

# A-Level D&T (Product Design): Theory PLCs

## Part 1: Technical Principles

Read IT The page in your revision guide		Record IT Use simplified notes, diagrams, images	Rag IT High / Medium / Low Understanding			
	I can know and understand:		Page	R	A	G
	<b>1-Materials and their applications</b> <ul style="list-style-type: none"> <li>Mechanical properties of materials</li> <li>Physical properties of materials</li> </ul>		1-2			
	<b>2-Classification of materials</b> <ul style="list-style-type: none"> <li>Metals</li> <li>Woods</li> <li>Polymers</li> <li>Paper &amp; boards</li> <li>Composites</li> <li>Smart materials</li> <li>Modern materials</li> </ul>		3-5			
	<b>3-Methods for investigating and testing materials</b> <ul style="list-style-type: none"> <li>Materials testing</li> <li>Simple workshop tests</li> <li>Industrial tests</li> </ul>		6-9			
	<b>4-Performance characteristics of paper and boards</b> <ul style="list-style-type: none"> <li>Types of paper and boards</li> <li>The performance characteristics</li> </ul>		10-11			
	<b>5-Performance characteristics of polymer-based sheet and film</b> <ul style="list-style-type: none"> <li>Polymer film</li> <li>Polymer sheet</li> </ul>		12-13			
	<b>6-Performance characteristics of woods</b> <ul style="list-style-type: none"> <li>Stock forms of timber</li> <li>Characteristics of wood</li> <li>Different woods, performance characteristics and their applications</li> </ul>		14-17			
	<b>7-Performance characteristics of metals</b> <ul style="list-style-type: none"> <li>Stock forms of metal</li> <li>Characteristics of metals and different applications for use</li> </ul>		18-20			
	<b>8-Performance characteristics of polymers</b> <ul style="list-style-type: none"> <li>Stock forms of polymers</li> <li>Characteristics of polymers</li> </ul>		21-23			
	<b>9-Biodegradable polymers</b> <ul style="list-style-type: none"> <li>Characteristics of biodegradable polymers</li> <li>Degradation</li> </ul>		24-25			
	<b>10-Composites</b> <ul style="list-style-type: none"> <li>Characteristics of composites</li> </ul>		26-27			
	<b>11-Smart materials</b> <ul style="list-style-type: none"> <li>Characteristics of smart materials</li> </ul>		28-29			
	<b>12-Modern materials</b> <ul style="list-style-type: none"> <li>Characteristics of modern materials</li> </ul>		30			
	<b>13-Enhancement of materials</b> <ul style="list-style-type: none"> <li>Polymer enhancement</li> <li>Wood enhancement</li> <li>Metal enhancement</li> </ul>		31-34			
	<b>14-Paper and board forming processes</b> <ul style="list-style-type: none"> <li>Die cutting and creasing</li> <li>Bending</li> <li>Laser cutting</li> </ul>		35-36			
	<b>15-Polymer processes</b> <ul style="list-style-type: none"> <li>Vacuum forming</li> <li>Thermoforming</li> <li>Calendaring</li> <li>Line bending</li> <li>Lamination</li> <li>Injection moulding</li> <li>Blow moulding</li> <li>Rotational moulding</li> <li>Extrusion</li> <li>Compression moulding</li> </ul>		37-39			
	<b>16-Metal processes</b> <ul style="list-style-type: none"> <li>Addition/fabrication processes</li> <li>Temporary fasteners and joining methods</li> <li>Wasting processes</li> </ul>		40-48			

	Topic	Page	R	A	G
	<b>17-Wood processes</b> <ul style="list-style-type: none"> <li>○ Addition/fabrication processes</li> <li>○ Forming processes</li> </ul>	49-51			
	<b>18-Adhesives and fixings</b> <ul style="list-style-type: none"> <li>○ Polyvinyl acetate (PVA)</li> <li>○ Contact adhesive</li> <li>○ UV hardening adhesive</li> <li>○ Solvent cement</li> <li>○ Epoxy resin</li> <li>○ Jigs and fixtures</li> </ul>	52-53			
	<b>19-The use of finishes</b> <ul style="list-style-type: none"> <li>○ Paper and board finishing</li> <li>○ Paper and board printing processes</li> <li>○ Polymer finishing</li> <li>○ Metal finishing</li> <li>○ Cathodic protection</li> <li>○ Wood finishing</li> </ul>	54-62			
	<b>20-Modern industrial and commercial practice</b> <ul style="list-style-type: none"> <li>○ Scales of production</li> <li>○ Efficient use of materials</li> <li>○ The use of computer systems</li> <li>○ Sub-assembly</li> </ul>	63-72			
	<b>21-Digital design and manufacture</b> <ul style="list-style-type: none"> <li>○ Computer aided design (CAD)</li> <li>○ Computer aided manufacture (CAM)</li> <li>○ Virtual modelling</li> <li>○ Rapid prototyping processes</li> <li>○ Electronic data interchange</li> <li>○ Production, planning and control (PPC) networking</li> </ul>	73-78			
	<b>22-The requirements for the product design and development</b> <ul style="list-style-type: none"> <li>○ Product development and improvement</li> <li>○ Inclusive design</li> </ul>	79-85			
	<b>23-Health and safety</b> <ul style="list-style-type: none"> <li>○ Safe working practices</li> <li>○ Safety in products and services to the customer</li> </ul>	86-90			
	<b>24-Protecting designs and intellectual property</b> <ul style="list-style-type: none"> <li>○ Intellectual property (IP)</li> <li>○ Copyright and design rights</li> <li>○ Patents</li> <li>○ Registered designs</li> <li>○ Trademarks and logos</li> <li>○ Open design</li> </ul>	91-93			
	<b>25-Design for manufacturing, maintenance, repair and disposal</b> <ul style="list-style-type: none"> <li>○ Ease of manufacture</li> <li>○ Disassembly</li> </ul>	94-99			
	<b>26-Feasibility studies</b> <ul style="list-style-type: none"> <li>○ Computer modelling in production planning</li> <li>○ Feasibility studies and costings</li> <li>○ Feasibility modelling in design</li> <li>○ Testing prototypes</li> </ul>	100-101			
	<b>27-Enterprise and marketing in the development of products</b> <ul style="list-style-type: none"> <li>○ The importance of marketing and brand identity</li> <li>○ Collaborative work</li> </ul>	102-105			
	<b>28-Design communication</b> <ul style="list-style-type: none"> <li>○ Report writing</li> <li>○ The use of graphs, tables and charts</li> <li>○ 2D and 3D drawing</li> <li>○ Dimensioning and details for manufacture</li> </ul>	106-109			
	<b>29-Modern manufacturing systems</b>	110			

## Next Steps

### Revisit IT

Add more detail or find out more about it

### Revise IT

Test yourself, be tested, practise answers

### Re-Rag IT

Any gaps? Target them

Access the PG ONLINE units on the school network.  
Use your revision APPS and E-Book of the revision guide.  
Carry out [web based research](#)  
Search the topics on YouTube, watch videos and make notes.

Attend subject theory surgery sessions at lunchtime or after school. Make use of the other subject textbooks in the classroom  
Check your exam feedback forms (question level analysis)  
Green pen previous exams