

Scheme of Work: Pewter Project

Year Group: 8

Key Stage: 3

Duration: 6 / 7 Weeks

No. of Lessons: 18 / 21

Project Title: Pewter Project

Introduction: Key Purpose of Project

During key stage 3 pupils use a wide range of materials to design and make products. In this project pupils will work out their ideas with some precision, taking into account how products will be used, who will use them, the process that will be used and their appearance. They will develop their understanding of designing and making and expand their practical skills. They will use computers, including computer-aided design and manufacture, as an integral part of designing and making. The main aim of this project is to develop pupils understanding of designing and manufacture.

Students will be set a fictional design problem by a company that design and manufacture quality and unique key-rings. The students challenge will be to design and make a key-ring to add to their range of products. Students will be given standard size pieces of MDF in which to cut out and shape their design into (60mm*30mm). Pupils will also be introduced to the use of computer-aided design and computer-aided manufacture by using a Laser cutter and 2D Techsoft design to draw and cut their mould out. These moulds will then be used to cast the product from Pewter using a Low Temperature Casting Machine. Students are asked to select and decide who they are going to design the key-ring for and how it could be marketed.

The main aim of this project is to develop pupils understanding of industrial casting techniques and metal work. The project allows pupils to understand basic principles of the properties of metals, packaging and marketing. The project builds upon design and making skills previously learnt. Pupils will also be introduced to other areas of design including:

Aims of the project:

- To enable pupils to develop their practical skills.
- To increase awareness of health and safety in a potentially dangerous area.
- Gain research through the use of questionnaires and market research of target users.
- To develop knowledge and understanding of materials, tools, machinery and processes.
- Select and use a range of tools, equipment and processes safely and accurately.
- Understand how to take account of working characteristics of materials and components and restrictions imposed by tools and equipment.
- Accurately use computer aided control and manufacture.
- To evaluate work throughout the manufacturing process.
- To understand different forms of packaging and ways to market a product.
- To develop knowledge/ skills to enable achievement of a high quality finish in practical work.

Knowledge and understanding that will be needed or acquired:

- Health and safety with a particular focus on metal work.
- Marking out techniques, the use of moulds and accuracy.
- Understanding of the different types of casting and casting processes
- Use of computer-aided design and manufacture skills, the use of 2D Techsoft Design and laser cutter.

Pupils will be assessed on:

- Research, analysis and planning of making.
- Design ideas and Development.
- Evaluations, testing and modifications/ improvements.
- Production of effectiveness of outcome (level of accuracy and finish)

Key Terms:

Task Analysis, Function, Manufacture, Ergonomics, Time, Target Audience, Research, Materials, Industrial Processes, Durability, Cost, Environment, Purpose, Casting, Sand Casting, Blister Packaging, Questionnaires, Aluminium, Pewter and Flow Diagram.

Areas to be covered within the Project:

During the project students will focus on Design Briefs, Task Analysis, Questionnaire, Research, Casting Theory, Design Ideas, Development, CAD—2D Techsoft Design, Making, Flow Diagrams, Blister Packaging and Plan of Making.

Acknowledgment of the range of skills of year 8 will be needed in order to keep the attention of the whole class. Allowing freedom within the project to personalize the work may help to do this. Also challenging the whole class and allowing for differentiation within the class. Pupils will also be introduced to peer assessment and evaluation of their ideas and of others.

Outline of Key Developments	Key Activities to Fulfil Developments
<p>Developing, planning and communicating ideas</p> <ul style="list-style-type: none"> • Generate, develop, model and communicate ideas in a range of ways, using appropriate strategies. • Respond creatively to briefs, developing their own proposals and producing specifications for products. • Use their understanding of others' designing to inform their own. • Analysing existing products and solutions to inform designing and making. • Undertake focused tasks that develop knowledge, skills and understanding in relation to design and make assignments, <p>Tools, equipment, materials and components (including CAD/CAM)</p> <ul style="list-style-type: none"> • Applying knowledge of materials and production processes to design products and produce practical solutions that are relevant and fit for purpose. • Have a broad range of techniques, including handcraft skills and CAD/CAM, and use them to ensure consistency and precision when making single and multiple products. • Evaluate which hand and machine tools, equipment and computer-aided design/manufacture (CAD/CAM) facilities are the most appropriate to use. <p>Understanding Materials and components</p> <ul style="list-style-type: none"> • Apply their knowledge and understanding of a range of materials, ingredients and technologies to design and make their products • Know how to use materials, smart materials, technology and aesthetic qualities to design and make products of worth. • Exploring and experimenting with ideas, materials, technologies and techniques. • How to use materials, smart materials, technology and aesthetic qualities to design and make products of worth. <p>Planning</p> <ul style="list-style-type: none"> • Plan and organise activities and then shape, form, mix, assemble and finish materials, components or ingredients. • Solve technical problems. • How to prepare and assemble components to achieve functional results. <p>Evaluation</p> <ul style="list-style-type: none"> • Reflect critically when evaluating and modifying their ideas and proposals to improve products throughout their development and manufacture. • Aesthetic, technical, constructional and relevant wider issues that may influence designing, selection of materials, making and product development. <p>Communication</p> <ul style="list-style-type: none"> • Use ICT as appropriate for image capture and generation; data acquisition, capture and handling; controlling; and product realisation. 	<p>Developing, planning and communicating ideas</p> <ul style="list-style-type: none"> • Developing, planning and communicating ideas to meet the needs of clients. • Introduce the project and allow pupils to explore the use and possible functions of the product (Mind Map). • Pupils will be required to develop and communicate a range of design ideas using appropriate strategies. • Use a range of research techniques (Questionnaires and Task Analysis) to develop Specifications • Pupils will be required to develop a range of ideas. Students will practice their sketching techniques, annotating and evaluating each idea. • Develop a final design idea in relation to the specification. Improving and adapting the idea. • Use of computer aided design (2D Techsoft Design) <p>Tools, equipment, materials and components</p> <ul style="list-style-type: none"> • Demonstrations on marking out, precision and accuracy. • Demonstrate safe use of tools and machinery to be used. Rules and regulations of the workshop. • Demonstrations of a selection of hand tools • Increase awareness of health and safety. • To develop knowledge and skills to enable the achievement of a high quality finish in practical work. • Development of marking out techniques, accuracy • Explanation of tools, materials and processes. • The use of quality control and quality assurance methods used throughout the project. • Produce a high quality and accurate product. <p>Understanding Materials and components</p> <ul style="list-style-type: none"> • Focus on material identification, properties of materials, working characteristics and environment issues. • Research of sustainable and recycling issues and relate information gained to the project. <p>Planning</p> <ul style="list-style-type: none"> • Understanding time management by drawing up, discussing a plan for making in the workshops and how it would be in industry. Procedure plan / sequence of manufacture produced. <p>Evaluation</p> <ul style="list-style-type: none"> • Evaluations of pupils own work and the work of others (self and peer evaluation/ assessment). • Analysis of the final design against the Specification. • Test, modify and evaluate that the quality of their product is suitable for intended users and devise modifications where necessary for improvements. <p>Communication</p> <ul style="list-style-type: none"> • Present information in a form that suits its purpose, using appropriate media. • Develop research techniques and the selection of relevant information. • Able to represent designs in the form of accurate and recognised drawing forms (quality of drawings).

Methods of Assessment (How and When)

Assessment is an essential part of teaching and learning in all subjects. It can take many forms and be used for a range of purposes. Use of Assessment of learning (summative assessment) to judge students' performance against national standards (level descriptions), at the end of a unit of work. Assessment for learning (formative assessment) involves using assessment in the classroom to raise students' achievement. It is based on the idea that students will improve most if they understand the aim of their learning, where they are in relation to this aim and how they can achieve the aim.

Learning and undertaking activities in design and technology contribute to achievement of the curriculum aims for all young people to become:

- Successful learners who enjoy learning, make progress and achieve.
- Confident individuals who are able to live safe, healthy and fulfilling lives.
- Responsible citizens who make a positive contribution to society.

Key characteristics of assessment for learning are:

- Using effective questioning techniques.
- Using marking and feedback strategies.
- Sharing learning goals.
- Peer and self assessment.

- Consistent Question and Answer sessions within lessons.
 - Formal questioning is used throughout the lesson which is addressed to the whole class, small groups or an individual.
 - Informal questioning takes place during pupil activities. This can be used to confirm pupils are kept on task, understand the work they are doing and motivate pupils in a positive direction.
- Praise and encouragement in the classroom. Pupils are monitored throughout the lesson and motivated through praise and encouragement. Providing students with both positive and constructive comments during assessment. Students will be given an area to improve on for each project.
- Pupils evaluate their own work during the course and assess their level of achievement towards the end of the project. Peer assessment involves students assessing the performance of other students.

Key characteristics of assessment of learning are:

- To judge students' performance against national standards.
- Measuring what has been learned in formal assessment.
- Emphasis is more on helping pupils learn.

- Regular homework once a week.
- National Curriculum level at the end of the topic. Pupils will be given a grade based on the national curriculum levels at the end of the topic. These will be from level 4 to level 8.
- Pupil monitoring during lesson. Assessing the students as you are walking around will provide more of an insight to how different students work. Students who seem to be working hard and show enthusiasm and effort could influence their mark. It will allow the students to ask for help or assistance if they see a teacher's presence. Guidance can be given and encouragement can be shown through positive comments.

Good assessment:

- Helps develop successful learners.
- Recognises strengths and areas for development and clearly identifies ways for learners to progress.
- Is based around pupils' needs and leads to improved attainment and progress.
- Encourages pupils to take a central role in their own assessment.
- Is essential in creating personalised learning
- Helps teachers to be flexible enough to recognise learning as it happens
- Results in decisions and actions from both day-to-day interactions with pupils and through taking a periodic overview of progress.

Assessment needs to:

- Value and include a wide range of attitudes, dispositions and skills, as well as achievement in subjects.
- Draw on a broad range of evidence, including beyond the school.
- Involve those that know the learner best – including parents, peers and members of the wider community.

Performance Criteria (National Curriculum Level Related)

Level 4

Pupils generate ideas by collecting and using information. They take users' views about aesthetic and technical issues into account as they respond to briefs. They communicate alternative ideas using words, labelled sketches and models, showing that they are aware of constraints. They apply their knowledge and understanding of materials, ingredients and components, and work with them with some accuracy, paying attention to quality of finish and to function. They use some ideas from others' designing to inform their own work. They produce step-by-step plans and then select and work with a range of tools and equipment. They identify what is working well and what could be improved to overcome technical problems. They reflect on their designs as they develop, recognising the significance of knowledge and previous experience.

Level 5

Pupils develop ideas by drawing on and using various sources of information. They clarify their ideas through discussion, drawing and modelling, showing understanding of aesthetic and economic dimensions. They respond to briefs showing understanding of how culture and society are reflected in familiar products when developing and communicating their own ideas. They show that they are aware of constraints as they apply knowledge and understanding of materials, ingredients and techniques. They use understanding of others' designing as they develop their work. They work from their own detailed plans, modifying them where appropriate. They work with a range of tools, materials, ingredients, equipment, components and processes with some precision. They check their work as it develops, solve technical problems and show some evidence of creativity as they modify their approach in the light of progress. They test and evaluate their products, showing that they understand the situations in which the products will function.

Level 6

Pupils draw on and use a range of sources of information, and show that they understand the form and function of familiar products as they develop and model ideas. They respond creatively to briefs, exploring and testing their design thinking. They develop detailed criteria for their products and use these to explore proposals. They apply their knowledge and understanding by responding to several aspects of the problem. They recognise the significance of others' designing and modify their approaches accordingly. They produce plans that outline alternative methods of making progress. They work with a range of tools, materials, ingredients, equipment, components and processes, showing that they understand their characteristics. They check their work as it develops and solve technical problems by modifying their approach in the light of progress. They evaluate how effectively they have used information sources, using the results of their research to inform their judgements when developing products. They evaluate their products as they are being used, and identify ways of improving them.

Level 7

Pupils use a wide range of appropriate sources of information when developing and modelling ideas. They investigate form, function and production processes as they respond creatively to briefs. They apply their knowledge and understanding, recognising the different needs of a range of users, and search for trends and patterns in existing solutions as they develop fully realistic products. They use their understanding of others' designing to inform their own as they communicate creative ideas. They produce plans that predict the time needed to carry out the main stages of making products. They work with a range of tools, materials, ingredients, equipment, components and processes, taking full account of their characteristics. They adapt their methods of manufacture to changing circumstances as they solve technical problems, providing a sound explanation for any change from the design proposal. They select appropriate techniques to evaluate how their products would perform when used and modify their products in the light of this evaluation to improve their performance.

Level 8

Pupils use a range of strategies to fully develop and model appropriate ideas, responding to information they have identified. They identify conflicting demands on a product and respond creatively to briefs, suggesting ways forward and explaining how their ideas address these demands. When applying knowledge they make decisions on materials, ingredients and techniques based on their understanding of physical properties and working characteristics. They use their understanding of others' designing by reinterpreting and applying learning in new contexts.

They organise their work so that they can carry out processes accurately and consistently, and use tools, equipment, materials, ingredients and components with precision. They use accurate testing to inform their judgements when solving technical problems. They identify a broad range of criteria for evaluating their products, clearly relating their findings to environmental, ethical, and social and cultural dimensions.

Exceptional Performance

Pupils seek out information to help their design thinking. They recognise how products contribute to lifestyle and choices of a variety of client groups as they develop and model ideas in an innovative way. Responding creatively to briefs, they are discriminating in their selection and use of information sources to support their work. They interpret and apply knowledge and understanding creatively in new design contexts and communicate ideas in new or unexpected ways. They use understanding of others' designing in innovative ways. They work with tools, equipment, materials, ingredients and components to a high degree of precision. They make products that are reliable and robust and that fully meet the quality requirements given in the design proposal. They reflect critically and effectively throughout designing and making processes.

Week by Week Planner					
Week	Topic/area of study	Skills/knowledge acquired (including curriculum links)	NC PoS links	Activities (extension/ differentiation)	Resources/risks
1	<ul style="list-style-type: none"> Introduction to the Project (aims and objectives of the project in relation to the Nation Curriculum Levels). Understanding of Design Briefs, Specifications and Mind Mapping techniques. Development a Design Brief and Specification. Researching a range of topics in relation to the project. 	<ul style="list-style-type: none"> Understand the project and how it will evolve over the course. Knowledge and understanding of Design Briefs, Specifications and Mind Maps. Developing research skills. Knowledge and understanding of theory work. <p>Links to literacy – Knowledge and understanding of technical terms used within design.</p> <p>Links to Citizenship – Designing for a user and development of a project to solve a problem and meet a need.</p>	1.1a 2b 3b 3e 4c	<ul style="list-style-type: none"> Students are introduced to the pewter-casting project via the Design Situation. Students are required to write their own Design Brief and Task Analysis for either a pewter-casted pendent or key fob. Students are to develop a Questionnaire to ask users what they want to include in their product. <p>Homework Students are to ask 10-12 people their questionnaire and write up the results by producing a set of graphs. Students must explain what the results show.</p>	<ul style="list-style-type: none"> Project Example. Graphic Materials: Paper, pencils, colouring pencils, rulers, project booklets. ICT computer room.
2	<ul style="list-style-type: none"> Introduction to Generation of Design Ideas (looking at sketching techniques and annotating ideas). Demonstration of sketching and rendering techniques. Use of labelling and evaluations to analyse the design idea. 	<ul style="list-style-type: none"> Able to generate ideas, develop project proposals and evaluate them. Improvement of design idea generation (looking at sketching techniques and annotating ideas). Development of presentation of work, evaluation skills and technical terms. <p>Links to numeracy – Setting up page borders.</p>	1.2a 1.3c 2b 4b	<ul style="list-style-type: none"> Students will generate a range of neatly presented design ideas. Students should ensure that that include labels, colour and evaluations. Students to develop their skills in communicating their initial ideas for a product. Students are to learn the 'two colour technique' (using a light coloured pencil first and then using a darker/opposite colour pencil to make the actual outline stand out). 	<ul style="list-style-type: none"> Graphic Materials: Paper, pencils, colouring pencils, rulers.
3	<ul style="list-style-type: none"> Develop a range of design ideas into a final design. Use of sketching and rendering techniques. Use of labelling and evaluations to analyse the design idea. 	<ul style="list-style-type: none"> Able to generate ideas, develop project proposals and evaluate them. Pupils will develop their project proposals and sketching techniques (annotations). Able to use a range of sketching techniques to explain design proposals. 	1.3c 2b 2h 4b	<ul style="list-style-type: none"> Students should develop at least two of their design ideas into a final proposal. Students must remember to evaluate the final design, use 3rd views and state the changes that have been made. Students to develop their initial idea into their final mould that they will produce to pewter cast their product. <p>Homework CAD/CAM Research</p>	<ul style="list-style-type: none"> Graphic Materials: Paper, pencils, colouring pencils, rulers.

4	<ul style="list-style-type: none"> • Begin manufacture of final project proposal. • Greater knowledge and understanding of the Health & Safety rules/behaviour within the workshop. • Pupils will be able to mark out and cut / drill / sand material accurately. • Knowledge and understanding of different forms of casting including die-casting and sand casting. 	<ul style="list-style-type: none"> • Health and Safety issues within a workshop (Rules, behaviour, safe working practice). • Demonstrations and Health and Safety issues regarding machinery & tools / equipment (pillar drill/ disc sander). • Demonstrations on basic principles of casting including the use of a mould in which molten metal is poured into. 	1.1b 2c 3l 4b	<ul style="list-style-type: none"> • Students are to learn about the different forms of casting including die-casting and sand casting. Students are to learn the basic principles of casting including the use of a mould in which molten metal is poured into. • Students are to learn about one-off production (sand casting), batch production (die casting) and mass production. Students to gain a better understanding of how their mould for their key fob/pendant will work. • Students are to learn how to use the pewter-caster safely in order to pour their key fob/pendant. 	<ul style="list-style-type: none"> • Tools and Machinery: <ul style="list-style-type: none"> ○ Pillar Drill ○ Files ○ Sand paper ○ Measuring Equipment
5	<ul style="list-style-type: none"> • Continue manufacture of product. • Pupils will be able to mark out and cut / drill / sand material accurately. 	<ul style="list-style-type: none"> • Accurately cut, drill and sand material into the desired sizes and shapes. • Join a range of materials together using a range of different techniques. 	2c 3l 4b	<ul style="list-style-type: none"> • Students are to begin cleaning up their finished product using files and wet/dry paper, referring back to a high quality finish. • Use of the low temperature casting machine to cast the key ring. 	<ul style="list-style-type: none"> • Tools and Machinery: <ul style="list-style-type: none"> ○ Pillar Drill ○ Files ○ Sand paper ○ Measuring Equipment
6	<ul style="list-style-type: none"> • Complete manufacture of product. • Pupils will be able to mark out and cut / drill / sand material accurately. • Use of the low temperature casting machine to cast the key ring. 	<ul style="list-style-type: none"> • Accurately cut, drill and sand material into the desired shapes. • Join a range of materials together using a range of different techniques. • Knowledge and understanding of a range of finishes that could be applied to the completed practical work. 	3l	<ul style="list-style-type: none"> • Students are to continue in the clearing up of their final product using files and wet/dry paper. • Students are to learn how to use the polishing wheel for metals so that they are able to get a highly polished finish to their product. <p>Homework Blister Packaging</p>	<ul style="list-style-type: none"> • Tools and Machinery: <ul style="list-style-type: none"> ○ Pillar Drill ○ Files ○ Sand paper ○ Measuring Equipment
7	<ul style="list-style-type: none"> • Produce a detailed plan of making. Include stages undertaken, tools and equipment used, health and safety and quality control. • Pupils will be able to assess and evaluate the work of others (peer assessment). • Completion of all project work. 	<ul style="list-style-type: none"> • Produce a detailed sequence of main making activities. • Evaluate the work of others and assess their own work against an original design and Specification. • Understand peer assessment and be able to provide positive, construct comments to classmates. 	1.4b 2e	<ul style="list-style-type: none"> • Students are to produce a plan of making for the manufacture of their mould that includes the actual casting process. • Students are to use notes and diagrams to communicate the different stages. • Students should evaluate their work and that of other students. 	<ul style="list-style-type: none"> • Graphic Materials: Paper, pencils, colouring pencils, rulers, project booklets.

Risk Assessment of Tools, Materials and Processes (BS 4163:2007 and CLEAPS)

Workshop Health and Safety: General Health and Safety

Electric shock from machinery, loose clothing not worn, jewellery removed, eye protection (goggles) worn when working, ventilation, extraction, equipment properly adjusted / used when working and emergency stop locations in the workshop.

Workshop rules and behaviour (safe working practice).

- Aprons and Goggles must be worn at all times when using machinery.
- Loose hair tied back and jewellery taken off. Shirt / pullover sleeves pulled up.
- Know where the Emergency stops are - locations within the room.
- Workshops should be kept clean and tidy. Scrap material should be put in bins.
- Never run in a workshop. Stools under desks if practical work is being undertaken.
- Never blow dust – sweep into a bin.
- Excess tools and materials put away after use. Carrying tools the correct way.
- Main risk when people do not know or understand how to use something correctly – if not sure always ask.

LOCATION	ALL	Hand Tools	RISK LEVEL	LOW
		Hazards	Risk Control Measures	
		<ul style="list-style-type: none"> • Sharp tools, falling tools, tools breaking or coming apart in use, slipping tools (which can occur when pressure is applied to them) can all cause injury. 	<ul style="list-style-type: none"> • Hand tools should be stored at a suitable height for access. Hand tools should not be left projecting from a bench. • Faces of hammer heads and hammer shafts should be frequently inspected. • Edged tools should be kept sharp and in good condition. Sharp or pointed tools should be handled with care (with cutting edges protected or pointing downwards). • Bench hooks should be maintained in good condition. • Tools should not be carried in pockets or under belts. 	

LOCATION	ALL	Drilling Machines	RISK LEVEL	MID
		Hazards	Risk Control Measures	
		<ul style="list-style-type: none"> • Chuck keys, broken drills, work pieces, etc. can be violently ejected. The chuck key should be removed immediately after use and before starting using the machine. The machine should be fitted with a spindle guard. • Unexpected spinning of hand held work pieces could cause injuries to hands. The work piece should be prevented from spinning around by using a vice, hand grips or clamping to the table. • The drill table can slip down and heavy objects can fall from the table. • Machine presents an electric shock hazard. • Closing movements between parts can lead to trapping, sharp edges on drills, work pieces and swarf can cause cuts. • Inadvertently starting of the machine can present a hazard. • Lack of space around the machine can lead to the operator being pushed by passers-by, slippery floors or loose items around the machine can result in contact with the moving parts. 	<ul style="list-style-type: none"> • The machine has a means of isolation, emergency stop. • A foot operated emergency stop so the machine can be stopped quickly in an emergency with the operator not having to let go of the spindle feed or work piece. • Fixed guards should enclose the pulleys and belts. • Eye protection (goggles) should be worn whilst operating the machinery. Long hair and loose clothing should be secured so as not to come in to contact with moving parts. Dangling jewellery should be removed. • Gloves or bandages should not be worn whilst operating the machine. • Manual handling tasks of lifting materials and the table should be reduced as can be beyond the physical capabilities of some persons. • Coolant nozzles should not be adjusted while the machine is in operation. • Suitable implements should be used to remove swarf to avoid hand contact. 	

LOCATION	IC4 & D2	Polishing (Buffering) Machines	RISK LEVEL	LOW
Hazards		Risk Control Measures		
<ul style="list-style-type: none"> • Long hair and loose clothing can become entangled in moving parts of the machine. • Work pieces, wires from brushes and particles from the polishing process can be ejected from the machine. Sharp edges can cause cuts. • Hot work pieces can cause burns. • Polishing machines can present a hazard of electrical shock. Inadvertent starting of the machine can present a hazard. • Dust can be inhaled. • Lack of space around the machine can lead to the operator being pushed by passers by. • Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts. 		<ul style="list-style-type: none"> • A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection. • A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency. • There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by. • Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed. • Wire brushes and mops should be suitable. 		

LOCATION	ALL	Low Temperature Casting	RISK LEVEL	LOW
Hazards		Risk Control Measures		
<ul style="list-style-type: none"> • Molten metal in contact with moisture on moulds and equipment can cause an explosion. • Some molten metals can give off harmful fumes. • Hot metal can cause burns. • Unstable equipment or work pieces can cause injury. • The equipment can present an electric shock hazard. 		<ul style="list-style-type: none"> • Appropriate personal protective equipment should be used. • Crucibles should be preheated before use to avoid cracking and to remove moisture. 		

LOCATION	IC3 & D7	Laser Cutters	RISK LEVEL	LOW
Hazards		Risk Control Measures		
<ul style="list-style-type: none"> • The equipment can present an electric shock hazard. • Leads could be tripped over. • Fumes from materials being cut might be harmful. • Looking into the light source when working on reflective materials might be harmful. • Moving parts might present a tripping hazard. 				