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| Light Project |
| Topic Outline: A skills based project where students re-design and manufacture ‘lighting’. Project focuses on independence.  |
| BriefTo re-design existing lighting products and manufacture them using a range of techniques | UserStudents are able to choose an end user for their design with no limitations | PurposeA student led project where they research and investigate to find real problems to solveTo allow the pupils to use 2D software to design and manufacture. | FunctionalityStudents use previous learning of electronics to aid designing | InnovationStudents are encouraged to be creative using a range of processes and equipment available.  | AuthenticityStudents create functional designs that work in real life situations. Students are able to create lighting and evaluate and test their designs |
| Task 1: Introduce topic. Show students lighting components they can use. Students research existing designs. Students choose one or two designs to analyse. Students make suggestions on how they can improve them. Students again look at the range of lighting components available and make suggestions on they can incorporate them in their designs. Students create a specification.  Task 2:  ***Assessment task*:** Students produce an initial idea based on their analysis in previous lesson. Students highlight measurements, processes, fixture/fittings and components. Teacher/peer assessment on initial ideas task with improvements suggested.Task 3: ***Assessment task*:** Students create their final design which should be an improvement on their initial design idea. Details of measurements, processes, fixture/fittings and components is an important aspect at this stage. Teacher/peer assessment on idea with changes suggested. Task 4: Students create an orthographic drawing of their final idea. Measurements are critical at this stage. **Feasibility checks will be the main focus here**. Opportunity for modelling in card. Task 5: Students manufacture their design or produce their design on CAD ready for laser cutting.Task 6: ***Assessment task*:** Students test and evaluate their final idea suggesting improvements.**Drop in lessons ideas:** **2D Design**- How to use 2D design (including the grid tool)**Components**- Circuits, resistors, capacitors, IC’s, types switches, types of lighting**Soldering**- How to solder**Measurin**g- Measurement exercises  | **Literacy Opportunity** Students are introduced to a range of key vocabulary that relates to Design & Technology. Student complete H/W tasks that are all literacy based. **Numeracy** Students have the opportunity to measure, work out angles and distances.**SMSC****Reflective Learning**Understanding how products evolve according to users' and designers' needs.**Independent enquiry** Analyse products to see how they function. **Creative Thinking**Respond creatively to briefs, developing their own proposals and producing specifications.**Cross- Curricular** ICT: Opportunity for students to explore 2D software for designing |
| Tools and Equipment Laser Cutter, Computers, Soldering irons, Light components, Various hand files, pillar drill, PVA glue and various sheet materials. Processes Designing using computer software, Sanding, fixing, soldering, drilling, Shaping, and Measuring.Health and SafetyIntroduction to workshop safetySafe use of laser machineSafe and correct use of soldering iron |

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| Student Scheme Light Project |
| Task 1: **Introduction: Take a look of all the lighting components available and make sure you understand how they work.**When researching try and make sure that you know what you are looking for. Is it a mood light, reading light or general lighting. Type in key terms when researching. ‘Wood reading lamp’ Also can you actually make the design yourself? Is it feasible? How will you power it? How can you manufacture it? What materials can you use? If you cannot come up with solutions to all of the above then move on to the next light. **Once you have chosen your light to re-design, ask yourself how you can improve it. When you have suggested improvements take another look at the lighting components shown earlier and see how you can incorporate them in your design.**Next create a detailed specification based on the outcomes of your research.Task 2: Right now it’s time to start designing. Produce an initial idea of your thinking on either paper, modelling, 3D or 2D software. You need to be careful here as measurements are the key factor. Ask yourself what size is my light going to be? How are you going to work that out? How are you going to work out the size of each individual section? You are going to need the measurements of the components as well. Will it be easier to make a model first then measure each section? You decide.**Next get your teacher or a friend to check over your measurements to see if they are feasible. They may well suggest changes or improvements. Does your idea meet your specification?**   | Task 3: Now it’s time to create your final design. You may want to choose a different way to create this design. Paper, modelling, 3D or 2D software it is up to you. Details of measurements, processes, fixture/fittings and components is an important aspect at this stage. You must get this right before moving on.Tip: **Don’t forget to think about how each section is joined together. Are they going to slot in? Are they simply going to be glued together? What fixings can you use to join to sections together?** Task 4: Ok everything is now in place, your design should look the way you want it to and you have checked all measurements. You now need to break your design down into sections and the best way to do this is to create an orthographic drawing. Again measurements are the key here. If you are manufacturing by hand draw out each section on paper stating measurements for each side. If you are using 2D design then draw each section to your stated measurements ready for laser cutting.Task 5: **Once you have made your sections it’s time to put them together using the methods you suggested earlier.**Task 6: No project is really complete without evaluating your design. Make sure you include and range of improvements that can be made.**Finally is your final design good enough to enter the start designing competition? Why not get your teacher to enter it and see if you can win a £30 amazon voucher.**  |