

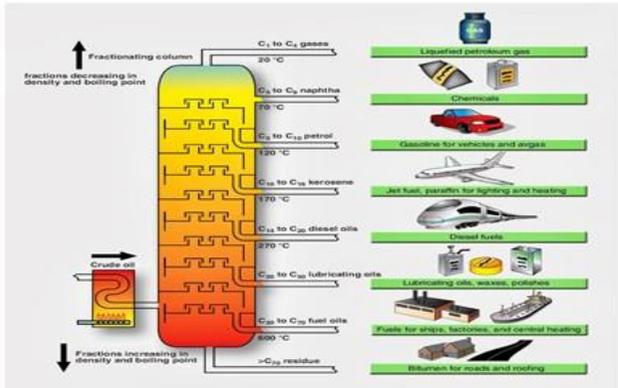
Year 8 - Polymers Design Technology Faculty

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:		
<p>Students have developed a repertoire of knowledge from their previous scheme of learning based on timbers. This scheme of learning introduces or extends that knowledge by the use of polymers. An extensive list of tools, techniques, machinery, CAD-CAM processes are implemented within the workshop to give students first-hand experience to ensure they have the practical expertise needed to preform everyday tasks confidently.</p> <p>Students are delivered content in similar way throughout KS3 to enable recall opportunities to be created throughout KS3 delivery. Tools, techniques, machinery, CAD-CAM processes are specific to the material that is being used however there are on occasions cross overs in subject pedagogy. Out of the three main material types timbers, polymers, metals, polymers have the largest array of manufacturing processes. Polymers are introduced to widen students knowledge of industrial processes available at Acle Academy.</p> <p>Design Technology operates a carousel system which enables clear sections in which students can learn subject specialist knowledge. Within Product Design students need to fully understand three main material types timbers, polymers and metals. These get delivered across KS3 with one material type covered per year.</p> <p>Students that undertake this scheme of learning develop their creative, technical and practical skills. They can apply a vast knowledge base in order to design and make high-quality products. Students are proactively asked to critique and evaluate the work of others to improve their own concepts.</p>	<p>AQA Design Technology Specification: Polymer based materials – Crisp Packets, 3D-printing, Vinyl Decals</p> <p>Origin of material: Oil</p> <p>How to shape and form: How to cut, drill and sand in Polymers.</p> <p>Stock forms: sheet, rod, powder, granules, foam and films. width, gauge and diameter, standard components. screws, nuts and bolts, hinges.</p> <p>Commercial processes: vacuum forming, 3D printing and injection moulding</p> <p>Quality Control: Dimensional accuracy by selecting correct laser settings.</p> <p>Surface Treatments: Polishing, printing and vinyl decals</p>	<p>Matter Molecule Solid Liquid</p>	<p>Types Plastic Acrylic</p>	<p>Categories Thermoplastic Thermosetting</p>
		<p>Manufacturing Processes Injection Extrude Vacuum</p>		

Challenge and Support:	Worldwide learning / links to 21 st century:	Cultural capital/ Industry/ Enrichment:
<p>Practical and theory lessons are delivered in very different teaching styles. Theory lessons are very much instruction based with specific content covered and lesson activities are similar however students' outcomes vary depending upon understanding. This also enables students learn independently. Practical lessons are very focused on problem solving and peer teaching enabling students to make positive relationships to overcome similar obstacles.</p> <p>Final outcomes are only allowed to leave the workshop once complete and this ethos ensures that practical activities a challenging and ambitious. Many students have never meaningfully manipulated a piece of plastic before however the practical outcomes achieved are very good.</p> <p>All students complete the book Learnabout The story of Plastics. This book gives a full spread of knowledge from the history of Polymers to manufacturing processes. The book also includes some fantastic illustrations that enable students to make links between.</p> <p>To ensure that students of all abilities have full access to the learning material given examples of work are always given. Theory work is modelled by the teacher and explained before being undertaken and during practical lessons examples and detailed CAD drawings given to work from.</p>	<p>The word design means different things to different people. Often the word design is associated with the way something looks, often it is used as a noun, that's a good design but really it is a verb. Design is a way of doing things, it is a way of thinking and above all it's a way of thinking creatively. Design Technology in all of its forms and disciplines are fundamentally about converting ideas and raw materials into the products and services that we all use and need today. Everything around us has been designed.</p> <p>https://www.youtube.com/watch?v=4ILSEDVSAp4</p>	<p>The skills used in practical activities have direct links to jobs market and these are highlighted throughout the rotation to students. These practical skills will also develop student's ability to problem solve and apply knowledge learnt across other faculties within Acle Academy. To further enrich our student's links have been made with the following to further develop the learning experience of our students.</p> <p>Worldwide: Playmobil Lego Bruder</p> <p>Local: U C P Zeller Ssaf Window Films Ltd</p>
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:
<p>The use of raw materials has a direct impact on the world we all live in. Students are introduced to plastic gyres and how they are created. Although materials are used it is important students appreciate to origin and environmental impact of that material.</p> <p>Students are introduced to a range of hand tools, machinery and equipment that all come with an element of risk. Students are taught how to use these in a safe manner and to work in a way to not endanger other.</p>	<p>Gatsby Benchmark: https://www.bbc.co.uk/bitesize/articles/zkw6cqt https://www.bbc.co.uk/bitesize/articles/z7thd6f https://www.bbc.co.uk/bitesize/articles/z74njhv</p> <p>STEAM Ambassadors: Students will be awarded a STEAM ambassador badges if they have been identified for doing exceptional work either academically or practically within this Design Technology curriculum.</p>	<p>Problem solving skills are a constant element that need to be developed. CAD-CAM enables problem solving skills to be developed through detailed step by step instructions with a common end result.</p> <p>Students unfortunately are not very 'computer literate'. Basic networking skills such as file saving has to be addressed.</p>

<p>Students enjoy the independence that the practical elements that the subject brings. It enables students to have a sense of achievement when completing their final outcome.</p>	<p>Cross Curricular links: The department has linked all KS3 schemes of learning with Maths: XY coordinates (All Years) Science: Fractional Distillation (YEAR 9)</p>	
<p>Assessment timeline:</p>		
<p>There are three formative assessments that take place throughout the Scheme of Learning. These formative tests are in the form of class quizzes and are tracked throughout on the student assessment sheet within class folders. At the end of the scheme of learning students take a test that amalgamates these tests into one large test. This data is recorded onto the front of student folders and informs teachers and students of subject knowledge retained.</p> <p>Typically, tests should be taken every three weeks to ensure that regular knowledge recall is in operation. The carousel is made up of 12 weeks with single lessons lending themselves to more theory-based lessons. Both formative and summative tests are multiple choice with questions covering a variety of subject specific pedagogy. Students will be questioned during plenaries of lessons and will be asked to explain the previous lessons content at the start of the following lesson.</p> <p>Students are given a target percentage to achieve for their summative tests and their success criteria would be beating this. For all practical lessons students are given WAGOLLS in the form of physical outcomes or of previous student's work. To ensure students develop independent skills within a workshop setting exemplar materials are always in place to ensure students can participate successfully.</p> <p>Through the use of Google Forms statistics are provided for teachers to identify specific areas of poor student knowledge retention. This information enables teachers amend teaching practice if required or enable more time to be given in its delivery.</p>		
<p>Assessment Area: Design This test is designed to assess students' knowledge on the following areas: Polymer: origin / manufacturing processes / states of matter Literacy spelling</p> <p style="text-align: right;">Exam: 20 marks</p>	<p>Assessment Area: Make This test is designed to assess students' knowledge on the following areas: Polymer: types / CAD-CAM / signage STEM simple addition / subtraction</p> <p style="text-align: right;">Exam: 20 marks</p>	<p>Assessment Area: Evaluate This test is designed to assess students' knowledge on the following areas: Polymer: fractions / stock forms / injection moulding</p> <p style="text-align: right;">Exam: 20 marks</p>
<p>Home learning</p>		
<p>Drawing skills are an essential part of Design Technology and a student has to be able to successfully communicate their ideas at all Key Stages. A booklet has been created to ensure students develop these skills. Students will be given traffic light feedback as to whether they need to revisit a specific drawing technique again.</p> <p>Literacy is an essential part of the subject and books have been assigned to all year groups. Students in year 7 read, Learnabout Woodwork. Three single lessons have been allotted to read the book and cover teaching strategies that are used throughout Acle Academy. Digital copies are also available on the Google Classroom platform.</p>		
<p>Feedback</p>		
<p>Design Technology uses subject specific front sheet to inform students of their learning journeys within that rotation. These will percentage scores of the student's attainment across theory and practical work based on: Design, Make and Evaluate. Within a practical environment verbal feedback is always present to ensure that students are focused and achieving their full potential. Demonstrations are always interactive with the teaching using student's knowledge to set the benchmark of discussion. During practical lessons WWW and EBI are used to maintain student engagement and raise aspiration.</p>		

Polymers



Design Technology



SMSC when designing



Origin



Scan me Careers

Career 1	Career 2
	

Plastic Types

 Plastic recycling	 PETE Polyethylene terephthalate	 HDPE High-density polyethylene	 PVC/V Polyvinyl chloride
 LDPE Low-density polyethylene	 PP Polypropylene	 PS Polystyrene	 0 OTHER

Lifecycle



CAD Programs



CAD Programs



CAD Programs



KNOW YOUR SAFETY SIGNS THERE ARE 4 TYPES

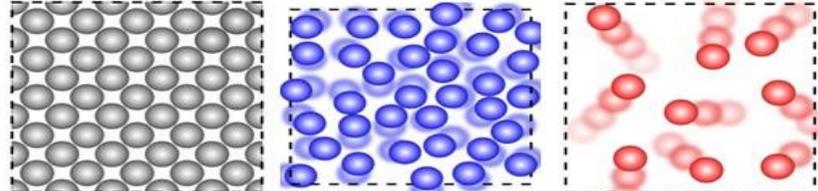
Origin



Recycle



States



Solid		Liquid		Plastic		Molecule		Injection	
Extrude		Vacuum		Acrylic		Thermoplastic		Thermosetting	

