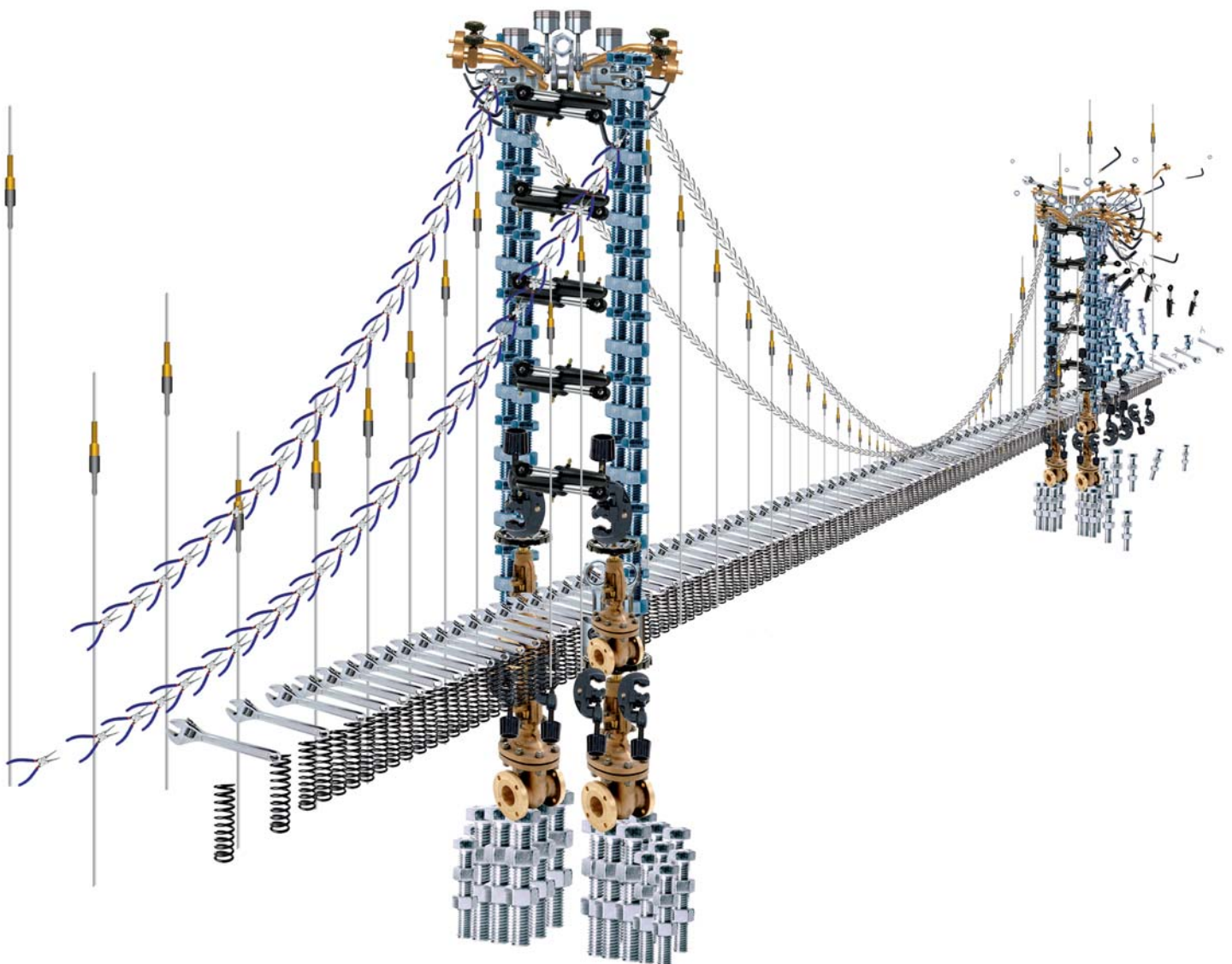


SAMPLE INTERNALLY ASSESSED UNIT

UNIT 2 - ENGINEERING DESIGN





**Diploma – Principal Learning
Engineering**

**Level 2 / Unit 2
Engineering design (ENG2U2)**

Sample Internally Assessed Unit

CANDIDATE'S WORK

Level 2 Unit 2: Engineering Design

Task 1

Analysis of the Design Brief

Constraints

The size of the phone should be suitable for 13-18 year olds.
It should be suitable for manufacture in quantities of 2,000 per day.

Needs

The phone should be in an unusual shape, based on either television, films or sport.
The phone should be attractive to 13-18 year olds.
The design should include any of the features of similar phones that would make it too attractive to the users.

(continued on the next page)

Research Plan

This is a list of the questions that need to be answered so that I can design the phone and where I will find the answers:

Question:	How I will find the answer:
What shape should the phone be to be attractive to 13-18 year olds?	I will do a survey of the people in my class
What should the phone look like to be attractive to 13-18 year olds?	I will do a survey of the people in my class
How much should the phone cost?	I will do a survey of the cost of phones in the shops
What power source will be used for the phone?	I will carry out a product analysis looking at existing phones
How do I make sure that the phone is safe?	I will carry out a product analysis looking at existing phones
What size should the phone be?	I will carry out a product analysis looking at existing phones and look in an ergonomics manual
What size should the buttons be?	I will look in an ergonomics manual
What size should the screen be?	I will carry out a product analysis looking at existing phones
What features should the phone include?	I will carry out a product analysis looking at existing phones and I will do a survey of the people in my class
What materials will be used to make the phone?	I will carry out a product analysis looking at existing phones and do some materials research
Will the materials that the phone is made from be recycled?	I will carry out a product analysis looking at existing phones and do some materials research
What processes will be used to make the phone?	I will carry out a product analysis looking at existing phones and do some process research
Will any maintenance be needed?	I will carry out a product analysis looking at existing phones

(continued on the next page)

Specification

After carrying out research I made the following list of needs:

No.	Need:	Type of need	Reason for Need	How I found this out:
1	The product should be a mobile phone.	Constraint	It said so in the brief	It said so in the brief
2	The phone shape should be based on a sports theme	Need	It said so in the brief and this was the choice that people in my class like	I did a survey in my class
3	The length of the phone should be between 150 and 170 mm	Constraint	So that they are a suitable size to reach between the ear and mouth of an 18 year olds and that the circuit fits inside	I looked at ear to mouth sizes 18 year olds in an ergonomics manual
4	The width of the phone should be between 55 and 65 mm	Constraint	So that they are a suitable size to be held by 13-18 year olds and so that the battery and the circuit fits	I looked at the grip sizes for 13-18 year olds in an ergonomics manual and used the sizes for 15 year olds as these were in the middle
5	The buttons should be 8 x12 mm	Constraint	So that they are a suitable size for an 18 year olds finger and the 18 year old wont press two buttons at once by accident	I looked at finger sizes for 13-18 year olds in an ergonomics manual and used the sizes for 18 year olds as these were the largest
6	The size of the screen should be between 35 and 45 mm by 55 and 65 mm	Constraint	This is the size that other phones use so the screen sizes will be available	I did a product analysis of other phones
7	The phone should cost less than £80	Want	So that the phone is competitive against other phones	I asked about phone prices in two shops.
8	All the wires must be enclosed inside the phone	Want	So that the user is safe from electricity and the phone is not damaged by rain	I did a product analysis and took apart two other phones
9	The phone should include a camera	Want	To be attractive to people aged 13-18	I did a product analysis of existing phones and did a survey in my class and asked people what features they liked
10	The phone should be able to	Want	To be attractive to people aged 13-	I did a product analysis of existing phones

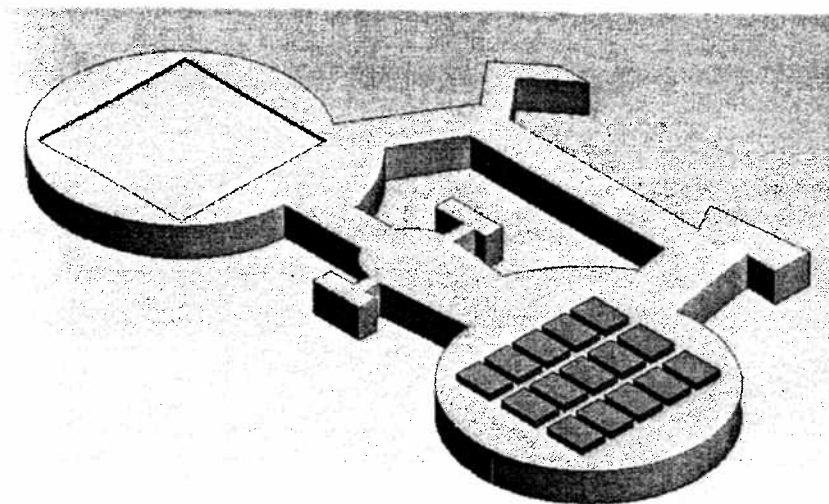
	play MP3s		18	and did a survey in my class and asked people what features they liked
11	The buttons should be protected so that you don't dial numbers when it is in your pocket	Want	So that people don't ring numbers by accident	I did a product analysis of existing phones and did a survey in my class and asked people what features they liked
12	The case should be made from a recyclable plastic that can be injection moulded	Want	So that it is more environmentally friendly and you can make 2,000/day	I did a product analysis of existing phones and saw a video of how they were made
13	The circuit should be made by using a pick and place machine.	Want	So that you can make 2,000/day	I did a product analysis of existing phones and saw a video of how they were made
14	The phone should be able to open so that you can take out the SIM card and battery	Want	So that you change the battery and SIM card	I did a product analysis of existing phones

Level 2 Unit 2: Engineering Design

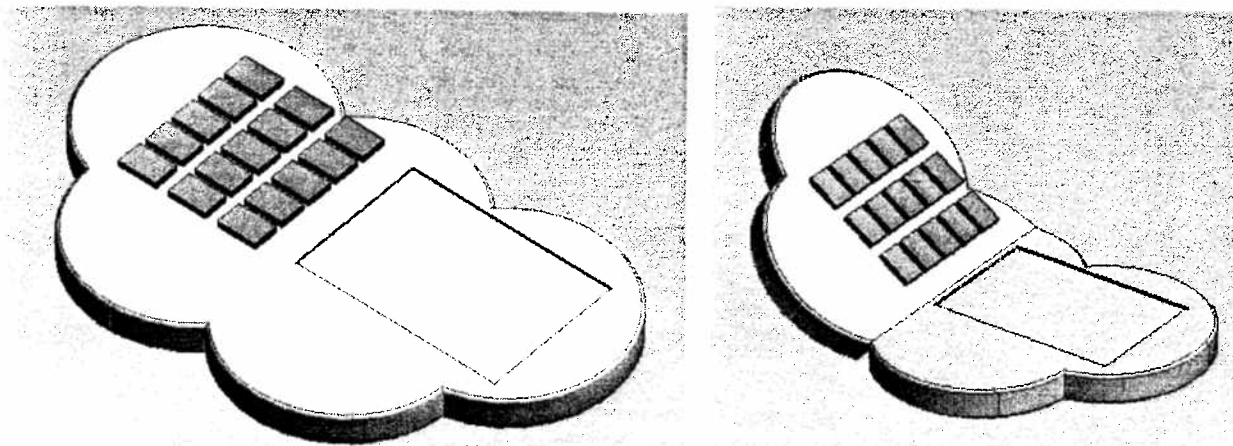
Task 2

Design Ideas

I used ProDesktop to do my design ideas. I used sport as my theme like it said in the specification. I used a screen and keys of the right size from my specification for all of my ideas to make sure that the sizes were right.



This idea was based on a bike. It looks very good but I was a bit worried that the small bits might snap off if they were made out of plastic by injection moulding.



This idea was based on the Olympic rings. It was a flip top phone to protect the keys from being pressed as it says in the specification but it was a bit too wide. I didn't like it as it looked too much like a cloud.



This idea was based on a rugby ball. I really like the sewing details on the top and the shape works really well. It has a nice rounded shape and would be easy to hold

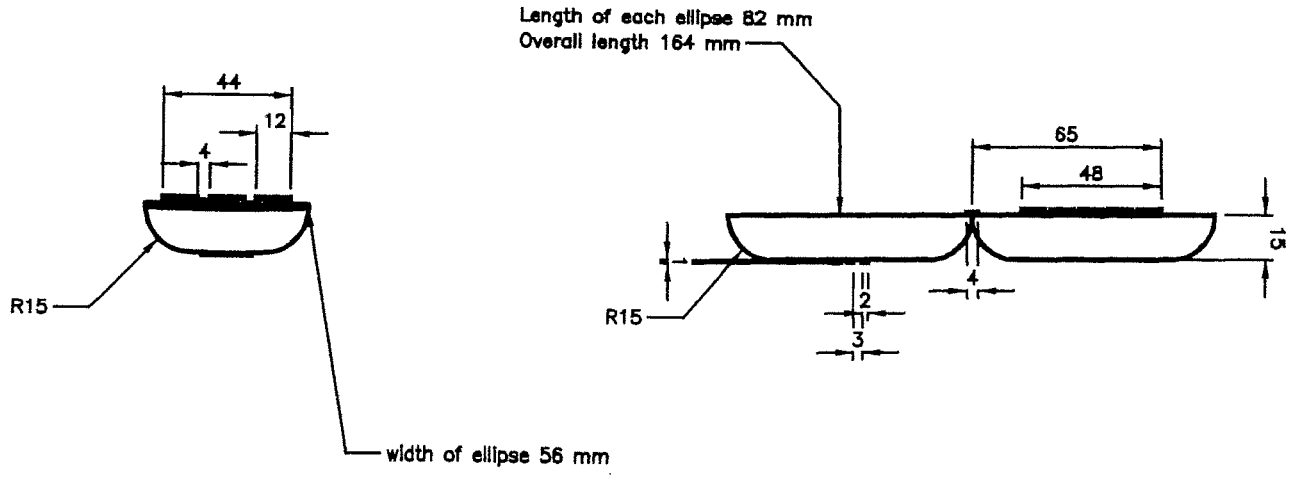
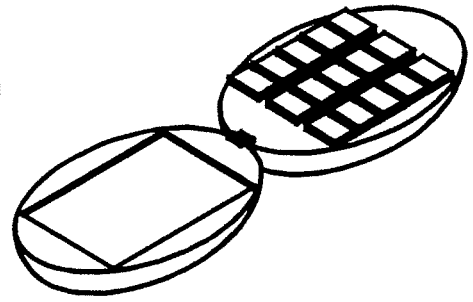
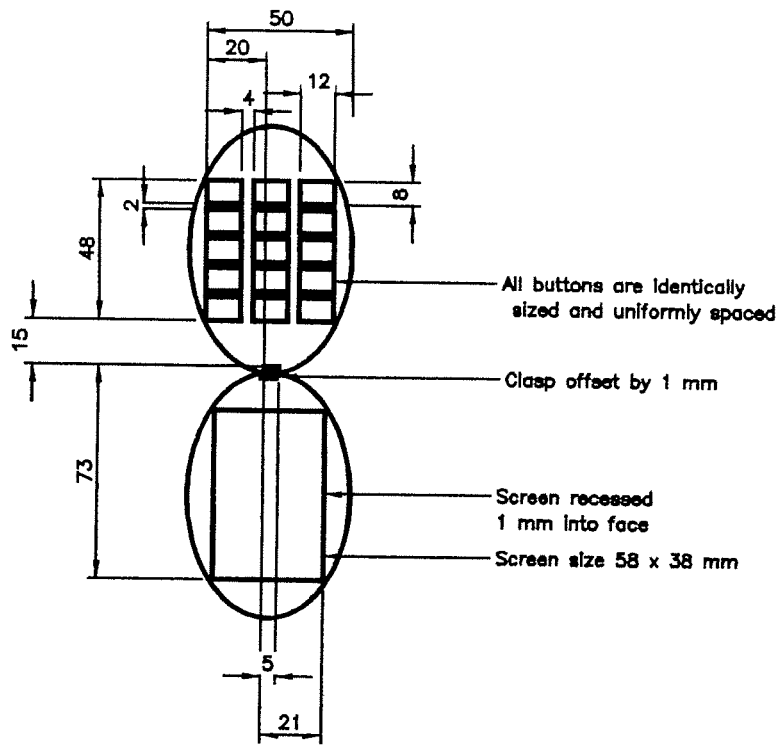
Level 2 Unit 2: Engineering Design

Task 3

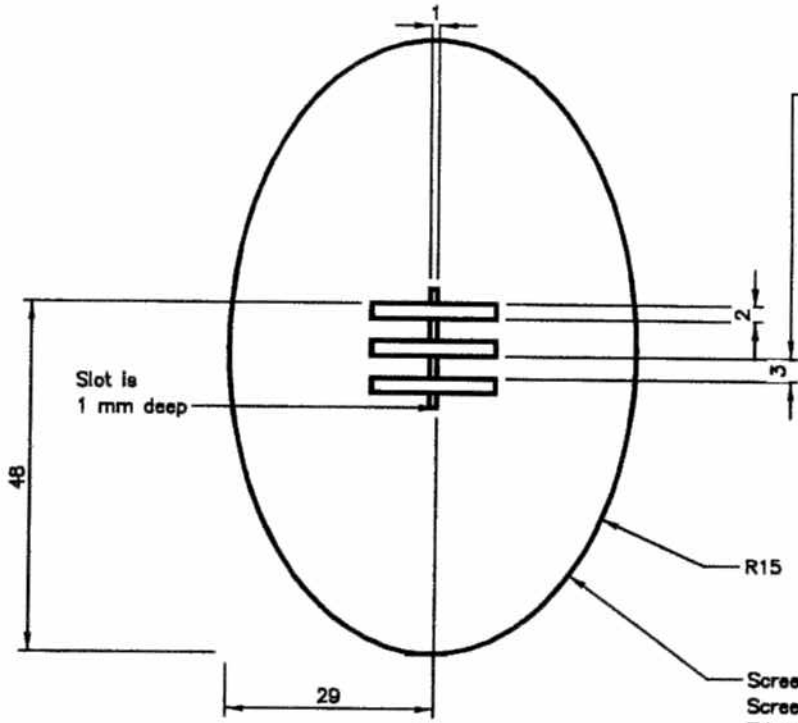
Working Drawings

Here are two third angle orthographic drawings of my ideas. They both show an isometric view too.

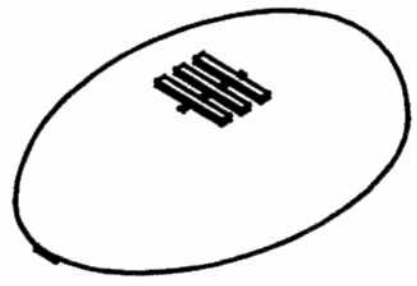
My design was the same as my idea but with more detail. I added the clasp that would let the clam shape open. The two sides of this had to be 1mm out either side, so that it would work from looking at another phone.



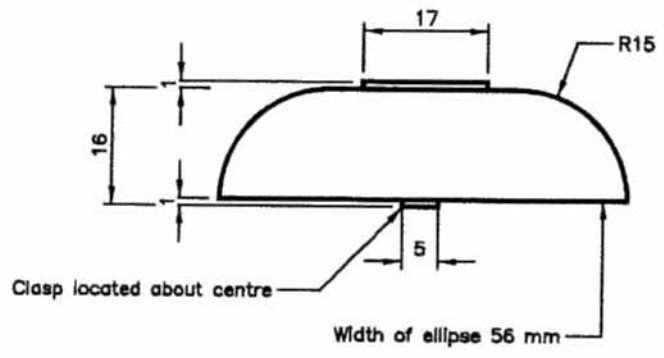
REV	DESCRIPTION	BY	DATE
TITLE			
PROJECT NUMBER		DRAWING NUMBER	
SCALE		DATE	
DRAWN BY			
CHECKED BY			
APPROVED BY			



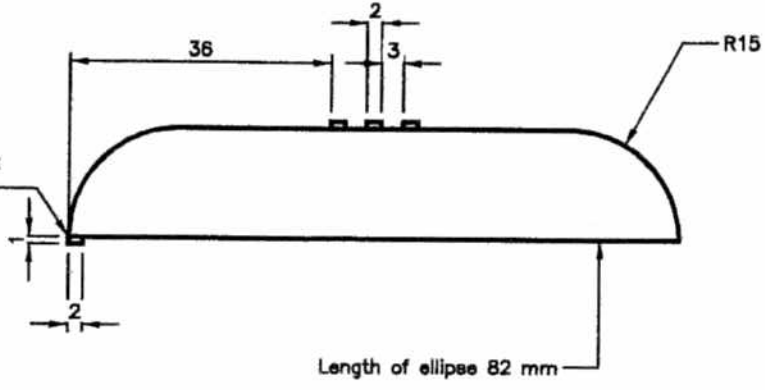
protruding features are equally sized and spaced



Screen Size 58 x 38 mm
Screen is recessed 1 mm into face
Edge of screen is located 10 mm from bottom edge of ellipse and 9 mm from side of ellipse



Clasp aligned with end



REV	DESCRIPTION	BY	DATE
TITLE			
SCALE		DATE	
DRAWN BY			
CHECKED BY			
APPROVED BY			
PROJECT NUMBER		DRAWING NUMBER	

Level 2 Unit 2: Engineering Design

Task 4

Comparison to the Specification and Brief

No.	Need:	How I checked it:	Pass or fail:
1	The product should be a mobile phone.	Looking at the working drawing	Pass
2	The phone shape should be based on a sports theme	Looking at the working drawing	Pass
3	The length of the phone should be between 150 and 170 mm	Checking the sizes on the working drawing	Pass
4	The width of the phone should be between 55 and 65 mm	Checking the sizes on the working drawing	Pass
5	The buttons should be 8 x12 mm	Checking the sizes on the working drawing	Pass
6	The size of the screen should be between 35 and 45 mm by 55 and 65 mm	Checking the sizes on the working drawing	Pass
7	The phone should cost less than £80	I would need to make a prototype to find this out	Probably
8	All the wires must be enclosed inside the phone	By looking at the working drawing	Pass
9	The phone should include a camera	By comparing it to similar products	Probably
10	The phone should be able to play MP3s	By comparing it to similar products	Probably
11	The buttons should be protected so that you don't dial numbers when it is in your pocket	By looking at the design – it is a clam shell design so the buttons are protected	Pass
12	The case should be made from a recyclable plastic that can be injection moulded	By comparing it to other designs, but I would need to make a prototype to make sure	Probably
13	The circuit should be made by using a pick and place machine.	By comparing it to other designs, but I would need to make a prototype to make sure	Probably
14	The phone should be able to open so that you can take out the SIM card and battery	I would need to make a prototype to find this out	Probably

My design met all of the needs of the specification and brief.

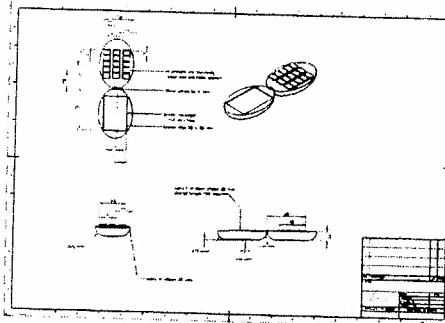
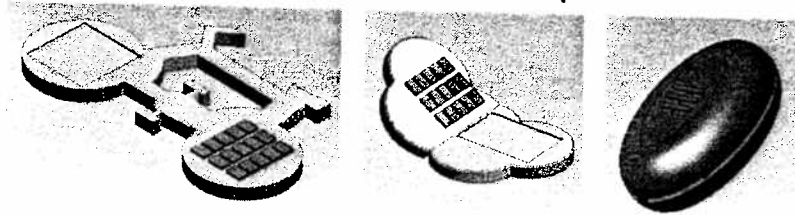
Level 2 Unit 2: Engineering Design

Task 5

Design Development The Rugby Ball Phone

Drawing Techniques Used

- CAD isometric for ideas and presentation



- Working drawings showing sizes

My final design

- Looks like a rugby ball
- Flip top



Comparison against the Specification

No.	Need:	How I checked it:	Pass or fail:
1	The product should be a mobile phone.	Looking at the working drawing	Pass
2	The phone shape should be based on a sports theme	Looking at the working drawing	Pass
3	The length of the phone should be between 150 and 170 mm	Checking the sizes on the working drawing	Pass
4	The width of the phone should be between 55 and 65 mm	Checking the sizes on the working drawing	Pass
5	The buttons should be 8 x12 mm	Checking the sizes on the working drawing	Pass
6	The size of the screen should be between 35 and 45 mm by 55 and 65 mm	Checking the sizes on the working drawing	Pass
7	The phone should cost less than £80	I would need to make a prototype to find this out	Probably
8	All the wires must be enclosed inside the phone	By looking at the working drawing	Pass
9	The phone should include a camera	By comparing it to similar products	Probably
10	The phone should be able to play MP3s	By comparing it to similar products	Probably
11	The buttons should be protected so that you don't dial numbers when it is in your pocket	By looking at the design – it is a clam shell design so the buttons are protected	Pass
12	The case should be made from a recyclable plastic that can be injection moulded	By comparing it to other designs, but I would need to make a prototype to make sure	Probably
13	The circuit should be made by using a pick and place machine.	By comparing it to other designs, but I would need to make a prototype to make sure	Probably
14	The phone should be able to open so that you can take out the SIM card and battery	I would need to make a prototype to find this out	Probably

My design meets all the needs of the Brief and Specification