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Teacher's Guide

Edexcel GCSE in Design and Technology: Resistant Materials Technology

ALWAYS LEARNING

PEARSON

Contents

Delivery models

The following delivery models highlight just three of the possible strategies that you could employ when structuring your course.

- Traditional combined design and make activity.
- Separate design and make activities.
- Design and make activities related but separate.

Delivery model 1: Traditional combined design and make activity

This delivery model should be very familiar to centres. In Year 10 an induction period is used to develop basic skills leading to specific investigation, design and make tasks. The investigation task develops product analysis skills. A series of design tasks could be used to develop creativity and working to limited deadlines, and a making task used to develop modelling skills. All of these skills prepare students for the 'major coursework project' in Year 11.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Combined design and make activity ie storage				Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Delivery model 2: Separate design and make activities

This model involves students designing one product and making another. The design activity could be as creative and unrestrained as a student likes, because there is no requirement to manufacture the design proposal, although it should be possible to do so, for example commercially. The make activity would be a product that was fully functioning and appropriate to the expected levels of response at GCSE. The making task would be challenging enough to demand high level making skills in order to be successful and have the potential to gain a student high levels of achievement.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Design activity ie a novelty seating unit for a nursey		Unit 2: Make activity ie an adjustable lamp		Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Delivery model 3: Design and make activities related but separate

Here, the make activity is tackled first by all students making, for example, a jewellery box from a manufacturing specification and a set of working drawings provided by the teacher. All students produce a similar outcome that can be used in the design activity later on in the year. The design activity that follows can focus on, for example, a rang of jewellery based on a theme or focused on a particular user group that could be stores in the previously made jewellery box.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Make activity ie jewellery design		Unit 2: Design activity ie a range of jewellery		Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Teaching ideas

This section contains some ideas for teaching the content.

The following three tasks focus on how to develop important investigation, design and making skills needed for coursework whilst addressing key examination topics.

Investigation task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	To disassemble a paper stapler. Parts to include; metal body, plastic base, lever mechanism and device for turning staples inwards or outwards. To outline the main factors affecting the specification criteria for the stapler.	**1.2: Research** Present selective and focused research. Students should be discouraged from presenting unnecessary research or 'padding' Use product disassembly in order to analyse a relevant, existing product's performance, materials and components, processes, quality and sustainability issues. Product analysis is an ideal focused research activity as it enables students to understand the work of professional designers and uncover the problems that they had to solve.	**Topic 4.1: Specification criteria** When analysing a product, students should take into account the following specification criteria: • form – Why is the product shaped/ styled as it is? • function – What is the purpose of the product? • user requirements – What qualities make the product attractive to potential users? • performance requirements – What are the technical considerations that must be achieved within the product? • material and component requirements – How should materials and components perform within the product? • scale of production and cost – How does the design allow for scale of production and what are the considerations in determining cost? • sustainability – How does the design allow for environmental considerations?
2	To discuss the materials used in the stapler, including, specific metals and polymers used in construction.	**1.2: Research**	**Topic 1.2: Metals** Aesthetic, functional and mechanical properties, application and advantages/ disadvantages of the following ferrous and non-ferrous metals when manufacturing products: • mild steel • carbon steel. **Topic 1.3: Polymers** Aesthetic, functional and mechanical properties, application and advantages/ disadvantages of the following thermoplastics when manufacturing products: • acrylic • high impact polystyrene • Acrylonitrile-Butadiene-Styrene (ABS)

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
3	To discuss issues relating to scales of production. To discuss the industrial processes for producing the main parts of the stapler.	1.2: Research	**Topic 3.1: Scale of production** Characteristics, application and advantages/disadvantages of the following scales of production in the manufacture of products: • mass. **Topic 3.2: Materials processing and forming** Characteristics, preparation, description of processes, application and advantages/disadvantages of the following methods when using materials and components: • drilling • turning • injection moulding • extrusion (metal).
4	To discuss the properties of the materials in the stapler that allow it to perform successfully.	1.2: Research	**Topic 1.2: Metals** Understand and describe the following properties when selecting and using metals in product manufacture: • hardness • toughness • strength in compression and shear.
5	To discuss sustainability issues relating to the extraction of materials, production, use and disposal of the stapler.	1.2: Research	**Topic 7.1: Minimising waste production** Principles, application, advantages/disadvantages to society and the environment of minimising waste production throughout the product life cycle using the following 4 R's: • reduce materials and energy • reuse materials and products where applicable • recover energy from waste • recycle materials and products or use recycled materials.

Design task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	**Brief:** To design a desktop organiser to hold a range of stationery items including pens, pencils, paper clips, scissors etc. To investigate existing similar products to establish materials and processes used typically for this type of product To discuss and develop specification criteria for a desktop organiser.	**1.3: Specification** Produce realistic, technical and measurable specification points which address some issues of sustainability for their own product. The specification is an extremely important document as it focuses the designer and enables them to review their design ideas as they progress. Each specification point needs to be fully justified and not simply a statement.	**Topic 4.1: Specification criteria** When designing a product, students should take into account the following specification criteria: • form – How should the product be shaped/styled? • function – What is the purpose of the product? • user requirements – What qualities would make the product attractive to potential users? • performance requirements – What are the technical considerations that must be achieved within the product? • material and component requirements – How should materials and components perform within the product? • scale of production and cost – How will the design allow for scale of production and what are the considerations in determining cost? • sustainability – How will the design allow for environmental considerations?

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
2	To design three different initial ideas for a desktop organiser.	**2.1: Initial ideas** Present alternative initial design ideas that are realistic, workable and detailed. This is the opportunity for students to demonstrate their creativity and flair for design. A wide range of different initial design ideas should be explored. Demonstrate their understanding of materials, processes and techniques applicable to their initial design ideas. Annotation should clearly show students' knowledge and understanding of workshop or industrial applications relevant to each design idea. Address specification points through their initial design ideas. Annotation should be clearly related to the specification points.	**Topic 5.2: Designing skills** When designing a product, students should be able to respond creatively to design briefs and specification criteria, including: • clear communication of design intentions using notes and/or sketches • annotation which relates to the original specification criteria. **Topic 5.3: Application of knowledge and understanding** When designing a product, students should be able to apply their knowledge and understanding of a wide range of materials and/or components and manufacturing processes to each design idea, including: • the properties of materials and/or components • the advantages/disadvantages of materials and/or components and manufacturing processes • justification of the choice of materials and/or components and manufacturing processes.
3	To review all design ideas and select one for further development.	**2.2: Review** Present objective evaluative comments against their original specification criteria. Initial design ideas are 'raw' at this stage and it is therefore important to determine which can be developed into workable solutions by testing against specification points. Use user-group feedback and issues of sustainability to evaluate their initial design ideas. All design is concerned with people, and their opinions are extremely useful in gaining another perspective on the further development of ideas.	

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
4–5	To develop one idea into a final design proposal.	**3.1: Development** Develop their initial design ideas into a single final design proposal that is significantly different, and improved, to any previous initial design idea. Development should refine technical aspects of the product design and not simply focus on cosmetic changes. Evaluate their ideas against relevant design criteria as they progress.	**Topic 5.2: Designing skills** When designing a product, students should be able to respond creatively to design briefs and specification criteria, including: • clear communication of design intentions using notes and/or sketches • annotation which relates to the original specification criteria. **Topic 5.3: Application of knowledge and understanding** When designing a product, students should be able to apply their knowledge and understanding of a wide range of materials and/or components and manufacturing processes to each design idea, including: • the properties of materials and/or components • the advantages/ disadvantages of materials and/or components and manufacturing processes • justification of the choice of materials and/or components and manufacturing processes. **Topic 3.8: Health and safety** • How to understand/describe safe working practices. • How to identify workshop hazards and precautions.
6–8	To model the final design proposal using resistant materials or 3D CAD.	**3.1: Development** Use modelling in traditional materials or in 3D CAD to test important aspects of the design idea as it progresses. Simple mock-ups or block models can be invaluable in determining whether a design is workable. **5.3: Health and safety** Demonstrate a high level of safety awareness throughout all stages of manufacture. No other formal evidence is required.	
9	To produce a working drawing(s) of the final design proposal that contains enough information to manufacture the product. To outline industrial and commercial applications relating to the final design.	**3.2: Final design** Present a final design proposal in an appropriate format that communicates their design intentions. Present technical details of materials and/or components, processes and techniques relating to their final design proposal. Final drawings should be clearly annotated and dimensioned so that they can be understood by a third party.	

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
10	To objectively test and evaluate the final design proposal against measurable points of the product specification.	**6.1: Testing and evaluation** Devise and carry out a range of suitable tests to check the performance and/or quality of the final product. Tests should be measurable and refer to specification points, if appropriate, to determine the product's fitness for purpose. Evaluate their final product objectively with reference to specification points and user group feedback. No product is ever perfect so students should discuss the positive and negative aspects of their final product. User group feedback should provide a further perspective.	**Topic 4.1: Specification criteria** When analysing a product, students should take into account the following specification criteria: • form – Why is the product shaped/styled as it is? • function – What is the purpose of the product? • user requirements – What qualities make the product attractive to potential users? • performance requirements – What are the technical considerations that must be achieved within the product? • material and component requirements – How should materials and components perform within the product? • scale of production and cost – How does the design allow for scale of production and what are the considerations in determining cost? • sustainability – How does the design allow for environmental considerations?

Making task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	**Brief:** To make a wooden artist's materials case to hold a range of artist's materials that need to be stored safely and separately. To discuss the design brief to clarify the key design requirements.	**1.1 : Analysing the brief** Analyse their design brief in enough detail to be able to clarify design needs. This will involve analysis of key words and phrases that help in understanding the issues related to the chosen/given design task.	
2	To produce a production plan for the manufacture of the artist's materials box.	**4.1 : Production plan** Produce a detailed production plan that considers the stages of manufacture for their product. Charts should clearly communicate the correct order of making and timings. Identify and describe the stages during making where specific quality control procedures should take place. Feedback in charts should state where quality control will take place.	
3–8		**5.1 : Quality of manufacture** Attempt a challenging making task involving the manufacture of several different components using a range of materials, equipment, techniques and processes. Students must ensure that their product provides an opportunity to manufacture several different component parts from different materials using different processes. Select tools, equipment and processes, including CAD/CAM where appropriate, for specific uses. Demonstrate detailed understanding of the working properties of materials they have selected for a specific use. Students should use their work plan to justify their choices. Demonstrate a wide range of making skills with precision and accuracy. This is an opportunity for students to be rewarded for the range of making skills they demonstrate during the making activity.	A range of suitable materials including: **Topic 1.1 : Woods** Aesthetic, functional and mechanical properties, application and advantages/disadvantages of the following woods when manufacturing products: • oak • mahogany • beech • ash • pine. **Topic 3.3: Joining methods:** • halving joint • butt joint • rebate joint • housing joint • mortise and tenon joint • dowel joint.

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
		5.3: Health and safety Demonstrate a high level of safety awareness throughout all stages of manufacture. Teachers will award these marks based on their observations of students during the make activity.	**Topic 6.3: CAD/CAM** Characteristics, processes, application and advantages/disadvantages of CAD/CAM in the design, development and manufacture of products: • computer numerically controlled (CNC) milling and turning • rapid prototyping. **Topic 3.4: Adhesives** Preparation, application and advantages/disadvantages of using the following adhesives for joining materials: • polyvinyl acetate (PVA) • contact adhesive • epoxy resin. **Topic 3.6: Finishing techniques** Processes, application and advantages/disadvantages of applying the following finishes to improve the performance, quality and appearance of manufactured products: • varnish • wax polish • stain • paint. Students should identify and understand the practical use of common workshop tools, equipment and components used in making products. **Topic 3.8: Health and safety** • How to understand/describe safe working practices. • How to identify workshop hazards and precautions.
9	To present the final product to the group. To discuss the performance and quality of the final product with peers.	**5.2: Quality of outcome** Produce high-quality components that are accurately assembled and well finished to produce a high-quality product overall. Where products are incomplete, it is the quality of the manufacture of individual components that will gain marks. Produce a completed product that is fully functional as a resistant materials technology product. The final product should be fit for purpose.	
10	To test and evaluate the completed model to determine performance and quality factors.	**6.1: Testing and evaluation** Devise and carry out a range of suitable tests to check the performance and/or quality of the final product. Tests should be measurable and refer to specification points, if appropriate, to determine the product's fitness for purpose. Evaluate their final product objectively with reference to specification points, user group feedback and sustainability issues. No product is ever perfect so students should discuss the positive and negative aspects of their final product. User group feedback should provide a further perspective.	

Student guide

Is this the right subject for me?

Do you enjoy:

- Thinking creatively? ❑
- Problem solving? ❑
- Designing products of the future? ❑
- Making models? ❑
- Testing your ideas? ❑

If you have ticked **any** of the boxes above, then this GCSE RMT course is the ideal subject for you.

What do I need to know, or be able to do, before taking this course?

Throughout Key Stage 3 you will have produced a wide range of exciting projects in Design and Technology, including graphics, textiles, food, electronics and RMT. If you particularly enjoyed the creative design side of design and technology then you now have the opportunity to specialise in one of those subject areas and follow a two-year course in GCSE RMT.

What will I learn?

GCSE RMT covers a wide range of activities based on designing and making products that are manufactured using materials such as wood, metal and plastics in many forms. As well as learning hand skills, you will use a range of industrials processes to shape and form materials into functioning products. Over the course of two years you will develop a whole range of creative designing and making skills, technical knowledge and understanding relating to RMT and invaluable transferable skills such as problem solving and time management.

How will I be assessed?

GGCSE Food Technology consists of two units:

Unit 1	Unit 2
Creative Design and Make Activities	Knowledge and Understanding of RMT
Controlled Assessment	Examination
60%	40%

You will have the option of completing your coursework unit in two different ways:

- through a combined design and make activity where you design a product and then make a model of it OR
- through separate design and make activities where you design one product and make another.

The examination will be based on a structured exam paper which your teacher will be able to guide you through. Everything that you need to learn for this unit is set out in the specification so your teacher will know exactly how to prepare you for the exam.

What can I do after I've completed the course?

Many students have enjoyed studying GCSE RMT so much that they go on to study A Level Product Design: RMT for a further two years. However, it is possible to study any D&T related course at post-16.

Creative students usually study one or more of the creative subjects including, A Level Art and Design, Media and/or Film, BTEC National Diplomas in Art and Design or Media and the 14-19 Diploma in Creative and Media.

Of course, if post-16 is not for you, employers value this GCSE RMT qualification as it develops creative, technical and transferable skills.

Next steps!

If you want to find out more about this GCSE RMT course then you can visit the Edexcel website at **www.edexcel.com**

You should also talk to the Head of Design and Technology at your school who will be able to describe the course in detail and advise you of what you need to do next when it comes to your options.

Assessment overview

This grid gives an overview of the assessment for this GCSE RMT course. Edexcel recommend that you make this information available to students to help ensure they are fully prepared and know exactly what to expect in the assessment of Units 1 and 2.

From summer 2014 onwards students will be required to sit all of their examinations at the end of the course. Students may complete the controlled assessment task at any point during the course and controlled assessment work must be submitted for moderation at the end of the course.

Unit 1	Percentage	Marks	Time	Availability
Creative Design and Make activities This unit is internally assessed under controlled conditions. Students must complete a design and make activity. These activities can be linked (combined design and make) or separate (design one product, make another).	60%	100	40 hours Controlled assessment External moderation	June
Unit 2	**Percentage**	**Marks**	**Time**	**Availability**
Knowledge and Understanding of RMT This unit is assessed through an examination paper set and marked by Edexcel. The examination paper will consist of multiple-choice, short-answer and extended-writing type questions.	40%	80	1 hour 30 minutes External assessment	June

Description	Knowledge and skills
The development of student design folders and manufacture of products must take place under controlled conditions. Students must be supervised by a teacher at all times. Student work must be collected in at the end of the lesson and handed back at the beginning of the next lesson. Student work must be produced individually. Centres will be given a list of five broad themes for task setting. Suggested RMT tasks are: 1 **Storage**, for example • small lockable box/container for holding personal objects such as jewellery or other valuable items • a bathroom cabinet with storage for cosmetics and medicines 2 **Lighting**, for example • an adjustable lamp for use when doing homework • a nightlight for young children who are afraid of the dark 3 **Furniture**, for example • a novelty seating unit for use in a children's nursery • an occasional table suitable for use in waiting rooms 4 **Toys and games**, for example • an educational toy to help with counting and shape recognition • a mobile cart/buggy that can carry toys from place to place 5 **The garden**, for example • a grabbing device for picking up small pieces of garden debris • a trolley to transport heavy objects around the garden. Centres can contextualise the task(s) to best suit their specific circumstances, which includes the availability of, and access to, resources. See the controlled assessment guide on page 38 for more information.	The Assessment Objectives covered in this unit are: Recall of knowledge and understanding **AO1**: 6% Application of knowledge and understanding **AO2**: 45% Product analysis **AO3**: 9% Students will follow the basic creative design process. This includes research, product development, communication skills, application of knowledge and understanding of RMT (materials, processes etc), planning and making a high quality product and testing and evaluating.

Description	Knowledge and skills
This unit is assessed through a 1-hour and 30-minute examination paper set and marked by Edexcel. The examination paper will: • be structured in the same way each year so that it is accessible to all students • be a question and answer booklet and all questions are compulsory • consist of multiple-choice, short-answer and extended-writing type questions. The total number of raw marks available is 80.	The Assessment Objectives covered in this unit are: **AO1**: 24% **AO2**: 8% **AO3**: 8% Students will develop a knowledge and understanding of a wide range of materials and processes used in design and technology. Students will learn about industrial and commercial practices and the importance of quality checks, and the health and safety issues that have to be considered at all times. The knowledge and understanding students develop in this unit can be easily applied to *Unit 1: Creative Design and Make Activities*.

Understanding Unit 1

Applying the assessment criteria

To support you in accurately and confidently applying the assessment criteria, Edexcel have written the mark bands like a mark scheme with key trigger points.

The table below shows how the descriptors in each mark band have been broken up into their individual marking points (denoted by bullet points). The marking points within each mark band are equally weighted. Edexcel suggest that you look at your students work for each criteria holistically and place it into the appropriate mark band. You must then determine the actual mark you wish to award.

For example:

b) Research	Level of response not worthy of credit.	0
	• Research is **superficial** and does not focus on the needs identified in the analysis. • Analysis of existing products is **insufficient** to aid the writing of specification criteria.	1-2
	• Research is **general**, focusing on some of the needs identified in the analysis. • Product analysis is used to inform the writing of **some** specification criteria.	3-4
	• Research is **selective** and focuses on the needs identified in the analysis. • The performance, materials, components, processes, quality and sustainability issues of relevant existing products are explored in **sufficient detail** to aid the writing of specification criteria.	5-6

1. Initially, I think the student's research is selective and worthy of the 'high' mark band.

2. However, I don't think that the student's product analysis is strong enough to warrant a high mark – more 'medium'.

Where a student's work does not fit perfectly to the descriptor statements in a band, a holistic (best fit) decision must be taken by the teacher when deciding upon the final mark. Look at the example above. The teacher cannot award the full 6 marks for research as the candidate has not fully met the criteria in the top band with one aspect (product analysis) achieving a level better described in the middle band. In this case the student is awarded 5 marks. If the product analysis was better described by the lowest band descriptor then the holistic decision taken by the teacher would be that the work was more appropriate to the middle band overall and would therefore be awarded 4 marks.

Design activity (50 marks)

Investigate (15 marks)

Sub-sections	Descriptor	Mark range
a) Analysing the brief	Level of response not worthy of credit.	0
	• Analysis is superficial leading to unclear design needs.	1
	• Analysis is **limited** with some design needs clarified.	2
	• Analysis is **detailed** with most design needs clarified.	3
b) Research	Level of response not worthy of credit.	0
	• Research is **superficial** and does not focus on the design needs identified in the analysis. • Analysis of existing products is **insufficient** to aid the writing of specification criteria.	1-2
	• Research is **general**, focusing on some of the design needs identified in the analysis. • Product analysis is used to inform the writing of **some** specification criteria.	3-4
	• Research is **selective** and focuses on the design needs identified in the analysis. • The performance, materials, components, processes, quality and sustainability issues of relevant existing products are explored in **sufficient detail** to aid the writing of specification criteria.	5-6
c) Specification	Level of response not worthy of credit.	0
	• Specification points are **superficial**. • Specification points are **not justified**.	1-2
	• **Some** specification points are realistic and measurable. • **Some** specification points are developed from research but are not justified.	3-4
	• **Most** specification points are realistic, technical, measurable and address some issues of sustainability. • Specification **fully** justifies points developed from research.	5-6

Design (20 marks)

Sub-sections	Descriptor	Mark range
d) Initial ideas	Level of response not worthy of credit.	0
	• Alternative design ideas are **similar**. • Ideas are **simplistic**. • Ideas are **superficial** and **limited** research is used. • **Limited** specification points are addressed.	1-4
	• Alternative design ideas are **realistic**. • Ideas are **workable**. • Ideas are **detailed** and **relevant** research is used. • Ideas address **most** specification points.	5-8
	• Alternative design ideas are **realistic**, **workable** and **detailed**. • Ideas demonstrate **detailed** understanding of materials, processes and techniques. • Ideas are **supported** by research information. • Ideas address **all** key specification points.	9-12
e) Review	Level of response not worthy of credit.	0
	• General and **subjective** comments against **some** specification points. • **Limited** use of user group feedback.	1-2
	• **Objective** evaluative comments, against **most** specification points. • Evaluation considers **user group** feedback and issues of **sustainability**.	3-4
f) Communication	Level of response not worthy of credit.	0
	• Use of a **range** of communication techniques, including ICT where appropriate. • Demonstrate **sufficient** skill to convey an understanding of design ideas.	1-2
	• Use of a **range** of communication techniques and media, including ICT and **CAD** where appropriate • Demonstrate **precision** and **accuracy**.	3-4

Develop (15 marks)

Sub-sections	Descriptor	Mark range
g) Development	Level of response not worthy of credit.	0
	• Developments from alternative design ideas are **minor** and **cosmetic**. • **Simple** practical activities (modelling) are used. • Test **an** aspect of the final design proposal against **a** design criterion.	1–3
	• Developments are **appropriate** and use **details** from alternative design ideas to change, refine and improve the final design proposal. • Modelling using ingredients and/or **3D computer modelling** is used. • Test **some** aspects of the final design proposal against **relevant** design criteria.	4–6
	• Development is used to produce a final design proposal that is **significantly different** and **improved** compared to any previous alternative design ideas. • Modelling to scale using traditional materials or 2D and/or 3D computer simulatoons is used • Test **important** aspects of the final design proposal against **relevant** design criteria. **User group** feedback is used in final modifications.	7–9
h) Final design	Level of response not worthy of credit.	0
	• Final design proposal includes **limited** consideration • of materials and/or component parts, processes and techniques.	1–2
	• Final design proposal includes **details** • of **some** materials and/or component parts, processes and techniques.	3–4
	• Final design proposal includes **technical details** • of **all** materials and/or component parts, processes and techniques.	5–6

Make activity (50 marks)

Plan (6 marks)

Sub-sections	Descriptor	Mark range
a) Production plan	Level of response not worthy of credit.	0
	• **Superficial** production plan that outlines **some** stages of manufacture. • Plan shows **limited** reference to quality control.	1-2
	• **Limited** production plan that considers the **main** stages of manufacture. • Plan shows some reference to **appropriate** forms of quality control.	3-4
	• **Detailed** production plan that considers stages of manufacture in the **correct sequence**. • Plan includes **specific** forms of quality control.	5-6

Make (38 marks)

Sub-sections	Descriptor	Mark range
b) Quality of manufacture	Level of response not worthy of credit.	0
	• Tools are selected **with guidance**. • Equipment is selected **with guidance**. • Processes, including CAD/CAM where appropriate, are selected **with guidance**. • Limited understanding of the working properties of materials used when selecting for manufacturing a product. • The task is **undemanding**. • A **limited** range of skills is used. • A **limited** range of processes is used. • **Little** attention to detail in the use of skills and processes.	1-8
	• Tools are selected with **some** guidance. • Equipment is selected with **some** guidance. • Processes, including CAD/CAM where appropriate, are selected with some guidance. • **Some** understanding of the working properties of materials used when selecting for manufacturing a product. • The task offers **some** challenge. • A **range** of skills is used. • A **range** of processes is used. • **Attention to detail** in the use of skills and processes.	9-16
	• Tools are selected for specific uses **independently**. • Equipment is selected for specific uses **independently**. • Processes, including CAD/CAM where appropriate, are selected for specific uses **independently**. • An **appropriate** understanding of the working properties of materials used when selecting for manufacturing a product. • The task is **challenging**. • A **wide range** of skills is used. • A **wide range** of processes is used. • **Precision** and **accuracy** in the use of skills and processes.	17-24

Sub-sections	Descriptor	Mark range
c) Quality of outcome	Level of response not worthy of credit.	0
	• Product includes the manufacture of **some** good quality component parts. • Product remains either unassembled or **poorly** assembled. • Product/ components are **poorly** finished. • Completed product functions **poorly**.	1–4
	• Product includes the manufacture of **good** quality component parts. • Product is generally **well** assembled. • Product/components are generally **well** finished. • Completed product functions **adequately**.	5–8
	• Product includes the manufacture of **high-quality** component parts. • Product is **accurately** assembled. • Product/components are **well** finished. • Completed product is **fully functional**.	9–12
d) Health and safety	• Level of response not worthy of credit. • Demonstrate an awareness of safe working practices for most specific skills and processes. • Demonstrate a high level of safety awareness throughout all aspects of manufacture.	0–2

Test and evaluate (6 marks)

Sub-sections	Descriptor	Mark range
e) Testing and evaluation*	Level of response not worthy of credit.	0
	• One or **more simple** tests carried out to check the performance and/or quality of the final product. • Evaluative comments are **subjective** and reference a **few** specification points **superficially**. **	1–2
	• A **range** of tests carried out to check the performance and/or quality of the final product. • Evaluative comments are **objective** and reference **most** specification points. ***	3–4
	• A **range** of tests carried out to check the performance and/or quality of the final product with **justifications**. • **Objective** evaluative comments, including **user group** evaluation, consider most relevant, measurable specification points in **detail**, including **sustainability** issues. ****	5–6

Notes

* Opportunity for students to be assessed on quality of written communication: strand (iii) – organise information clearly and coherently, using specialist vocabulary when appropriate.

** The student uses basic language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar used with limited capacity.

*** The student uses some design and technology terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar used with some accuracy. Some spelling errors may still be found.

**** The student uses a range of appropriate design and technology terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.

Examination guide

This examination guide looks at the style of questions your students will be faced with when they sit the written paper. Those of you already familiar with the current format of Edexcel's GCSE D&T paper will clearly recognise the style of the majority of questions on the sample assessment material although clearly, to comply with QCA regulations there are some differences, notably the introduction of questions that require some extended writing. It should be highlighted, this change is a small percentage of the examination and therefore its impact on students should be minimal. Another change is the inclusion of some multiple-choice questions to give student confidence at the start of the paper.

The examination paper is 'ramped' and within each question the sub questions are ramped as well. The advantage of ramping the whole paper is that the questions at the beginning of the paper are accessible to the whole ability range, thereby easing the student into the paper and allowing them to work with confidence. As they work through the paper, the questions will get progressively more challenging as they move through the grade range G–A*.

However, candidates are advised to attempt all questions as there will be opportunities to gain marks throughout the paper.

The examination paper contains different types of questions:

- multiple-choice
- short-answer
- design questions
- extended-writing.

Each RMT exam paper will be structured in the following way:

Questions 1-10	Question 11	Question 12	Question 13	Question 14
Multiple-choice.	Knowledge and understanding of RMT. Structured questions based on a theme.	Designing products.	Analysing products.	Knowledge and understanding of RMT. Short-answer and extended-writing type questions.
10 marks	19 marks	16 marks	16 marks	19 marks

(Total 80 marks)

Command words

Students should be reminded to always read each question carefully before they respond. They should always look at the amount of marks awarded for each question in brackets. This will give them a good indication of how many points need to be raised in their response. As a general rule of thumb, look at the following command words and what students have to do in order to gain the marks:

Command word	Marks awarded	Description
Give/state/name	(1 mark)	These type of questions will usually appear at the beginning of the paper or question part and are designed to ease students into the question with a simple statement or short phrase.
Describe/outline	(2 + marks)	These type of questions are quite straightforward. They ask students to simply describe something in detail. Some questions may also ask students to use notes and sketches, therefore, they can gain marks with the use of a clearly labelled sketch.
Explain/justify	(2 + marks)	These type of questions are asking students to respond in detail to the question – no short phrases will be acceptable here. Instead, students will have to make a valid point and develop/justify it to gain full marks.
Evaluate/discuss/ compare	(4 + marks)	These type of questions are designed to stretch and challenge students. They will always be awarded the most amount of marks because they require students to make a well-balanced argument, usually involving both advantages and disadvantages.

Questions 1-10: Multiple-choice (10 marks)

New to D&T exam papers. This paper starts off with 10 multiple-choice questions which become gradually more demanding. These questions can cover any part of the specification. For example:

Which of the following joining methods requires the use of heat?

Please mark a cross (☒) in the correct box.

☒ A Brazing

☒ B Housing Joint

☒ C Mortise and tenon

☒ D Butt Joint

(Total 1 mark)

Answer

A Brazing

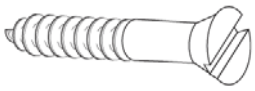
Examiner comment

An extremely straightforward question which applies knowledge and understanding from Topic 3.3 Joining methods.

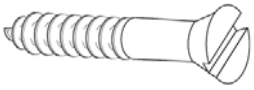
Question 11(a): Name and give the use of tools and equipment (4 marks)

Question 11 starts with four marks awarded to students for either naming or giving the use of tools and equipment related to RMT. The tools and equipment will be laid out in a table format, for example:

The table below shows some tools and components.
Complete the table below by giving the missing names and uses.

Tool/component	Name	Use
	Countersink screw	

Answer

Tool/component	Name	Use
	Countersink screw	Screwing things together to join them

Examiner comment

Students have to write clearly within the relevant box. In this response, the student has stated what a screw is for and would gain the mark, but Edexcel would recommend that because the name 'screw' was given, it should not appear again in this answer. 'Fixing or joining' things together would have been better. Students should be familiar with a wide range of specialist tools and equipment through the course of their design and make activities and Topic 3.3 Joining methods covers this part of question 11 (a).

Question 11(b–f): Knowledge and understanding of RMT (15 marks)

Subsequent questions are comprised of parts questions combined to produce structured questions on a theme, for example;

> Give **two** properties of plywood
>
> **(Total 2 marks)**

Answer

It resists splitting.

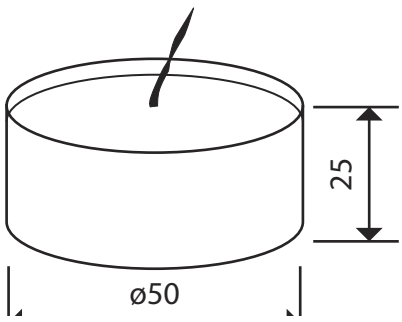
It has a good strength to weight ratio.

Examiner comment

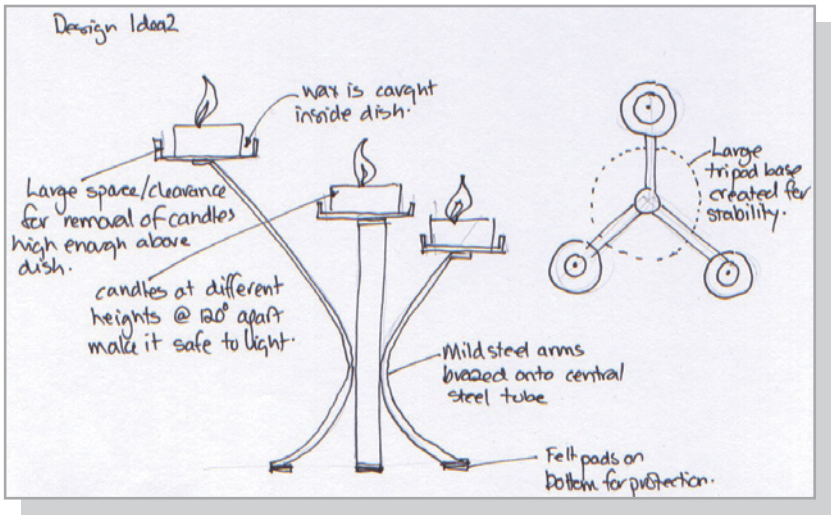
A give type question requires a single response. The student would gain a mark for each response. A response such as 'available in large sheets' is not acceptable as this is not a property, This question focuses upon Topic 1.1: Woods. Students need to learn about the functional and mechanical properties, the application and advantages/disadvantages of manufactured boards such as plywood.

Question 12: Designing products (16 marks)

Question 12 enables students to respond creatively to a given design need and detailed specification, for example:

> You have been asked to design a tea light candle holder.
> The specification for the tea light candle holder is that it must:
> - hold three tea light candles
> - enable easy changing of the tea light candles
> - have a stable base
> - not mark the surface it sits on
> - catch any spilt wax
> - enable safe lighting of the tea light candles
> - be made from flame proof materials
> - be manufactured using appropriate processes.
>
> **ADDITIONAL INFORMATION**
> Tea light candle dimensions
>
> 
>
>
> *All dimensions in millimetres*
>
> In the boxes opposite, use sketches and, where appropriate, brief notes to show **two different** design ideas for the tea light candle holder that meet the specification points above.

Answer



Examiner comment

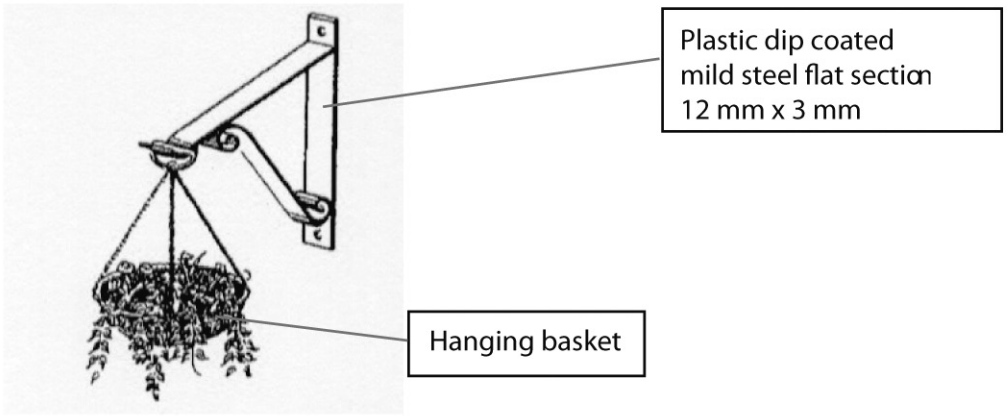
The second design solution must be conceptually and technically different in design and construction and not simply variations on a theme. Students must use annotated sketches in the boxes provided in order to design a product that satisfies the criteria outlined in the design specification. Here, the student has used sketches to convey their design idea. No drawing equipment needs to be provided for this exam, as clear annotated sketches are sufficient. The annotation is extremely important for showing the examiner how the design idea satisfies each of the specification criteria.

The annotation is succinct and covers all specification points, supporting the clear sketches.

Question 13: Analysing products (16 marks)

In question 13, students will be given a labelled diagram of a specific product and are required to answer a series of questions relating to it, for example:

The drawing below shows a hanging basket bracket.



Explain why the hanging basket bracket is successful in meeting the following specification points:

(i) Support the weight of the hanging baskets.

(ii) Be easy to attach the basket to the bracket.

(Total 4 marks)

Answer

The triangulated shape will provide a structure strong enough to take the weight under tension/ compression The bracket has a lip on the end which means that the basket will not slip off the end once in place.

Examiner comment

An `explain' type question requires a statement and then a justification in order to be awarded full marks. For example, an examiner would award marks for the student discussing the triangular shape's structure and that it will take weight under tension/compression. This question requires students to apply their knowledge and understanding of Topic 1.2: Metals to the given product, in particular functional and mechanical properties.

Question 14: Knowledge and understanding of RMT including extended-writing style questions (19 marks)

Some part questions will require an extended writing response. This is designed to stretch and challenge students, for example:

> Many plastics can now be recycled.
> Discuss the positive impacts the recycling of plastics has had on the environment.
>
> **(Total 6 marks)**

Student answer

When recycling plastics, less landfill is required which means that landfill sites will last longer, requiring less land to be given up.

There is reduced pollution and production of toxic waste by not burning plastics and causing fumes to be given into the atmosphere, causing less damage to the ozone layer.
Fewer natural resources including oil are required to make new material which means that oil reserves will last longer.

Recycled plastics can be used to make new products which cuts down the demand for new material.

Less environmental damage is caused by not having to drill for oil and transport it which will protect and preserve the environment.

Examiner's comments

This 'discuss' question requires a student to write an extended writing style response.

This question has a levels mark scheme. The student response clearly fits into Level 3 (5–6 marks):

Student identifies a range of impacts with associated developments showing a detailed understanding of the impacts. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The student spells, punctuates and uses the rules of grammar with considerable accuracy.

Controlled assessment

About controlled assessment

Controlled assessment is similar to coursework except that controls have been added to ensure that all of the work is the student's own.

The level of control for each of activity in each subject is specified by QCA. This section explains the level required for each activity and what it means for teachers and students, and the frequency of change.

Task setting

What is the level of control?

High

What does this mean?

Tasks will be set by Edexcel and centres will choose a task from a list available of five tasks on our website in September at the start of each academic year. Centres can contextualise the task(s) to best suit their specific circumstances by developing design briefs, which includes the availability of and access to resources. Suggested RMT tasks are given on page 12–19.

How often will the tasks change?

Edexcel will review the tasks every two years. Edexcel will look at the tasks in the light of student performance and make any amendments necessary to make the tasks clearer.

If students want to improve the coursework they will need to use the controlled assessment unit available for the session in which they are retaking, regardless of what task they did originally. If students are taking the same task, they must start from scratch, and do the whole task again.

Task taking

The task taking controls have been designed to ensure that the task is done by the student and that all work is their own. This means that students cannot carry out work at home and bring it to the classroom.

The task is split into two phases:

- initial research
- design and make tasks

The levels of control and the effect are different for each part.

What is the level of control?

Initial research:

Low

Design and make tasks

Medium

What does this mean?

Initial research

Students can undertake research to locate sources outside of the classroom **without supervision**. They can locate as many sources to take into the write-up phase as they wish. **Design and make tasks**

The student must complete the following under classroom supervision:

- write up of their portfolio
- making their product.

However, students are allowed to use the following to help them with completing their task:

- the initial research they have undertaken outside of the classroom to produce focused selective research for their portfolio
- sources the centre provides.

A student can bring in additional research notes at any time provided the write up of their research is done under the same supervised conditions.

Students cannot take any information away from the classroom to complete. They can make an outline plan for the task beforehand and bring it to the classroom.

Teachers need to make sure the selected task is appropriate to KSIV requirements and offers students the opportunity to access the full range of marks available.

You can give students normal teacher support regarding design ad make activities, but you must not guide them along a particular path.

This stage is not an exam and requires supervision not invigilation. There is no need to set up the room like an exam or for the room to be silent. The key requirement is that students are supervised at all times.

The task must be taken during curriculum time.

Task marking

This is similar to the current arrangements, so will be familiar.

What is the level of control?

Medium

What does this mean?

You will mark all the tasks. You then fill in a form to show all the marks achieved. Edexcel will ask for a sample of the work to moderate, including student work with the highest and lowest scores.

Edexcel will moderate the work and you will receive a summary report on results day.

Training courses on marking tasks will be available to help you mark the work effectively. Our specification experts can also provide support, just email dandt@edexcelexperts.co.uk

Controlled assessment exemplars

Centres will appreciate that no student has actually submitted controlled assessment work under the new specification at the time of publication. Therefore, existing examples of students' GCSE RMT work have been modified by the Principal Moderator for illustrative purposes only.

Suggested timings

As a guideline only, we have suggested times for each of the stages in the design and make activities. Obviously, you as a teacher will be best suited to gauge the times taken to complete each task as you know your students best.

Design activity

Stage	Tasks	Suggested times
1. Investigate	1.1 Analysing the brief	1 hour
	1.2 Research	3 hours
	1.3 Specification	1 hour
2. Design	2.1 Initial ideas	5–6 hours
	2.2 Review	1 hour
	2.3 Communication	Evidenced throughout
3. Develop	3.1 Development	5–6 hours
	3.2 Final design	1–2 hours

Make activity

Stage	Tasks	Suggested times
4. Plan	4.1 Production plan	1–2 hours
5. Make	5.1 Quality of manufacture	16 hours
	5.2 Quality of outcome	
	5.3 Health and safety	Evidenced throughout
6. Test and evaluate	6.1 Testing and evaluation	1–2 hours

Student outcomes

Investigate

Task: I.2 research

Information. **Research:** Existing Products.

This is the sort of product I would love to produce! It is made to a very high standard. I think that the shape of this object will be good for children for their visual senses and the theme of this is good because this would be good for the child and might encourage them to eat carrots when they are older! The function of this is to hold personal belongings and also it looks excellent and also is very safe to put in a young persons bedroom. The size of the product is appropriate as it isn't exceptionally large. The main desirable parts of the product is the fact that it looks so different to anything else that I have looked at. I stands out from the rest because of this. It has been made from painted wood, possibly a manufactured board of some type as the paint finish is very smooth. MDF may have been used. This kind of product may be a bit too hard for me to make but I could try to make a product that is as memorable!

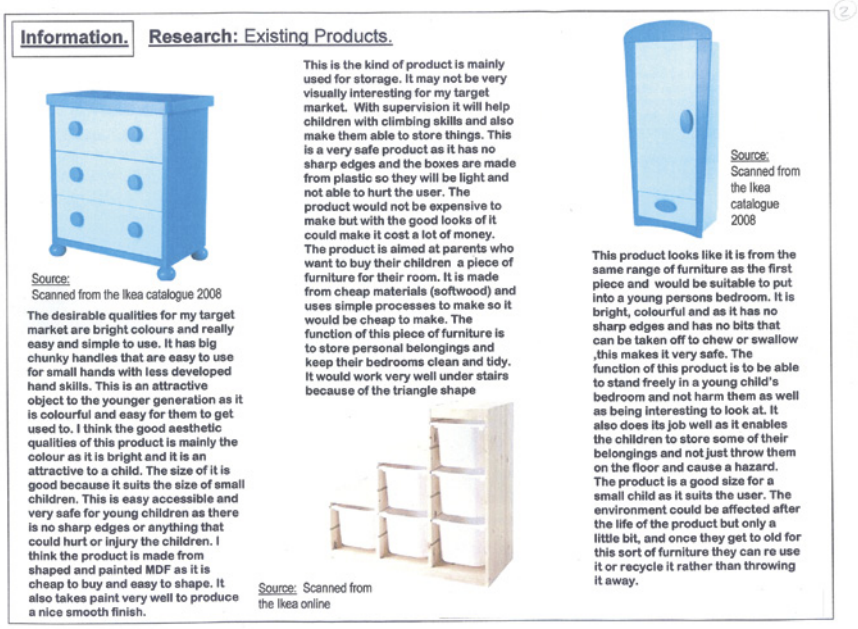
Source: Image imported from starightline designs.com

Source: Scanned from the Ikea online

This is very simple item which would be exceptionally cheap to make as there is only two materials which are really cheap to buy. It has a softwood frame with painted MDF panels. The only complicated processes involved are the jointing of the softwood at the corners. The product will be batch produced. This maybe why the product is only approximately £10-£20. The safety of this product is perfect for a child's room because it is safe and also no sharp edges where they could cut themselves. The function is good as the storage box would hold exactly what you want to put into it and would keep the room clean just as the parents want s the room so their children don't have any safety precautions. This is aimed at the parent to buy for their child's room. I think the product looks really boring when compared with the carrot. There is very little imagination used in the design as the product is only a functional one.

This is a interesting and very simple product. The bright primary colour is appealing to children and the legs look different to normal table legs. It will also will be very safe for the children as all the edges are rounded off so there are no injury worries to the parents. This is cheap to make because there is only two materials used (softwood legs and a plywood top). There are very few processes used as well, only some basic cutting for the top and turning for the legs. This makes it quite cheap in the shops as it is approximately £20-£30. This is aimed at parents to buy for their children's bedroom and put the lamp or books onto when they aren't using them. Also this can be used to store things as you have it in the corner of a room you have room underneath to put things that are just thrown in the middle of the floor. This is an acceptable size to put into a child's room as they will not have the biggest room.

Source: Scanned from "1000 new designs" book



Information. **Research:** Existing Products.

Source: Scanned from the Ikea catalogue 2008

The desirable qualities for my target market are bright colours and really easy and simple to use. It has big chunky handles that are easy to use for small hands with less developed hand skills. This is an attractive object to the younger generation as it is colourful and easy for them to get used to. I think the good aesthetic qualities of this product is mainly the colour as it is bright and it is an attractive to a child. The size of it is good because it suits the size of small children. This is easy accessible and very safe for young children as there is no sharp edges or anything that could hurt or injury the children. I think the product is made from shaped and painted MDF as it is cheap to buy and easy to shape. It also takes paint very well to produce a nice smooth finish.

This is the kind of product is mainly used for storage. It may not be very visually interesting for my target market. With supervision it will help children with climbing skills and also make them able to store things. This is a very safe product as it has no sharp edges and the boxes are made from plastic so they will be light and not able to hurt the user. The product would not be expensive to make but with the good looks of it could make it cost a lot of money. The product is aimed at parents who want to buy their children a piece of furniture for their room. It is made from cheap materials (softwood) and uses simple processes to make so it would be cheap to make. The function of this piece of furniture is to store personal belongings and keep their bedrooms clean and tidy. It would work very well under stairs because of the triangle shape

Source: Scanned from the Ikea online

Source: Scanned from the Ikea catalogue 2008

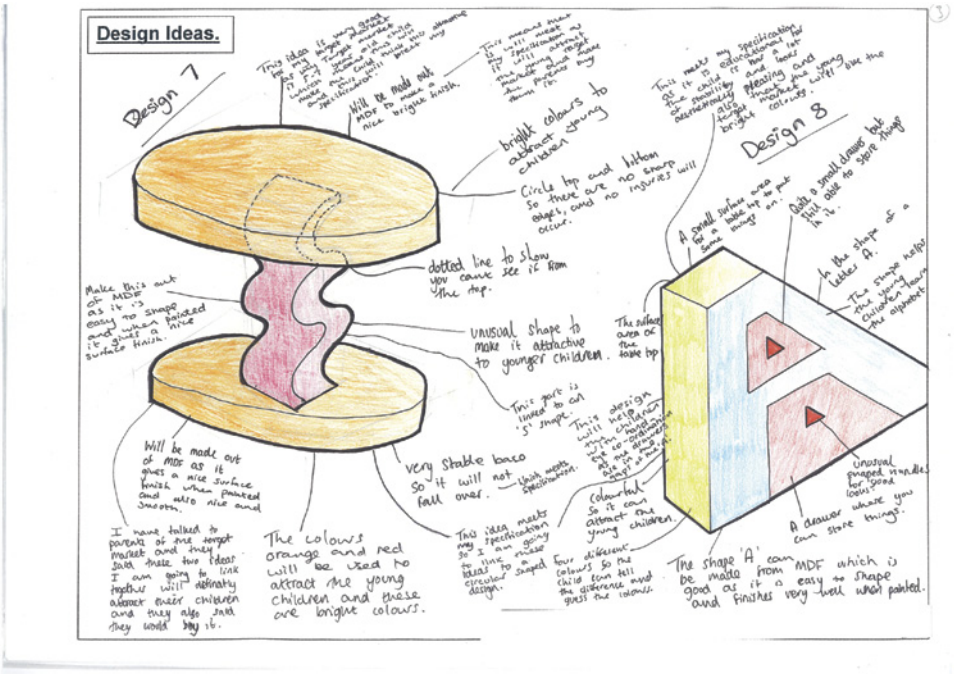
This product looks like it is from the same range of furniture as the first piece and would be suitable to put into a young persons bedroom. It is bright, colourful and as it has no sharp edges and has no bits that can be taken off to chew or swallow ,this makes it very safe. The function of this product is to be able to stand freely in a young child's bedroom and not harm them as well as being interesting to look at. It also does its job well as it enables the children to store some of their belongings and not just throw them on the floor and cause a hazard. The product is a good size for a small child as it suits the user. The environment could be affected after the life of the product but only a little bit, and once they get to old for this sort of furniture they can re use it or recycle it rather than throwing it away.

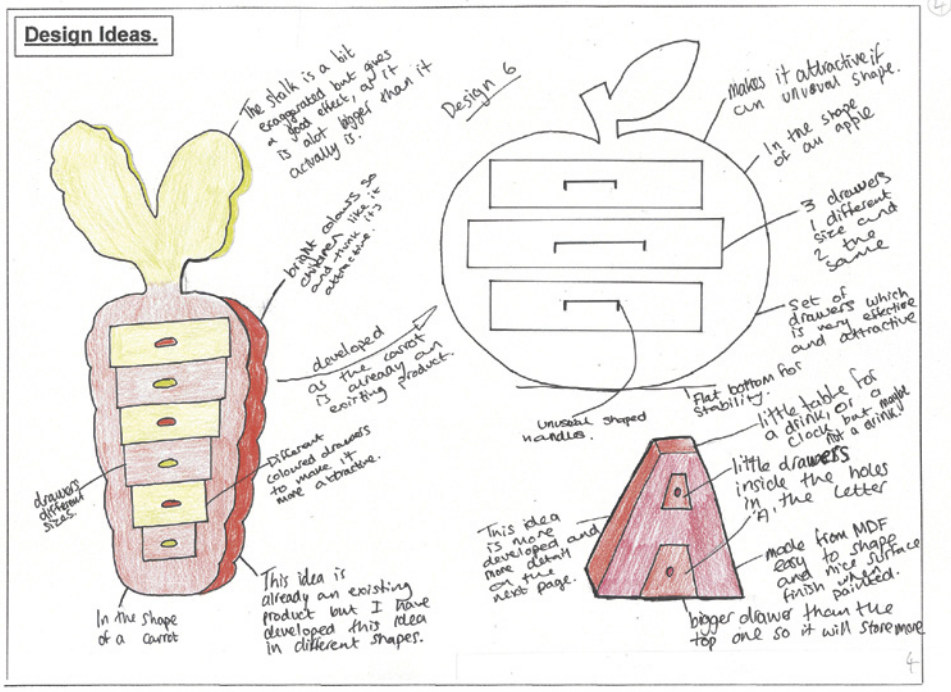
Moderator comments

Teachers should encourage students to gather research that is focused and selective, avoiding useless padding that has no currency value. Areas for useful research include similar product analysis to establish materials and manufacturing processes used, the context in which the product will be used, market research to determine potential user preferences and relevant materials research. Selectivity, relevance and succinct presentation are key to effective research. In the example shown, the student investigates existing products to learn about the materials and processes used, the function and aesthetics and the costs of products similar to the problem under consideration.

Design

Task: 2.1 Initial ideas





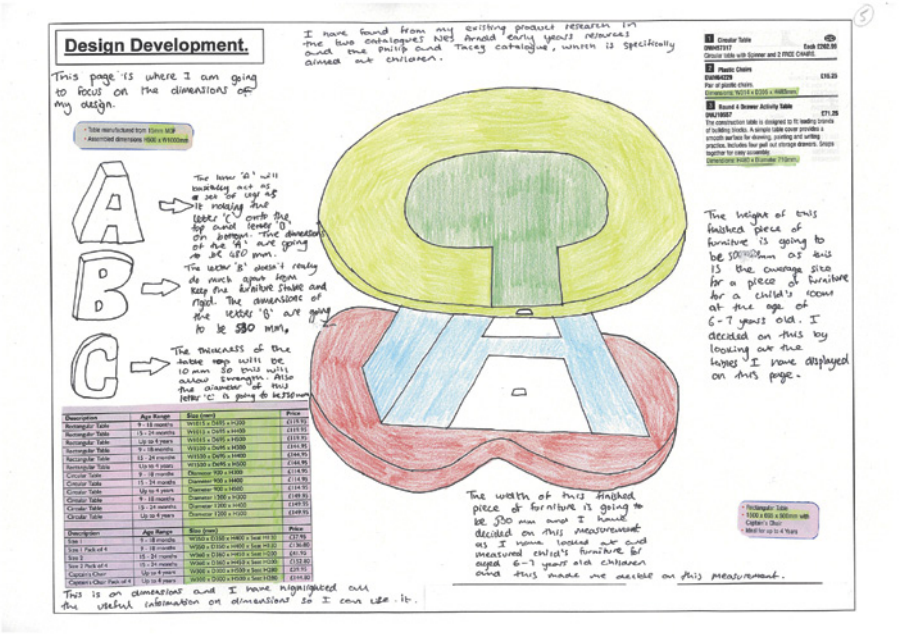
Moderator comments

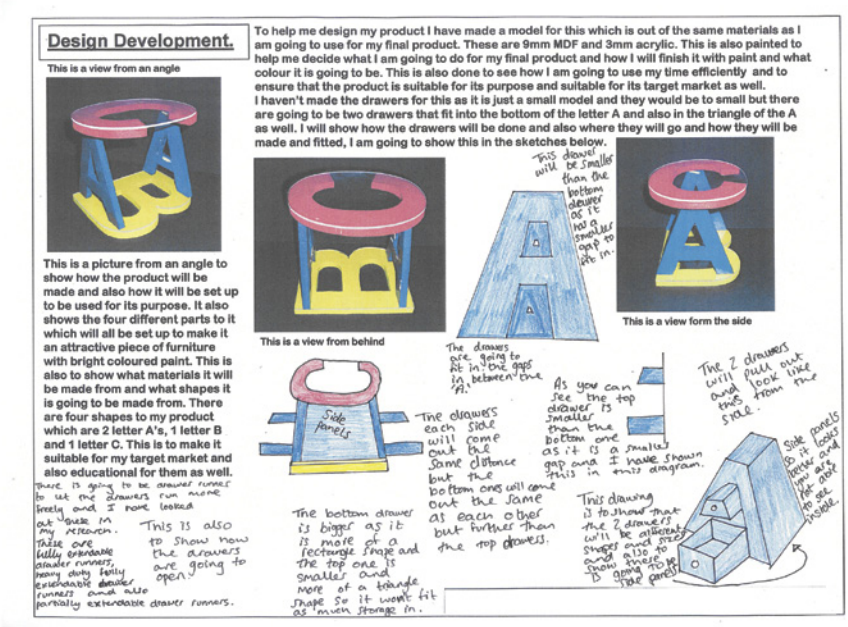
In this assessment criterion, it is expected that students will produce a range of alternative ideas that reflect their knowledge and understanding of the needs of the product specification.

It is important that students avoid producing lots of work in this area that does not progress. It is better to produce fewer ideas and concentrate on detailed well-thought through work that is well annotated to include good technical understanding of materials techniques and processes relating to a product.

Develop

Task: 3.1 Development





Moderator comments

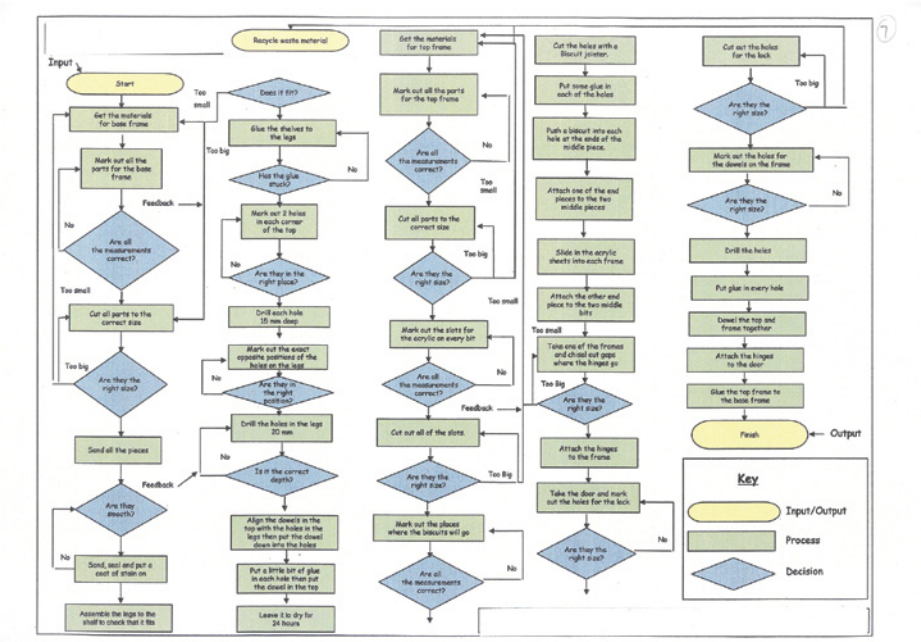
In this section, students should use their initial ideas to develop a final design for their product that matches most points of the product specification. Develop means 'change' and students should show how their final design has moved on from initial ideas to a point where it is ready to be made.

Modelling is an important part of development and can include the use of 3D materials or 2D and 3D CAD to test ideas against the specification requirement. There must be a point to modelling and this should be explained e.g. to test proportions, materials etc.

In the example here, the student has shown design development and modelling to test proportions and the proposed colour scheme of the product.

Plan

Task: 4.1 Production plan



Schedule.

Days	1		2		3		4		5		6		7		
Time (hours) / Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mark out and cut all the pieces for the base frame, then sand until all pieces are smooth.															
Glue the legs to the middle.															
Mark out and cut all the pieces for the top frame, then sand until all pieces are smooth.															
Router each bit of the top frame then mark out and cut out the places where the biscuits will go.															
Next assemble each frame using biscuits and glue together.															
Drill the dowel holes in the top and in the legs then dowel the top of the base frame to the legs.															
Next attach each individual frame together to make a big box.															
Stain all of the base frame and the top frame with mahogany colour.															
Attach the top frame to the base frame by using dowels															

Risk Assessment Table

Machine/Tool	Hazard Identification	Risk	Control Measures
Sander, Pillar drill, router, biscuit jointer, Band Saw, Cordless drill.	Dust, Swarf, and other small particles.	Getting it in you eyes and breathing it in.	Safety goggles, face mask, extraction unit on.
Sander, Pillar drill, router, Band Saw, Cordless drill.	Long hair, ties, long sleeves, jewelry.	Being dragged into a machine.	Tie long hair back, tuck tie into shirt or take it off, roll up sleeves, take jewelry off.
Pillar drill, router, fret saw, Band saw, Cordless drill.	Needles i.e. saw and drill bits.	Getting it in your eye	Safety goggles, protective guards on the machine.
Sander, Pillar drill, router, fret saw.	More than more person using the machine at one time.	Some part of someone's body getting caught in the machine.	Make sure there is only one person inside the black and yellow lines.
Wood dye	Harmful vapor.	Inhaling it.	Face mask
General hand tools.	Sharp blades.	Cuts.	Always keeping your fingers behind the blade.

Part		Amount	Dimensions (mm)	Material
Frame	A	12	400 by 50 by 20	Yellow Pine
	B	4	510 by 50 by 20	Yellow Pine
	C	2	500 by 25 by 20	Yellow Pine
Legs		4	65 by 65 by 770	Yellow Pine
Middle		1	500 by 500 by 20	Yellow Pine
Top		1	500 by 500 by 30	Yellow Pine
Door	A	2	350 by 50 by 20	Yellow Pine
	B	2	400 by 25 by 20	Yellow Pine
Screens	A	4	320 by 420 by 5	Acrylic
	B	1	420 by 420 by 5	Acrylic

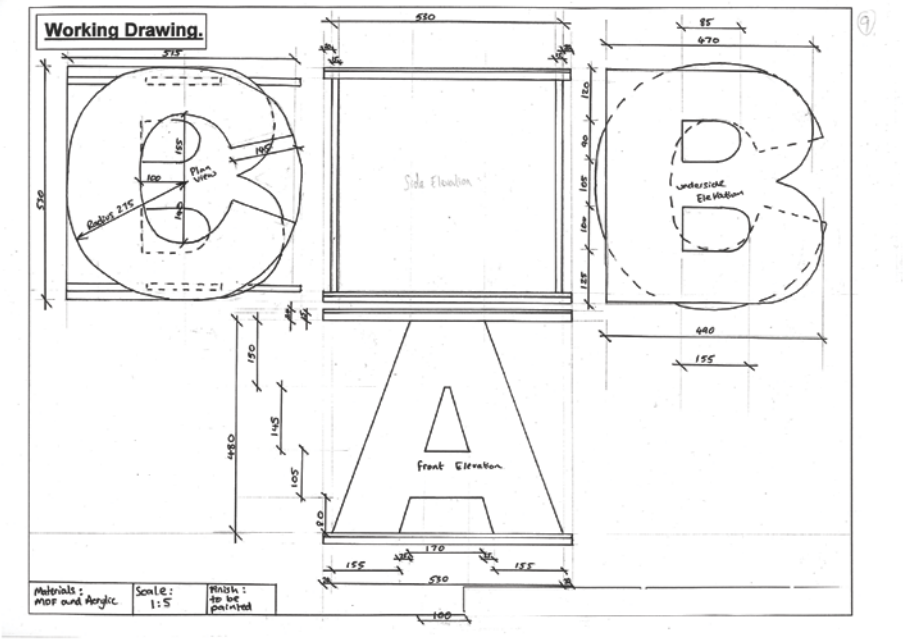
Moderator comments

The production plan should show the correct sequence of operations undertaken during a student's intended product manufacture and this can be done well through a flow chart that covers the stages of production and identifies where quality checks can be made. Planning requires time consideration and this can be done through a Gantt chart, which can be used to map time against task.

The example here shows a comprehensive flow chart and a Gantt chart and the student has also added a safety chart and a cutting list, which are not necessary to achieve full marks.

Make

Task: 5.1 Quality of manufacture and 5.2 Quality of outcome

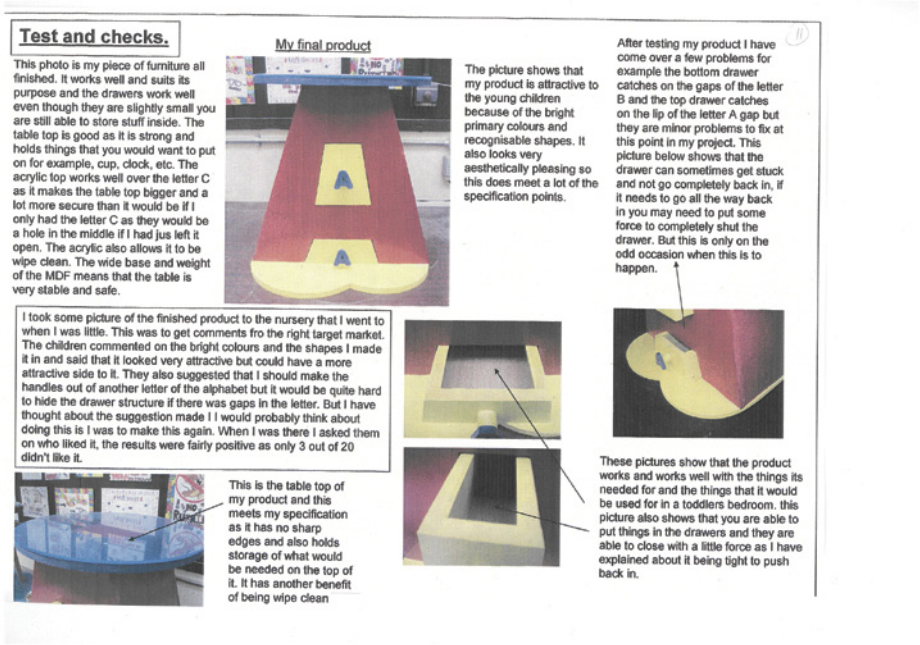


Moderator comments

It is essential that students provide detailed evidence of them making their product and this should be done through series of clear photographs that illustrate the processes, techniques and skills involved. Photographs of making in progress and the final outcome are the only evidence a moderator will see, so it is essential that images are detailed in order to show what a student has done. In the images shown here, the student has provided sound evidence of a range of skills and processes that support the final product. The working drawing from the development section is used as an essential part of manufacturing.

Test and Evaluate

Task: 6.1 Quality of manufacture and 5.2 Quality of outcome



Test and checks.

This photo is my piece of furniture all finished. It works well and suits its purpose and the drawers work well even though they are slightly small you are still able to store stuff inside. The table top is good as it is strong and holds things that you would want to put on for example, cup, clock, etc. The acrylic top works well over the letter C as it makes the table top bigger and a lot more secure than it would be if I only had the letter C as they would be a hole in the middle if I had jus left it open. The acrylic also allows it to be wipe clean. The wide base and weight of the MDF means that the table is very stable and safe.

My final product

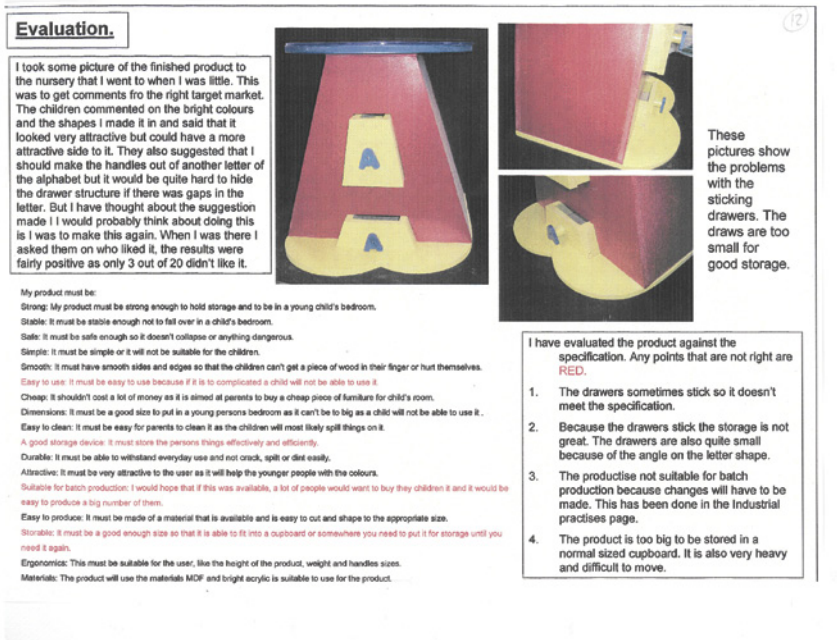
The picture shows that my product is attractive to the young children because of the bright primary colours and recognisable shapes. It also looks very aesthetically pleasing so this does meet a lot of the specification points.

After testing my product I have come over a few problems for example the bottom drawer catches on the gaps of the letter B and the top drawer catches on the lip of the letter A gap but they are minor problems to fix at this point in my project. This picture below shows that the drawer can sometimes get stuck and not go completely back in, if it needs to go all the way back in you may need to put some force to completely shut the drawer. But this is only on the odd occasion when this is to happen.

I took some picture of the finished product to the nursery that I went to when I was little. This was to get comments fro the right target market. The children commented on the bright colours and the shapes I made it in and said that it looked very attractive but could have a more attractive side to it. They also suggested that I should make the handles out of another letter of the alphabet but it would be quite hard to hide the drawer structure if there was gaps in the letter. But I have thought about the suggestion made I I would probably think about doing this is I was to make this again. When I was there I asked them on who liked it, the results were fairly positive as only 3 out of 20 didn't like it.

This is the table top of my product and this meets my specification as it has no sharp edges and also holds storage of what would be needed on the top of it. It has another benefit of being wipe clean

These pictures show that the product works and works well with the things its needed for and the things that it would be used for in a toddlers bedroom. this picture also shows that you are able to put things in the drawers and they are able to close with a little force as I have explained about it being tight to push back in.



Evaluation.

I took some picture of the finished product to the nursery that I went to when I was little. This was to get comments fro the right target market. The children commented on the bright colours and the shapes I made it in and said that it looked very attractive but could have a more attractive side to it. They also suggested that I should make the handles out of another letter of the alphabet but it would be quite hard to hide the drawer structure if there was gaps in the letter. But I have thought about the suggestion made I I would probably think about doing this is I was to make this again. When I was there I asked them on who liked it, the results were fairly positive as only 3 out of 20 didn't like it.

These pictures show the problems with the sticking drawers. The draws are too small for good storage.

My product must be:
Strong: My product must be strong enough to hold storage and to be in a young child's bedroom.
Stable: It must be stable enough not to fall over in a child's bedroom.
Safe: It must be safe enough so it doesn't collapse or anything dangerous.
Simple: It must be simple or it will not be suitable for the children.
Smooth: It must have smooth sides and edges so that the children can't get a piece of wood in their finger or hurt themselves.
Easy to use: It must be easy to use because if it is to complicated a child will not be able to use it.
Cheap: It shouldn't cost a lot of money as it is aimed at parents to buy a cheap piece of furniture for child's room.
Dimensions: It must be a good size to put in a young persons bedroom as it can't be to big as a child will not be able to use it .
Easy to clean: It must be easy for parents to clean it as the children will most likely spill things on it.
A good storage device: It must store the persons things effectively and efficiently.
Durable: It must be able to withstand everyday use and not crack, split or dint easily.
Attractive: It must be very attractive to the user as it will help the younger people with the colours.
Suitable for batch production: I would hope that if this was available, a lot of people would want to buy they children it and it would be easy to produce a big number of them.
Easy to produce: It must be made of a material that is available and is easy to cut and shape to the appropriate size.
Storable: It must be a good enough size so that it is able to fit into a cupboard or somewhere you need to put it for storage until you need it again.
Ergonomics: This must be suitable for the user, like the height of the product, weight and handles sizes.
Materials: The product will use the materials MDF and bright acrylic is suitable to use for the product.

I have evaluated the product against the specification. Any points that are not right are RED.

1. The drawers sometimes stick so it doesn't meet the specification.
2. Because the drawers stick the storage is not great. The drawers are also quite small because of the angle on the letter shape.
3. The productise not suitable for batch production because changes will have to be made. This has been done in the Industrial practises page.
4. The product is too big to be stored in a normal sized cupboard. It is also very heavy and difficult to move.

Moderator comments

It is important that final products are tested and evaluated to establish whether or not they have been successful. In the example shown, the student has completed an integrated design and make activity, so the original product specification can be used to measure the performance and quality of the product.

If separate design and make activities had been set, a manufacturing specification would have been given to students and this would have been used to test the performance of the product. Students can also set their own test criteria, so long as they are able to use it to objectively test the performance and quality of their work.

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