



Kings Langley School

Unlocking Potential for Life



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D&T:

KS5 Product Design (*Pearson Edexcel - 9DT0*)

Tracker statements

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Year 12 – Learning Environments Project

Phase: Learning Environments Project 1 HOU & PHI	Check 1	Check 2	Final check
I can explain the course requirements			
I can carry out an effective site analysis			
I can use my site analysis to inform my research			
I can complete an effective product analysis			
I can carry out an effective client interview			
I can identify a range of appropriate research opportunities			
I can write an effective Design Brief			
I can write an effective Design Specification			
I can explain what rendering means			
I can render shapes to make them look 3D			
I can vary the weight of my pencil line			
I can through rendering replicate a series of different material textures			
I can freehand sketch			
I can produce an Orthographic drawing			
I can produce an Isometric drawing			
I can produce a One Point Perspective drawing			
I can produce a Two Point Perspective drawing			
I can cut safely using a craft knife			
I can confidently model using corrugated card board			
I can produce a model to scale			
I can use 2D Design			
I can use the laser cutter			

Year 12 – Pinewood Derby Car Project

Phase: Pinewood Derby Car Project 2 HOU	Check 1	Check 2	Final check
I can define block modelling			
I can block model using styrofoam			
I can block model using clay			
I can block model using Pine			
I can use the Vacuum former and produce an annotated diagram of the process			
I can use the 3D printer and produce an annotated diagram of the process			
I can use fusion 360 to create files for 3D printing			
I can cut safely using a Tenon Saw			
I can cut safely using a Coping Saw			
I can use a bench hook			
I can use a chisel safely			
I can Pewter cast safely			
I can use the pillar drill safely			
I can use vinyl to enhance graphical presentation			
I can design a net			
I can explain why tabs are important on a net			

Year 12 – Upcycling Design Challenge Project

Phase: Upcycling Design Challenge Project 3 HOU	Check 1	Check 2	Final check
I can explain the term upcycling			
I can explain why upcycling is important			
I can explain Life cycle assessment (LCA)			
I can explain why is it important to show environmental awareness			
I can use the orbital sander safely			
I can use spray paint safely			
I can identify an appropriate method of joining unlike materials together			
I can solve a design challenge creatively			

Year 12 – Tooth brush product design challenge Project

Phase: Tooth brush project design challenge Project 4 HOU	Check 1	Check 2	Final check
I can explain the purpose of packaging			
I can explain the purpose of a POSD			
I can identify appropriate materials used for packaging			
I can identify appropriate materials used for a POSD			
I can justify the material selection for a POSD			
I can justify the material selection for an item of packaging			

Year 12 and 13 Theory

Phase: Topic 1 - Materials	Check 1	Check 2	Final check
I can explain the differences between a Hardwood and a Softwood			
I can apply a knowledge and understanding of the working properties of Oak (<i>Hardwood</i>)			
I can discuss the characteristics of Oak (<i>Hardwood</i>)			
I can identify the applications of Oak (<i>Hardwood</i>)			
I can state the advantages of Oak (<i>Hardwood</i>)			
I can state the disadvantages of Oak (<i>Hardwood</i>)			
I can apply a knowledge and understanding of the working properties of Mahogany (<i>Hardwood</i>)			
I can discuss the characteristics of Mahogany (<i>Hardwood</i>)			
I can identify the applications of Mahogany (<i>Hardwood</i>)			
I can state the advantages of Mahogany (<i>Hardwood</i>)			
I can state the disadvantages of Mahogany (<i>Hardwood</i>)			
I can apply a knowledge and understanding of the working properties of Beech (<i>Hardwood</i>)			
I can discuss the characteristics of Beech (<i>Hardwood</i>)			
I can identify the applications of Beech (<i>Hardwood</i>)			
I can state the advantages of Beech (<i>Hardwood</i>)			
I can state the disadvantages of Beech (<i>Hardwood</i>)			
I can apply a knowledge and understanding of the working properties of Jelutong (<i>Hardwood</i>)			
I can discuss the characteristics of Jelutong (<i>Hardwood</i>)			
I can identify the applications of Jelutong (<i>Hardwood</i>)			
I can state the advantages of Jelutong (<i>Hardwood</i>)			
I can state the disadvantages of Jelutong (<i>Hardwood</i>)			

I can apply a knowledge and understanding of the working properties of Balsa (<i>Hardwood</i>)			
I can discuss the characteristics of Balsa (<i>Hardwood</i>)			
I can identify the applications of Balsa (<i>Hardwood</i>)			
I can state the advantages of Balsa (<i>Hardwood</i>)			
I can state the disadvantages of Balsa (<i>Hardwood</i>)			
I can apply a knowledge and understanding of the working properties of Pine (<i>Softwood</i>)			
I can discuss the characteristics of Pine (<i>Softwood</i>)			
I can identify the applications of Pine (<i>Softwood</i>)			
I can state the advantages of Pine (<i>Softwood</i>)			
I can state the disadvantages of Pine (<i>Softwood</i>)			
I can apply a knowledge and understanding of the working properties of Cedar (<i>Softwood</i>)			
I can discuss the characteristics of Cedar (<i>Softwood</i>)			
I can identify the applications of Cedar (<i>Softwood</i>)			
I can state the advantages of Cedar (<i>Softwood</i>)			
I can state the disadvantages of Cedar (<i>Softwood</i>)			
I can apply a knowledge and understanding of the working properties of Larch (<i>Softwood</i>)			
I can discuss the characteristics of Larch (<i>Softwood</i>)			
I can identify the applications of Larch (<i>Softwood</i>)			
I can state the advantages of Larch (<i>Softwood</i>)			
I can state the disadvantages of Larch (<i>Softwood</i>)			
I can apply a knowledge and understanding of the working properties of Redwood (<i>Softwood</i>)			
I can discuss the characteristics of Redwood (<i>Softwood</i>)			
I can identify the applications of Redwood (<i>Softwood</i>)			
I can state the advantages of Redwood (<i>Softwood</i>)			

I can state the disadvantages of Redwood (<i>Softwood</i>)			
I can explain the differences between Ferrous Metals, Non Ferrous Metals and Alloys			
I can apply a knowledge and understanding of the working properties of Mild Steel (<i>Ferrous</i>)			
I can discuss the characteristics of Mild Steel (<i>Ferrous</i>)			
I can identify the applications of Mild Steel (<i>Ferrous</i>)			
I can state the advantages of Mild Steel (<i>Ferrous</i>)			
I can state the disadvantages of Mild Steel (<i>Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Carbon Steels (<i>Ferrous</i>)			
I can discuss the characteristics of Carbon Steels (<i>Ferrous</i>)			
I can identify the applications of Carbon Steels (<i>Ferrous</i>)			
I can state the advantages of Carbon Steels (<i>Ferrous</i>)			
I can state the disadvantages of Carbon Steels (<i>Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Cast Iron (<i>Ferrous</i>)			
I can discuss the characteristics of Cast Iron (<i>Ferrous</i>)			
I can identify the applications of Cast Iron (<i>Ferrous</i>)			
I can state the advantages of Cast Iron (<i>Ferrous</i>)			
I can state the disadvantages of Cast Iron (<i>Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Aluminium (<i>Non-Ferrous</i>)			
I can discuss the characteristics of Aluminium (<i>Non-Ferrous</i>)			
I can identify the applications of Aluminium (<i>Non-Ferrous</i>)			
I can state the advantages of Aluminium (<i>Non-Ferrous</i>)			
I can state the disadvantages of Aluminium (<i>Non-Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Copper (<i>Non-Ferrous</i>)			

I can discuss the characteristics of Copper (<i>Non-Ferrous</i>)			
I can identify the applications of Copper (<i>Non-Ferrous</i>)			
I can state the advantages of Copper (<i>Non-Ferrous</i>)			
I can state the disadvantages of Copper (<i>Non-Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Zinc (<i>Non-Ferrous</i>)			
I can discuss the characteristics of Zinc (<i>Non-Ferrous</i>)			
I can identify the applications of Zinc (<i>Non-Ferrous</i>)			
I can state the advantages of Zinc (<i>Non-Ferrous</i>)			
I can state the disadvantages of Zinc (<i>Non-Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Tin (<i>Non-Ferrous</i>)			
I can discuss the characteristics of Tin (<i>Non-Ferrous</i>)			
I can identify the applications of Tin (<i>Non-Ferrous</i>)			
I can state the advantages of Tin (<i>Non-Ferrous</i>)			
I can state the disadvantages of Tin (<i>Non-Ferrous</i>)			
I can apply a knowledge and understanding of the working properties of Stainless Steel (<i>Alloy</i>)			
I can discuss the characteristics of Stainless Steel (<i>Alloy</i>)			
I can identify the applications of Stainless Steel (<i>Alloy</i>)			
I can state the advantages of Stainless Steel (<i>Alloy</i>)			
I can state the disadvantages of Stainless Steel (<i>Alloy</i>)			
I can apply a knowledge and understanding of the working properties of Duralumin (<i>Alloy</i>)			
I can discuss the characteristics of Duralumin (<i>Alloy</i>)			
I can identify the applications of Duralumin (<i>Alloy</i>)			
I can state the advantages of Duralumin (<i>Alloy</i>)			
I can state the disadvantages of Duralumin (<i>Alloy</i>)			

I can apply a knowledge and understanding of the working properties of Brass (Alloy)			
I can discuss the characteristics of Brass (Alloy)			
I can identify the applications of Brass (Alloy)			
I can state the advantages of Brass (Alloy)			
I can state the disadvantages of Brass (Alloy)			
I can explain the differences between a Thermoplastic, Thermosetting plastic and an Elastomer			
I can apply a knowledge and understanding of the working properties of Acrylic (Thermoplastic)			
I can discuss the characteristics of Acrylic (Thermoplastic)			
I can identify the applications of Acrylic (Thermoplastic)			
I can state the advantages of Acrylic (Thermoplastic)			
I can state the disadvantages of Acrylic (Thermoplastic)			
I can apply a knowledge and understanding of the working properties of Polyethylene (Thermoplastic)			
I can discuss the characteristics of Polyethylene (Thermoplastic)			
I can identify the applications of Polyethylene (Thermoplastic)			
I can state the advantages of Polyethylene (Thermoplastic)			
I can state the disadvantages of Polyethylene (Thermoplastic)			
I can apply a knowledge and understanding of the working properties of Polyethylene terephthalate (PET) (Thermoplastic)			
I can discuss the characteristics of Polyethylene terephthalate (PET) (Thermoplastic)			
I can identify the applications of Polyethylene terephthalate (PET) (Thermoplastic)			

I can state the advantages of Polyethylene terephthalate (PET) <i>(Thermoplastic)</i>			
I can state the disadvantages of Polyethylene terephthalate (PET) <i>(Thermoplastic)</i>			
I can apply a knowledge and understanding of the working properties of Polyvinyl chloride (PVC) <i>(Thermoplastic)</i>			
I can discuss the characteristics of Polyvinyl chloride (PVC) <i>(Thermoplastic)</i>			
I can identify the applications of Polyvinyl chloride (PVC) <i>(Thermoplastic)</i>			
I can state the advantages of Polyvinyl chloride (PVC) <i>(Thermoplastic)</i>			
I can state the disadvantages of Polyvinyl chloride (PVC) <i>(Thermoplastic)</i>			
I can apply a knowledge and understanding of the working properties of Polypropylene (PP) <i>(Thermoplastic)</i>			
I can discuss the characteristics of Polypropylene (PP) <i>(Thermoplastic)</i>			
I can identify the applications of Polypropylene (PP) <i>(Thermoplastic)</i>			
I can state the advantages of Polypropylene (PP) <i>(Thermoplastic)</i>			
I can state the disadvantages of Polypropylene (PP) <i>(Thermoplastic)</i>			
I can apply a knowledge and understanding of the working properties of Acrylonitrile butadiene styrene (ABS) <i>(Thermoplastic)</i>			
I can discuss the characteristics of Acrylonitrile butadiene styrene (ABS) <i>(Thermoplastic)</i>			
I can identify the applications of Acrylonitrile butadiene styrene (ABS) <i>(Thermoplastic)</i>			

I can state the advantages of Acrylonitrile butadiene styrene (ABS) (<i>Thermoplastic</i>)			
I can state the disadvantages of Acrylonitrile butadiene styrene (ABS) (<i>Thermoplastic</i>)			
I can apply a knowledge and understanding of the working properties of Epoxy resins (ER) (<i>Thermosetting plastics</i>)			
I can discuss the characteristics of Epoxy resins (ER) (<i>Thermosetting plastics</i>)			
I can identify the applications of Epoxy resins (ER) (<i>Thermosetting plastics</i>)			
I can state the advantages of Epoxy resins (ER) (<i>Thermosetting plastics</i>)			
I can state the disadvantages of Epoxy resins (ER) (<i>Thermosetting plastics</i>)			
I can apply a knowledge and understanding of the working properties of Urea formaldehyde (UF) (<i>Thermosetting plastics</i>)			
I can discuss the characteristics of Urea formaldehyde (UF) (<i>Thermosetting plastics</i>)			
I can identify the applications of Urea formaldehyde (UF) (<i>Thermosetting plastics</i>)			
I can state the advantages of Urea formaldehyde (UF) (<i>Thermosetting plastics</i>)			
I can state the disadvantages of Urea formaldehyde (UF) (<i>Thermosetting plastics</i>)			
I can apply a knowledge and understanding of the working properties of Polyester resin (PR) (<i>Thermosetting plastics</i>)			
I can discuss the characteristics of Polyester resin (PR) (<i>Thermosetting plastics</i>)			
I can identify the applications of Polyester resin (PR) (<i>Thermosetting plastics</i>)			

I can state the advantages of Polyester resin (PR) <i>(Thermosetting plastics)</i>			
I can state the disadvantages of Polyester resin (PR) <i>(Thermosetting plastics)</i>			
I can apply a knowledge and understanding of the working properties of elastomers – rubber			
I can discuss the characteristics of elastomers – rubber			
I can identify the applications of elastomers – rubber			
I can state the advantages of elastomers – rubber			
I can state the disadvantages of elastomers – rubber			
I can apply a knowledge and understanding of the working properties of composites - carbon fibre (CFRP)			
I can discuss the characteristics of composites - carbon fibre (CFRP)			
I can identify the applications of composites - carbon fibre (CFRP)			
I can state the advantages of composites - carbon fibre (CFRP)			
I can state the disadvantages of composites - carbon fibre (CFRP)			
I can apply a knowledge and understanding of the working properties of composites - glass fibre (GRP)			
I can discuss the characteristics of composites - glass fibre (GRP)			
I can identify the applications of composites - glass fibre (GRP)			
I can state the advantages of composites - glass fibre (GRP)			
I can state the disadvantages of composites - glass fibre (GRP)			

I can apply a knowledge and understanding of the working properties of composites - Medium Density Fibre Board (MDF)			
I can discuss the characteristics of composites - MDF			
I can identify the applications of composites - MDF			
I can state the advantages of composites - MDF			
I can state the disadvantages of composites - MDF			
I can apply a knowledge and understanding of the working properties of composites - hardboard			
I can discuss the characteristics of composites - hardboard			
I can identify the applications of composites - hardboard			
I can state the advantages of composites - hardboard			
I can state the disadvantages of composites - hardboard			
I can apply a knowledge and understanding of the working properties of composites - chipboard			
I can discuss the characteristics of composites - chipboard			
I can identify the applications of composites - chipboard			
I can state the advantages of composites - chipboard			
I can state the disadvantages of composites - chipboard			
I can apply a knowledge and understanding of the working properties of composites - plywood			
I can discuss the characteristics of composites - plywood			
I can identify the applications of composites - plywood			
I can state the advantages of composites - plywood			
I can state the disadvantages of composites - plywood			
I can apply a knowledge and understanding of the working properties of paper and board – layout paper			
I can discuss the characteristics of paper and board – layout paper			

I can identify the applications of paper and board – layout paper			
I can state the advantages of paper and board – layout paper			
I can state the disadvantages of paper and board – layout paper			
I can apply a knowledge and understanding of the working properties of paper and board – tracing paper			
I can discuss the characteristics of paper and board – tracing paper			
I can identify the applications of paper and board – tracing paper			
I can state the advantages of paper and board – tracing paper			
I can state the disadvantages of paper and board – tracing paper			
I can apply a knowledge and understanding of the working properties of paper and board – copier paper			
I can discuss the characteristics of paper and board – copier paper			
I can identify the applications of paper and board – copier paper			
I can state the advantages of paper and board – copier paper			
I can state the disadvantages of paper and board – copier paper			
I can apply a knowledge and understanding of the working properties of paper and board – cartridge paper			
I can discuss the characteristics of paper and board – cartridge paper			

I can identify the applications of paper and board – cartridge paper			
I can state the advantages of paper and board – cartridge paper			
I can state the disadvantages of paper and board – cartridge paper			
I can apply a knowledge and understanding of the working properties of commercial printing paper and board – bond paper			
I can discuss the characteristics of commercial printing paper and board – bond paper			
I can identify the applications of commercial printing paper and board – bond paper			
I can state the advantages of commercial printing paper and board – bond paper			
I can state the disadvantages of commercial printing paper and board – bond paper			
I can apply a knowledge and understanding of the working properties of commercial printing paper and board – coated paper			
I can discuss the characteristics of commercial printing paper and board – coated paper			
I can identify the applications of commercial printing paper and board – coated paper			
I can state the advantages of commercial printing paper and board – coated paper			
I can state the disadvantages of commercial printing paper and board – coated paper			
I can apply a knowledge and understanding of the working properties of board – mounting board			
I can discuss the characteristics of board – mounting board			

I can identify the applications of board – mounting board			
I can state the advantages of board – mounting board			
I can state the disadvantages of board – mounting board			
I can apply a knowledge and understanding of the working properties of board – corrugated board			
I can discuss the characteristics of board – corrugated board			
I can identify the applications of board – corrugated board			
I can state the advantages of board – corrugated board			
I can state the disadvantages of board – corrugated board			
I can apply a knowledge and understanding of the working properties of board – foam board			
I can discuss the characteristics of board – foam board			
I can identify the applications of board – foam board			
I can state the advantages of board – foam board			
I can state the disadvantages of board – foam board			
I can apply a knowledge and understanding of the working properties of board – folding box board			
I can discuss the characteristics of board – folding box board			
I can identify the applications of board – folding box board			
I can state the advantages of board – folding box board			
I can state the disadvantages of board – folding box board			
I can apply a knowledge and understanding of the working properties of board – foil-lined board			
I can discuss the characteristics of board – foil-lined board			
I can identify the applications of board – foil-lined board			
I can state the advantages of board – foil-lined board			
I can state the disadvantages of board – foil-lined board			

I can apply a knowledge and understanding of the working properties of textiles (natural fibres) – cotton			
I can discuss the characteristics of textiles (natural fibres) – cotton			
I can identify the applications of textiles (natural fibres) – cotton			
I can state the advantages of textiles (natural fibres) – cotton			
I can state the disadvantages of textiles (natural fibres) – cotton			
I can apply a knowledge and understanding of the working properties of textiles (natural fibres) – linen			
I can discuss the characteristics of textiles (natural fibres) – linen			
I can identify the applications of textiles (natural fibres) – linen			
I can state the advantages of textiles (natural fibres) – linen			
I can state the disadvantages of textiles (natural fibres) – linen			
I can apply a knowledge and understanding of the working properties of textiles (natural fibres) – wool			
I can discuss the characteristics of textiles (natural fibres) – wool			
I can identify the applications of textiles (natural fibres) – wool			
I can state the advantages of textiles (natural fibres) – wool			
I can state the disadvantages of textiles (natural fibres) – wool			
I can apply a knowledge and understanding of the working properties of textiles (manmade fibres) – nylon			

I can discuss the characteristics of textiles (manmade fibres) – nylon			
I can identify the applications of textiles (manmade fibres) – nylon			
I can state the advantages of textiles (manmade fibres) – nylon			
I can state the disadvantages of textiles (manmade fibres) – nylon			
I can apply a knowledge and understanding of the working properties of textiles (manmade fibres) – polypropylene			
I can discuss the characteristics of textiles (manmade fibres) – polypropylene			
I can identify the applications of textiles (manmade fibres) – polypropylene			
I can state the advantages of textiles (manmade fibres) – polypropylene			
I can state the disadvantages of textiles (manmade fibres) – polypropylene			
I can apply a knowledge and understanding of the working properties of textiles (manmade fibres) – polyester			
I can discuss the characteristics of textiles (manmade fibres) – polyester			
I can identify the applications of textiles (manmade fibres) – polyester			
I can state the advantages of textiles (manmade fibres) – polyester			
I can state the disadvantages of textiles (manmade fibres) – polyester			
I can apply a knowledge and understanding of the working properties of textile treatments – flame resistant			

I can discuss the characteristics of textile treatments – flame resistant			
I can identify the applications of textile treatments – flame resistant			
I can state the advantages of textile treatments – flame resistant			
I can state the disadvantages of textile treatments – flame resistant			
I can apply a knowledge and understanding of the working properties of textile treatments – polytetrafluoroethylene (PTFE)			
I can discuss the characteristics of textile treatments – polytetrafluoroethylene (PTFE)			
I can identify the applications of textile treatments – polytetrafluoroethylene (PTFE)			
I can state the advantages of textile treatments – polytetrafluoroethylene (PTFE)			
I can state the disadvantages of textile treatments – polytetrafluoroethylene (PTFE)			
I can apply a knowledge and understanding of the working properties of Smart and modern materials a) thermo-ceramics			
I can discuss the characteristics of Smart and modern materials a) thermo-ceramics			
I can identify the applications of Smart and modern materials a) thermo-ceramics			
I can state the advantages of Smart and modern materials a) thermo-ceramics			
I can state the disadvantages of Smart and modern materials a) thermo-ceramics			

I can apply a knowledge and understanding of the working properties of Smart and modern materials b) shape memory alloys (SMA)			
I can discuss the characteristics of Smart and modern materials b) shape memory alloys (SMA)			
I can identify the applications of Smart and modern materials b) shape memory alloys (SMA)			
I can state the advantages of Smart and modern materials b) shape memory alloys (SMA)			
I can state the disadvantages of Smart and modern materials b) shape memory alloys (SMA)			
I can apply a knowledge and understanding of the working properties of Smart and modern materials c) reactive glass			
I can discuss the characteristics of Smart and modern materials c) reactive glass			
I can identify the applications of Smart and modern materials c) reactive glass			
I can state the advantages of Smart and modern materials c) reactive glass			
I can state the disadvantages of Smart and modern materials c) reactive glass			
I can apply a knowledge and understanding of the working properties of Smart and modern materials d) liquid crystal displays (LCD)			
I can discuss the characteristics of Smart and modern materials d) liquid crystal displays (LCD)			
I can identify the applications of Smart and modern materials d) liquid crystal displays (LCD)			
I can state the advantages of Smart and modern materials d) liquid crystal displays (LCD)			

I can state the disadvantages of Smart and modern materials d) liquid crystal displays (LCD)			
I can apply a knowledge and understanding of the working properties of Smart and modern materials e) photo-chromic materials			
I can discuss the characteristics of Smart and modern materials e) photo-chromic materials			
I can identify the applications of Smart and modern materials e) photo-chromic materials			
I can state the advantages of Smart and modern materials e) photo-chromic materials			
I can state the disadvantages of Smart and modern materials e) photo-chromic materials			
I can apply a knowledge and understanding of the working properties of Smart and modern materials f) thermo-chromic materials			
I can discuss the characteristics of Smart and modern materials f) thermo-chromic materials			
I can identify the applications of Smart and modern materials f) thermo-chromic materials			
I can state the advantages of Smart and modern materials f) thermo-chromic materials			
I can state the disadvantages of Smart and modern materials f) thermo-chromic materials			
I can apply a knowledge and understanding of the working properties of Smart and modern materials g) quantum tunnelling composites.			
I can discuss the characteristics of Smart and modern materials g) quantum tunnelling composites.			
I can identify the applications of Smart and modern materials g) quantum tunnelling composites.			

I can state the advantages of Smart and modern materials g) quantum tunnelling composites.			
I can state the disadvantages of Smart and modern materials g) quantum tunnelling composites. In order to discriminate between them and select appropriately.			

Phase: Topic 2 – Performance characteristics of materials	Check 1	Check 2	Final check
I can define conductivity and select appropriate materials with this characteristic.			
I can define strength and select appropriate materials with this characteristic.			
I can define elasticity and select appropriate materials with this characteristic.			
I can define plasticity and select appropriate materials with this characteristic.			
I can define malleability and select appropriate materials with this characteristic.			
I can define ductility and select appropriate materials with this characteristic.			
I can define hardness and select appropriate materials with this characteristic.			
I can define toughness and select appropriate materials with this characteristic.			
I can define durability and select appropriate materials with this characteristic.			
I can define biodegradability and select appropriate materials with this characteristic.			

Phase: Topic 3 - Processes, techniques and specialist tools	Check 1	Check 2	Final check
<i>I can describe</i> heat treatments – hardening and tempering (including use of specialist tools)			
<i>I can describe</i> heat treatments – case hardening (including use of specialist tools)			
<i>I can describe</i> heat treatments – annealing (including use of specialist tools)			
<i>I can describe</i> heat treatments – normalising (including use of specialist tools)			
<i>I can describe</i> alloying (including use of specialist tools)			
<i>I can describe a range of</i> printing processes – offset lithology (including use of specialist tools)			
<i>I can describe a range of</i> printing processes – flexography (including use of specialist tools)			
<i>I can describe a range of</i> printing processes – screen-printing (including use of specialist tools)			
<i>I can describe a range of</i> printing processes – gravure (including use of specialist tools)			
<i>I can describe</i> casting – sand (to include investment) (including use of specialist tools)			
<i>I can describe</i> casting – die (including use of specialist tools)			
<i>I can describe</i> casting – resin (including use of specialist tools)			
<i>I can describe</i> casting – plaster of Paris (including use of specialist tools)			
<i>I can describe</i> machining – milling/routing (including use of specialist tools)			

<i>I can describe</i> machining – drilling (including use of specialist tools)			
<i>I can describe</i> machining – turning (including use of specialist tools)			
<i>I can describe</i> machining – stamping (including use of specialist tools)			
<i>I can describe</i> machining – pressing (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes – blow moulding, injection moulding, vacuum forming, extrusion, rotational moulding (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes – blow moulding (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes - injection moulding (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes – vacuum Forming (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes – extrusion (including use of specialist tools)			
<i>I can describe a range of</i> moulding processes - rotational moulding (including use of specialist tools)			
<i>I can describe</i> lamination (including use of specialist tools)			
<i>I can use a range of</i> marking out techniques on – woods (including use of specialist tools).			

<i>I can use a range of marking out techniques on – metals (including use of specialist tools).</i>			
<i>I can use a range of marking out techniques on – polymers (including use of specialist tools).</i>			
<i>I can use a range of marking out techniques on – paper and boards (including use of specialist tools).</i>			

Phase: Topic 4 – Digital technologies	Check 1	Check 2	Final check
I can Set up, safe and accurate operation and identify advantages of the following digital technologies: CAD (Computer aided design).			
I can Set up, safe and accurate operation and identify disadvantages of the following digital technologies: CAD (Computer aided design).			
I can Set up, safe and accurate operation, and identify advantages of the following digital technologies: CAM (Computer aided manufacture) and Rapid Prototyping.			
I can Set up, safe and accurate operation, and identify disadvantages of the following digital technologies: CAM (Computer aided manufacture) and Rapid Prototyping.			

Phase: Topic 5 – Factors influencing the development of products	Check 1	Check 2	Final check
The importance and influence of user centred design in ensuring products are fit-for-purpose and meet the criteria of specifications when designing, making and evaluating in relation to: a) user needs, wants and values			

The importance and influence of user centred design in ensuring products are fit-for-purpose and meet the criteria of specifications when designing, making and evaluating in relation to: b) purpose			
The importance and influence of user centred design in ensuring products are fit-for-purpose and meet the criteria of specifications when designing, making and evaluating in relation to: c) functionality			
The importance and influence of user centred design in ensuring products are fit-for-purpose and meet the criteria of specifications when designing, making and evaluating in relation to: d) innovation			
The importance and influence of user centred design in ensuring products are fit-for-purpose and meet the criteria of specifications when designing, making and evaluating in relation to: e) authenticity			
Principles, applications and the influence on design of anthropometrics and ergonomics: a) sources and applications of anthropometric data			
Principles, applications and the influence on design of anthropometrics and ergonomics: b) ergonomic factors for a designer to consider when			

developing products and environments with which humans react.			
The influence of aesthetics, ergonomics and anthropometrics on the design, development and manufacture of products: a) form over function			
The influence of aesthetics, ergonomics and anthropometrics on the design, development and manufacture of products: b) form follows function.			
I can explain the philosophies of Arts and Crafts			
I can identify the work of William Morris			
I can explain the philosophies of Art Nouveau			
I can identify the work of Charles Rennie Mackintosh			
I can explain the philosophies of Bauhaus			
I can identify the work of Marianne Brandt			
I can explain the philosophies of Art Deco			
I can identify the work of Eileen Gray			
I can explain the philosophies of Post Modernism			
I can identify the work of Philippe Starck			
I can explain the philosophies of Streamlining			
I can identify the work of Raymond Lowey			
I can explain the philosophies of Memphis			
I can identify the work of Ettore Sottsass.			

Phase: Topic 6 - Effects of technological developments	Check 1	Check 2	Final check
<p>I can explain Current and historical technological developments that have had an effect on the work of designers and technologists and their social, moral and ethical impacts: a) mass production – the consumer society, built-in obsolescence, the effect mass production has on employment</p>			
<p>I can explain Current and historical technological developments that have had an effect on the work of designers and technologists and their social, moral and ethical impacts: b) the ‘new’ industrial age of high-technology production – computers and the development and manufacture of products, miniaturisation of products and components, the use of smart materials, products from innovative applications</p>			
<p>I can explain Current and historical technological developments that have had an effect on the work of designers and technologists and their social, moral and ethical impacts:</p>			

<p>c) the global marketplace – multinational companies in developed and developing countries, manufacturing 'offshore' in developing countries and local and global production.</p>			
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Phase: Topic 7 - Safe working practices, potential hazards and risk assessment	Check 1	Check 2	Final check
<p>I can adopt safe working practices, recognise and react to potential hazards: a) understanding safe working practices for yourself and others when designing and making, including when selecting and safely using machinery, equipment and tools in order to ensure safe working environments</p>			
<p>I can adopt safe working practices, recognise and react to potential hazards: b) understanding the need for risk assessments – identification of potential hazards, identification of people at risk, evaluation of risks, implement control measures, recording and storing of risk assessment documentation.</p>			

Phase: Topic 8 - Features of manufacturing industries	Check 1	Check 2	Final check
I can discuss the characteristics and stages of the following method of production when applied to products and materials: a) one-off production			
I can discuss the characteristics and stages of the following method of production when applied to products and materials: b) batch production			
I can discuss the characteristics and stages of the following method of production when applied to products and materials: c) mass production			
I can discuss the characteristics of the following quality monitoring system a) quality control – the monitoring and achieving of high standards and degree of tolerance by inspection and testing, computer-aided testing			
I can discuss the applications of the following quality monitoring system a) quality control – the monitoring and achieving of high standards and degree of tolerance by inspection and testing, computer-aided testing			

I can discuss the advantages of the following quality monitoring system a) quality control – the monitoring and achieving of high standards and degree of tolerance by inspection and testing, computer-aided testing			
I can discuss the disadvantages of the following quality monitoring system a) quality control – the monitoring and achieving of high standards and degree of tolerance by inspection and testing, computer-aided testing			
I can discuss the characteristics of the following quality monitoring system b) quality assurance – monitoring the quality of a product from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction			
I can discuss the applications of the following quality monitoring system b) quality assurance – monitoring the quality of a product from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction			
I can discuss the advantages of the following quality monitoring system b) quality assurance – monitoring the quality of a product			

<p>from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction</p>			
<p>I can discuss the disadvantages of the following quality monitoring system b) quality assurance – monitoring the quality of a product from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction</p>			
<p>I can discuss the characteristics of the following quality monitoring system c) Total Quality Management (TQM) – when applied to quality assurance procedures and its impact on employees at every stage of the production process, ISO 9000</p>			
<p>I can discuss the applications of the following quality monitoring system c) Total Quality Management (TQM) – when applied to quality assurance procedures and its impact on employees at every stage of the production process, ISO 9000</p>			
<p>I can discuss the advantages of the following quality monitoring system c) Total Quality Management (TQM) – when applied to quality assurance procedures and its impact on</p>			

employees at every stage of the production process, ISO 9000			
I can discuss the disadvantages of the following quality monitoring system c) Total Quality Management (TQM) – when applied to quality assurance procedures and its impact on employees at every stage of the production process, ISO 9000			
I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: a) production scheduling and production logistics			
I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: b) robotics in production – robots on fully-automated			

production and assembly lines/cells			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: c) materials handling systems – automated storage and retrieval systems (ASRS), automatic guided vehicles (AGVs)</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: d) flexible manufacturing systems (FMS), modular/cell production systems</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of</p>			

<p>production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: e) lean manufacturing using just-in-time (JIT) systems</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: f) standardised parts, bought-in components</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: g) quick response manufacturing (QRM)</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of</p>			

<p>production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: h) data integration – product data management (PDM), enterprise resource planning (ERP) systems</p>			
<p>I can identify and discuss the characteristics, processes, application, advantages and disadvantages and the importance of considering accuracy of production and efficiency of modern manufacturing methods and systems when designing for manufacture for small, medium and large scale production: i) concurrent manufacturing.</p>			

Phase: Topic 9 - Designing for maintenance and the cleaner environment	Check 1	Check 2	Final check
<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues: a) material selection – source, quantity, quality, range, recyclability, biodegradability</p>			

<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues:</p> <p>b) manufacture – minimising energy use, simplification of processes, achieving optimum use of materials and components, giving consideration to material form, cost and scale of production</p>			
<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues:</p> <p>c) distribution – efficient use of packaging, reduction of transport, alternatives to fossil fuels</p>			
<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues:</p> <p>d) use – repair versus replacement, energy efficiency, efficiency ratings</p>			

<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues: e) repair and maintenance – standardisation, modular construction, bought in parts</p>			
<p>I can identify and discuss the characteristics, application, advantages and disadvantages of 'cleaner' design and technology – a product's life cycle in relation to the following sustainable development issues: f) end of life – design for disassembly, recovered material collection, sorting and re-processing methods, energy recovery, environmental implications of disposal to landfill.</p>			
<p>I can identify and discuss the wider issues of using cleaner technologies: a) cost implications to the consumer and manufacturer</p>			
<p>I can identify and discuss the wider issues of using cleaner technologies: b) sustainability – designing without jeopardising the</p>			

potential for people in the future to meet their needs.			
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Phase: Topic 10 - Current legislation	Check 1	Check 2	Final check
I can discuss from the consumer's point of view the implications of consumer rights legislation to consumers and manufacturers: a) Consumer Rights Act (2015)			
I can discuss from the consumer's point of view the implications of consumer rights legislation to consumers and manufacturers: b) Sale of Goods Act (1979)			
I can discuss the principles and applications of health and safety laws and regulations and their impact on the designing and making process, including the consequences of non-adherence: a) health and safety regulation – the Health and Safety Executive and an awareness of relevant regulations to manufacturing industries			
I can discuss the principles and applications of health and safety laws and regulations and their impact on the designing and making process, including the consequences of non-adherence: b) Health and Safety at Work etc Act (1974) – the procedures to safeguard the risk of injury to people: personal protective equipment (PPE), signage, warning symbols			

<p>I can discuss the principles and applications of health and safety laws and regulations and their impact on the designing and making process, including the consequences of non-adherence:</p> <p>c) Control of Substances Hazardous to Health (COSHH) regulations – the storage and use of solvent-based substances containing volatile organic compounds (VOCs).</p>			
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Phase: Topic 11 – Information handling, modelling and forward planning	Check 1	Check 2	Final check
<p>I can discuss the collection, collation and analysis of information and the use of this to make informed decisions:</p> <p>a) marketing – marketing analysis, research techniques, raw data/analysed data to enable enterprise to be encouraged</p>			
<p>I can discuss the collection, collation and analysis of information and the use of this to make informed decisions:</p> <p>b) innovation management – cooperation between management, designers and production engineers, the encouragement of creativity</p>			
<p>I can discuss the collection, collation and analysis of information and the use of this to make informed decisions:</p> <p>c) the use of feasibility studies on the practicability of proposed solutions.</p>			

<p>I can discuss modelling the costing of projects to achieve an optimum outcome: a) budgets – undertake financial forecasts</p>			
<p>I can discuss modelling the costing of projects to achieve an optimum outcome: b) planning for production – allocation of: o employees o materials o scale of production</p>			
<p>I can discuss modelling the costing of projects to achieve an optimum outcome: c) selection of appropriate tools, machines and manufacturing processes.</p>			
<p>I can explain and discuss the importance, implications and ways of protecting the intellectual property rights of designers, inventors and companies: a) patents</p>			
<p>I can explain and discuss the importance, implications and ways of protecting the intellectual property rights of designers, inventors and companies: b) copyrights</p>			
<p>I can explain and discuss the importance, implications and ways of protecting the intellectual property rights of designers, inventors and companies: c) design rights</p>			
<p>I can explain and discuss the importance, implications and ways of protecting the</p>			

intellectual property rights of designers, inventors and companies: d) trademarks			
I can explain and discuss the implication to designers, manufacturers and consumers of the following standards when developing designs and manufacturing products: a) British Standards (BSI and kite mark)			
I can explain and discuss the implication to designers, manufacturers and consumers of the following standards when developing designs and manufacturing products: b) European (CEN and CE)			
I can explain and discuss the implication to designers, manufacturers and consumers of the following standards when developing designs and manufacturing products: c) International Standards (ISO)			

Phase: Topic 12 - Further processes and techniques	Check 1	Check 2	Final check
I can explain and discuss strategies, techniques and approaches to explore, create and evaluate design ideas: a) user-centred design: o framework process o problem solving o user needs, wants and values o limitations of end user consideration			

<p>I can explain and discuss strategies, techniques and approaches to explore, create and evaluate design ideas: b) circular economy – biologically-based systems and an understanding of how waste and pollution can be eliminated</p>			
<p>I can explain and discuss strategies, techniques and approaches to explore, create and evaluate design ideas: c) systems thinking – the influence of systems on commercial activity to enable all elements of a manufacturing enterprise to work together</p>			
<p>I can explain and discuss the applications, characteristics, advantages and disadvantages of the following project management strategies: a) critical path analysis – the handling of complex and time sensitive operations</p>			
<p>I can explain and discuss the applications, characteristics, advantages and disadvantages of the following project management strategies: b) scrum – how flexible, holistic product development is achieved</p>			
<p>I can explain and discuss the applications, characteristics, advantages and disadvantages of the following project management strategies: c) Six Sigma – the improvement of output quality of a process by identifying and removing the causes of defects and setting value targets of: o reduce process cycle time</p>			

<ul style="list-style-type: none">o reduce pollutiono reduce costso increase customer satisfactiono increase profits.			
<p>I can explain and discuss the cost, sales, profit and market implications to the designer and manufacturer of the stages of a product's life cycle:</p> <ul style="list-style-type: none">● Introduction Stage● Growth Stage● Maturity Stage● Decline Stage.			

Year 13 NEA

Phase 1: Investigation (9 marks)	Check 1	Check 2	Final check
I can show evidence of a range of pertinent design possibilities.			
I can justify a design possibility.			
I can investigate the needs and wants of a client.			
I can use these needs to inform design requirements.			

Phase 2: Research (15 marks)	Check 1	Check 2	Final check
I can assess the needs and wants of the user			
I can identify the needs for a prototype			
I can show consideration of form			
I can show consideration of function			
I can show consideration of sustainability			
I can show an awareness of the scale of production			
I can complete a product analysis			
I can conduct a client interview			
I can define Anthropometrics			
I can define Ergonomics			
I can create a focussed Mood Board			
I can select and carry out a range of appropriate additional research			
I can complete an effective site/location analysis			
I can identify a range of appropriate materials and processes			

Phase 3: Specification (9 marks)	Check 1	Check 2	Final check
I can write an effective Design Brief			

I can write a detailed Design Specification			
I can justify my specification criteria			
I can identify performance/success criteria			

Phase 4: Design Ideas (9 marks)	Check 1	Check 2	Final check
I can confidently deploy a range of different design strategies			
I can identify appropriate materials and processes			
I can use a range of drawing techniques			
I can reference historical and or cultural influences in my design ideas			
I can produce sketches			
I can manufacture prototypes			
I can use CAD simulation software			
I can evaluate my design ideas			
I can review my design ideas			
I can lease effectively with my client			
I can document my findings effectively to generate development opportunities			

Phase 5: Development (9 marks)	Check 1	Check 2	Final check
I can analyse my research			
I can use my research to inform my design decisions			
I can define iteration			
I can demonstrate iteration through development			
I can conduct client feedback during the design and development process			
I can produce an isometric drawing			
I can produce a third angle Orthographic drawing			
I can produce a single point perspective drawing			

I can produce a double point perspective drawing			
I can annotate my work showing knowledge of materials			
I can annotate my work showing knowledge of processes			
I can use block modelling to develop my idea			
I can use 2D Design and the laser cutter			
I can use fusion 360 and the 3D printer			
I can use a range of sophisticated modelling/simulation techniques to develop my final prototype			

Phase 6: Final Design (9 marks)	Check 1	Check 2	Final check
I can produce a detailed manufacturing specification that comprehensively addresses the needs and wants of the client/end user is presented that includes comprehensive technical details to allow fully accurate interpretation by a third party			
I can show sophisticated refinement of design proposals to generate a design solution that comprehensively meets the requirements of the design specification.			
I can show calculations of material costs and quantities.			
I can demonstrate how to reduce wastage			

Phase 7: Review of Development and Final Idea (12 marks)	Check 1	Check 2	Final check
I can comprehensively analyse/evaluate developments			
I can collect and present feedback from others			
I can comprehensively evaluate material selection			
I can comprehensively evaluate process selection			
I can objectively evaluate developments			

I can draw conclusions and make decisions from analysis and evaluation in order to meet my specification			
I can analyse and evaluate the work of others			
I can present perceptive and balanced evaluation of the other work of others in order to inform design decisions			

Phase 8: Communication of Ideas (6 marks)	Check 1	Check 2	Final check
I can select and use a range of traditional/manual graphical techniques to communicate design proposals			
I can select and use a range of computer-aided design (CAD) techniques to communicate design proposals			
I can select and use a range of written techniques to communicate design proposals			

Phase 9: Tools and Equipment (12 marks)	Check 1	Check 2	Final check
I can select materials, fixtures, components and fittings which are fully appropriate for the final prototype			
I can justify material selection through knowledge of their working properties			
I can justify material selection based on the needs/requirements of the end user			
I can justify material selection based on the intended purpose of the prototype			
I can use tools, equipment and techniques to prepare materials for the manufacture of the prototype, showing an in-depth understanding of the need for dimensional and geometric accuracy			
I can demonstrate a consistently high degree of safe working practice for self and others.			

Phase 10: Quality and Accuracy (18 marks)	Check 1	Check 2	Final check
I can produce a prototype that demonstrates accomplished making skills at an advanced level in relation to a sophisticated design problem			
I can produce a fully functional prototype which matches the end user needs			
I can produce a prototype that fully meets the design specification			
I can show sophisticated application of an iterative approach to manufacture to produce a prototype			

Phase 11: Testing and Evaluation (12 marks)	Check 1	Check 2	Final check
I can comprehensively analyse the prototype, taking into account refinements implemented during the development and the client/end user specification, showing a perceptive approach to testing against most measurable criteria			
I can evaluate the prototype, taking into account the iterative design process and the intended purpose of the prototype, drawing balanced conclusions from testing against measurable criteria			
I can comprehensively develop analysis of the social, moral, ethical and environmental impact of materials and manufacturing processes of the prototype			
I can show evaluation of the social, moral, ethical and environmental impact of the prototype			