Subject: Design Technology: Year 11 Design Technology (Workshop) Term 1

This term, students working in Design Technology (Workshop) will be developing their projects started in the Summer term of 2021. They will be at different points carrying out individual pieces of work however all will need to be working towards beginning practical projects by early December.

All students need to have completed relevant research, written a brief and specification and produced a range of individual design ideas. These ideas need to be developed and drawn up in CAD before starting the making.

Year group: 11

| Week | Lesson Topic | Independent/Home learning question 1 | Independent/Home learning question 2 | Key Vocab | Resources |
|---|---|---|---|---|---|
| 1 | Research | State a suitable hardwood to be used in outdoor furniture. Explain why you have chosen it | Describe benefits of using CAD software to develop a design idea compared with using traditional drawing tools | Hardwood<br>Softwood<br>Dense<br>Teak<br>Modified<br>Assembled |  |
| 2 | Research | Explain the differences between ferrous and non-ferrous metals | In terms of sustainability what are the considerations of using of recycled materials in products? | Alloys<br>Ferrous<br>Nonferrous<br>Environment<br>Recycled<br>Landfill |  |
| 3 | Specification | A plastic water bottle is made from PET. State if this is a thermoplastic or thermoset.<br>a. State two physical properties that make it suitable for a drinks bottle<br>b. Describe how this bottle will be recycled | Why are hardwoods more expensive than softwoods? | PET<br>Thermoforming<br>Thermoplastic<br>Managed forests |   |
| 4 | Design ideas | Explain of the Rs of sustainability. | What is meant by the term “smart material” | Reduce Reuse<br>Recycle Refuse<br>Rethink Repair<br>Smart material |   |
| 5 | Design Ideas | State one machine that can be used to produce a CAM Product | Can you explain one example of where and how piezoelectric materials might be used? | CAM<br>CNC<br>Piezoelectric<br>Smart material |  |

| | | | | | |
|---|---|---|---|---|---|
| **6** | Design Development | Explain an advantage and a disadvantage of using Shape memory alloys in glasses | State the properties and two uses of aluminium. You should include two advantages and two disadvantages of aluminium. | Shape memory alloy<br>Nitinol<br>Aluminium<br>Corrosion | |
| **7** | Design Development | Name a type of manufactured board and describe its properties | Describe what an alloy is. Give one example of an alloy | Manufactured board<br>Laminated<br>Plywood<br>Chipboard<br>Alloy | |
| 8 | CAD | Describe an example of CAD software | Explain the disadvantages of using CAD in design | CAD<br>Collaborative<br>Edited<br>Cyber attack<br>Software<br>Hardware | |
| 9 | CAD | Describe what possible social effect CAD/CAM could have? | Describe how Information and Communication Technology (ICT) can be used to communicate and present ideas during design development. | Video conferencing<br>Architectural<br>Silicon Valley | |
| 10 | Cutting list | State the properties and two uses of stainless steel. You should include two advantages and two disadvantages | In terms of sustainability discuss the use of glass for a milk bottle. | Stainless steel<br>Alloy<br>Chromium<br>Corrosion<br>Fatigue<br>Reused | |
| 11 | Workshop practical | Hard hat safety helmets as worn on construction sites are made from ABS<br>a. Name two properties that make ABS suitable for this product<br>b. What process is used to make it? | State if melamine formaldehyde is a thermoplastic or thermoset polymer<br>a. Describe the physical properties of melamine formaldehyde<br>b. Name two products made from this polymer | ABS<br>Thermoforming<br>Thermosetting<br>Recycled<br>Melamine formaldehyde | |
| 12 | Workshop practical | What is a risk of the laser cutter? How do you prevent this? | State three wood finishes and give an example of why you would use it | Laser cutter<br>Interlocked<br>Wood finishes<br>Aesthetics<br>Decay | |
| 13 | Workshop practical | Describe tracing paper | A plug socket is made from which material?<br>Melamine Formaldehyde Epoxy Resin Urea Formaldehyde | | |

| | | | | | |
|---|---|---|---|---|---|
| 14 | Workshop practical | An engineering company has decided to use corrugated board for the packaging of a common car part to ship to one of their customers. Can you give reasons in relation to the corrugated boards' physical characteristics (density) and working properties (flexibility, printability, biodegradability and weight) as why they selected this material? | Explain the difference between hardwoods and softwoods | |   |