

Cambridge International AS & A Level
Information Technology
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For examination from 2017

Topic 10 Sound and video editing
Sub-topic 10b Video editing

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Contents

Introduction.....	2
How to use this guide	2
Learning objectives	2
Prior knowledge and preparation	2
1. Key terms	3
2. Theory.....	5
3. Video editing tasks	7
Theme – clock work	7
4. Further resources	9
Free video files	9
Free editing tutorials	9
YouTube tutorials	9
5. Further study.....	10

Introduction

How to use this guide

The aim of this guide is to facilitate your teaching of Cambridge International AS & A Level Information Technology, syllabus topic 10, Sound and Video editing. The guidance and activities in this resource are designed to help teachers devise programmes of study for sound and video editing that provide teaching time devoted to theory work and opportunities for practical exercises.

Learning objectives

After reading this guide you should be able to teach the following learning objectives:

- edit a video clip to meet the requirements of its intended application and audience
 - set an aspect ratio
 - trim a video clip to remove unwanted footage
 - join together video clips
 - create text-based slides
 - create credits
 - add captions and subtitles
 - add fading effects
 - add animation effects
 - extract a still image from a video clip
 - insert a still image
 - add sound to a video clip
 - remove sound from a video clip
 - alter the speed of a video clip
 - export a video clip in different file formats
 - compress a video to different resolutions to suit different media (including: DVD, internet)
- describe how typical features found in video editing software are used in practice

Prior knowledge and preparation

Before you begin teaching this topic:

- Make sure you understand the concepts mentioned in the introduction to the theory section.
- Undertake some further study of the concepts using the resources suggested. This will be needed to provide depth to your knowledge and the ability to encourage students to explore these topics further than the examples provided.
- Tackle all the tasks and develop some extension material or additional tasks.

1. Key terms

Word/phrase	Meaning
movie	This is often used to refer to the published video. In most circumstances, the terms video and movie are synonymous.
timeline/storyboard	A 'display' of the sequence of the video project, to include: title frames, snapshots, video clips, credit frames etc.
video frame	A video or movie frame is a single picture or still shot, that is shown as part of a larger video clip. Many single frames are run in succession to produce what appears to be a seamless piece of film or videotape. A frame can be selected on its own to create a snapshot.
playhead	The playhead is the vertical line that indicates the current position in the storyboard. It can be moved manually and used to set the start point and end point of a video clip
snapshot	A single frame used as a still shot. This can be displayed for a selected duration.
video clip	A video clip is a small section of a larger video presentation. A series of video frames are run in succession to produce the final production. A compilation of video frames results in a video clip.
transitions	Video transitions are the visual movements as one snapshot or video clip changes to another. Most video editing applications have a number of preset transitions such as mix, dissolve, crossfade, wipe or a simple cut from one clip to another.
visual effects	Video effects differ from video transitions. The effect is applied to the snapshot or clip rather than to the change from one snapshot or clip to another. There are many effects that are often available in video editing applications such as colour replacement, animated effects, pixelisation, blurring, lighting effects, etc.
aspect ratio	The width of a picture (or screen) in relation to its height. Ratios are expressed in the form 'width × height'. For example, a 4 : 3 ratio means the picture is 4 units wide by 3 units high. The actual physical size of the picture is irrelevant; the aspect ratio refers only to the relationship between width and height. The common ratios for video are 4 : 3 (standard), 16 : 9 (widescreen) or 21 : 9 (cinemascope).
titles	Text on standalone clips, frames or snapshots usually at the start of a movie.
caption	Text superimposed on video. Captions can be used to add context to a scene. They are also sometimes used for viewers who are hearing impaired and will describe what is being said, emotions and background sounds. Captions can also be used for indexing and retrieval.

Key terms

credits	Opening or closing credits, in a movie, are shown at the beginning or the end of a movie and list the most important information about the production. They are usually shown as text superimposed on a blank screen or static pictures, or sometimes on top of action in the movie.
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You will also need to become familiar with some commonly used editing terms like:

- split
- trim
- capture.

2. Theory

The term video editing refers to the process of manipulating video images. It includes cutting segments (trimming), re-sequencing clips, and adding transitions and other special effects.

You do not need to be concerned with the technical aspects of video production, video signals or video equipment but it is good to be aware that the term **video editing** may apply to different forms.

The following three types are the most important:

- linear video editing, using tape to tape technology
- non-linear editing system (NLE), using computers with video editing software
- vision mixing, when working within live television and video production environments.

This qualification concentrates exclusively on **non-linear video editing** using video editing software.

There are many software packages that provide different levels of sophistication and various numbers of features.

For the purpose of the practical tasks set for this qualification, the free applications for Windows (Movie Maker®), Apple Mac (iMovie®) and Linux (Openshot®) are sufficient.

In addition to the production of a video or movie we need to consider the settings for saving and publication.

The video settings chosen determine the quality and file size of the published movie file. The file type, resolution and bit rate depend on the medium on which the movie is to be shown.

For example:

Medium	Resolution	Bit rate	Recommended use	Typical file size per minute of video
HD display	1920 x 1080 widescreen	25 Mbps	This setting produces the highest quality output in most situations. Because the quality is so high, files saved using this setting are larger than files saved at most other settings.	173 MB
Portable Device	960 x 720	10 Mbps	This setting is suitable for a portable device like a tablet or smartphone.	73 MB
PC	640 x 480	6 Mbps	This setting produces good-quality standard definition movies.	41 MB
Email	320 x 240	2 Mbps	This setting could keep the file size small enough for attaching to an email.	11 MB

There are many video file formats and not all devices record video in the same file format. The most common file formats are:

- AVI
- MPEG
- MP4
- WMV
- MOV.

Theory

For this qualification we do not need to be concerned with their technical details or their advantages and disadvantages. All video editing applications can import, save and publish the movies in most of the common formats.

Online services often still convert videos into FLV files or Flash video, as most web browsers on non-mobile devices can play these files.

3. Video editing tasks

Theme – clock work

These tasks are designed to be undertaken as a learning process covering most of the objectives listed above. Learners should be encouraged to use the tasks to explore the menu items and tools available in the video editing software.

Often there is more than one way to satisfy the requirements of the task. At first, the exercises should be about exploring a variety of options and not about determining the most efficient methods. It is recommended therefore, that learners begin the tasks without access to the tutorial material, which can be downloaded with this guide.

If the video application allows, it is better to undertake and save these tasks as a complete project rather than individual tasks. This will enable learners to revise and polish their work. The movies for each can still be saved for publication as required.

<p>Task 1</p> <ol style="list-style-type: none"> (1) Open the Countdown15.avi movie. (2) The sequence of the countdown is wrong. Split the movie into parts that enable the numbers to be re-ordered. (3) Remove the leading dashes (--) and replace with a title frame with '15 second timer' as the text. (4) Set the duration of the title frame to five seconds. (5) Add a zoom effect to the title frame. (6) Save the movie in an aspect ratio of 4 : 3 with a size of 640 × 480 in .mp4 format. 	<p>Task 2</p> <ol style="list-style-type: none"> (1) Use the images in the Countdown_Files folder to create a countdown timer from 10 to 1. (2) Ensure the numbers are in the correct sequence and each one is displayed for one second. (3) Add the Alarm.avi movie as a clip at the end of the movie. (4) Change the speed of the alarm clip so that it is five seconds long. (5) Take a snapshot of the alarm clock. (6) Add a caption with the text 'Countdown Complete' and display the caption for three seconds. (7) Add an effect to fade the snapshot to black. (8) Set an aspect ratio of 16 : 9. (9) Save the movie for viewing with a resolution of 854 × 480 as Countdown10.mp4.
<p>Task 3</p> <ol style="list-style-type: none"> (1) Add the Logo.png file to the end of the Countdown10 movie. (2) Set an animation to the image so that it pans from the top of the screen for three seconds. (3) Add credits to the movie. Insert the text 'Clock Work. Brought to you by <your name>' to show for a duration of five seconds. (4) Begin the credits with a 'Pixilate' animation. (5) Save the movie. 	<p>Task 4 – Use the files created in the sound editing tasks (sub-topic 10a) or the sound files provided.</p> <ol style="list-style-type: none"> (1) Add a title frame to the Countdown10 movie. Use '10 second timer' as the text. Set the duration of the title frame to five seconds. (2) Over dub the 'winding' sound (Winding_clock.mp3) with the title frame. (3) Overdub the 'clock ticking' sound (Clock_tick.mp3) with the countdown sequence. Ensure the clock ticking sound lasts for the whole countdown. (4) Overdub the 'alarm ringing' sound (Alarm_ring.mp3) with the alarm clock frames but not the 'Countdown Complete' caption or the logo and credits. (5) Save the movie.

Media files provided: Countdown15.avi; Countdown_files.zip; Alarm.avi; Logo.png; Winding_clock.mp3; Clock_tick.mp3; Alarm_ring.mp3. The files are included in the zip file with this guide.

4. Further resources

Free video files

<http://www.stockfootageforfree.com/>

Register for a free account to search for and download video clips.

<http://www.free-hd-footage.com/>

Search for royalty free files – no registration needed.

<http://www.hongkiat.com/blog/download-free-stock-video-intros/>

A list of websites for downloading free stock video introductions and footage.

Free editing tutorials

<http://www.iskysoft.com/video-editing/windows-movie-maker-tutorial.html>

10 tutorials for Windows Movie Maker.

<http://desktopvideo.about.com/od/imovietutorials/ss/imovietour.htm>

Getting started with iMovie.

<http://www.openshotusers.com/help/1.3/en/>

The official Openshot manual with step by step guides.

YouTube tutorials

https://www.youtube.com/results?search_query=video+editing+%2Bmoviemaker

Movie Maker tutorial videos at all levels.

https://www.youtube.com/results?search_query=video+editing+%2Bimovie

iMovie tutorial videos at all levels.

https://www.youtube.com/results?search_query=video+editing+%2Bopenshot

Openshot tutorial videos at all levels.

5. Further study

It is recommended that learners be encouraged to research the following questions independently.

1. Explain what is meant by the timeline in a video editing application.
2. Describe the features of a timeline.
3. Explain what is meant by aspect ratio.
4. List two commonly used aspect ratios.
5. Describe how you would trim a video clip to remove unwanted footage.
6. Explain what is meant by a transition.
7. Describe a common transition.
8. Describe three uses for text in a clip or still.
9. What resolution (width × height) would be suitable for a video intended for:
 - a. email
 - b. HD standard display (4 : 3)
 - c. a smartphone with a 720p display.
10. Explain the effect of setting higher frame rates.
11. Suggest why someone might want to convert a video file to FLV format.