West Park School

Design and Technology

GCSE Examination Summer 2024

In readiness for your GCSE examination in Design and Technology you must **LEARN** and **REVISE** the following content and skills:

Advice:

- Use the number of marks linked to each question to guide not only how long you spend on a question but also the number of points you need to include in your answer.
- There will be some questions that include a product or a process example from all of the specialism areas. For these questions, you need to identify the product or process that allows you to answer the question to the best of your ability from your knowledge and revision.
- You must bring the following equipment to your Design and Technology examination: normal writing and drawing instruments, a calculator and a protractor.

Layout of paper:

- **Section A** – Core technical principles (20 marks)
  A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.
- **Section B** – Specialist technical principles (30 marks)
  Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.
- **Section C** – Designing and making principles (50 marks)
  A mixture of short answer and extended response questions.

Section A – Core technical principles:

In order to make effective design choices students will need a breadth of core technical knowledge and understanding that consists of:

- New and emerging technologies
- Energy generation and storage
- Developments in new materials
- Systems approach to designing
- Mechanical devices
- Materials and their working properties.

The full specification for these elements can be found on Firefly.

Section B – Specialist technical principles:

Pupils have chosen one of the specialist material areas to study from the following list:

- Papers and boards
- Timber based materials
- Metal based materials
- Electronic and mechanical systems.

It must be noted that those pupils who selected **electronic and mechanical systems** as their specialist area, are also required to learn and revise the **metal specialist material** section.

In addition to the core technical principles, all students should develop an in-depth knowledge and understanding of the following specialist technical principles that relate to their material area:

- Selection of materials or components
- Forces and stresses
- Ecological and social footprint
- Sources and origins
- Using and working with materials
- Stock forms, types and sizes
- Scales of production
- Specialist techniques and processes
- Surface treatments and finishes.

Section C – Designing and making principles:

Students should know and understand that all design and technology activities take place within a wide range of contexts.
They should also understand how the prototypes they develop must satisfy wants or needs and be fit for their intended use. For example, the home, school, work or leisure.
They will need to demonstrate and apply knowledge and understanding of designing and making principles in relation to the following areas:

- Investigation, primary and secondary data
- Environmental, social and economic challenge
- The work of others (At least 2 designers and 2 companies, e.g., Norman Foster, Apple respectively)
- Design strategies
- Communication of design ideas
- Prototype development
- Selection of materials and components
- Tolerances
- Material management
- Specialist tools and equipment
- Specialist techniques and processes.

Links to Maths and Science:

- Analysing responses to user questionnaires.
- Frequency tables and information on design decisions.
- Presentation of client survey responses – Graphs.
- Percentiles ranges used in anthropometrics and/or ergonomics data.
- The use of reference datum points and co- ordinates.
- Measurement and marking out of component parts for models.
- Scaling of drawings.
- SI units; identify appropriate commercially available stock forms and select appropriately. Accurate use of appropriate tolerances +/- 2mm, resistor tolerance and seam allowance. Accurate use of appropriate units of measurement to calculate material requirements. Measurement of materials and components using standard units as appropriate.
- Calculate surface area and volume, e.g., material requirements.
- Angular measures, e.g., measurement and marking out.
- Use angular measures, e.g., tessellation of component parts.
- Calculating material area, e.g., working out the quantity of materials required.
- Expression in decimal and standard form e.g. calculation of required materials.
- Composition of some important alloys; selecting appropriate metal alloys as required.
- Corrosion and oxidation, e.g., how corrosion and/or oxidation affects different materials, how they can be protected through different surface treatments and finishes.