

YEAR: 8	SUBJECT: D&T	TITLE: Steady Hand Game
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OBJECTIVE: To introduce the pupils to basic electronics with specific reference to the thyristor.

STAGE	ADDITIONAL SKILLS	EXTENSION WORK	RESOURCES	H&S
<p>Stage One: The pupils will be asked to list as many types of game as they can remember. They will then be asked to categorise the games into categories such as: Educational, mechanical, electronic, chance, card, board etc..... They will be shown how to produce a rich picture - main theme in the centre, categories arranged around the theme, extension words on the outer boundary. Printing style books will be used to help the pupils formulate a style for the centre word.</p>	<p>L. Key words identified and categorised C. Emphasis placed on the role of educational toys and the role they play in educating young children. N. Pupils will count the number of games in each category and work out the most popular. ICT. Use of spreadsheet software to create categories and rank in alphabetic order. HWK. Pupils to complete the rich picture.</p>	<p>Ask relatives the types of games they find the most interesting and entertaining. Record the results and present using ICT.</p>	<p>Lettering style books. Colours and drawing equipment. Example games / pictures of games.</p>	<p>CONTROL MEASURE CLEAPPS REF. RESIDUAL RISK</p>
<p>Stage Two: The pupils will be given a design problem. A local 'game' company has found that its sales are falling as many of the games it manufactures are traditional. A recent survey has found that electronic games that involve a degree of skill are likely to be popular. The problem will be discussed and the pupils will highlight the main aspects of the problem</p>	<p>L. Discussion of the design problem and identify key aspects. N. Pupils to set out the problem and brief using traditional drawing techniques relying on the accurate drawing of guidelines and layout. C. Pupils encouraged to discuss the problem and brief and to compare each others work. The importance of listening to the views of others will be emphasised. ICT. Use of word processing / DTP software in the production of the problem and brief.</p>	<p>Discuss the problem and brief with parents/relatives and make changes if necessary.</p>	<p>Lettering style books. Colours and drawing equipment. Example games / pictures of games.</p>	<p>CONTROL MEASURE CLEAPPS REF. RESIDUAL RISK</p>
<p>Stage Three: The pupils will write a design brief based on the problem outlined above. I am going to design and make a small electronic Game. It will include a measure of skill (hand/eye coordination) and be fun to use. It will contain an electronic circuit that will be battery powered. The game will be safe and interesting to look at. The brief and problem will be presented using traditional drawing techniques.</p>				

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<p>Stage Four : The pupils will be introduced to a basic circuit which includes a thyristor (no buzzer, one LED). The pupils will be shown a how a thyristor can be used to keep an LED light.. The three pins of the component will be explained - Anode, Cathode and Gate. Resistors also explained.</p> <p>The pupils will complete the information sheet relating to the components required to construct the circuit.</p> <p>They will use crocodile clips to draw a circuit and cut and paste it into DTP software. An explanation will included in the DTP version.</p>	<p>ICT. Use of crocodile clips and DTP software.</p> <p>L. Pupils write an explanation of the circuit and how it works.</p> <p>N. The values of resistors will be explained.</p> <p>C. The role of electronics in society, the home etc....</p> <p>HWK. Complete the worksheet and ICT drawing of the circuit.</p>	<p>Explain how a thyristor circuit could be used in any circuit eg. an alarm. Collect information regarding alarms.</p>	<p>Crocodile clips software. Drawing equipment. White board projector.</p>	<p>CONTROL MEASURE</p> <p>CLEAPPS REF.</p> <p>RESIDUAL RISK</p>
<p>Stage Five: The pupils will be shown a thyristor circuit that includes a buzzer and LED. They will draw it using traditional drawing equipment and label the components. Component symbols will used.</p>				
<p>Stage Six: The pupils will write an analysis regarding the steady hand game. They will be asked to list as many questions as possible, each point will be discussed with the class.</p> <p>The pupils will devise a lettering style for the title and the questions will be listed.</p> <p>Pupils will produce two versions one using word-processing and the other using traditional techniques.</p>	<p>ICT. Use of word processing.</p> <p>L. Listing questions and discussing each within the class.</p> <p>N. Proportion in relation to writing styles, Upper and Lower case.</p> <p>HWK. Complete the analysis section.</p>	<p>Research basic circuits using circuit books or internet sites. Draw at least one circuit, explain how it could be used and add notes.</p>	<p>Drawing and writing equipment. DTP/WP software.</p>	<p>CONTROL MEASURE</p> <p>CLEAPPS REF.</p> <p>RESIDUAL RISK</p>

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<p>Stage Seven: The pupils will be shown how to produce four ideas for the background of the steady hand game. Emphasis will be placed on the wire following the shape of the background. The pupils will be shown a number of examples. The importance of notes (and type) will be stressed.</p> <p>Pupils will rough out a number of ideas discussing the ideas in groups.</p> <p>The use of T squares and set squares will be emphasised.</p>	<p>ICT. Pupils will be expected to draw at least one of the ideas using CAD. N. Overall sizes will be given for the background. The pupils will draw the backgrounds to scale. L. Pupils will produce notes for each idea. HWK. Complete four ideas, with notes.</p>	<p>Design a further idea using CAD software. Discuss completed ideas with parents/guardians.</p>	<p>Drawing equipment. CAD software.</p>	<p>CONTROL MEASURE</p> <p>CLEAPPS REF.</p> <p>RESIDUAL RISK</p>
<p>Stage Eight: Vacuum forming will be demonstrated. Types of plastics explained. Each stage will be explained and the pupils will write notes alongside each diagram of the worksheet. Atmospheric pressure, as utilised by the vacuum forming machine, will be explained. The pupils will produce a presentation sheet regarding vacuum forming - including explanatory notes.</p> <p>Each pupil will manufacture a vacuum formed base.</p>	<p>ICT. Pupils will watch animations of vacuum forming. L. Pupils will make notes and read captions regarding vacuum forming. N. Atmospheric pressure will be discussed (fifteen pounds per square inch) C. The role of plastics in society, environmental concerns. HWK. Complete vacuum forming sheets.</p>	<p>Describe different types of plastics and explain their uses.</p>	<p>Drawing equipment. CAD software. Animations.</p>	<p>CONTROL MEASURE Teacher Instruction and supervision Ventilation</p> <p>CLEAPPS REF. 1.051 Heating 1.042 plastics</p> <p>RESIDUAL RISK Low</p>
<p>Stage Nine: The pupils will start making the PCB based circuit. Soldering will be demonstrated and each pupil will setup the basic components and solder them in position.</p> <p>Whilst waiting pupils will draw an instruction sheet which represents soldering techniques and associated safety.</p>	<p>ICT. The pupils will study soldering through the use of an internet site. L. Pupils add notes to each stage of soldering. Notes read out to other pupils. N. Temperatures at which solder melts will be explained. Melting point of other metals discussed. C. The role of electronics in society . HWK. Complete soldering instruction sheet.</p>	<p>Make a list of electronic devices around the home and explain how they are used.</p>	<p>Drawing equipment. Internet access. Example instruction sheets.</p>	<p>CONTROL MEASURE Eye protection. Ventilation Teacher instruction</p> <p>CLEAPPS REF. 1.012 General electronics 1.019 Soldering, Fumes and fluxes</p> <p>RESIDUAL RISK Medium</p>

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<p>Stage Ten: The pupils will test their circuits. Fault finding will be discussed. The use of metres for testing/fault finding will be explained.</p> <p>The pupils will cut the shapes for the backgrounds, using fretsaws. A safety demonstration will be given and use of the fretsaw explained. The backgrounds will be coloured using felt pens, pencils etc.... Foregrounds can also be manufactured in the same way.</p> <p>Pupils will continue the sequence drawing</p>	<p>ICT. Pupils can use the internet and clipart facilities to produce pictures for the backgrounds/foregrounds.</p> <p>L. Pupils add notes to all stages of the sequence drawings.</p> <p>C. Explanation of the need for clear instructions not only sequence drawings but also for forms people face on a day to day basis.</p> <p>N. Accuracy of measurement for the various shapes. Millimetres and centimetres explained.</p> <p>HWK. Complete the next stages of the sequence drawing.</p>	<p>Using the internet, find more appropriate clipart for use in this project.</p>	<p>ICT access. Drawing and writing materials. Felt pens, coloured pencils etc... Internet access.</p>	<p>CONTROL MEASURE Dust extraction. Goggles Teacher instruction</p> <p>CLEAPPS REF. 1.067 Fretsaws 1.012 General electronics</p> <p>RESIDUAL RISK Low</p>
<p>Stage Eleven: The pupils will test and evaluate their projects. The importance of evaluating products and customer participation in evaluations will be discussed.</p> <p>The pupils will mark each others work awarding marks for quality of finish, fitness for purpose, design/imagination. The marks will be totalled and the average mark worked out.</p> <p>Each pupil will be given the opportunity to explain their marks.</p> <p>Pupils will draw a table to display the results, including a pictogram.</p>	<p>ICT. The use of spreadsheet software for the collection of data and use of sums/formulas.</p> <p>L. Tables as a format for information</p> <p>C. The importance of seeking peoples opinion on a range of matters.</p> <p>N. Data collection, formulas/sums.</p> <p>HWK. Complete the data collection table and pictogram.</p>	<p>Ask parents, guardians, friends and family to evaluate the completed project. Present the findings.</p>	<p>ICT access. Drawing and writing materials. Felt pens, coloured pencils etc... Internet access. Spreadsheet software.</p>	<p>CONTROL MEASURE Teacher Instruction</p> <p>CLEAPPS REF. 1.012 General electronics</p> <p>RESIDUAL RISK Low</p>