

YEAR 10	SUBJECT: Product Design	TITLE: Small Scale Casting
OBJECTIVE: To introduce the pupils to basic drawing techniques including single point perspective. Introduction to small scale casting using pewter and petrabond. Introduction to joint work, housing joint.		

STAGE	ADDITIONAL SKILLS	EXTENSION WORK	RESOURCES	H&S
<p>Stage One: The pupils will be introduced to small scale casting. They will be shown how to produce a pattern, pack a casting box with petrabond and manufacture a cast in pewter.</p> <p>Safety will be discussed in detail at all points especially the pouring of the molten metal.</p> <p>The casting box will be discussed and the way joints are used to produce it. Housing joints will be discussed.</p>	<p>L. Key words will be emphasized. Pewter, casting, etc.....</p> <p>C. The role of casting in the manufacture of everyday items and the way in which Britain manufactures much of its cast products abroad, in India and China.</p> <p>ICT. Animations of the casting procedure will be shown and explained.</p> <p>HWK. Complete the sequence drawing of pewter casting.</p> <p>N. Casting temperature, centigrade explained.</p>	<p>List as many products as possible that rely on casting during production.</p>	<p>General workshop equipment. Heat treatment area. Computer and projector General writing and drawing equipment. Sample castings.</p>	<p>CONTROL MEASURE Demonstration only. Pupils behind glass. Teacher pours pewter.</p> <p>CLEAPPS REF. 1.015 - Casting Fumes 1.016 - Casting process</p> <p>RESIDUAL RISK Medium</p>
<p>Stage Two: The pupils will be introduced to single point perspective. They will be shown how to draw one a number of simple shapes in perspective. Cubes and letters.</p> <p>Shading techniques will be introduced. Single tone, two tone and three tone shading followed by line techniques.</p> <p>The pupils will draw one of their initials in single point perspective. This will be a drawing of their pattern.</p>	<p>L. Key words linked to the project - perspective, drawing equipment listed.</p> <p>C. Recycling discussed in relation to pewter and other casting techniques. Responsibilities of citizens and the environment.</p> <p>ICT. Potential use of CAD/CAM in production of drawings and pattern.</p> <p>HWK. Complete design of initial in single point perspective.</p> <p>N. measurements given in relation of size of pattern.</p>	<p>Produce two more designs in single point perspective.</p>	<p>General workshop equipment. Heat treatment area. Computer and projector General writing and drawing equipment. Sample castings.</p>	<p>CONTROL MEASURE</p> <p>CLEAPPS REF.</p> <p>RESIDUAL RISK</p>
<p>Stage Three: The pupils will begin to manufacture the casting box. They will be shown how to mark out the face side and face edge and number each corner. Reasons for this will be discussed.</p> <p>Use of marking out tools and tenon saw demonstrated.</p> <p>Pupils will cut and joint each of the corners.</p>	<p>L. Key words relating to tools and equipment required.</p> <p>C. Sustainability discussed in relation to the pine used.</p> <p>ICT. Animations of the stages of making displayed - computer system allowing.</p> <p>HWK. Produce a log of the stages of cutting the joint.</p> <p>N. Measurements and accuracy are a critical factor in the marking out of joints.</p>	<p>Research alternative joints that could be used for the casting box.</p>	<p>General workshop equipment. Heat treatment area. Computer and projector General writing and drawing equipment. Sample joints.</p>	<p>CONTROL MEASURE Teacher instruction Ventilation</p> <p>CLEAPPS REF. 1.066 Handsaws and files 1.067 Fretsaws</p> <p>RESIDUAL RISK Low</p>

STAGE	ADDITIONAL SKILLS	EXTENSION WORK	RESOURCES	H&S
<p>Stage Four: Demonstration on the casting procedure.</p> <p>Packing the casting box with petrabond. Fitting the pattern. Use of strickling bar. Sieved petrabond as facing sand. Heating the pewter and pouring.</p> <p>The pupils will cast their completed molds.</p>	<p>L. Key words reinforced in relation to casting. EG. Ladle, drag, cope etc..... C. Health and safety, Every Child Matters. ICT. Animations of casting procedure. N. Temperatures discussed again. HWK. Work on log book of manufacture.</p>	<p>Research alternative materials for small scale casing.</p>	<p>General workshop equipment. Heat treatment area. Computer and projector General writing and drawing equipment. Sample castings.</p>	<p>CONTROL MEASURE Demonstration only. Pupils behind glass. Teacher pours pewter.</p> <p>CLEAPPS REF. 1.015 - Casting Fumes 1.016 - Casting process</p> <p>RESIDUAL RISK Medium</p>
<p>Stage Five: Methods of the cleaning up the castings will be discussed.</p> <p>Cutting of sprues. Use of filing techniques., Use of grades of wet and dry / emery cloth. Demonstration of the use of the buffer.</p> <p>Pupils clean up their castings and drill holes for chain / ribbon.</p>	<p>L. Key words and phrases regarding new techniques. E.G. through filing, draw filing etc..... ICT. animations of stages of cleaning up castings. Pupils could produce their log book using DTP. HWK. Complete log book of manufacture. C. Quality discussed with pupils. Product quality and critical evaluation.</p>	<p>Collect images of small scale casting / jewelry from different cultures.</p>	<p>General workshop equipment. Heat treatment area. Computer and projector General writing and drawing equipment. Sample castings.</p>	<p>CONTROL MEASURE</p> <p>CLEAPPS REF. 1.031 Drilling machine 1.049 Polisher 1.066 Handsaw - metal.</p> <p>RESIDUAL RISK Low</p>