**TERM: Summer 2017**

**SUBJECT: Technology, Engineering and Design**

**YEAR GROUP: 9**

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| **TERM TOPIC: Architecture** | |
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| Skill KPIs | To be able to successfully communicate architectural ideas through 1 and 2 point perspective drawings. Annotation should justify all design decisions in relation to the client, design brief and specification. |
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| Theory KPIs | To write a design Context, Brief and a specification that clearly communicates the aim of the project and the criteria which the project must follow. All points must be fully justified in relation to the client. |
| To be able to justify design decisions based on manufacturing sustainability and cultural considerations. |
| To be able to effectively evaluate design ideas to allow design development. Evaluative comments should reflect on advantages and disadvantages of design work and skills and should result in justified improvements being suggested. |
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| **TERM TOPIC: Desk fan** | |
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| Skill KPIs | To be able to communicate design ideas with 2D and 3D drawing skills, 2D CAD design, effective rendering and detailed and justified annotation. |
| To be able to skilfully use 2D CAD packages to create intricate designs that are suitable for laser cutting. |
| To be able to quality control circuit and component problems, 2D CAD/CAM issues and problem solve effectively to find workable solutions. |
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| Theory KPIs | To be able to identify at least 3 different metals, polymers and woods. Explain their scientific properties and suitability for different uses. |
| To be able to discuss the advantages and disadvantages of using CAD/CAM for the project rather than traditional hand tool methods. |
| To be able to identify, draw the circuit symbols and explain the function of battery cells, switches, capacitors, transistors, potentiometers, LEDs, motors, microchips and resistors. |
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| **TERM TOPIC: Flat pack Furniture** | |
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| Skill KPIs | To be able to discuss the benefits of CAD/CAM in relation to mass and batch production techniques and flat pack furniture design. |
| To be able to analyse existing products in detail using the ACCESSSFMM model and to discuss strengths and weaknesses of current products in relation to a target consumer. Analysis should also identify construction methods and relate to flat pack construction. |
| To write a design Context, Brief and a 10 point specification that clearly communicates the aim of the project and the criteria which the project must follow. All points must be fully justified in relation to the client. |
| To be able to justify design decisions based on manufacturing sustainability, the ethics of off shore manufacture and cultural considerations. |
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| Theory KPIs | To be able to use 2D Design to create a laser cut piece of flat pack furniture that consists of at least 6 components. |
| To manipulate dimensions on 2D Design to create precisely measured components that will fit together to create a secure piece of flat pack furniture. |
| To be able to spot construction errors and innovatively problem solve in order to find a workable solution. |
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| **TERM TOPIC: Screw Driver** | |
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| Skill KPIs | To be able to accurately draw an orthographic technical drawing which communicated enough information for third party manufacture. |
| To be able to accurately measure, mark, cut and finish 3 components with a 0.1mm tolerance. The components should fit together securely. |
| To be able to use hacksaws, files, lathes, tapping and die cutting tools and the brazing hearth confidently and accurately with support. |
| To be able to join two or more components securely using brazing and threading methods. |
| To work safely and follow the correct health and safety procedures at all times when carrying out an engineering or design task. |
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| Theory KPIs | To be able to discuss the scientific properties and qualities of steel and alternative metals in relation to performance and fitness for purpose. |
| To be able to discuss how to face off, taper and turn down metal on a lathe. To be able to explain the purpose and procedure of tapping and die cutting. To be able to discuss the production steps of brazing. |
| To be able to assess the foundry and lathe machines for hazards and risk and suggest suitable control measures and PPE. |
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