| DESIGN & TECHNOLOGY | **Curriculum Team Vision** |
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At OMA we believe education is for everyone, that all students irrespective of their backgrounds, will be exceptional pupils, so they are equipped with the necessary knowledge, skills, qualifications, and mind-set to contribute positively to society.
Everything we do in the vocational faculty is aimed at providing an ambitious and challenging curriculum which inspires, motivates, and exploits the limitless potential of all our students. This will be achieved by us '*being inspired by the past - creating excellence in the present- by embracing the future'.*
Our long-term aim is to produce thinking, adaptable adults capable of taking his / her place in a changing technological society. We strive to create distinctive and dynamic partnerships between students and the world or work, forging active relationship with industry-based external training providers and employers.
The vocational curriculum seeks to promote an educational culture which is scientific, technological, creative, healthy, and entrepreneurial within the framework of the school and national curriculum. In addition, our faculty aims to provide the excellent practical technological, scientific, and holistic communication skills needed by our manufacturing and service industries within the UK and global markets. Thus, ensuring that our students will be well-educated and skilled, ready, and able to progress into employment, further training, or higher education according to their individual aptitudes and ambitions.
The faculty will be truly cross-curricular and will use aspects of many subjects to aid the students when developing innovative ideas and solving problems individually or as a team. The only boundary to making an impact in the future is our '*imagination*' and our ability to '*engineer'* the solutions that could affect peoples' lives. Students arrive and leave our faculty with a sense of wonder in learning…. that they will carry with them for a lifetime.

**Pupils should be taught to:**
This qualification aims to:
• Focus on the study of creative design and production in the design and production industry
• Offer breadth and depth of study, incorporating a key core of knowledge
• Provide opportunities to acquire a number of practical and technical skills

The objectives of this qualification are to:
• Place design and production in context
• Understand design materials and processes
• Understand design brief and production processes
• Prepare for the presentation of a design solution
• Undertake a review of processes and final solution
• Explore working in the design production industries

**Learning journey across KS3:**

• Work confidently within a range of relevant domestic, local, and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture, and fashion
• Consider the influence of a range of lifestyle factors and consumer choices when designing products
• Take creative risks when making design decisions
• Consider additional factors such as ergonomics, anthropometrics
• Analyse where human values may conflict, and compromise must be achieved
• Develop design specifications that include a wider range of requirements
such as environmental, aesthetic, cost, maintenance, quality, and safety
• Research the health and wellbeing, cultural, religious, and socio-economic
contexts of their intended users
• Understand how to reformulate design problems given to them products that respond to needs in a variety of situations
• Combine ideas from a variety of sources

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| • Use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses<br>• Decide which design criteria clash and determine which should take priority<br>• Develop and communicate design ideas using annotated sketches<br>• Produce 3D models to develop and communicate ideas, use 3D CAD to model, develop and present their ideas<br>• Use CAD and related software packages to validate their designs in advance of manufacture<br>• Use mathematical modelling to indicate likely performance before using physical materials and components, for instance when developing circuits or gearing systems<br>• Give oral and digital presentations and use computer-based tools<br>• Select appropriately from specialist tools, techniques, processes, equipment, and machinery, including computer-aided manufacture<br>• Select appropriately from a wider, more complex range of materials, components, considering their properties such as water resistance and stiffness follow procedures for safety and hygiene and understand the process of risk assessment<br>• Use a wider, more complex range of materials and components, considering their properties<br>• Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely<br>• Exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision<br>• Apply a range of finishing techniques, including those from art and design to a broad range of materials including textiles, metals, polymers, and woods<br>• Select appropriate methods to evaluate their products in use and modify them to improve performance<br>• produce short reports, making suggestions for improvements<br>• Products that they are less familiar with using themselves<br>• Products considering life cycle analysis<br>• How products can be developed considering the concept of 'cradle to grave'<br>• the concept of circular economy approaches in relation to product development and consumption how to adjust the settings of equipment and machinery such as sewing machines and drilling machines<br>• Understand the properties of materials, including smart materials, and how they can be used to advantage<br>• Understand the performance of structural elements to achieve functioning solutions |
| **Where can studying design & Technology take you? Click on the link below:**<br><br>https://resources.careersandenterprise.co.uk/sites/default/files/2021-01/1438_MLMF_PPT_food_FINAL_ON_SCREEN.pptx |

Subject:
**DESIGN AND TECHNOLOGY**

| Terms | **Topics covered** and **core knowledge and skills** | Links to careers | Links to the Knowledge organiser and other additional resources |
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| Half term 3 | *The impact of resource consumption on the planet:*<br>*• finite • non-finite • disposal of waste*<br>*How technology push/market pull affects choice. Changing job roles due to the emergence of new ways of working driven by technological change.* | https://www.rya.org.uk/training/careers<br><br>https://www.indeed.com/career-advice/finding-a-job | **Knowledge Organisers:** |

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| | *Changes in fashion and trends in relation to new and emergent technologies.*<br>*Respecting people of different faiths and beliefs.*<br>*How products are designed and made to avoid having a negative impact on others: • design for disabled • elderly • different religious groups.*<br>*Positive and negative impacts new products have on the environment: • continuous improvement • efficient working • pollution • global warming*<br>*The contemporary and potential future use of: • automation • computer aided design (CAD) • computer aided manufacture (CAM) • flexible manufacturing systems (FMS) • just in time (JIT) • lean manufacturing.*<br>*That it is important to consider scenarios from different perspectives and considering: • planned obsolescence • design for maintenance • ethics • the environment.* | https://www.stem.org.uk/resources/community/collection/458166/careers-fashion-and-textiles<br><br>https://www.drapersonline.com/news<br><br>https://theartcareerproject.com<br><br>https://www.velvetjobs.com/articles/insights | |
| Half term 4 | *How power is generated from: • coal • gas • oil. Arguments for and against the selection of fossil fuels*<br>*How nuclear power is generated. Arguments for and against the selection of nuclear power.*<br>*How power is generated from: • wind • solar • tidal • hydro-electrical • biomass. Arguments for and against the selection of renewable energy.*<br>*Developments made through the invention of new or improved processes eg Graphene, Metal foams and Titanium.*<br>*Alterations to perform a particular function eg Coated metals, Liquid Crystal Displays (LCDs) and Nanomaterials.* | | |

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| | *That materials can have one or more properties that can be significantly changed in a controlled fashion by external stimuli, such as stress, temperature, moisture, or PH eg shape memory alloys, thermochromic pigments and photochromic pigments*<br>*That composite materials are produced by combining two or more different materials to create an enhanced material eg glass reinforced plastic (GRP) and carbon fibre reinforced plastic (CRP).* | | |