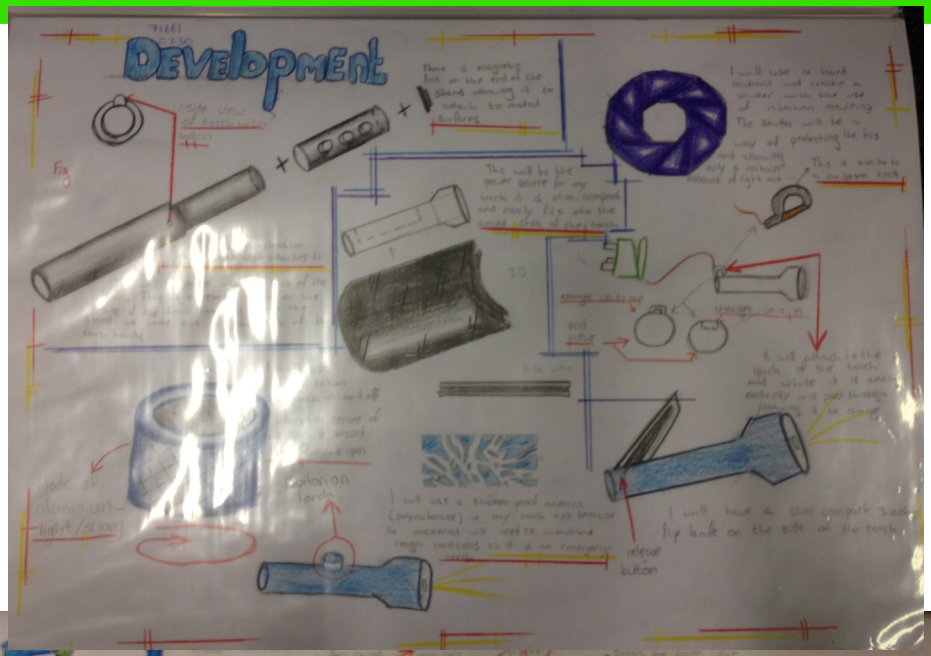
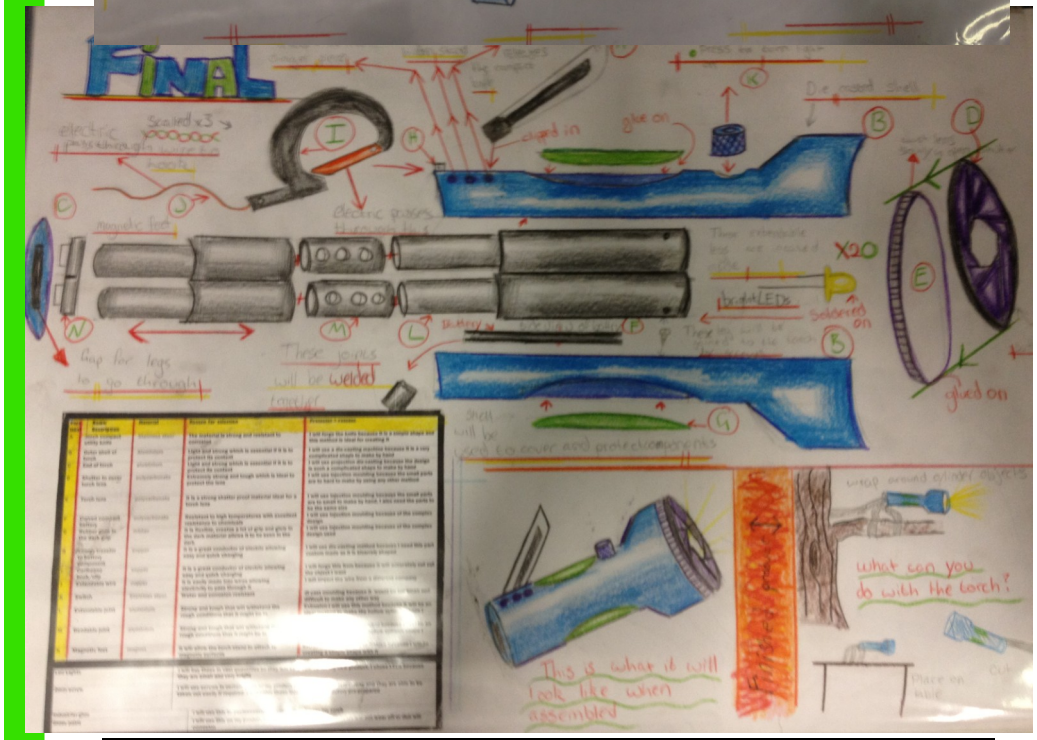




Notes: -

Name:_____

Candidate No. _____

Rewarding Learning

technology and design

CCEA GCE Specification in Technology and Design: GCSE Coursework Student Guide

Unit 4—Controlled Assessment Task

Unit 4: Design Assignment

This unit is **compulsory** for all students. Students have **13 hours** to complete the design assignment. It carries a weighting of **20%**. The assignment enables students to demonstrate their capability to design a product under controlled conditions.

We issue **up to three** comparable tasks each year in September of the first year of study.

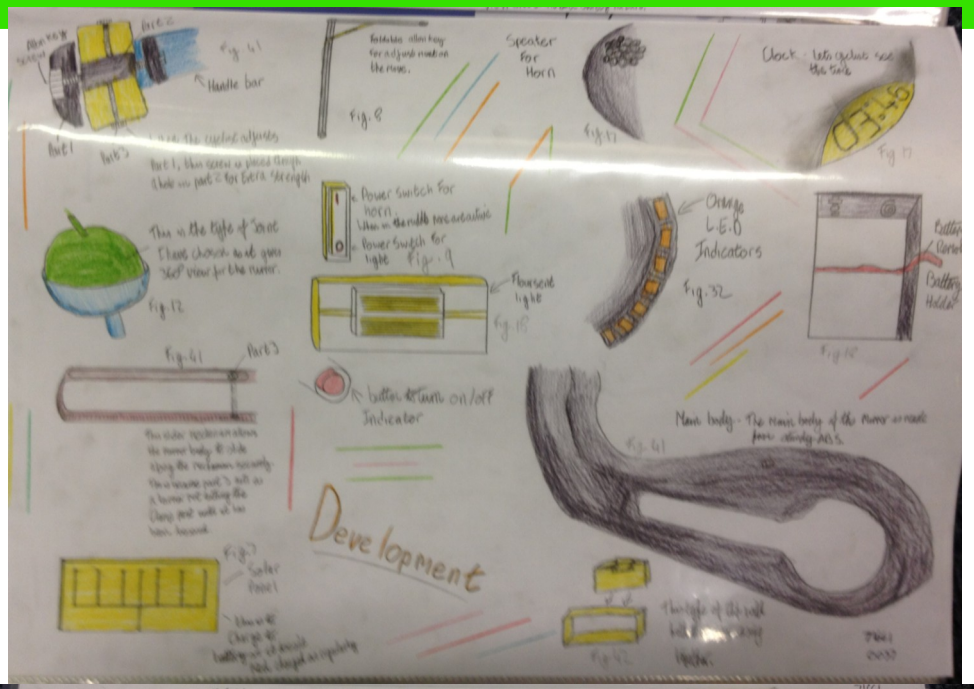
Centres select the task that is best suited to their needs. Students have a total of **8 hours** to complete their preparation and research, which they complete under limited supervision. They then have a further **5 hours** to produce their assessed work, which they must complete under informal supervision.

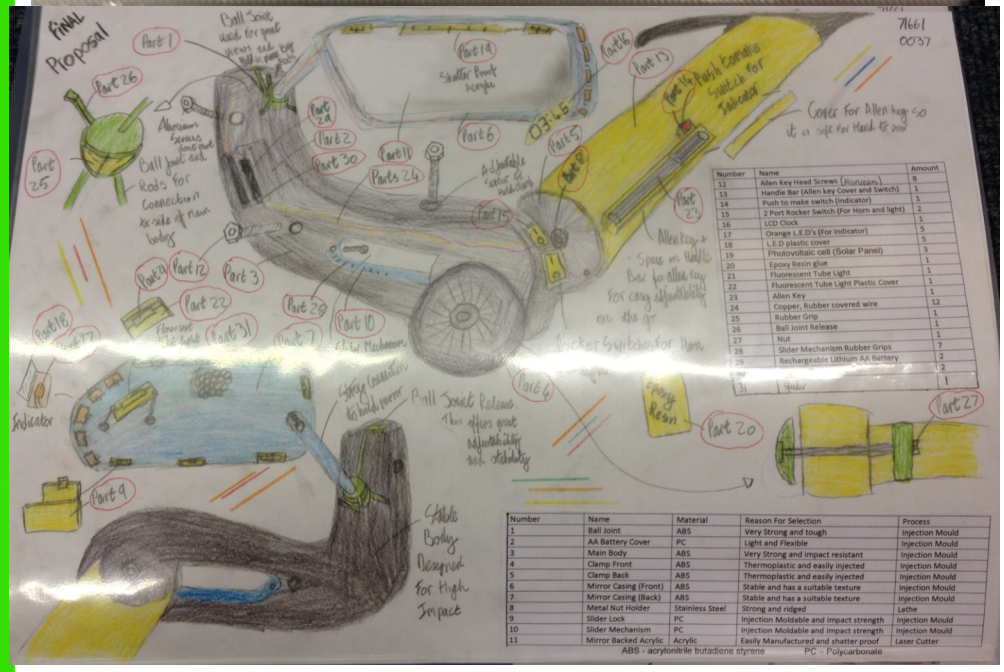
Students' preparation work is likely to include research on existing pro ucts, materials,
components and processes. They use their research and preparation to help them produce a final outcome for assessment. We recommend that the research materials students use to help produce a final outcome be limited to a maximum of **three A4 pages** (with information on only one side of each sheet).

Students then complete the design aspect of the task under informal supervision within the classroom. They may use a maximum of **four A3** design sheets. Centres must submit students' research and reference materials along with their design
sheets.

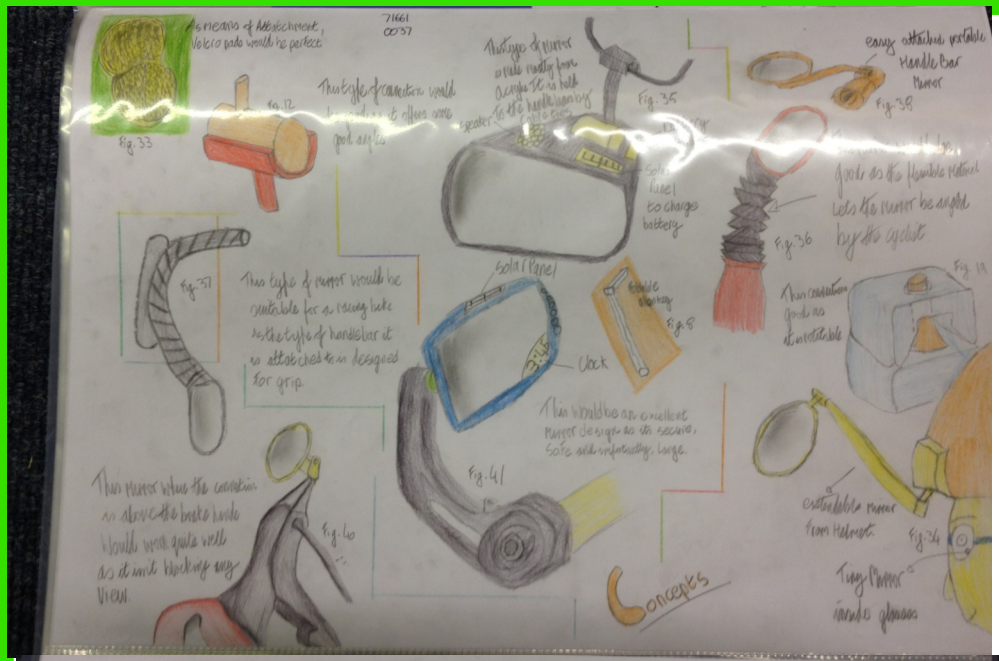
	Examination lasts **1 hour**		
Unit 4: Design Assignment	**Controlled assessment 1** We set the design assignment. Teachers mark the assignment and we moderate it.	20%	Every Summer (beginning in 2010)
Unit 5:	**Controlled assessment 2**	40%	Summer

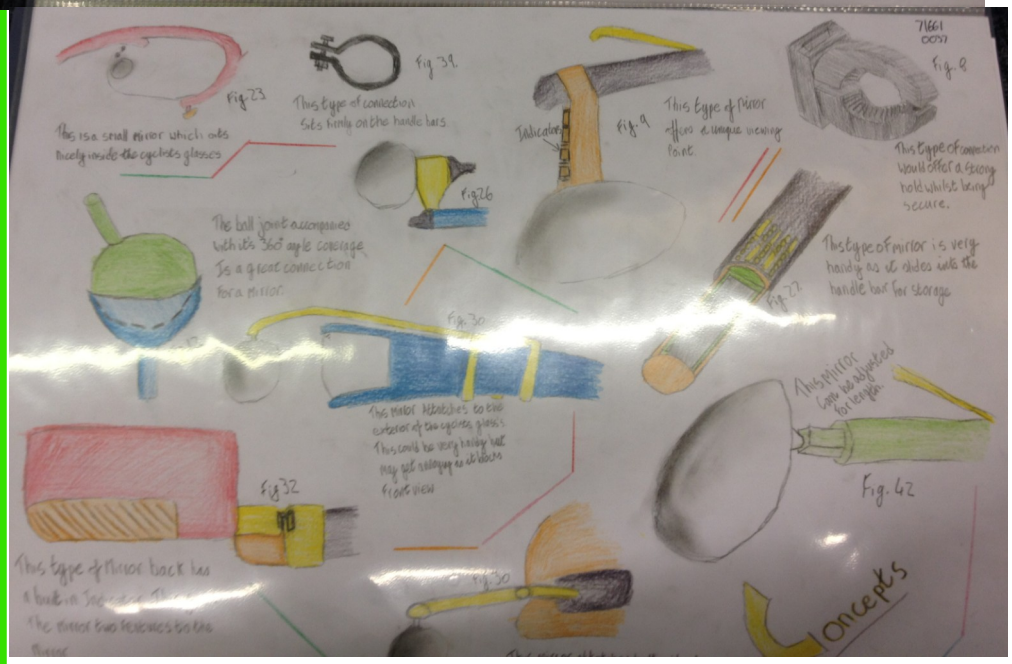
Notes:_____





Notes: -





Notes: -

Submission Date _____

Research Materials

3 Pages A4

*Articulate their **understanding** of the **problem statement**;*

*Collate relevant research materials **appropriate to the problem** and show evidence of a **technology enriched vocabulary**;*

***Reference** their research materials;*

*Demonstrate their ability to **analyse** these materials and show **understanding** for high marks.*

- Does the product trigger and idea
- The style of the product—shape, colour, form, texture and compactness, Aesthetics and Ergonomics
- The desirability factor. Why does it appeal
- Function—ease of use
- The assembly details i.e. How the parts fit together?
- Ease of manufacturing?
- The materials used and reasons for their selection
- Safety features when in use


GCSE Technology and Design Unit 4 Research
Safe Cycling

In recent years cycling has become more popular with almost half a million journeys made in London everyday which is why Safe Cycling has become a big issue. In order to reduce annual death tolls and injury rates on roads I am going to carry out research and design on the use of "bicycle mirrors".

Figure 1

I liked the ease of attachment of this product and I especially I think the product looks aesthetically pleasing. It is very functional because it is large enough to give the user a good rear view of traffic. This product is made from chrome plated steel and plastic and this product would also be very steady but would have limited movement. I might try to include the aesthetics of this product and the means of attachment.

This product is good because it would be easily attached to any handlebar but it is not very aesthetically pleasing as it is very dull. Also it is not very big making it less useful and less safe than figure 1. This product would be stable enough to stay attached to the handlebars but cannot move limiting rear view. This product would be manufactured easily and cost effectively. I might incorporate the attachment to the handlebar method of this product. Figure 2 is made of PVC.

Figure 2

Figure 3

The main reason that this product is good is because it has a flexible arm this would make the product more functional than Figure 2. It looks to have a good attachment and would be easy to use. The product is also aesthetically pleasing but would be a lot harder to manufacture than Figure 2. I might try to incorporate the flexible arm of this product.

This product would not be as flexible as Figure 3 but it would have enough movement to allow the cyclist to see the surroundings behind them. The main reason that I like this product is that it is not very aesthetically pleasing. I might try to include the attachment method of this mirror as it would be very strong. This product would be made out of ABS using split injection moulding.

Figure 4

The best thing about this product is the attachment method, it is a nylon cable tie which uses a locking mechanism. It would function properly as it has a good shape and sized mirror.


Figure 10

This product is made from PVC which is very strong. This product is slightly harder to attach than figure 15 as you need an Allen Key to tighten it. This product would be the most secure and stable of the 3 connectors.

Figure 11

This connector is very easy to attach as the handlebar goes through the loop then the nut is tightened securely. This connector is made from stainless steel so would not rust.

This product makes cycling in the dark safer as it has a light on it. This product would be harder to manufacture and assemble because the light needs a power supply. The product is also aesthetically pleasing as it has a light on it and it is a nice shape. I will try to incorporate the light on this product in my design as it makes cyclists more visible in the dark. This product is made by split injection moulding with ABS.

Figure 12

This connector is a nylon cable tie. It would hold the mirror on securely but it would not be as stable as figure 10.

Figure 15

Figure 13

This product is very futuristic and innovative as it has a mirror build into it which makes it very functional. This product is very easy to use as you don't have to attach the mirror it is built in. This product has a good aesthetic appeal however it would be hard and costly to manufacture. I may try to incorporate this product into my design.

Figure 14

I like this product because it is easily attached to any handlebar using the Velcro strap, it is also a good size to ensure a good enough view of the rear traffic is visible. It also has a movable arm which allows the mirror to be moved to a custom position making it very functional. This product would also be easier to manufacture than figure 13. I may try to incorporate the Velcro strap in my designs.

Figure 16

Submission Date _____

Page 1-3

- Research each area of the design to include areas on previous page
- Also include analysis of the designs
- Methods of adjustability (At least 3)
- Methods of attachment (At least 3)
- Use of possible smart materials
- Methods of assembly
- Examples of how the product works

Figure 5

Figure 5 is Bar End Fitting which is easily **attachable** quickly and easily onto most handlebars. It has an oval convex mirror which increases viewing area and is fully adjustable for a custom view making it very **functional** and increases bicycle **safety**. The product is vibration resistant for durable life and off-road use. The product is **aesthetically** pleasing however it could be improved with a bit more colour like Figure 1. Figure 5 is made using split injection moulding.

This product **attaches** to most helmets through one of the air flow holes. This product is not very **aesthetically** pleasing although it would **function** quite well as would move round as the cyclist moves their head. This product would also be quite easy to **manufacture** and would be cheap to **assemble**. This product would be **easy to use** as it can easily be attached to most helmets. This product is very **compact** making it lightweight although the mirror is quite small so it could be improved. It is made by injection moulding.

Figure 6

Figure 7

Figure 7 also **attaches** through one of the airflow holes in the helmet which makes it **easy to use**. This product is not the best looking bicycle mirror but may be appealing to younger children. This product is very **functional** and **compact** as it has a moveable arm and has a small mirror. I think I will use this product for inspiration in my designs.

Product 8 also attaches to the helmet , but uses a sticky pad making it east to **attach** however once you attach it, it will not come off until you pull it off yourself. This product is also **aesthetically** pleasing as it looks quite sleek with a moveable arm. The mirror on this product is very small but would still **function** well as it moves round as the cyclist moves their head. This product would be hard to **manufacture** but the product itself is very good. I might include aspects of this product in my design. This product is made of ABS.

Figure 8

Figure 9

Mirror 9 is very alike to a car mirror (**aesthetically** pleasing) as it is aerodynamic and is a similar shape. This product would **function** very well as it has a bendable arm which allows you to customise your view. This product would definitely increase safety due to its size which is why I am going to try and incorporate it in my designs.

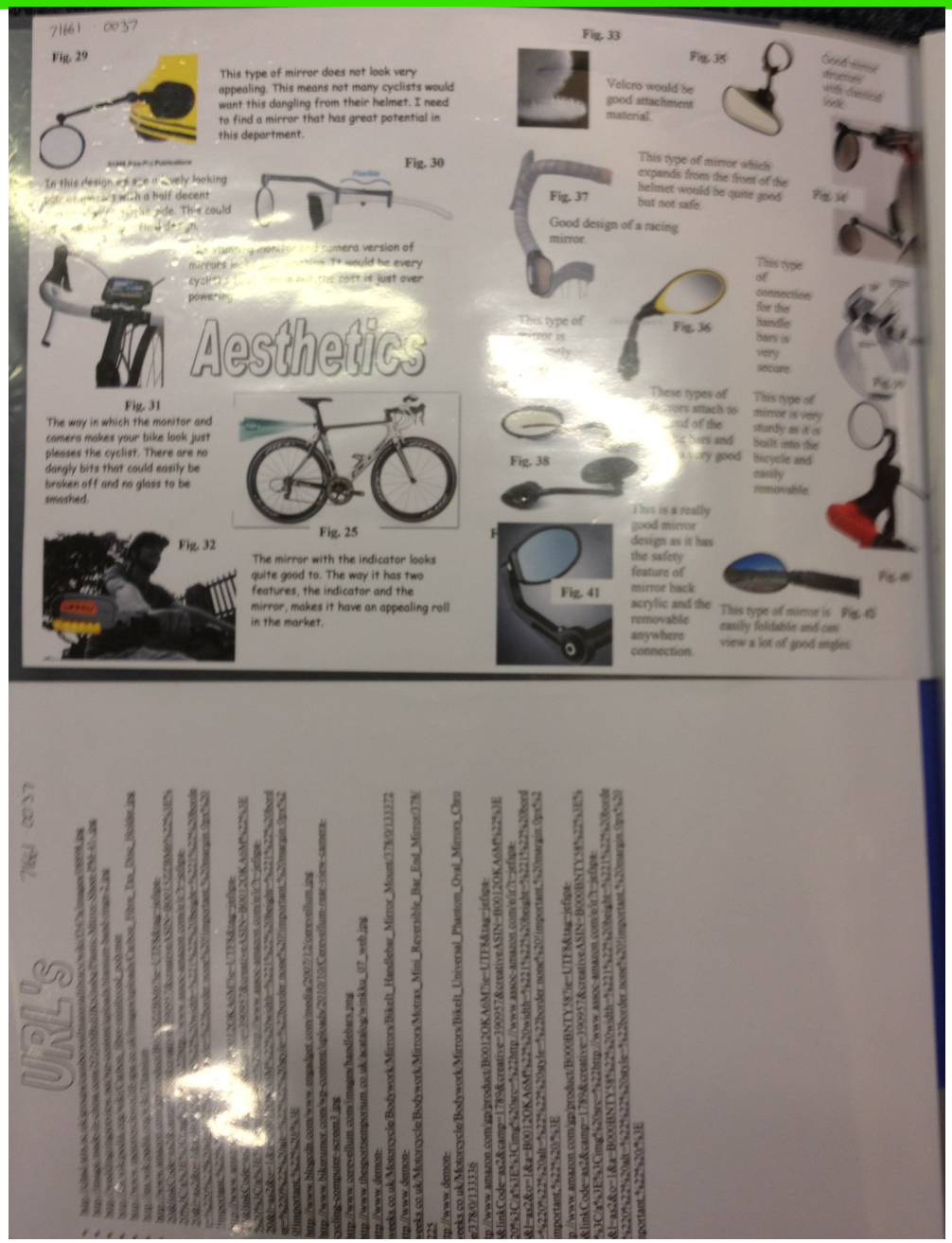
Notes:_____

_____

_____

_____

_____



Notes: -

_____

_____

_____

_____

What make a good piece of work?

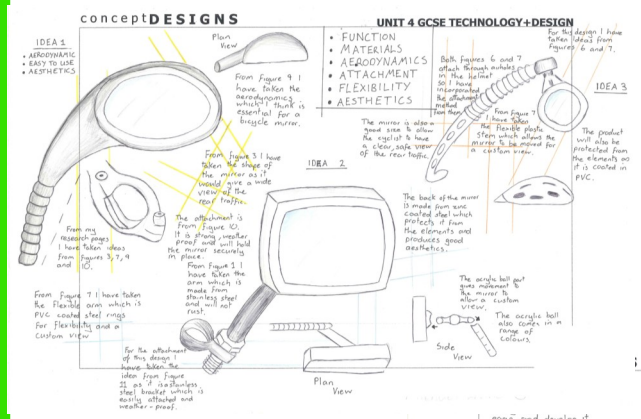
- Pupils must come to class having prepared exactly what is going to go on to each A3 page.
- Research pages and information are full with very little of no free space
- That items shown in the research section are relevant, well annotated and their possible use in your design explained.
- Concepts must not be direct copies from the research section
- Concepts are well referenced to the research section and well annotated
- Designs are detailed, well drawn and shaded using a range of drawing techniques
- All available space on the pages has been used.

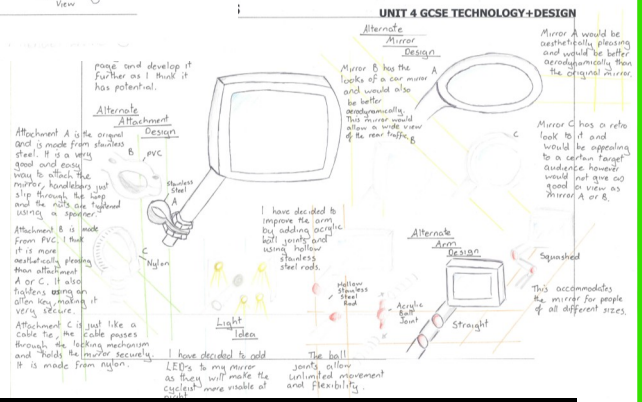
Submission Date _____

A3 Page 1/2 —Concepts

Pupils must create a range of possible concept drawings (at least 3 for each section)

- Show a range of designs of how the solution could look
- Show a range of solutions for how the design could be adjustable
- Show a range of ways in which the design could be attached
- Show a range of ways in which the product could function
- Designs should clearly be progressions from the research materials
- Every design must be annotated to explain the thinking processes
- Every design must be referenced to the research materials but must be different from the researched ideas.
- Clear reasons for the selection of concepts to take forward to the development section



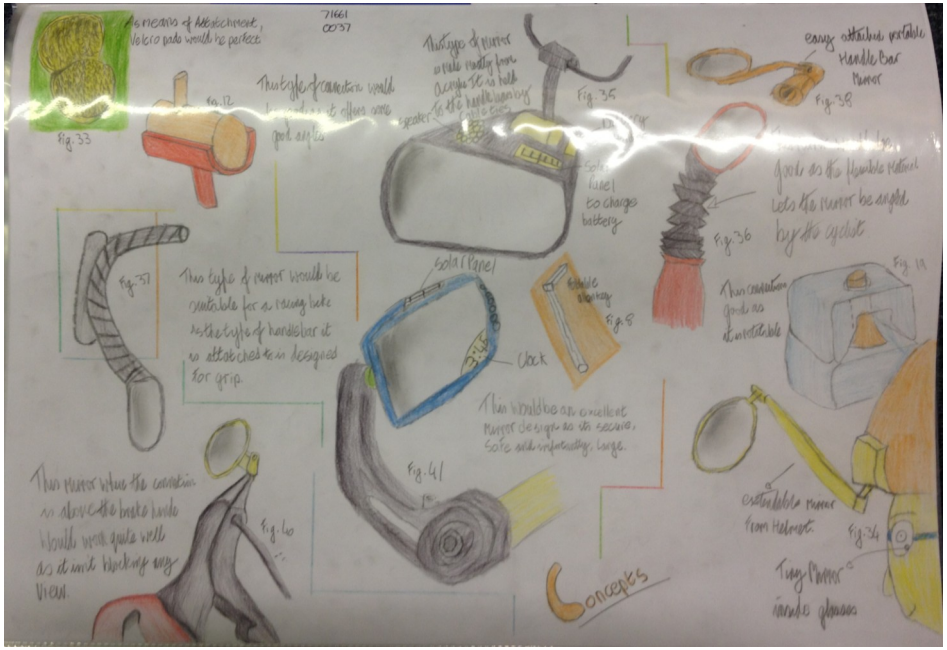


Notes: _____

Submission Date _____

A3 Page 3—Development

- Clear evidence that the solutions have been selected from the concepts section
- Choose 1 design, 1 method of adjustability, 1 method of attachment, 1 method of function etc for this page.
- Show in detail exactly how each component of the design will look using 2D, 3D elevations, section views, perspective drawings, zooms of elements of parts
- Show assembly detail about how parts will be attached together
- Show material information about the materials used and the reasons for their use
- High quality and detailed drawings are required.
- Good use of referencing



Notes:_____

_____

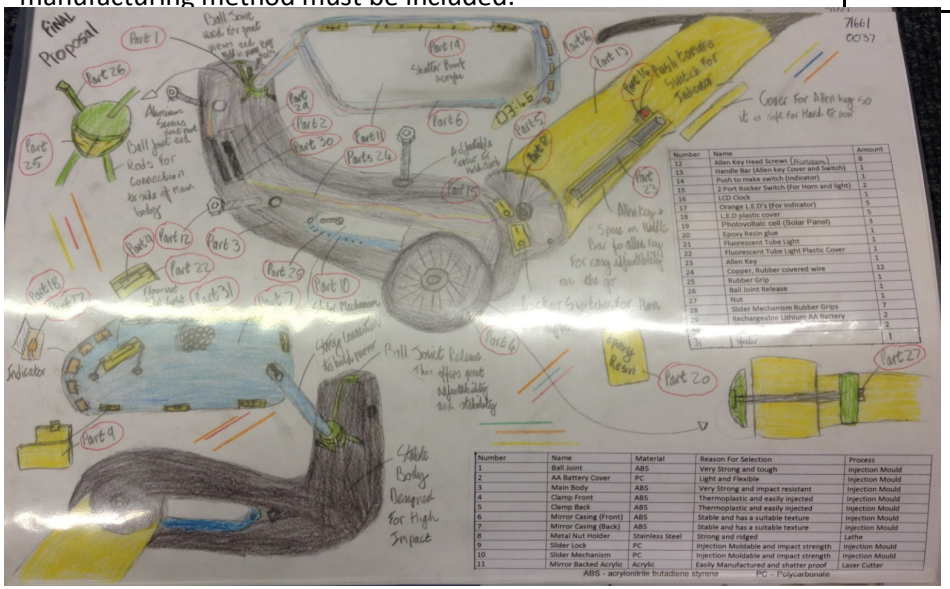
_____

_____

_____

A3 Page 4—Development and Representation of final design

- Large detailed final 3D drawing of the final design
- This Can be an exploded drawing
- The design must show all parts of the design with all components labelled
- Can show zooms, section views and assembly information
- Must include table with all components named and labelled
- For each part, the material, reason for selection of material and the manufacturing method must be included.



Number	Name	Material	Reason For Selection	Process
1	Ball Joint	ABS	Very Strong and tough	Injection Mould
2	AA Battery Cover	PC	Light and Flexible	Injection Mould
3	Main Body	ABS	Very Strong and impact resistant	Injection Mould
4	Clamp Front	ABS	Thermoplastic and easily injected	Injection Mould
5	Clamp Back	ABS	Thermoplastic and easily injected	Injection Mould
6	Mirror Casing (Front)	ABS	Stable and has a suitable texture	Injection Mould
7	Mirror Casing (Back)	ABS	Stable and has a suitable texture	Injection Mould
8	Metal Nut Holder	Stainless Steel	Strong and ridged	Lathe
9	Slider Lock	PC	Injection Moldable and impact strength	Injection Mould
10	Slider Mechanism	PC	Injection Moldable and impact strength	Injection Mould
11	Mirror Backed Acrylic	Acrylic	Easily Manufactured and shatter proof	Laser Cutter

ABS - acrylonitrile butadiene styrene PC – Polycarbonate

Notes: -

_____

_____

_____

_____