The Importance of Prototypes

Using creativity and imagination, students are asked to design a new gift idea for a specific consumer. Once they have thought of a few gift ideas students will develop a final idea to take to the next step - turning their 2D sketches into reality by creating visual, working cardboard prototypes.
The use of a booklet enables students to work in an organised way, whilst also providing the teacher opportunities for assessment of and for learning.

Year 8

Are you ever frustrated with something that you thought you could design better? This short project will show you how to structure your natural creativity to come up with solutions to all kinds of problems, and have fun in the process too!

This project is based on a few simple yet fundamental premises:

- Designing is fun and should be enjoyed by young and old alike.
- Designing is a basic human activity which has been around since tools were first developed to help feed, clothe and make our lives better.
- Designing is much more than a paper based activity and can be undertaken using a wide variety of methods and media.
- Designing requires a wide range of knowledge and skills drawn from across the traditional curriculum.
- There is not just one linear design process - there are as many different ways to approach designing as there are people and design contexts.
- There are many approaches to innovation in product design to stimulate ideas, from models, a critical examination of existing products, real or imagined.
- There are a wide variety of 'tools' which the designer can use to help identity, clarify, develop and communicate design intentions. Like tools in any tool box, they can be used in a variety of ways.

Research	Client Profiles	Design ideas	Prototypes
Research before and after the **design brief** can identify any limitations to ideas and help with initial designs. Analysis of research and user feedback can lead to changes being made to the brief, such as a change in timescale or budget. The results of feedback, testing and **product analysis** should give the designer a good starting point to adapt, test, evaluate and improve their product.	Being a Designer means stepping out of your comfort zone and forgetting about your own preferences & needs. However, I have noticed that this is sometimes lost in classroom practice. Students are given a design brief or problem to solve, yet the final outcome is bias and based upon what THEY like and want. To prevent this from happening students will look at a variety of consumer profiles and design a gift suitable for that customer.	Iterative design: The iterative approach to designing is a flexible way of designing by working through ideas with sketches and notes and developing models when they are needed. It is a journey that could have a number of different starting points and outcomes. The iterative approach gives the designer the freedom to follow an idea in the direction that feels best for that idea. The designer's tools of sketching, modelling, testing and evaluating may be used in any order as long as they support rather than hinder the flow of ideas. These could be different from each other or developments of an original idea.	Prototypes: Prototype modelling can be constructed to test different elements of a design to help work out how viable it is likely to be. Modelling can involve creating a whole scaled up or down product or it may just be needed to help work through an important element of the design. You will find an introduction to materials, learn about some basic cardboard skills such as scoring and strengthening, making circles and cones, but also how to connect pieces together with flanges, tabs and slots. Another great way to work with cardboard and paper is to play with textures, by folding, fringing, layering, but you can also use the corrugations of cardboard to create curves. You then might want to add movement to your model, using rotation to make a cuff, add dials and buttons to your idea, or even wheels and axles.

Remember the SSS	Chosen Idea	Go Make (Homework)	Evaluation

Remember that everything you see has been designed for a reason. For a person or group of people. It's the premise of all our design work. We are designing: **S**omething for **S**omeone for a **S**olution	Students will work on developing their own chosen idea, taking on board their peer's feedback and making improvements. Students then present their finished design back to their partners, swapping sheets for comment. They will then draw their final design onto the final Design page within their booklet.	Students will be asked to make a product at home based on the work they have completed in previous lessons. The product is to be made from something that may otherwise end up in landfill. It would be helpful for students to photograph the making process themselves and show photographs and drawings of the finished product	Students will be encouraged to discuss ideas, especially how the designs meet the specification points. Students then present to each other, swap design ideas and write comments on each other's designs. Students will learn how evaluation is an important part of the design process. They will look at how well they managed their own time, the product they created and attention will be drawn back to the specification and how the students consider their design meets the criteria.

Key Terms	**Extended Learning & Support**
Definitions of key words and phrases are highlighted throughout the powerpoint and printed in their booklet for them to refer too. ● **Function** - The intended use of a product. e.g. The function of a toothbrush is to clean your teeth. ● **Characteristics** - a special quality or trait that makes a person, thing, or group different from others ● **Design Process** - design process is a series of steps that engineers follow to come up with a solution to a problem. ● **Modelling / Prototyping** - Using an easy to modify material provides a good way of seeing how a product looks and works. ● **Analyse the brief** - Picking out the important information. ● **Modelling / Prototyping** - A quick way to do initial trials with a product. ● **Annotate** - add notes to (a text or diagram) giving explanation or comment. ● **Iterative Design** - Improving your designs by testing and re-thinking ideas. ● **Consumer / Client** - The person /people you are designing your product for. ● **Different types of movement:** ○ Linear /Reciprocating / Rotary / Oscillating ● **Pulley:** uses grooved wheels and a rope to raise or lower an object	Creative things you can do to support your Design and Technology project. ● The black of the booklet contains a fun extension menu that allows students the freedom to select from a wide variety of different tasks, interpret them in their own way and promote the development of design thinking. Some of these can only be completed at home whereas others will act as additional classwork. ● Start an ideas book and doodle in it. Drawing is ideal for making ideas tangible. You don't need to have the best drawing skills either. You can also use it to write down ideas when you think of them. Extended learning online: ● Explore the world of STEM through our interactive games: https://new.siemens.com/uk/en/company/education/students/interactives.html ● Watch a number of the videos on the YouTube playlist below and attempt to copy the techniques shown to improve your sketching ability. Start with the video at the bottom of the playlist (the oldest) and work your way towards the top to gradually increase the level of challenge. Continue to practice after watching all the videos by attempting the drawing of everyday objects from around your house using the techniques or designing a new product and sketching your ideas. ● https://www.youtube.com/playlist?list=PLUmGIca4HGqZKHiBZtL_zHjh2HBoBNerA

● **Lever:** a stiff bar rests on a support which lifts or moves a load ● **Inclined Plane:** a slanting surface connecting a lower lever to a higher level ● **Screw:** an inclined plane wrapped around a pole; holds things together ● **Wheels and Axles:** a rod (axle) holds a wheel through the centre to move loads ● **Wedge:** an object with at least one slanted side that pushes materials apart	