



YEAR 12 2023-2024 TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Polymers and Processes



In addition to working further on objectives from Year 911, pupils will be taught, following National Curriculum guidelines, the following this term:

Curriculum Intent

To be able to describe the performance characteristics of polymers including:

- toughness
- elasticity
- insulation (thermal and electrical)
- UV resistance
- ability to be moulded
- resistance to chemicals and liquids
- melting points
- suitability for food packaging applications
- biodegradability
- recyclability
- self finishing
- ability to be combined with other polymers and/or additives.

To understand the difference between the categories of polymers

To know different types of thermo and thermoset polymers (HDPE, LDPE, HIPS, PP, ABS, PMMA, Nylon, PVC) / (UF, MF, Polyester Resin, Epoxy Resin).

To know the different processes to shape polymers

To understand the injection moulding, extrusion, vacuum forming and blow moulding processes

To be able to link the product with the process.

To know the different processes to shape polymers

To understand the rotational moulding, compression moulding, extrusion, calendaring and laminating processes

Skills/Assessment Objective Links

To gain knowledge and understanding of additives to enhance polymers.

To know specific finishes of polymers. Including: acrylic spray paints, thermoplastic elastomer

To know how smart pigments are added and gel coats when laminating GRP.

To know different polymer based sheets and processing techniques. Including:

- the ability to be scored
- cutting
- folding
- moulding
- transparency
- translucency
- flexibility

recyclability and/or biodegradability.

To be able to explain uses and suitability for:

- foam board: model making
- fluted polypropylene: signs and box construction
- translucent polypropylene sheets: packaging

	<ul style="list-style-type: none"> • styrofoam: modelling and formers • low density polyethylene sheet: wrapping, packaging and bags • plastazote foam: protective packaging • cellulose acetate: packaging • polyactide sheet and film: biodegradable packaging.
Spiritual, moral, social, and cultural development	SMSC : Sustainability linking to materials and reduction in CO2 emissions PSHE/British Values : UK industry links through case studies e.g. Dyson Skills Builder : Linking product with the type of material and the reasons why the material is used.
Numeracy	
Literacy	Vocabulary Tier 2 : See highlighted above Vocabulary Tier 3 : See highlighted above Reading : exam style question, text book terminology Writing : use of technical tier 3 vocabulary within an exam question and annotation Oracy : when questioned pupils are able to use technical subject specific language
Becoming future ready	Careers/Employability : Environmental industry, various industrial links as examples
Adaptation	Throughout this topic, quality first teaching will provide differentiation:
QFT/SEND Provision	By product : By resource : worksheets By Intervention : by providing different levels of supervision and support By Progressive Questioning : exploring pupils' understanding through interactive dialogue. By Grouping : according to prior attainment, gender, social preference, preferred learning style. By Task : Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range. By Offering Optional Activities : In class or as homework, to extend learning. This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.
Implementation Curriculum Delivery	To be able to describe the performance characteristics of polymers including: <ul style="list-style-type: none"> • toughness • elasticity • insulation (thermal and electrical) • UV resistance • ability to be moulded • resistance to chemicals and liquids • melting points • suitability for food packaging applications • biodegradability • recyclability • self finishing • ability to be combined with other polymers and/or additives.
Learning Outcomes (Knowledge)	Red denotes interleaving; aspects of knowledge covered previously in Yr10 if studied at GCSE
Current learning to be developed in the future within:	To be applied to NEA annotations and Paper 2 style questions

Assessment	Formative – exam questions throughout topic Summative – end of unit test
Impact	Pupils to have knowledge and understanding of polymers, processes and finishes in order to be able to answer exam style questions and apply knowledge and understanding to NEA tasks.