Unit 8: Design Principles in Art and Design

Unit code: T/502/5741

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

Aim and purpose

This unit aims to develop learners' understanding and skills in applying design principles. In this unit, learners will experience the same constraints and situations designers face. They will be taught to consider how form relates to function in their own work, and how to evaluate and consider their choice of materials.

Unit introduction

Within the field of design there are principles that govern the development and production of design solutions. Designers use their knowledge of design principles in all stages of their work. Key considerations include how form relates to function, choice of materials, issues of cultural association, design for need and the responsibilities of designers.

Designers have to balance commercial needs with considering aesthetics. They have to consider production and financial constraints. As consumer expectations and modern technologies are continually changing, designers need to use a broad range of skills to meet the challenges of contemporary design.

Learners will investigate and consider design for purpose and sustainability. They will explore design responsibility and ecological and social issues surrounding design.

Learners will begin to understand how technology relates directly to their practical work. Emphasis will be on the development stages in the design process, producing ideas and solutions to meet the constraints of design briefs. Learners will explore cultural impacts on design and the cross-cultural influences of historic and contemporary design.

In studying this unit, learners will gain an understanding of the key principles of design in order to produce effective design solutions, and address the underlying questions of purpose, user needs and preferences and cost. In a complex and developing society, design must be innovative, strategic and sustainable. In understanding the principles of design, learners should be better equipped to develop coherent and responsive design solutions.

Learning outcomes

On completion of this unit a learner should:

1   Understand how form relates to function in own work

2   Be able to use appropriate materials in own work

3   Understand cross-cultural influences on own work

4   Understand design responsibilities

Unit content

1 Understand how form relates to function in own work

Own work: aesthetics eg formal, appearance, finish, surface decoration, styles, trends; properties eg functional needs, practical use, sustainability; significance eg symbolic, historical, contemporary, cultural, social, religious, political, philosophical

Form and function: functional requirements eg ergonomics, physical function, comfort, protection, shelter, mobility; commercial considerations eg communication, information, persuasion, propaganda; needs eg corporate, individual; technical accuracy; sustainability

2 Be able to use appropriate materials in own work

Appropriate materials: briefing context eg functional materials, creative proposals; structural qualities eg strength, weight, flexibility, durability, malleability; visual qualities eg colour, surface, texture, opacity, transparency, pattern; tactile qualities eg texture, smooth, warm, cold, comfortable, hard, soft; emotional effects eg soothing, exciting; relationships between materials

3 Understand cross-cultural influences on own work

Cultural associations: values of contemporary society eg local, urban, communities, cosmopolitan, world wide; context; aesthetic values; views eg individuals, user groups, cultural, social groups, commercial organisations, target market groups; cultural styles eg western, non-western, historical, contemporary; identity eg trends, fashion, individual, group; cultural significance eg signs, symbols, style conventions, codes; impact on marketing; propaganda; ethical; environmental

4 Understand design responsibilities

Design for need: key requirements eg design brief, user, client, purpose, constraints, opportunities

Responsibilities of designers: responsibilities to others eg teamworking, clients, the public, specified users; value for money; quality control; durability of design; environmental impact eg sustainability, disposal, recycling, source materials, carbon footprint, associated production costs; ethical issues, emotional design; health and safety

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 explain how form relates to function in own work [CT, RL, TW, EP, SM]	**M1** demonstrate skills and understanding in applying aesthetic considerations to functional requirements in their finished design work	**D1** apply design principles to own design development and ideas to create innovative design work.
P2 show how materials and technology inform ideas development [CT, RL, TW, EP, SM]	**M2** show an effective and considered understanding of applying design principles when producing their own work	
P3 explain how cross-cultural influences impact on the design process [IE, CT, RL, TW, EP, SM]	**M3** demonstrate an understanding of design responsibilities in the context of own and others' work.	
P4 demonstrate an understanding of design responsibilities. [IE, CT, RL, TW, EP, SM]		

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 offers learners the opportunity to engage with, and demonstrate a knowledge of, design principles. In all stages of their art and design work learners will be taught to consider their design responsibilities, how form relates to function, how to make informed choices about materials, observing issues of cultural association and designing for need and sustainability.

In this unit, learners should consider the theory of design principles when applied to practical design briefs. They should study at least one project as part of a group or team, reflecting professional practice in design. As in *Unit 7: Design Methods in Art and Design*, developing industry links, learners can benefit from opportunities to communicate their innovative ideas and proposals in a professional context. For this unit the principles support the method in the same context. Case studies of design practice and design management can be used as well as live briefs.

Where possible, learners should be given opportunities to observe and record examples of professional practice, through recorded observation, witness testimonies and online conferencing where resources permit. In this way they can consider the importance of design principles as applied to different levels of design, from basic economy products through to high end specialist design.

Initial exercises considering design principles may need to be tutor led. Subsequent exercises should encourage learners to develop an independent approach through researching books and other printed matter, the internet, face-to-face questioning, market research and professional practice.

Learning outcome 1 can be delivered across a number of integrated practical units. Evidence can be acquired through the core and selected professional specialist units, for all pathways.

Learners should be given sufficient examples of form and function to consider, which might be in the context of specific planned assignments and/or other related unit assignments. Learners should explore the stages of design development as they work to a brief, identifying design principles and exploring issues of form and function. Evaluation, feedback and reflection should be part of the design process so that ideas are considered and informed throughout.

Records of evaluation, both of others' design examples and their own work, need to be structured appropriately, identifiable and relevant. Design appreciation should be linked to learners' specialist pathways rather than whole sections of the history of design in *Unit 2: Contextual Influences in Art and Design.*

Learning outcome 2 can be delivered through a series of design briefs asking for responses against clear constraints. Learners will need to be taught the necessary project management skills. They should be encouraged to explore materials and techniques in developing their ideas.

Learners will need to record their evaluations clearly across their different projects. Initially, it may be useful for tutors to provide a template for evaluation against the principles of design that learners can apply to their developmental work. Learners should identify clearly their reasons for selecting certain materials over others. Learners should be encouraged to experiment with materials in a creative way, combining different visual elements to create visually dynamic finished work.

Learning outcome 3 involves learners in considering aspects of cultural association and this process will need to be supported by a range of relevant examples. As learners' understanding grows, tutors should be able to introduce more complex issues relating to cultural styles and codes.

Where possible, learners should be given a design brief that explicitly challenges preconceptions. Learners should be taught the necessary skills to evaluate how their work is affected by cultural ideas. As this knowledge grows, learners should be expected to become more independent in exploring these issues further.

Learning outcome 4 involves learners understanding the responsibilities associated with designing. It relates to questioning the purpose of symbols, styles and conventions and learners will need to record their research into cultural associations, with visual materials and examples. Learning outcome 4 will have been touched on when delivering the other learning outcomes and demonstrates that the learner can understand design responsibilities. The ability to question the purpose of a design brief and establish the needs of users, and to provide valid answers to these questions, is a skill. This skill will need to be introduced through tutor-led examples and developed by learners' continuing to use it in their design tasks in this and other units where evidence is being sourced.

Learners should be encouraged to develop knowledge and understanding through consistent questioning of items, products or situations from the world around them. Learners should gather information on the responsibilities of designers that will help with their practical work. Responsibilities to other team members, to users and clients should also be studied and responses recorded.

Issues such as emotional design should also be highlighted. Learners should consider what responsibilities designers have to reduce any harmful impact on the environment, or to design with renewable or recycled materials.

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 content
Project briefing (which may involve clients from outside)
Briefing analysis and clarification
Identify design responsibilities
Assignment 1: Using Materials and Technology to Inform Ideas Development
Project planning, observing design responsibilities
Outline research proposals including cross-cultural influences and design responsibilities
Planning resources for concept development to ensure that form relates to function
Establishing timelines, to include internal and external design reviews, presentation(s), revisions, evaluations
Accommodation of project/client variations/revisions
Self-initiated study – generation of outcomes
Assignment 2: Investigate Cross-Cultural Influences in Given Design Objects
Plan research
Research traditional and contemporary cultural influences and, design responsibilities in a global context
Record, illustrate and reference research and analysis
Develop methods for implementing design principles
Learner-initiated generation of outcomes

Topic and suggested assignments/activities and/assessment
Assignment 3: Product Design Brief
Review and develop design concepts to meet specific design responsibilities
Affirm clear methodology for interim presentation of 2D-3D design concepts
Investigate and develop verbal presentation skills
Investigate and develop visual presentation skills using media techniques and technology
Present interim design proposals to individuals, team and assessors using a range of visual and verbal techniques
Agree revisions and confirm any variations
Implement revisions and any variations
Present final project proposals
Self-initiated study – generation of outcomes

Assessment

For P1, learners will be able to create finished work that meets the constraints of design briefs. They will show an understanding of how form relates to function in their own work, having researched that of others to develop an understanding.

For P2, learners will use appropriate materials in their own work. They will show a basic understanding of the qualities of materials and evaluate design needs in their own specialist projects, having researched others' products to develop an understanding.

Materials selected for use need to meet the requirements of the brief alongside creative solutions.

For P3, learners will show a basic understanding of the values of user groups. Evaluations will provide a limited range of conclusions, working towards developing insight. Application of knowledge to design solutions will be basic. Learners will show understanding of purpose in design, and will record considerations in a basic format. There will be some application of knowledge gained when working to design briefs, but conclusions reached will be obvious.

For P4, learners will understand the responsibilities of designers, but the range of research and conclusions may be relatively narrow. Evaluation will provide a basic level of knowledge, and responses will be described in limited depth.

For M1, learners will show independence and skill in researching and recording their observations on the principles of design. They will apply these principles to the development of their design work. Learners will demonstrate skill and understanding in applying aesthetic considerations to the development of their design work. They will make direct links between their evaluations and how they have applied their knowledge in the design process. Design work will show a skilful level of awareness and responsiveness to briefs.

For M2, learners will show an effective and, considered understanding of applying design principles when producing their own work. Learners will analyse examples of materials and technology in the context of their own work, to produce coherent conclusions. They will demonstrate, a range of appropriate materials and of technology. Critical awareness will be demonstrated in the clarity of their conclusions and subsequent actions taken.

For M3, learners will demonstrate design responsibilities effectively in the context of own work, and that of others where they are part of a team

For D1, learners will show an individual approach in researching design ideas. Their conclusions will be well informed and support the development of innovative design ideas. Learners' records will be concise and show clarity of thought. Learners' will consistently apply the principles of design in their development work. They will demonstrate a cohesive strategy in developing and evaluating design proposals, working on their own or as part of a team. Ideas will be applied consistently to the production of coherent, dynamic and individual design work. There will be a level of individuality and personal involvement with the design process, whether working on their own or as part of a team, that distinguishes the work from that of merit level.

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, P2, P3, P4 M1, M2, M3 D1	**Assignment 1:** Using Materials and Technology to Inform Ideas Development	Client requires designer to use specific materials and techniques to promote a new manufacturing process	Portfolio evidence of a ideas development, demonstrating: • materials and technology influencing development of own ideas, in association with form and function • visual and spoken presentation to justify own proposals
P1, P2, P3 M1, M2 D1	**Assignment 2:** Investigate Cross-Cultural Influences in Given Design Objects	The brief is to demonstrate how cross-cultures have influenced given pieces of design within specialist pathways	Sketchbook including: • annotated images of given objects identifying where cross-cultural influences have impacted on form and function and the choice of materials and technology
P1, P2, P3, P4 M1, M2, M3 D1	**Assignment 3:** Product Design Brief	Product design team to produce designs for a new restaurant	Portfolio evidence including: • completed project demonstrating cohesion of design principles in the design solution • evidence of working as part of a team, to provide a purposeful and sustainable design outcome

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 to a 3D Brief	Using Ideas to Explore, Develop and Produce Art and Design	Ideas and Concepts in Art and Design
Working to a Visual Arts Brief	Working in the Art and Design Industry	Communication Through Art and Design
Investigate Interactive Media Products	Building an Art and Design Portfolio	Professional Practice in Art and Design
Working to a Graphics Brief		Freelance Work in Art and Design
Working to a Photographic Brief		Community Art

National Occupational Standards

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSkills Sector Skills Council

Design (revisions in draft form June 2009)

- DES1 Apply Research on the History and Theory of Design to Your Own Design Activities
- DES2 Apply Design Industry Knowledge to Inform Your Own Design Work Practice and Work
- DES3 Use Critical Thinking Techniques in Your Design Work
- DES4 Communicate the Importance of the Design Brief
- DES5 Follow a Design Process
- DES6 Work Effectively with Others in a Creative Environment
- DES7 Contribute to the Production of Prototypes, Models, Mock-ups, Samples or Test Pieces
- DES8 Explore the Use of Colour in a Creative Environment
- DES9 Research, Test and Apply Techniques for the Design of Products
- DES10 Create Visual Designs
- DES11 Provide Written Information in Relation to Your Design Work
- DES12 Make a Presentation
- DES14 Explore the History and Social Impact of Creativity and How it can Influence Your Own Design Work
- DES15 Research and Evaluate the Nature of Design in a Specific Industry Context
- DES18 Interpret the Design Brief and Follow the Design Process
- DES21 Articulate, Present and Debate Ideas in a Creative Environment
- DES23 Create 2D Designs Using a Computer Aided Design System
- DES24 Create 3D Models Using a Computer Aided Design System

- DES28 Developing Your Own Design Offer
- DES32 Apply Concepts and Theories of Creativity and Innovation to Your Own Design Work
- DES36 Develop and Extend Your Design Skills and Practices
- DES38 Manage Design Realisation
- DES39 Manage a Design Project

Skillset Sector Skills Council

Interactive Media and Computer Games

- IM9 Provide Creative and Strategic Direction for Interactive Media Projects
- IM16 Plan Content for Web and Multimedia Products
- IM17 Architect Interactive Media Products
- IM20 Design Electronic Games

Photo Imaging

- C1 Contribute to Effective Performance at Work
- C3 Contribute to the Maintenance of Health, Safety and Security at Work
- C6 Contribute to the Development of The Photo Imaging Brief
- D7 Contribute to the Effectiveness of Imaging Activities

Skillfast-UK Sector Skills Council

Textiles and Material Design

- D1 Research design information and ideas for textiles and materials using a range of techniques
- D3 Develop design responses for textiles and materials to meet agreed requirements
- D2 Develop and communicate design ideas for textiles and materials
- D4 Contribute to producing detailed designs for textiles and materials
- D5 Contribute to realising design prototypes for textiles and materials
- D6 Contribute to realising final textiles and materials design
- D9 Clarify textile and material design briefs and research information
- D10 Develop alternative textile and material design ideas
- D12 Develop, produce and present design responses
- D13 Plan and manage design work
- D14 Realise design prototypes
- D15 Plan and contribute to the realisation of final textile and material design

Essential resources

The unit will require substantial teaching and tutors will provide the initial focus for developing an understanding of design principles. As learner understanding develops the focus should change from the tutor to a more independent approach referring to resources such as books, other reference materials, digital information sources and, interviews with designers and the public in relation to design projects, market research and professional practice.

Practical facilities, sufficient to support a range of 2D and 3D design studies, must be provided. Live projects or client-led briefs may also be used to provide sufficient opportunities for learners to experience aspects of professional practice.

Advantage should be taken of any relevant design exhibitions or events suited to learners' specialist pathways. These may be useful in providing a suitable background to ask questions relating to the key principles of design.

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.

Local businesses and, charitable organisations offer opportunities to provide briefs. Work-based learning guidance is also available at – www.aimhighersw.ac.uk/wbl.htm

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.

Skillset, the sector skills council for creative media (www.skillset.org), provide details on their pages (www.skillset.org/careers) about careers advice and industry information, plus a regularly updated news and events page.

Skillfast-UK, the sector skills council for fashion and textiles, provide details (www.skillfast-uk.org/justthejob) about careers advice and industry information, plus regularly updated news and events pages.

Indicative reading for learners

Textbooks

Bowers J – *Introduction to Two-Dimensional Design: Understanding Form and Function* (Wiley, John & Sons, Incorporated January 1999) ISBN 978-0471292241

Butler J et al – *Universal Principles of Design: 100 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Decisions and Teach Through Design* (Rockport Publishers Inc, 2007) ISBN 978-1592530076

Ching F D K – *Architecture: Form, Space, and Order* (Wiley, John & Sons, Incorporated June 2007) ISBN 978-0471752165

De Sausmarez M – *Basic Design: The Dynamics of Visual Form* (Herbert, 1983) ISBN 978-0713683660

Feill C and Feill P – *Designing the 21st Century* (Taschen, 2005) ISBN 978-3822848029

Forty A – *Objects of Desire: Design and Society Since 1750* (Thames & Hudson, 1986) ISBN 978-0500274125

Gregory R L – *Eye and Brain: The Psychology of Seeing* (Oxford University Press, 1997) ISBN 978-0198524120

Norman D A – *The Design of Everyday Things* (Basic Books, 2002) ISBN 978-0465067107

Pipes A – *Foundations of Art and Design* (Laurence King, 2008) ISBN 978-1856695787

Sparke P – *Design in Context* (Bloomsbury Publishing PLC, 1991) ISBN 978-0747510949

Wirfs-Brock R and McKean A – *Object Design: Roles, Responsibilities, and Collaborations,* (Addison-Wesley, 2002) ISBN 978-0201379433

Journals

Digital Web Magazine

Design Week

Websites

www.design-council.org.uk	the national strategic body for design in the UK
www.designmuseum.org	website of the Design Museum, dedicated to contemporary design
www.theworkfoundation.com/aboutus.aspx	the Work Foundation
desktoppub.about.com/od/designprinciples	principles of design about.com on the principles of design

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	planning and carrying out research into specialist projects
Creative thinkers	exploring design principles and generating ideas
Reflective learners	reviewing, reflecting on and evaluating own and others' work
Team workers	collaborating with other to develop ideas, concepts, proposals, techniques and processes
Self-managers	organising time, planning resources, handling budgets when working to a specialist design brief, whether working on own or as part of a design team
Effective participators	allowing for own and others' requirements and proposals to be respected, considered, reviewed and actioned where appropriate.

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	planning and carrying out research into design responsibilities carrying out research to implement design responsibility in their own design work
Creative thinkers	trying out alternative ways of developing their concepts, following ideas through to complete a design brief, adapting their ideas as design responsibilities change
Reflective learners	setting goals, with success criteria, for their design work inviting feedback on their own work and dealing positively with praise, setbacks and criticism evaluating their experiences and learning to inform future progress
Team workers	if working as part of a design project team, taking responsibility for their own role managing discussions to reach agreements and achieve results
Self-managers	seeking out challenges or new responsibilities and showing flexibility when priorities change deal with competing pressures, including personal and work-related demands responding positively to change, seeking advice and support when needed
Effective participators	implementing opportunities, during a project schedule, to allow for own and others' requirements and proposals to be respected, considered, reviewed and actioned where appropriate allowing project scheduling to encompass implementation of action points.

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 design responsibilities
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning for a design project which involves working in the context of design responsibilities
Manage information storage to enable efficient retrieval	developing appropriate methods of storing visual and written materials relating to the design project
Follow and understand the need for safety and security practices	creating and finding appropriate materials, techniques and processes, and adapting them for use
Troubleshoot	exploring, extracting and assessing the relevance of information from design-related specialists and associated sources
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	creating and finding appropriate resources, materials, techniques, technologies and processes, and adapting them as principles in a design project
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	exploring and assessing the relevance of information from design-related websites
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	sourcing, evaluating and testing appropriate information to influence ideas, underpin proposals and enable safe use of media, materials, techniques and processes
Bring together information to suit content and purpose	implementing design proposals, bringing together a variety of ideas, concepts, materials, techniques and processes gathered through research and development
Present information in ways that are fit for purpose and audience	using specialist media, techniques and processes to present design proposals
Evaluate the selection and use of ICT tools and facilities used to present information	evaluating the appropriate use of tools and software in the design development and presentation of 2D and 3D design proposals
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	communicating with other members of a design project team

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	using appropriate calculations and tests to develop creative ideas and eventual project proposals
Identify the situation or problem and the mathematical methods needed to tackle it	considering a range of techniques, processes and materials which can be investigated through mathematical calculation
Select and apply a range of skills to find solutions	considering appropriate media, techniques, processes and specialist skills need to implement design development and project proposals
Use appropriate checking procedures and evaluate their effectiveness at each stage	implementing the appropriate project reviews to evaluate concepts and proposals
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	implementing a range of specialist techniques, processes and materials which have be proven through mathematical calculation
Draw conclusions and provide mathematical justifications	evaluating, analysing and recording findings and results of mathematical testing in a design context
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	being a part of design project reviews and critiques presenting conclusions attending production meetings
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading information gathered from a range of visual, written and electronic sources to gather ideas, influence development and effect proposals
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively.	recording written research, analysis and evaluation producing design project reports summaries which confirm ideas and proposals effectively, purposefully and sustainably.