



New and **Yr11 Design & Technology – Revision Topics – Paper 1**

General D&T questions covering much of the course.

Design and technology and our world - The impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society, the environment, production techniques, systems

- Emerging Technologies
- Product Life Cycle
- Sustainability
- 6Rs
- **Carbon Footprint**
- **Advantages and disadvantages of using computer aided design (CAD).**
- **Advantages and disadvantages of the use of computer aided manufacture (CAM).**
- **Energy and renewable energy sources – advantages and disadvantages.**

Materials - The categorisation and properties of a range of materials. Use and applications of materials in products.

- **Papers & Boards – Types and uses**
- **Timber and Manufactured Boards**
- **Ferrous and Non-Ferrous Metals - Properties**
- **Thermosetting and Thermoforming Polymers – Types, uses and stock forms.**
- **Fibres and Fabrics – Biomimicry and denim**
- **Finishes and decorative coatings.**

Developments in modern and smart materials, composite materials, and technical textiles

- **Smart Materials and Fabrics – Thermochromic film, Photochromic Film and glass, Electroluminescent Film.**
- Composite Materials

Electronic Components and Systems - How electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs.

- Component Symbols
- Microcontrollers – advantages / disadvantages
- PICs – Programmable Interface Controllers – advantages / disadvantages
- **Systems Approach – Block Diagrams and feedback**
- **Analogue and Digital Inputs sensors – Switches, (Light) - LDR, (Temperature) - Thermistor, (Sound) – Microphone, (Environment) – Moisture.**
- Outputs – (Visual) LED, (Audible) buzzer, (kinetic) motor, solenoid.
- Programming and Flowcharts

Mechanical Components and Devices - The functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces.

- **Types of motion**
- Types of mechanisms – **Levers**, Linkages, Rack & Pinion, Crank & Slider, Pulley & Belt, **Gears, Chain & Sprocket**, Ratchet & Pawl.
- Changing Magnitude - **Speed**
- Changing Force
- Calculating **Gear ratio**, Velocity Ratio and Rotational Velocity in machines.
- **Mechanical Advantage**



Yr11 Design & Technology – Revision Topics – Paper 2

Pupils choose one specialised area of focus to answer: -

You will be able to choose from five topics to answer.

- Electronic Programmable Systems and Mechanical Devices
 - PCB production
 - Circuit simulation Software – Livewire / PCB Wizard
 - Ohms Law – $V = I \times R$
 - Area of circle = πr^2
 - Area of rectangle
 - Mechanisms
 - Velocity Ratio
 - Mechanical Advantage
 - Rotational velocity.
- Thermosetting and Thermoforming Polymers
 - Thermoforming Polymers – properties.
 - Forming processes - Vacuum forming, Injection moulding, blow moulding, rotational moulding.
 - Surface finishes
 - Natural vs synthetic polymers
 - Area of circle = πr^2
 - Area of rectangle
- Timbers and Manufactured Boards.
 - Surface finishes
 - Manufactured boards – advantages / disadvantages
 - Knock Down (KD) fittings
 - Wood joints
 - Area of circle = πr^2
 - Area of rectangle
- Metals and Alloys.
 - Ferrous metals / non-ferrous metals and alloys – advantages / disadvantages – properties.
 - Finishes and coatings.
 - 3rd angle orthographic drawings
 - Forming processes – wasting, reforming and deforming – press forming, milling, casting
 - Area of circle = πr^2
 - Area of rectangle