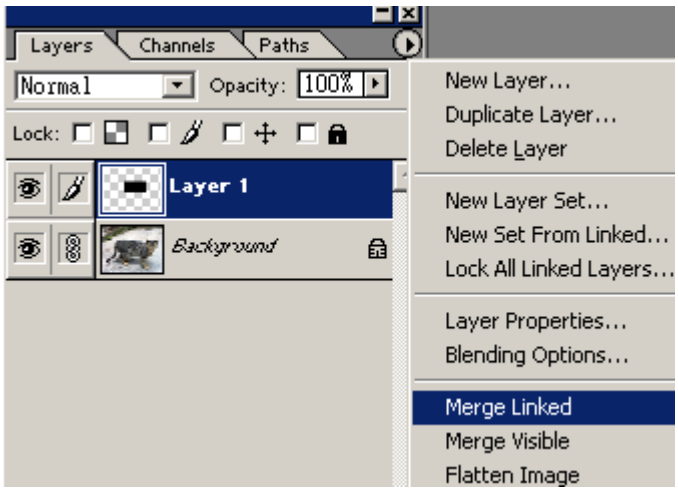
1. Select a layer or layer set in the Layers palette.
2. Drag the layer to the New Layer button, or drag the layer set to the New Layer Set button.

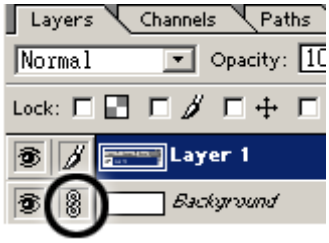
6. Duplicating layers

Duplicating layers is an easy way to copy content within an image or between images. When duplicating layers between images, keep in mind that the layer's content will appear smaller or larger if it is copied to a file with different resolution.

7. Linking layers

By linking two or more layers or layer sets, you can **move their contents together**. You can also copy, paste, align, merge, apply transformations to, and create clipping groups from linked layers.

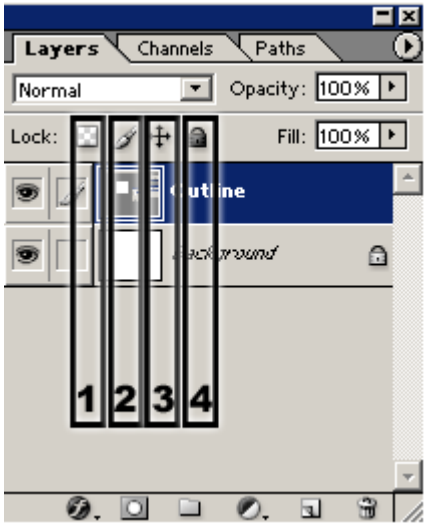




1. Select a layer or layer set in the Layers palette.
2. Click in the column immediately to the left of any layers you want to link to the selected layer. A link icon appears in the column.

8. Locking layers

You can fully or partially lock layers to **protect their contents**. When a layer is locked, a lock icon displays to the right of the layer name. The lock icon is solid when the layer is fully locked; it is hollow when the layer is partially locked.



To lock all properties of a layer or layer set:

1. Select a layer or layer set.
2. Do one of the following:
   - Click the Lock All option in the Layers palette.

To partially lock a layer:

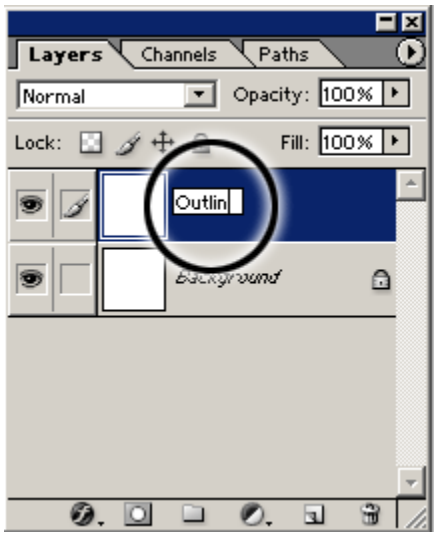
- Lock Transparency to confine **editing to the opaque portions** of the layer. This option is equivalent to the Preserve Transparency option in earlier versions

of Photoshop.

- Lock Image to **prevent** modification of the layer's pixels using the **painting tools**.
- Lock Position to **prevent** the layer's pixels from **being moved**.

9. Renaming layers

As you add layers to an image, it's helpful to rename layers based on their content. Using descriptive layer names allows you to easily identify layers in the Layers palette.



Double-click the layer or layer set's name in the Layers palette, and enter a new name.

10. Rasterizing layers

You cannot use the painting tools or filters on layers that contain vector data (such as type layers, shape layers, and vector masks) and generated data (such as fill layers). However, you can rasterize these layers to convert their contents into a flat, raster image.

Select the layer you want to rasterize. Choose Layer > Rasterize, and choose an option from the submenu.

11. Merging layers

When you have finalized the content of layers, you can merge them to create partial versions of your composite image. The intersection of all transparent areas in the merged layers remains transparent. Merging layers helps manage the size of image files.

In addition to merging layers, you can stamp layers. Stamping allows you to merge the contents of more than one layer into a target layer while leaving the other layers intact. Typically, the selected layer will stamp down to the layer below it.

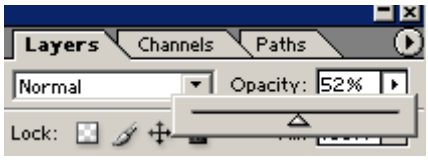
12. Flattening all layers

In a flattened image, all visible layers are merged into the background, which greatly reduces the file size. Flattening an image discards all hidden layers and fills the remaining transparent areas with white. In most cases, you won't want to flatten a file until you have finished editing the individual layers.

Make sure that all the layers you want to keep are visible. Choose Layer > Flatten Image

13. Setting layer opacity

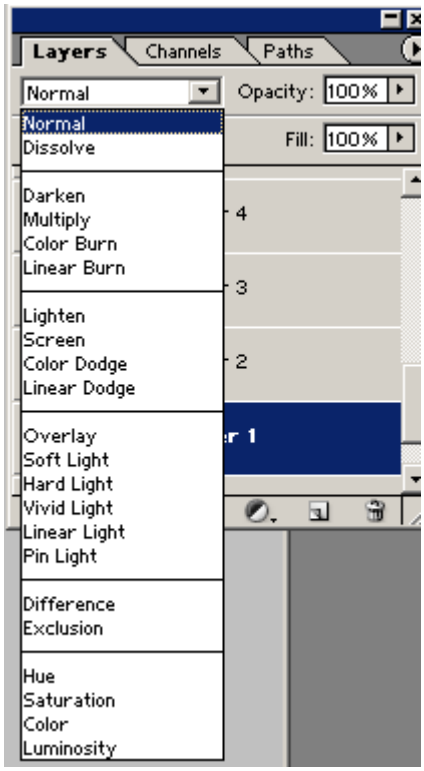
A layer's opacity determines to what degree it obscures or reveals the layer beneath it. A layer with 1% opacity appears nearly transparent, while one with 100% opacity appears completely opaque.



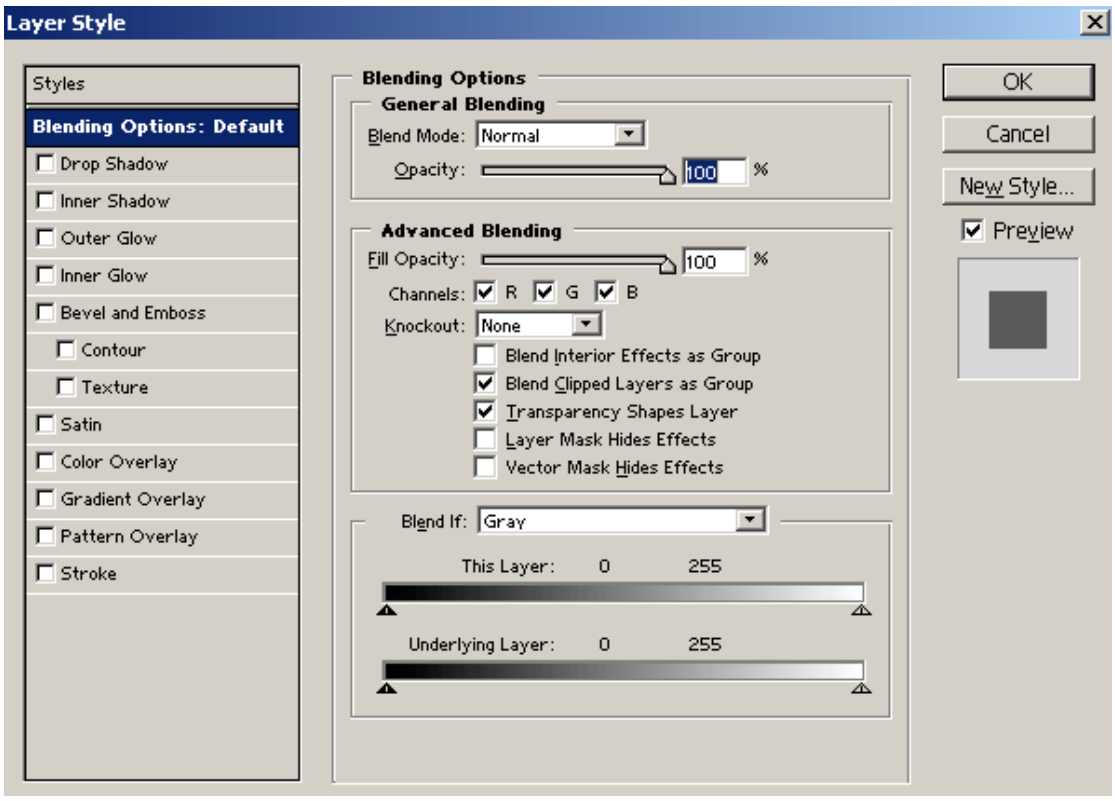
14. Choosing a blending mode

A layer's blending mode determines how its pixels blend with underlying pixels in the image. You can create a variety of special effects using blending modes.

By default, the blending mode of a layer set is Pass Through, which means that the layer set has no blending properties of its own. When you choose a different blending mode for a layer set, you effectively change the order in which the entire image is composited. All of the layers in the layer set are composited first. The composited layer set is then treated as a single image, and blended with the rest of the image using the selected blending mode. Thus, if you choose a blending mode other than Pass Through for the layer set, none of the adjustment layers or layer blending modes inside the layer set will apply to layers outside the set.



15. About layer effects and styles



Photoshop and ImageReady provide a variety of effects--such as shadows, glows, bevels, overlays, and strokes--that let you quickly change the appearance of a layer's contents. Layer effects are linked to the layer contents. When you move or edit the contents of the layer, the effects are modified correspondingly. For example, if you apply a drop shadow effect to a text layer, the shadow will change automatically when you edit the text.

The effects that you apply to a layer become part of the layer's custom *style*. When a layer has a style, an "f" icon appears to the right of the layer's name in the Layers palette. You can expand the style in the Layers palette to view all the effects that comprise the style and edit the effects to change the style.

When you save a custom style, it becomes a preset style. Preset styles appear in the Styles palette and can be applied with just a click of the mouse. Photoshop and ImageReady provide a variety of preset styles to fill a wide range of uses.

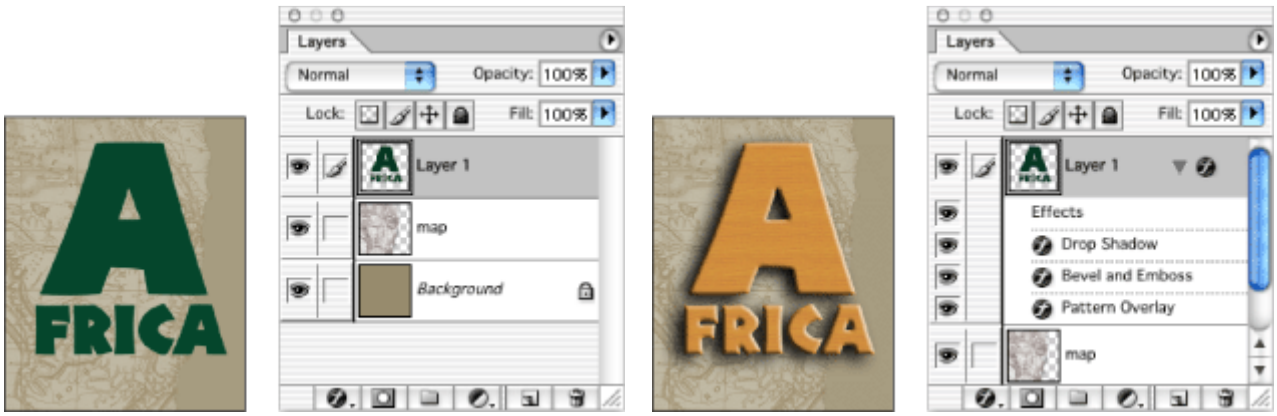


Illustration of a layer without a style

Illustration of a layer with a style

Note: You cannot apply layer effects and styles to a background, a locked layer, or to a layer set.

 No effect	 Drop Shadow	 Inner Shadow	 Outer Glow
 Inner Glow	 Bevel and Emboss	 Satin	 Colour Overlay
 Gradient Overlay	 Pattern Overlay	 Stroke	

16. Removing layer effects

You can remove individual effects from a layer style and remove a style from the layer.

To remove an effect from a style:

In the Layers palette, expand the layer style so you can see its effects. Drag the effect to the Trash button.

17. Converting layer styles to layers

To customize or fine-tune the appearance of layer styles, you can convert the layer styles to regular image layers. Once you have converted a layer style to image layers, you can enhance the result by painting or applying commands and filters. However, you can no longer edit the layer style on the original layer, and the layer style will no longer update as you change the original image layer.

Note: The layers produced by this process may not result in artwork that exactly matches the version using layer styles. In Photoshop, you may see an alert when you create the new layers.

To convert a layer style to image layers:

In the Layers palette, select the layer containing the layer style you want to Choose Layer > Layer Style > Create Layers.

Appendix - Basic function of 2D Animation - Flash

Part 1: Preparation for the graphics and text

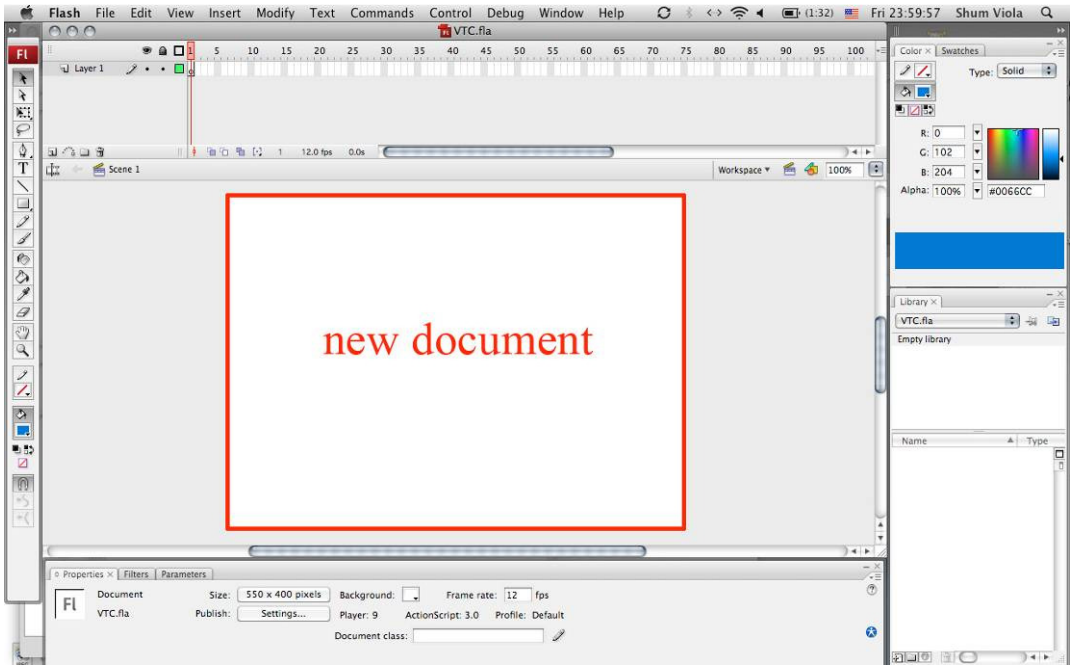
A. Creating a new document in Flash

Method 1:

1. Choose to create a new "Flash File (ActionScript 3.0).

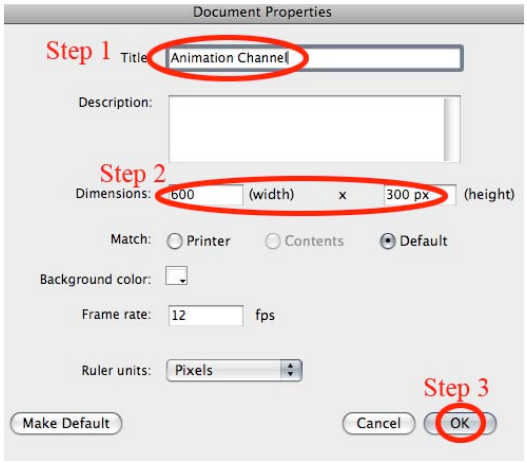
Method 2:

1. Select File > New. Choose Flash File (ActionScript 3.0) from the "General" tab.



2. Select Modify > Document.

3. Set the document as the following picture.

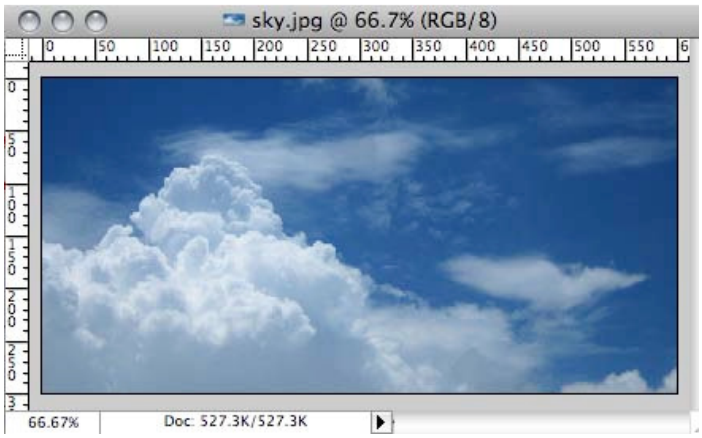


Title: Animation Channel

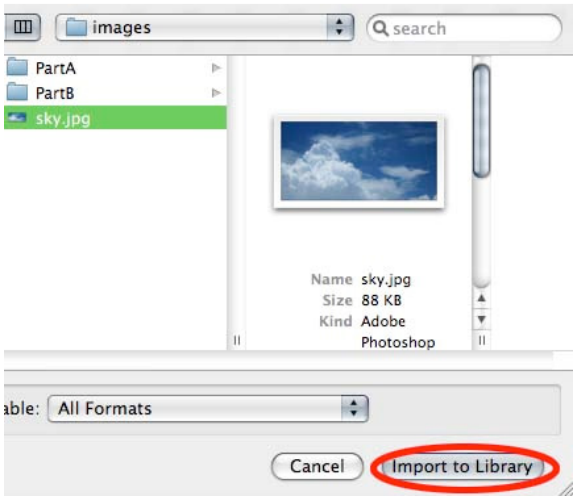
Dimension: 600 pixels x 300 pixels

B. Importing image from other application

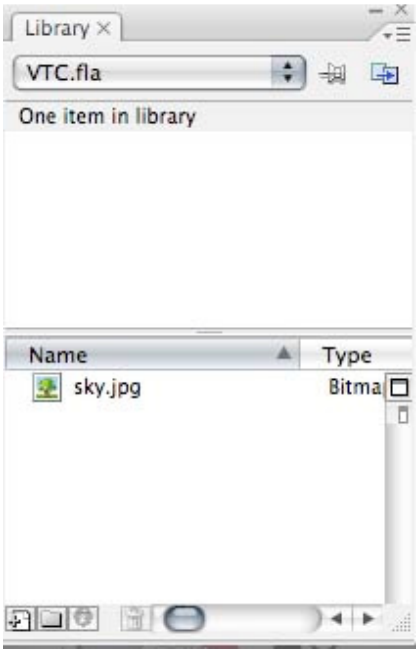
1. Prepare an image in Photoshop and set the size as 600 pixels width and 300 pixels height.



2. Return to Flash and select Import > Import to Library… and browse this image in your computer.



3. This image is automatically imported into the Flash library like this.



C. Drawing objects in Flash

1. In order to draw a graphic in Flash, using a "symbol" to contain the graphic is highly recommended.

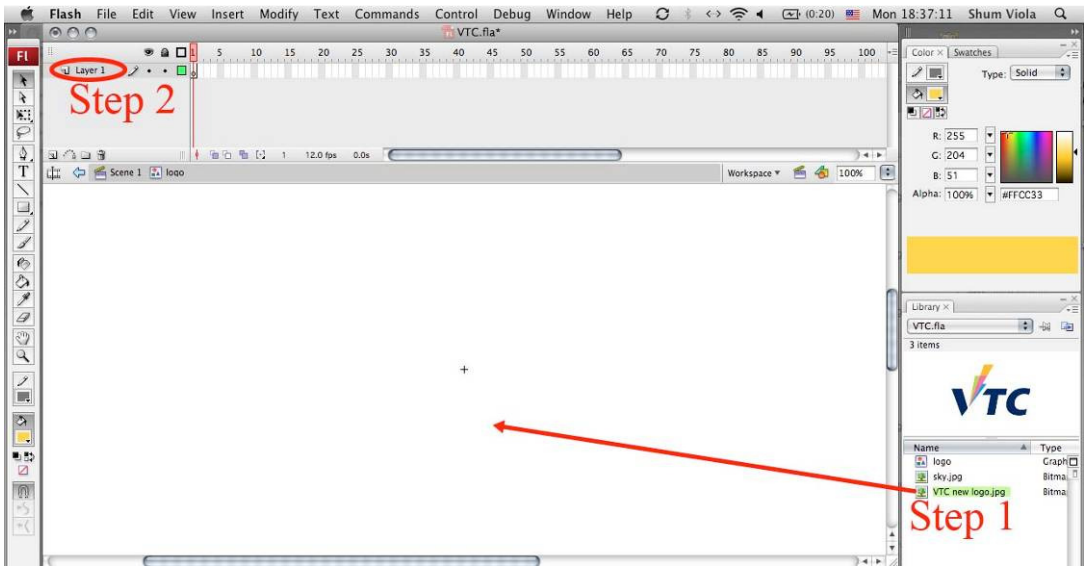
2. To create a symbol, select Insert > New Symbol… Name this symbol as "logo" and set the type as "Graphic".

3. Symbol “logo” is automatically selected in the library and allow to draw into the canvas.

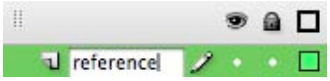
4. In “Toolbars” palette, “Pen Tool” and “Brush Tools” and “Oval Primitive Tools” provide a tool for drawing.

5. Select Import > Import to Library… and choose the reference image to trace. Here is the reference:

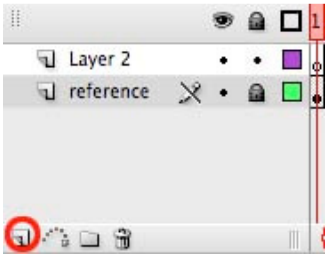
6. Drag the imported image into the default layer. Rename the default layer into “reference” by double-clicking “Layer 1”.



like this:



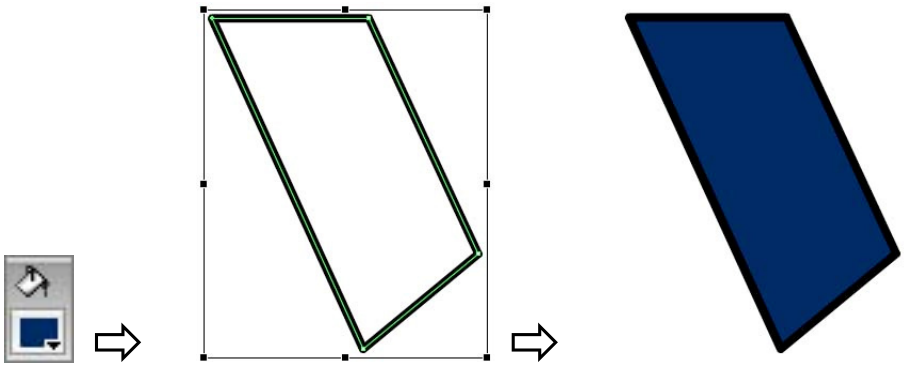
7. Lock the “reference” layer and create a new layer by clicking “Insert Layer”.



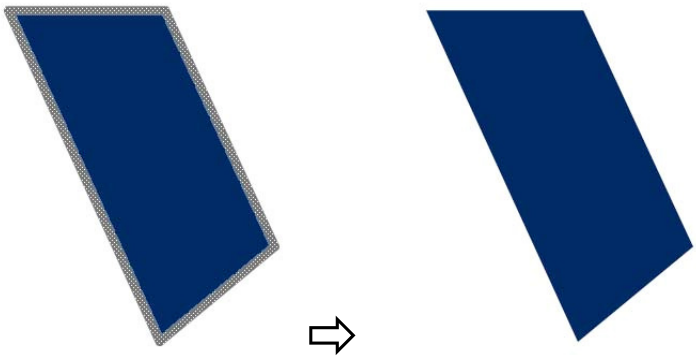
8. Rename “Layer 2” as “vtc” and click on the frame 1 in this layer.

9. Use the “Pen Tool” to draw “V” in the “vtc” layer. Stroke width, colour and style can be set up in the Property Palette at the bottom of the workspace.

10. “Paint Bucket” allows to fill the colour into a closed path. The colour can also be adjusted into the “Fill Colour” in “Toolbars”.

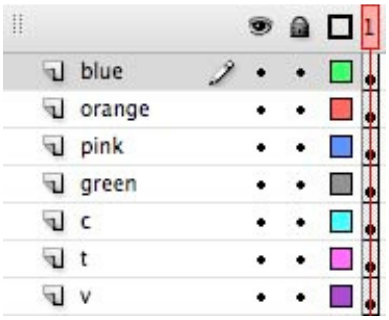


11. Use the “Selection Tool” to pick the stroke as the following and then delete it.



12. Create a “t” and “c” layers and trace the logo into these separate layers.

13. Repeat creating layers and draw the triangular rainbow in different layers and named with their colours.

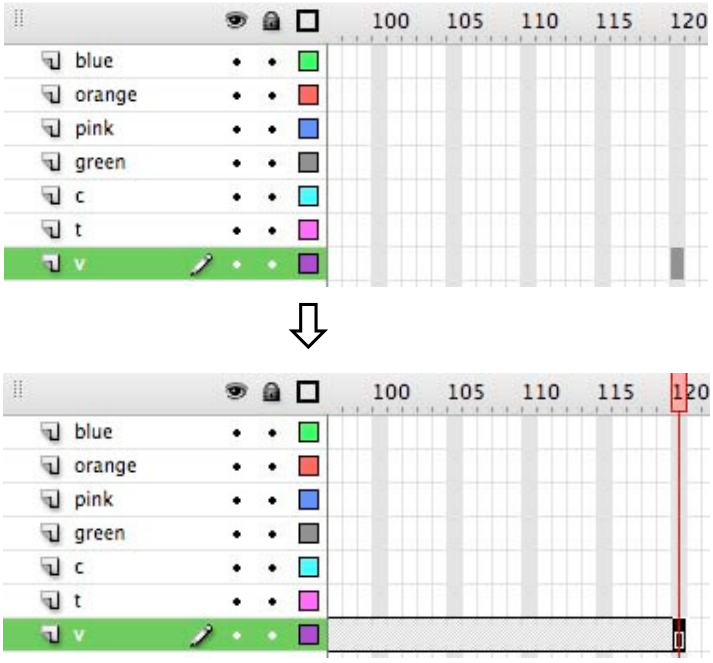


14. Drag the “reference” layer into the trash in the timeline.

Part 2: Animating the symbols

A. Setting up the rotation animation

1. Click frame 120 in layer “v” and highlight it and Inserting frames by selecting Insert > Timeline > Frames.



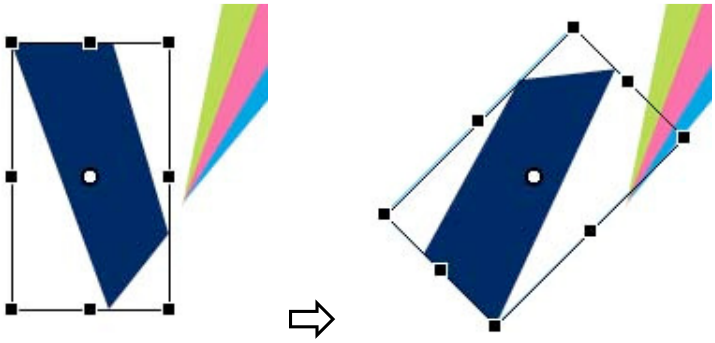
2. Select Insert > Timeline > Keyframe.

3. Click any frame in between frame 1 to 120 in layer “v” Select Insert > Timeline > Create Motion Tween. The grey bar becomes purple and an arrow appears.

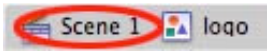
4. 

5. Select Modify > Transform > Rotate and Skew.

6. Go to frame 1 and rotate the object.



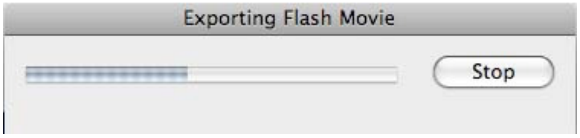
7. Click “Scene 1” on the top-left corner to the canvas to switch back to the main scene. Flash only allows to test the movie which is shown in the scene.



8. Drag the symbol “logo” into the main scene to play the animation.

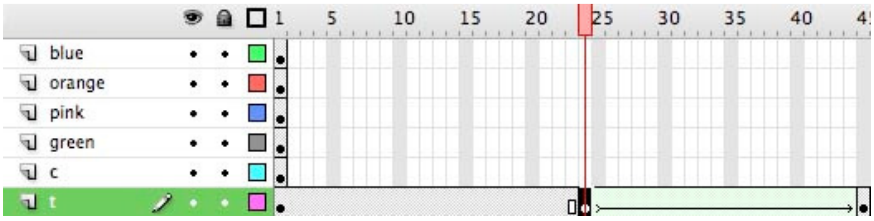
9. The symbol “logo” is automatically added into the layer 1. Select Insert > Timeline > Frame to add 120 frames in the Scene 1.

10. Select Control > Test Movie.

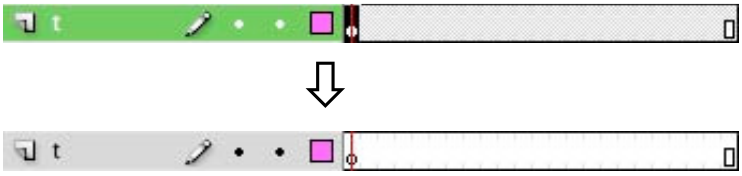


11. Now, it’s the turn to animate layer “t”. In this layer, add frames until frame 45 by selecting Insert > Timeline > Frame. Insert keyframe in frame 24 and frame 48.

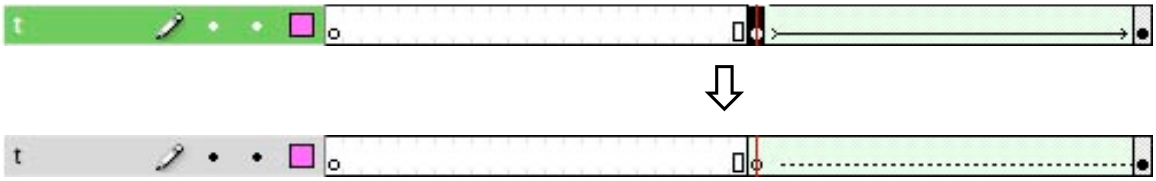
12. Select Insert > Timeline > Create Shape Tween.



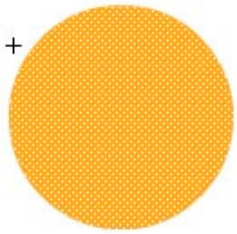
13. Delete the frame at frame 1 in layer “t” by clicking frame 1 and then delete.
14.



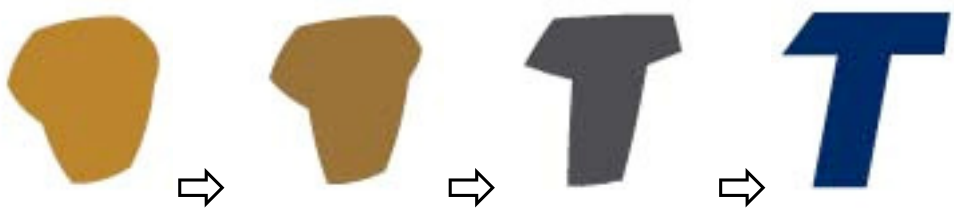
15. Keep select layer “t” and then delete the object “t” in frame 24.



16. Use “Oval Primitive Tool” to draw a circle and fill with “yellow” at frame 24.



17. Test the animation again. The followings are the snapshots of the animation:



18. Try to animate the layer “c”. Here is the sample:

Tips: To animate this animation, it is a simply a Skew transformation.

19. In the layer “green”, add a keyframe at frame 72, frame 80 and frame 120.

20. Add a motion *Tween* in between 72 and 80, and then move the green triangle out of the canvas.

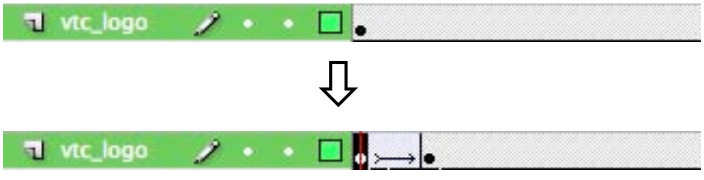
21. Test the animation again. The green triangle is now entering the frame.

22. Repeat the step 17 and 18 for the pink, orange and blue triangles with time offset.

23. Test the animation again.

24. Go back to the main scene by clicking “Scene 1” on the top-left corner.

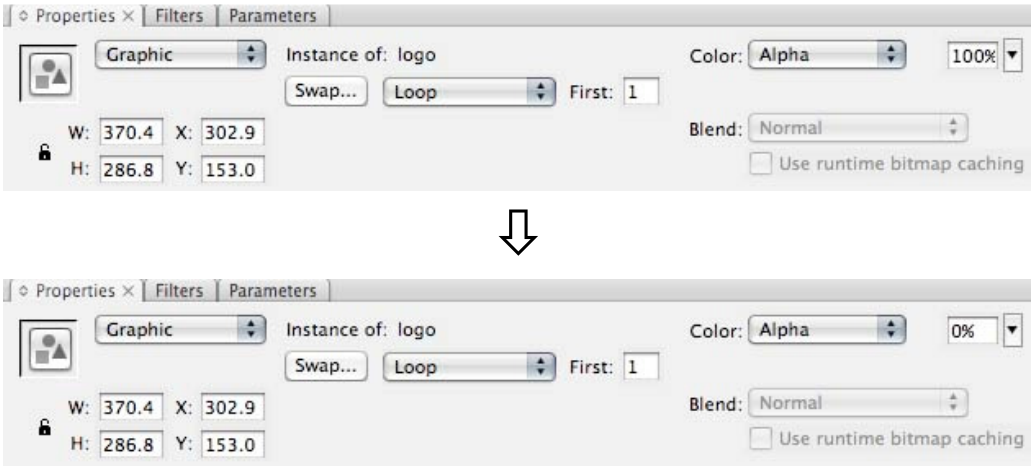
25. Select the logo symbol in the canvas. Add two keyframes at frame 1 and frame 5 and create the motion tween.



26. Click the symbol in the canvas again, the property palette has been changed into the property of the symbol itself.

27. Toggle the Colour type into “Alpha”

28. Change the parameter next to “Colour” into 0.



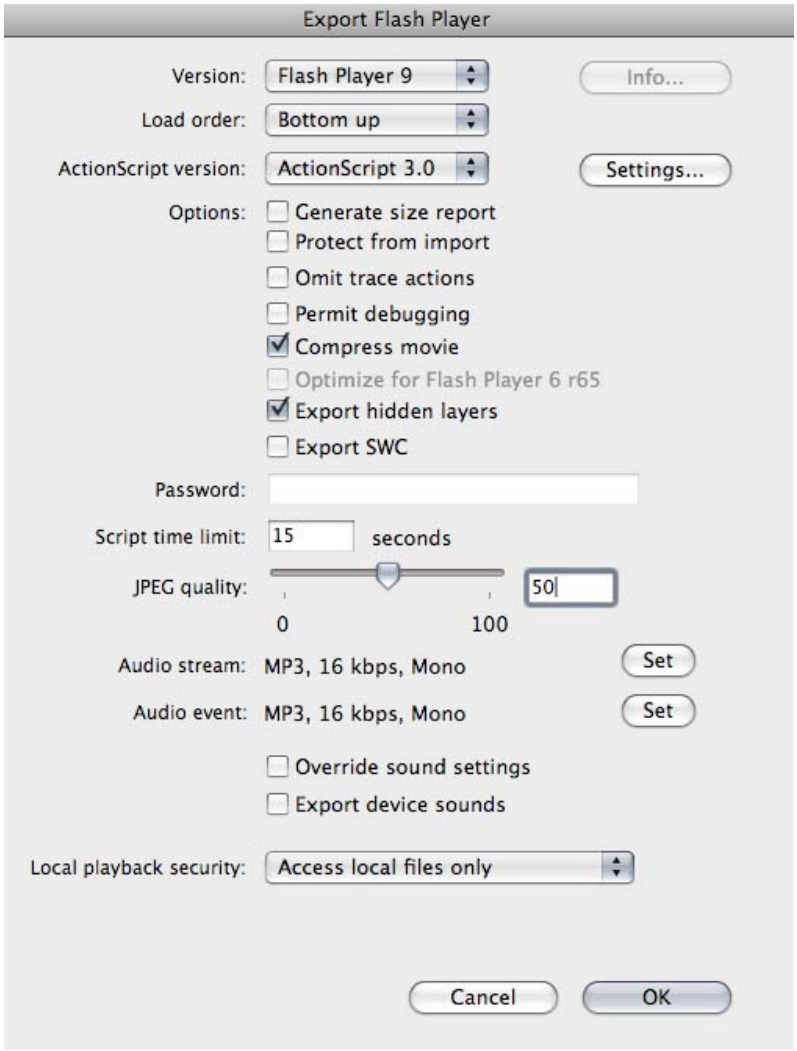
29. Test the animation again and a logo fades in.

30. Repeat the step 23 to 27 at the end of this animation. A fading out effect is applying to this logo animation too.

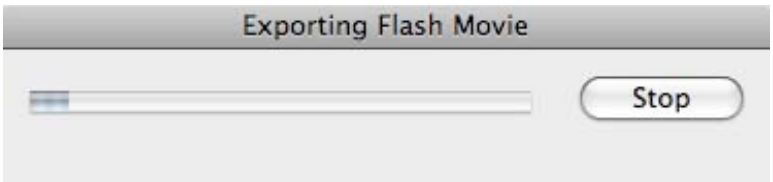
31. Test the animation one more time.

Part 3: Exporting the animation

1. Select File > Export > Export Movie…
2. Save as "vtc_logo.swf" and press "OK".
3. Try these settings:



4. A progress bar shows and disappears when it is done.



5. Done.

Appendix - 3D Animation

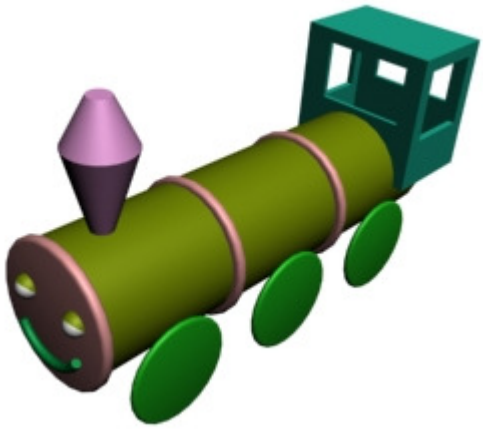
Practical Task 1: Primitive modelling

After completing this lesson, you should be able to:

1) Use Primitive objects to create simple effective models
2) Manipulate object parameters to refine your model's objects
3) Understand the usage of the tools: cloning and Array
4) Use Boolean operations
5) Assemble objects together using Attach, Groups and Linking

What is Geometric Primitives?

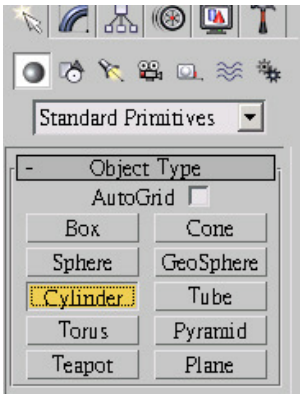
All 3D modelling computer programs provide a collection of tools for creating simple shapes with a fixed structure known as geometric primitives, such as: cubes, spheres, cylinders, cones and toruses. They are standard shapes that the modelling program can create and manipulate effortlessly and usually from a simple predefined mathematical description. Geometric primitives may be modified or used to build more complex objects with a variety of utility tools for trimming, attaching and blending, among others.



Getting Started

1. *Reset* the file

2. Go to Create Panel and create a cylinder



3. In the front view, click and create a cylinder with radius 30 units and height - 210 units.

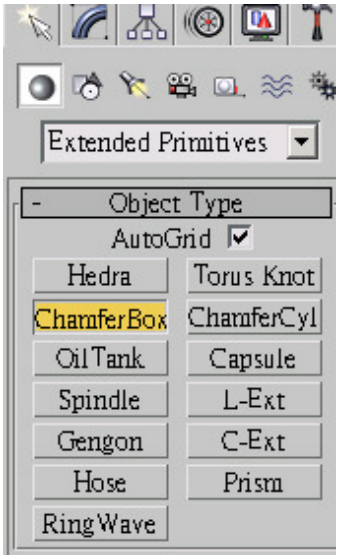
4. Go to the Modify panel and change the parameter as follows
   Radius: 30
   Height: -210
   Height Segments: 1
   Sides: 24

5. Change the name of the cylinder to: Train Body at the top of the Modify panel (Object

Name edit box)

6. Go to the Create Panel and Select from the Pull down list: Extended Primitive (Extended Primitives comprises a collection of complex primitives)

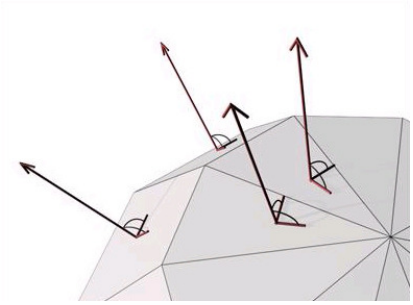
7. Select ChamferCyl (Chamfer Cylinder), then enable AutoGrid by clicking in the AutoGrid checkbox.



(AutoGrid lets you automatically create objects on the surface of other objects by generating and activating a temporary construction plane based on *normals* of the face that you click.)

What is normals?

NORMALS



The normal of each face can point in a different direction.

A normal is a vector that defines which way a face or vertex is pointing. The direction of the normal indicates the front, or outer surface of the face or vertex.)

8. In the front view, drag over the front face of the cylinder. A temporary grid appears as you drag over the face.

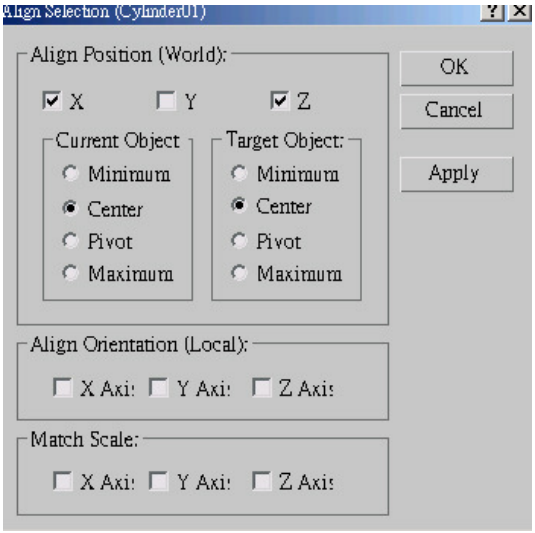
9. Adjust the parameter at modify panel as:

Radius:	32.5
Height:	5.0
Fillet:	2.5

Fillet Segs: 4
Sides: 24

10. Rename this object to Train Body Rim

11. With the Train Body Rim object selected, click on the Align Tool button in the Main Toolbar. Select the Train body object and the Align Selection dialog



12. Turn off auto grid

13. Create a Box and modify it parameter as:
Length: 50 Width: 70.0 Height: 70

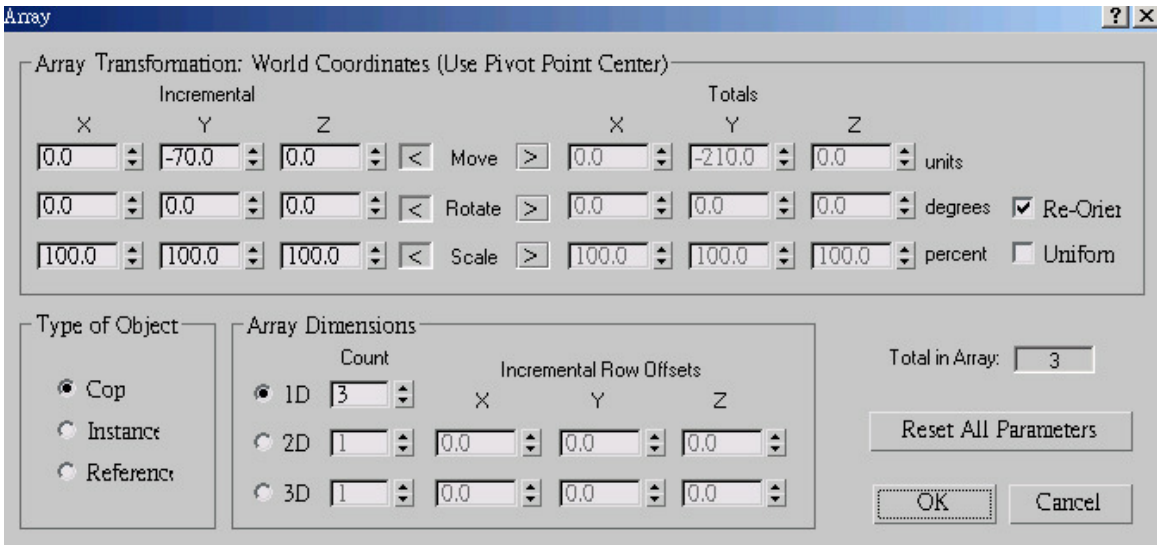
14. Rename the Box to Train Cabin and align it to the end of the Train Body

Understand Array

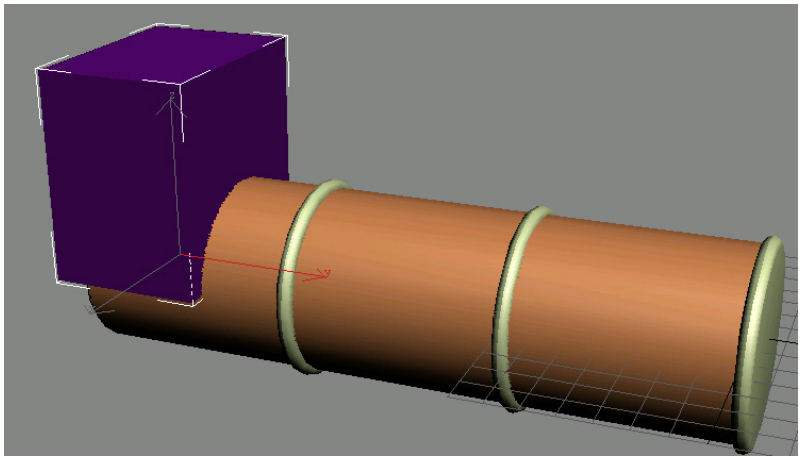
15. Select the Train Body Rim object

16. Click the Array icon and change the parameter as following:

The



cylinder

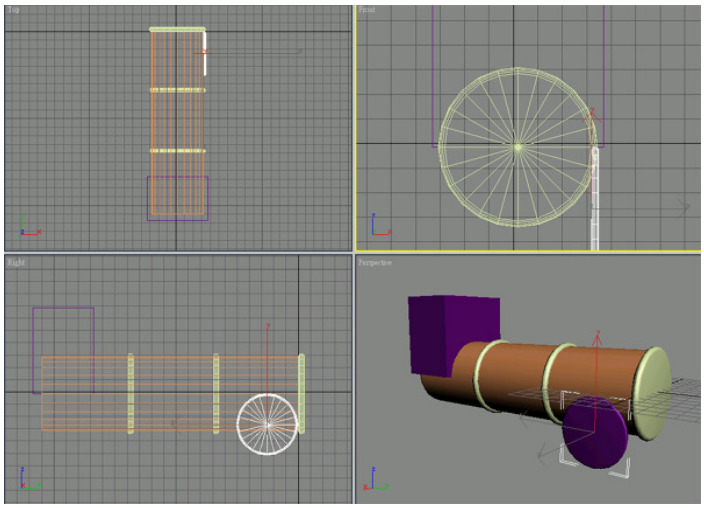


17. In the Left viewport create a chamfered cylinder with the following parameter

Radius:	25.0
Height:	3.0
Fillet:	1.5
Fillet Segs:	3
Sides:	24

- **Rename the object to Train Wheel**

18. Align the wheel as follow:



19. Create a Cylinder in the Left viewport with the following value:

Radius:	2.0
Height:	60.0
Height Segments:	1
Sides:	12

- **Rename the cylinder to Axle**

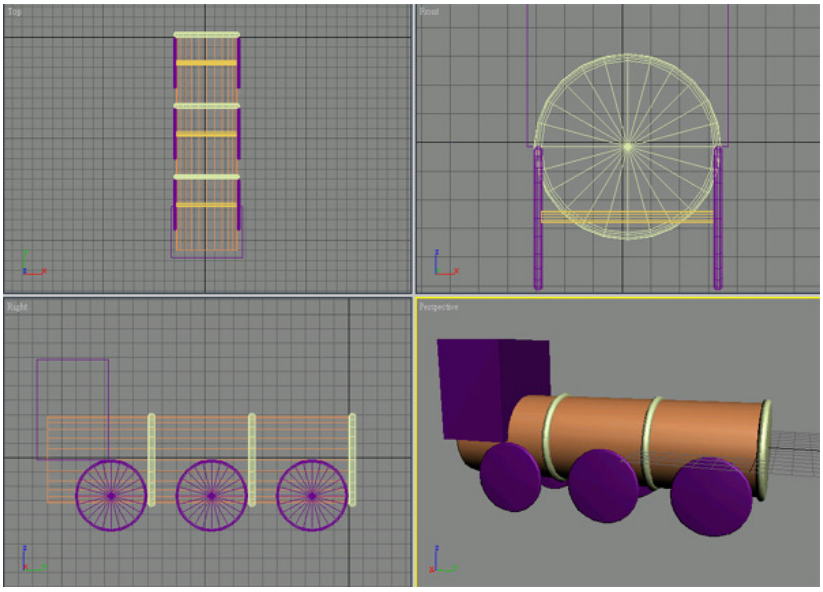
20. Use the Align tool to center the Axle to the Train Wheel

21. Cone the Train Wheel and move it toward another side of the Axle

22. Align the new wheel to another face of the Axle

23. Select the two wheels and the Axle and select Group from the Group pull down menu. Name the Group to Wheel Assembly

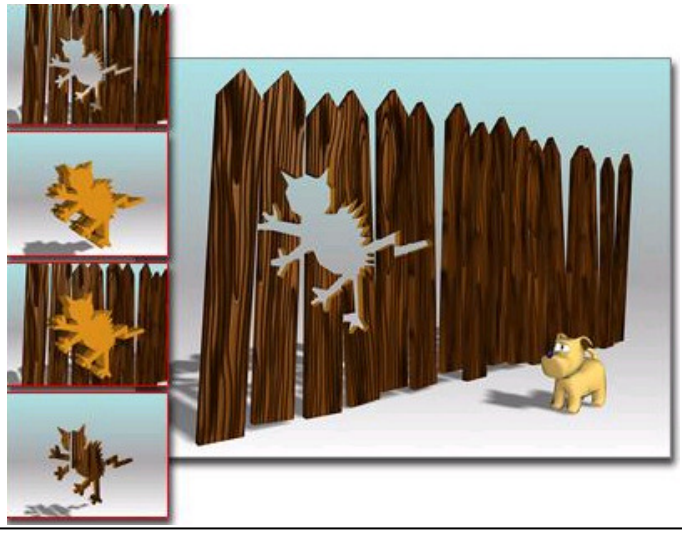
24. Create an Array of the Wheel Assembly group, so that there are 3 wheel assemblies instanced along the length of the Train Body.



- **Using Boolean Operation to create the cab:**

Understand Boolean

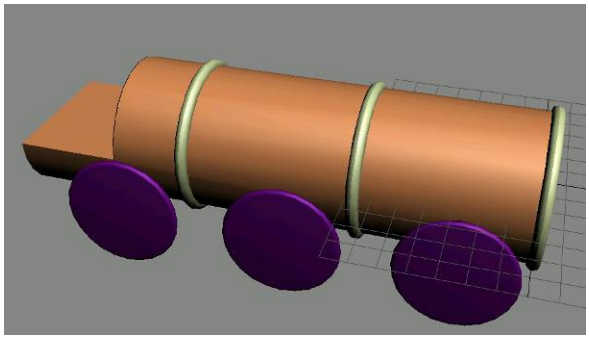
A Boolean object combines 2 objects by performing a Boolean operation on them. In the software, a Boolean object is made from 2 overlapping objects. The original 2 objects are the operands (A and B) and the Boolean object itself is the result of the operation. There are 3 operations: Union, Intersection, and different.



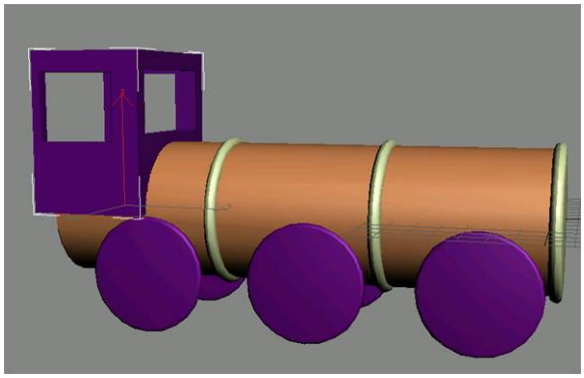
25. Clone the train Cabinet and hide the new Cabinet at the Display Panel.

26. Select the Train body and the Boolean Compound Object icon at the Compound Tab

27. Pick the Operand B button and select the Train Cabin object.



28. Unhide all (display panel) and complete the Train Cabinet as following (with the use of Boolean):



A polygon is a type of deformable object. Polygons are useful for creating complex object. You can convert a primitive geometry into an editable Polygon.

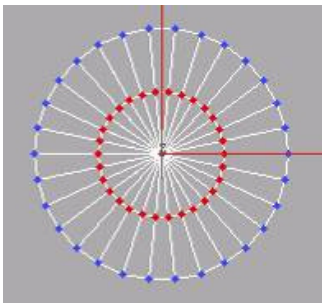
The method of modeling in polygon is to start with a simple primitive, collapse it to an editable polygon, and then move vertices and extrude and scale polygons to get the basic form you want

Practical Task 2: Polygon modelling

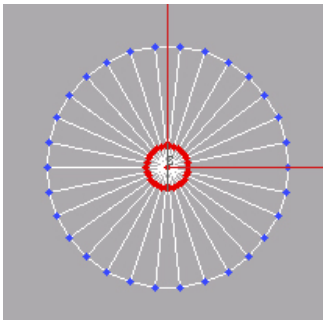
1. In the front viewport, drag out a cylinder with the following dimensions:
   Radius: 150
   Height: 100
   Height Segments: 2
   Cap Segments: 2
   Sides: 30

2. In the Modify panel, right-click cylinder in the stack and choose “Convert To: Convert to Editable polygon”.

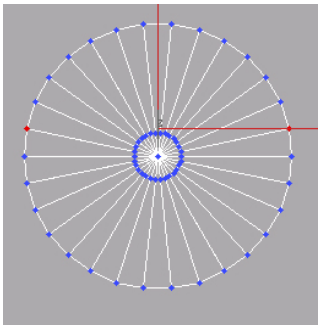
3. 3. Go to the “vertex sub-object level”. With the Circular option chosen from the Selection Region “flyout”, select the inner ring of vertices of the “cylindercap”.



4. With the Non-uniform Scale tool, scale these vertices down.

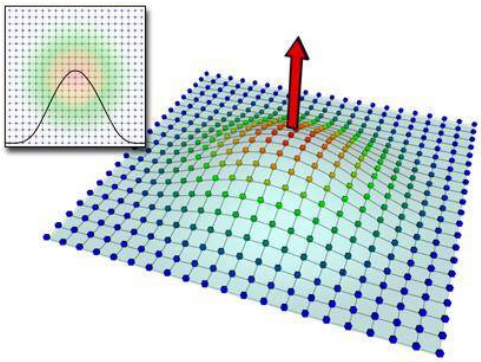


5. In the front view, select the vertices on the perimeter of the cylinder that are just above the vertices in the midsection of the circle.

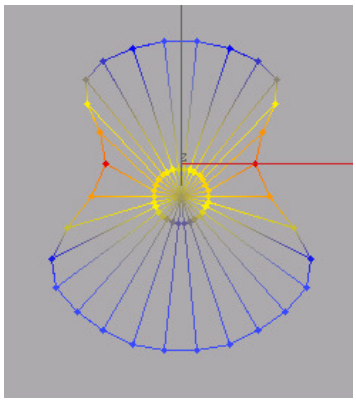


6. Check use Soft selection and set the falloff to 125.

   (The Soft Selection controls make a sub-object selection behave as if surrounded by a "magnetic field." Unselected sub-objects within the field are drawn along smoothly while you transform the sub-object selection, the effect diminishing with distance. This falloff is visible in the viewports as a colour gradient surrounding the selection.)



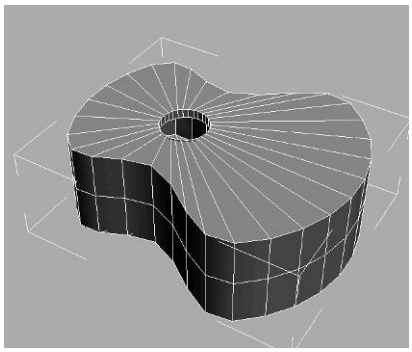
7. Nonuniformly scale the vertices toward the centre of the cylinder until a guitar-like form is achieved.



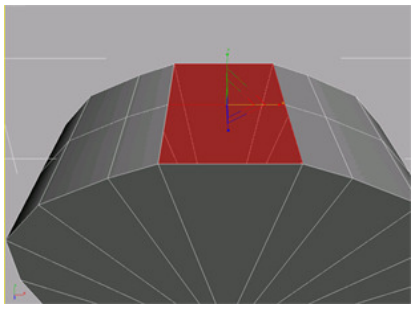
8. In the front view, move the inner circle to the upper half of the guitar.

9. Go to the bottom view, select the vertices of the inner circle. Click Collapse to collapse these vertices to a single vertex.

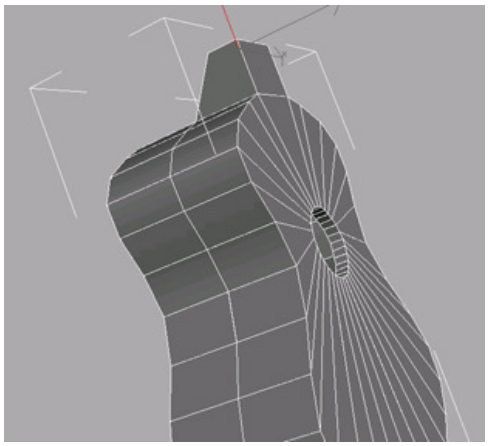
10. Go to Polygon sub-object level. Select the polys inside the inner circle on the front of the guitar. In the Edit Geometry rollout, click Extrude, type in a value of –5, and press Enter. Press the Delete key to create the hole of the guitar.



11. Select the two polygons at the very top of the guitar, non-uniformly scale them along the X axle



12. Select the top polygon toward the top of the guitar, perform an Extrude with a value of 40. Scale and Move the polygon



13. With the top polygon of the bridge still selected, extrude a value of 250 to form the bridge.

14. Use “Bevel” function to complete the end of the guitar.

Practical Task 3: Animation and Rendering

Every time we switch on our television or go into a cinema, we can easily watch a 3D logo animation before the TV program/movie start. A good logo animation design can help to recall audiences' memory of an organization.

Objectives:

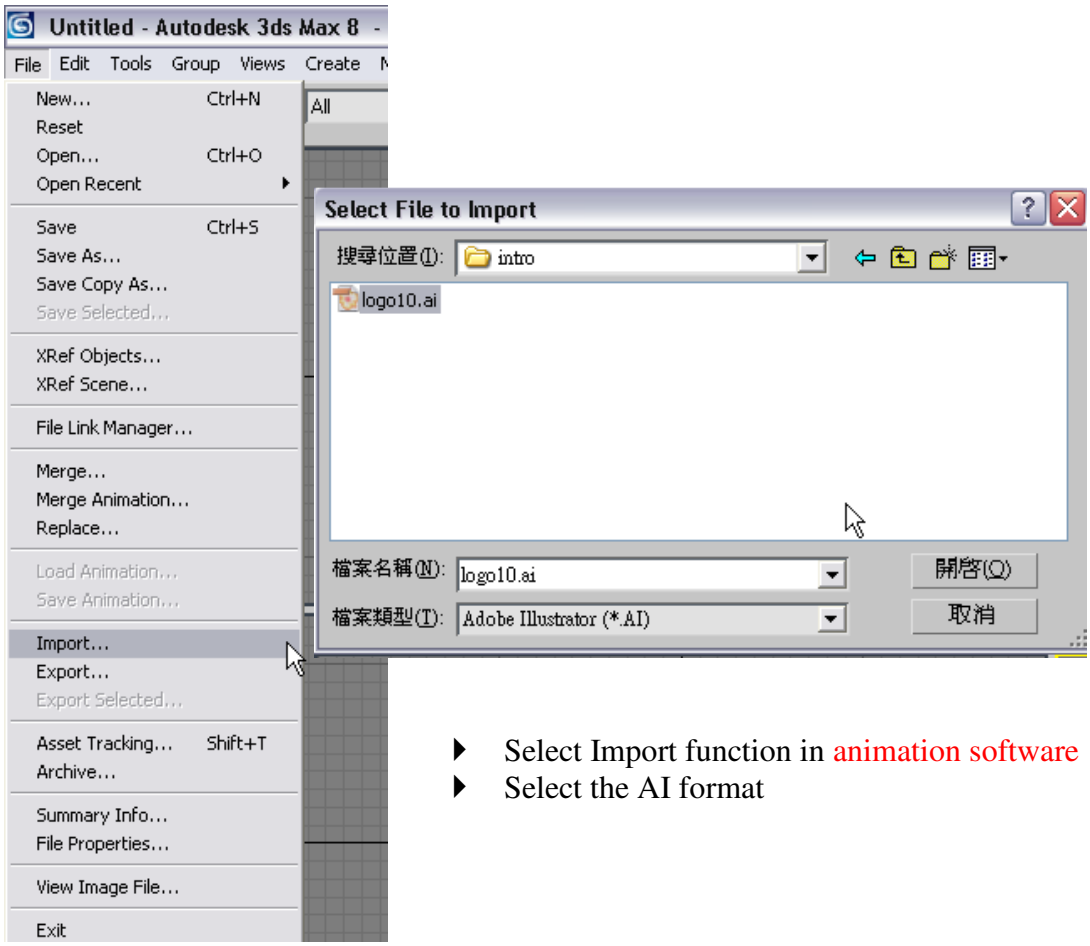
After completing this lesson, you should be able to:

1) Understand the basic 3D animation production workflow
2) Create your own 3D logo
3) Create a 3D camera
4) Completed a simple 3D logo animation

Preparation:

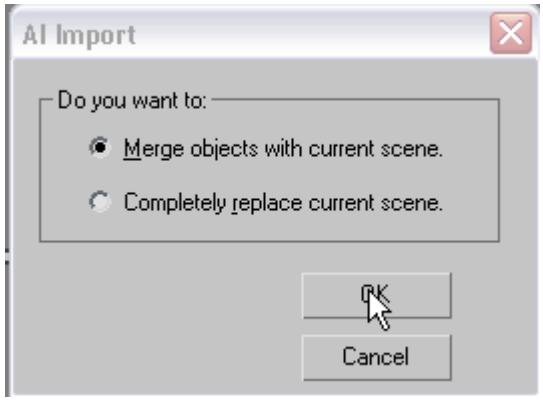
1) Design a Logo
2) Draw the logo it in Adobe Illustrator
3) Save it in AI format in version 8 or lower

Step 1: Import AI file into 3ds Max

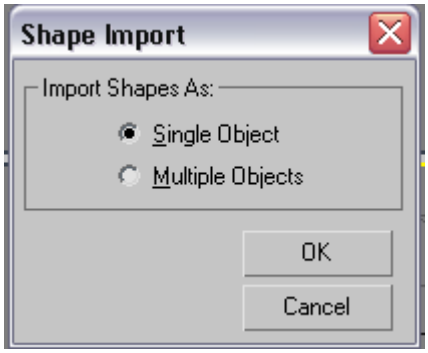


- Select Import function in animation software
- Select the AI format

- After you select the AI file, a pop-up window will appear and ask you to make a selection. If there is nothing else in your scene, you can select the first option "Merge objects with current scene" and click "OK"

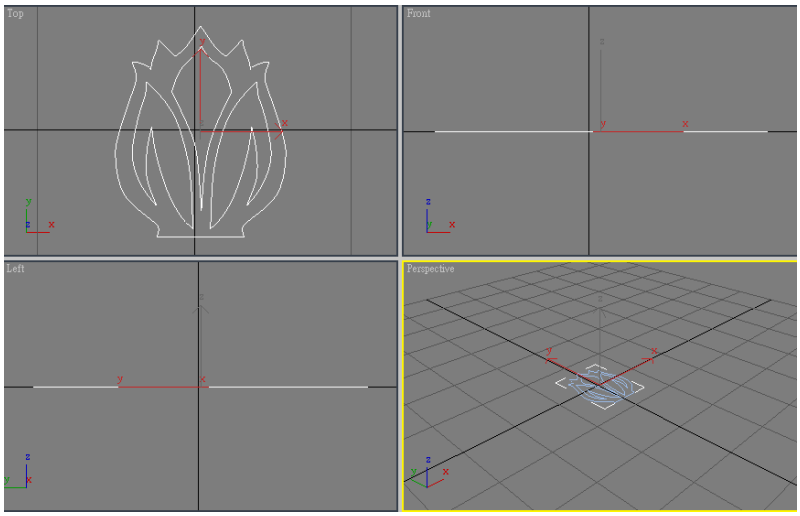


- Another Option box will appear and select the first option "Single Object".



Select "Single Object" can help you to group all logo elements into one single object

- The logo has already imported into the 3D environment as a "Editable Spline"

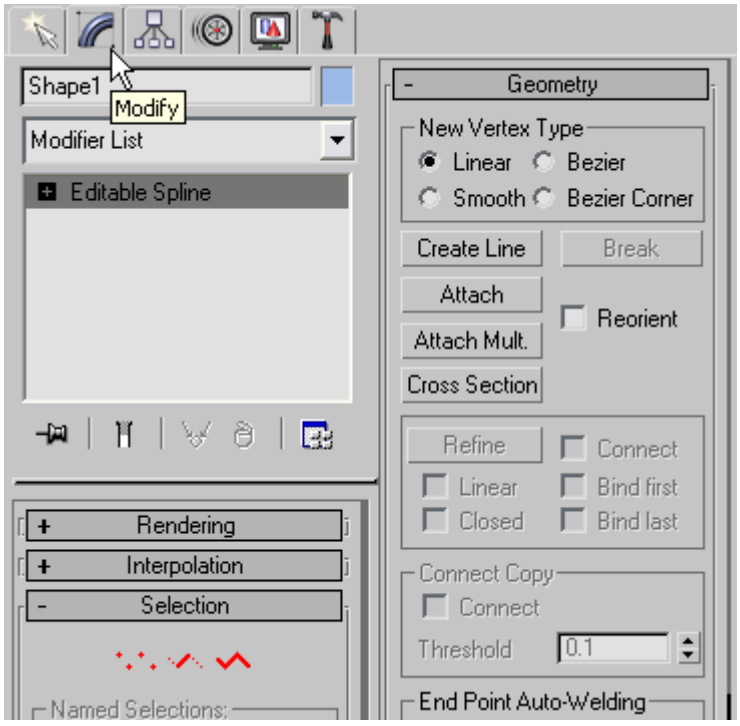


It may be too small and please scale it to a bigger size!!!

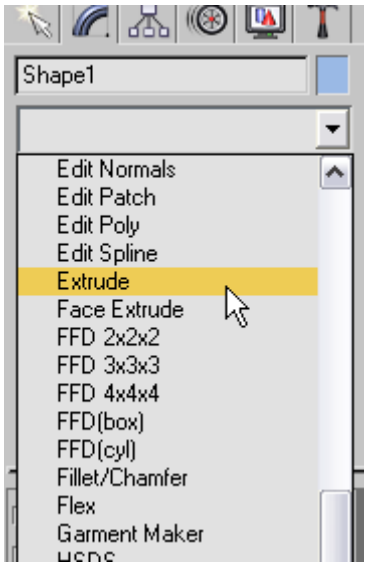
Step 2: Turn the lines into a 3D geometry

You imported the logo into the 3D environment and we are going to turn it into a 3D object.

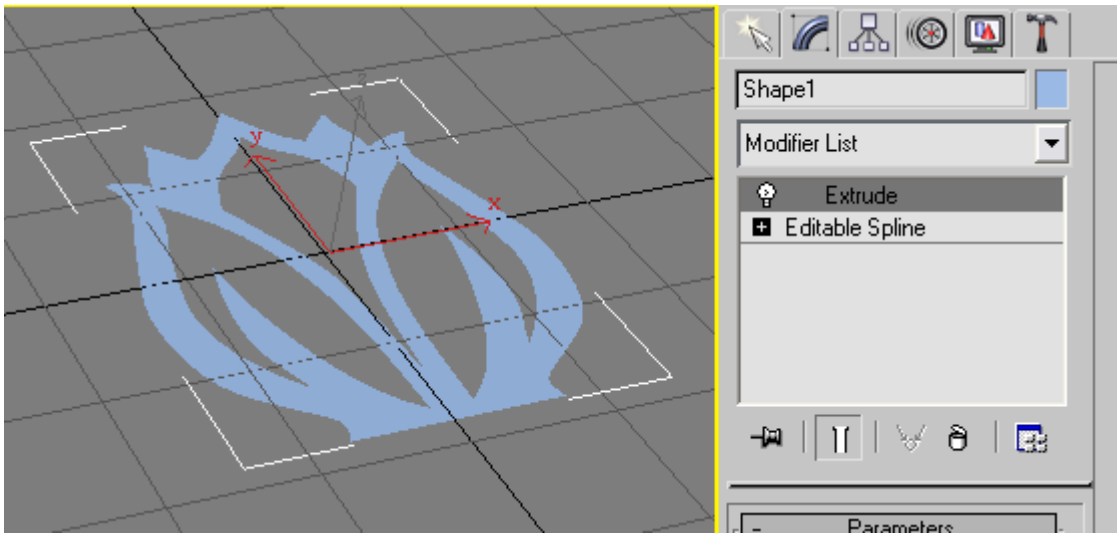
- Click on the Modify panel and you can see that the logo is a Spline. We are going to change it to a 3D geometry.



- Click on the Modifier List button and you can find a list of different modifiers. Select "Extrude".



- The logo is converted to a geometry and you can see the face of the logo

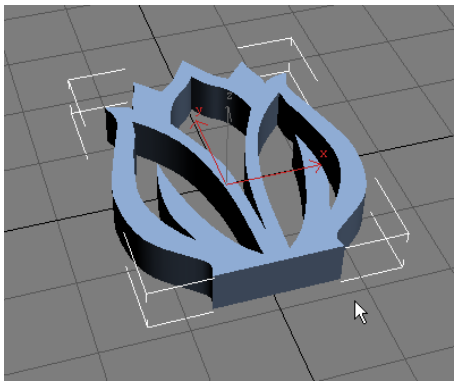


- To make it become a 3D object, we amend the parameter of the Extrude modifier to add depth to the shape.

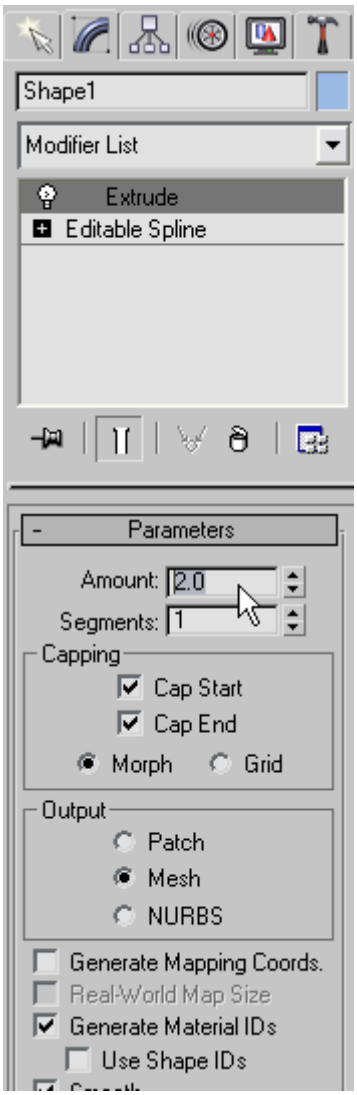
With the selection of the Extrude modifier, we amend the Parameter:

Amount: 2

— it sets the depth of the extrusion to 2 units.

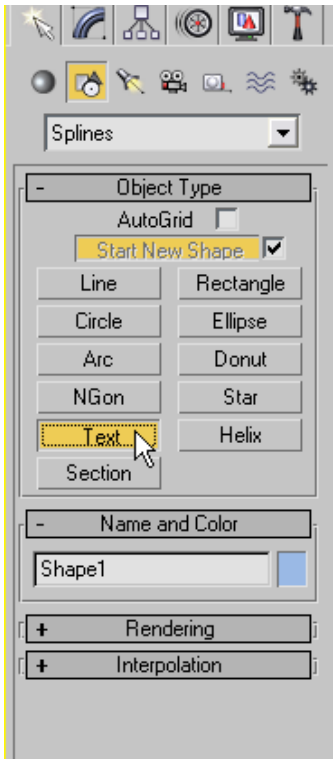


We converted the line into a 3D object!!!

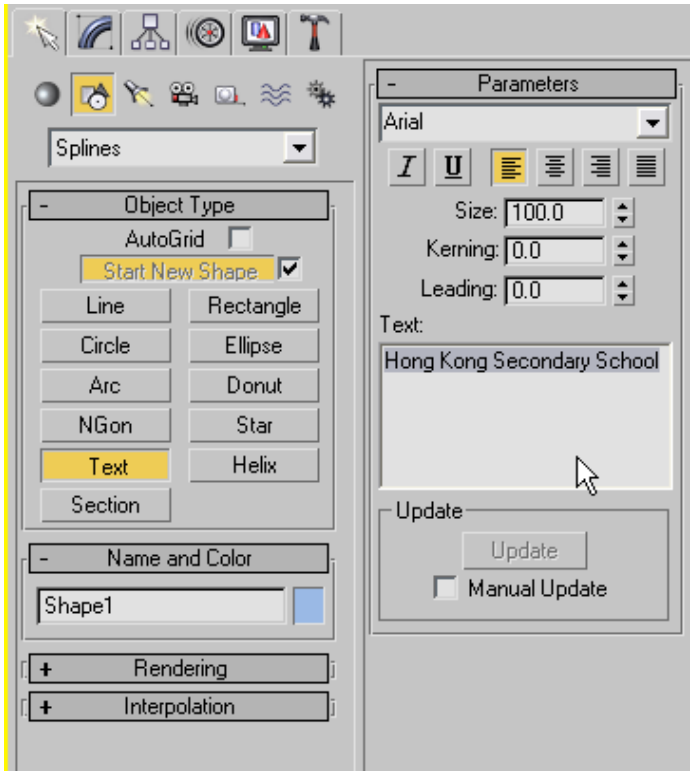


Step 3: Create the Wording

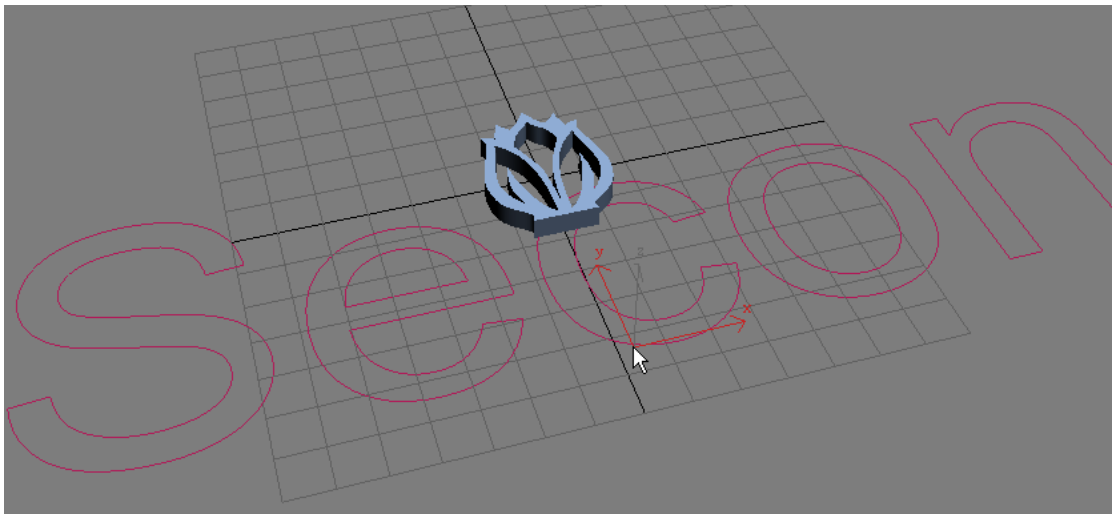
- Select the Create panel and click on the "Shape" mode  , then select the "Text" option to create the wordings.



- You can enter the wordings in the "Text" box and also change the word type according to your preference.

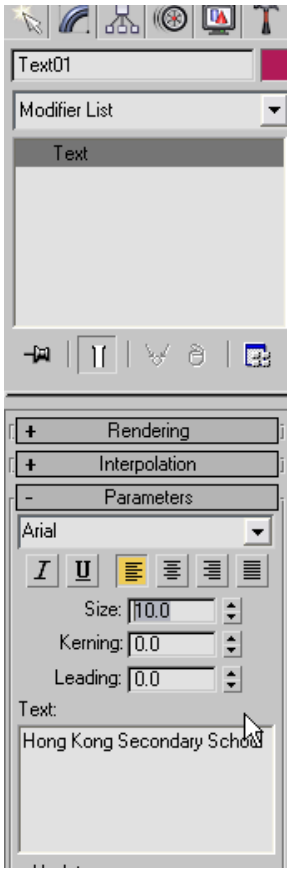


- Click your mouse on the viewport and the wordings appear on the viewport



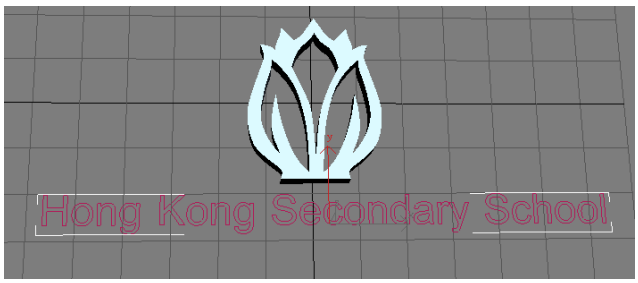
It may be extremely large and we will change it in the modifier panel.

- Turn on modifier panel and amend the wording parameters



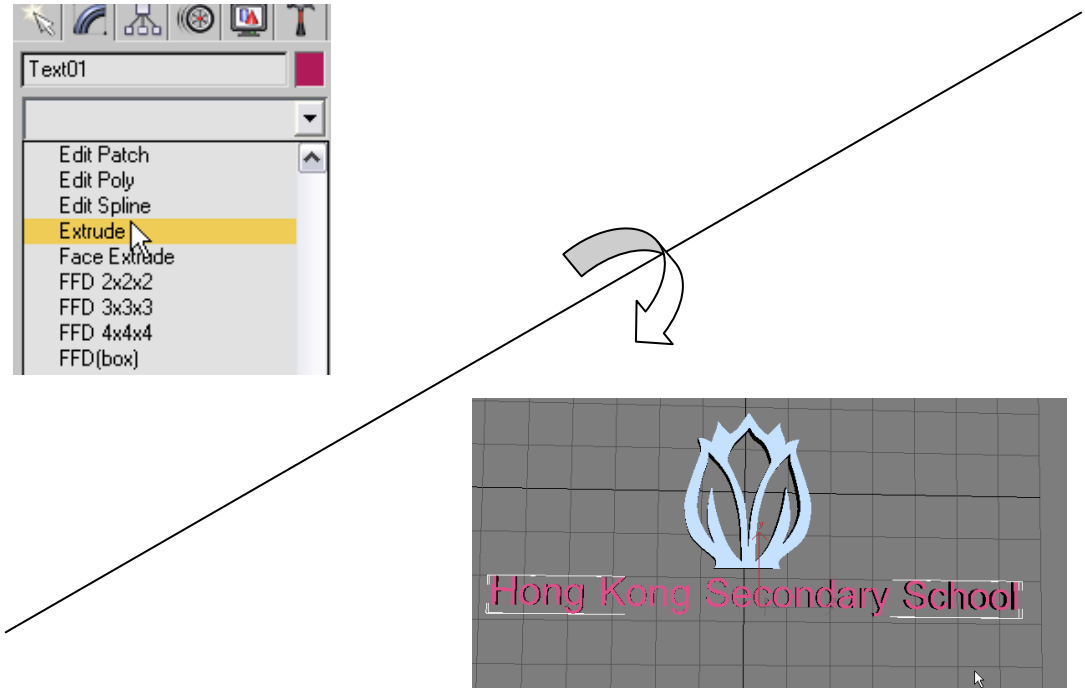
You can amend the parameters of the wordings:

Size:	Sets the text height
Kerning:	Sets the distance between letters
Leading:	Set the distance between lines
Text:	Amend the wordings



Step 4: Use "Extrude" Modifiers to create the 3D text

- In the modifier panel, select the Extrude modifier to create the 3D geometry.



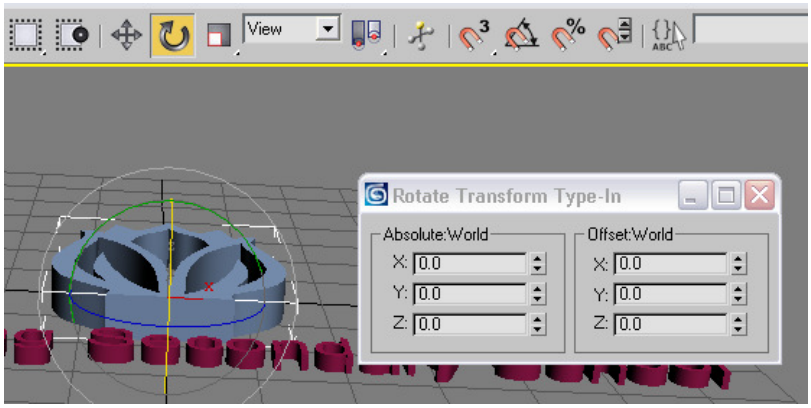
The 3D logo and wording are completed. If you want to make amendments, you can adjust the parameters on the modify panel.

Step 5: Create a Camera Animation

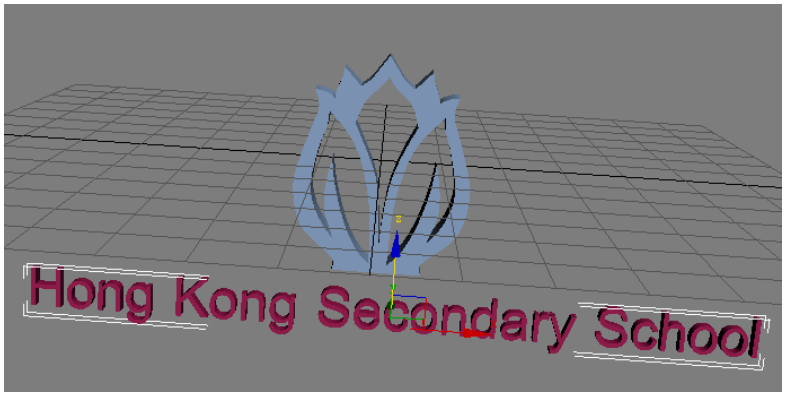
We will create camera movement in this section with the use of keyframe skills. 3D camera frames the scene, providing a controllable point of view. It offers a great deal of control over the look and feel of a 3D image.

Preparation:
Rotate the logo 90 degree along the X Axis.

- Select the logo and right click on the Rotation Button  , then enter "90" in the "Rotate Transform Type-in" box



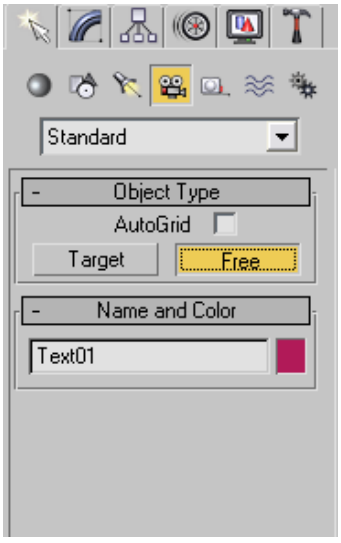
- Use the same way to rotate the wordings and change their positions.



Step 6: Create the 3D Camera:

We will create the camera on the front view

- On the Command panels, choose Create > Cameras > Free



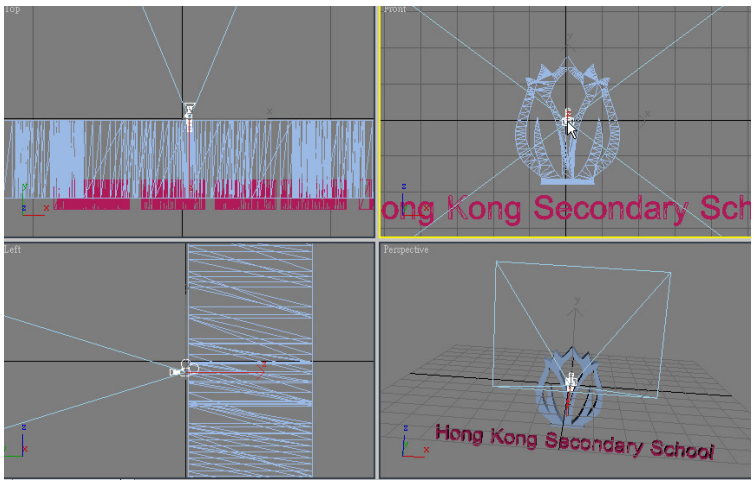
You can create 2 types of cameras:

a) Target camera:
Target cameras view the area around a target object. When you create a target camera, you see a two-part icon representing the camera and its target (a white box).

b) Free camera;
Free cameras view the area in the direction the camera is aimed. When you create a free camera, you see a singe icon representing the camera and its field of view.

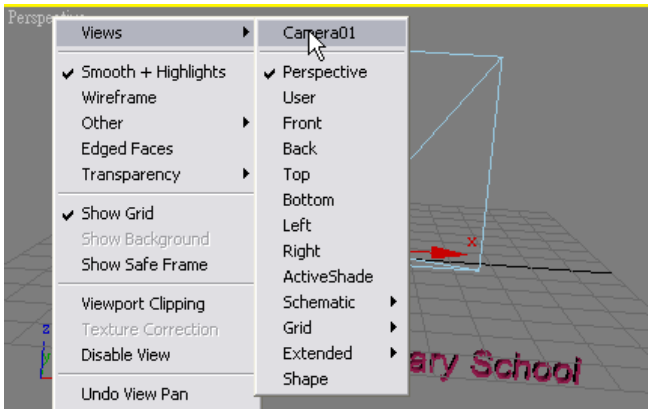
In our case, we create free camera

- With the Free camera icon highlighted, click to the front view.



- View the camera view

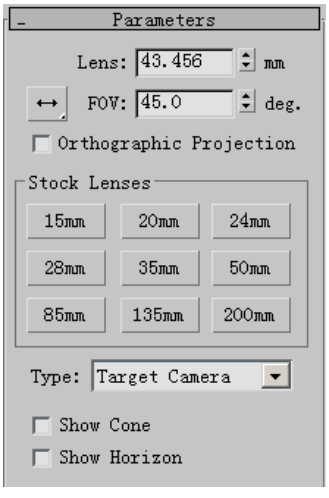
  If you want to change the Perspective view to camera, right-click on the Left corner of the viewport and select views > Camera 01 (short-cut key C)

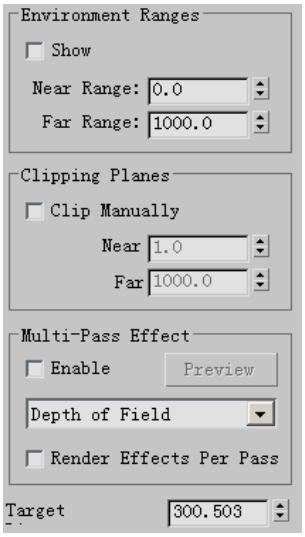


You are looking at the view of Camera 01.

Camera Parameter:

- Lens and FOV:



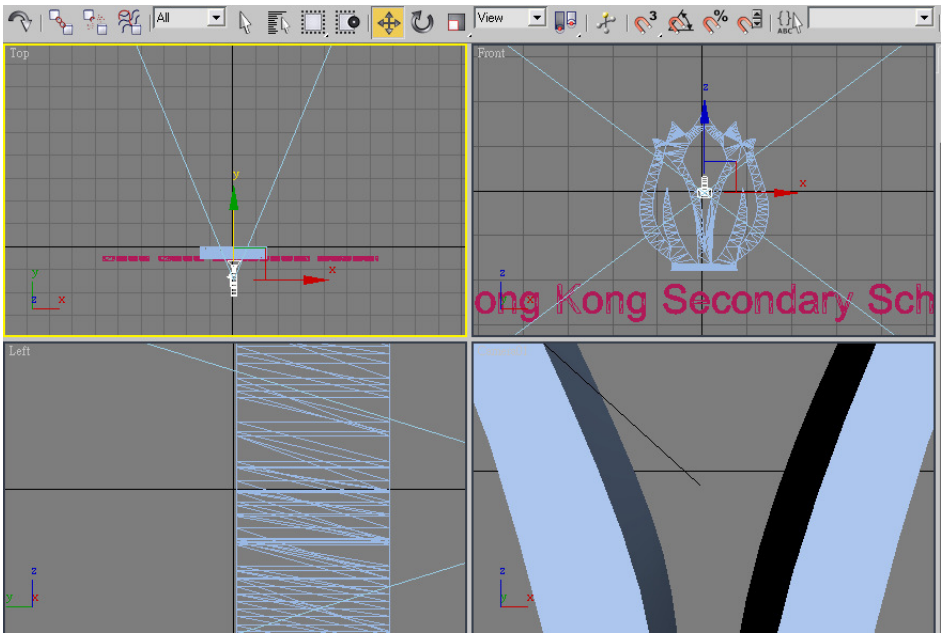


The Lens and FOV function together; changing the lens setting to millimetres also adjusts the camera's Field of View. In real cameras, the lens and the FOV function together, but various camera and lens setups have differing lens to FOV ration. The other factor influencing the FOV is the aspect ratio of the image, expressed as X/Y.

- FOV measurement buttons
  - The FOV is measured horizontally; this is the standard method of measuring FOV.
  - The FOV is measured vertically
  - The FOV is measured diagonally.

Step 7: Animate the camera

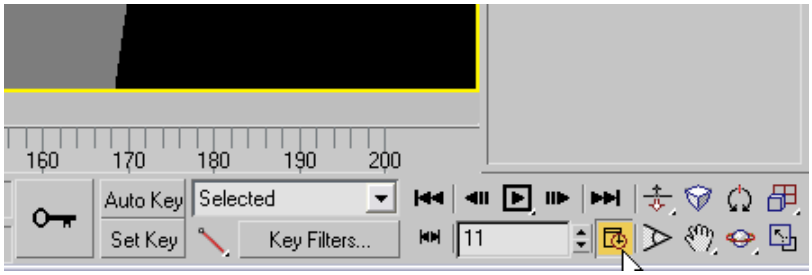
We are going to create camera movement animation.
Switch to the front view and select the camera with move button. When you move the camera, you can see that the camera 01 view is updated according to your movement.

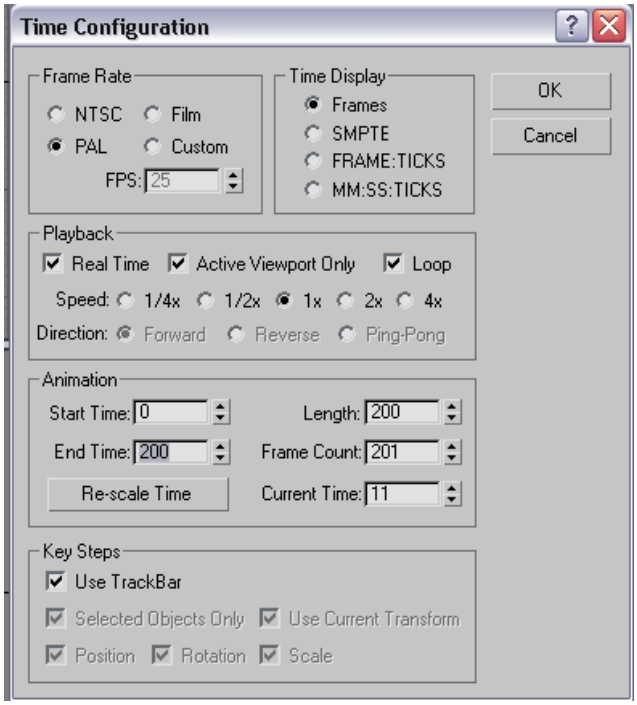


- Setup the timeline duration

We have to change the timeline duration from 100 to 200. Animation is created by the rapid change of a sequence of still pictures. In film and television industries, we use "frame rate per sec" to represent the number of picture will be displayed per sec. and it index the speed of the picture changed. In Hong Kong, our Television system uses 25 frames per system. If we want to create 10 seconds animation, the timeline should has: 25 frame x 10 sec – 250 frame duration.

Click on the Time Configuration Button on the right-bottom corner 





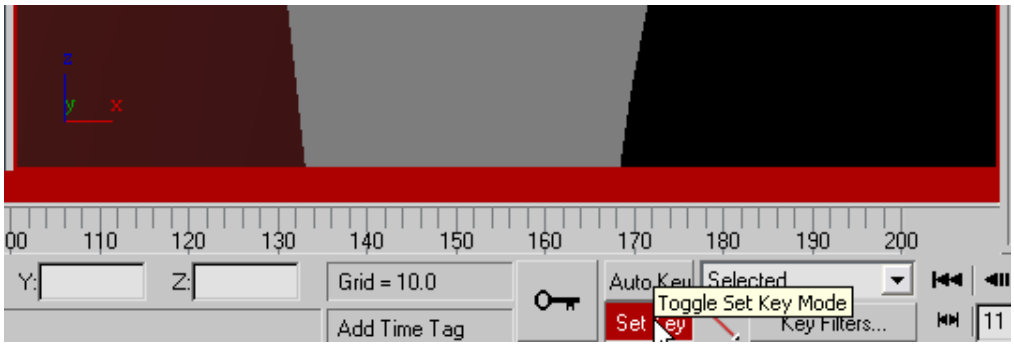
In the Time Configuration Dialogue Box:

1) Change the Frame Rate system to Pal.
2) Change the End Time to 200
   (For an 8 second animation)
3) Click OK to confirm the new setup

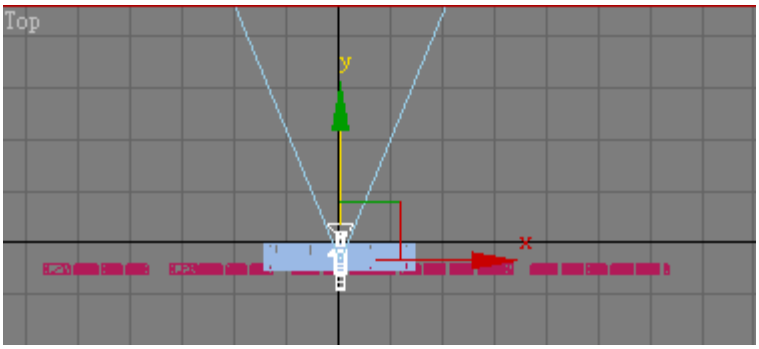
- Create Animation

In 3D animation software, you can have two methods to create animation – Auto Key and Set key. In Auto Key mode, all changes will be recorded and create animation automatically. In the Set Key mode, you have to confirm your selection after you change any parameter. In our logo animation, we will try Set Key mode.

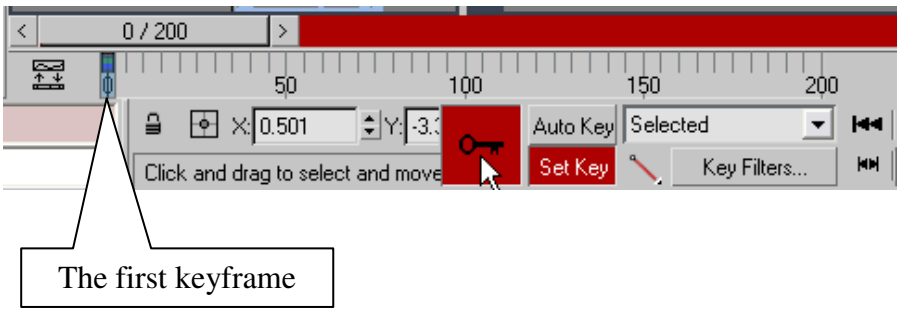
In the bottom of the window, select the Set Key Button



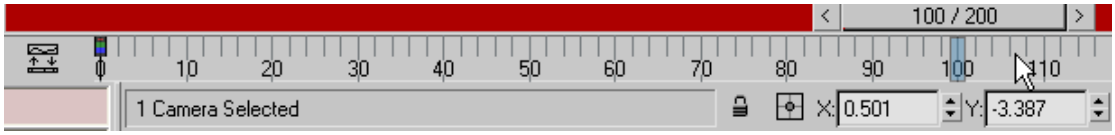
Change the position of the camera on the top view, move it close to the logo



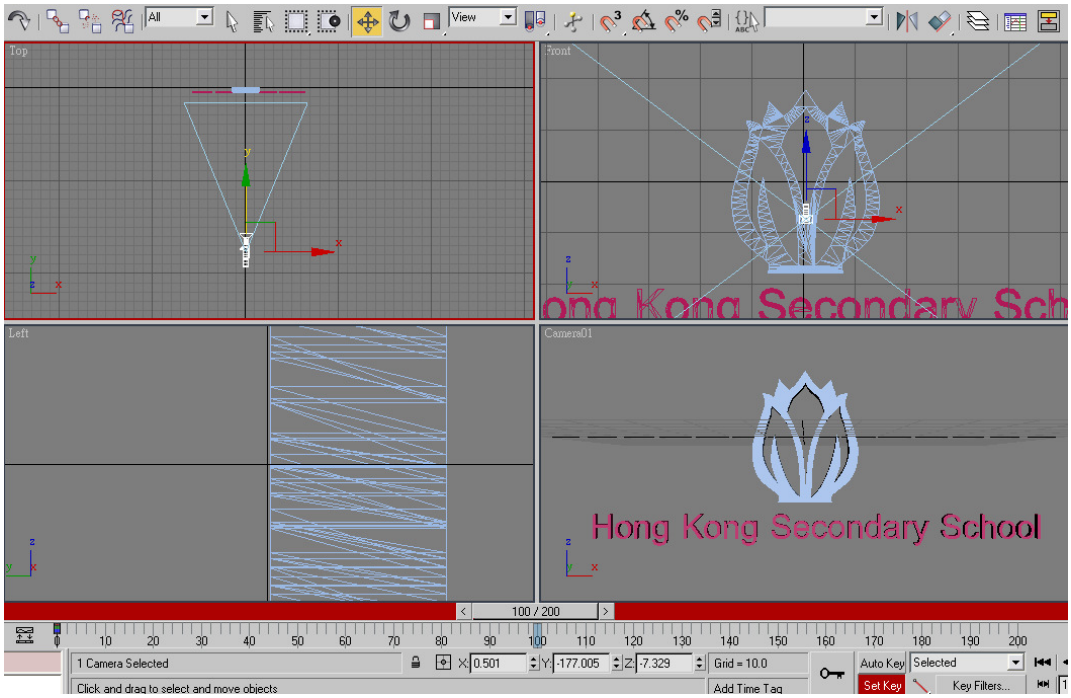
Click Set Keys  to create the first keyframe.



We are going to create a 4 sec camera animation, change the time indicator to 100 frames.



Move the camera backward (on the top view) until you see the whole logo in the Camera 01 view. Also adjust the position in the front view.



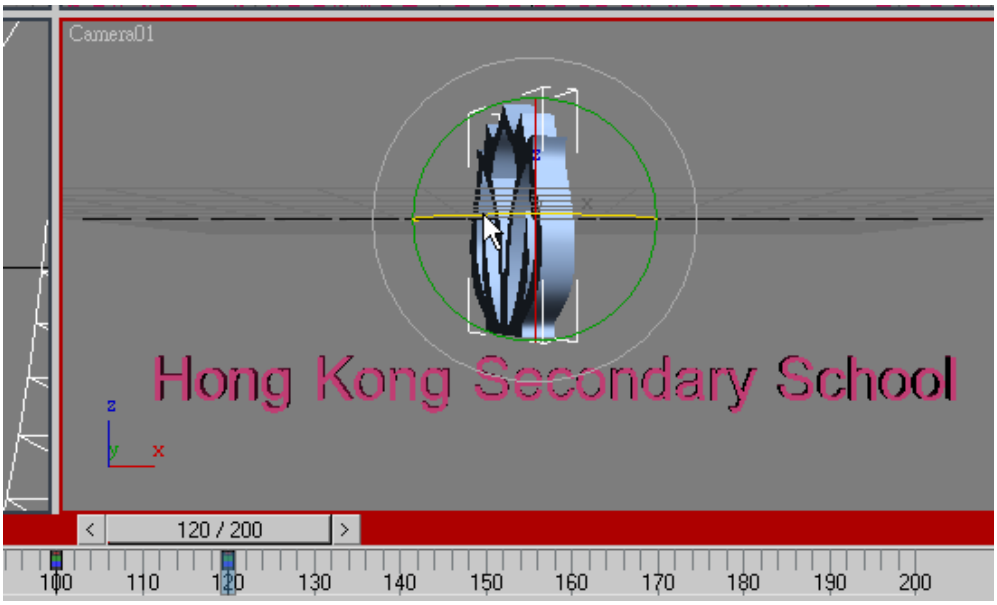
Click Set Keys  once you want to confirm the sec keyframe.

Now, you can see the animation that you have just created with the "play animation" button.

Step 8: Create the Logo Rotation Animation

We are now going to create rotation animation for the logo.

- Go to frame 100, where the camera animation just stop, select the logo and click on the Set Keys button  to create the first key frame.
- Go to frame 120, rotate the logo  and click Set Keys  to create the second key frame



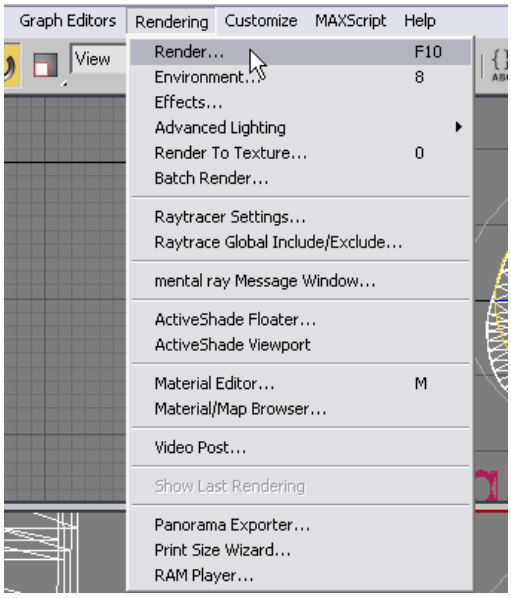
- Go to frame 120, rotate the logo  back to it original angle and click Set Keys  to create the last key frame.

  We have just created the logo animation after the camera movement. You can use the same method to create your own logo animation!!!

Step 9: Final rendering

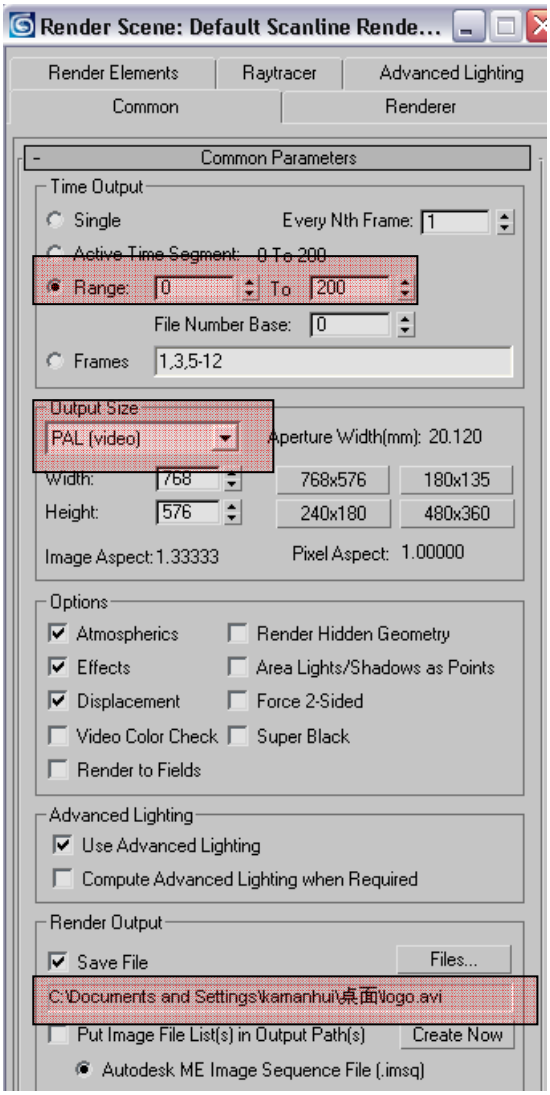
To output the logo animation, we have to render the pictures.

Select from the menu bar: *Rendering* > *render* or click the *Render Scene Dialog* button



The Render Scene Dialog

The COMMON panel is where you setup various parameters of the final output animation. It includes different specification of the frames you want to render: the resolution (size of the each picture), the time output (duration), the file path to save etc...

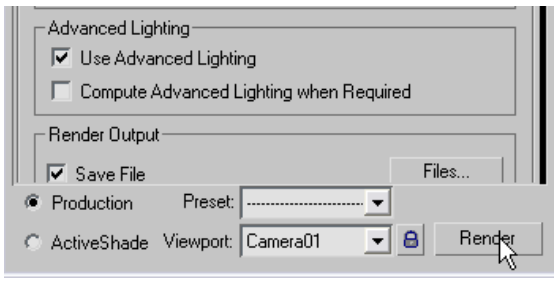


1) Time Output
   - Single：Render current frame
   - Active Time Segment：Renders the current range of frames shown on Track Bar
   - Range：render according to your selection of which frame to start and stop

2) Output Size：Give you control over the resolution and the pixel aspect of the final rendered picture
   - Preset drop-down list- This list provides instant access to a variety of industry image formats

3) Render Output: Specify the output path and select the video/picture format.

4) Click the Render Button to output the animation



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