Unit 43: Graphics for 3D Applications

Unit code: T/502/5254

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to develop learners' skills, knowledge and understanding through investigating examples of graphics for 3D applications and learn about the factors that influence design in this field. They will develop personal creative responses to briefs, exploring how surface graphics, shape and colour are used in 3D applications.

Unit introduction

Graphics for 3D applications are required for a variety of purposes. In packaging, graphic designers use shape, colour and surface graphics to protect, advertise and promote the brand identity of a product or item. In point of sale displays designers aim to attract the attention of the public to a product or item at the same time as providing information about its content or unique qualities. Surface graphics are also applied to areas such as vehicle livery and consumer information.

Graphic designers use a range of skills to work in graphics for 3D applications. They need to be aware of the design constraints when working in 3D and also have to consider qualities of materials and properties, such as strength against weight of product and so on. This unit focuses on these important skills.

In this unit learners will work through a variety of tasks aimed at solving to realistic design problems. Learners will be encouraged to evaluate existing examples of graphics for 3D applications to learn about the factors that influence design in this field. They will then be encouraged to develop personal creative responses to briefs, where they can explore how surface graphics, shape and colour work in 3D applications. There is scope for learners to develop innovative and individual outcomes. Experimentation with materials and ideas will be actively encouraged.

Learners will need to work safely, carefully and skilfully with materials. Design ideas can be as varied as the imagination of learners will permit. The unit will be concluded with learners evaluating their trials and mock-ups. In doing this they will be learning how to recognise strengths and development areas in their work, improving their working practices for the future.

Learning outcomes

On completion of this unit a learner should:

1 Know about the construction of graphics for 3D applications

2 Be able to explore how surface graphics can be applied to 3D applications

3 Understand the practical constraints of graphics for 3D applications

4 Be able to present own graphic design work for 3D applications.

Unit content

1 Know about the construction of graphics for 3D applications

Construction: eg structure, point of sale displays, mobiles, packs, packages; factors eg size, proportion, measurements; use of blanks; techniques eg scoring, folding, joining, gluing; characteristics of materials eg wood, fabric, adhesives; trials; mock-ups; tools eg craft knife, scissors, set square, T-square, steel rule

2 Be able to explore how surface graphics can be applied to 3D applications

Surface graphics: application eg designing, surface graphics, 3D outcomes; functional requirements eg fitness for purpose, shape information, context; aesthetic requirements eg illustration techniques, line, tone, colour, media; visual information eg typography, style, size of copy, legibility, technical information; layout of graphic information eg colour, typography, visual impact, readability, grid systems; layout in 3D context; brand identity eg packaging, re-branding developments, look-a-likes, own brand profile, branded products

3 Understand the practical constraints of graphics for 3D applications

Practical constraints: factors eg size, shape, product weight, function, performance, context, purpose of design; production processes eg cost constraints, choice of materials, methods of production

4 Be able to present own graphic design work for 3D applications

Present: audience; show designs eg portfolio presentation, exhibition, crits, formal presentations; format eg mounted prints, digital files, audio/visual presentations

Graphic design work: design ideas; potential products eg packaging, food, drink, consumer durables, clothing, toiletries, cosmetics; 2D design ideas; 3D mock-ups; outcomes (media, materials, construction techniques); use of imagery, communication; originality; brand identity; awareness of constraints; feasibility of the design; client 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 describe the construction of graphics for 3D applications [IE, CT, RL, TW, SM, EP]	**M1** investigate experimental design proposals for trials and mock-ups in 3D graphics applications	**D1** independently produce innovative proposals for 3D graphics applications which demonstrate diverse use of surface graphics
P2 explore how surface graphics can be applied to 3D applications [IE, RL, CT]	**M2** coherently explore different applications of effective surface graphics in own work	**D2** engagingly present and evaluate diverse graphic design work for 3D applications.
P3 review the practical constraints of graphics for 3D applications [IE, CT, RL]	**M3** effectively present own graphic design work for 3D applications and compare with others' production.	
P4 present own graphic design work for 3D applications. [CT, RL, SM, 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 need access to the appropriate 2D and 3D materials, computer software and peripherals with relevant technical support. This unit requires the learner to develop and demonstrate an understanding of working with 2D and 3D design media.

Learning outcome 1 can be delivered through short presentations, group discussion or lectures that show examples of graphics for 3D applications. Learners should consider how the different examples could be applied to the other learning outcomes: use of materials, design constraints, construction methods, fitness for purpose and use of surface graphics. Learners should make notes regarding the characteristics of graphics for 3D applications in their sketchbooks or work journals. Much of this learning outcome could be group based, with learners discussing examples before reaching conclusions. The learning outcome should provide learners with underpinning knowledge to enable them to progress through the next stages of the unit.

Learning outcome 2 is linked to learning outcome 1 by continuing the evaluative process. Learners need to consider how surface graphics have been applied to 3D applications; focusing their explorations on the constraints and on the factors they will be designing around in the unit's practical tasks. Learners should consider surface graphics in terms of legibility, brand identity, fitness for purpose and visual impact. Learners can extend their understanding in this area by applying knowledge gained to designing and making.

Learning outcome 3 extends learners' understanding through practical design work. They should be set a brief to develop designs for a selection of items. Their designs should show understanding of the design constraints in working with graphics for 3D applications. They should also address the characteristics and properties of the materials they intend to use. They need to be taught how to bring the results of their research through to the design process and how to use the information to really inform their design work.

Learning outcome 4 involves learners in developing their design proposals into 3D graphic trials and mock-ups. They should take care when translating their designs across to the materials to be used for construction. Learners should produce well-made and well-constructed models. They need to have designed how they are going to use surface graphics, showing how this relates to the object in three dimensions. They can use a variety of techniques to make their products. Surface graphics should be applied with equal care. Potential methods may range from hand-rendered (possibly direct to card when in net form) to Mac or PC output to card, or be carefully pasted into place. Finally, learners should present and evaluate their work. A group critique may provide a suitable forum for this, followed by one-to-one tutorials where strengths and development areas can be discussed with learners in more depth.

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 **Assignment 1:** Package design Introduction to brief • Discussion – initial thoughts • Potential, constraints, contexts • Possible outcomes • Ideas generation.
Discussions and examples of work • Past and present examples • Different media – point of sale displays, mobiles, packs and packaging.
Supported study time • Individual learning plans • Production of sketchbook work, mood boards, thumbnails and roughs • Annotation and research • Ideas development • Informal discussions • Production of final piece/s.
Workshops Source materials – depending on assignment brief/specialism/pathway • Mixed media • Photography • Construction techniques, materials, techniques and processes Technical – depending on assignment brief/specialism/pathway • Software/hardware training – scanning, cameras, image manipulation software workshops, storing work.
Learner initiated study.
Learner initiated study • Individual learning plans • Ideas generation • Time management • Formal discussion with tutors • Assignment feedback • Evaluations • Formal and informal presentation/discussion • Production of ideas and final outcomes.

Topic and suggested assignments/activities and/assessment
Peer assessment • Individual learning plans • Ideas generation and development • Interim critique • Final critique • Discussion group.
Visiting speaker • Product designer.
Field trip • Exhibition (packaging) • Museum • Studio.
Review of unit and assessment.

Assessment

To achieve a pass grade, learners must provide evidence in the form of a sketchbook, (electronic or paper based), design boards, annotated notes, mock-ups etc that show they have investigated the construction and development of 3D graphic applications. Learners need to be guided through how all this can influence the development of their work and how to generate ideas incorporating these findings using basic techniques. Learners should produce evidence through sketchbook annotation whether (digital or paper-based), interim critiques, computer printouts, individual learning plans that cover the learning that has taken place including the generation and development of ideas, the production, presentation and review of final outcomes. Evidence of developing skills in digital techniques can be evidenced through witness testimonies, use of screen shots as learners progress work, and Q and A evaluation.

To achieve a merit grade, learners must pass all of the pass criteria plus all of the merit criteria. Learners must provide a variety of evidence in the form of digital or paper-based annotated sketchbooks, design boards, and discussion evidence that shows they have effectively investigated the construction and development of 3D graphic applications. Learners must demonstrate competence in the way that they apply the results of their investigations to the origination and development of 3D applications. Learners should show an intelligent understanding of others' work to inform their own, ideas generation techniques, and image manipulation techniques to produce final outcomes against a defined theme/assignment brief. A coherent and individual approach to the development of ideas and final solutions should be evident within learners' work. Justification of these ideas and solutions should also be evident in the form of written notes, verbal feedback and possibly learning journals that include technical notes and screen shots.

Learners' final designs should show an individual and thoughtful process of decision-making has taken place. Learners should coherently present their work for a given brief to an effective standard of presentation, identifying how research, ideas development and the development of image manipulation skills have impacted on their work.

For a distinction grade, learners must pass all of the pass and merit criteria plus all of the distinction criteria.

Learners need to demonstrate they have a firm understanding of image manipulation techniques and can confidently use these techniques within their own work They should show that they can apply this understanding creatively and fluently to the set brief conveying comprehensive knowledge of how the research into the work of others and ideas generation using digitised source materials have influenced their final design solutions. Learners should demonstrate confidence in the presentation of highly imaginative work produced using diverse but relevant media. Work should be presented to a high standard and acceptable forms of evidence are identified in the pass and merit sections.

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, D2	**Assignment 1:** Package Design	Graphic designer briefed to research and develop ideas for a piece of food packaging that is part of a new budget range being launched by a leading supermarket. This should include the packaging of the actual product and a point of display stand for the launch of the new range.	Sketchbook (paper-based or PDF) consisting of research into examples of packaging and point of sale stands. Development of ideas (experiments with graphics for 3D applications). Final piece/s mounted/ mocked up to a professional standard. Formal presentation/critique that incorporates an overall evaluation of learners' 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
Introduction to Graphic Materials, Techniques and Processes	Working with Graphic Design Briefs	Words and Images in Graphic Design
Introduction to Letterforms and Words	Advertising in Graphic Design	Ideas and Concepts in Art and Design
Introduction to Creative Use of Computers	Graphic Ideas and Concepts	

Essential resources

Learners require access to specialist graphic design studios and digital workshops. These should be equipped with appropriate hardware, software and materials to fulfil the practical work in this unit. Access to digital media and design software is essential. A well-stocked learning resource centre should be available with appropriate research materials in the form of books, magazines and internet facilities.

The computer software and hardware will vary depending on the specialism/pathway as well as the centre's resources.

Employer engagement and vocational contexts

Centres should develop links with practising graphic designers, 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

Creative and Cultural Skills (www.ccskills.org.uk), the Sector Skills Council for Arts, Crafts and Design have 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.

Skillset, the Sector Skills Council for Creative Media (www.skillset.org), provides details (www.skillset.org/careers) on careers and the industry and has plus a regularly updated news and events page.

Indicative reading for learners

Textbooks

Calver G – *What is Packaging Design?* (RotoVision, 2007) ISBN 978-2940361885

Cliff S – *50 Trade Secrets of Great Design Packaging* (Rockport Publishers Inc, 1999) ISBN 978-1564965998

Pederson B M – *Graphis Packaging Design: No 9* (HarperCollins, 2004) ISBN 978-1931241380

Pederson B M – *Graphis Packaging: An International Compilation of Packaging Design* (Graphis Press, 1996) ISBN 1888001178

Roat R – *Eco Design: Environmentally Sound Packaging and Graphic Design* (Rockport Publishers, 1997) ISBN 978-1564960832

Stewart B – *Packaging Design* (Laurence King, 2007) ISBN 978-1856695251

Journals

Baseline

Computer Arts

Computer Arts Projects

Creative Review

Websites

www.bbc.co.uk	BBC
www.computerarts.co.uk	Computer arts news and tips
www.creativereview.co.uk	Creative review

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS that have been included within the assessment criteria of this unit:

Skill	When learners are ...
Independent enquirers	discussing assignment requirements researching and annotating evaluating work
Creative thinkers	generating and developing ideas developing final outcomes evaluating work
Reflective learners	evaluating their own work and that of others presenting ideas and final solutions
Team workers	generating ideas developing software and hardware skills
Self-managers	researching and annotating developing ideas and final solutions managing time and workload
Effective participators	generating ideas peer assessing discussing work.

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 ...
Reflective learners	giving feedback on assessment decision
Team workers	discussing ideas
Self-managers	organising time and managing resources effectively
Effective participators	participating in critiquing their own work and that of others.

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 examples of others' work developing and producing final outcomes
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning assignment
Manage information storage to enable efficient retrieval	effectively backing up digital files
Follow and understand the need for safety and security practices	adhering to health and safety practices
Troubleshoot	working through any issues arising using correct procedures
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding related examples to support development of ideas
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	finding using relevant information to support the development of ideas and the formulation of opinions
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	developing ideas and producing final piece/s
Bring together information to suit content and purpose	researching developing ideas and producing final outcomes
Present information in ways that are fit for purpose and audience	producing final outcomes

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	scale paper sizes and formats font sizes managing files with the correct use of file formats to manage memory issues constructing prototypes
Identify the situation or problem and the mathematical methods needed to tackle it	scale paper sizes and formats font sizes constructing prototypes
Select and apply a range of skills to find solutions	using effective file management techniques
Use appropriate checking procedures and evaluate their effectiveness at each stage	constructing prototypes
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting, developing evaluating and analysing ideas
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	looking at assignment opportunities, contexts and constraints
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	annotating ideas writing evaluation.