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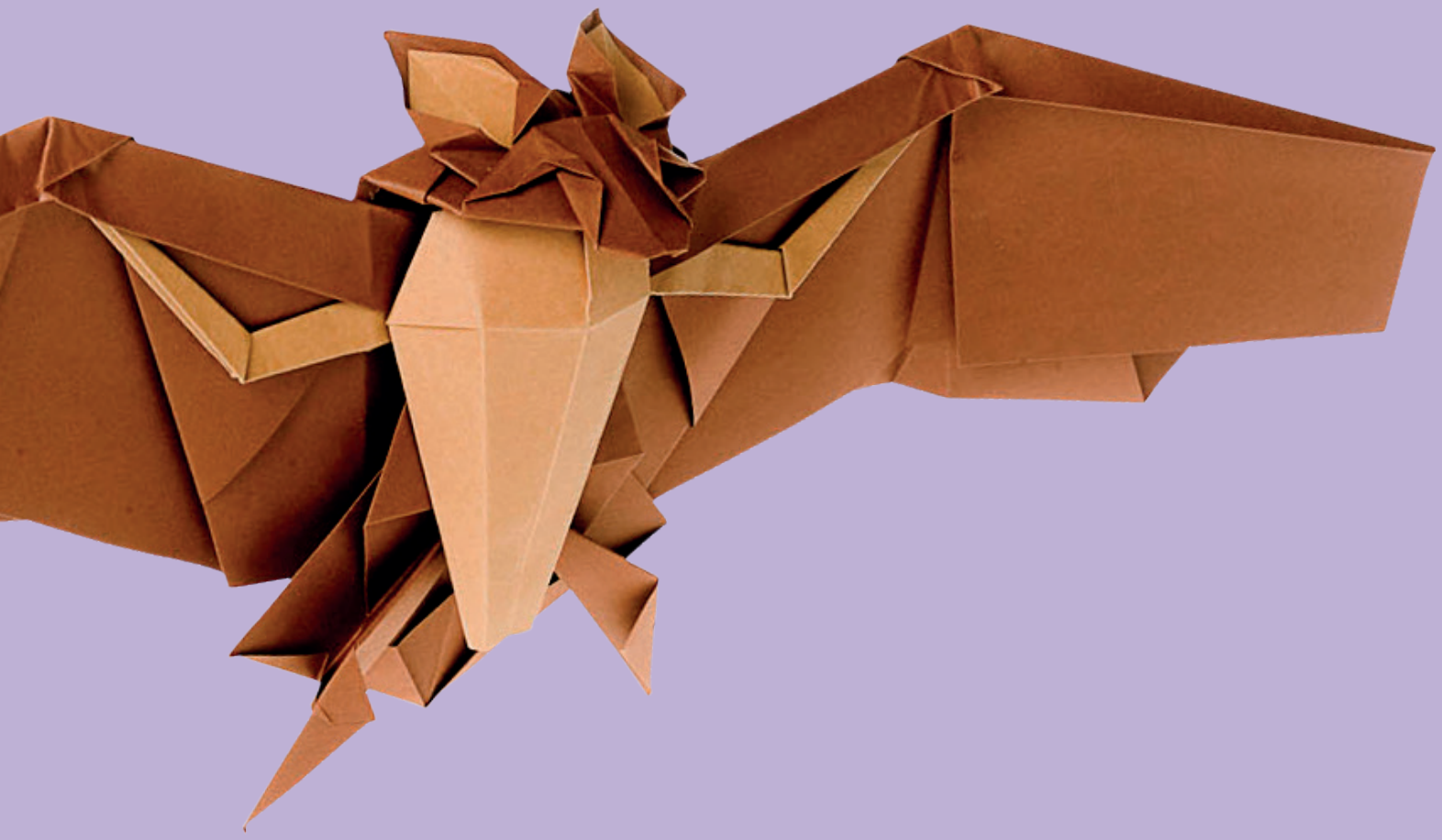

A Level Music Technology

Specification

Pearson Edexcel Level 3 Advanced GCE in Music Technology (9MT0)

First teaching from September 2017

First certification from 2019

Issue 1

Pearson

Contents

1 Introduction

Why choose Edexcel A Level Music Technology?

We've listened to feedback from all parts of the music technology community, including teachers, subject associations and higher education. We've used this opportunity of curriculum change to redesign qualifications so that they reflect the demands of the evolving music technology environment, allowing us to design qualifications that enable your students to apply themselves and give them the skills to succeed in their chosen field.

Clear emphasis on music technology, without the emphasis on music theory – We've retained the practical and theoretical elements of music technology which motivate your students and reduced the emphasis on music theory which we know some students have struggled with.

Keeping the engaging practical content your students love – We know that it's important that the content is relevant to your students and for them to see the practical application in everyday life. We've retained the practical tasks they love and ensured the theory is relevant to the technology they are using.

Equipping students with skills for higher education and beyond – Our content is designed to develop a broad range of skills including project management, appraising and analysis, creativity and imagination. Students will be able to progress to undergraduate study in Music Technology, Sound Production, Sound Engineering and many other courses requiring a similar skill set.

Clearly defined and accessible assessments – Despite an increased exam content, we've kept a lot of practical elements in the course and given higher weighting to the exam containing practical elements. We've also clearly defined the skills required in each of the NEA assessments to help you focus on the demands and outcomes of the tasks.

Trusted expert support when you need it – We share your passion for the subject and will support you through the introduction of the new specification and help you feel confident with the new content through training events, course planners, case studies, guides and mapping documents.

Supporting you in planning and implementing this qualification

Planning

- Our ***Getting Started*** guide gives you an overview of the new AS and A Level qualifications to help you to get to grips with the changes to content and assessment and to help you understand what these changes mean for you and your students.
- We will give you an editable **course planner** and **scheme of work** that you can adapt to suit your department.
- **Our mapping documents** highlight key differences between the new and 2008 qualifications.

Teaching and learning

There will be free teaching and learning support to help you deliver the new qualifications, including:

- editable **course planner** and **schemes of work** that you can adapt to suit your department
- support in delivering a the new **NEA tasks of recording and technology** based composition
- guidance on how to co-teach the AS and A Level qualification

Preparing for exams

We will also provide a range of resources to help you prepare your students for the assessments, including:

- access to past papers to allow you to develop homework and test resources,
- marked exemplars of student work with examiner commentaries.

ResultsPlus

ResultsPlus provides the most detailed analysis available of your students' exam performance. It can help you identify the topics and skills where further learning would benefit your students.

Get help and support

Our subject advisor service, led by Jeffery Hole, will ensure you receive help and guidance from us and that you can share ideas and information with other teachers. You can sign up to receive e-newsletters from Jeffery Hole to keep up to date with qualification updates and product and service news.

You can contact our Subject Advisors in a number of ways:

- through our website at qualifications.pearson.com/en/subjects/music.html
- by email at TeachingMusic@pearson.com
- by telephone on 020 7010 2176

Learn more at qualifications.pearson.com

Qualification at a glance

Content and assessment overview

The Pearson Edexcel Level 3 Advanced GCE in Music Technology consists of two externally-examined papers and two non-examined assessment components.

Students must submit their non-examined assessment (NEA) and complete the examinations in May/June in the year of certification.

Component 1: Recording (*component code: 9MT0/01)
Non-examined assessment: externally assessed ***20% of the qualification*** ***60 marks***
Content overview Production tools and techniques to capture, edit, process and mix an audio recording.
Assessment overview • One recording, chosen from a list of 10 songs provided by Pearson, consisting of a minimum of five compulsory instruments and two additional instruments, released on our website on 1st June in the calendar year preceding the year in which the qualification is to be awarded. • Keyboard tracks may be sequenced. • Total time must be between 3 minutes and 3½ minutes. • Logbook and authentication form must be supplied.

Component 2: Technology-based composition (*component code: 9MT0/02)
Non-examined assessment: externally assessed ***20% of the qualification*** ***60 marks***
Content overview Creating, editing, manipulating and structuring sounds to produce a technology-based composition.
Assessment overview • One technology-based composition chosen from three briefs set by Pearson released on our website on 1st September in the calendar year preceding the year in which the qualification is to be awarded. • Synthesis and sampling/audio manipulation and creative effects use must be included. • Total time must be 3 minutes. • Logbook and authentication form must be supplied.

*See *Appendix 7: Codes* for a description of this code and all other codes relevant to this qualification.

Component 3: Listening and analysing (*component code: 9MT0/03)

Written examination: 1 hour 30 minutes

25% of the qualification

75 marks

Content overview

- Knowledge and understanding of recording and production techniques and principles, in the context of a series of unfamiliar commercial recordings supplied by Pearson.
- Application of knowledge related to all three areas of study:
  - recording and production techniques for both corrective and creative purposes
  - principles of sound and audio technology
  - the development of recording and production technology.

Assessment overview

- This paper comprises two sections: A and B and all questions are compulsory.
- One audio CD with the unfamiliar commercial recordings to accompany questions on the paper will be provided per student.
- Section A: Listening and analysing (40 marks) – four questions, each based on unfamiliar commercial recordings supplied by Pearson (10 marks each).
- Section B: Extended written responses (35 marks) – two essay questions. One comparison question, which uses two unfamiliar commercial recordings from the CD (15 marks). The second essay uses the final unfamiliar commercial recording on the CD (20 marks).

Component 4: Producing and analysing (*component code: 9MT0/04)

Written/practical examination: 2 hours 15 minutes (plus 10 minutes setting–up time)
35% of the qualification

105 marks

Content overview

- Knowledge and understanding of editing, mixing and production techniques, to be applied to unfamiliar materials provided by Pearson in the examination.
- Application of knowledge related to two of the areas of study:
  - recording and production techniques for both corrective and creative purposes
  - principles of sound and audio technology.

Assessment overview

- This paper comprises two sections: A and B and all questions are compulsory.
- Each student will be provided with a set of audio/MIDI materials for the practical element of the examination, to include:
  - audio files relating to three instrumental/vocal parts.
  - a single MIDI file from which a fourth instrumental part will be created or synthesised.
- Students will correct and then combine the audio and MIDI materials to form a completed mix, which may include creating new tracks or parts from the materials provided.
- Section A: Producing and analysing (85 marks) – five questions related to the audio and MIDI materials provided that include both written responses and practical tasks.
- Section B: Extended written response (20 marks) – one essay focusing on a specific mixing scenario, signal path, effect or music technology hardware unit.

Overview of Areas of Study

Three Areas of Study underpin the whole specification, encouraging both breadth and depth of knowledge and understanding. In addition, within individual components, they provide a contextual focus for students' practical and theoretical work. They are:

Area of Study 1: Recording and production techniques for both corrective and creative purposes

In component 1, the focus of this Area of Study will be on the use of recording and mixing techniques to capture, edit and produce a recording. In component 2, the focus will be on the use of sound creation and manipulation techniques to create, edit and structure a technology-based composition. In component 3, the focus will be on the capture, arrangement of sounds and mixing and mastering techniques that have been used on a series of unfamiliar commercially available recordings and in component 4, the focus will be on use of sound creation and processing techniques to correct and mix a recording.

Area of Study 2: Principles of sound and audio technology

In component 3, the focus of this Area of Study will be the knowledge and understanding of the principles of sound and of audio technology in relation to unfamiliar commercially available recordings provided by Pearson in the exam. In component 4, the focus will be the knowledge and understanding of the principles of sound and of audio technology in relation to theoretical and practical contexts provided by Pearson in the exam.

Area of Study 3: The development of recording and production technology

In component 3, the focus of this Area of Study will be the knowledge and understanding of the history and development of recording and production technology from current digital technologies back to the mono, analogue recording technologies in the 1930s.

The table below identifies where each Area of Study is covered in the components. Please refer to *Appendix 3* for definitions of any acronyms used in each Area of Study.

Area of Study	Component
1: Recording and production techniques for both corrective and creative purposes	1: Recording 2: Technology-based composition 3: Listening and analysing 4: Producing and analysing
2: Principles of sound and audio technology	3: Listening and analysing 4: Producing and analysing
3: The development of recording and production technology	3: Listening and analysing

2 Subject content and assessment information

This qualification will support students in forming personal and meaningful relationships with music technology through the development of musical knowledge, understanding and skills. These include recording, technology-based composition, listening, analysing and producing. Students will be encouraged to engage with a wide range of music technology techniques and develop an understanding of the historical and cultural contexts of the use of music technology in the creation and production of music.

This qualification will also allow students to develop particular strengths and interests, encourage lifelong learning and provide access to higher education and university degree courses in music technology and music technology-related subjects, as well as music technology-related and other careers.

Qualification aims and objectives

The aims and objectives of this qualification are to enable students to:

- understand the principles of sound and audio technology and how they are used in creative and professional practice
- understand a wide range of recording and production techniques and how they are used in practice for both corrective and creative purposes
- develop recording skills to demonstrate an understanding of sound and its capture
- develop the skills to create and manipulate sound in imaginative and creative ways
- develop skills in critical and analytical listening to evaluate the use of sound and audio technology in students' own and others' work
- develop an understanding of the historical and cultural contexts of the use of technology in the creation, performance and production of music
- understand the interdependence of sound engineering knowledge, understanding and skills
- make links between the integrated activities of recording, processing, mixing, sound creation and creative music technology applications, underpinned by analytical listening
- understand the basic principles of acoustics, psycho-acoustics, and the digitalisation of sound
- understand the latest developments in music technology and the impact they have on technology-based composition, performance and the tonal qualities of recordings
- develop and extend the knowledge, understanding and skills needed to create recordings and technology-based compositions which communicate effectively to the listener
- understand the history and traditions of the sonic and musical applications of technology and how they promote personal, social, intellectual and cultural development
- develop the skills required to manage music technology projects from inception to completion, by evaluating and refining recordings and technology-based compositions over extended periods of time
- develop as effective and independent students, and as critical, creative and reflective thinkers with enquiring minds.

Component 1: Recording

Overview

The purpose of this component is to assess students' skills in capturing, editing and mixing sounds to produce an audio recording with increased sensitivity and control. Students will develop the skills to capture and manipulate sounds in corrective and creative ways in order to communicate effectively with listeners.

The recording relates to Area of Study 1: Recording and production techniques for both corrective and creative purposes.

Students will use technology to explore a range of techniques for capturing, editing and manipulating sound which will help them understand the impact of music technology on creative processes in the studio. They will then produce a completed mix.

Content

Skills, knowledge and understanding

Students will be required to demonstrate the ability to:

- use music production tools and techniques to capture sounds, including musical instruments with accuracy and control
- manipulate existing sounds and music with technical control and style to produce recordings
- use processing techniques effectively to produce a balanced final mix
- develop competence as a music producer and sound engineer by producing recordings
- use aural discrimination to evaluate music technology elements to refine recordings
- use music production tools and techniques to create new sounds and music with technical control and style
- develop effectiveness as a music producer and sound engineer by producing recordings.

Area of Study 1: Recording and production techniques for both corrective and creative purposes		
Topic	**Content**	**Skills, knowledge and understanding**
1.1 Software and hardware	The core and advanced functions of a digital audio workstation (DAW)	• Functions are detailed below in this table
	A range of hardware	• Microphones; audio interfaces; microphone pre-amps; DI boxes; mixing desks; outboard effects; guitar pedals
1.2 Capture of sound	Gain structure and how it affects noise and distortion	• Setting gain to maiximise signal-to noise-ratio • Avoiding clipping, interference and hiss • Pre-amp controls: phantom power; gain; pad; high pass filter; polarity; clip/activity LED
	Characteristics and suitability of microphones	• Dynamic, condenser • Directional microphones; (cardioid, hypercardioid and figure of eight polar patterns): omnidirectional microphones • Proximity effect • Microphone frequency responses • Sensitivity
	Microphone techniques	• Single and multiple microphone techniques • Placement distance and angle • Managing spill and background noise • Eliminating plosives
1.3 Audio editing	Truncating	• Scissor tool/split
	How to remove clicks and noise	• Fades and cross fades
	Audio editing functions	• Normalising and inverting waveforms

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.4 Pitch and rhythm correction and manipulation	How to correct inaccuracies in pitch	• For example, re-tuning a vocal part with automatic tuning • Manually tuning individual notes using pitch shift • Replacing small errors with material from elsewhere in the song
	How to correct inaccuracies in rhythm	• Replacing small errors with material from elsewhere in the song • Manually cutting and moving notes that are out of time
	Parameters that allow greater control and creativity	• Pitch: use of automatic tuning as a creative effect; response time; fine tuning in cents
1.5 Automation	Volume and pan automation	• Fades and movement in the stereo field
	Automating parameters of plug-ins	• For example, cut-off frequency and delay feedback
1.6 Dynamic processing	Uses of compression and gating	• Situations when you would use a compressor and or/gate • Limiting; expansion; de-essing • Pumping
	Core and advanced parameters of a compressor and gate	• Compressor threshold, ratio and make-up gain, attack, release, knee and side-chain • Gate threshold, attack, release, reduction/range
1.7 Stereo	Pan	• Setting pan positions for individual parts (tracks, instruments and/or vocals) in a recording
	Panning law, mono-summing and mid-side processing	• Stereo widening • Mono compatibility
1.8 EQ	Different types of EQ in a recording	• Low shelf; high shelf; band; low pass filter; high pass filter; band pass filter • Correcting problems including sibilance, noise and resonances
	How different parameters affect sound	• Gain; frequency/cut off; resonance; Q; slope

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.9 Effects	Core and advanced parameters	• Wet/dry and bypass settings • Core and advanced parameters as listed for each effect
	Reverb	• Room; hall; plate; spring, gated; reversed • Reverb time
	Delay	• Single and multi-tap; slapback; timed; ping pong • Delay time; feedback • Automatic double tracking (ADT)
	Modulated delay	• Flange; chorus; phaser • LFO rate; LFO depth; feedback
	Wah wah pedal	• Band pass filter
	Distortion	• Overdrive; fuzz • Gain/drive; tone • Amp modelling parameters: amps and speaker types; virtual mic type/placement
	Tremolo	• LFO rate; LFO depth
	Vocal effects	• Vocoder; Talk Box
1.10 Balance and blend	Balance	• The relative balance of parts (tracks, instruments and/or vocals)
	Blend	• How blend is affected by compression, EQ and effects
1.11 Mastering	Perceived volume	• Limiting
	Understanding how EQ is used in the mastering process	• Master EQ, e.g. high shelf boost and rumble (high pass) filter

Assessment Information

- First assessment summer 2019.
- Centres must ensure that recordings submitted are valid for the series in which they are submitted.

Assessment setting, taking and marking

Assessment setting

Students must choose one song from the list of 10 songs or artists released for the correct series and produce a stereo mix of that song that meets the requirements listed below.

A list of 10 new songs or artists will be released every year.

The list will be released:

- on 1st June in the calendar year preceding the year in which the qualification is to be awarded
- via the Pearson website.

The length of the recording must be between 3–3½ minutes. The recording should be captured and produced in the student's academic year of certification.

In order to be assessed, the recording must meet the following instrumentation requirements:

Instrumentation requirements	
Compulsory audio instruments You must record all of the instruments in this list. Each must be played for a total of at least 2 minutes.	**Additional audio instruments** You must record at least two different instruments from this list. Each must be played for a total of at least 1 minute.
Drum kit recorded with a minimum of four microphones Bass guitar or double bass Electric guitar Lead vocal Backing vocal	Acoustic melody instrument Acoustic guitar Keyboard
Additional instances of any of the instruments listed above may be used in the recording, if appropriate to the instrumentation of the chosen song, for example additional guitar and/or keyboard part. Additional unpitched percussion instruments (including electronic percussion) must **not** be included in the recording. You may capture keyboard instruments using microphones, DI, or plug-in virtual instruments. It is not acceptable to use plug-in virtual instruments to replace any of the other instruments required in the minimum instrumentation. This includes drum replacement software and other virtual instrument player software.	

The playing times stated above for the compulsory and additional instruments do not have to be in one continuous section; the time may be made up of a number of shorter sections.

The purpose of the minimum timings is to avoid very short tracks inserted purely to satisfy the requirements. The additional instruments should make a significant contribution to the texture of the song. An example of what will not meet the requirements would be a brass section playing only a few stabs in an introduction.

Any instrument(s) not achieving the minimum playing time requirement will only have access to levels 1 and 2 of assessment grid 5 (balance and blend) (see page 18).

If additional unpitched percussion instruments are used then 0 marks will be awarded for grids 5 (balance and blend) and 7 (production) (see pages 18 and 19).

For the purposes of this recording, the drum kit must consist of a minimum of:

- kick
- snare
- hi-hats
- crash cymbal.

The two instruments chosen from the additional audio instruments list must be different.

An example of an allowed combination would be: drum kit, bass guitar, electric guitar, lead vocal, backing vocal, acoustic guitar and electric piano.

An example of a disallowed combination would be: drum kit, bass guitar, electric guitar, lead vocal, backing vocal, two acoustic guitars.

The recording should be high quality, with careful attention to avoid noise and distortion. Contemporary standards are expected regarding clarity of EQ and the handling of stereo.

Students must ensure that the instrument requirements for the task, as presented in the table, are met. If necessary, the song should be adapted to be 3-3½ minutes long.

Assessment taking

Students may:

- replicate the instruments as present on the original song for their chosen song or
- adapt the instrumentation to suit available performers, including transposing the song to suit the range of a vocalist
- use drop-ins/overdubs and double tracking technique
- compile performances from several complete takes of a track
- use editing techniques to correct timing and pitch errors
- capture keyboard parts using live recording techniques, or by MIDI sequencing techniques using virtual instruments. Any MIDI editing techniques (with the exception of looping) may be used to improve the interpretation of keyboard parts.

Students must not use looping techniques to construct tracks from short sections of audio or MIDI. However, it is acceptable to correct occasional performance mistakes using short sections of audio from elsewhere in the song.

Drum replacement techniques must not be used; the drums must be captured live and the resulting recording processed to create the final drum mix.

During the recording sessions, the student must be the sole person in control of the entire recording process from capture to mixdown. The student may record as many takes as is practical in the time available. The recording must be made at the centre under the supervision of the teacher, and may not be made under professional guidance in a commercial studio.

Students must complete a logbook detailing the equipment and techniques used in the recording.

Recording task completion

- The recording task may take place over multiple sessions.
- The completed task must be submitted by 15th May.
- A stereo mix must be produced.
- The recording must be worked on and produced in the student's academic year of certification.
- The overall length of the submission must be 3–3½ minutes.
- Songs on the list that are longer than the maximum time of 3½ minutes should be arranged to fade or finish within the given time of 3–3½ minutes by omitting, for example a verse, chorus or middle eight.
- The mark for under-length recordings will be reduced proportionally according to the percentage that the recording is under length. For example, a recording of 1½ minutes is 50% of 3 minutes, therefore if the raw mark is 48, the scaled total would be 24.
- In over length recordings, any content up to 3½ minutes will be assessed; content after 3½ minutes will not be assessed and no higher than level 2 will be awarded for production in assessment grid 7
- Students who submit recordings with additional unpitched percussion instruments (including electronic percussion) present will be awarded 0 for balance and blend in assessment grid 5 and 0 for production in assessment grid 7.
- Students who submit songs not on the list for the series will receive 0 marks.

Collaboration

Students may work together on their preparation but group recordings are not allowed.

While preparation may be carried out by the student in or out of the centre, the final recording and logbook must be completed in the centre under teacher supervision.

Group recordings are not acceptable for which the capture and mixing is the work of more than one student. Each individual student must do their own tracking and mixing.

The sharing of audio files between students is not permitted.

Resources

Students must have access to:

- a selection of good quality microphones intended for music recording
- an acoustically suitable recording space large enough to accommodate a number of performers
- an acoustically suitable control room with recording hardware and software, to include a set of studio grade monitor speakers.

Authenticity

Students and teachers must sign the logbook. Teachers must be satisfied that the work is the student's own and should sign the logbook to this effect.

Teachers can give support and guidance at the development stage of the recording but not during the recording.

Teachers are allowed to:

- help students with interpreting information, for example explaining assessment criteria and the requirements of the component
- intervene if a health and safety issue arises
- intervene if a risk to security of evidence arises
- undertake a management role in relation to managing time, space, resources
- ask questions to stimulate independent thought without leading students.

Teachers are not allowed to:

- direct students
- undertake an artistic/creative role
- give solutions to artistic/creative problems
- make artistic/creative decisions.

The recording must be completed in the centre under teacher supervision.

Items for submission for assessment

1. Recording

The complete recording must be submitted digitally in the format detailed in the administrative support guide which can be found on the Pearson website. Each student's work should be clearly labelled with their name, centre number, candidate number and component code.

2. Recording logbook

The logbook must be completed and detail the equipment, techniques and instrument playing times used in the recording, and is essential to facilitate the accurate marking of the work.

The authentication form at the back of the logbook must be completed by the teacher, and signed by the student and teacher, authenticating that the work is the student's own. A copy of the logbook can be found on the Pearson website.

If the logbook and authentication form are not submitted, examiners will be unable to mark the recording. Logbooks that are incomplete may result in examiners being unable to award marks in the levels of the assessment grids.

Assessment marking

Recordings will be externally assessed for all students. All assessment materials must be sent to the examiner to arrive by 15th May in the year of certification.

There are 60 marks available for this assessment.

Recordings will be assessed individually, using the assessment grids on the following pages.

These criteria assess students' skills in audio capture, processing (EQ, dynamics and effects), and managing the final mix regarding balance and blend, noise and distortion, and use of stereo.

Recording assessment grids

In the case of assessment grids 1–4, marks are awarded in the three categories shown below:

- drum kit
- vocals (lead and backing)
- other parts as required by the task, and handling across entire mix.

In the case of assessment grids 5–7, marks are awarded for all tracks in the mix.

Assessment grid 1

	Drum kit	Vocals	Other parts	Capture Use of microphones and DI to capture live performance.
Level	**Mark**	**Mark**	**Mark**	
	0	0	0	No rewardable material; no live capture using microphones or DI
Level 1	1	1	1	Limited success of capture; misjudgements detract from the clarity throughout
Level 2	2	2	2	Inconsistent capture; misjudgements occasionally detract from clarity
Level 3	3	3	3	Competent capture; misjudgements do not impact significantly on clarity
Level 4	4	4	4	Excellent capture throughout
	TOTAL for Capture – **12 marks**			

Assessment grid 2

	Drum kit	Vocals	Other parts	Editing – processing EQ (drum kit, vocals, other parts) Assessment of other parts must also consider distribution of frequencies across entire mix
Level	**Mark**	**Mark**	**Mark**	
	0	0	0	No rewardable material, including extreme uncontrolled variation in EQ in a number of places
Level 1	1	1	1	Limited success in shaping EQ; misjudgements detract from the overall mix throughout
Level 2	2	2	2	Inconsistent shaping of EQ; misjudgements occasionally detract from the overall mix
Level 3	3	3	3	Competent shaping of EQ; misjudgements do not impact significantly on the overall mix
Level 4	4	4	4	Excellent shaping of EQ throughout
	TOTAL for Processing EQ – **12 marks**			

Assessment grid 3

	Drum kit	Vocals	Other parts	Editing – dynamic processing (drum kit, vocals and other parts) Assessment of acoustic guitar and other parts must also consider management of dynamics across the entire mix
Level	**Mark**	**Mark**	**Mark**	
	0	0	0	No rewardable material, including extreme uncontrolled variation in dynamics in a number of places
Level 1	1	1	1	Limited success in management of dynamics; misjudgements detract from the overall mix throughout
Level 2	2	2	2	Inconsistent management of dynamics; misjudgements occasionally detract from the overall mix
Level 3	3	3	3	Competent management of dynamics; misjudgements do not impact significantly on the overall mix
Level 4	4	4	4	Excellent management of dynamics throughout
	TOTAL for Processing Dynamics – **12 marks**			

Assessment grid 4

	Drum kit	Vocals	Other parts	Editing – use of effects, including ambience (drum kit, vocals, other parts) assessment of other parts must also consider distribution of effects across entire mix
Level	**Mark**	**Mark**	**Mark**	
	0	0	0	No rewardable material, including extreme misjudgements in effects use in most parts
Level 1	1	1	1	Limited success in use of effects; misjudgements detract from the overall mix throughout
Level 2	2	2	2	Inconsistent use of effects; misjudgements occasionally detract from the overall mix
Level 3	3	3	3	Competent use of effects; misjudgements do not impact significantly on the overall mix
Level 4	4	4	4	Excellent use of effects throughout
	TOTAL for Processing Effects – **12 marks**			

Assessment grid 5

Marking instructions No higher than level 2 will be awarded if any instrument does not meet the minimum playing time. 0 marks will be awarded if drum kit and/or unpitched percussion instruments (including electronic percussion) are present.		
Level	**Mark**	**Production – balance and blend**
	0	No rewardable material, including extreme misjudgements in balance and blend in most parts; parts missing or inaudible.
Level 1	1	Limited success with balance and blend; misjudgements detract from the overall mix
Level 2	2	Inconsistent balance and blend; misjudgements occasionally detract from the overall mix
Level 3	3	Competent balance and blend; misjudgements do not impact significantly on the overall mix
Level 4	4	Excellent balance and blend throughout

Assessment grid 6

Level	**Mark**	**Production – use of stereo**
	0	No rewardable material, including completely mono submission or only one channel present
Level 1	1	Limited success in use of stereo; misjudgements detract from the overall mix throughout
Level 2	2	Inconsistent use of stereo; misjudgements occasionally detract from the overall mix
Level 3	3	Competent use of stereo; misjudgements do not impact significantly on the overall mix
Level 4	4	Excellent use of stereo throughout

Assessment grid 7

Marking instructions No higher than level 2 will be awarded if the student submission is longer than the required maximum length. 0 marks will be awarded if additional unpitched percussion instruments (including electronic percussion) are present.		
Level	**Mark**	**Production – management of noise, distortion, master level and audio editing (including compiling, pitch correction, handling of fades, top and tail)**
	0	No rewardable material
Level 1	1	Limited success in management of noise, distortion, master level and audio editing; misjudgements detract from the overall mix
Level 2	2	Inconsistent management of noise, distortion, master level and audio editing; misjudgements occasionally detract from the overall mix
Level 3	3	Competent management of noise, distortion, master level and audio editing; misjudgements do not impact significantly on the overall mix
Level 4	4	Excellent management of noise, distortion, master level and audio editing throughout

Security and backups

Centres must keep backup copies of the recording software project files (including all audio files) for each student's recording, as was submitted, for a period of six months after the results are released.

It is also the centre's responsibility to keep the work that students have submitted for assessment secure. Secure storage is defined as a securely locked cabinet or cupboard.

The rules on storage also apply to electronic data. For example, centres should collect memory sticks for secure storage between sessions or restrict student access to specific areas of the centre's IT network.

For materials stored electronically, centres are strongly advised to utilise firewall protection and virus-checking software, and to employ an effective backup strategy, so that an up-to-date archive of students' evidence is maintained.

Further information

For up-to-date advice on teacher involvement and administration of non-examination assessments, please refer to the Joint Council for Qualifications (JCQ) document *Instructions for conducting non-examination assessments (new GCE and GCSE specifications)* available on the JCQ website: www.jcq.org.uk

Component 2: Technology-based Composition

Overview

The purpose of this component is to assess students' skills in creating, editing and structuring sounds with increased sensitivity and control to develop a technology-based composition. Students will develop the skills to create and manipulate sounds in imaginative and creative ways in order to communicate effectively with listeners.

The technology-based composition relates to Area of Study 1, recording and production techniques for both corrective and creative purposes.

Students will use technology to explore a range of techniques for developing ideas. They will then turn their ideas into completed technology-based compositions.

Students should develop in-depth knowledge and understanding of musical elements and musical language, and apply these, where appropriate, to their own technology-based compositions.

Content

Skills, knowledge and understanding

Students will be required to demonstrate the ability to:

- compose music that is musically convincing and shows a sophisticated use of musical and technological elements in combination, responding to a brief supplied by others
- apply musical elements and language, for example structure, timbre, texture, tempo and rhythm, melody, harmony and tonality and dynamics within the context of music technology
- manipulate existing sounds and music with technical control and style to produce technology-based compositions
- use synthesis and sampling to create and manipulate sound in imaginative and creative ways
- develop effectiveness as a music producer and sound engineer by producing technology-based compositions
- use music production tools and techniques to create new sounds and music with technical control and style
- use processing techniques effectively to produce a balanced final mix
- use aural discrimination and technical skill to evaluate music technology elements to refine technology-based compositions.

Area of Study 1: Recording and production techniques for both corrective and creative purposes		
Topic	**Content**	**Skills, knowledge and understanding**
1.1 Software and hardware	The core and advanced functions of a digital audio workstation (DAW)	• Functions are detailed below in this table
	A range of hardware	• Microphones; audio interfaces; microphone pre-amps; DI boxes; mixing desks; outboard effects; guitar pedals
	Other programming environments and new and emerging software	• MIDI, OSC or any other programming environments may be used
1.2 Capture of sound (may be required for some briefs)	Gain structure and how it affects noise and distortion	• Setting gain to maximise signal-to noise-ratio • Avoiding clipping, interference and hiss • Pre-amp controls: phantom power; gain; pad; high pass filter; polarity; clip/activity LED
	Characteristics and suitability of microphones	• Dynamic; condenser • Directional microphones; (cardioid, hypercardioid and figure of eight polar patterns); omnidirectional microphones • Proximity effect • Microphone frequency responses • Sensitivity
	Microphone techniques	• Single and multiple microphone techniques • Placement distance and angle • Managing spill and background noise • Eliminating plosives
1.3 Synthesis	How synthesis is used to create sounds	• Selecting and mixing different waveforms; white noise; low frequency oscillator (LFO); filters; envelopes
	How timbre is affected by a wider range of parameters	• How timbre is affected by cut-off frequency and resonance • Mapping envelope and LFO to filter cut-off and pitch • Oscillator octave, coarse and fine tuning • Pitch bend • Portamento; arpeggiator

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.4 Sampling	Editing samples	• Cutting/trimming • Tuning
	Looping	• Loop points • Crossfades
	Pitch mapping	• Transposing
	Other sampling parameters	• Reversing samples; stuttering • Using synthesis parameters on samples, e.g. filter and envelope • Setting pitch key zones • Velocity layering
	Context	• Use of samples in new contexts to create new meanings or effects
1.5 Sequencing	Real-time input	• Using a MIDI controller keyboard
	Non real-time input	• Step grid (drum editor) • Using a pencil tool to draw in notes
	Quantise	• Hard quantise values • Swing/percentage quantise • Groove templates
	Editing skills	• Piano roll and list editor • Velocity and note length • Cutting, looping and duplicating
1.6 Audio editing	Truncating	• Scissor tool/split
	How to remove clicks and noise	• Fades and cross fades
	Audio editing functions	• Normalising and inverting waveforms
1.7 Pitch and rhythm correction and manipulation	How to correct inaccuracies in pitch	• For example, re-tuning a vocal part with automatic tuning • Manually tuning individual notes by drawing in pitch, playing via MIDI or offline pitch shift process
	Parameters that allow greater control and creativity	• Pitch: use of automatic tuning as a creative effect; formant shifts; fine tuning in cents • Rhythm: groove templates; time stretching
1.8 Automation	Volume and pan automation	• Fades and movement in the stereo field
	Automating parameters of plug-ins	• For example, cut-off frequency and delay feedback

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.9 Dynamic processing	Uses of compression and gating	• Situations when you would use a compressor and or/gate • Limiting; expansion; de-essing • Pumping
	Core and advanced parameters of a compressor and gate	• Compressor threshold, ratio, make-up gain, attack, release, knee and side-chain • Gate threshold, attack, release, reduction/range
1.10 Stereo	Pan	• Setting pan positions for individual parts (tracks, instruments and/or vocals) in a recording
1.11 EQ	Different types of EQ in a recording	• Low shelf; high shelf; band; low pass filter; high pass filter; band pass filter • Parametric EQ; graphic EQ • Correcting problems including sibilance, noise and resonances
	How different parameters affect sound	• Gain; frequency/cut off; resonance; Q; slope
1.12 Effects	Core and advanced parameters	• Wet/dry and bypass settings • Using sends and inserts • Core and advanced parameters as listed for each effect
	Reverb	• Room; hall; plate; spring, gated; reversed • Reverb time
	Delay	• Single and multi-tap; slapback; timed; ping pong • Delay time; feedback • Automatic double tracking (ADT)
	Modulated delay	• Flange; chorus; phaser • LFO rate; LFO depth; feedback
	Wah wah pedal	• Band pass filter
	Distortion	• Overdrive; fuzz • Gain; drive; tone • Amp modelling parameters: amps and speaker types; virtual mic type/placement
	Tremolo	• LFO rate; LFO depth
	Vocal effects	• Vocoder; Talk Box

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.13 Balance and blend	Balance	• The relative balance of parts (tracks, instruments and/or vocals)
	Blend	• How blend is affected by compression, EQ and effects
1.14 Mastering	Perceived volume	• Limiting
	Understanding how EQ is used in the mastering process	• Master EQ, e.g. high shelf boost and rumble (high pass) filter

Assessment Information

- First assessment summer 2019.
- Centres must ensure that technology-based compositions submitted are valid for the series in which they are submitted.

Assessment setting, taking and marking

Assessment setting

Three new technology-based composition briefs will be released each year.

The briefs will be released:

- on 1st September in the calendar year preceding the year in which the qualification is to be awarded
- via the Pearson website.

Students should choose one technology-based composition brief released for that series with the support of their teacher.

The format of the briefs will be the same each year but the specific content will vary.

The options will be:

1. To produce music for a supplied stimulus. The stimulus may be a short film clip, computer game footage, or a descriptive scenario such as an art installation. If the stimulus is a video clip, only the version of the video supplied by Pearson should be used. Audio must not be sampled from any other version of the video. It should be remembered that this is a composition task, and a Foley soundtrack and/or dialogue must not be included.
2. To use a text supplied by Pearson as the basis for a technology-based composition, which may be implemented as a song, or may use readings of the text, or samples made from portions of the text. The meaning of the text must be reflected in the music.
3. To use 'sound bites' (i.e. samples) in a structured way to create a technology-based composition concerning a topic set out by Pearson.

The technology-based composition must be 3 minutes long, and must contain at least six separate vocal/instrumental/sample-based parts.

Assessment taking

Students must use synthesis and sampling/audio manipulation techniques, as well as creative effects processing to create their own unique sounds for use within their technology-based composition.

Virtual instruments and live recorded audio may also be used.

While live recording may be used, it should be remembered that simply doing a live recording of a song in response to one of the briefs would be unlikely to meet the requirements for synthesis, sampling and audio manipulation.

Automation must be used to create real-time control over features such as volume, panning and plug-in parameters.

Any samples used must be manipulated in order to gain credit.

The technology-based composition briefs will make demands in terms of the treatment of ideas, techniques and structures but between them will be sufficiently open ended to allow students the freedom to work in any technology-based style or genre.

Technology-based composition task completion

- The technology–based composition task may be completed over multiple sessions.
- The completed task must be submitted by 15th May.
- A stereo recording must be produced.
- Centres must ensure that the technology-based compositions submitted are valid for the series in which they are submitted.
- The technology-based composition must be worked on and produced in the student's intended year of certification.
- The overall length of the submission must be 3 minutes.
- The mark for under-length technology-based compositions will be reduced proportionally according to the percentage that the composition is under length. For example, a composition of 1½ minutes is 50% of 3 minutes, therefore if the raw mark is 48, the scaled total would be 24.
- In over length technology-based compositions, any content up to 3 minutes will be assessed; content after 3 minutes will not be assessed and no higher than level 2 will be awarded for response to brief in assessment grid 5.

Collaboration

Students may work together on their preparation, but group compositions are not allowed.

While preparation may be carried out by the student in or out of the centre, the final technology-based composition and logbook must be completed in the centre under teacher supervision.

Resources

Students must have access to:

- DAW with sequencing and audio editing software, including access to effects plug-in suites
- comprehensive synthesis and sampling packages
- an acoustically suitable room with studio grade monitor speakers for mixing down the final recording.

Students may also require access to:

- MIDI–controlled virtual instruments
- hardware synths/keyboards and samplers
- facilities for recording live audio.

Technology-based composition recording

Technology-based compositions will be realised through music technology. The production and quality of the recording will be integral to the concept and impact of the technology-based compositions and will be assessed along with the musical content of the technology-based composition. Students should pay attention to all aspects of the production – capture, balance and blend, EQ, dynamics, creative effects and use of the stereo field.

Authenticity

Students and teachers must sign the logbook. Teachers must be satisfied that the work is the student's own and should sign the logbook to this effect.

Teachers can give support and guidance at the development stage of the technology-based composition but not during the recording of the final technology-based composition.

Teachers are allowed to:

- help students with interpreting information, for example explaining assessment criteria and the requirements of the component
- intervene if a health and safety issue arises
- intervene if a risk to security of evidence arises
- undertake a management role in relation to managing time, space, resources
- ask questions to stimulate independent thought without leading students.

Teachers are not allowed to:

- direct students
- undertake an artistic/creative role
- give solutions to artistic/creative problems
- make artistic/creative decisions.

The final recording must be completed in the centre under teacher supervision.

Items for submission for assessment

1. Recording

The complete technology-based composition must be submitted digitally in the format detailed in the administrative support guide which can be found on the Pearson website. Each student's work should be clearly labelled with their name, centre number, candidate number and component code.

2. Technology-based composition logbook

The logbook must be completed and detail the original sound design that has been carried out using synthesis, sampling and creative effects. It must also list the sources for all samples that have been used.

The authentication form at the back of the logbook must be completed by the teacher, and signed by the student and teacher, authenticating that the work is the student's own. A copy of the logbook can be found on the Pearson website.

If the logbook and authentication form are not submitted, examiners will be unable to mark the technology-based composition. Logbooks that are incomplete may result in examiners being unable to award marks in the levels of the assessment grids.

Assessment marking

Technology-based compositions will be externally assessed for all students. All assessment materials must be sent to the examiner to arrive by 15th May in the year of certification.

There are 60 marks available for this assessment.

Compositions will be assessed individually, using the assessment grids on the following pages.

These criteria assess students' skills in creating and developing sounds using synthesis, sampling and creative effects, production of the mix, response to brief and coherence, and demonstrating technical control over musical elements (melody/harmony/rhythm/texture/ structure).

Technology-based composition assessment grids

The use of technology and the structural elements of the composition must be clearly audible in the submitted recording to gain credit.

Assessment grid 1

Synthesis – designing own sounds, and manipulating using automation or real-time control of LFO, filter, envelopes; cut-off and resonance, attack, decay, sustain, release; mapping envelopes.

Level	Mark	Create and edit sounds – synthesis
	0	No rewardable material
Level 1	1–2	• Limited use of synthesis techniques • Synthesis use is ineffective and does not make a significant contribution to the piece overall
Level 2	3–4	• Inconsistent use of synthesis techniques • Use of synthesis is evident but with some misjudgements
Level 3	5–6	• Competent use of a range of synthesis techniques • Use of synthesis is evident and makes a positive contribution to the piece overall
Level 4	7–8	• Excellent use of a range of synthesis techniques throughout • Synthesis has been used creatively with a high level of skill and control to develop an original sonic palette

Assessment grid 2

Sampling – using short audio files to develop new sonic elements; pitch-mapping, cutting/trimming, looping; creating new meanings or effect; sample rate and bit-depth; manipulation using sampling.

Level	Mark	Create and edit sounds – sampling
	0	No rewardable material
Level 1	1–2	• Limited use of sampling techniques • Sample use is ineffective and does not make a significant contribution to the piece overall
Level 2	3–4	• Inconsistent use of sampling techniques • Sample use is evident but with some misjudgements
Level 3	5–6	• Competent use of a range of sampling techniques • Sample use is evident and makes a positive contribution to the piece overall
Level 4	7–8	• Excellent use of a range of sampling techniques throughout • Samples have been used creatively with a high level of skill and control to develop an original sonic palette

Assessment grid 3

Creative effects – adding time-based effects or processors to modify existing sounds; control of core and detailed parameters.

Level	Mark	Create and edit sounds – creative effects
	0	No rewardable material
Level 1	1–2	• Limited use of creative effects techniques • Creative effects use is ineffective and does not make a significant contribution to the piece overall
Level 2	3–4	• Inconsistent use of creative effects techniques • Creative effects use is evident but with some misjudgements
Level 3	5–6	• Competent use of a range of creative effects techniques • Creative effects use is evident and makes a positive contribution to the piece overall
Level 4	7–8	• Excellent use of a range of creative effects techniques throughout • Creative effects have been used imaginatively with a high level of skill and control to develop an original sonic palette

Assessment grid 4

Editing of mix must consider balance and processing to include stereo, EQ, dynamics, mix effects, master level, top and tail.

Level	Mark	Create and edit sounds Editing of mix – control of processing and balance
	0	No rewardable material. Parts missing or inaudible
Level 1	1–2	Unconvincing editing of mix Handling of processing and balance is limited
Level 2	3–4	Generally convincing editing of mix Handling of processing and balance is mostly successful
Level 3	5–6	Excellent editing of mix All aspects of processing and balance are handled successfully throughout

Assessment grid 5

Marking instructions No higher than level 2 will be awarded if the submission is longer than the required length.		
Level	**Mark**	**Structure sounds** **Response to brief – sonic and musical ideas combined to reflect the requirements of the brief**
	0	No rewardable material
Level 1	1–2	Unconvincing combination of sonic and musical ideas Sonic and musical ideas are limited in meeting the requirements of the brief
Level 2	3–4	Generally convincing combination of sonic and musical ideas Sonic and musical ideas meet mostly the requirements of the brief
Level 3	5–6	Excellent combination of sonic and musical ideas All aspects of the brief are successfully reflected throughout

Assessment grid 6

Level	**Mark**	**Structure sounds** **Style and coherence – use of stylistic conventions and control of flow and direction of ideas**
	0	No rewardable material
Level 1	1–2	• Unconvincing flow and direction to the piece • Use of stylistic conventions is limited
Level 2	3–4	• Generally convincing flow and direction to the piece • Use of stylistic conventions is mostly successful
Level 3	5–6	• Excellent flow and direction to the piece • Stylistic conventions are used successfully throughout

For the following five assessment grids, all will be assessed but only the three highest marks will be used to calculate the total.

Assessment grid 7

Level	**Mark**	**Structure Sounds – Melody**
	0	No rewardable material
Level 1	1–2	• Limited or repetitive melodic ideas • Melodies are underdeveloped and lack shape, fluency and direction
Level 2	3–4	• Melodic ideas are developed in some places • Melodies are generally effective but may lack shape, fluency or direction
Level 3	5–6	• Consistent development of melodic ideas throughout • Melodies have shape, fluency and a sense of direction

Assessment grid 8

Level	Mark	Structure sounds – harmony
	0	No rewardable material
Level 1	1–2	• Limited or misjudged harmonic ideas • Harmonies are underdeveloped and lack variety
Level 2	3–4	• Harmonic ideas are mostly suitable • Harmonies are functional and show some development
Level 3	5–6	• Harmonic ideas are imaginative • Harmony is well handled throughout with variety and development

Assessment grid 9

Level	Mark	Structure sounds – rhythm
	0	No rewardable material
Level 1	1–2	• Limited or repetitive rhythmic ideas • Rhythms are underdeveloped and lack shape, fluency and direction
Level 2	3–4	• Rhythmic ideas are developed in some places • Rhythms are generally effective but may lack shape, fluency or direction
Level 3	5–6	• Consistent development of rhythmic ideas throughout • Rhythms have shape, fluency and a sense of direction

Assessment grid 10

Level	Mark	Structure sounds – texture
	0	No rewardable material
Level 1	1–2	• Limited or misjudged use of texture • Texture is underdeveloped and lacks variety
Level 2	3–4	• Use of texture is mostly suitable • Texture is functional and shows some development
Level 3	5–6	• Use of texture ideas is imaginative • Texture is well handled throughout with variety and development

Assessment grid 11

Level	Mark	Structure sounds – form and structure
	0	No rewardable material
Level 1	1–2	• Limited or repetitive structural ideas • Structure is underdeveloped and lacks variety
Level 2	3–4	• Structural ideas are mostly suitable • Structure is functional and shows some development
Level 3	5–6	• Structural ideas are imaginative • Structure is well handled throughout with variety and development

Security and backups

Centres must keep backup copies of the software project files for each student's technology-based composition, as submitted, for a period of six months after the results are released.

It is also the centre's responsibility to keep the work that students have submitted for assessment secure. Secure storage is defined as a securely locked cabinet or cupboard.

The rules on storage also apply to electronic data. For example, centres should collect memory sticks for secure storage between sessions or restrict student access to specific areas of the centre's IT network.

For materials stored electronically, centres are strongly advised to utilise firewall protection and virus-checking software, and to employ an effective backup strategy, so that an up-to-date archive of students' evidence is maintained.

Further information

For up-to-date advice on teacher involvement and administration of non-examination assessments, please refer to the Joint Council for Qualifications (JCQ) document *Instructions for conducting non-examination assessments (new GCE and GCSE specifications*) available on the JCQ website: www.jcq.org.uk

Component 3: Listening and analysing

Overview

The purpose of this component is for students to develop listening and analysing skills through the study of a range of music production techniques used in unfamiliar commercial recordings. The production stages of capture and creating sounds, editing and arranging sounds and mixing will be covered in the examination. Content is grouped according to three of the areas of study.

This component gives students the opportunity to identify, analyse and evaluate a range of creative music production techniques, as applied to the unfamiliar commercial recordings supplied in the examination. As well as identifying effects and their associated parameter settings, students will explain the principles behind the choice of the effects heard on each recording, and their sonic character, in a series of written responses.

Through the deconstruction and analysis of a final, commercial product, students will expand their knowledge of the recording and production practices associated with a number of historical eras.

Content

Skills, knowledge and understanding

Students will be required to demonstrate the ability to:

- comment on the music production tools and techniques used to capture sounds, including musical instruments
- use aural discrimination to identify and evaluate music technology elements in unfamiliar works
- analyse critically and comment perceptively on music production techniques from a range of source material and their impact on music styles
- apply musical elements and language, for example structure, timbre, texture, tempo and rhythm, melody, harmony, tonality and dynamics within the context of music technology
- produce informed written responses about equipment used in unfamiliar commercial recordings by identifying effects used and associated parameter settings
- understand the wider context of music technology and how it has influenced trends in music.

Music styles

Students should have knowledge and understanding of the instruments, the sounds associated with them and the combination of instruments and voices used in the following styles:

- jazz
- blues
- rock ’n’ roll
- rock
- metal
- punk
- soul
- disco and funk
- reggae
- acoustic and folk
- commercial pop
- urban
- electronic and dance.

Students need to understand a range of recording and production techniques, identifying and discussing their use in the context of a series of unfamiliar commercial recordings. The techniques, which are further defined in the Area of Study 1 content section below.

Area of Study 1: Recording and production techniques for both corrective and creative purposes		
Topic	**Content**	**Skills, knowledge and understanding**
1.1 Capture of sound	Gain structure and how it affects noise and distortion	• Setting gain to maximise signal-to-noise ratio • Avoiding clipping, interference and hiss • Checking input and output levels when several effects/pieces of hardware are chained together
	The characteristics and suitability of microphone types	• Dynamic; condenser; ribbon
	The suitability of microphone placement techniques	• Suitable distances and angles • Recording instruments using multiple microphones, e.g. drum kit
	The advantages and disadvantages of microphone types in terms of polar pattern and frequency response	• Directional: cardioid; hypercardioid; figure of 8 • Proximity effect • Omnidirectional • Frequency response and transient response
	Advanced microphone techniques	• Coincident and spaced stereo pairs
	How microphones work	• Sensitivity • Microphone switches: pad; high pass filter; polar pattern switch • Microphone accessories: pop shield; elastic suspension/cradle
1.2 Synthesis	How synthesis is used to create sounds	• Selecting and mixing sine, square and saw waveforms; white noise; low frequency oscillator (LFO); low pass and high filters; envelopes
	How timbre is affected by a wider range of parameters	• How timbre is affected by cut-off frequency, resonance, attack, decay, sustain and release (amplitude envelope) • Oscillator octave, coarse and fine tuning • Pitch bend range • Monophonic; polyphonic • Portamento; arpeggiator

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.3 Sampling	Pitch mapping	• Transposing
	Editing samples	• Cutting and trimming
	Looping	• Loop points
	Advanced parameters	• Sample rate and bit depth • Reversing samples
1.4 Sequencing	Quantise	• Hard quantise values, e.g. 8, 12, 16, 24, 32 (and note length equivalents) • Swing/percentage quantise
	Editing skills	• Velocity and note length • Piano roll editor • Cutting, looping and duplicating
1.5 Audio editing	How to remove clicks and noise	• Removing hiss, hum and plosives
1.6 Pitch and rhythm correction and manipulation	How to correct inaccuracies in pitch	• For example, re-tuning a vocal part with automatic tuning • Manually tuning individual notes using pitch shift
	How to correct inaccuracies in rhythm	• For example, tightening drum parts using audio quantise m anually cutting and moving notes that are out of time
	Parameters that allow greater control and creativity	• Pitch: use of automatic tuning as a creative effect; response time; selecting notes/scales; fine tuning in cents • Rhythm: time-stretch
1.7 Automation	How to use volume and pan automation	• Fades and movement in the stereo field
	Automating parameters of plug-ins	• For example, cut-off frequency and delay feedback
1.8 Dynamic processing	Uses of compression and gating	• Situations when you would use a compressor and or/gate • Limiting; expansion; de-essing • Pumping
	Core and advanced parameters of a compressor and gate	• Compressor threshold, ratio and make-up gain, attack, release and side-chain • Gate threshold and reduction/range

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.9 Stereo	Pan	• How to identify pan positions of individual parts (tracks instruments and/or vocals) in a recording
1.10 EQ	Different types of EQ used in a recording	• Low shelf; high shelf; band; low pass filter; high pass filter; band pass filter • Correcting problems, including sibilance, noise and resonance
	How parameters affect the sound	• Gain; frequency/cut-off; resonance; Q; slope
1.11 Effects	Core and advanced parameters	• Wet/dry and bypass settings • Core and advanced parameters as listed for each effect
	Reverb	• Room; hall; plate; spring; gated; reversed • Reverb time
	Delay	• Single and multi-tap; slapback; timed; ping pong • Delay time; feedback • Automatic double tracking (ADT)
	Modulated delay	• Flange, chorus and phaser • LFO rate; LFO depth; feedback
	Wah wah pedal	• Band pass filter
	Distortion	• Overdrive; fuzz • Gain/drive; tone
	Tremolo	• LFO rate; LFO depth
	Vocal effects	• Vocoder; Talk Box
	Lo-fi	• Bit-crushing; vinyl surface noise/crackle effects; telephone effect; vocal distortion; ambient/found sound
1.12 Balance and blend	Balance	• The relative balance of parts (tracks, instruments and/or vocals)
	Blend	• How blend is affected by compression, EQ and effects

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.13 Mastering	Perceived volume	• Limiting
	Mastering parameters	• Stereo width; master reverb wet/dry mix
	Understanding how EQ is used in the mastering process	• Master EQ, e.g. high shelf boost and rumble (high pass) filter

Students will also need to study the technical principles that underpin recording and production techniques, with a focus on how the acoustics of the recording space, interconnection of equipment and signal path all affect the recorded signal. Furthermore, students will be required to apply an understanding of units of measurement and scales when analysing effects parameters. These principles are defined in the Area of Study 2 content table below.

Area of Study 2: Principles of audio and sound technology		
Topic	**Content**	**Skills, knowledge and understanding**
2.1 Acoustics	How the live room acoustics affect the recording	• Room size; absorption; reflection; diffusion • Isolation booths for vocals, drums and amps; using natural and chamber reverb
	Acoustics parameters	• Describing a reverb tail; pre-delay time; reverb time (RT60)
2.2 Leads and signals	Connectivity including signal path and signal types	• Discussing signal path in context of the effects heard on commercial recordings
	The different types and uses of leads	• Jack; XLR • Use of balanced connections to avoid noise problems, e.g. hiss, hum and rumble • DI boxes
	Impedance	• Signal levels: mic; line; instrument
2.3 Numeracy	Technical numeracy	• Parameter settings and associated units of measurement: levels in decibels; frequency in Hertz; delay time in milliseconds/note values; tempo in bpm; synthesiser octave settings in feet; coarse tuning in semitones; fine tuning in cents; feedback and effects mix percentages
2.4 Levels	Principles of levels and metering	• Management of levels to prevent distortion and maximise signal-to-noise ratio
	Levels and metering scales	• Psycho-acoustics related to perceived volume

Students are required to develop knowledge and understanding of the history and development of recording and production technology, from current digital technologies back to the mono, analogue recording technologies in the 1930s, through the following eras:

- Digital audio workstations (DAW) and emerging technologies (c.1996 – present day)
- Digital recording and sequencing (c.1980 – present day)
- Large-scale analogue multitrack (c.1969 – 1995)
- Early multitrack recording (c.1964 – 1969)
- Direct to tape mono recording (c.1930 – 1963).

Area of Study 3: The development of recording and production technology		
Topic	**Content**	**Skills, knowledge and understanding**
3.1 Software and hardware: digital	Digital hardware/software attributes	• The differences between digital and analogue recordings • The advantages and disadvantages of digital hardware/software • Graphical user interfaces (GUI) • Sampling theory and converters
	Digital sequencing and digital audio workstations (DAW)	• Core and advanced functions of a digital audio workstation • Real-time (native) processing; software instruments • Non-destructive and non-linear editing • Convolution reverb; amp modelling
	Digital consumer formats	• CD; mp3/m4a; high definition masters; emerging technologies • Data bit rate
	Digital recording and sampling hardware	• Digital multitrack formats • Sampling with limited available memory
3.2 Hardware: analogue	Analogue hardware attributes	• The differences between analogue and digital recordings • The advantages and disadvantages of analogue recordings • Valves; soft clipping; tape saturation • Solid state (transistor) amplifiers/distortion for hard-clipping • Maintenance issues and variations in frequency/pitch
	Tape machines	• Editing and splicing • Multitrack tape formats
	Analogue consumer formats	• Vinyl; cassette tape • Mono and stereo releases • Mixing and mastering principles for analogue formats, e.g. vinyl; cassette
	Analogue effects	• Delay: tape; bucket brigade • Mechanical reverbs: plate; spring • Rotary speaker (Leslie cabinet) • Vinyl scratching • Pitch changes and reversing using vinyl and tape
	Analogue synthesisers	• Advantages and disadvantages • Modules and patching
	Electric instruments	• Electric guitar; bass guitar • Theremin; Mellotron; electric organ; electric piano; Clavinet

Assessment information

- First assessment: May/June 2019.
- The assessment is 1 hour 30 minutes.
- The assessment is marked out of 75 marks.
- There are two sections in the examination:
  - Section A (40 marks) – four written questions, each based on an unfamiliar commercial recording supplied by Pearson
  - Section B (35 marks) – two essay questions based on unfamiliar commercial recordings supplied by Pearson.
- Students must answer all questions.
- The paper may include multiple-choice, gap-fill, diagrammatic, short-open, open and extended open response questions.
- Each student will have an audio CD containing seven recordings.
- Each student will need access to a computer workstation or CD player.
- Students must not have access to music production (DAW) software or the internet.

Section A

Section A will consist of four questions of 10 marks each, which may include multiple-choice, gap-fill, diagrammatic, short-open and open response questions (see *Appendix 2* for further details) using unfamiliar commercial recordings as a stimulus.

Section B

Section B will consist of two extended open response questions (see *Appendix 2* for further details). The first will be comparative and based on production techniques and effects processing used on two unfamiliar commercial recordings (15 marks).

The second will be based on one recording and ask the student to consider the wider musical context (20 marks).

Synoptic assessment

Synoptic assessment requires students to work across different parts of a qualification and to show their accumulated knowledge and understanding of a topic or subject area.

Synoptic assessment enables students to show their ability to combine their skills, knowledge and understanding with breadth and depth of the subject.

Sample assessment materials

A sample paper and mark scheme for this paper can be found in the *Pearson Edexcel Level 3 Advanced GCE in Music Technology Sample Assessment Materials (SAMs)* document.

Please see *Appendix 1* for a description of what the command words used in the SAMs mean.

Component 4: Producing and analysing

Overview

This component assesses students' knowledge of the techniques and principles of music technology through a series of written and practical tasks, in the context of audio and MIDI materials provided by Pearson. The production stages of sound creation, audio editing and mixing will be covered. The content is grouped into two of the areas of study.

Students will work with unedited audio and MIDI materials provided by Pearson that have been captured using microphone, DI and sequencing techniques. The examination will assess the ability to process and correct these materials using a range of production skills, culminating in a series of audio bounces/exports for individual instrumental/vocal parts, plus a final stereo mix. Students will refine and combine pre-existing 'ingredients' of a mix to form a convincing final product.

Students will also comment on sonic characteristics of the materials provided, interpreting the underlying theory associated with these as well as justifying decisions they have made in respect of selecting processes and parameters when undertaking the practical tasks.

Content

Skills, knowledge and understanding

Students will be required to demonstrate the ability to:

- comment on the music production tools and techniques used to capture sounds including musical instruments
- use music production tools and techniques to create new sounds
- Use processing techniques to edit, correct and process audio and MIDI tracks
- use aural discrimination to identify and evaluate music technology elements in unfamiliar works and to refine recordings
- use processing techniques effectively to produce a final, balanced mix
- apply musical elements and language, for example structure, timbre, texture, tempo and rhythm, melody, harmony, tonality and dynamics within the context of a music technology production
- make informed decisions about equipment by analysing and interpreting a range of data, graphical representations and diagrams, for example relating to frequency response, microphone polar patterns and dynamic response
- apply technical numeracy to make calculations within the context of music technology.

Music styles

Students should have knowledge and understanding of the instruments, the sounds associated with them and the combination of instruments and voices used in the following styles:

- jazz
- blues
- rock 'n' roll
- rock
- metal
- punk
- soul
- disco and funk
- reggae
- acoustic and folk
- commercial pop
- urban
- electronic and dance.

The examination focuses on the techniques required to edit, process and mix audio and MIDI materials, as well as the creation of sounds using microphones and DI, synthesis and MIDI techniques. Students will apply appropriate techniques and effects processing, providing a technical justification for the parameters chosen. The following techniques will be covered, which are defined in the Area of Study 1 content table below.

Area of Study 1: Recording and production techniques for both corrective and creative purposes		
Topic	**Content**	**Skills, knowledge and understanding**
1.1 Software and hardware	The core and advanced functions of a digital audio workstation (DAW)	• Functions are detailed below in this table
	A range of hardware	• Microphones; audio interfaces; microphone pre-amps; DI boxes; mixing desks; outboard effects; guitar pedals; controller keyboard
	Other programming environments and new and emerging software	• Awareness of new, alternative software environments used in music production*
	The impact of new and emerging software on music production	• The contribution of new technology to music production practices*
1.2 Capture of sound	Gain structure and how it affects noise and distortion	• Setting gain to maximise signal-to-noise ratio • Avoiding clipping, interference and hiss • Checking input and output levels when several effects/pieces of hardware are chained together • Pre-amp controls: phantom power; gain; pad; high pass filter; polarity; clip/activity LED
	The characteristics and suitability of microphone types	• Dynamic; condenser; ribbon
	The suitability of microphone placement techniques	• Suitable distances and angles • Recording instruments using multiple microphones, e.g. drum kit • On-axis and off-axis frequency responses

* Pearson will review any new and emerging music technology on an ongoing annual basis and advise centres of any changes via the Pearson website on June 1.

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.2 Capture of sound *continued*	The advantages and disadvantages of microphone types in terms of polar pattern and frequency response	• Advantages and disadvantages of different polar patterns • Directional: cardioid; hypercardioid; figure of 8 • Proximity effect • Omnidirectional • Frequency response and transient response
	Advanced microphone techniques	• Understanding phase relationships between multiple microphones • Coincident and spaced stereo pairs
	How microphones work	• Sensitivity; electromagnetic induction; capacitanceDiaphragms; moving coil; platesPhantom powerMicrophone switches: pad; high pass filter; polar pattern switchMicrophone accessories: pop shield; elastic suspension/cradle
1.3 Synthesis	How synthesis is used to create sounds	• Selecting and mixing sine, triangle, pulse, square and saw waveforms; white noise; low frequency oscillator (LFO); low pass and high pass filters; envelopes
	How timbre is affected by a wider range of parameters	• How timbre is affected by cut-off frequency, resonance, attack, decay, sustain and release (amplitude envelope) • Mapping envelope and LFO to filter cut-off and pitch • Oscillator octave; coarse; fine tuning • Pitch bend range • Monophonic; polyphonic • Portamento; arpeggiator
1.4 Sampling	Pitch mapping	• Transposing
	Editing samples	• Cutting and trimming
	Looping	• Loop points • Zero crossings; cross-fade looping
	Advanced parameters	• Sample rate and bit depth • Using synthesis parameters on samples, e.g. filter and envelope • Setting pitch key zones • Velocity layering • Time-stretch • Reversing samples

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.5 Sequencing	Real-time input	• Using a MIDI controller keyboard
	Non real-time input	• Step grid (drum editor) • Using a pencil tool to draw in notes
	Quantise	• Hard quantise values, e.g. 8, 12, 16, 24, 32 (and note length equivalents) • Swing/percentage quantise • Snap/grid
	Editing skills	• Velocity and note length • Piano roll and list editor • Cutting, looping and duplicating
	How MIDI works by studying data bytes	• Note on/off; pitch; controllers; pitch bend; LSB and MSB; tempo data in bpm • Setting a fixed tempo and applying tempo changes
1.6 Audio editing	Truncating	• Scissor tool/split • Lead-in and lead-out times
	How to remove clicks and noise	• Removing hiss, hum and plosives • Fades and cross-fades
	How and why clicks and other noises occur	• For example, discontinuous waveforms and plosives
	Audio editing functions	• Normalising and inverting waveforms
1.7 Pitch and rhythm correction and manipulation	How to correct inaccuracies in pitch	• For example, re-tuning a vocal part with automatic tuning • Manually tuning individual notes by drawing in pitch, playing via MIDI or offline pitch shift process
	How to correct inaccuracies in rhythm	• For example, tightening drum parts using audio quantise • Manually cutting and moving notes that are out of time
	Parameters that allow greater control and creativity	• Pitch: use of automatic tuning as a creative effect; response time; selecting different algorithms; formant shifts; fine tuning in cents; polyphonic re-tuning • Rhythm: transient detection threshold; groove templates; selecting different algorithms; time-stretch

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.8 Automation	How to use volume and pan automation	• Fades and movement in the stereo field
	Automating parameters of plug-ins	• For example, cut-off frequency and delay feedback
1.9 Dynamic processing	Uses of compression and gating	• Situations when you would use a compressor and or/gate • Limiting; expansion; de-essing • Pumping
	Core and advanced parameters of a compressor and gate	• Compressor threshold, ratio, make-up gain, attack, release, knee and side-chain • Gate threshold, reduction/range attack, release, hold and side-chain • Drawing graphs of compression and gating
1.10 Stereo	Pan	• Setting pan positions for individual parts (tracks, instruments and/or vocals) in a recording
1.11 EQ	Different types of EQ used in a recording	• Low shelf; high shelf; band; low pass filter; high pass filter; band pass filter • Parametric EQ; graphic EQ • Correcting problems, including sibilance, noise and resonances
	How different parameters affect the sound	• Gain; frequency/cut-off; Q; slope; resonance • Drawing graphs of EQ
1.12 Effects	Core and advanced parameters	• Wet/dry and bypass settings • Using sends and inserts • Core and advanced parameters as listed for each effect
	Reverb	• Room; hall; plate; spring; gated; reversed • Reverb time; pre-delay time; high frequency damping
	Delay	• Single and multi-tap; slapback; timed; ping pong • Delay time; feedback; number of repeats; delay pan and EQ • Automatic double tracking (ADT)

Area of Study 1: Recording and production techniques for both corrective and creative purposes *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
1.12 Effects *continued*	Modulated delay	• Flange, chorus and phaser • LFO rate; LFO depth; feedback • Comb filtering
	Wah wah	• Band pass filter • How the pedal controls the centre frequency
	Distortion	• Overdrive; fuzz • Gain; drive; tone • Amp modelling parameters: amps and speaker types; virtual mic type/placement
	Tremolo	• LFO rate; LFO depth
	Vocal effects	• Vocoder; Talk Box
	Lo-fi	• Bit-crushing; vinyl surface noise/crackle effects; telephone effect; vocal distortion; ambient/found sound
1.13 Balance and blend	Balance	• The relative balance of parts (tracks, instruments and/or vocals)
	Blend	• How blend is affected by compression, EQ and effects
1.14 Mastering	Perceived volume	• Limiting
	Mastering parameters	• Limiter gain • Fade in/fade out
	Understanding how EQ is used in the mastering process	• Master EQ, e.g. high shelf boost and rumble (high pass) filter

Students will also need to study the technical principles that underpin recording and production techniques, with a focus on how acoustics of a recording space contribute to the production process as well as supplementing the study of software and hardware in Area of Study 1. Students will study how such technology works and is operated, applying this knowledge to written tasks in the examination. Students will also need to understand the units of measurement associated with effects and other signal processes, including the graphical representation of these processes.

Area of Study 2: Principles of audio and sound technology		
Topic	**Content**	**Skills, knowledge and understanding**
2.1 Acoustics	How the live room acoustics affect the recording	• Room size; absorption; reflection; diffusion • Isolation booths for vocals, drums and amps
	Acoustics parameters	• Describing a reverb tail: pre-delay time; early and late reflections; reverberation time (RT60); resonant frequencies
2.2 Monitor speakers	The characteristics of different monitor speakers	• The frequency ranges handled by tweeters, woofers and subwoofers
	How monitor speakers work	• Electromagnetic induction
	How different types of monitor speakers affect mix translation	• Checking mixes on different monitoring, e.g. headphones, speakers with pronounced mid range and systems with subwoofers
2.3 Leads and signals	How leads work	• Balanced and unbalanced connections
	Connectivity including signal path and signal types	• Aux sends; insert points; sub-groups; mixer channel strips
	The different types and uses of leads	• Jack; XLR; MIDI cable; digital ins/outs; computer data cables e.g. Firewire and USB • Using balanced connections to avoid noise problems, e.g. hiss, hum and rumble • DI boxes
	Impedance	• Signal levels: mic; line; instrument
	The advantages and disadvantages of different leads and connectivity	• Comparing balanced and unbalanced; analogue versus digital connections; comparing computer data connections • Comparing computer data connections
2.4 Digital and analogue	The differences between digital and analogue technologies	• Frequency response; signal-to-noise ratio (dynamic range); headroom • Digital and analogue clipping • How components such as valves and transistors affect the sound

Area of Study 2: Principles of audio and sound technology *continued*		
Topic	**Content**	**Skills, knowledge and understanding**
2.5 Numeracy	How to display and interpret information graphically	• Waveforms; EQ curves; compressor responses; amplitude envelopes • Interpreting frequency response and polar response graphs, to understand how sound quality is affected
	Technical numeracy	• Parameter settings and associated units of measurement: levels in decibels; frequency in Hertz; delay time in milliseconds/note values; tempo in bpm; synthesiser octave settings in feet; coarse tuning in semitones; fine tuning in cents; feedback and effects mix percentages • Understanding binary, formulae and logarithms and how they are used in music technology
	How to make calculations to describe sound waves	• Waveform frequency, phase and amplitude
2.6 Levels	Principles of levels and metering	• Management of levels to prevent distortion and maximise signal-to-noise ratio
	Levels and metering scales	• Decibel scales: when to use peak and RMS metering • Psycho-acoustics related to perceived volume
	The specifications of digital recordings and how they affect sound quality	• A/D and D/A conversion; sample rate; bit depth; streaming bit rate; uncompressed PCM audio formats; data compressed formats, e.g. mp3

Assessment information

- First assessment: May/June 2019.
- The assessment is 2 hours 15 minutes, plus an additional 10 minutes setting–up time.
- Each student will need access to a computer workstation, music production (DAW) software, MIDI keyboard and headphones.
- Students must not have access to the internet or use a calculator.
- Each student will have a CD-ROM containing the audio/MIDI materials required for the examination.
- The assessment is marked out of 105 marks.
- There are two sections in the examination:
  - Section A (85 marks) – five questions with a selection of written and practical responses based on the audio/MIDI materials
  - Section B (20 marks) – one essay question based on a specific effects process or music technology hardware unit.
- Students must answer all questions.
- The paper may include multiple-choice, gap-fill, diagrammatic, short-open, open and extended open response questions (see *Appendix 2* for further details).
- The paper will also include a range of practical tasks, for which four audio exports/bounces will be submitted for assessment (three individual instrument/vocal bounces plus a final mix).
- Audio bounces/exports will be in the format of 16-bit /44.1kHz stereo PCM wave file (wav).

Section A

Questions 1-4 will be related to the audio and MIDI materials provided and students will create written responses as well as an individual audio bounce/export for each instrument or vocal part that has been edited (61 marks).

Question 5 will be an extended practical response (24 marks). The question asks students to complete a series of mixing and production tasks and then combine all the instrument/vocal parts to create a finished stereo mix.

Section B

Section B will feature one extended open response question (see *Appendix 2* for further details) focusing on a specific recording or mixing scenario, signal path, effect or music technology hardware unit (20 marks).

Sample assessment materials

A sample paper, audio/MIDI materials, mark scheme and exemplar audio extracts for this paper can be found in the *Pearson Edexcel Level 3 Advanced GCE in Music Technology Sample Assessment Materials (SAMs)* document.

Please see *Appendix 1* for a description of what the command words used in the SAMs mean.

Assessment Objectives

Students must:		% in GCE A Level
AO1	Demonstrate use of music technology to capture, edit and produce recordings	35
AO2	Demonstrate use of music technology to create, edit and structure sounds to develop a technology based-composition	20
AO3	Demonstrate and apply knowledge and understanding of music technology	27-30
AO4	Use analytical and appraising skills to make evaluative and critical judgements about the use of music technology	15-18
	Total	**100%**

Breakdown of Assessment Objectives

Component	Assessment Objectives				Total for all Assessment Objectives
	AO1 %	AO2 %	AO3 %	AO4 %	
Component 1: Recording	20	-	-	-	20%
Component 2: Technology-based composition	-	20	-	-	20%
Component 3: Listening and analysing	-	-	14–16	9–11	25%
Component 4: Producing and analysing	15	-	13–16	5-–7	35%
Total for GCE A Level	**35%**	**20%**	**27–30%**	**15–18%**	**100%**

3 Administration and general information

Entries

Details of how to enter students for the examinations for this qualification can be found in our *UK Information Manual*. A copy is made available to all examinations officers and is available on our website: qualifications.pearson.com

Discount code and performance tables

Centres should be aware that students who enter for more than one GCE qualification with the same discount code will have only one of the grades they achieve counted for the purpose of the school and college performance tables. This will be the grade for the larger qualification (i.e. the A Level grade rather than the AS grade). If the qualifications are the same size, then the better grade will be counted (please see *Appendix 7: Codes*).

Please note that there are two codes for AS GCE qualifications; one for Key Stage 4 (KS4) performance tables and one for 16–19 performance tables. If a KS4 student achieves both a GCSE and an AS with the same discount code, the AS result will be counted over the GCSE result.

Students should be advised that if they take two GCE qualifications with the same discount code, the colleges, universities and employers to which they wish to progress are likely to take the view that this achievement is equivalent to only one GCE. The same view may be taken if students take two GCE qualifications that have different discount codes but which have significant overlap of content. Before embarking on their programmes, students or their advisers who have any doubts about their subject combinations should check with the institution to which they wish to progress.

Access arrangements, reasonable adjustments, special consideration and malpractice

Equality and fairness are central to our work. Our equality policy requires all students to have equal opportunity to access our qualifications and assessments, and our qualifications to be awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Language of assessment

Assessment of this qualification will be available in English. All student work must be in English.

Access arrangements

Access arrangements are agreed before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

The intention behind an access arrangement is to meet the particular needs of an individual student with a disability, without affecting the integrity of the assessment. Access arrangements are the principal way in which awarding bodies comply with the duty under the Equality Act 2010 to make 'reasonable adjustments'.

Access arrangements should always be processed at the start of the course. Students will then know what is available and have the access arrangement(s) in place for assessment.

Reasonable adjustments

The Equality Act 2010 requires an awarding organisation to make reasonable adjustments where a person with a disability would be at a substantial disadvantage in undertaking an assessment. The awarding organisation is required to take reasonable steps to overcome that disadvantage.

A reasonable adjustment for a particular person may be unique to that individual and therefore might not be in the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, including:

- the needs of the student with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the student with the disability and other students.

An adjustment will not be approved if it involves unreasonable costs to the awarding organisation, or affects timeframes or the security or integrity of the assessment. This is because the adjustment is not 'reasonable'.

Special consideration

Special consideration is a post-examination adjustment to a student's mark or grade to reflect temporary injury, illness or other indisposition at the time of the examination/ assessment, which has had, or is reasonably likely to have had, a material effect on a candidate's ability to take an assessment or demonstrate their level of attainment in an assessment.

Further information

Please see our website for further information about how to apply for access arrangements and special consideration.

For further information about access arrangements, reasonable adjustments and special consideration, please refer to the JCQ website: www.jcq.org.uk.

Malpractice

Candidate malpractice

Candidate malpractice refers to any act by a candidate that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

Candidate malpractice in examinations **must** be reported to Pearson using a *JCQ Form M1* (available at www.jcq.org.uk/exams-office/malpractice). The form can be emailed to pqsmalpractice@pearson.com or posted to Investigations Team, Pearson, 190 High Holborn, London, WC1V 7BH. Please provide as much information and supporting documentation as possible. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

Staff/centre malpractice

Staff and centre malpractice includes both deliberate malpractice and maladministration of our qualifications. As with candidate malpractice, staff and centre malpractice is any act that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

All cases of suspected staff malpractice and maladministration **must** be reported immediately, before any investigation is undertaken by the centre, to Pearson on a *JCQ Form M2(a)* (available at www.jcq.org.uk/exams-office/malpractice). The form, supporting documentation and as much information as possible can be emailed to pqsmalpractice@pearson.com or posted to Investigations Team, Pearson, 190 High Holborn, London, WC1V 7BH. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice itself constitutes malpractice.

More detailed guidance on malpractice can be found in the latest version of the document *General and Vocational Qualifications Suspected Malpractice in Examinations and Assessments Policies and Procedures,* available at www.jcq.org.uk/exams-office/malpractice.

Awarding and reporting

This qualification will be graded, awarded and certificated to comply with the requirements of Ofqual's General Conditions of Recognition.

This A Level qualification will be graded and certificated on a six-grade scale from A* to E using the total subject mark. Individual components are not graded.

Students whose level of achievement is below the minimum judged by Pearson to be of sufficient standard to be recorded on a certificate will receive an unclassified U result.

The first certification opportunity for this qualification will be 2019.

Student recruitment and progression

Pearson follows the JCQ policy concerning recruitment to our qualifications in that:

- they must be available to anyone who is capable of reaching the required standard
- they must be free from barriers that restrict access and progression
- equal opportunities exist for all students.

Prior learning and other requirements

There are no prior learning or other requirements for this qualification.

Students who would benefit most from studying this qualification are likely to have a Level 2 qualification such as a GCSE in Music.

Progression

Students can progress from this qualification to:

- music schools and university courses that relate to music technology
- university courses that will benefit from the skills acquired from this GCE
- employment where music technology skills are essential, for example trainee producer or engineer, studio manager

Appendices

Appendix 1: Command word taxonomy

The following table lists the command words that will appear in question papers, along with their definitions. Not all command words will appear in each paper.

Command word	Definition
State, give, name, list	Give one or more points. Recall or find factual information
Identify	Give one or more points. Find factual information in given stimulus
Complete, label, draw	Questions, for example, that require a table to be filled in, or a graph/diagram to be labelled
Calculate	Questions that require calculation
Describe	Give points which may or may not be linked
Explain	Give points that are linked to a justification or extension
Compare	Make points about the similarities and differences Make relative judgements
Discuss	Identify the issue/situation/problem/argument that is being assessed within the question Explore all aspects of an issue/situation/problem/argument Investigate the issue/situation/problem/argument by reasoning or argument
Analyse	Examine, dissect elements in detail Focus on individual elements and how they combine to create an effect/achieve a purpose
Evaluate	Make judgements against parameters Draw conclusions, justify opinions or making comparisons

Please refer to the *Pearson Edexcel Level 3 Advanced GCE in Music Technology Sample Assessment Materials (SAMs)* for the application of some of these command words.

In addition, command words will be used that relate to the functions of a DAW in *Component 4: Producing and analysing*.

Appendix 2: Question types

The following table contains the types of questions used in the examination papers and the assessment objectives (AO) associated with these questions.

Question type	Expected responses
Practical questions	These questions will be used to assess AO1 and range from creating or correcting a sound to producing a final stereo mix
Multiple choice questions	Multiple choice questions (MCQs) will be used to assess standalone knowledge recall (AO3) and to identify information from stimulus materials (AO3). MCQs will require students to select the correct answer from four options.
Gap fill and line matching	These questions will be used to assess AO3, and involve filling in missing words in a sentence or matching pieces of information by drawing a line between them.
Diagrammatic	These questions will be used to assess AO3, and involve drawing and labelling a graph or labelling a diagram.
Calculation	These questions will be used to assess AO3, and involve obtaining a numerical answer, showing relevant working when requested, such as calculating the frequency.
Completion of a table	These questions will be used to assess AO3. They will require candidates to give or identify information in the form of completing a table.
Short open response questions	These questions will be used to assess AO3. They will be low tariff items of 1 mark from short answer recall questions (AO3) such as identifying a feature of a stimulus.
Open response questions	These questions will be used to assess AO3 or AO4. They will range in mark tariff from 2-4 marks such as describing what …. or to explain how …..
Long Open response	These questions will be used to assess AO3 and AO4 in equal proportions, and will be higher mark tariff questions (e.g 8 marks), such as explaining a process.
Extended open response questions	Extended open response questions will be used to give students opportunities to show higher-order thinking skills and to stretch and challenge them through application of knowledge and understanding. This question type will target a combination of Assessment Objectives in order to assess breadth of knowledge and depth of understanding. Extended open response questions will always require candidates to draw on underpinning knowledge and understanding (AO3) and either apply this knowledge and understanding in order to make judgements and/or reach conclusions (AO4) or to analyse (AO4) stimulus material to find connections and logical chains of reasoning between elements (AO4). In either case the emphasis will be on the application, conclusion, analysis, connection and logical chains of reasoning in order to elicit the higher order thinking skills being drawn out.

Appendix 3: List of acronyms

Term	Definition
A/D conversion	Analogue-to-digital conversion
ADT	Automatic double tracking or artificial double tracking
D/A conversion	Digital-to-analogue conversion
DAW	Digital audio workstation
dB scales	Decibel scales
EQ	Equalisation
LFO	Low frequency oscillator
LPF and HPF	Low pass filter and high pass filter
LSB and MSB	Least significant byte and most significant byte
MIDI	Musical Instrument Digital Interface
OSC	Open Sound Control
Q	Quality
RMS	Root-mean-square

Appendix 4: The context for the development of this qualification

All our qualifications are designed to meet our World Class Qualification Principles[1] and our ambition to put the student at the heart of everything we do.

We have developed and designed this qualification by:

- reviewing other curricula and qualifications to ensure that it is comparable with those taken in high-performing jurisdictions overseas
- consulting with key stakeholders on content and assessment, including learned bodies, subject associations, higher-education academics, teachers and employers to ensure this qualification is suitable for a UK context
- reviewing the legacy qualification and building on its positive attributes.

This qualification has also been developed to meet criteria stipulated by Ofqual in their documents *GCE Qualification Level Conditions and Requirements* and *GCE Subject Level Conditions and Requirements for* Music Technology, published in March 2016.

[1] Pearson's World Class Qualification Principles ensure that our qualifications are:

- **demanding**, through internationally benchmarked standards, encouraging deep learning and measuring higher-order skills
- **rigorous**, through setting and maintaining standards over time, developing reliable and valid assessment tasks and processes, and generating confidence in end users of the knowledge, skills and competencies of certified students
- **inclusive**, through conceptualising learning as continuous, recognising that students develop at different rates and have different learning needs, and focusing on progression
- **empowering**, through promoting the development of transferable skills, see *Appendix 5*.

From Pearson's Expert Panel for World Class Qualifications

"The reform of the qualifications system in England is a profoundly important change to the education system. Teachers need to know that the new qualifications will assist them in helping their learners make progress in their lives.

When these changes were first proposed we were approached by Pearson to join an 'Expert Panel' that would advise them on the development of the new qualifications.

We were chosen, either because of our expertise in the UK education system, or because of our experience in reforming qualifications in other systems around the world as diverse as Singapore, Hong Kong, Australia and a number of countries across Europe.

We have guided Pearson through what we judge to be a rigorous qualification development process that has included:

- establishing External Subject Advisory Groups, drawing on independent subject-specific expertise to challenge and validate our qualifications
- subjecting the final qualifications to scrutiny against the DfE content and Ofqual accreditation criteria in advance of submission.

Importantly, we have worked to ensure that the content and learning is future oriented. The design has been guided by what is called an 'Efficacy Framework', meaning learner outcomes have been at the heart of this development throughout.

We understand that ultimately it is excellent teaching that is the key factor to a learner's success in education. As a result of our work as a panel we are confident that we have supported the development of qualifications that are outstanding for their coherence, thoroughness and attention to detail and can be regarded as representing world-class best practice. "

Sir Michael Barber (Chair)
Chief Education Advisor, Pearson plc

Bahram Bekhradnia
President, Higher Education Policy Institute

Dame Sally Coates
Principal, Burlington Danes Academy

Professor Robin Coningham
Pro-Vice Chancellor, University of Durham

Dr Peter Hill
Former Chief Executive ACARA

Professor Lee Sing Kong
Director, National Institute of Education, Singapore

Professor Jonathan Osborne
Stanford University

Professor Dr Ursula Renold
Federal Institute of Technology, Switzerland

Professor Bob Schwartz
Harvard Graduate School of Education

Appendix 5: Transferable skills

The need for transferable skills

In recent years, higher education institutions and employers have consistently flagged the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as 'the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning.' [1]

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, we identified the National Research Council's (NRC) framework as the most evidence-based and robust skills framework. We adapted the framework slightly to include the Program for International Student Assessment (PISA) ICT Literacy and Collaborative Problem Solving (CPS) Skills.

The adapted National Research Council's framework of skills involves: [2]

Cognitive skills

- **Non-routine problem solving** – expert thinking, metacognition, creativity.
- **Systems thinking** – decision making and reasoning.
- **Critical thinking** – definitions of critical thinking are broad and usually involve general cognitive skills such as analysing, synthesising and reasoning skills.
- **ICT literacy** – access, manage, integrate, evaluate, construct and communicate.[3]

Interpersonal skills

- **Communication** – active listening, oral communication, written communication, assertive communication and non-verbal communication.
- **Relationship-building skills** – teamwork, trust, intercultural sensitivity, service orientation, self-presentation, social influence, conflict resolution and negotiation.
- **Collaborative problem solving** – establishing and maintaining shared understanding, taking appropriate action, establishing and maintaining team organisation.

Intrapersonal skills

- **Adaptability** – ability and willingness to cope with the uncertain, handling work stress, adapting to different personalities, communication styles and cultures, and physical adaptability to various indoor and outdoor work environments.
- **Self-management and self-development** – ability to work remotely in virtual teams, work autonomously, be self-motivating and self-monitoring, willing and able to acquire new information and skills related to work.

Transferable skills enable young people to face the demands of further and higher education, as well as the demands of the workplace, and are important in the teaching and learning of this qualification. We will provide teaching and learning materials, developed with stakeholders, to support our qualifications.

[1] OECD – *Better Skills, Better Jobs, Better Lives* (OECD Publishing, 2012)

[2] Koenig J A, National Research Council – *Assessing 21st Century Skills: Summary of a Workshop* (National Academies Press, 2011)

[3] PISA – *The PISA Framework for Assessment of ICT Literacy* (2011)

Appendix 6: Level 3 Extended Project qualification

What is the Extended Project?

The Extended Project is a standalone qualification that can be taken alongside GCEs. It supports the development of independent learning skills and helps to prepare students for their next step – whether that be higher education or employment. The qualification:

- is recognised by higher education for the skills it develops
- is worth half of an Advanced GCE qualification at grades A*–E
- carries UCAS points for university entry.

The Extended Project encourages students to develop skills in the following areas: research, critical thinking, extended writing and project management. Students identify and agree a topic area of their choice for in-depth study (which may or may not be related to a GCE subject they are already studying), guided by their teacher.

Students can choose from one of four approaches to produce:

- a dissertation (for example an investigation based on predominately secondary research)
- an investigation/field study (for example a practical experiment)
- a performance (for example in music, drama or sport)
- an artefact (for example creating a sculpture in response to a client brief or solving an engineering problem).

The qualification is coursework based and students are assessed on the skills of managing, planning and evaluating their project. Students will research their topic, develop skills to review and evaluate the information, and then present the final outcome of their project.

The Extended Project has 120 guided learning hours (GLH) consisting of a 40-GLH taught element that includes teaching the technical skills (for example research skills) and an 80-GLH guided element that includes mentoring students through the project work. The qualification is 100% internally assessed and externally moderated.

How to link the Extended Project with music technology

The Extended Project creates the opportunity to develop transferable skills for progression to higher education and to the workplace, through the exploration of either an area of personal interest or a topic of interest from within the music technology qualification content.

Through the Extended Project, students will develop skills that support their study of music technology, including:

- conducting, organising and using research
- independent reading in the subject area
- planning, project management and time management
- defining a hypothesis to be tested in investigations or developing a design brief
- collecting, handling and interpreting data and evidence
- evaluating arguments and processes
- critical thinking.

In the context of the Extended Project, critical thinking refers to the ability to identify and develop arguments for a point of view or hypothesis and to consider and respond to alternative arguments. This supports the development of evaluative skills, through evaluating music technology arguments and using qualitative and quantitative evidence to support informed judgements and propose evidence-based solutions to music technology issues.

Types of Extended Project related to music technology

The Extended Project creates the opportunity to develop transferable skills for progression to higher education and to the workplace, through the exploration of either an area of personal interest or a topic of interest from within the music technology qualification content.

Students can use the Extended Project to build in-depth knowledge and understanding of a music producer or engineer, or of a specific recording or production technique.

Here are some suggestions:

- in-depth investigation into a music producer or engineer and the impact they had on a musical style
- investigating production methods and how thy have changed over a period of time
- producing a recording using contrasting studio techniques and making an in-depth comparison of them.

Using the Extended Project to support breadth and depth

In the Extended Project, students are assessed on the quality of the work they produce and the skills they develop and demonstrate through completing this work. Students should demonstrate that they have extended themselves in some significant way beyond what they have been studying in business. Students can demonstrate extension in one or more dimensions:

- ***deepening understanding*** – where a student explores a topic in greater depth than in the specification content. This could be an in-depth exploration of one aspect of the broad pre-release context
- ***broadening skills*** – where a student learns a new skill. This might be learning a new recording or production technique or process that can be used in the analysis of either primary or secondary data collected by the student
- ***widening perspectives*** – where the student's project spans different subjects. A student studying music technology with mathematics may wish to use statistical techniques to analyse recording data and research one aspect in more detail.

A wide range of information to support the delivery and assessment of the Extended Project, including the specification, \teacher guidance for all aspects, an editable scheme of work and exemplars for all four approaches, can be found on our website.

Appendix 7: Codes

Type of code	Use of code	Code
Discount codes	Every qualification eligible for performance tables is assigned a discount code indicating the subject area to which it belongs. Discount codes are published by DfE in the RAISEonline library (www.raiseonline.org)	LJ9
Regulated Qualifications Framework (RQF) codes	Each qualification title is allocated an Ofqual Regulated Qualifications Framework (RQF) code. The RQF code is known as a Qualification Number (QN). This is the code that features in the DfE Section 96 and on the LARA as being eligible for 16–18 and 19+ funding, and is to be used for all qualification funding purposes. The QN will appear on students' final certification documentation.	The QN for this qualification is: 603/0188/0
Subject codes	The subject code is used by centres to enter students for a qualification. Centres will need to use the entry codes only when claiming students' qualifications.	A Level – 9MT0
Component codes	These codes are provided for reference purposes. Students do not need to be entered for individual components.	Component 1: 9MT0/01 Component 2: 9MT0/02 Component 3: 9MT0/03 Component 4: 9MT0/04

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