

Department: Technology and Art: **Motor Vehicle**

What is the intent statement for you subject? What does the discipline offer young people? What is the subject's purpose ? This should be a short, snappy statement.		
	Design and Technology prepares students for the modern world by focusing on innovating solutions to a problem. Students will be empowered to work with a wide range of materials, ingredients, modern technology and components in order for them to design and manufacture creative solutions to a wide range of problems and scenarios.	
What are the core aims of the curriculum? What key knowledge do you want students to have at the end of their learning journey?		
Year 7	Core Aims:	
	<ul style="list-style-type: none"> • Understand safe working practices within the Technology environment using substances, materials, food, tools and equipment. • Developing an understanding for healthy choices in nutrition. • Introducing basic electronic principles and key component function. • Develop presentation, drawing and communication skills through sketching, using drawing equipment and computer aided design. • Introducing an understanding of mechanical systems through linkages and cams. • Introducing practical skills in wood working using hand tools and machinery. • Introducing food hygiene and basic food handling skills. • Working with care and precision to accurately cut, measure and weigh materials 	
	Key knowledge:	Key skills:
	<ul style="list-style-type: none"> • Nutrients: • Food Safety • Eat well guide. • 3D sketching skills – isometric, oblique and 2-point perspective. • Health and safety • Mechanisms- linkages, Cams. • Tool names and functions. • Understanding the purpose of a specification 	<ul style="list-style-type: none"> • Knife skills. • Weighing, cutting, marking measuring accurately – use of templates. • Heat control in food – use of hob, oven and grill. • Soldering. • Computer Aided Drawing • 3D drawing. • Cutting, smoothing and drilling wood.

Year 8	Core aims:	
	<ul style="list-style-type: none"> • Developing an understanding of material properties in wood, metal and plastic through modelling and experimenting. • Introducing programmable electronics. • Developing communication skills through 3D drawing and computer aided design. • Sustainability, environmental impact, life cycle of plastic and metal. • Sustainable energy. • Sustainability in Food- Food Miles, seasonality. • Develop nutritional knowledge by understanding special dietary needs. • Increase time management skills by creating more complex dishes. • Working as a team 	
	Key knowledge:	Key skills:
	<ul style="list-style-type: none"> • Sustainable energy and finite resources – advantages and disadvantages. • Life cycle of plastics and aluminium- effect on the environment. • Developing an understanding of the properties of Thermoplastics and alloys. • Developing evaluative skills to make considered choices. • Understanding the effect of friction- use of bearings and pulleys. • Using electrical generator. • Designing for function • Developing their own technical specifications to meet the needs of a user. • Dietary needs, Seasonality and food miles. 	<ul style="list-style-type: none"> • Cutting screw threads. • Forming: -Heat forming thermoplastics and bending alloys. • CAD using Autodesk Fusion. • Programming using the BBC Micro bit • Communication skills- working as a team; development of drawing skills; 3D modelling ideas; • Dough, batter and cake making consistency; • Kneading, proving and shaping. • Planning and time management. • Developing practical cooking skills.

	Core aims:	
	<ul style="list-style-type: none"> • Develop practical skills to create complex dishes. • To understand and apply time plans to meet a brief and specification. • To be able to use wood working tools with care and accuracy: - measuring tools, templates. • Developing an understanding of material properties in timber, ferrous and non-ferrous materials. • Further develop CAD drawing skills to create 3D and 2D images which can be manufactured through laser cutting. • Develop an understanding of wood finishes. • Sustainability in Timber- FSC. • Scales of Production. • Metal processes- Heat Treatment, wasting using the lathe, • Creating a thread through tapping a hole. 	
Year 9	Key knowledge:	Key skills:
	<ul style="list-style-type: none"> • Food Safety: - Apply it to making plans. • Food quality, temperature control; Contingency plans for change and adaptation. • Softwoods, Hardwood, manufactured boards – properties and sustainability-FSC • Wood finishes. • Processes: - lathe, heat treatment, metal properties. • Scales of manufacture. • Specifications- How to write accurately and create a brief. 	<ul style="list-style-type: none"> • • Using chisels safely and accurately. • Developing CAD skills in 2D design and Auto Desk. • Understanding how to use the lathe correctly to parallel turn, knurl, taper turn, facing and drilling. • Heat treatment- hardening and tempering. • Casting using moulds. • Cutting a screw thread with a die. • Spot welding. • Quality testing- seasoning and using temperature probes. • Quality control checking. • Independence when looking at contingencies.

Year 10	Core aims:	
	<ul style="list-style-type: none"> • Introduction to health and safety practices in the motor vehicle workshop. • Introduction to VPE and PPE required to demonstrate safe, methodical working practices throughout practical based assessments. • To understand basic engine principles and key parts that make up the engine. • Introduction to key theory units to support over all learning throughout the course in year 10 and 11 L2 CAMS: <ul style="list-style-type: none"> ➤ Mathematics relating to engine compression ratios, ➤ Basic engine principles relating to 2 stroke and 4 stroke engines, Lubrication and cooling systems, ➤ Steering and suspension systems, ➤ Fault diagnosis, ➤ Structural makeup analysis. ➤ Identification of marking for tyres. ➤ Basic electrical principles • Introduction to basic practical tasks such as tyre removal and balancing, air filter removal, oil changes to develop confidence and understanding for future practical assessments throughout the IMI course. • Introduction to tools and equipment in the motor vehicle workshop and how to operate safely. 	
	Key knowledge:	Key skills:
<p>To develop understanding of safe, methodical approaches on carrying out practical based tasks:-</p> <ul style="list-style-type: none"> • Cooling system pressure testing. • Cylinder compression testing. • Thermostat removal and fault diagnosis. • Steering and suspension component inspections / removal. • Full brake inspections front and rear. <p>To develop understanding of legal limits for vehicle components and their effects as stipulated by the automotive industry.</p> <p>To develop understanding of the importance of interpreting data to determine fit for purpose.</p>	<p>To be able to demonstrate the correct use of access equipment such as: trolley jacks, axle stands, hydraulic ramps, wheel chocks</p> <p>To be able to demonstrate the correct use of routine servicing equipment/ tools such as: wheel braces, socket sets, varied amounts of measuring equipment, tyre changer + balancer, Manual /Laser wheel alignment, engine / cooling system compression testing equipment.</p> <p>To be able to demonstrate competency and understanding of vehicle wiring diagrams and how to construct and test an operational electrical circuit</p>	

Core aims:

- Knowledge relating to automotive engine and chassis component maintenance (J/616/9420)
 - automotive engine mechanical systems.
 - automotive engine lubrication systems
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 - automotive engine lubrication systems
 - automotive engine cooling systems
 - light vehicle engine air supply
 - automotive wheels and tyres makeup and marking identification along with manufacturers recommended limits and legal limits.
 - automotive braking systems
 - automotive steering systems
 - basic electrical principles

- To be able to demonstrate competency and a safe methodical approach when carrying out 9 practical tasks relating to skills in maintaining automotive engines and chassis components (L/616/9421)

Task 1 – Engine compression/cylinder testing

Task 2 – Liquid cooling

Task 3 – Fuel or ignition system

Task 4 – Air intake and exhaust system

Task 5 – Steering system

Task 6 – Suspension system

Task 7– Brakes

Task 8 – Wheels and tires

Task 9 - Construct and test an operational electrical circuit

- Maintenance Inspection and Condition Reporting of Engine and Chassis Systems ((R/616/9422) Synoptic Written Report Synoptic Practical Task Synoptic Online Assessment
 - Inspect automotive engine and chassis systems and identify non-complex faults.
 - Report your findings of completing the task above including identifying non-complex faults and making recommendations for repair using the Synoptic Unit Written Report document.

Year 11

	Key knowledge:	Key skills:
	<p>Knowledge relating to engine and chassis component maintenance:</p> <ul style="list-style-type: none"> • Understand housekeeping and health and safety practices within an engineering environment • Understand how engine and chassis systems operate • Understand how to carry out engine and chassis component maintenance • Students will develop their Understanding of how to carry out a controlled step by step methodical approach to a full MOT inspections 	<p>Skills in maintaining engine and chassis components</p> <ul style="list-style-type: none"> • Be able to follow health and safety practices • Be able to use tools, equipment and information when maintaining engine and chassis system components • Be able to remove, inspect and replace engine and chassis system components • Be able to record information and make suitable recommendations