

# ResultsPlus

## Examiners' Report June 2010

### GCSE Design and Technology 5EP02

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## **Introduction**

It was encouraging to see so many centres entering candidates for the first session of the new modular GCSE examination. While most of these candidates would have been year 10 students who have previously not sat examinations within the Design & Technology suite, they performed well and their comparative lack of maturity was not a significant impediment. Candidates had clearly been prepared for the structure of this examination and responded to each question appropriately.

This is a 90 minute examination, and candidates' responses suggested that they had sufficient time to complete all sections, but not so much time that time-killing 'doodling' was apparent. Candidates generally used their time wisely, with little evidence of unnecessary 'padding' within responses or of failing to complete all sections due to a lack of time, although there is still a small proportion of candidates who leave a space where they do not know an answer rather than offering an educated guess.

Candidates should be aware that the space available for each response is the maximum that would be expected rather than a suggested length of response, and that exceeding the available space does cause difficulties within the making process.

Responses to the individual questions are given in the following pages of this document.

### **Question 11 (a) (i)**

Candidates performed particularly well in question 11(a), although using side cutters for wire stripping was a common misconception.

### **Question 11 (b) (i) (1)**

Again, candidates tended to have little trouble with question 11(b) apart from occasionally suggesting thermistors or thyristors in place of the transistor.

### **Question 11 (b) (ii)**

Candidates displayed little misunderstanding about this question, but often lost marks by only giving one part of the answer.



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Examiner Comments

Examiner tip - 'Describe' questions require more detail than 'name' questions'

### **Question 11 (c)**

This question was well answered. As expected, the most common error was having a black third band to represent '0', rather than brown to represent ONE zero.

### **Question 11 (d)**

Most candidates completed this question successfully. There was no obvious trend amongst incorrect responses, but it was encouraging to see candidates offering an educated guess rather than leaving the question blank.

### **Question 11 (e) (i)**

Students performed very well in this question. Any wrong answers were as likely to be mistakes rather than a lack of understanding.

### **Question 11 (e) (ii)**

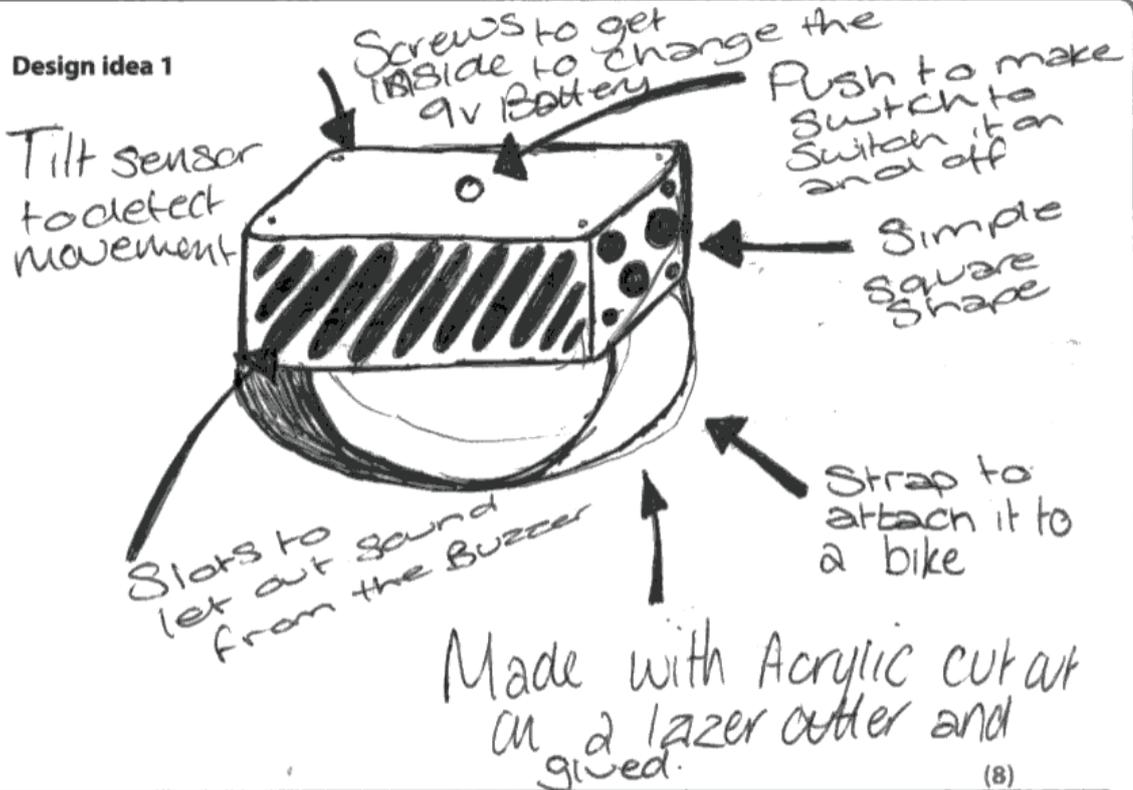
While most candidates were aware of the need to avoid touching hot tools or materials, goggles and aprons are generic safety precautions which do not specifically relate to this process, and so realised no marks.

### **Question 12**

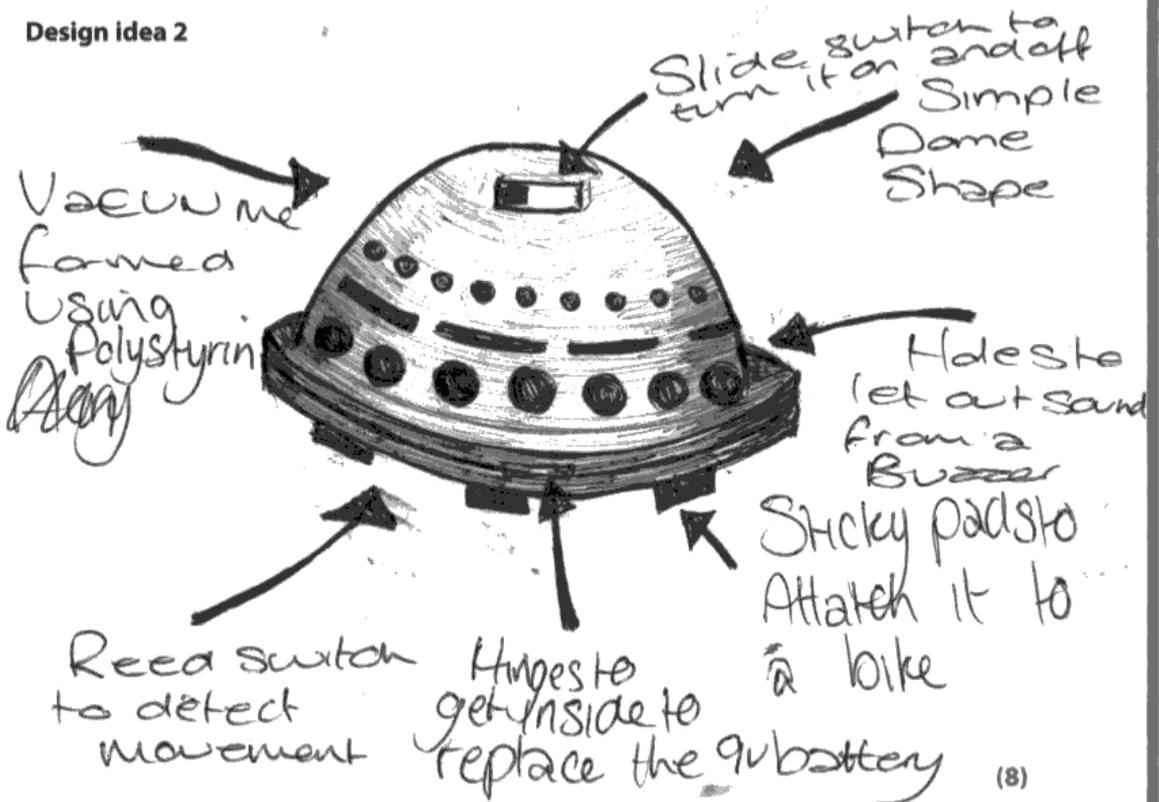
Candidates were familiar with the structure of the design question from the previous specification and were often able to realise high marks. The first response was always the stronger, and in the second response there was often insufficient information to indicate how the battery was accessed, how the reed switch detected motion, and candidates lost marks where they had already suggested a buzzer in their first design.

Candidates are familiar with the structure of these design questions from the previous specification and tend to realize high marks. This is a strong response, although in the second response there is insufficient information to indicate how the battery is accessed, how the reed switch detects motion, and the candidate loses a third mark as they have already suggested a buzzer in their first

Design idea 1



Design idea 2



(Total for Question 12 = 16 marks)

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## Examiner Comments

This is one of the stronger responses seen. For idea 1, the candidate has referred to;

- 1) The simple square shape,
- 2) The fixing strap,
- 3) A push-to-make switch,
- 4) The 9v battery,
- 5) A screw-on lid retaining the battery,
- 6) A tilt-sensor,
- 7) A buzzer, and
- 8) Acrylic.

By stating all of the above features, this response must be awarded full marks. While the drawing is attractive, in this case it is the annotation that achieves the marks. While the second diagram is fascinating, the candidate fails to specify how the reed switch detects motion, and uses a 9V battery and a buzzer for a second time, so only achieves five marks rather than the full eight.

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## Examiner Tip

Make sure your drawing or annotation addresses every specification point and use clearly different solutions for Design Idea 2.

### **Question 13 (a) (i)**

The most popular responses referred to the LCD display being large and clear. A few candidates suggested that different colours are available with LCD displays.

### **Question 13 (a) (ii)**

Candidates referred to the socket, but some failed to achieve the second mark by failing to suggest that the protruding socket could be located by touch or was a standard size.

### **Question 13 (b)**

Candidates clearly understand injection moulding and its benefits, but they must be aware that the word 'strong' is technically vague, and properties such as 'tough' or 'rigid' are required to achieve these marks. The reasons given were usually appropriate so many candidates achieved the 'Reason' mark but not the 'Property' mark.

### **Question 13 (c)**

'Built-in obsolescence' is in the specification for this paper, so it was disappointing that so many candidates failed to achieve these marks, and even left this section blank. An educated guess may get a mark, but a blank space never will.

### **Question 13 (d)**

This question was intended to give higher ability candidates the opportunity to apply their knowledge and understanding appropriately. Lengthier responses tended to achieve higher marks, but re-wording the question and summarising responses add no supplementary information and achieve no additional marks.

This question was intended to give higher ability candidates the opportunity to apply their knowledge appropriately. Lengthier responses tended to achieve higher marks, but re-wording the question and summarising their responses supply no additional information and so achieve no additional marks.

Evaluate injection moulding compared with vacuum forming as a suitable process for producing the case of the MP3 player.

(6)

Injection moulding is far more suitable as the MP3 player will need holes in for the LCD display, headphone socket and controls. This would not be possible with vacuum forming. Also MP3 players would be mass produced and the casing would need to be made as quick as possible, injection moulding is far more quicker than vacuum forming. Injection moulding is also very precise and almost exactly the same casing made everywhere with very little waste. It would also cut the costs of labourers working a vacuum former than on an injection moulding machine is quite independent.

(Total for Question 13 = 16 marks)



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Examiner Comments

This candidate achieved five marks as follows;

- 1) Holes are required in the moulding,
- 2) Injection moulding is a quicker process-
- 3) whereas vacuum forming is slower,
- 4) Injection moulding is extremely accurate,
- 5) Injection moulding creates little waste.

To achieve top marks, candidates should compare the suitability of the two processes on three distinct criteria.



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Examiner Tip

Think of three relevant criteria, and compare the two processes according to those criteria. Don't waffle or repeat yourself.

### **Question 14 (a) (i)**

This question is of increased challenge and few candidates could identify that VR1 would alter the sensitivity/switching temperature of the circuit.

### **Question 14 (a) (ii)**

Candidates usually knew that the resistor was a protective component, but sometimes failed to understand that it protects the transistor rather than the LED.

### **Question 14 (a) (iii)**

Candidates who are familiar with this type of numerical question clearly had little trouble in answering, although many candidates confused ohms and kilohms.

### **Question 14 (a) (iv)**

Candidates found this one of the hardest questions on the paper, with few discussing reference voltage or comparing voltages, and many blank responses resulted. It is fortunate that this question was only worth two marks!

### **Question 14 (b)**

Most candidates could describe the benefits of prototyping boards and some could describe benefits of stripboard, but few suggested appropriate benefits of PCBs.

The accompanying response is unusual as the candidate achieves no marks for b(i) as there is too little detail, but full marks for b(ii) and b(iii).

### **Question 14 (c)**

Most candidates scored well in this question, giving a wide range of appropriate responses. Some candidates went off-topic by discussing subjects such as wind turbines, or the cost of routing power cables back to large centres of population.

Candidates should not summarise their responses, a practice which offers no new information but consumes valuable time. This response achieves five of the available six marks by offering five different valid points and little irrelevant material.

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Candidates should not summarise their responses. This offers no new information, but consumes valuable time. This response achieves five of the available six marks by offering five different valid points and little irrelevant material.

\*(c) There is a need to use renewable sources of energy.

Discuss the advantages and disadvantages of using solar energy in remote locations.

(6)

Solar energy is good in remote areas as there is no need for long distance connections to the national grid. Solar panels use energy which is free so no added costs. The energy from the sun is renewable and does not affect global warming or pollute the earth. ~~minimise waste~~ Disadvantages are that solar energy can be very unreliable. With a lack of sun the energy will reduce. So when the sun isn't out less energy will be made. It is expensive to install. Some say it can look ugly and ~~less attractive~~ make properties less attractive.



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Examiner Comments

The candidate has given several points in short snappy sentences, using clear grammar and good spelling.



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Examiner Tip

Give six clear relevant points in short but clear sentences. Make sure you include both advantages and disadvantages.

Overall candidates responded well to this paper, although in future years centres may wish to 'coach' candidates to respond to all specification points given in question 12.

## Grade Boundaries

Grade	Max. Mark	A*	A	B	C	D	E	F	G	U
Raw mark boundary		59	51	43	36	32	28	24	20	0
Uniform mark scale boundary	80	72	64	56	48	40	32	24	16	0



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