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Technology I

3º ESO

UNIT	FINAL TASK	DEVELOPMENT	FINAL PAGES
The technological process	Designing a drip irrigation system	<ol style="list-style-type: none"> What is technology? What factors are involved in the technological process? The classroom workshop <ol style="list-style-type: none"> Order and organization of workshop activity Hygiene and safety rules Signage Stages of the technological process <ol style="list-style-type: none"> Approach to and analysis of the need or problem Gathering together and analysing precedents Individual design of the idea Pooling of ideas and choosing the best solution Developing the solution Planning the work of the group: action plan Manufacturing budget Construction and experimentation Evaluation and checking of the product Record of manufacture Materials for technical use The influence of technology on society Technology and the environment 	<p>PROCEDURES: Creating the project documents</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>
Graphic communication and expression	Making a photo frame with wooden clothes pegs	<ol style="list-style-type: none"> Technical documents used in a project <ol style="list-style-type: none"> Presentation of technical drawings Materials for drawing: pencil and paper <ol style="list-style-type: none"> Drawing tools: pencil Base for the drawing: paper Sketches, outlines and plans <ol style="list-style-type: none"> Sketch Outline Outlined plans Drawing tools: measuring and designing <ol style="list-style-type: none"> Basic measuring tools Drawing tools: isosceles and scalene set-squares, compass Scales <ol style="list-style-type: none"> Choosing scales Graphical scale Scalometer Standardisation Drawing the boundaries <ol style="list-style-type: none"> Boundary drawing rules Views of an object Multiview orthographic projection 	<p>PRODUCT DOCUMENTATION</p> <p>PROCEDURES: Computer-aided drawing</p> <p>PROCEDURES: Introduction to computer-aided 3D drawing</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>
Wood and its derivatives	Making a jigsaw and its box	<ol style="list-style-type: none"> Wood <ol style="list-style-type: none"> The process of obtaining wood Classification of wood Products derived from wood <ol style="list-style-type: none"> Prefabricated woods Cellulosic materials Properties of wood Tools, equipment and machines <ol style="list-style-type: none"> Measuring Marking and tracing Treating Cutting and sawing Drilling Carving and shaping Planing and sanding Joining Painting 	<p>PROCEDURES: Making a wooden puzzle</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>

UNIT	FINAL TASK	DEVELOPMENT	FINAL PAGES
Metal	Design and making of a metal flower	<ol style="list-style-type: none"> Metals <ol style="list-style-type: none"> The process of obtaining metals Classification of metals Properties of metals Ferrous metals Non-ferrous metals <ol style="list-style-type: none"> Ultralight metals Light metals Heavy metals Forming techniques <ol style="list-style-type: none"> Deformation Moulding Manipulation techniques <ol style="list-style-type: none"> Etched Cut Perforated Carved/Shaped Polished Machine tools for smoothing and polishing Finishes Connections <ol style="list-style-type: none"> Fixed connections Detachable connections 	PROCEDURES: Making an aluminium flower FINAL ACTIVITIES FINISHING THE FINAL TASK
Structures	Building a bridge	<ol style="list-style-type: none"> Structures <ol style="list-style-type: none"> Natural and artificial structures Forces and loads Forces <ol style="list-style-type: none"> Types of forces Artificial structures <ol style="list-style-type: none"> Massive structures and structures with lintels Vaulted structures Triangulated structures Suspended structures Reinforced concrete lattice structures Lamellar structures Pneumatic structures Spatial and geodesic structures Conditions of structures <ol style="list-style-type: none"> How can we ensure that a structure is stable, resistant and not easily deformed? Structural elements <ol style="list-style-type: none"> Pillar, column and pilaster Beam, joist and lintel Arches and vaults Flying buttresses and buttresses Load-bearing and artificial walls Floor structure Base, shoe, slab and piling Braces and tensors Mechanisms <ol style="list-style-type: none"> Transmission of linear movement Transmission of circular movement Mechanisms for transforming movement 	ANALYSIS OF STRUCTURES SIMULATIONS OF STRUCTURES: Virtual test of your design PROCEDURES: Building structures using paper and cardboard FINAL ACTIVITIES FINISHING THE FINAL TASK

UNIT	FINAL TASK	DEVELOPMENT	FINAL PAGES
Electricity	Designing and manufacturing an electronic game and an advertisement for it	<ol style="list-style-type: none"> Electrical charge Electric current <ol style="list-style-type: none"> Conducting and insulating materials Electric circuit <ol style="list-style-type: none"> Generators Conductors Receivers Switching and control elements Protective elements Representation and symbols The effects of electric current <ol style="list-style-type: none"> Heat Light Movement Basic electrical variables and measuring instruments <ol style="list-style-type: none"> Voltage, intensity and electrical resistance Electrical energy and power Ohm's law Serial and parallel circuits <ol style="list-style-type: none"> Connecting receivers Connecting generators Rational use of electricity 	SIMULATION OF CIRCUITS: Simulation of circuits using the Yenka program PROCEDURES: Building circuits FINAL ACTIVITIES FINISHING THE FINAL TASK
Hardware and software	Hardware board	<ol style="list-style-type: none"> Computer language <ol style="list-style-type: none"> Binary code Binary system of numbering Hardware <ol style="list-style-type: none"> Hardware components Software and the operating system <ol style="list-style-type: none"> Types of software Operating system Windows operating system <ol style="list-style-type: none"> Working with Windows Linux operating system Mobile operating systems <ol style="list-style-type: none"> Using an operating system: iOS and Android IT applications <ol style="list-style-type: none"> Word processors Presentations 	IT APPLICATION: Office automation in the Cloud PROCEDURES: Creating a template for entering a record of the project FINAL ACTIVITIES FINISHING THE FINAL TASK
Internet: safety and networks	Designing computer graphics about IT security	<ol style="list-style-type: none"> Communication systems Computer networks <ol style="list-style-type: none"> Parts of a computer network Interconnected nets Internet, the net of nets <ol style="list-style-type: none"> Internet domains Internet services Connecting to the Internet Searching for information on the Internet <ol style="list-style-type: none"> Online dictionaries and encyclopedias Publishing on the Internet <ol style="list-style-type: none"> Creating a web page Creating a blog Comparing information <ol style="list-style-type: none"> Sharing information using cloud services Sharing information on social networks 	FINAL ACTIVITIES FINISHING THE FINAL TASK

PROJECTS

- Design and construction of a drawbridge
- Design and construction of a lectern
- Design and construction of an electrical circuit for lighting

UNIT	FINAL TASK	DEVELOPMENT	FINAL PAGES
Project planning	Designing a portable air-conditioning unit	<ol style="list-style-type: none"> Technology solves problems <ol style="list-style-type: none"> The different aspects of technology Stages of a technological process <ol style="list-style-type: none"> Need Individual analysis and solving of the problem Pooling of ideas and choosing the group solution Developing the group solution Construction Verification, presentation and evaluation Commercialisation Necessary technological tools Organisation and management of a workshop Companies, advertising and the environment 	<p>ANALYSIS OF A TECHNOLOGICAL OBJECT: Formal, technical, functional and socioeconomic analysis of an object</p> <p>PROCEDURES: Creation of a personal collaborative ITC environment</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>
Representational systems	Designing a sculpture	<ol style="list-style-type: none"> Presentation of an ensemble <ol style="list-style-type: none"> Types of perspective <ul style="list-style-type: none"> Conical projection Axonometric projection Cavalier projection Isometric projection Drawing a perspective from views <ol style="list-style-type: none"> Compositional method Substrate method Drawing geometrical entities using the two different systems of perspective <ul style="list-style-type: none"> Slanting lines Polygons Circumferences Circumference arcs and elliptical protractors Normalisation Delimitation Measuring and precision instruments <ol style="list-style-type: none"> Calibre Micrometre Technical instructions <ol style="list-style-type: none"> Assembly instructions 	<p>REPRESENTATION OF PIECES IN 3D: Representation in 3D with Google Sketchup</p> <p>3D PRINTING OF A PIECE: Reproduction of the sculpture with 3D printing</p> <p>PROCEDURES: Models with developed plans</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>
Plastic and textiles	Designing an information campaign about plastics	<ol style="list-style-type: none"> Plastic materials <ol style="list-style-type: none"> The origin of plastic materials Transformation of plastics Properties Classification of plastics <ol style="list-style-type: none"> Classification according to structure Industrial plastics Forming techniques <ol style="list-style-type: none"> Extrusion Calendering Vacuum forming Moulding Manipulation techniques <ol style="list-style-type: none"> Measuring Marking and tracing Cutting Perforating Refining Joining Textile materials <ol style="list-style-type: none"> Natural fibres Synthetic fibres 	<p>PROCEDURES: Construction of a vehicle</p> <p>ANALYSIS OF TECHNOLOGICAL OBJECTS: Objects made with plastic and textile materials</p> <p>FINAL ACTIVITIES</p> <p>FINISHING THE FINAL TASK</p>

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Stone and ceramic materials	Recognising stone and ceramic materials	<ol style="list-style-type: none"> Stone materials <ol style="list-style-type: none"> Obtaining stone materials Natural stones Conglomerants Artificial stones Ceramic materials <ol style="list-style-type: none"> General properties The process of obtaining ceramic materials Classification of ceramic materials Glass <ol style="list-style-type: none"> Forming techniques 	PROCEDURES: How to build a reinforced concrete pillar FINAL ACTIVITIES FINISHING THE FINAL TASK
Mechanisms	Analysis of the mechanisms of a bicycle	<ol style="list-style-type: none"> What are mechanisms? <ol style="list-style-type: none"> The parts involved in mechanisms Classification of mechanisms Conserving energy and effort in mechanisms Linear transmission <ol style="list-style-type: none"> Levers Pulleys and hoists Turning transmission <ol style="list-style-type: none"> Variation in speed Speed gears Pulley and gear trains Changes of direction and direction of rotation Worm drive Transformation of movement <ol style="list-style-type: none"> Circular-linear transformation Circular-linear transformation with alternative movement Mechanisms for controlling movement <ol style="list-style-type: none"> Control of the direction of rotation: ratchet Control of speed of rotation: brake Mechanisms for absorbing energy <ol style="list-style-type: none"> Accumulation: springs Dissipation: suspension systems Couplings and brackets Plain and rolling contact bearings Free wheel 	PROCEDURES: Construction of mechanisms PROCEDURES: Creation of pulley using 3D printing SIMULATORS OF MECHANISMS: Virtual test of your mechanism ANALYSIS OF MECHANISMS: Basic operations with your bicycle FINAL ACTIVITIES FINISHING THE FINAL TASK
Electrical and electronic circuits	Dance of the crickets	<ol style="list-style-type: none"> Electrical circuit <ol style="list-style-type: none"> Elements of an electrical circuit Representation and symbols Electrical variables <ol style="list-style-type: none"> Voltage or potential difference Intensity of electrical current Electrical resistance. Ohm's law Electric energy and power Types of circuits <ol style="list-style-type: none"> Series circuit Parallel circuit Mixed circuit Types of current <ol style="list-style-type: none"> Direct current Alternating current Effective value of alternating current Transformers The effects of electric current <ol style="list-style-type: none"> Heat Light Electromagnetic effects Sound Electromagnetic mechanisms <ol style="list-style-type: none"> Dynamo Alternator Electric motor Relay 	ANALYSIS OF A TECHNOLOGICAL OBJECT: Analysis of an electric car PROCEDURES: The multimeter SIMULATION OF CIRCUITS: Simulation of circuits using the Yenka program FINAL ACTIVITIES FINISHING THE FINAL TASK

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		7. Systems of electromechanical control 7.1 The cam as a control element 7.2 The limit switch 8. Electronics 8.1 Electronic components 8.2 Basic assemblies with electronic parts	
The computer and our projects	Digital wall	1. Computer architecture 1.1 Motherboard connection and devices 1.2 Connection of external devices 2. The operating system 2.1 What tasks does an operating system carry out? 2.2 How does the operating system start an application? 2.3 Operating system functions 3. Installation of programs and applications 3.1 Installing and uninstalling Windows 3.2 Installing and uninstalling Linux 3.3 Mobile operating systems 4. The spreadsheet in technology 4.1 Basic operations 4.2 Graphics 4.3 Spreadsheet applications 4.4 Documentation and scheduling. Gantt chart. 5. Presentations 5.1 Slide transitions 5.2 Animating presentations 5.3 Adding video and sound 6. Image processing 6.1 Editing images 7. Audio processing 7.1 Editing audio 8. Video processing 8.1 Editing video 9. Other types of presentation 10. Augmented reality 10.1 QR codes 10.2 marks 10.3 images	FINAL ACTIVITIES FINISHING THE FINAL TASK
Digital information and the Web	Finding out about our Personal Learning Environment and possibilities of expanding it	1. WEB 1.0, WEB 2.0 and WEB 3.0 2. Information sources 2.1 Web pages 2.2 News on demand (RSS technology) 3. Information management 3.1 Social bookmarking 3.2 Working with the cloud 4. Sharing information 4.1 Horizontal social networks 4.2 Vertical social networks 5. Creating information 5.1 Web page 5.2 Blogs 5.3 Wikis 6. Information exchange on the Internet 7. User licences	PROCEDURES: Apps for mobile devices FINAL ACTIVITIES
PROJECTS: 1. Design and construction of an automatic garage door 2. Design and construction of a cable railway 3. Design and construction of a self-propelled car			