



Design & Technology GCSE Year 9 Options Open Evening

Mrs Schillaci-Rowland

January 2021

Introduction

- **D&T Department** – grown over the last five years, with three different specialisms
- **GCSE** – 4 Graphics groups:
 - 2 in Yr 11
 - 2 in Yr 10
- **A-level** – 20 students across the two years, mix of internal and external students and mix of girls and boys.

Course

- **AQA Examboard** – 50% Exam/50% NEA
- **NEA Coursework** – Project based (50%)
- **1 Exam Papers**
 - **1 Paper:** Technical Principles - 2 hours (50%)

NEA – Non-examination Assessment

- Project that runs from 1st Half Summer Term in Year 10, until end of Spring Term in Year 11
- To prepare for this we do two extensive mini-projects in Year 10; The LP Cover project and the Confectionery Packaging project
- These are self, peer and teacher assessed, with an end of unit written assessment

Theory – Core & Technical Principles

- There are 3 main theory sections, which last half a term each:
 - Materials and Processes
 - Product Design
 - Design and Make Principles
- The content covered here will help students to attempt the Exam Paper at the end of Year 11 – students will have end of topic tests at the end of each of the theory units

Year 10

Product Analysis

Aesthetic: The font of the company name Lindt is delicate and appears fancy, almost looking expensive. They cleverly use gold and black colours to reflect the caramel flavour and the high percentage of cocoa in the chocolate. The chocolate is also pictured on the front and looks appealing which could persuade customers to pick up and buy this product. The colours are bold and the white sub text that stands out "CARAMEL with a touch of sea salt" is written in white that stands out from the dark background that it is in contrast with and draws the customers attention nearly straight away. The inspiration for this design seems to be from the flavours that can be found within the chocolate since a swirl of caramel encircling chocolate with a smaller line of salt along the top is the main feature of the design.

Cost: The manufacturing process for this packaging costs around 15p per bar and if sold at around £2, guarantees a £1.85 profit for each bar sold at local supermarkets or shops. In comparison to other high end chocolate products, Lindt chocolate bars are extremely affordable taking into consideration the high level of cocoa and size of the bar which is roughly equivalent to a large Cadbury's chocolate bar which is £1 but uses less cocoa and a higher percentage of cream in the recipe. It is a reasonable price to pay for the high-end ingredients and delicious chocolate.

Customer: The product is designed for adults more than it is for chocolate and this is due to its more expensive retail price and strong flavours that may not particularly appeal to younger children. It can be eaten as a light snack is small proportions or given as a gift to others. Chocolate is said to release serotonin, a feel-good hormone, which will increase the customers happiness therefore increasing their quality of life. Also, dark chocolate is said to health benefits and increasing their quality of life. Also, dark chocolate is said to health benefits and increasing their quality of life. Also, dark chocolate is said to health benefits and increasing their quality of life.

Environment: The company Lindt has spoken out about their companies' sustainability policies previously and they are said to be committed to building long-term partnerships with suppliers and working towards full traceability of raw materials in order to create a sustainable supply of resources that they need to produce their product. A spokesman for Lindt quoted that wherever possible the company always try to make their products one hundred percent recyclable and avoid plastic in exchange for paper and cardboard wherever it is possible to do so. As well as this, in a column about Lindt, 'new food magazine' stated, "They help to safeguard the long-term suitability of land for agricultural use and foster access to rural infrastructure". The company are deeply committed to reducing their packaging waste and destruction each year.

Manufacturing: To make the chocolate, cocoa beans are blended and the "nibs" are roasted which gives off the unique aroma of cocoa. After this they are quickly processed into the end product in order to retain the flavour of the roasted cocoa as best as possible and since Lindt have full control over their production chain, the company are one of the few largest beans to bar chocolate makers in the world so that the quality of their ingredients and end product is always ensured to be high. The Lindt manufacturing process of the packaging is laid out clearly on the Lindt website which states that they work closely with the packaging manufacturer which states that they use modern technologies in order to reduce the raw materials used as well as the number of paints used in their packaging process.

Materials: The ingredients in a Lindt caramel sea salt chocolate bar are, but not limited to, sugar, cocoa mass, caramel pieces, cocoa butter, sea salt and flavouring. The bar is then wrapped in a aluminium foil for preservation, which is described as endlessly recyclable since it can be transformed into a whole number of different products, and paper is then on the outside packaging. Since they take their dedication towards reducing plastic waste extremely seriously, Lindt do not use any plastic materials in the packaging of this product. I think these materials were the best choice for the company because they are recyclable and work well for their function.

Size: The intended use of this product is for it to be enjoyed over a course of a few days, a few squares after dinner each night. For this function it is perfectly sized and provides the customer with enough chocolate without being too little or too big and provides the customer with enough chocolate without being too little or too big and provides the customer with enough chocolate without being too little or too big.

The only comment I have about this product is that it takes a few bites to eat one square and perhaps one bite per square would be suitable. The measurements for this chocolate bar are 19cm length, 8.7cm width and 0.7cm depth. Each square of chocolate is 4 x 4cm.

Safety: A part of the product that could perhaps be improved are the sharp edges of the chocolate which could be smoothed out to make it easier to eat.



Customer comment: The aesthetic appeal of this packaging is what first enticed me to buy it which means that this company have perfectly hit the spot in their sleek design. It is appetising and enticing and made to look expensive at the same time, and made to look easy to open up the package.

What do you think about the LP cover I have designed?

- It's very pretty and I like how the tube lines have a glowing effect, it looks really cool and the name on the cover is really interesting but I think that the record label kind of ruins the design because the green doesn't go with the other colours.
- It looks really cool and it's very bold so it stands out. I also really like the colour choices it makes the cover very eye catching.
- I like how the colours are bold and how the background is black because it really helps the design stand out.

Would the cover appeal to the target market and why?

- Yes, as it reflects the artist with the colour scheme of orange, red, blue and green which links to the target audience as teenagers prefer the music from the artist and like the designs on some of his other covers.
- Yes, because it looks very professional and modern which appeals to the new generation of teens.
- Yes because, the colours are quite bright and bold which attracts teenagers.

Testing and Evaluation:



What makes it look like a professionally designed cover?

- The way the cover is presented gives of a professional look because it is very simple and there are no visible errors that you can see straight away when you look at it giving it a very professional look.
- The record label makes it look very professional because it shows that the cover has been designed by a company.
- It's not too overcrowded and busy which makes it look very professional and well planned.

Does the cover link well to the Designer inspiration (Harry Beck)?

- Yes, I think it links extremely well as the designers ideas reflect well to the tube effect but it has it's own twist on it which reflects your design ideas too.
- Yes, because when I first looked at the cover I knew straight away that it was the tube map.
- Yes, because you can clearly see that it's the tube map and the tube map has a lot of different colours and so does this design.

What modifications would you make to the cover?

- Change the colour of the record label, as the colours don't really go with the tube map colours and have the artists name on the cover.
- Have the name of the artist on the cover because it will help promote the record.
- I wouldn't change anything because I really like how the cover looks.

SUSTAINABILITY

FINITE RESOURCES

A finite resource is a resource that does not renew itself quickly enough to meet the needs of a future generation. A resource that will run out eventually is a finite resource. Oil, gas and coal are finite resources. They are also non-renewable like fossil fuels. They are also finite resources. They are also non-renewable like fossil fuels. They are also finite resources. They are also non-renewable like fossil fuels.

Hydrogen production or packing is a new technology designed to produce hydrogen gas and it's all made from water but is supplied with renewable energy. It's a method of production because it concerns regarding environmental concerns.

NON-FINITE RESOURCES

Non-finite resources are resources that can replenish quickly enough to meet our needs. A resource that won't run out. Examples of non-finite resources are water and plant life such as trees. There are also common renewable energy resources that we are now using such as, geothermal, solar wind and tidal power. Technological advances have allowed us to use these renewable resources more effectively and to generate more energy from them, reducing our reliance on finite resources.

PRODUCT LIFE CYCLE

Designers need to think about the life cycle of a product. They need to consider the environmental impact of the product from the raw materials required, how long the product will last before it wears out/breaks, and it's disposal at the end of it's life. There are many different ways designers can do this, including using low-impact materials.

Recycling reduces the use of newly created materials while composting and energy generating reduces landfill and the further use to materials. Energy generation is also known as energy recovery.

Incineration = A waste treatment process that involves the burning of waste materials. It can reduce the mass of waste by up to 90%. Significantly reducing the volume of landfill. However, there are concerns about pollutants in the gas emissions from incineration including large amounts of carbon dioxide (CO2) being discharged into the atmosphere.

ENVIRONMENT

Global warming is when thermal energy is trapped by the atmosphere, causing the planet to become warmer than it would be naturally. Global warming is caused by carbon dioxide, methane and other air pollutants + greenhouse gases collected in the earth's atmosphere and trap the sun's rays in the atmosphere therefore heating up the earth. Global warming is causing severe wild fires, water shortages, drought, massive storm damage, pest invasions, destroying animal habitats, stressing systems, melting ice caps, sea level rising rapidly and a few other causes.

- Encouraging retailers to stop single use packaging
- Reducing material usage
- Encouraging products that use less or no energy when the product is in use
- Encouraging a package lifecycle
- Making sure materials and components can be easily recycled and disposed at the end of their lifecycle

The first approach to reducing the ethical impact of the product. The ethical issue a company/professional has on a product and its materials is called a social footprint. Companies have a responsibility to consider human rights and labour working conditions or their materials. Companies with a good social footprint are more likely to be successful in terms of health and safety, workforce regulatory, ethical labour and other social issues that affect communities in their supply chains.

DISPOSAL OF WASTE

At the end of a products life it's disposal has to be taken into consideration. Landfill - The most common method of waste disposal is to involve putting waste into the ground and burying it. However, this has many problems as it can cause pollution of the local environment. Such as contamination of groundwater, soil and leaching of toxic waste. This waste also generates methane gas (a greenhouse gas) which affects wildlife and has a horrible smell. Alternatives to landfill are being developed across the globe. Resource recovery - A process that recovers certain disposed materials for specific use. Some materials can be used in many ways.

Year 11

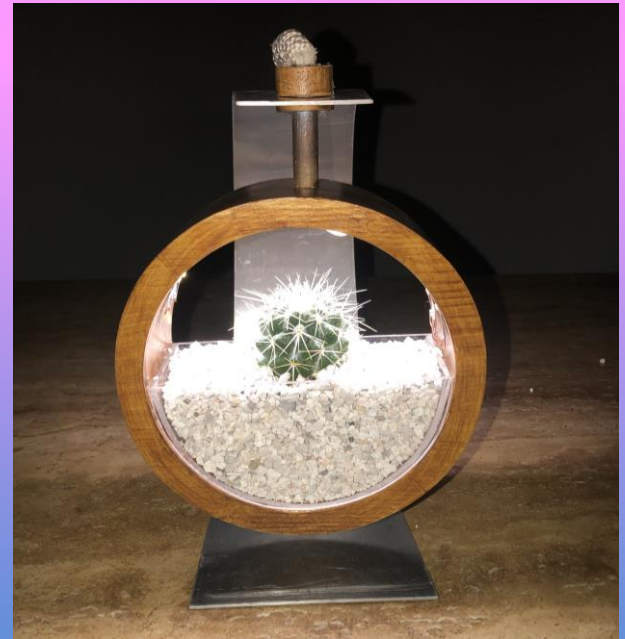
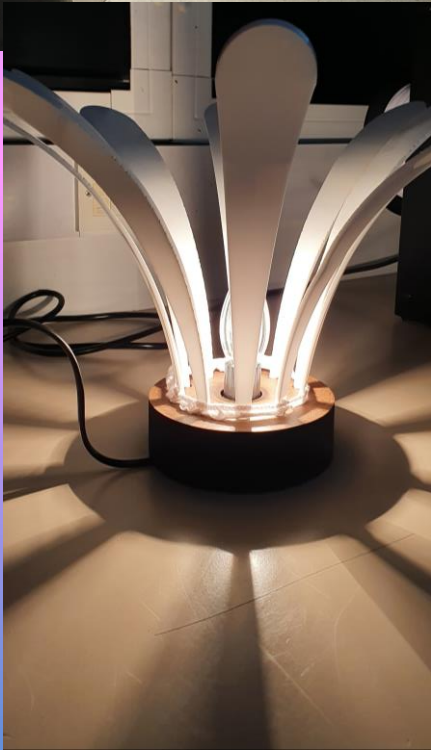
A-Level

Year 12

&

Year 13





Developing the Connection Point

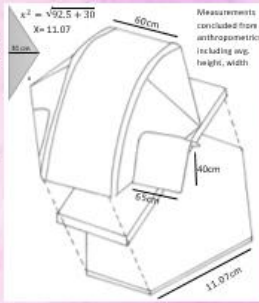
In my initial plan for this section, I hadn't intended to base a sheet on this area of the design however, I began to realise that the connection point is one of the most intricate and complex parts of my design. My client too agreed and asked to see a more in-depth evaluation and explanation of how the connection point will function.

To the right is the exploded view of my design. It shows the three levels of the product. On the first level is the base of the tent, this is a thin layer of material that is waterproof to stop water seeping through when exposed to it for a long period of time.

On the second level shows the built-in sleeping area. This is the padded area that the tent folds up to and becomes the back of the backpack. Level one and two are the simple sections of the design and so this is something to take into account during manufacture. These stages should be done in good time to be able to have as much time as possible on the final layer, which is the most complex and time consuming.

The third layer is the main body of the tent, the cover, and doors. The design of this is much more complex. During the manufacture I have to take into consideration the doors, the connection point, and any possible windows when I make the net. When I come to the manufacturing, I may find it easier to cut out different areas of the net at a time and sew them together.

When I come to manufacture, I will do it in this order, making the base first, then the second level, and then the third. All levels will be attached together with sewing. One thing to consider during manufacture is whether I will attach the top of the tent to the base of the tent to stop water coming through or create an inner tent if I were not to attach these together. The inner tent may reduce condensation in the tent however, this will add to the materials which means more weight and more cost. Attaching the levels together will be quicker and cheaper to manufacture and erect and so this is looking like the more likely option moving forward.



Measurements calculated from trigonometry including hyp. height, width



The tent groundsheet will be made from a form of polyester.

At the moment, when the tents are connected, they are forming one long straight line. Although this would all work, it may be difficult to fit this space at a festival when it is busy. To combat this problem, it may be necessary to add the same shaped flat door on both side on the left side of the tent. This would allow the user to choose which door to attach to the connection point of the next tent (forming a line or bending round). This can allow the chain of tent to fit in all spots.



Due to the tents being connected only by a small area I need to think about incorporating windows. Although this will reduce the privacy element of the tent, it will make it feel more like you are all in a tent together. The window could have a cover to leave this as an option to the user. The material of the connection point will be made of the same material as the rest of the tent (treated cotton) and will be on both the connection points and the door zips. The alternative is to use Velcro to attach at the connection point. The end of the connection point will have a semi-circle shaped pole in the end to keep its shape. There is a cover and zip on the end of the connection point for wind protection. Due to the tents being connected only by a small area I need to think about incorporating windows. Although this will reduce the privacy element of the tent, it will make it feel more like you are all in a tent together. The window could have a cover to leave this as an option to the user. The material of the connection point will be made of the same material as the rest of the tent (treated cotton) and will be on both the connection points and the door zips. The alternative is to use Velcro to attach at the connection point. The end of the connection point will have a semi-circle shaped pole in the end to keep its shape. There is a cover and zip on the end of the connection point for wind protection.

From the specification: "In the event of company, the zips opposite each other can attach onto another of the same product. This can be done with as many tents and deemed necessary. This enables the tent to accommodate as many required at that specific event."

This is a design dilemma that I will present to my client for him to choose which route to go down. This is essential as either possibility have both benefits and drawbacks to them.

Reducing the size of the connection point by half could bring the price of the product down by approx. £2.58

The connection point either use a zipping system (but the zipping up a coil) This is simple and easy to use by all ages. They are lightweight and convenient. Due to zips not being protective against water seeping through, a flap to cover it will be necessary. The flap will be made from the same material as the rest of the tent (treated cotton) and will be on both the connection points and the door zips. The alternative is to use Velcro to attach at the connection point. The end of the connection point will have a semi-circle shaped pole in the end to keep its shape. There is a cover and zip on the end of the connection point for wind protection.

I have come to the con- This brings the total no Client Comment: Great

QC/QA - Full inspection at the end of the manufacture to ensure no human error has occurred. Such things to look out for include holes between pieces of fabric which have not been sewn properly, Poles not fitting into poles sleeves due to inaccurate tolerances etc.

Due to the two triangular sections coming out towards each other, this makes the connection point have to be longer to fit onto the next tent without these areas clashing. This creates two possibilities moving forwards.

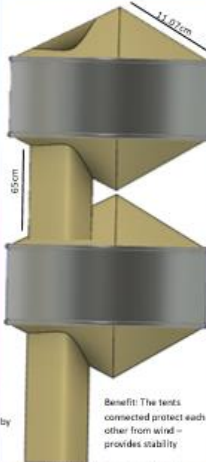
The first possibility is to keep the tent design the same, despite the connection point sticking out further than previously planned for, it allows for more room inside the tent.

The second possibility is to reduce the size of the triangular sections that are sticking out or changing the shape of the (making them rectangular) so that the two tents being connected can be positioned closer together. This will mean the connection point does not need to come out as far which adds weight from the extra material and can be difficult to get through.

This is a design dilemma that I will present to my client for him to choose which route to go down. This is essential as either possibility have both benefits and drawbacks to them.

Reducing the size of the connection point by half could bring the price of the product down by approx. £2.58

The connection point either use a zipping system (but the zipping up a coil) This is simple and easy to use by all ages. They are lightweight and convenient. Due to zips not being protective against water seeping through, a flap to cover it will be necessary. The flap will be made from the same material as the rest of the tent (treated cotton) and will be on both the connection points and the door zips. The alternative is to use Velcro to attach at the connection point. The end of the connection point will have a semi-circle shaped pole in the end to keep its shape. There is a cover and zip on the end of the connection point for wind protection.



Benefit: The tents connected protect each other from wind - provides stability

Modelling

The purpose of modelling is to provide an accurate representation of the function of my product. This needs to be done to see if my ideas work and if they are practical to be used by people from all ages. This means a full analysis of the product can be carried out and the appropriate testing and modifications can take place before any manufacturing takes place. This saves time, money and materials that would be required

I attempted to create the tent using strap materials I could find and recycle. The idea was to create a scaled down version of my design to show the function. I was not very pleased with the outcome of the model and so I have fully analysed what needs to be improved. Despite the model not going to plan, I can now learn from this and not make the same mistakes going forward. I believe, the main problem was not using the correct materials that I have previously planned to use.



Despite the model not going to plan, there are plenty of parts to analyse and evaluate and key lessons to take away as a result. It is important in the design stages to not get down when something does not go to plan. Learning from the mistakes makes the process a success. Below I have commented some of the lessons I have learnt and the improvements that need to be made:

Ensuring each part (each step) of the product is in line with upmost quality standards. To do this I will create a Quality Assurance/ Quality Control page to have alongside when I come round to manufacturing. This will be done through the use of a flow chart.

Use thinner materials on the outer shell of the tent. The thick material did not provide the correct properties or layers. They don't look aesthetically pleasing and do not conform to the shape of the design. They create thick layers of materials which will be heavy to carry and hard to compact.

The bottom of the tent pole needs to be closer to the tent material so that it doesn't make the corner rise. This will easily be possible with the correct materials.

The material I used frayed along every side making the model look scruffy and not aesthetically pleasing. This made the model look extremely unprofessional and unconvincing.

The tent poles need to be collapsible to allow compact storage to be carried around easily and efficiently. Find a way to attach the poles to the tent so they cannot be left behind/ lost.

Areas of the model which did go well and will incorporate onto my final design:

The base of the tent worked extremely well. The thicker material on the bottom provides extra protection for the user. This is protection from both water absorption and uneven surfaces. This thicker material also held the sleeping area in securely, keeping its shape and function.

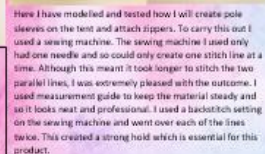
The sleeping area was attached on top of the base, securing it down with simple stitching. This meant it couldn't be moved around which provides ease when packing the tent away.

To model the sleeping bag, I used bubble wrap with two heat sealed edges. This was a successful mode of how the real design will look.

After my evaluation of my model I will carry out some testing and produce modifications as a result. The areas of the tent model which were successful will be kept in mind and incorporated when undergoing this process. One way in which I will come to decisions about the best way to make changes is through testing. All testing and modifications will be shown and analysed on a separate sheet. Testing allows me to find faults in the design before manufacturing the final product. Testing allows small parts of the product to be made, reducing material wastage and sticking to my time plan. It is important to think iteratively in this stage, coming back to the design brief and specification and look at the original design proposals to not get carried away with unrealistic ideas, yet not allow this to hinder risk taking.

QC/QA

Make sure that no ends of the material are left to fray. This can ruin the aesthetics of the design and cause it to break, losing its properties.



Here I have modelled and tested how I will create pole sleeves on the tent and attach zippers. To carry this out I used a sewing machine. The sewing machine I used only had one needle and so could only create one stitch line at a time. Although this meant it took longer to stitch the two parallel lines, I was extremely pleased with the outcome. I used measurement guide to keep the material steady and so it looks neat and professional. I used a backstitch setting on the sewing machine and went over each of the lines twice. This created a strong hold which is essential for this product.

I thought about the health and safety of the poles. The end of the poles are relatively sharp which could cause injury, especially when the product is being erected/ taken down.

To eliminate the risk of injury I created rubber caps for the ends of the poles. Although this doesn't stop the poles from hitting into people, the injury should be reduced.

Another way to reduce tent poles causing injury is to have them attached to the tent. This is something I am already looking into as it creates benefits elsewhere on my designs.

My modelling was successful and my methods to complete this will be incorporated into my final manufacturing

Time plan reference



Here I have taken the relevant part of my time plan to show where I should be up to at this part of the coursework and how much time I should be spending on it. The Modelling section should be completed on the week commencing 26th October and last for one week. This is exactly what has happened. I have clearly calculated a realistic time frame and believe my time management skills are excellent.

The third piece of modelling I have completed is the connection points. To carry this out I had two potential ideas.

The first idea shown which I illustrated and described on my design proposal 1 is to have an extendable part from each of the tents being connected creating a tunnel shape. This does work with the use of a simple zip. The design allows privacy as well as connection between tents without going outside. However, the tunnel may become inconvenient for some creating a whole host of drawbacks.

The second method of carrying this out is to have one extendable part from one tent which attached onto a flat area of the second tent. This is a new idea that I have come up with and is shown in my first page of CAD development. The main reason for this modification is to reduce material wastage. This makes the product fit closely with the specification, improving on more than one area. Reducing weight means more convenience for user, reduce risks of back injury and improve convenience. Having just one extendable means also means using less material, it reduces material costs and manufacturing costs, reducing the overall price of the tent. These are all areas described on my specification.

From the specification: "In the event of company, the zips opposite each other can attach onto another of the same product. This can be done with as many tents and deemed necessary. This enables the tent to accommodate as many required at that specific event."

The tent poles need to be collapsible to allow compact storage to be carried around easily and efficiently. Find a way to attach the poles to the tent so they cannot be left behind/ lost.

The material I used frayed along every side making the model look scruffy and not aesthetically pleasing. This made the model look extremely unprofessional and unconvincing.

The tent poles need to be collapsible to allow compact storage to be carried around easily and efficiently. Find a way to attach the poles to the tent so they cannot be left behind/ lost.

Areas of the model which did go well and will incorporate onto my final design:

The base of the tent worked extremely well. The thicker material on the bottom provides extra protection for the user. This is protection from both water absorption and uneven surfaces. This thicker material also held the sleeping area in securely, keeping its shape and function.

The sleeping area was attached on top of the base, securing it down with simple stitching. This meant it couldn't be moved around which provides ease when packing the tent away.

To model the sleeping bag, I used bubble wrap with two heat sealed edges. This was a successful mode of how the real design will look.

After my evaluation of my model I will carry out some testing and produce modifications as a result. The areas of the tent model which were successful will be kept in mind and incorporated when undergoing this process. One way in which I will come to decisions about the best way to make changes is through testing. All testing and modifications will be shown and analysed on a separate sheet. Testing allows me to find faults in the design before manufacturing the final product. Testing allows small parts of the product to be made, reducing material wastage and sticking to my time plan. It is important to think iteratively in this stage, coming back to the design brief and specification and look at the original design proposals to not get carried away with unrealistic ideas, yet not allow this to hinder risk taking.

Client comment: Great detail and layout!

**What current Year 10
students say about GCSE
Graphics...**

Why did you choose to do Graphics as a GCSE?

- Because it really compliments my art skills and I can apply them to practical work as well as testing my ability to analyse and improve my own work.
- I chose Graphics as I really enjoyed the mini-projects we did at Key Stage 3. I also want to go into a creative career when I am older so I think it will help me.
- I liked the idea of a mix of creative projects and also learning more about the theory of Design and Technology.

What would you say are the best things about Graphics in Year 10?

- I would say the best things is the fact that you can add your own personal touch to your products and designs.
- When it comes to projects it is up to you what creative spin you put into the design ideas. I can already see that I am developing my skills in Graphics as well as learning so much about the theory of the subject too.
- The freedom to come up with your own design ideas. When it comes to the theory you are glad as you can link all of the creative learning you have done to the history of design and also learn about how technology has developed over the years and allowed us to manufacture new products that get better and better with each iteration.

What things do you think students considering taking Graphics at GCSE should consider before choosing it?

- The potential knowledge and its use for future jobs.
- If you like the idea of designing new things then this is the subject for you.
- It was important for me to know that the theory was linked to design as I want to be an architect. Knowing that we would learn about things like materials and processes and that there would be project based work was also quite important.

What differences are there to what you thought the GCSE would be like (before starting Year 10), and what it is like now?

- There is an equal amount of focus given to the theory which I was surprised at, but really enjoy. I thought the projects would mostly be drawn by hand, but I like the fact we have learnt how to use computer based programmes too.
- I thought it would be a lot of hand drawn sketches and also writing, however we do a lot on computer and learn how to use new design packages such as Photoshop.
- I knew there would be a lot of work, however because I enjoy the mix of theory and design, it does make the work seem less. We also have one homework a week, which again is helpful rather than just finishing tasks.

What you wish you had been told about GCSE that you didn't know at the Options Evening?

- That the project work always seems to link with the theory, so remembering key facts makes it easier.
- That the subject develops you as a person too, we have a lot of discussions in class with our peers and this is important in developing communication skills and confidence too.
- That there is always an opportunity to complete work or ask questions at Graphics Club which is on either at a lunchtime or after school.

What sort of students should consider taking Graphics at GCSE?

- Ones who have high ambitions and goals with a strong will, so that when they face difficulties in the design and manufacturing of their product they're easily able to pick themselves back up. You don't need good art skills to do well in graphics either as we do use computers too.
- Anyone who enjoys designing, anyone who likes to find out about how products are designed with a customer in mind, and also those who are creative.
- A positive attitude and to understand that you need to work hard and be organised!

Common Career Paths

- Product Design
- Interior Design
- Creative Design
- Automotive Design
- Architecture
- Graphic Designers
- Engineering
- Marketing
- Environmental Design
- Town and Country Planning
- Quantitate Surveyor
- **Anything creative!**

Other paths our students have taken:

- Economics
- Maths
- Criminology
- Accountant/Finance

Questions:

schillacirowlandd@presdales.herts.sch.uk