

Moderators' Report/  
Principal Moderator Feedback

Summer 2012

GCSE Design & Technology  
Electronic Products (5EP01)

Paper 01 Creative Design and  
Make Activities

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## Introduction

Many positive comments were sent to centres' thanking them for the care and attention taken with this year's submission. In nearly every case candidates' folders were well organised and collated. Candidates are advised however to have their centre and candidate number clearly shown on numbered pages.

CMRBs were generally well completed with the 'Assessor witness statement' being completed very well. Teachers should ensure that page numbers are given to indicate where the evidence can be found for each section. Comments may be given to help support the mark awarded but repeating the descriptors for each mark or set of marks is not required. The front page should be completed to show whether the candidate has produced combined or separate design and make activities.

In all instances photographs should be shown in the CMRB for both sides of the PCB and of the finished product. Candidates are advised to produce a photo-diary in their folders that highlights the range of skills and processes used during the manufacture of their product.

More centres took the separate option this year with candidates making a fresh start to the make activity. In such cases teachers should ensure that a 'Specification' is supplied which candidates can refer to when testing and evaluating. Whichever option is taken it is imperative that candidates generate and develop their own ideas during the *Creative Design* section. Our subject is special as we ask candidates to apply knowledge to design situations and there is a wide range of input, process and output devices for them to select from in order to generate ideas.

Details for each stage are given below. Candidates would benefit by understanding how each stage feeds into the next and not treating them as separate entities.

## **Design Activity**

### **Analysing the brief**

This was completed in a variety of formats but few candidates gained full marks as the analysis points could have applied to virtually any electronic product. In this section candidates should be asking questions about their brief in order to identify research and design areas. Many points will be general (e.g. what type of battery would be best? How will I access the battery? How will the circuit fasten in the case?) In order to gain top marks candidates must ask questions that are pertinent to their brief. For example a candidate producing a metronome would ask 'what is the range of beats required per minute'.

### **Research**

The key to good marks in this section is to ensure that the research is selective and focuses on the design needs identified in the analysis. Many candidates produced too much work that was of a generic nature and not focused on their design needs. Questionnaires tended to be weak and did little to help candidates in the design section. It should be noted that this section together with Specification, Review and Evaluation should consider issues of sustainability. Please see Topic 6.1 of the subject specification for further details.

### **Specification**

An improvement was seen in the quality of work in this section with more points being realistic and technical. However marking was often generous as many points were not justified and measurable. For example a candidate designing a shed alarm may state that 'It must have a loud buzzer'. This is a realistic and technical point but it is not justified or measurable. Stating that the shed is at the bottom of the garden and the owners are in the house and that it needs to be heard from 20 metres away not only gives access to the top marks but also gives the candidate something to realistically test in the evaluation section.

### **Initial ideas**

A very wide range of work was seen with able candidates demonstrating a very good understanding of Unit 2. The casing element was generally completed well but this accounts for about one-third of the marks only. Marking was generous however in many instances with centres not always seeming to understand the electronic requirements of this section. We do not expect candidates to invent circuits but we are looking for them to apply knowledge learned during their study of Unit 2. Keeping with the shed alarm project, candidates could select from sensing, latching, logic and timing circuits with appropriate inputs and outputs. All should be encouraged to annotate their designs to demonstrate their understanding and higher ability candidates may combine processes. Candidates can gain full marks by using only those components stated in Unit 2. There are so

many possible outcomes that the ideas of each candidate should be different even if their brief is the same.

### **Review**

Although most candidates reviewed their ideas against specification points there was a lack of user group feedback. Issues of sustainability were only considered by the minority.

### **Communication**

Centre marks were generally accurate and on occasions a little harsh as a wide range of techniques were used with precision and accuracy.

### **Development**

Again in this section candidates should produce unique work. They should begin by developing to their final circuit. More able candidates should justify component values and includes calculations if applicable. Some good 2D and 3D modelling was seen but when developing the PCB layout many used the auto route layout without any further development. Refining this in order to reduce wire links and overall size should be encouraged for those expecting high marks.

### **Final Design**

Candidates should be encouraged to produce this as a separate section although credit was given where evidence could be found during development. Technical details should be given for all the components, materials and processes to be used during the manufacture of the PCB, casing and assembly.

## **Make Activity**

### **Production Plan**

A marked improvement was seen in the quality of work in this section with the majority of candidates producing plans that considered all stages of manufacture for the casing, circuit and assembly. In order to gain top box marks however candidates should consider specific forms of quality control. This should progress beyond a simple question to an actual statement of how the test will be conducted. For example after the circuit has been etched a statement such as 'use a multimeter to test tracks for continuity' rather than 'has it etch OK?'

## **Quality of manufacture**

A wide range of work was seen that in the main was accurately assessed. By the nature of our project work candidates will use a wide range of skills and processes. The key elements in this section are;

- i) The range of skills and processes used.
- ii) The level of precision and accuracy.
- iii) The level of independence.
- iv) The level of challenge.

As stated earlier the 'Assessor witness statement' was generally completed well and this helped moderators greatly. Where marking was generous it was usually due to the fact that the task did not present the level of challenge required for high marks. As a general rule the use of one process device such as a transistor or thyristor cannot score in the top box as it does not offer the level of challenge. 555 timers and Op Amps offer slightly more challenge and logic gates more still but it is only when process devices are combined that the challenge is suitable for high marks. Clearly PIC's used with a single input and output would not offer the same level of challenge as multiple inputs and/or outputs.

## **Quality of outcome**

This section was generally well assessed by centres and those who produced good quality photographic evidence helped both their candidates and the moderators. Quality is the key word in this section. Candidates should be encouraged to use LED mounts, insulate bare wires, mount their circuit and battery within the casing, feed long wires through stress relief holes and twist loose wires or use ribbon cable.

## **Health and safety**

Teachers award marks in this section based on their observations of students during the make activity and no formal evidence is required. It was good to see that in most cases photographs of students manufacturing showed them taking precautions to work safely.

## **Testing and evaluating**

Overall better work was seen in this section with many more candidates showing evidence of having worked to a time plan in order to do this section justice. Most were able to make some comments that related to specification points but at the lower end they tended to be subjective. Most candidates would benefit by being directed to the testing part of this section. A few relevant tests using a member from their user group would allow access to higher marks. Please note that QWC is assessed in this section only and marks cannot be awarded if no work is submitted in this section.

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