

Unit 104: Extending Specialist Glass Techniques

Unit code:	T/502/4993
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 in working with specialist glass techniques and associated materials through an essentially practical programme of designing and making to produce innovative final outcomes in response to specified intentions.

● Unit introduction

Glass has particular physical properties that distinguish it from other materials and these properties can appear to contradict each other. Glass can be solid yet transparent, fragile yet structural, rigid yet formed (and more) and the exploitation of these properties, through a range of specialist techniques, can result in innovative outcomes. For inspiration, learners should look at Danny Lane's layered glass furniture, Dale Chihuly's blown glass chandeliers, traditional and contemporary stained glass such as Patrick Heron's unleaded window in the Tate Gallery at St. Ives, Max Jacquard's human forms from linked, slumped glass pieces, and glass artists from the Czech Republic such as Václav Cigler and Stanislav Libensky who with Jaroslava Brychtova, pioneered, explored and defined glass as a medium for sculpture and have been influential in developing casting techniques to produce monumental, architectural forms. On a smaller scale there is glass jewellery, fused and slumped bowls and plates, lampshades and lighting. Combining techniques, as in fused and slumped 3D pieces collaged into stained glass panels, can produce exciting and unusual outcomes and has huge potential. Additionally, there is the glassware industry producing anything from jam jars and bottles to precision scientific equipment and lead crystal goblets.

For any practitioner working within the field of art, design and applied arts the ability to work towards focused outcomes whilst using the specialist techniques, materials and processes relevant to their chosen field is essential. Finished work needs to respond to specified intentions. These may arise from a specific design brief from a client, be self-directed or 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.

This unit encourages learners to apply knowledge and understanding gained in Exploring Specialist Glass Techniques to produce innovative final outcomes. 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 in and understanding of working with specialist glass techniques and associated materials through an essentially practical programme of designing and making. An important aspect of all design work is the continuous review of results to inform further work.

Use of materials, tools and equipment has health and safety implications and learners will become familiar with the COSHH guidance relevant to specialist glass techniques and materials.

This unit is likely to be delivered mainly in the workshop or studio but may be supplemented with outside visits. It is one of two units designed to introduce learners to the specialist techniques for glass and associated materials and will also extend understanding gained in *Unit 2: Materials, Techniques and Processes in Art and Design*. Additionally, it contributes to preparation for progression to higher education or to work as a practitioner.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to develop specialist design ideas in response to a brief
- 2 Be able to select and prepare specialist glass materials to meet design intentions
- 3 Be able to produce finished specialist work to specific design intentions
- 4 Understand the specialist process and finished product in relation to the design brief.

Unit content

1 Be able to develop specialist design ideas in response to a brief

Design briefs: clarify the brief eg client requirements, self-directed intentions, theme, context for the final outcome

Research: identify sources of information eg appropriate materials, historical and contemporary influences

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

Review progress: against original creative intentions eg assess, strengths, weaknesses, aesthetics, function, form; suitability, making; potential, fitness for purpose; select, propose solutions, intended outcomes

2 Be able to select and prepare specialist glass materials to meet design intentions

Planning: scheduling, time management; sourcing materials; planning work eg cutting lists, firing schedules, costing

Select appropriate materials: eg sheet, cullet, crystal, optical glass; associated materials eg lead calm, copper foil, glass paints, lustres, wire, wax, clay, plaster, flexible and rigid mould-making materials, alginate, card, glues, found objects and recycled materials

Preparing specialist glass materials: techniques; processes; preparation; specialist glass materials eg cutting, crushing, layering; associated materials eg forming, modelling, stretching, glueing

Health and safety in workshop practice: the Health and Safety at work Act 1974, elimination of risk to self and others; thinking and working safely within a studio or workshop environment; following relevant COSHH guidance on materials and workshop practice for specialist glass techniques and associated materials

3 Be able to produce finished specialist work to specific design intentions

Practical processes: appropriate, specialist glass techniques, making processes eg cutting, crushing, leading, copper foiling, patination, painting, model, mould making, fusing, slumping, pate de verre, lost wax, casting, kiln firing, cold working, 'hot' glass processes

Using specialist equipment: hand tools, machine tools eg glass cutters, soldering irons, pliers, hammers, drills, grinders, diamond saws, kiln, sand blaster, torches

Finishing processes: finishing processes, surface treatments eg assembling, constructing, shaping, joining, applying patination, painting, decorating, polishing, etching, sand blasting

Reviewing and recording: work in progress; modifying; justifying; refining; appropriate formats eg notes, technical data, reports, drawings, samples, photographs

4 Understand the specialist process and finished product in relation to the design brief

Present work: formats eg mounted, suspended, on plinth, lightbox, photographic, digital media; presenting finished work to others eg discussion, group critique, seminar, tutorials

Techniques and processes: review eg design, making, decisions, suitability, choice of materials, choice of processes; present eg written evaluation, oral presentation, discussion annotations eg in sketchbooks, notebooks

Suitability of alternatives: aesthetic qualities; fitness for purpose; appropriate stages; creative process;

Final outcomes: finished body of work eg functional, aesthetic, characteristics, technical qualities, fitness for purpose, visual qualities, design, 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 develop specialist design ideas in response to a brief [CT, IE]	M1 develop coherent specialist design ideas, supported by relevant contextual examples, in response to a brief	D1 develop effective specialist design ideas, supported by diverse contextual examples and innovative use of materials and techniques
P2 select and prepare specialist glass materials safely in response to specified design intentions [IE, SM]	M2 select materials and techniques purposefully from trials and records to meet specified design intentions	D2 produce innovative and effective outcomes, using perceptive technical and visual analysis to evaluate own work.
P3 produce finished specialist work [CT, SM]	M3 produce artefacts with attention to detail and finish, using appropriate vocabulary to explain intended design brief.	
P4 review and record the specialist process and the finished product in relation to the design brief. [RL]		

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

This unit has been designed to give learners the opportunity to consolidate learning and the ability to develop ideas acquired in *Exploring Specialist Glass Techniques*. The emphasis in this unit is on design development from initial ideas, in response to a design brief, to the finished product. It offers learners the opportunity to develop and extend ideas in the specialist area of glass to produce finished work in response to specified design intentions. It is therefore essential that learners 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 the making process and the finished artefacts and these records, alongside actual work and tutor observation, will provide the evidence required for assessment purposes. The combination of all records, explorations and evaluations, along with the finished work should demonstrate clearly the level of understanding achieved by learners. The quality and range of responses to the brief, mainly through practical work, will provide proof of competence in using specialist glass techniques.

Learning outcome 1 should focus on the generation and development of ideas in response to a design brief which may be given or self-directed. Initially, learners will 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 will then be able to establish the context for the work through investigating, for example, the specified audience, the intended location and any safety issues. Questioning, individually or 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 them 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 instruction will be needed to introduce learners to a broad range of techniques.

For learning outcome 2, exploration and investigation of ideas will continue using the range of specialist glass techniques, according to the resources and facilities available. Learning outcomes 2 and 3 link together and learners should expect to produce a range of developmental and final work that demonstrates the depth of their skill and understanding accurately when working with specialist glass techniques. Work produced will mainly be practical but supported by written and visual records.

For learning outcome 4, learners will 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 to present to peers, tutors and others for feedback. Tutors will need to provide specific vocational, technical and theoretical support throughout to enable learners to produce an effective body of work.

This unit is likely to be delivered mainly in the workshop or studio but may be supplemented with outside visits to exhibitions, museums, glass studios and glass suppliers. When evaluating the development work or the final outcomes, learners should be invited to discuss and comment on the suitability, success and/or failure of the specialist glass techniques and materials used in terms of technical and aesthetic qualities, fitness for purpose and relevance to the design intentions. Discussion, group work, seminars, presentation to peers may form part of the delivery.

This unit is linked to *Exploring Specialist Glass Techniques* and in most cases the two should be taught either in sequence or through an integrated programme. For assessment purposes the units have been designed order 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.

Learners will need to be advised of, and adhere to, all aspects of current legislation associated with health and safety practices in the studio or workplace. 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 glass techniques. They need to understand the importance of using personal protective equipment, for example clothing, eye shields, masks and gloves, and behaving with due regard for the health of themselves and of others. Where glass is concerned it is clearly important to continuously reinforce the principles of safe working practice in order to avoid minor 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 and activities
Introduction to unit and structure of the programme – whole class.
Reinforce relevant health and safety in the workshop including COSHH, use of personal protective equipment etc – whole class.
Assignment 1: Inspired by the Victoria and Albert Museum Adult Learners' Competition Introduction to assignment brief – whole class, Q&A, brainstorming to clarify brief. Part 1: Research and development: <ul style="list-style-type: none">• visit V&A to identify inspiring objects – sketchbook, notes, photos – whole group/tutor• mind map 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• carry out testing of proposed materials, and 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.
Part 2: Design realisation: <ul style="list-style-type: none">• finalise design concept – drawings, test pieces• plan work schedule• participate in one-to-one tutorials to move work on• create the work including problem solving to address the unexpected.
Part 3: Final competition entry: <ul style="list-style-type: none">• 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.
Review of unit and assessment.

Assessment

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

For the pass criteria learners will be expected to develop ideas and final outcomes in response to a design brief, prepare and use the relevant specialist glass techniques and materials safely and be able to present and discuss 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 should, therefore, be reflected in the presentation of initial responses to the brief, drawings, samples, prototypes, research material, development work and evaluation. It is anticipated that learners will need tutor support in order 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 finished product, with well-organised records. Work generated will be influenced by the technical opportunities and constraints of the specialism and the available resources.

Evidence for P4 requires learners to review the process and outcomes. This may be part of an oral presentation, discussion or may take the form of ongoing annotation, 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 plan, 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 before making.

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

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

For D1, learners need to demonstrate the full potential of research material, a high level of visual enquiry, extract selected visual elements and investigate variations of design ideas thoroughly. They will use contextual examples as an inspiration to pursue alternative solutions. Designs will be ambitious and challenging, but take constraints into account. Learners will 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, continuously reflecting on the effectiveness of their decision making and using 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
P1, M1, D1 P2, M2	Assignment 1: Inspired by the Victoria and Albert Museum Adult Learners' Competition Part 1: Research and development	An annual live national competition for all learners 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.	Evidence consisting of: <ul style="list-style-type: none"> annotated sketchbook work test pieces technical notes.
P2, M2 P3 D1	Part 2: Design realisation	The final submission has to meet set criteria for scope, presentation and format.	Presentation of work including: <ul style="list-style-type: none"> drawings test pieces work schedule finished pieces.
P3, M3 P4 D2	Part 3: Final competition entry	Winners are invited to a presentation evening and to exhibit their work in the museum alongside the piece that inspired them.	Competition submission consisting of: <ul style="list-style-type: none"> photos, annotated drawings of the object that inspired the work development work, annotated design drawings, photos of 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 units in the BTEC Art and Design suite:

Level 1	Level 2	Level 3
Creative Use of Materials, Techniques and Processes	Explore Surface Decoration	Extending Resistant Materials
Explore Surface Decoration	Working in 3D Design Crafts	Exploring Resistant Materials
		Exploring Specialist Glass Techniques

This unit provides learners with a progression pathway from Level 2 BTEC courses. The skills and knowledge gained in this unit can also provide a good grounding for many other units within the BTEC Nationals in Art and Design (Design Crafts) where glass could be the focus. There are likely to be links with all core units.

Essential resources

Workshop facilities equipped to the appropriate standards for this level of specialised work. Conditions should, as far as possible, equate to those of professional practitioners.

The provision of workbenches, glass working tools and machinery with extraction mechanisms where necessary storage facilities and a suitable space for experimental work.

Suitable space for 'hot' work such as soldering and a safe area for handling hazardous materials such as sheet glass, lead, glass paints, plaster and alginate are required according to the techniques offered.

Where kiln formed glasswork is to be offered there will need to be access to appropriate kilns together with a range of mould making and cold working equipment if casting is to be offered.

A separate plaster area with appropriate extraction is essential if mouldmaking is to be offered.

There should be adequate storage space for materials, work in progress and finished work.

Learners also need a clean area for drawing and recording work.

The research resources needed include access to technical resources, a library, a slide index, journals and IT facilities.

Employer engagement and vocational contexts

Centres should develop links with practising artists, craftspeople and designers, to deliver assignments to learners or to provide work experience.

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

Vocational learning support resources include:

- 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' to support the vocational content of the unit and programme.

- The creative and cultural skills sector is in need of designer makers with good presentation skills. These are addressed in several ways in this unit through visual and verbal presentation to the tutor and the whole group, with the added possibility of presenting to an external potential client.
- 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 glass specialist materials and techniques, supported by sound technical knowledge to underpin the processes.
- With the lack of craft education in schools this unit contributes to the continuing training of glass crafts people.
- The Crafts' Council offer start-up grants for new designer makers www.craftscouncil.org.uk
- Cockpit Arts (Holborn and Deptford) offer reduced rents on studio spaces for new designer makers through their seedbed scheme www.cockpitarts.com
- Contemporary Glass Society includes student pages, job vacancies etc www.cgs.org.uk

Creative & Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Beveridge P, Domenech I and Pacual E – *Warm Glass: A Complete Guide to Kiln-Forming Techniques: Fusing Slumping Casting* (Lark Books, 2005) ISBN 978-1579906559

Bray C – *A Dictionary of Glass: Materials and Techniques* (A&C Black, 2001) ISBN 978-0713657920

Cummings K – *Techniques of Kiln Formed Glass* (A&C Black, 2002) ISBN 978-0713661200

Gerstein M and Wrigley L – *The Complete Stained Glass Course: How to Master Every Major Glass Work Technique, with Thirteen Stunning Projects to Create* (Apple Press, 2000) ISBN 978-1840922745

Hawkins Opie J – *Contemporary International Glass* (V&A Publications, 2004) ISBN 978-1851774265

Hess C and Wight K – *Looking at Glass: A guide to terms, styles and techniques* (J Paul Getty Trust Publications, 2005) ISBN 978-1851774609

Isanberg A and S – *How to Work in Stained Glass* (Krause Publications, 1998) ISBN 978-0873416283

Lundstrom B – *Glass Casting and Moldmaking: Book 3* (Vitreous Publications, 1989) ISBN 978-0961228224

San Casciani P – *The Technique of Decorative Stained Glass* (Dover Publications Inc, 2009) ISBN 978-0486261577

Journals

Crafts – magazine published by the Crafts' Council every two months covering the full range of crafts including glass

Neues Glass/New Glass – Quarterly German publication in English featuring interviews with artists, reviews, information on exhibits and competitions, book reviews and the latest glass art news from around the world

Websites

www.cmog.org	Corning museum of glass, New York: good range of images of work by international glass artists
www.craftscouncil.org.uk	Crafts Council: examples of work by contemporary glass makers
www.glassindustry.info	Index of glass makers, suppliers etc
www.nationalglasscentre.com	The National Glass Centre: a cultural and educational resource, shows artists' work and exhibitions past, present and future
www.sunderland.ac.uk	International Institute for Research in Glass: range of research projects in glass
www.vam.ac.uk/collections/glass	Victoria and Albert Museum: glass gallery

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	generating and developing ideas in response to specified design intentions originating design work to realise design intentions
Reflective learners	evaluating the process and outcomes in relation to the brief
Self-managers	working safely when preparing materials communicating intentions.

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	developing and adapting ideas based on results problem solving to address unexpected outcomes of experiments presenting experimental work and justifying decisions made
Reflective learners	evaluating own work and using findings to inform future work and improve performance
Team workers	working in pairs or groups for sharing initial research and taking responsibility for 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	contributing to group discussions, and 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 work of other artists, designers and makers
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning research and presentations presenting 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 internet for research 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 	planning presentation presenting findings evaluating work
Bring together information to suit content and purpose	researching and presenting findings
Present information in ways that are fit for purpose and audience	presenting findings of research
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	planning project work calculating sizes/weights of materials
Identify the situation or problem and the mathematical methods needed to tackle it	measuring for drawing up and cutting templates for stained glass
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	

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	<p>discussing their own, their peers and others' views of their own work and the work of others</p> <p>presenting own creative work to peer group and tutors</p>
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading for research
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	<p>writing up research</p> <p>writing up technical notes on processes and materials</p> <p>writing an evaluation of own work.</p>