

Unit 106: Extending Specialist Metal and Jewellery Techniques

Unit code:	M/502/5379
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

The aim of this unit is to give learners the opportunity to extend their skills and understanding of working with specialist metal and jewellery techniques and associated materials. Learners will do this through a practical programme of designing and making to produce innovative final outcomes in response to specified intentions.

● Unit introduction

Creating jewellery and silverware is one of Britain's oldest crafts and there is still an important place for these trades. Jewellery is often used to make a statement about wealth and social status, for example the precious stones adorning the throats of the rich and famous, the crown jewels, and 'bling'. Earrings and necklaces, cufflinks and tie clips, cigarette cases, compacts, silver and plated wares for the table are all supplied by the jeweller or metalworker. Most rites of passage are marked with some form of metalwork or jewellery; silver or pewter for christening gifts, precious metals for engagement and wedding rings, pearl, ruby, silver and golden wedding anniversaries.

For any practitioner working within the field of metal and jewellery design the ability to work towards focused outcomes whilst employing the specialist techniques, materials and processes is essential. Finished work needs to respond to specified intentions. These may arise from a specific design brief from a client, they may be self-directed or they may be based on a given or chosen theme. It is unlikely to be purely ad hoc, although designers should always be open and able to respond to the unexpected.

The emphasis in this unit is on the development of design ideas in response to specified intentions together with the planning, production and completion of finished work. Learners will have the opportunity to extend their skills and understanding of working with specialist metal and jewellery techniques and associated materials through an essentially practical programme of 'making'. An important aspect of all design work is the continuous review of results and use of the knowledge and understanding gained to inform further work.

This unit is likely to be delivered mainly in the workshop or studio but could be supplemented with outside visits. It is one of two units designed to introduce learners to the specialist techniques for metal and jewellery and associated materials and will also extend the understanding gained in *Materials, Techniques and Processes in Art and Design*. Additionally, it contributes to preparation for progression to higher education or to work as a practitioner.

The use of materials, tools and equipment has health and safety implications and learners will become familiar with the COSHH guidance relevant to specialist metal and jewellery techniques and materials.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to create designs in specialist metalwork and jewellery materials in response to set briefs
- 2 Be able to use specialist metalwork and jewellery materials and techniques
- 3 Be able to produce finished work to specific design intentions
- 4 Understand the process and finished products.

Unit content

1 Be able to create designs in specialist metalwork and jewellery materials in response to set briefs

Design briefs: clarify the brief eg client requirements, self-directed intentions, theme

Research: sources; information eg materials, techniques, historical, contemporary, precedents, market potential, visual references

Design development: originate; initial ideas eg brainstorming, drawing, visual references, experimental models, sampling, CAD, group discussion, sketching, working drawings; alternative ideas eg problem solving, analysis, recording, refining

Review progress: creative intentions eg strengths, weaknesses, aesthetics, function, form; suitability for making; potential; fitness for purpose; intended outcome eg selection, proposals, solutions

2 Be able to use specialist metalwork and jewellery materials and techniques

Planning: scheduling; time management; sourcing materials; planning work; costing

Select materials to meet specified outcomes: alternatives eg base metals, precious metals, alloys, acrylics, resin, gemstones, glass, feathers, shells, wood, found objects, recycled materials; metal forms eg sheet, wire coils, tube; components eg fastenings, fixings

Preparing specialist materials: eg stretching, measuring, marking, cutting, piercing, sawing, annealing, forming

Health and safety in workshop practice: the Health and Safety Act 1974, elimination of risk to self and others; thinking and working safely within a studio or workshop environment; COSHH

3 Be able to produce finished work to specific design intentions

Practical processes: eg cutting, shaping, forming, laminating, forging, casting, stone setting; surface treatments eg hammering, filing, engraving, scoring, carving, inlay, acid etching, sand blasting, roller printing, patination, reticulation, granulation, enamelling; techniques (construction, assembling) eg soldering, welding, riveting, screwing, bolting

Using specialist equipment: tools (hand, machine) eg hammers, saws, pliers, callipers, doming block, punches, rolling mill, pendant drills, sand blaster, soldering torches, enamelling kiln, polishing unit

Finishing processes: finishing processes eg polishing, buffing, oxidising, grinding, sand blasting, burnishing, pickling; additions (fixings, fastenings) eg clasps, links, hinges, springs

Reviewing and recording: modify; justify; refine; recording eg notes, technical data, reports, drawings, samples, photographs

4 Understand the process and finished products

Present work: eg mounted, suspended, worn, photographic, digital media, portfolio, box, cabinet

Evaluate techniques and processes: designing; making processes; decisions (techniques, materials, processes, suitability, choices) eg written evaluation, oral presentation, discussion

Evaluate suitability of alternatives: aesthetic qualities; fitness for purpose; creative process; annotation (sketchbooks, notebooks)

Evaluate the final outcomes: finished body of work; qualities eg functional, aesthetic, technical, fitness for purpose, visual, design, product, strengths, weaknesses; relevance to the brief

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 create designs in specialist metalwork and jewellery materials in response to set briefs [IE, CT, RL]	M1 conduct considered research and development of a range of design ideas, supported by relevant contextual examples	D1 demonstrate full potential of research material and design ideas, using theoretical understanding and observations to make informed judgements when selecting and preparing materials and techniques
P2 use specialist metalworking and jewellery materials and techniques [IE, CT]	M2 purposefully select materials and techniques from trials and records for specified design intentions	D2 produce innovative and exciting outcomes, using perceptive technical and visual analysis to review and evaluate progress of own work.
P3 produce finished artefacts that meet design briefs [SM]	M3 produce consistently effective artefacts with attention to detail and finish, making considered visual decisions using appropriate vocabulary in relation to intended design.	
P4 review how ideas, materials and techniques were used. [RL, EP]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

For this unit learners should have access to workbenches with appropriate tools and equipment in a studio/workshop environment. Depending on the range of specialist techniques to be offered, this may include metalwork tools, standard jeweller's equipment, hand tools and appropriate machinery with extraction mechanisms where necessary. In all cases appropriate personal protective equipment should be available.

This unit has been designed to give learners the opportunity to put into practice the knowledge and skills and the ability to develop ideas acquired in *Exploring Specialist Metal and Jewellery Techniques* and to consolidate their learning. The emphasis is on design development from initial ideas in response to a design brief, to the finished product. It is, therefore, essential to generate evidence of the whole process from inception to realisation. This should be reflected in the presentation of initial responses to the brief, drawings, samples, prototypes, technical notes, written records of research, development and evaluation as well as the finished pieces. It is particularly important for learners to make accurate and comprehensive records of their working process. These should be organised in a sketchbook or notebook.

Learners should also analyse and evaluate both the making process and the finished artefacts and these records, alongside actual work and tutor observation, will provide the evidence required for assessment purposes.

This unit is likely to be delivered mainly in the workshop or studio but may be supplemented with outside visits to exhibitions, museums, galleries, jewellery studios, metal and jewellery suppliers.

Learning outcome 1 is dedicated to the generation and development of ideas in response to a design brief which may be given or self-directed. Initially learners need to learn how to clarify and understand the requirements of the brief, for example, through identification of task, client needs, resources and constraints. Learners then need to establish the context for the work through investigating, for example, the specified audience, the intended occasion and any safety issues. Questioning, individually and in groups, discussions, seminars and tutorials may be used to establish intentions and context.

Once the requirements of the brief are established, learners can begin to explore and develop ideas, modifying, justifying and refining as the work develops. Learners should be encouraged to develop an exploratory and individual approach to their work before making final design decisions. The development of sketchbook skills is an essential part of this process and tutors need to introduce learners to a broad range of mark-making techniques and drawing media.

Learning outcomes 2 and 3 are linked. Exploration and investigation of ideas will continue using the range of specialist metal and jewellery techniques according to the resources and facilities available. Learners should produce a range of developmental and final work that accurately demonstrates the depth of skill and understanding when working with specialist metal and jewellery techniques. Work produced should be mainly practical but supported by written and visual records.

For learning outcome 4, learners need to consider how to produce, present and evaluate a body of finished work in response to the intentions of the brief and how to select and display work and ideas for presentation to peers, tutors, and/or others for feedback. Tutors need to provide specific vocational, technical and theoretical support throughout to enable learners to produce an effective body of work.

When evaluating the development work or the final outcomes produced, learners should discuss and comment on the suitability, success and/or failure of the specialist metal and jewellery techniques and materials used in terms of technical and aesthetic qualities, fitness for purpose and relevance to design intentions. Discussion, group work, seminars, presentation to peers may form part of the delivery.

This unit is linked to *Exploring Specialist Metal and Jewellery Techniques* and in most cases the two should be taught either in sequence or through an integrated programme. For assessment purposes the units are ordered so as to separate exploration and preparation from design development and production processes. As this is an artificial separation an integrated approach to delivery is likely to be more suitable. It is essential that there are appropriate means of referencing the unit specifications within integrated projects and programmes.

Tutors need to advise learners of, all aspects of current legislation associated with health and safety practices in the studio or workplace and ensure they adhere to it. Learners should observe appropriate COSHH guidance material and will need to be inducted in the safe working practices as they are applied to the working characteristics of specialist metalwork and jewellery techniques. Tutors should explain the importance of using personal protective equipment, such as clothing, eye shields and masks and behaving with regard to the health and safety of themselves and of others. Where sharp materials and hot processes are concerned, it is clearly important to continuously reinforce the principles of safe working practice to avoid injuries.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to unit and structure of the programme – whole class.
Reinforce relevant Health & safety in the workshop including COSHH, use of personal protective equipment etc – whole class.
<p>Assignment: 'Inspired by the V&A' Competition</p> <p>Introduction to assignment brief – whole class, Q&A, brainstorming to clarify brief.</p> <p>Part 1: Research and development.</p> <p>Learners:</p> <ul style="list-style-type: none"> • visit the V&A to identify objects that inspire – sketchbook, notes, photos – whole group/tutor • brainstorm with whole group/tutor • revisit chosen object – self-directed research • develop a range of design ideas – models, maquettes, drawings etc • present ideas – whole group/tutor • test of proposed materials, test and of identified relevant processes – sample pieces, analysis of results, annotated drawings • evaluate effectiveness of techniques and processes used – verbally and written • plan interim presentation • present results of explorations as a series of maquettes, drawings, sample pieces, annotations.
Learner initiated study.

Topic and suggested assignments/activities and/assessment

Part 2: Design realisation.

Learners:

- finalise design concept – drawings, test pieces
- plan work schedule
- participate in one to one tutorials to move work on
- make the components for the work
- apply required surface finish and detail
- construct and assemble work including problem solving to address the unexpected.

Learner-initiated study.

Part 3: Final competition entry.

Learners:

- plan for and present final piece of work – to tutor and group
- prepare submission for competition – photos, drawings, notes
- produce written rationale in response to brief.

Unit review and assessment.

Assessment

Evidence can be assessed by observation, discussion, and feedback from group presentations.

For the pass criteria learners must develop ideas and final outcomes in response to a design brief, select, prepare and use the relevant specialist metal and jewellery techniques and materials safely and present and explain their ideas in simple terms. It is important that all developmental work is recognised as being as valuable to the project as the finished artefact. This therefore, be reflected in the presentation of initial responses to the brief, drawings, samples, prototypes, research material, development work and evaluation. Some learners may need tutor support to achieve the pass criteria.

Evidence for P1, P2 and P3 will overlap to a certain extent and should include design development and finished work. Development work and technical notes should be organised in a sketchbook or notebook. These records, alongside actual work and tutor observation, will provide the evidence required for assessment purposes.

Evidence for P3 should include a body of work, both developmental and the finished product, with well-organised records. Work generated will be influenced by the technical opportunities and constraints of the specialism and the available resources.

For P4, learners need to present finished work in an appropriate format and to explain the work. This may be part of an oral presentation or discussion or may take the form of a written evaluation or questionnaire. Evidence for oral presentation/discussion could be recorded or in the form of tutor written observations.

For M1, learners need to show the ability to select, record and extract visual information purposefully, pursue several directions for initial design ideas, use relevant contextual examples as an aid to extending possibilities, develop individual realisations and refine the selected design prior to making.

For M2, learners must show purposeful selection and preparation of materials and techniques with regard for their possibilities and limitations to inform individual design intentions.

For M3, learners must produce effective artefacts skilfully, with attention to detail and finish, demonstrating considered visual decisions, evaluating successes and failures in relation to design brief, using appropriate vocabulary.

For D1, learners are required to demonstrate full potential of research material, a high level of visual enquiry, extract selected visual elements and comprehensively investigate variations of design ideas. They should use contextual examples as inspiration to pursue alternative solutions. Designs will be ambitious and challenging, but must take constraints into account. Learners must make informed judgements about risks and anticipate problems and solutions when selecting materials, techniques or processes.

For D2, learners should demonstrate a high level of dexterity, sustained control and a flexible approach to making processes to produce innovative and exciting outcomes. They must continuously reflect on the effectiveness of their decision making and use knowledge and skills gained to advance the creative work.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
PI, P2 MI, M2 DI	Assignment: 'Inspired by the V&A' Competition Part 1: Research and development	An annual live national competition in response to a brief given by the museum. Learners start with museum research to identify objects that inspire them. This is followed by a period of design development to arrive at a final solution that meets the requirements of the brief. The final submission must meet set criteria for scope, presentation and format. Winners are invited to a presentation evening and exhibit their work in the museum alongside the piece that inspired them.	<ul style="list-style-type: none"> • Annotated sketchbook. • Test pieces. • Models/maquettes. • Technical notes.
PI, P2, P3, P4 MI, M2, M3 DI, D2	Part 2: Design realisation		<ul style="list-style-type: none"> • Drawings. • Test pieces. • Work schedule. • Finished pieces.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4 M1, M2, M3 D1, D2	Part 3: Final competition entry		<ul style="list-style-type: none"> • Photos, annotated drawings of the object that inspired the work. • Development work – annotated design drawings, photos of models/maquettes, test pieces. • Written rationale. • The finished piece of work.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the BTEC Art and Design suite:

Level 1	Level 2	Level 3
Working in 3D Design Crafts	Working in 3D Design Crafts	Exploring Specialist Metal and Jewellery Techniques
Explore Surface Decoration	Working to a 3D Design Crafts Brief	Exploring Resistant Materials
		Extending Resistant Materials

Essential resources

Learners need access to workshop facilities equipped to the appropriate standards for this level of specialised work. For metalwork, learners need workbenches, metalwork tools and machinery with extraction mechanisms where necessary. For jewellery, learners need standard jeweller's equipment, jewellery workbenches, pendant drills, soldering torches and polishing unit and a, pickle tank with extraction mechanisms. A rolling mill, sand blaster, and enamelling kiln are desirable according to the techniques offered. Learners also need a full range of hand tools including hammers, saws, pliers, anvils, leather bags, doming blocks and punches, pitch bowl, stakes, mandrils and tribletts. Suitable space for 'hot' work such as soldering, welding, forging, pouring and casting and a space for the use of small hand tools and experimental work are required according to the techniques offered. There should also be a safe area for handling hazardous substances such as acids, mordants and pickle. There should be adequate storage space for materials, work in progress and finished work including secure and appropriate facilities for the safe storage of valuable materials. Learners also need a clean area for drawing and recording work. For research learners need access to technical resources, a library, the internet, journals and IT facilities.

Employer engagement and vocational contexts

Centres should develop links with metal workers and jewellers, to deliver assignments to learners or to provide work experience.

Links with employers are essential to the delivery of the programme for work experience and future employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant; centres should consider the delivery of 'live projects', for example, to support the vocational content of the unit and programme.

Creative and Cultural Skills (www.ccskills.org.uk), the Sector Skills Council for Arts, Crafts and Design, has launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the arts, crafts and design sector, including job descriptions.

Creative making skills are identified as a long term need for the sector and this unit aims to equip learners with a broad base of practical design and making skills relating to specialist jewellery and metalwork materials and techniques, supported by sound technical knowledge to underpin the processes. With the lack of craft education in schools, the programme which includes this unit contributes to the continuing training of jewellers and metalworkers.

Indicative reading for learners

Textbooks

McCreight T – *Practical Casting* (Davis Publications, 1994) ISBN 978-0961598457

McCreight T – *The Complete Metalsmith* (Davis Publications, 1991) ISBN 978-0871922403

McGrath J – *The Jeweller's Directory of Decorative Finishes* (A&C Black, 2005) ISBN 978-0713670936

Olver E – *The Jeweller's Directory of Shape and Form* (A&C Black, 2001) 978-0713654875

Untracht O – *Jewellery Concepts and Technology* (Robert Hale, 1985) ISBN 978-0709196167

Journals

Crafts – magazine published by the Crafts' Council every two months covering full range of crafts including metalwork and jewellery.

Websites

www.craftscouncil.org.uk

Crafts Council: photo library of work by contemporary jewellers

www.jaitc.org.uk

Jewellery and Allied Industries Training Council

www.vam.ac.uk/collections/jewellery

Victoria & Albert Museum

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	presenting and expressing ideas selecting appropriate materials for design work
Creative thinkers	creating and developing a range of design ideas in response to specified design intentions originating design work to realise design intentions and demonstrate practical skills
Reflective learners	evaluating the process and the outcomes
Self-managers	working safely to prepare selected materials communicating design intentions
Effective participators	contributing to group discussions.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Independent enquirers	researching and expressing ideas exploring material combinations experimenting with processes.
Creative thinkers	problem solving to address unexpected outcomes of experiments presenting experimental work and justifying decisions made communicating intentions
Reflective learners	evaluating their own work and using findings to inform future work and improve performance
Team workers	working in pairs or a group for sharing initial research and taking responsibility for their own contribution.
Self-managers	setting targets and objectives for working independently to develop own work and learning from experience gained organising time and resources
Effective participators	group brainstorming sessions.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching into metalworkers and jewellery makers
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning research and presentations presenting their own creative work to peer group and tutors
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching into work of other artists, designers and makers and presenting findings
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	using the internet for research into historical and contemporary precedents selecting appropriate material for presentation
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	presenting findings of research discussing their own, their peers' and others' views on the work.
Bring together information to suit content and purpose	researching and presenting findings planning presentation
Present information in ways that are fit for purpose and audience	presenting research findings, possibly as a PowerPoint presentation.
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	planning project work and accessing information from suppliers etc calculating sizes/weights of materials
Identify the situation or problem and the mathematical methods needed to tackle it	calculating ring sizes using appropriate formula for circumference of a circle (πd)
Select and apply a range of skills to find solutions	using ring size calculations to inform work
Use appropriate checking procedures and evaluate their effectiveness at each stage	

Skill	When learners are ...
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	discussing their own, their peers' and others' views on their own work and on the work of other artists, designers and makers presenting their own creative work to peer group and tutors
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching into work of other artists, designers and makers and presenting findings in their own words
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing an evaluation of their own work writing up and collating research writing up technical notes on processes and materials.