PARKSIDE COMMUNITY SCHOOL

EMBARK FEDERATION

Technology Curriculum Learning Journey

Technology

Learning Journey

Intent · Implementation · Impact

Curriculum Intent

The technology curriculum at Parkside is contemporary and varied and develops learning which results in the acquisition of knowledge and practical skills over their 5 years here. When we think about what we want students to know and be able to do by the time that they leave school, technology is a subject which allows students to develop what they are able to do; for example, practical wood working and operation of computer aided machinery as well as developing knowledge. Pupils will develop their understanding of material properties and the principles of design.

The design of the technology curriculum, ensures that cross curricular links are central, using math skills in a practical context, applying learning in science to the materials and manufacturing methods gives real life understanding to our students. Students develop their literacy skills, learning to use technical terminology to describe products and processes.

It is crucial for students to understand the role that technology has played in the development of our world, from the food that we eat, the clothes we wear, the homes we live in and our methods of transport, and that they have been created and designed by innovators, pupils should develop an understanding for the objects around them and the design of products to make aesthetically pleasing, well-engineered and high functioning items which we use every day.

Technology is a subject where students can develop their autonomy and are encouraged to think independently to be innovative in their designs and creation of original practical outcomes. The technology curriculum is structured to support the physical development and technical understanding of pupils, and prepares them for the opportunities, responsibilities and experiences in later life. The curriculum is designed in such a way, to reflect Parkside Community School's local context and the range of qualifications and vocations our students will progress onto after life at Parkside. We will prepare students to take part in the development of tomorrow's rapidly changing world.

Creative thinking encourages students to make positive changes to their quality of life and the life of others within our local community in Chesterfield and beyond. The subject will stimulate young people to become creative problem-solvers, both as individuals and as part of a team. It enables students to identify needs and opportunities and to respond by developing ideas and making products through a variety of techniques, materials and processes.

Our curriculum is committed to extending our pupils' learning by offering a wide range of extracurricular opportunities which include technology competitions and work with our local industries as these opportunities help to put Technology into a real word and local setting context.

We are committed to developing students' skills to live independent lives when they have completed their learning journey. They will understand nutrition and how to live a healthy lifestyle, along with being able to cook for themselves and their family. Students will develop skills of problem solving and creativity which they will be able to apply to a range of situations along with an understanding of how to shape and manipulate materials to make products.

A Godley – Head of Arts, Business and Technologies

Technology Curriculum Learning Journey

Curriculum Implementation

The five-year learning journey in Technology equips students with a range of practical skills and knowledge of the real world and industry for a time when they leave Parkside. Pupils will learn a systematic set of processes which are used to design, develop, make and test products which they will use throughout every year of their learning in Technology

Concepts are studied and skills are practiced to build knowledge and then revisited in various contexts, creating links across topics and projects. Students will learn that in every product that they create, they will follow the same process of the design cycle.

In Technology Pupils will naturally draw upon their knowledge and understanding of Mathematics, Science, Computing, Art and Design. Our Technology curriculum is delivered through a progression of skills that start in year 7 and are built on throughout each year group. Pupils at Parkside learn how to develop, plan and communicate their ideas, following the design cycle. They investigate how to work with tools, equipment, materials and components to make quality products.

Students are encouraged to become creative problem solvers, both independently and as part of a team. Responsive Sequencing and Interleaved curriculum implementation are used to support student's development of knowledge. We understand that pupils have a higher rate of knowledge retention if they are given the opportunity to recall past learning and apply this learning in future lessons. As a result, each topic uses the design cycle consistently and within each lessons Memory platform, activities are used to interleave knowledge and give students the opportunity to recall learning.

Disciplinary literacy and the knowledge of specialised vocabulary which are used in technology is essential to supporting students' academic and theoretical knowledge of Technology. The development of subject specific literacy will also support pupils' ability to express their opinions of design and knowledge in an examination style question. We know that without competent and confident literacy skills, our pupils cannot flourish in the world; it is therefore our duty to prioritise the vital acquisition of high-quality communication skills within the Technology Curriculum and within our whole school planning.

The 5 year learning journey leads to the final two years at Parkside where students in KS4 study GCSE Design and Technology, design briefs, design specifications and user requirements, product analysis and research, developing and presenting a final product. 50% is coursework based, with a mixture of development of theory knowledge, practical skills and computer design. The other 50% is final exam at the end of Y11. The knowledge gained through the course is interweaved with synoptic links to support students in making relevant connections in their learning and broader understanding of Design and Technology.

The technology curriculum is fully inclusive, every child is valued and respected. We are committed to the inclusion, progress and independence of all our students, including those with SEND. The Technology teachers, technicians and support staff work to support our students to make progress in their learning, their emotional and social development and their independence. As Technology teaches many life skills; it is paramount within the implementation of the technology curriculum to support the learning and needs of all members of our community.

Technology Curriculum Learning Journey

Curriculum Impact

The impact of our Technology Curriculum Learning Journey is defined through the accessibility pupils have to developing knowledge and the application of skills. This is determined through a number of measures:

- ✓ **Formative Reporting of Pupil Progress** will take place through assessments that take place each lesson and include pupil questioning, discussion, the completion of examination style questions and the completion of homework.

- ✓ **Summative Reporting of Pupil Progress** will take place through examination paper assessments and assessment of student's practical outcomes at the end of each topic. Parents/Carers receive a report following each mid and end point assessment to understand their child's current depth of knowledge and the support they need to further develop this knowledge both inside and outside of school.

- ✓ **In-lesson learning, participation and belonging** is measured by continually monitoring pupil punctuality to lessons, rewards and sanctions, behaviour referrals, pupil voice and work-scrutiny. Our hope is that by continued positivity in these areas, our Technology Curriculum Learning Journeys are accessible and will, therefore, positively impact knowledge growth and skill application.

- ✓ **Knowledge and understanding of the key concepts and skills**. Pupils will be able to speak with confidence about design and explain how products are made. Pupils will know how to live a healthy lifestyle and will have life skills to use tools to manipulate food and materials to make products to make their life more comfortable. All pupils will understand the opportunities available to them in the field of technology.

- ✓ **Post-16 Progression has demonstrated** extremely strong with many of our pupils moving on to pursue Technology after life at Parkside. Our students follow a range of paths including the study of Design Technology at Sixth forms and colleges. Construction, Engineering and Catering qualifications at College along with a number of our students furthering their study of technology through a range of apprenticeships.

PARKSIDE COMMUNITY SCHOOL

EMBARK FEDERATION

Learning Journey overview

Technology Curriculum Learning Journey

Technology Curriculum Learning Journey

Year 7: Topic summary

How we interleave topics to enable pupils to build and recall knowledge.

Timbers – Block Bot	Textiles – Animal Cushion	Polymers – Keyring	Paper and Board – Exploding Box
Introduction to the workshop safely using hand tools and machines. Categories of timbers.	Introduction to hand sewing and applique. Design ideas and textiles care labels.	Introduction to CAD CAM using 2D design and the laser cutter. Producing a manufacturing diary.	Introduction to paper and board and measuring skills.

Timbers - Block Bot Pencil Pot

Key Skills and Theory: Family tree, keywords, design development, workshop safety, intro to tools and machines.

Introduction into Design and Technology, allowing students to build confidence as they take their first steps into the design world and technology learning. The focus of this term is to develop designing and making skills. Students will develop basic knowledge of the workshop using simple hand tools and workshop machinery with supervision.

Textiles - Animal Cushion,

Key Skills and Theory: - Design ideas, keywords, basic hand sewing and applique, care labels, introduction to sewing machines.

Students will develop their knowledge of designing and design development around the ever evolving and pivotal theme of sustainability in design. Students will develop collaborative working skills which would be key if they were to pursue a career in the design industry. Pupils will learn how to develop their designs into 3D models which will be a key skill that they develop on throughout KS3 in preparation for KS4.

Polymers - Keyring

Key Skills and Theory: - CAD/CAM, 2d design, manufacturing diary, intro to laser cutter, keywords.

Pupils will develop their graphic design skills on CAD and learn how to design a product for a client. Students will learn about target markets and how designers adapt and tailor their products to meet the needs of their user. Pupils will build on the 3D modelling skills using CAM. Students will use these skills to create a final outcome of an acrylic keyring.

Paper and Board – Exploding Box

Key Skills and Theory: - Drawing skills, measuring skills (mm cm), decorative techniques.

Students will work on measuring skills to product a final outcome, students will draw on all of their developed skills and knowledge from the previous topics. In the Design and Technology rotations students will enhance their product using decorative techniques.

Technology Curriculum Learning Journey

Year 7: Cooking and Nutrition topic summary

How we interleave topics to enable pupils to build and recall knowledge.

Introduction to cooking and nutrition Introduction to the food room. Health and safety considerations when working with food	**Cooking on a budget** Eating a healthy balanced diet while considering budget restrictions

Key Skills and Theory: - Knife safety, weighing and measuring, Eatwell guide, carbohydrates, recipe reading, protein sources, vitamins and minerals, keywords, seasonal foods

Introduction to food and nutrition

Students will learn how to prepare food safely, cooking predominantly savoury dishes and exploring the use of different ingredients. They will learn basic practical skills and be introduced to foods and recipes to enable them to feed themselves an affordable and healthy diet. They will learn about the importance of health and safety in the food room and the correct techniques for using a knife safely. Students will learn about the design and planning process though design work, including modifying recipes and presentation skills.

Cooking on a budget

Students will learn about the importance of different food groups of the Eatwell guide and be able to prepare a range of dishes which will include the ingredients from each section. They will learn about the importance of a balanced diet. Students will learn about macro nutrients, their main functions and sources. They will have an introduction to the importance of micro nutrients.

Students will be encouraged to evaluate their cooking and consider how recipes can be adapted and improved.

Technology Curriculum Learning Journey

Year 8: Topic summary

How we interleave topics to enable pupils to build and recall knowledge.

Timbers – Lamp base	Textiles – Gonk	Polymers – Lampshade	Electronics - Light
Building confidence and skills in the workshop. Introduction to orthographic drawings.	Sustainability in Textiles. 6Rs and suitable fabric choices. Fabric construction	Introduction to the Vacuum former. Categories of plastics and suitability of use.	Introduction electronics. Soldering a simple circuit to make fully functioning product.

Timbers – Lamp base

Key Skills and Theory: - Intro to orthographic drawing, workshop risk assessment, finishes, component basics.

The focus of this term is to develop designing skills further from year 7 work. Students will develop their knowledge of the workshop using hand tools and workshop machinery. Students will develop skills to correct errors and will develop skills with a range of wood working tools. Pupils will learn about a range of finishing techniques, waxing, lime finish, dye and paint. Students will select an appropriate finish for their product.

Polymers - Lampshade

Key Skills and Theory: - Categories of polymer, specification using ACCESSFM, designer influences, vacuum forming, intro to sketch up

Pupils will use the vacuum former to make a lampshade for their lamp base. They will learn how to select appropriate materials to make a lampshade. They will develop a former into a mold and then a working product. Students will use a range of decorative techniques including CAD CAM.

Electronics – Light

Key Skills and Theory: - Input- process-output, simple circuit, risks and hazards, soldering, component identification.

This is an introduction into electronics. Components and soldering. Students will learn how to complete a simple circuit by selecting appropriate components and soldering to make a functioning product. Hazards and risks will be considered at each stage of the make.

Textiles – Gonk

Key Skills and Theory: Sustainability, carbon footprint, 6R's, SMSC fabric construction hand sewing expansion

Students will develop their knowledge of designing and design development around the ever evolving and pivotal theme of sustainability in design. Students will develop collaborative working skills which would be key if they were to pursue a career in the design industry. Students will explore a range of stitch types which can be used as decoration and embellishment. Choice of materials also play a large role in this project and independent learning will be developed through students choice of chosen fabrics to use on final outcome.

Technology Curriculum Learning Journey

Year 8: Cooking and nutrition topic summary

How we interleave topics to enable pupils to build and recall knowledge.

Balanced Diet	World Food
Building skills in the food room and using the Eatwell guide to plan and prepare a healthy balanced diet	Exploring how food choices differ around the world. Looking at the impact of food provenance

Key Skills and Theory: Complex carbohydrates, healthy meal planning, 4Cs cleaning, cross contamination, cooking, chilling, food hygiene and safety, fats and sugars, food around the world, key terminology, alternative diets and meal plans, food provenance.

Balanced Diet:

Building on previous learning in year 7 students will continue to build their confidence in preparing food safety, cooking predominantly savoury dishes and exploring the use of different ingredients. They will continue to learn key practical skills and be introduced to foods and recipes to enable them to feed themselves an affordable and healthy diet.
Students will learn about the principles of cleaning, preventing cross-contamination, chilling and cooking food thoroughly. They will also have the opportunity to create and evaluate their own recipe.
.

World Food

Students will continue to learn about the importance of the different food groups of the Eatwell guide and be able to plan and prepare a range of dishes which will include the ingredients from each section. They will find out about diets from around the world and look at differing dietary requirements for religious or ethical reasons.
They will find out about food provenance, including work on seasonality. They will also continue to work on their evaluation skills, using sensory vocabulary appropriately.
.

Technology Curriculum Learning Journey

Year 9: Topic summary

How we interleave topics to enable pupils to build and recall knowledge.

Timbers – Mood Frame Using orthographic drawings to produce a product withing tolerance levels. Testing.	Textiles – Bag Development of a range of decorative techniques and construction using the sewing machine.	Polymers – Bauble decoration Development of CAD CAM tools and processes linking to industry.	Paper and Board – Transformers Development of design through modeling. Slot together construction.

Timbers – Mood frame

Key Skills and Theory: - Orthographic drawing, tolerance, testing, machine use expansion, mixed materials, design development

The focus of this term is to develop independent designing skills in preparation for KS4. Pupils will develop their analysis skills and be able to use a specification structure. Follow orthographic drawings to product a fully functioning product within a given tolerance. Students will develop design development skills and learn to annotate design ideas in depth, knowing how to add details of material choices, manufacture suggestions and design justification.

Polymers – Bauble decoration

Key Skills/Theory: - CAD/CAM, industry links, production methods, polymer identification and properties.

Students will develop CAD CAM skills in 2D design and following a specification. Clients needs and wants are focused on here to give outcome. Students will have to follow but adapt the size requirements.

Textiles - Bag

Key Skills/ Themes: - Use of a sewing machine, decorative techniques, skills and troubleshooting, introduction to overlocking.

Pupils will develop their decorative skills and produce a bag. Students will learn Batik, Tie Dye, Screen printing, transfer printing along with a range of other techniques. Sustainably will be reflected upon in research and make. Use of the sewing machine will play a large role in this project and students will gain confidence in using but also troubleshooting setup and basic running of the machine.

Paper and board – Transformers

Key Skills/ Theory: - turning design ideas into 3D models, modeling skills, testing and needs of a product modelling, design development, client profile, mechanisms, hand tool expansion

Pupils will learn to safely use craft knifes to model a transformer. Students will develop collaborative working skills which would be key if they were to pursue a career in the design industry. Students will learn how to develop their design into 3D models.

PARKSIDE COMMUNITY SCHOOL

EMBARK FEDERATION

GCSE Eduqas Design and Technology

How we interleave topics to enable pupils to build and recall knowledge.

Year 10

This year students will be in preparation for their NEA and end of year exam. Through small practical projects students will continue to develop their skills. Theory will be delivered throughout the year interleaved with practical projects. Projects students will complete throughout the year include Timbers Box: focus on 4 joints, Paper and board: students will complete, design, develop test and evaluate a pizza box and shoe. Smart materials. Polymer jewelry project CAD CAM and chocolate mold as well as drawing skills and challenges. All of these projects are bringing together the knowledge and the skills needed to complete the NEA and exam in Y11.

Materials	
Papers and boards	paper types
	paper sizes
	card types
	laminating
natural and manufactured timber	hardwoods
	softwoods
	manufactured boards
Ferrous and non-ferrous metals	ferrous and metal finishes
	non-ferrous metals and finishes
	alloys
Polymers	thermoforming polymers
	thermosetting polymers
Textiles	natural polymers
	manufactured polymers
	microfibres
	blending and mixing fibres
	woven, non-woven and knitted

Smart Materials, Composites, Technical Textiles	
smart materials	electroluminescent materials
	quantum tunnelling composite
	shape memory alloys
	polymorph
	photochromic pigment
	thermochromic pigment
	micro-encapsulation
	biomimetics
composites	carbon fibre reinforced polymer
	glass reinforced plastic
	kevlar
technical textiles	interactive textiles
	microfibres
	phase changing materials
	breathable fabrics
	kevlar
	sun-protective clothing
	gortex
	geotextiles

Design Technology and Our World	
the impact of new and emerging technologies	mass production & assembly lines
	market pull and technology push
	consumer choice
	Product Life Cycle Analysis
People, culture and society	Global production and its effects on people and culture
	legislation and consumer rights
	moral and ethical factors
Production techniques and systems	CAD
	CAM
	using CAM equipment
the importance of sustainability issues	sustainable design
	linear and circular economy
	6R's
	life cycle analysis
	biocode
	carbon footprint
	ecological footprint
how energy is generated and stored	types of renewable and non-renewable energy sources
	Advantages and disadvantages
	renewable energy sources for products
	energy generation and storage

In depth knowledge and understanding (question 6)	
Natural and manufactured timber	primary sources
	seasoning
	defects in timber
	types of natural timber
	manufactured timber
ecological and social footprint	deforestation
	social footprint
	life cycle of timber products
The factors that influence material selection	functionality
	aesthetics
	environmental factors
	availability
	cost
	social/cultural/ethical factors
	biodiversity
forces and stress on materials	forces and stress
	reinforcing and stiffening
	joining and fixing
stock form and cost calculations	stock sizes of materials
manufacturing	scales of production; one off, batch, mass, continuous
	use of jigs
tools and processes	marking out
	measuring
	sawing wood
	shaping wood
	drilling
	de forming and reforming
joining wood	wood joints
	adhesives
	screws
	knock down fittings
	laminating and steam bending
CAM	laser cutting
	3d router
Finishes	surface preparation
	stains
	preservatives
	varnish
	oils
	polish
	paints

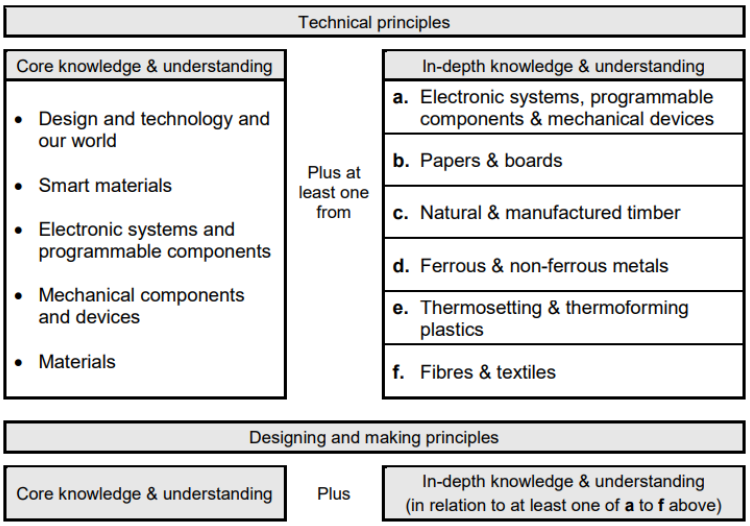
Electronic Systems and Programmable Components	
How electronic systems provide functionality to products and processes	electronic control systems
	input sensors
	output devices
	control systems in familiar devices
The use of programmable components	embedding functionality
	flow chart programs
	subroutines
	microcontrollers

Mechanical Devices and Components	
Types of motion	rotary
	linear
	oscillating
	reciprocating
Mechanical systems	input-process-output
Mechanical components	levers
	linkages
	cams
	gears
	belt drive
	rack and pinion

Technology Curriculum Learning Journey

Year 11

Component 1: Design and Technology in the 21st Century Written examination: 2 hours 50% of qualification	Component 2: Design and make task Non-exam assessment: approximately 35 hours 50% of qualification
A mix of short answer, structured and extended writing questions assessing candidates' knowledge and understanding of: • technical principles • designing and making principles along with their ability to • analyse and evaluate design decisions and wider issues in design and technology.	A sustained design and make task, based on a contextual challenge set by WJEC, assessing candidates' ability to: • identify, investigate and outline design possibilities • design and make prototypes • analyse and evaluate design decisions and wider issues in design and technology.



Technical principles

Core knowledge and understanding is presented in five clear and distinct topic areas:

• design and technology and our world

• smart materials

• electronic systems and programmable components

• mechanical components and devices

• materials

Learners are required to study all of the content in these five areas, to ensure they have a broad knowledge and understanding of design and technology and that they are able to make effective choices in relation to which materials, components and systems to utilise within design and make activities.

In-depth knowledge and understanding is natural & manufactured timber. Learners are required to have an in-depth knowledge and understanding of this area to support their design and make activities.

Designing and making principles

Technology Curriculum Learning Journey

Core knowledge and understanding that learners are required to develop and apply is presented in ten clear topic areas:

- understanding design and technology practice
- understanding user needs
- writing a design brief and specifications
- investigating challenges
- developing ideas
- investigating the work of others
- using design strategies
- communicating ideas
- developing a prototype
- making decisions

Learners are required to cover all of the content in these ten areas, to ensure they are able to apply a broad knowledge and understanding of design and technology principles within design and make activities.

In-depth knowledge and understanding is presented in five clear topic areas:

- selecting and working with materials and components
- marking out
- using tools and equipment
- using specialist techniques
- using surface treatments and finishes

Learners are required to cover all of the content in these five areas.

Design and Technology in the 21st Century
Written examination: 2 hours
50% of qualification
100 marks

Design and make task
NEA: approximately 35 hours
50% of qualification
100 marks