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## 1.0 INTRODUCTION

The Junior Certificate (JC) syllabuses are designed as three-year courses for examination in Form 3. The purpose of the syllabus is to set standards to be achieved by the learners of varied abilities in their Design and Technology programme, through activities that encourage the use of initiative to solve problems. It is meant to prepare candidates taking this course to dovetail well with the Design and Technology, Eswatini General Certificate of Secondary Education (EGCSE) curriculum. The syllabus attempts to move towards greater emphases on design, the reasoned application of knowledge, skills and problem solving.

All JC syllabuses follow a general pattern. The main sections are:

Aims  
Assessment Objectives  
Assessment  
Curriculum Content

## 2.0 AIMS

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The aims of this syllabus are common for all candidates. They are set out and describe the educational purposes of a course in Design & Technology for the Junior Secondary Certificate of Education. They are not listed in any order of priority.

### **The aims are to enable learners to:**

1. stimulate and develop a range of making skills
2. develop a range of communication skills which are central to design, making and evaluation
3. relate their work, which should demand active and experimental learning based upon the use of materials in practical areas, to their personal interests and abilities
4. develop technological awareness, foster attitudes of co-operation and social responsibility, and develop abilities to enhance the quality of the environment
5. acquire attitudes and values, develop basic skills and understanding to allow the execution of rights and responsibilities as good citizens of Swaziland and the world
6. acquire knowledge, attitudes and practices that will ensure good family and health practices including awareness and management of epidemics (such as HIV/AIDS) that prepare them for productive life
7. foster awareness, understanding and experience in those areas of creative thinking which can be expressed and developed through investigation and research, planning, designing, making and evaluating working with media, materials and tools
8. stimulate the exercising of value judgements of an aesthetic, technical, economic, and moral nature.

### **3.0 ASSESSMENT OBJECTIVES**

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The four Assessment Objectives in Design & Technology are:

- a) Knowledge with understanding
- b) Problem solving
- c) Communication
- d) Realisation

A description of each Assessment objective follows:

Under each Assessment objective is a list of activities a candidate should be able to carry out.

#### **A KNOWLEDGE WITH UNDERSTANDING**

Candidates should be able to:

1. demonstrate the ability to state facts, recall and name items, recall and describe processes
2. demonstrate the ability to apply and relate knowledge to designing and making
3. make reasoned arguments and anticipate consequences about the outcomes of the design
4. demonstrate a crucial awareness of the interrelationship between design and the needs of society.

#### **B PROBLEM SOLVING**

Candidates should be able to:

1. recognise problems, identify clearly from a problem situation, a specific need for which a solution is required and compose a design brief
2. analyse a problem by considering any relevant functional, aesthetic, human, economic and environmental design factors and draw up a design specification
3. investigate, research, collect and record relevant data and information
4. generate a range of outline solutions to a design problem, giving consideration to constraints of time, cost, skill and resources
5. develop, refine, test and evaluate the effectiveness of design solutions.

#### **C COMMUNICATION**

Candidates should be able to:

1. recognise information in one form and where necessary change it into a more appropriate form
2. produce or interpret data in a variety of forms such as charts, diagrams, graphs, and flow charts
3. propose and communicate ideas graphically using a range of media
4. develop ideas and represent details of form, shape, construction, movement, size, and structure through graphical representation and three-dimensional modelling.

#### **D REALISATION**

Candidates should be able to:

1. plan and organise the work procedure involved in the realisation of a solution
2. select from a range of resources, those appropriate for the realisation of the product
3. demonstrate appropriate manipulative skills by showing an understanding of materials and their characteristics in relation to their use
4. evaluate the product against the specification.

#### 4.0 SPECIFICATION GRID

The approximate weightings allocated to each of the Assessment Objectives in the Assessment model are summarised in the table below.

Assessment Objectives	Weighting
A Knowledge with understanding	24%
B Problem solving	31%
C Communication	16%
D Realisation	29%

PAPER		ASSESSMENT OBJECTIVES				
		A. Knowledge & understanding	B. Problem solving	C. Communication	D. Realisation	TOTAL
1 Theory	Section A	9%	5%	2%	4%	20%
	Section B	15%	6%	4%	5%	30%
2 Project		-	20%	10%	20%	50%
OVERALL		24%	31%	16%	29%	100%

## 5.0 ASSESSMENT

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### Scheme of Assessment

All candidates must enter for two (2) papers. These will be Paper 1 (Theory), and Paper 2 (Project). Candidates are eligible for the award of Grades A to G. A description of each paper follows.

### Description of Papers

#### Paper 1 theory (2 hours) 100 Marks

This paper will have **two** sections: **Section A** and **Section B**.

**Section A:** will consist of **15 – 20** questions with a total of **40 marks**.

**Section B:** will consist of **three (3)** structured questions, based on Graphic Products, Resistant Materials and Systems and Control with a total of **60 marks**.

Candidates will be required to answer **all questions in both sections**. This paper is intended to assess candidates' knowledge and understanding of the subject and their abilities of analysis and synthesis.

This paper will be weighted to 60% of the final total available marks.

#### Paper 2 Project (two terms) 100 marks

This paper will be a **Project (Product and Folio booklet)**. Each candidate will undertake a project on a **specified theme** chosen from the available options (Graphics Products, Resistant Materials and Systems and Control). The **product** will be **internally marked and internally moderated**. The Project will be worked over from mid-February and Folio booklet submitted to the Examinations Council of Eswatini by the 30<sup>th</sup> or last working day of September of each year. The Folio will be awarded 70% of the total mark, and the 'made Product' is awarded 30% of the total marks. The Assessment criterion of the project is provided on pages 17 and 18 of this document.

The Folio must include sufficient photographs of the made product, showing an overall view together with detailed views of evidence to support the award of marks for Assessment criterion 7 'Product Realisation'. (See Appendix 'Project Assessment Criteria').

This paper will be weighted to 40% of the final total available marks.

### Weighting of Papers

Paper	Weighting
1	60%
2	40%
	100%

## 6.0 CURRICULUM CONTENT

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The curriculum content is to be followed by all learners. It is envisaged that this course content will be covered; in an integrated manner in the teaching of all three content areas (**Graphic Products, Resistant Materials and Systems and Control**).

Note: The appropriate use of ICT and CAD/CAM is encouraged throughout the curriculum if facilities are available. However, candidates will not be tested on ICT or CAD/CAM in the examination, nor will marks be awarded for the appropriate use of ICT in the project.

Appropriate teaching time for the Design and Technology syllabus should be equivalent to eight (8) periods of forty (40) minutes each over a period of sixty (60) weeks/cycles.

### 6.1 Graphics Products

#### PRACTICAL APPLICATIONS

All candidates should be able to:

##### Use of Instrument

- Use drawing instruments to achieve a good standard of graphical representation

##### Formal Drawing

- use lettering techniques to demonstrate a working knowledge of appropriate British Standards BS 308.
- understand and use a working drawing of appropriate British Standard (conventions) including the dimensioning of drawings and drawing to recommended scales

##### Geometric Construction

- bisect, subdivide and proportionally divide lines.
- measure and construct the following angles:  $7.5^{\circ}$ ,  $15^{\circ}$ ,  $30^{\circ}$ ,  $45^{\circ}$ ,  $60^{\circ}$ ,  $75^{\circ}$ ,  $90^{\circ}$ ,  $105^{\circ}$ , and  $120^{\circ}$
- construct circles, tangents, and tangential arcs.
- construct regular and irregular linear shapes including triangles, quadrilaterals, pentagons, hexagons, circles, and octagons.

##### Geometrical Solids

- construct solids of cubes, prisms, cylinders, pyramids and cones.

##### Freehand sketching

- use freehand drawing to communicate ideas, thoughts and information from written, visual and tabular data, presenting these ideas in pictorial, plane or orthographic mode

##### Isometric

- understand and use this form of projection for producing isometric views including circles, arcs, and other curves

##### Oblique projection

- use this form of projection for producing views in oblique projection.

**Estimated perspective**

- understand and produce perspective drawing using one-point and two-point starts

**Orthographic projection**

- understand and use both 1<sup>st</sup> and 3<sup>rd</sup> angle projections, and use proper projection symbols

**Sectional views**

- select the most suitable section and draw whole, part and removed sections

**Exploded views**

- draw exploded views of component parts along one axis only

**Assembly drawings**

- assemble given component parts into a single drawing, including parts lists

**Loci**

- Use geometrical means to construct paths of points in the manner of simple plane mechanisms.

**Ellipse**

- Construct ellipses by any accurate method, including the use of a trammel.

**Enlargement and reduction**

- Use appropriate constructions and geometric calculations to scale, enlarge and reduce drawings by linear and area proportions.

**Developments**

- Construct developments of cubes, prisms, cylinders and cones, including simple truncations.

**Presentation techniques**

- Demonstrate an understanding of colouring, rendering and texturing

**Modelling and making**

- Explain the purposes of modelling; have knowledge of the following materials: paper, card, modelling materials, styro-foam, foam board and plastics.

## 6.2 Resistant Materials

### Practical Application

**All candidates should be able to:**

#### **Safety Precautions**

- point out and apply all safety rules applicable in a practical workshop.
- identify, name and state the use of the safety equipment.

#### **First Aid**

- apply first-aid treatments for workshop accidents and take preventive measures.

#### **Resistant Materials**

##### **Wood**

- identify and name the prescribed natural timbers: South African Pine (SAP), meranti, saligna.
- show a working knowledge, uses, and working properties of the prescribed timbers.

##### **Classification of wood**

- classify the prescribed timber: hard wood and soft wood.
- select the right type of timber to be used for a specific project.

##### **Conversion of timber**

- identify, sketch and describe the methods of conversion of timber (plain and quarter sawing).

##### **Seasoning of timber**

- identify and describe the two methods of seasoning timber (kiln and air seasoning).
- explain why timber is seasoned and how to take care of timber during storage.

##### **Manufactured boards**

- identify and name the prescribed manufactured boards: hard board, plywood, and super wood medium density fibre (MDF).
- show a working knowledge, classification and uses of prescribed manufactured boards.

##### **Metals**

- classify the prescribed metals: mild steel, aluminium, copper, brass, bronze and cast steel.
- show a working knowledge, uses, and working properties of the prescribed metals.

##### **Plastics**

- identify and state the tools used with plastics.
- identify and name the prescribed plastics: acrylic, Acrylonitrile-butadiene-styrene (ABS), polyester resin, and Polyvinyl chloride (PVC).
- show a working knowledge, classification, uses, and working properties of the prescribed plastics.

#### **TOOLS**

##### **Measuring and marking out tools**

- identify and state the correct use of the following measuring tools: steel rule, tape measure, straight edge, outside calipers, inside calipers
- identify and state the correct use of the following marking out tools: pencil, marking knife, sliding bevel, mitre square, combination square, try square, scribe, wing compass mortice gauge, marking gauge, spring dividers, odd-leg calipers, centre punch, dot punch and engineers' try square
- label the parts of the prescribed measuring and marking out tools.

##### **CUTTING TOOLS:**

###### **planes**

- identify and state the correct use of the following bench tools: bench planes (jack plane and smoothing plane).



- identify and state the correct use of the following curve cutting planes – spoke shaves (round sole, flat sole)

#### **Files**

- show a working knowledge, state the uses of the prescribed files: round, square, three-square, flat, hand and half round.

#### **Saws**

- show a working knowledge, state the correct uses of the prescribed saws: ripsaw, cross-cut saw, tenon saw, dovetail saw hacksaw and junior hacksaw.
- show a working knowledge, state the correct uses of the prescribed saws: coping saw, fret saw, keyhole saw or pad saw,

#### **Chisels**

- identify and state the correct use of the following chisels: firmer chisels (bench firmer chisel, bevelled edge firmer chisel) and cold flat chisel.
- show a working knowledge of the following paring chisels: bevelled edge firmer chisel, and paring chisel.
- identify and state the correct use of the following chisels: registered chisel (mortice chisel).

#### **Drilling tools**

- identify and state the uses of the following tools: twist drill, flat bit, forstner bit, bradawl, countersink bits, and dowel trimmer bit.

#### **Tin Snips**

- identify and state the correct use of the following tools: tin man's snip (straight and curved)

#### **Rasps**

- show a working knowledge, state the uses of the prescribed rasps: flat, and half round rasp.

#### **NB: label the parts of the prescribed cutting tools.**

#### **Holding and supporting tools**

- identify and state the correct use of the following holding and supporting tools: bench vice, hand vice, machine vice, combination pliers, anvil, bench stop, bench hook/cutting board, G-cramp, Sash cramp, mitre clamp, bench hold fast, mole wrench and pipe wrench.
- show an understanding of the practical application of the prescribed holding and supporting tools.

#### **Impelling/percussion tools**

- identify and state the correct use of the following percussion/impelling tools: mallet (woodworker's mallet, bossing, rubber and rawhide tinman's mallet) London pattern screwdriver, cabinet pattern screwdriver, flat and star/Phillips head screwdriver).
- demonstrate proper use of the prescribed impelling and percussion tools.
- identify and state the use of the following hammers: ball-pein hammer, claw hammer, warrington hammer.

#### **Abrasives and scraping tools**

- identify and name the following abrasives: glass paper, wet and dry paper, and emery cloth.
- show a working knowledge, and state the uses of the prescribed abrasives, and grade: smooth, medium and coarse.

#### **Power tools**

- show a working knowledge of the following power tools: pillar drill, electric hand drill, and rechargeable electric hand drill.

#### **Cutting Processes**

- have a working knowledge of the following processes: sawing, planing, filing, drilling, boring, and chiselling.
- have a working knowledge of the following cutting processes: shearing, and threading.

#### **Wastage**

- select and perform the following forms of cutting and removal of material; simple hole drilling by hand or machine including pilot, clearance, tapping, counter-bored holes; use taps and dies for screw cutting by hand.

### **Fixings and Fittings**

- identify and name the following fixings: rivets (round head, countersunk head and pop rivet), screws (countersunk and round head), nails (round wire nail, clout nail, and panel pin), bolts & nuts, and washers (flat and spring washers).
- show a working knowledge, and state the uses of the prescribed fixings
- identify and name the following fittings: hinges (butt, and piano hinges), handles, locks (cupboard lock, mortise lock and drawer lock), and catches (magnetic, spring and ball catches).
- show a working knowledge, and state the uses of the prescribed fittings.
- select the proper fastening or fitting for the type of work to be joined.
- demonstrate the use of safety precautions when fastening and fitting materials.

### **Adhesives**

- identify and name the following adhesives: polyvinyl acetate (PVA), contact glue, tensol cement, and paper glue.
- show a working knowledge, state the uses, and working properties of the prescribed adhesives.

### **Temporary and permanent methods of joining and assembly**

- acquire various methods of joining materials together.
- show a working knowledge of the following joints: butt joint, dowel joint, lap joint, seam joints (lap seam and folded seam), housing, halving, common dovetail, simple mortise and tenon and bridle joints.
- show a working knowledge of joining metals: arc welding and soft soldering.
- demonstrate the appropriate choice of joining materials together.

### **Finishes and Finishing**

- identify and name the following finishes: varnish, paint (primer, oil and water paint), linseed oil, bluing and stain.
- show a working knowledge, state the uses, and working properties of the prescribed finishes.
- describe the preparation for and application of surface treatments.
- be aware of special treatments including abrasives, painting, and staining.
- demonstrate knowledge of proper handling and taking care of finishing equipment.

### **Shaping**

- demonstrate a working knowledge of the following shaping processes: bending, vacuum forming, press forming and edge treatments of materials.

### **Heat treatment**

- define and explain the process of hardening, tempering and annealing mild steel.

## 6.3 Systems and Control

### Practical Application

All candidates should be able to:

#### Structures

- explain a structure
- classify structures
- identify and name types of structures
- draw, describe, and identify types of structural members such as beam, strut and tie
- apply the concepts of triangulation

#### Types of movement

- show an understanding of the following movements: linear, rotary, oscillation, and reciprocating

#### Forces

- recognize the use of static and dynamic forces: tension, compression, bending, torsion, shear and triangulation

#### Mechanisms

- define a mechanism

#### Levers

- explain the general concept of levers, load, effort, and fulcrum
- identify and describe the three classes of levers

#### Pulleys and belts

- demonstrate an understanding of how pulleys and belts function
- select appropriately vee belts, sprockets, and chains

#### Gears

- list the different types of gears: rack and pinion, bevel gear, worm gear, and spur gear

#### Simple cams and followers

- recognise the use of cams and followers in conversion of motion

#### Linkages

- recognise the importance of linkages in the conversion of motion

## 6.4 Design

### **Design Process**

#### **Theme**

- demonstrate a clear understanding of the theme

#### **Situation**

- derive a situation from a theme

#### **Brief**

- formulate a brief from a situation

#### **Research**

- research into the design brief resulting in a specification

#### **Possible solutions**

- generate a variety of possible solutions to a given situation.

#### **Working drawing**

- produce a working drawing in conformity to international standards (BS 308).

#### **Realization**

- realise the developed design solution from the working drawing

#### **Evaluation**

- appraise own product

## 7.0 PROJECT ASSESSMENT

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### 7.1 Introduction

Candidates will be given a **Theme** for the project. The project (Paper 2) should be based on the interests and observations of the candidates to arrive at a project that identifies a real design need and which is within the scope of the candidate in terms of both time and ability. The teacher has a major role in helping learners to formulate ideas and act as an advisor throughout the project. It is essential that the chosen project should test their design and making skills, but also include aspects of planning and evaluation. The Project has a maximum mark of 100 and comprises of a folio and the product. The product is marked and moderated by the teachers whilst the folio is marked at the Examinations Council of ESwatini (ECESWA).

### 7.2 MODERATION

#### (a) Internal Assessment

ECESWA requires that final product marks together with the folio be submitted to ECESWA by the 30<sup>th</sup> September of each year. This should be adhered to. Centres are at liberty to set their own coursework deadlines so that work can be collected and assessed in good time.

Teachers are required to mark the candidates' products using the Product marking scheme which is provided by ECESWA. Marks for each candidate should be recorded against each candidate's name on the Product Assessment Form, a copy of which is attached at the back of the syllabus. An internal assessor will moderate and fill in marks in the appropriate spaces. These marks should then be totalled, addition checked before submission.

When several teachers in a centre are involved in internal Assessments, arrangements must be made within the Centre for all candidates to be assessed to a common standard.

It is essential that within each Centre the marks for each skill assigned within different teaching groups (e.g., different classes) are moderated internally for the whole Centre entry. The Centre Assessments will then be subject to external marking.

**NOTE:** All records and supporting written work should be retained at the school until the publication of results.

Centres should arrange their candidates Folios in numerical order before submitting to ECESWA.

**Marks submitted for the product must be based completely on the candidates own work and not that of others.**

#### (b) External moderation and marking.

Product Assessment Forms and the Folio booklet must be submitted to ECESWA for external moderation and marking respectively, not later than 30<sup>th</sup> September for the October/November examination.

Centres should, on no account, attempt to send made products to ECESWA for moderation purposes. Design folders, however, must include **sufficient photographs of the made product** showing an overall view together with **detailed views of evidence** to support the award of marks for Assessment criteria: Product Realisation.

**PROJECT ASSESSMENT CRITERIA**

<b>Criterion</b>	<b>Level of response</b>	<b>Mark range</b>	<b>Max mark</b>
1. Analysis of the theme	Limited understanding of the theme.	0-1	5
	Analysis of the theme limited to three general areas of interest.	2-3	
	A fully expanded analysis of the theme consisting general and specific areas of interest relevant to the theme.	4-5	
2. Identification of a need or opportunity with a brief analysis leading to the Design Brief.	A statement of what is to be made.	0-1	5
	Consideration of the design need or the intended user(s) leading to a design brief.	2-3	
	Consideration of both the design need and the intended user(s) leading to a clear design brief.	4-5	
3. Research into the Design Brief resulting in a Specification.	Limited examination of the design brief with a specification identifying some basic requirements.	1-3	10
	Meaningful research of the design brief with some data identified. A specification including key features of the intended product.	4-7	
	Thorough research of the design brief with relevant data identified and collected. Analysis of the research leading to a detailed specification for the intended product.	8-10	
4. Generation and exploration of Design Ideas	A limited range of ideas with a tendency to focus on a single concept. Little or no evaluation of ideas.	1-5	15
	A range of appropriate solutions proposed. Ideas examined with evaluations leading to the identification of possible ideas for development.	6-10	
	A wide range of not less than three appropriate solutions with imaginative interpretation. Detailed evaluation of ideas and consideration of the requirements of the specification.	11-15	
5. Development of Proposed Solution	Some decisions made about form, materials and/or construction methods.	1-5	

	As a result of investigation, appropriate decisions made about form, materials and construction/production methods. Evidence of some testing and/or trialling.	6-10	15
	Appropriate testing and trialling resulting in reasoned decisions about for, materials, construction/production methods and other items.	11-15	
6. Planning for Production	Limited evidence of any forethought. A working drawing with little detail.	1-3	10
	A simple plan showing awareness of the main processes involved. A clear working drawing showing overall layout and major dimensions.	4-6	
	Clear and detailed planning showing an effective order for the sequence of operations. Drawing and other information give full details of the final product.	7-10	
7. Product Realisation	The product will exhibit a reasonable standard of outcome, be mainly complete and satisfy some aspects of the specification.	1-10	30
	The product may have some minor inaccurate and blemishes but will be complete and function as intended.	11-20	
	The product will be completed to a high standard of outcome with precision and accuracy. It will meet fully the requirements of the product specification.	21-30	
8. Testing and Evaluation	Little or no evidence of testing. General overall appraisal with little reference to the specification.	1-3	10
	Appropriate reporting and/or comment on simple testing. Reference to the specification with some conclusions leading to possible modifications or improvements.	4-6	
	Objective testing with reference to the specification and user. Detailed and meaningful conclusions leading to proposals for further development.	7-10	

## DESIGN AND TECHNOLOGY TERMINOLOGY

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### Design Process

<b>ANALYSIS</b>	A questioning of the brief to find out what it could mean.
<b>ANTHROPOMETRIC DATA</b>	Body measurements taken from large numbers of people.
<b>BRIEF</b>	A statement of the design problem.
<b>ERGONOMICS</b>	Recommended dimensions of objects based on anthropometric data.
<b>EVALUATION</b>	An Assessment of the completed project and the processes involved.
<b>INVESTIGATION/ RESEARCH</b>	Reading and experimenting to gather information about the problem. May also involve 'market research', internet searches, etc.
<b>MANUFACTURE</b>	The process of making the designed project.
<b>PROTOTYPING</b>	Making models to test design ideas.
<b>SPECIFICATION</b>	A statement of the design problem and all the factors that might be linked to it.

### Design Graphics

<b>ASSEMBLY DRAWING</b>	One or a series of drawings indicating how and in what order the parts are assembled.
<b>CUTAWAY DRAWING</b>	A drawing in which a part is removed to show the inner detail.
<b>ELEVATION</b>	An orthographic view of the front, rear, or end of an object.
<b>EXPLODED DRAWING</b>	A drawing in which the parts are separated so that each can be clearly seen.
<b>ISOMETRIC PROJECTION</b>	An isometric drawing shows two sides of the object and the top or bottom of the object. All vertical lines are drawn vertically, but all horizontal lines are drawn at 30 degrees to the horizontal. Isometric is an easy method of constructing a reasonable '3 dimensional' images.
<b>OBLIQUE PROJECTION</b>	A 3D drawing system which views one face of the object as a 'true shape' and projects parallel lines from it to suggest solidity.
<b>ORTHOGRAPHIC PROJECTION</b>	An organised series of flat views of an object, drawn so that all the details can be clearly seen. There are two types:- 1 <sup>st</sup> and 3 <sup>rd</sup> angle. These will show a plan view and, usually, front and side elevations.
<b>PERSPECTIVE</b>	A 3D drawing system which produces a realistic image of the object. This appears to get smaller as it recedes into the picture space. There are three types - single point, two point, and three point.
<b>PLAN</b>	An orthographic view of the object seen from above.
<b>RENDERING</b>	Making a line drawing appear more realistic by applying tone, line, texture, or colour shading.



**SECTIONAL VIEWS** These are used to show hidden detail more clearly. They are created by using a cutting plane to cut the object. A section is a view of no thickness and shows the outline of the object at the cutting plane. Visible outlines beyond the cutting plane are not drawn.

### Aesthetics

**COLOUR THEORY** An explanation as to how colours (hues) are related to each other and how they are made darker (shaded) or lighter (tinted).

**FINISH** The surface treatment of a material. This ranges from matt (dull) to glossy (shiny) and can include the application of materials such as paint, lacquer or varnish.

**FORM** A 3D shape.

**PATTERN** This usually refers to surface decoration which can be applied using colour or texture.

**PROPORTION** The relative size of objects or the relationship of their parts.

**SHAPE** An area enclosed by an outline. This can be geometric (drawn with instruments) or organic (based on natural object).

**TEXTURE** The surface quality of a material; this can be coarse (rough) or fine (smooth).

### Resistant Materials

**ALLOY** A mixture of two or more metals.

**DEFORMING** Also called forming, shaping a material by pushing or pulling it into a three dimensional form.

**FERROUS METAL** A metal which contains iron (Non-ferrous metals contain no iron).

**LAMINATING** Thin strips of material are glued together to form thick sections or shaped objects.

**THERMOPLASTICS** A plastic that can be softened by heat.

**THERMOSET** A plastic that cannot be softened with heat.

**VACUUM FORMING** A thermoplastic sheet is heated until soft then sucked onto a mould by pumping out the air from the mould chamber.

**VENEER** A thin sheet of timber.

**DESIGN AND TECHNOLOGY**  
**Product Assessment Form**

**JUNIOR CERTIFICATE 537**

Please read the instructions printed overleaf and in the General Coursework Regulation before completing this form.

<b>Centre Number</b>						<b>Centre Name</b>		<b>November</b>	<b>2</b>	<b>0</b>		
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JC Design and Technology Syllabus 537  
November 2021-2023 Examination

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Candidate Number	Candidate Name	Suitability (max 9)		Range of skills displayed (max 4)		Standard of making skills (max 6)		Construction methods (max 1)		Precision and accuracy (max 2)		Safety consideration (max 1)		Appearance (max 5)		Use of materials (max 2)		Total Mark (max 30)	Internally Moderated Mark (max 30)
		T	M	T	M	T	M	T	M	T	M	T	M	T	M				

Name of teacher			Signature	Date
Name of internal moderator			Signature	Date
Head of Centre (Name)			Signature	Date

### **INSTRUCTIONS FOR COMPLETING PRODUCT ASSESSMENT FORMS**

1. Complete the information at the head of the form.
2. List the candidates in a numerical order. Show the teaching group or set for each candidate. The initials of the teacher may be used to indicate the group or set.
3. The teacher and the moderator must enter marks for the individual skills or assignments in the column indicated 'T' and 'M' respectively. Internal moderation should be done by an ECESWA trained professional teacher
4. Both the teacher completing the form and the internal moderator (or moderators) should check the form and complete and sign the bottom portion.
5. The Head of Centre should endorse the Product Assessment Form as a sign of approval of proper submission of work.
6. The Product Assessment Form should be submitted in one envelope with the candidates' Coursework.
7. A copy of the Product Assessment Form should be kept safely at the school.