D&T Final countdown – GCSE examination 2024

Name _____

Faculty:	Date of exam	Exam title	Duration	Exam board
D&T	18th June 2024	D&T in the 21st century	2 hours	Eduqas

Date	Task to be revised	GCSE Pod link
18th March	You need to create a mind map of metals. Include ferrous and non-ferrous. Which are alloys, what are their properties and what are they used in. Method of revision = Mind map.	
25th March **Easter Holiday**	You need to complete the tables on of paper and boards. Include the meaning of GSM, Microns, standard sizes and uses. Method of revision = Table and questions.	
1st April **Easter Holiday**	You need to complete the mind maps on natural woods and manufactured boards. Method of revision = Mind map and questions	
8th April	You need to complete the questions and tables on natural and synthetic fibres. Method of revision = Tables and questions.	
15th April	You need to complete the mind maps and tables on thermosetting and thermoforming polymers. Method of revision = Tables and mind maps. You need to complete the glossary of key words to explain the physical properties of materials. *You will need to research beyond the content of the video for some.* Method of revision = Glossary of key words.	
22nd April	You need to complete the table on smart materials and technical textiles. Method of revision = Table	
29th April	You need to complete a poster on 'Factors that effect your choice of plastic'. **In-depth knowledge.** Method of revision = Poster	
6th May	You need to create notes on polymerisation and answer questions on the sources and origins of plastics. **In-depth knowledge.** Method of revision = Notes and questions.	

13th May	You need to complete revision notes on 'working with plastics'. **In-depth knowledge.** Method of revision = Notes, mind map and questions.	
20th May	You need to complete revision notes on shaping and joining plastics. **In-depth knowledge.** Method of revision = Notes	
27th May **Half Term**	You need to create a poster on sustainability. Reference finite and non-finite resources, fossil fuels, recycling, deforestation, life cycle assessment, 'our' impact on the environment, waste disposal, pollution and global warming. Method of revision = Poster – A4 (with a diagram)	
3rd June	You need to create a mind map on CAD/CAM, FMS and JIT. Method of revision = Mind map	
10th June	You need to fill in the notes on mechanical systems. Method of revision = Notes.	
17th June	You need to complete the table on renewable energy sources, Method of revision = Table.	
Exam – Tuesday 18th June	You need to; - Get a good night's sleep. - Eat a healthy breakfast. - Yes, it is 2 hours long. No, I cannot change this. 😊 - Think happy thoughts "You've got this!"	

List of properties

1. Durable (long lasting)
2. Strong, tough, hard
3. Crease resistant
4. Lightweight
5. Heat conductor/insulator, Electrical conductor/insulator
6. Elastic, malleable, flexible
7. Corrosion resistant
8. Strength to weight ratio
9. Shock resistant/impact resistant
10. Water resistant/waterproof/absorbent

Metals Mind map

Design and Technology Knowledge organiser							Name			
Timber and Board			**Textiles**		**Metals**		**Plastics**		**Paper and Board**	
Softwoods	**Hardwood**	**Manufactured board**	**Natural**	**Synthetic**	**Ferrous**	**Non-ferrous**	**Thermoforming**	**Thermosetting**	**Paper**	**Board**
Pine	Oak	Plywood	Wool	Polyester	Cast Iron	Aluminium	Polythene	Urea formaldehyde	Layout paper	Corrugated board
Larch	Mahogany	MDF	Cotton	Nylon	Mild steel	Copper	Polystyrene	Melamine formaldehyde	Tracing paper	Catridge paper
Cedar	Teak	Chipboard	Cashmere	Acrylic	Medium carbon steel	Brass	Polypropylene	Polyester resin	Copier paper	Boxboard
	Ash	Hardboard	Silk	Elastane	Stainless steel	Bronze	PVC	Epoxy resin	Recycled paper	Mount board
Manufacturing processes			**Manufacturing processes**		**Manufacturing processes**		**Manufacturing processes**		**Manufacturing processes**	
Lathe			Sewing machines	Sublimation printer	Brazing		Vacuum forming	Blow moulding	Laminating	
Laminating (with wooden mould)			Heat press	Batik			Injection moulding	Press moulding	Printing	
				Tie dye			Compression moulding			
Stock forms			**Stock forms**		**Stock forms**		**Stock forms**		**Stock forms**	
Plank	Square		Sheet on a roll		Sheet	Tube	Sheet	Extruded form	Sheet	
Board	Dowel				Rod	Angle iron	Film	Pellets/granules	Roll	
Strip					Bar		Bar	Powder	ISO - A1 - A6	
							Rod	Tube		
Material Properties			**Material Properties**		**Material Properties**		**Material Properties**		**Material Properties**	
Strong	Water resistant	Cheap	Warm	Waterproof	Conductive	Ductile	Malleable	Heat resistant	Lightweight	Flexible
Tough	Durable	Tough	Durable	Crease resistant	Magnetic	Impact resistant	Waterproof	Abrasion resistant	Foldable	Strong

Electronics	**Mechanisms**
Inputs	Pulleys
Processes	Gears
Outputs	Levers
Microcontrollers	Rack and pinion
Soldering	Cams

Smart materials and technical textiles		
Smart materials	**Techncial textiles/materials**	
Polymorph	Geotextiles	Kevlar
Photochromic	Quantum tunnelling composites	Nomex
Thermochromic	Micro-encapsulation	E-textiles
SMA - Smart memory alloy	Biometrics	Sun-protective clothing
Electroluminescent wire	Carbon Fibre	Rhoyvl

Sustainability				**D&T and our world**	
6 r's		**Renewavle energy**	**Finite energy sources**	Market pull	CAD - Computer sided design	
Rethink	Reuse	Fair trade	Solar	Oil	Technology push	CAM - Computer aided manufacture	
Refuse	Repair	Carbon footprint	Hydro	Gas	Product life cycle	2D design	Laser cutter
Reduce	Recycle		Wind	Coal		3D printer	Vinyl cutter

Shenley ACADEMY

You need to create a mind map of metals. Include ferrous and non-ferrous. Which are alloys, what are their properties and what are they used in.

What does Ferrous mean?

Draw the periodic table symbol.

Give the properties.

Name that pro's and con's

Ferrous metals

Non - ferrous metals

You need to complete the tables on of paper and boards. Include the meaning of GSM, standard sizes and uses.

GSM

_____

_____

Paper is made from

_____

_____

Paper comes in

_____

_____

Paper	***Properties***	***Uses***
Cartridge paper		
Layout paper/Tracing paper		
Grid paper		
Bleed proof paper		

Boards are made from_____

_____

Boards are measured in

_____

_____

Microns are used to measure a board when

_____

_____

Boards	***Properties***	***Uses***
Corrugated card		
Foil lined board (duplex board)		
Solid white board		
Inkjet card		
Foam board		

Natural woods and manufactured boards

You need to complete the mind maps on natural woods and manufactured boards.

Hardwoods (facts, types, uses and properties)

Softwoods (facts, types, uses and properties)

Which wood is more resistant to water?

_____

_____

What does deciduous mean?

_____

Are manufactured board cheaper or more expensive?

_____

What is a veneer?

_____

Manufactured boards (facts, types and properties)

Natural and Synthetic fibres (and extension)

You need to complete the questions and tables on natural and synthetic fibres.

Fabric comes in

_____

_____

A staple fibres in _____

A filament fibre is _____

A renewable fabric means it _____

Natural fabrics	*Source **	*Renewable?*	*Properties*	*Uses*
Cotton				
Wool				
Silk				

A blended fibre is_____

_____

Polyester and cotton are regularly combined. This is known as _____. It is blended to incorporate the following properties of each, which are

_____

_____

Synthetic fabrics	*Source **	*Renewable?*	*Properties*	*Uses*
Elastane (Lycra)				
Polyamide (Nylon)				
Polyester				

**Source means where the fabric comes from/what makes it.*

Extension - make notes on fabric construction (grade 6 +)

_____

_____

_____

_____

_____

_____

_____

Thermoforming and Thermosetting polymers (plastics)

You need to complete the mind maps and tables on thermosetting and thermoforming polymers.

Thermoforming facts

Thermoforming polymers	***Properties***	***Uses***
Polypropylene		
Polyethylene (PET)		
High impact polystyrene (HIP's)		
HDPE		
Acrylic		
PVC		

Thermosetting facts

Thermoforming polymers	***Properties***	***Uses***
Epoxy resin (ER)		
Melamine formaldehyde (MF)		
Polyester resin (PR)		
Urea formaldehyde (UF)		
Phenol Formaldehyde (PF)		

Material properties

You need to complete the glossary of key words to explain the physical properties of materials. *You will need to research beyond the content of the video for some.*

Property	*Meaning*
Absorbency	
Fusibility	
Electrical conductivity/insulator	
Thermal conductivity/isolator	
Moisture resistance	
Strength	
Hardness	
Toughness	
Density	
Malleability	
Elasticity	
Ductility	
Impact resistance	
Strength to weight ratio	
Crease resistance (textiles only)	
Water proof/resistant	
Corrosion resistant	
Durable	
Flexible	

Smart materials and Technical textiles

You need to complete the table on smart materials and technical textiles.

Name	*Properties*	*Use*
Thermochromic pigment		
Photochromic pigment		
Shape memory alloy (Nitinol)		
GRP (glass reinforced plastic)		
Carbon Fibre		
E-fabrics		
Fire resistant fabric (Nomex)		
Kevlar		
Microfibres		
Microencapsulation		

Factors that affect your choice of plastic

You need to complete a poster on 'Factors that affect your choice of plastic'. **In-depth knowledge.** Watch the video and make notes on each section.

Factors that affect your choice of plastic	Functionality	Aesthetics
Cost	Availability (stock form)	Environmental factors
Social factors	Cultural factors	Ethical factors

Note that these are the same criteria that your would conduct when completing a product analysis or a design specification.

Polymerisation and sources/origins of plastic

You need to create notes on polymerisation and answer questions on the sources and origins of plastics. **In-depth knowledge.**

How polymers are made (polymerisation) – complete the boxes

Crude oil (fossil fuel). Deep in earths crust. Extracted through drilling.	Fractional distillation _____ _____ _____	Cracking _____ _____ _____	Polymer (plastic)

Life cycle assessment

1) _____
2) _____
3) _____
4) _____

A life cycle assessment is carried out to assess the_____
_____

Negative effects of plastic on the environment

Which plastic is commonly recyclable? _____

Polymers made from plant sources are known as _____

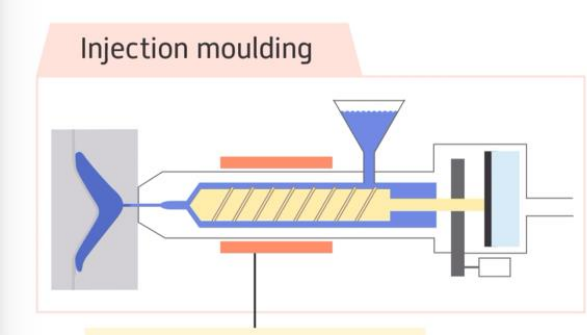
PLA stands for _____. It's properties are it is _____.

Biopolymers ae cheap/expensive.

Working with plastics

You need to complete revision notes on 'working with plastics'. **In-depth knowledge.**

What material to choose on a job?



Name two properties to explain why thermoforming plastics are used in injection moulding?_____

Which specific plastics are used in injection moulding?_____

Which category of plastic is used on kettles and hairdryer? _____

Name two common thermoset polymers?_____

Which properties make them ideal for working with electrical products?_____

_____

Notes on additives (grade 6 +)

Shaping and joining plastic.

You need to complete revision notes on shaping and joining plastics. **In-depth knowledge.**

Cutting, fling and finishing
Drilling, line bending and vacuum forming
Casting and printing
Joining polymers - ultrasonic welding and chemical welding (tensol cement glue)

Sustainability

You need to create a poster on sustainability. Reference finite and non-finite resources, fossil fuels, recycling, deforestation, life cycle assessment, 'our' impact on the environment, waste disposal, pollution and global warming.

Industry - CAD/CAM, FMS and JIT

You need to create a mind map on CAD/CAM, FMS and JIT.

Automation is when

_____

_____

_____

CAD is_____

CAM is _____

Two examples of CAM are_____

JIT stands for_____

FMS stands for _____

CAD – Pro's and con's

CAM – pro's and con's

FMS – pro's and con's

JIT – Pro's and con's

Mechanical systems

You need to fill in the notes on mechanical systems.

Four types of motion are:

1) _____

2) _____
3) _____
4) _____

A sewing machines converts_____ motion into _____ motion.

A mechanical device is _____.

A lever provides a _____.

The three elements to a lever are _____

1st order lever example	2nd order lever example	3rd order lever example

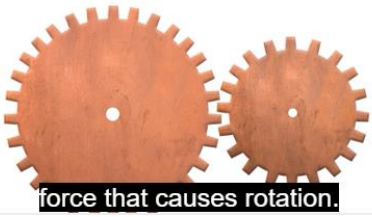
A linkage is _____

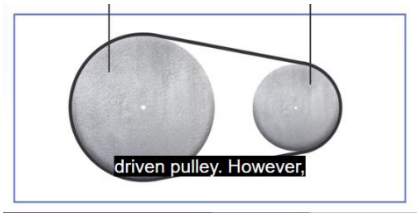
This is a _____ mechanism.

_____
_____
_____

These are _____.

_____
_____
_____





This is a _____ mechanism.

_____
_____
_____

This is a _____ mechanism.

_____
_____
_____

Energy sources

You need to complete the table on renewable energy sources,

Energy Source	***Pro's***	***Con's***
Tidal		
Hydroelectric		
Wind power		
Solar		
Biomass