

Examiners' Report
June 2012

GCSE Design & Technology
Resistant Materials 5RM02 01

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.

Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service. See the ResultsPlus section below on how to get these details if you don't have them already.



Get more from your exam results

...and now your mock results too!

ResultsPlus is Edexcel's free online service giving instant and detailed analysis of your students' exam and mock performance, helping you to help them more effectively.

- See your students' scores for every exam question
- Spot topics, skills and types of question where they need to improve their learning
- Understand how your students' performance compares with Edexcel national averages
- Track progress against target grades and focus revision more effectively with NEW Mock Analysis

For more information on ResultsPlus, or to log in, visit www.edexcel.com/resultsplus. To set up your ResultsPlus account, call us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk.

June 2012

Publications Code UG031999

All the material in this publication is copyright
© Pearson Education Ltd 2012

Introduction

This is the third year that this specification has been tested. That said the first year only saw a relatively small number of candidates sit the paper, all in year 10.

Generally candidates are demonstrating a better level of understanding of the format and requirements of the paper and as such performance levels are improving.

There appears to be a better understanding of the command words such as 'explain and describe' and candidates are scoring better on these questions.

The design question format is now well established and candidates are responding better here too.

Question 11 (a) (i)

This question was very well done by the majority of candidates. The most common incorrect response seen was related to the apron protecting the body or body items.

	Apron	To protect clothes from getting messy during cooking. (1)
---	-------	--



ResultsPlus
Examiner Comments

This was a popular correct answer for the protection of clothing.

Question 11 (a) (ii)

Again a well answered question gaining 1 mark.

Question 11 (a) (iii)

The pillar drill was correctly identified by many candidates.

Question 11 (a) (iv)

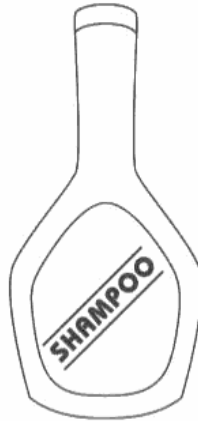
The mortise gauge was identified as a marking gauge by the majority of candidates.

Question 11 (b) (i)

The most common answers here were durable and tough. Many candidates gave cheap and strong as properties, but these are incorrect and these terms should be avoided.

This 'give' type of question only warrants a simple word or statement.

(b) The drawing below shows a shampoo bottle.



The shampoo bottle is made from polyvinyl chloride (PVC) and is blow moulded.

(i) Give **three** properties of polyvinyl chloride.

(3)

1 Plasticity

2 Lightweight

3 Waterproof

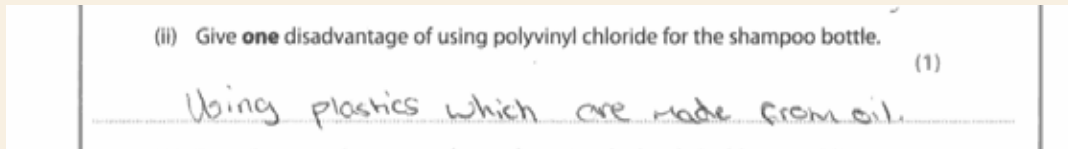


ResultsPlus
Examiner Comments

The candidate here has correctly identified three correct properties with a simple word for each.

Question 11 (b) (ii)

This question was poorly done with the majority of candidates unable to score a mark. The most common incorrect responses were expensive and cannot be recycled. A general comment such as 'bad for the environment' is far too general and sweeping, and will not score any marks.



ResultsPlus
Examiner Comments

A very simple statement here scored the 1 mark available.

Question 11 (b) (iii)

There was a definite lack of knowledge related to blow moulding. Generic responses such as cheaper and faster are inappropriate at this level. Some candidates were able to identify that the bottle needed to be hollow, but were unable to go on and develop their response for a second mark.

(iii) Describe **two** advantages of manufacturing the bottle by blow moulding rather than by injection moulding.

- 1 It needs to be hollow therefore blow moulding is better because injection makes solid objects
- 2 Injection moulding casts cost a lot of money so you need to make lots of bottles to make money and blowmoulding casts aren't expensive.



ResultsPlus
Examiner Comments

This response has a single mark for identifying that the bottle would be hollow but the candidate was unable to go on and develop the point for a second mark.

Question 11 (c)

Many candidates made reference to recycling the bottle once it had been used as opposed to during manufacture which is what the question was asking. Most were able to make reference to some of the 4 R's but were not always able to apply them to the situation.

(c) Minimising waste during production of the shampoo bottles is important.

Give **three** ways in which waste can be minimised during the production of the shampoo bottles.

(3)

- 1 Re-use shampoo bottles by melting them again.
- 2 Recycle the waste so that it can be used to make other things.
- 3 He could use CAM to make the products more accurate so that there's less waste.



ResultsPlus
Examiner Comments

This candidate has given two correct ways; re-using and recycling the waste.

Question 11 (d)

Both solar power and wind energy were amongst the most common responses seen although candidates did not always go on to say how the energy could be used or applied in the factory.

Question 12

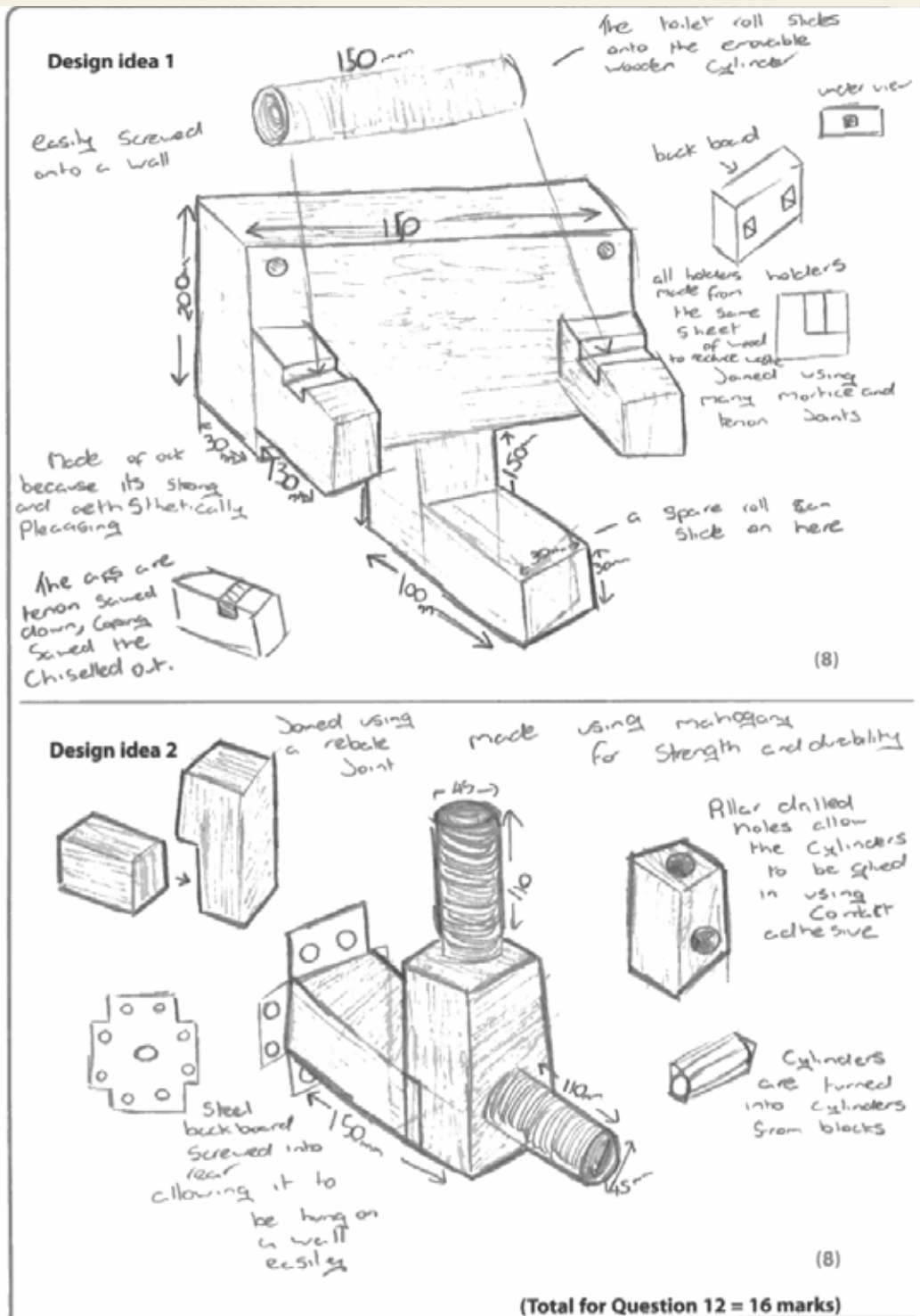
Generally candidates were able to generate and present two design ideas that showed an understanding of the specification. However marks were often lost because candidates labelled diagrams with annotation, repeated the specification point but did not explain in the note, or with sufficient clarity in the diagram, how their design actually met the point. For example '*easy to clean*' without saying what made it easy to clean.

Many candidates, perhaps the majority, produced a workable first design that met many or most of the criteria but were unable to produce a second response without repeating some of the design features of the first and this cost them marks. Although the question paper makes it clear that there must be two **different** designs, it is clear that candidates regard two different overall concepts as sufficient but repeated the same methods of achieving the details. For example many showed holes and screws to attach the holder to the wall on both designs even where the designs of the holder were otherwise radically different. Often marks were lost in the same way because candidates had specified the same material for both design proposals.

Although not impacting on the actual mark awarded, the quality of drawing varied enormously. At one level very clear with details explained carefully, contrasting with a few lines of the barest information which made it very difficult to work out the orientation of the design or any detail that evidenced the specification point. Although many candidates were systematic with their labelling, most were not and this made finding evidence more difficult. Annotation and its clarity varied and deciphering writing was the time consuming element for the examiner.

There is still evidence of a lack of specific material knowledge where candidates still refer to materials as wood, metal and plastic. Similarly with processes, candidates are able to name a range of manufacturing processes which are often not appropriate for their chosen material eg blow moulding aluminium.

Candidates selected materials that are appropriate and many designs fulfilled the specification.



ResultsPlus
Examiner Comments

This response was typical in many ways, and the overall score of 11 reflects a good score. The drawing is clear and it was easy to follow. Writing was clear and relevant to the design task. Good use was made of dimensions to help to show how things would work and fit together.

Question 13 (a)

The majority of candidates scored 1 mark. There does seem to be a general lack of understanding as to what is meant by the term property, as quite often responses, such as cheap and strong, are seen time and time again.

13 The photograph below shows a mild steel dustbin.



(a) Give **two** properties of mild steel which make it suitable for the dustbin.

(2)

- 1 Tough
- 2 Malleable



ResultsPlus
Examiner Comments

Two good correct properties have been given here by this candidate.

Question 13 (b)

Many correct responses related to the corrosive nature of steel outside and that zinc afforded some protection to this along with the fact that the zinc coating improved the aesthetic qualities of the steel.

(b) The surface of the dustbin has been plated with zinc.

Describe **two** reasons why plating with zinc is a suitable surface finish for the dustbin.

- (4)
- 1 As mild steel is a ferrous metal it rusts. By plating the dustbin with zinc it would prevent rusting ~~and also~~ but at the same time ^{the dustbin} it would maintain the properties of the mild steel.
 - 2 The zinc would give the mild steel a very shiny ^{silver} finish rather than a dull grey one. This would make it look nicer out on the streets.



ResultsPlus
Examiner Comments

This candidate has scored 3 out of the 4 marks available with some good points made and reasons developed well.

Question 13 (c) (i)

This question was done well with most candidates understanding the importance of the lid. The second mark was awarded for candidates including the benefit of having a lid. No marks were awarded for just repeating the question i.e. 'it has a lid to keep the rubbish in'.

(c) Explain how the dustbin is successful in meeting the following specification points:

(i) keeping the rubbish inside

(2)

Dustbin is hollow and therefore rubbish can fit inside it. The lid on top then stops the rubbish from being blown out everywhere.



ResultsPlus

Examiner Comments

A good answer here with an appropriate reference to a lid not allowing any rubbish being able to be blown out.

Question 13 (c) (ii)

Again this part question was done well by the majority of candidates. Most were able to relate to the fact that the handles made the bin relatively easy to lift up and move around. No marks were given to candidates who just repeated the stem in the question to say 'it has handles and so is easy to move'.

(ii) 'being easy to move.

(2)

There is handles on the side so that the bin can easily be picked up and moved around



ResultsPlus

Examiner Comments

A good response with reference to the handles and how it can be picked up and moved around.

Question 13 (d)

The term 'discuss' is not yet fully recognised by many candidates. Many responded with a list of bullet points here and given that this part question is being marked with specific reference to the Quality of Written Communication (QWC), such lists are inappropriate. Candidates should be looking to demonstrate their subject knowledge by using appropriate Design and Technology terms with precision and accuracy. In some cases, candidates did not respond to the two headings specified and as such they were not awarded any marks. The headings given must be followed.

* (d) The photographs below show two different types of dustbin.



Dustbin A – mild steel



Dustbin B (Wheelie Bin) – ABS

Evaluate dustbin A compared with dustbin B in terms of 'user requirements' and 'performance requirements' for the householder.

(6)

Dustbin A is made of mild steel so it can be bent because it is malleable. So the dustbin can easily get damaged. Whereas dustbin B is made from ABS which is a tough plastic. It will not be damaged easily as it is hard but brittle. In terms of transportation, even though Dustbin A has 2 handles and is lighter than B, dustbin B has wheels which makes it easier to transport and less energy is needed. Both bins look similar in size, so they probably can carry the same amount. However if there is a need to lift the bin high, dustbin B would be ideal since it has no handles at the bottom and will be hard to lift, whereas dustbin A has 2 simple handles on either side making it ideal for that situation. Also Dustbin A has a wider base enabling it to be more stable, dustbin B will tip over when overfilled. To conclude in terms of 'user requirements' and 'performance requirements' dustbin B is the best option as it has many benefits than dustbin A.



ResultsPlus

Examiner Comments

This response shows a very good level and understanding of key Design & Technology terms that are appropriate to the headings given in the question, namely user requirements and performance requirements.

Question 14 (a)

This was very well done but some candidates gave MDF as their answer despite what the question said.

Question 14 (b) (i)

Most candidates indicated the correct metals for the alloy although a significant number gave steel, aluminium, iron or carbon.

Question 14 (b) (ii)

Again, a poor understanding of what is meant by the term 'property' gave rise to many low scores on this part question. Too many candidates use the term 'strong' to mean much and it should be avoided in the future.

(ii) Give **one** property of brass that makes it suitable for the handle.
Justify your answer. (2)

Property
Malleable

Justification
Can ~~easy~~ easily be shaped into the required ~~the~~ handle shape



ResultsPlus Examiner Comments

A good property and linked justification is worthy of 2 marks for this candidate.



ResultsPlus Examiner Tip

Make sure you are familiar with the correct terminology for all properties in the specification.

Question 14 (c)

Generally most candidates scored 1 mark with responses related to 'easier to assemble and move'. On the whole this was disappointing as candidates needed to 'explain two reasons'.

(c) The desk is joined together with knock down fittings, enabling it to be put together in a consumer's home.

Explain **two** reasons why consumers may prefer to buy furniture that uses knock down fittings.

- (4)
1. it will be cheaper because you have to build it yourself.
 2. ~~the~~ furniture can be very big so it may not fit through doors and such so you can take it through the door in pieces and then assemble on the inside of the room.



ResultsPlus
Examiner Comments

This response was very good, scoring full marks. Two good points were made and then fully developed.

Question 14 (d)

Most candidates did not give full answers here with responses being limited to short statements or bullet point lists. Candidates do not always go on to develop their responses fully and therefore limit the marks they can achieve. In some cases candidates were confused and made reference to CAM as opposed to CAD.

(d) The computer desk was designed using computer-aided design (CAD).

Describe **two** advantages for the designer of using CAD to design the computer desk.

(4)

1 designs can be saved securley

2 designs can be edited.



ResultsPlus

Examiner Comments

This response was typical in so many cases. A good point was made but the candidate did not go on to develop the point eg 'Can be edited *which means mistakes can be easliy changed/additions made*'.

Question 14 (e)

Many responses showed that candidates could identify ways to conserve materials and many generated lists to show this. Several candidates confused the word 'conserve' with the word 'preserve'. Candidates filled much of the space but in fact there was a lot of repetition demonstrating a lack of organisation when writing. This part question also focussed on the Quality of Written Communication (QWC) and therefore a degree of planning and structure is needed with points being made and subsequently developed.

*(e) Natural wood and timber need to be conserved.

Discuss the ways in which natural wood and timber can be conserved when manufacturing products.

(6)

Natural Wood and timber can be conserved when manufacturing products by recycling. The waste materials which come off Natural Wood and Timber could be recycled and used for ~~res~~ manmade boards such as chipboard and plywood. The Natural Wood and Timber could also be used to create a veneer. Natural Wood and Timber need to be conserved as global warming is a crisis. One a tree is cut down they need to plant another. Waste wood from large products could be used to make smaller products. The manufacturer should use as little as possible so that there is a smaller amount of waste product left.



ResultsPlus

Examiner Comments

This candidate has made two good points and has gone on to develop them with an example of a piece of coherent writing, achieving 4 marks. With the addition of another point, further marks could have been achieved.

Paper Summary

There were a high number of scripts returned this year with additional sheets attached with cable clips and such like. There is sufficient space to complete all answers in the spaces provided and additional sheets should not be necessary.

If candidates use a pencil for their design work in Question 12, they should go over it in pen. A number of scripts could not be marked on screen since they were not visible.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code UG031999 June 2012

For more information on Edexcel qualifications, please visit

www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual
.....



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

