ORMISTON RIVERS ACADEMY– KEY STAGE 3 ADT OVERVIEW

ADT DEPARTMENT KEY STAGE 3 CURRICULUM OVERVIEW

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education make an essential contribution to the creativity, culture, wealth and well-being of the nation.

The Art, Design and Technology department at Ormiston Rivers Academy seeks to serve the community by the education of local students in vocational areas. We design our curriculum to suit the aspirations of students, matching the nature of the local demographic. In order to inform and raise student aspirations, the individual lessons will provide reference to careers and industrial practices.

We aim to develop a culture of independence, resilience based on a strong underpinning knowledge. Students are taught problem-solving skills though heuristic projects. This is aimed at developing wider thinking skills which can be used across the curriculum.

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Year 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Food	**Afternoon Tea baking for special diets**											
	Health and Safety incl personal safety and food hygiene .	Practical skills in baking- pastry, bread and cakes		Basic Nutrition - functions of nutrients and sources	Practical skills in baking- pastry, bread and cakes		Practical skills in baking- pastry, bread and cakes			Assessed: Design and Make Task Solving a problem - to plan and make a dish which has been adapted to suit a dietary need.		
RM	**Night Light (box)**						**Night Light (Electronics)**					
	Safety in the workshop.	Measuring and cutting. Cutting lap joints		Joining materials Drilling and gluing			Basic circuits Soldering Inputs and outputs			Assembly and personalisation. Design for an application.		

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Food Half Term 1

Block 1 – Weeks 1 to 3

- Introduction to Health and Safety encompassing personal safety in the food room and food hygiene.
- Practical skills making a savoury dish which can be adapted to increase/adjust nutritional content. (e.g Mini quiches)
- Focus on meeting Personal safety and food hygiene rules whilst making.

Block 2 – Weeks 5 to 6

- Basic nutrition overview including macronutrients, micronutrients, fibre and water
- Practical skill development - practical making bread dough and developing into "Savoury swirls"
- Further research into yeast, flour science and provenance.

Notes/Links/Interleaving

- Health and Safety (personal rules for food room) Food Hygiene incl. Food poisoning, correct storage, cross contamination, allergies.
- Nutritional needs for a healthy diet - the Eatwell Guide, understanding of the 3 macronutrients, micronutrients and fibre and water within the diet.

Additional Higher Content

- Understanding the scientific interactions of ingredients
- Provenance of ingredients (grains)
- Dietary restrictions with grains (coeliac, intolerances)

Food Half Term 2

Block 3 – Weeks 7 to 9

- Continuation of development of skills in baking, knife skills, weighing and measuring and adapting recipes for specific need in preparation for assessment.

Block 4 = Weeks 10 to 12

- Assessment of practical skills and recipe adaptation for a specific need.
- Test, evaluate and refine ideas and products against a specification taking into account the views of intended users and other interested groups.

Notes/Links/Interleaving

- Practical skills development - using the oven and hob.
- Application of nutritional knowledge within special dietary needs
- Secure and accurate weighing and measuring and understanding of importance

Additional Higher Content

- Understanding of the food science and principles behind how ingredients behave
- Refined and independent practical skills
- Understanding of specific nutritional needs and assessment of products performance against these.

Resistant Materials Term 1	
Block 1 – Weeks 1 to 4	**Block 2 – Weeks 5 to 6**
• Introducing materials and basic material properties. • Introducing different tools and process and where they will be used. • Introducing workshop safety procedures and practising these. • Development of psychomotor skills in relating to processes.	• Material properties related to plastics and electronics. • Understand how more advanced electrical systems can be powered and used in their products. • Material joining processes including related to wood, metals and plastics.
Notes/Links/Interleaving • Identifying tools processes related to marking out and shaping material related to woods and plastics. • Health and Safety, specific to RM including PPE, safety procedures, entry and exist protocols relating to DT rooms, specific tools and equipment safety procedures.	**Additional Higher Content** • Function of input/process/output systems. • Modern manufacturing techniques.

RM Term 2	
Block 3 – Weeks 7 to 9	**Block 4 = Weeks 10 to 12**
• Understanding the function of input/output systems • Identify and assemble electronic components • Reading and understanding circuit diagrams • Reviewing and correcting of manufacturing errors	• Assembling products. • Applying and checking finishes. • Test for functionality. • Critically evaluate.
Notes/Links/Interleaving • Making skills. • Identification and use of correct tools. • Electronic components and joining processes. LED Battery, Switch. • Identifying a variety of joining processes and when to use them.	**Additional Higher Content** • Function of electronic components. • Links to physics with Ohm's law. • Metallurgy. • Microcontrollers.

ORMISTON RIVERS ACADEMY– KEY STAGE 3 ADT OVERVIEW

Year 8	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Food	**Food – Food makeup and risks**						**Food – Responding creatively to a brief**					
	Health and Safety incl personal safety and food hygiene .Recap / extension	Developing practical skills using high risk foods		Recap of nutrients in a balanced diet - further detail classifying nutrients.	Developing practical skills using a range of equipment and utensils		Research and design / planning of multicultural dishes in response to a NC "Use research and exploration, such as the study of different cultures, to identify and understand user needs Identify and solve their own design problems and understand how to reformulate problems given to them."			Independent practical work to respond to user need and develop their own multicultural dish in response to a brief.		
RM	**Mechanisms - Cam toy – Investigation and planning**						**Mechanisms - Cam toy – Design and Make**					
	• Design and make a Cam driven toy. • Investigation of existing products on the market and market needs under ACCESSFM. • Recap and further development of woodwork joint types.		• Investigate complex materials, components and properties		• Practice and testing of joint/material properties. Choosing joints based on test results. • Understand how mechanical systems used in products enable changes in movement and force. • Cam design on MDF prototype. 2D Design orthographic projection drawing with border/title block.		• Using complex materials to manufacture a productive toy to engage young children. • Use CAD CAM (laser cutter) to complete a show piece for the top of the project. • Students to individualise styles based on their target market. • Show how their design fits their target market.			• Student develop an understanding of how CAD CAM is used in industry, how this has changed manufacturing and the negatives including the future of manufacturing.		

Food Term 1	
Block 1 – 6 Weeks	**Block 2 – 6 Weeks**
• Development of practical skills and competence in all areas of the kitchen - using wide range of equipment. • Key Nutrients for healthy and balanced diet and their classification (including sat. and unsat. Fat, starch,NSP, Sugar, HBV and LBV protein etc)– Eatwell Guide recap	• Knowledge of multicultural issues with food - study of different laws and religions. • Research and design of products with a multicultural theme to fit a specific need / brief • Making of products demonstrating developed practical skills and awareness. • Assessment of practical work both self and teacher.
Notes/Links/Interleaving • Bacteria types / sources and ideal conditions for multiplication = danger zone and key temperatures. Safe handling of food, colour coded equipment etc. • Development of practical skills – ongoing through KS3 in preparation for life skills and KS4+5 study potentially. • Dishes will become more challenging and demonstrate higher level skills over time, as well as encompassing more elements thus improving time management and organisational skills. • SMSC link – tolerance and understanding other cultures and religions, mutual respect. **NC Link:** • Use research and exploration, such as the study of different cultures, to identify and understand user needs	**Additional Higher Content** • Binary Fission – multiplication of bacteria – extension • Deficiencies of some nutrients could be included as well as excesses • Opportunity for extension of skills in practical- adaptation/substitution of recipes. • Evaluation skills could be developed as extension to practical work, including organoleptic analysis, opportunity for costing (numeracy skills) and nutritional analysis – consolidating previous study on nutrients.

RM Half Term 1	
Block 3 – 3 Weeks	**Block 4 = 3 Weeks**
• Developing knowledge of wood-based material and their properties • Introducing design and design development. • Developing and understanding of joining methods relating to woodworking.	• Engineering drawing. • 3rd angle orthographic. • Isometric. • Design and make mechanical systems.
Notes/Links/Interleaving • Introducing to manufactured boards types, hardwood and softwood and pro's and con's of each. • Analysis existing products in relation to design and develop own design from this. • Developing of wood joining skills with addition and Finger joint.	**Additional Higher Content** • Material scientific properties testing. • Design communication methods. • Cam and mechanisms. • Design related to industry.

RM Half Term 2	
Block 1 – 3 Weeks	**Block 2 – 3 Weeks**
• Designing for others • Research of target market • Evaluation of product against target market	• Using CAD software • Operating CAD hardware • Making finished items using CAD and CAM
Notes/Links/Interleaving • Considering the needs of others in relation to design. • Considering design approaches and existing product analysis under the heading of ACCESSFM • Design and making CAD and CAM machines. Including 2D design, AutoCAD, Laser cutting, and 3D Printing.	**Additional Higher Content** • Using a 3d printer. • Analysing others activities in the design field. • CAD & CAM related to industry. • Moral and social issues related to industrialisation.

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Year 9	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Food	**Advanced skills in Food**						**Food and Society**					
	Health and Safety. Food Safety, Personal safety incl. associated legislation.	Advanced practical skill development using a variety of ingredients, equipment and utensils - emerging cooking techniques and trends. Finishing techniques. Customer demographics lifestyles and expectations - customer service.					Environmental issues in food and cookery - incl. climate change, carbon footprint, food miles, packaging, sustainability and reducing food waste. Practical response to the issues learnt - producing food products with low environmental impact - local food, cooking in energy efficient ways etc. <u>Meeting NC Eval Pt 4</u> "understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologist					
RM	**Photo frame project – Researching materials and markets**						**Making – Control and Quality**					
	• Investigate design and research existing products. • Develop design skills. • Construct and test woodworking joining methods.		• Develop design skills using 2D design software, to communicate their design ideas. • Use flow chart and production plans.				• Practice joining methods. • Develop practical skills • Work using printed working drawings.			• Develop finishing skills and adding unique design features • Work and design evaluation		
RM/ Tex	**Bottle opener – More challenging materials**						**Textiles – Using the ideas of others**					
	• Marking out metal using correct tools • Cutting and shaping steel with accuracy. Using drills with accuracy • Use templates to cut hardwood.		• Using rivets to assemble items • Using finishing materials to add quality to a product.				Crazy creatures project. Research successful designs. Produce effective designs based on other people's work. Produce quality products.					

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Food Half Term 1

Block 1 – Weeks 1 to 4

- Health and Safety (food and personal safety) and associated legislation (pertinent to food industry)
- Advanced practical skills – opportunity for student adaptations to standard recipes and modification based on current techniques and trends (NC link Eval pt. 4)
- Developing skills using a range of equipment and utensils
- Garnishing and finishing skills
- Plans and evaluations written as part of lessons to build skills.

Block 2 – Weeks 5 to 6

- Advanced practical skills – opportunity for student adaptations to standard recipes and modification based on current techniques and trends (NC link)
- Developing skills using a range of equipment and utensils
- Customer demographics – expectations and customer service – built into practical lessons and demonstrations.

Notes/Links/Interleaving

- Understanding of emerging trends, demographics, consumer expectations, customer service etc.
- Developing and demonstrating higher level practical and presentation skills
- Teacake challenge could be used to show skills as extra curricular competition.

Additional Higher Content

- Higher level understanding of social, moral and ethical issues surrounding food production.
- Higher level advanced practical skills and presentation skills demonstrated

Food Half Term 2

Block 3 – Weeks 7 to 9

- Practical work – response to needs identified
- Including planning and evaluation of dishes made, suggestions for improvement

Block 4 – Weeks 8 to 12

- Practical work – response to needs identified
- Including planning and evaluation of dishes made, suggestions for improvement

Notes/Links/Interleaving

- Environmental considerations studied and encompassed into practical lessons - including climate change, carbon footprint, food miles, packaging, 3Rs etc.
- Evaluations will also summarise effectiveness of products in relation to the environmental needs and opportunity for extension and differentiated writing.
- Practical response to the issues learnt – producing food products in response to a need (low environmental impact) student led response using the prior knowledge from the beginning of unit and their additional research (HWK)
- Link → Meeting NC Evaluation Pt 4
- "understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologist

Additional Higher Content

- Opportunity to develop and demonstrate advanced preparation, cooking and presentation skills responding to current trends, and the environmental needs identified.
- Further research, investigation and practice out of class will be beneficial to practical results.
- Opportunity for extension of skills in practical- adaptation/substitution of recipes.
- Evaluation skills could be developed as extension to practical work, including organoleptic analysis, opportunity for costing (numeracy skills) and nutritional analysis – consolidating previous study on nutrients.

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Engineering Half term 1

Block 1 – Weeks 1 to 4

- National curriculum point Design Point 5.
- Pupils investigate design of photo frames and pictures, pupils practise stretching, and design development, pupils produce working drawings and orthographic drawings using CAD design software.

Block 1 – Weeks 5 to 6

- National curriculum point Make Point 1.
- Pupil produce flow chart production plan detailing steps of manufacture. Puli design CAM element of project using CAD software.
- National curriculum point - Technical Knowledge Point 5.
  Pupils develop programming and electronics using programming software.

Notes/Links/Interleaving

- Designing for others
- Making use of others designs
- Testing and evaluation
- Planning for making

Additional Higher Content

- Use of further CAD/CAM techniques
- Analysis of others designs
- Using planning software

Engineering Half Term 2

Block 3 – Weeks 7 to 9

- Marking out and making
- Preparing work space for manufacture
- Using information from testing to inform choice

Block 4 – Weeks 9 to 12

- Quality manufacture
- Finishing techniques
- Quality control
- Evaluations
- Justifying design decisions

Notes/Links/Interleaving

- Evaluation of work and design
- Quality of manufacture
- Testing and evaluation

Additional Higher Content

- Further materials testing
- Links to Physics (Stress, strain, hardness)

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Engineering Half Term 3	
Block 5 – Weeks 13 to15	**Block 6 – Weeks 16 to 18**
• Marking out from given designs using tools with skill and accuracy • Using tools with skill and accuracy in order to produce a component • Evaluating accuracy and correcting for errors	• Using rivets to join materials • Using various methods to produce a finish
Notes/Links/Interleaving • Using planning, marking and other techniques to produce a finished product. • Using tools and machinery with skill.	**Notes/Links/Interleaving** • Types of materials, differing joining methods.
Textiles Half Term 1	
Block 1 – Weeks 1 to 3	**Block 2 – Weeks 4 to 6**
• Basic textiles skills cutting and joining • Attaching buttons • Analysing other designs • Creating innovative designs • Planning for manufacture	• Setting up and using a sewing machine • Cutting and joining textiles • Making 3D shapes in textiles • Finishing textile designs with quality
Notes/Links/Interleaving • Analysis of designs and creating new innovative designs using the work of others as an influence	**Additional Higher Content** • Types of materials, differing joining methods.