

Yr 11 GCSE Design and Technology (AQA):

Core Technical Principles (all page references refer to your Blue CGP revision book)

Topic	R	A	G	To further your understanding try answering these questions:	Page ref.
New and Emerging Technologies					
Industry				<ul style="list-style-type: none"> How do new and emerging technologies (including automation and robotics) impact on: <ul style="list-style-type: none"> the design and organisation of the workplace? buildings and place of work? tools and equipment? 	2,3,4
Enterprise				<ul style="list-style-type: none"> What is crowd funding and how does it work? What is meant by virtual marketing and retail? What is a cooperative and what are the advantages of them? What is fair trade and what are the benefits to the different parties? 	10
Sustainability				<ul style="list-style-type: none"> What is the impact of the following on the planet: <ul style="list-style-type: none"> finite resources? non-finite resources? disposal of waste? 	6,7,8
People				<ul style="list-style-type: none"> What are technology push and market pull? How do these affect product choice? 	10
Culture				<ul style="list-style-type: none"> How can fashion and trends have an impact on new/ emerging technologies? Give an example (maybe Apple?). How can someone's faith/ belief influence what they will/ won't buy? 	10
Society				<ul style="list-style-type: none"> How are products designed/ made so they don't have a negative impact on: <ul style="list-style-type: none"> disabled? elderly? different religious groups? 	10,35
Environment				<ul style="list-style-type: none"> What are the positive and negative impacts of the following on the environment: <ul style="list-style-type: none"> Continuous improvement? Efficient working? Pollution? Global warming? 	6,7
Production techniques and systems				<ul style="list-style-type: none"> Can you explain what each of the following are: <ul style="list-style-type: none"> Automation CAD CAM Flexible Manufacturing Systems (FMS) Just in Time (JIT) Lean manufacturing 	3,4,5
How the critical evaluation of new and emerging technologies informs design decisions				<ul style="list-style-type: none"> What is planned obsolescence? How can you design for maintenance? 	7

Energy generation and storage					
Fossil fuels				<ul style="list-style-type: none"> • How is power generated from: <ul style="list-style-type: none"> • Coal? • Gas? • Oil? • What are the pros and cons of using each fossil fuel? 	12,13
Nuclear power				<ul style="list-style-type: none"> • How is nuclear power generated? • What are the pros and cons of using nuclear power? 	12
Renewable energy				<ul style="list-style-type: none"> • How is power generated from: <ul style="list-style-type: none"> ○ Wind? ○ Solar? ○ Tidal? ○ Hydro-electrical? ○ Biomass? • What are the pros and cons of using each renewable energy type? 	12,13
Energy storage systems including batteries				<ul style="list-style-type: none"> • What is a kinetic pumped storage system? • How do batteries work? 	13
Developments in new materials					
Modern materials				<ul style="list-style-type: none"> • What is a 'new material?' • What are Graphene, Metal Foams, Titanium, LCDs and nanomaterials? 	32
Smart materials				<ul style="list-style-type: none"> • What is a 'smart material?' • What stimuli can the react to? • What properties can be affected? • Can you explain three different smart materials? 	33
Composite materials				<ul style="list-style-type: none"> • What is a 'composite material?' • Can you explain GRP and CRP? 	33
Technical textiles				<ul style="list-style-type: none"> • What is a 'technical textile?' • Can you explain conductive materials, fire resistant fabrics, Kevlar and microfibers/ microencapsulation? 	33
Systems approach to designing					
Inputs				<ul style="list-style-type: none"> • What is an 'input' device? • Can you name four? 	24,25
Processes				<ul style="list-style-type: none"> • What is a 'process' and how can it affect an electronic system? 	24,26,27
Outputs				<ul style="list-style-type: none"> • What is an 'output' device? Can you name three? 	24,27
Mechanical devices					
Different types of movement				<ul style="list-style-type: none"> • What are the four types of movement? • Give an example for each. 	28,29, 30,31
Changing magnitude and direction of force				<ul style="list-style-type: none"> • Levers come in three orders – can you explain each of the following, with examples: <ul style="list-style-type: none"> ○ First order? ○ Second order? ○ Third order? • What is a linkage, bell crank and push-pull linkage? • Can you explain the following rotary systems, with examples: <ul style="list-style-type: none"> ○ Cams and followers? ○ Gear trains? ○ Pulleys and belts? 	28,29

Materials and their working properties					
Paper and Board				<ul style="list-style-type: none"> • Can you explain the following papers and their working properties? <ul style="list-style-type: none"> ○ Bleed-proof ○ Cartridge ○ Grid ○ Layout/ tracing • Can you explain the following boards and their working properties? <ul style="list-style-type: none"> ○ Corrugated ○ Duplex ○ Foil lined ○ Ink jet card ○ Solid white 	16,17,44,48,49
Natural and manufactured timbers				<ul style="list-style-type: none"> • Can you explain the difference between a hardwood, softwood and manufactured board? • Can you explain the following hardwoods and their working properties? <ul style="list-style-type: none"> ○ Ash ○ Beech ○ Mahogany ○ Oak ○ Balsa • Can you explain the following softwoods and their working properties? <ul style="list-style-type: none"> ○ Larch ○ Pine ○ Spruce • Can you explain the following manufactured boards and their working properties? <ul style="list-style-type: none"> ○ MDF ○ Plywood ○ Chipboard 	17,44
Metals and alloys				<ul style="list-style-type: none"> • Can you explain the difference between ferrous, non-ferrous and alloy? • Can you explain the following ferrous metals and their working properties? <ul style="list-style-type: none"> ○ Low carbon steel ○ Cast iron ○ High carbon steel • Can you explain the following non-ferrous metals and their working properties? <ul style="list-style-type: none"> ○ Aluminium ○ Copper ○ Tin ○ Zinc • Can you explain the following alloys and their working properties? <ul style="list-style-type: none"> ○ Brass ○ Stainless steel ○ High speed steel 	18,19,45
Polymers				<ul style="list-style-type: none"> • Can you explain the difference between thermosetting plastics and thermoforming plastics? • Can you explain the following thermosetting plastics and their working properties? <ul style="list-style-type: none"> ○ Epoxy resin ○ Melamine Formaldehyde 	19,45

				<ul style="list-style-type: none"> ○ Phenol Formaldehyde ○ Polyester resin ○ Urea Formaldehyde <ul style="list-style-type: none"> • Can you explain the following thermoforming plastics and their working properties? <ul style="list-style-type: none"> ○ Acrylic ○ HIPS ○ HDPE ○ PP ○ PVC ○ PET 	
Textiles				<ul style="list-style-type: none"> • Can you explain the following natural fibres and their working properties? <ul style="list-style-type: none"> ○ Cotton ○ Wool ○ silk • Can you explain the following synthetic fibres and their working properties? <ul style="list-style-type: none"> ○ Polyester ○ Nylon ○ Elastane/ Lycra • Can you explain the following blended and mixed fibre and its working properties? <ul style="list-style-type: none"> ○ Cotton/polyester • Can you explain the following woven material and its working properties? <ul style="list-style-type: none"> ○ Plain weave • Can you explain the following non-woven fabrics and their working properties? <ul style="list-style-type: none"> ○ Bonded ○ Felted • Can you explain the following knitted textile and its working properties? <ul style="list-style-type: none"> ○ Knitted fabric 	20,21, 43,46
Materials Properties					
Materials Properties				<ul style="list-style-type: none"> • Can you explain the following 'working properties?' <ul style="list-style-type: none"> ○ Strength ○ Elasticity ○ Ductility ○ Malleability ○ Hardness ○ Toughness 	59