

Edward Peake C of E VC Middle School



Medium Term Plan

Subject: Design Technology	Unit: Pencil Box	Term/Duration: Rotation 5 weeks	Year Group: 8
Prior Learning: <ul style="list-style-type: none"> • · How to produce design ideas. • · How to work safely in the workshop. • · What plywood is and the properties that make it suitable. • · How to use a tenon saw to cut straight lines in timber. • · How to use files and glass paper to smooth the edges of timber • · How to evaluate design ideas and a finished design. 		Key Vocabulary: <ul style="list-style-type: none"> • Memphis design • Softwood • Hardwood • Manufactured board • Veneer • Lap joint • Comb/ finger joint • Grain • Accuracy • Computer aided design • Computer aided manufacture 	
By the end of this unit...			
<p>All pupils will be able to:</p> <p>Produce 2 ideas for the chocolate mould that are coloured and simply annotated (labelled). They may need to be adjusted slightly to fit the space available or to make them achievable to make.</p> <p>Know there are different categories of wood and may be able to explain some differences and/or give some examples.</p> <p>With some support use hand tools correctly and safely to make a lap joint and a comb joint.</p> <p>With support mark out the sides of the box.</p> <p>With some support use hand tools correctly and safely to make lap joints/ comb joints.</p> <p>With support assemble the box.</p> <p>Know there are different finishes for plywood.</p> <p>With some support use files and glass paper to make the sides of the box smooth.</p> <p>With some support use CAD/CAM make the design for the top of the box that has some links to Memphis design.</p> <p>With a little support wax the box, in some areas you will have used too much or not enough.</p> <p>Carry out a simple evaluation of your box.</p> <p>Suggest a modification that could be made to the finished box.</p>			



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Most children will have made more progress; they will be able to:

Use ACCESSFM to annotate ideas. Ideas include detail about how they are based on the design style of Memphis. The ideas will take into account the space available on top of the box and will be achievable to make.

Understand there are different categories of wood, can explain some of the differences and give some examples.

With a little support or slightly inaccurately use hand tools correctly and safely to make a lap joint and comb joint.

With a little support or slightly inaccurately mark out the sides of the box.

With a little support or slightly inaccurately use hand tools correctly and safely to make lap joints/ comb joints.

With a little support or slightly inaccurately assemble the box.

Describe how different finishes change the look of the plywood.

With a little support or slightly inaccurately use files and glass paper to make the sides of the box smooth.

Produce the design for the top of the box that resembles the chosen design idea using CAD/CAM.

Once shown wax the box, in some areas you may have used a little bit too much.

Carry out an evaluation of your box with some explanations and some subject specific terms.

Take some account of other people's opinions to suggest modifications that could be made.

Some children will have progressed further; they will be able to:

Explain the points you annotate. Ideas include strengths and weaknesses of the designs in the annotation. The ideas carefully consider the space available and how practical they are to achieve.

Explain the differences between the different categories of wood and can give examples of each.

Independently use hand tools correctly and safely to make a lap joint and comb joint.

Independently mark out the sides of the box.

Independently use hand tools correctly and safely to make lap joints/ comb joints.

Independently assemble the box.

Explain the advantages and disadvantages of using different finishes.

Independently use files and glass paper to make the sides of the box smooth.

Produce a design for the box lid that accurately matches the chosen design idea using CAD/CAM.

Wax the box so it is uniformly covered.

Carry out a detailed evaluation using subject specific terms of your completed box that takes account of other people's opinions.

Explain in detail modifications that could be made to the box.

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◆ **Notes:**

Visit: The V&A including hands on workshop.

	Learning Objectives	Content	Assessment	Resources /Health and Safety	ICT Opportunities
1	<p>To use Memphis as a starting point to produce design ideas.</p> <p>To understand the different categories of wood.</p>	<p>Starter - What are the starting points for these designs? Do you know anything about who designed them?</p> <p>Read through the information on Memphis. Discuss the key characteristics of Memphis style. Put up the slide of Memphis products. Use random questioning to see if students can pick out the key characteristics of Memphis in the designs.</p> <p>Students complete the mind map of key characteristics of Memphis design in their work booklets.</p> <p>Monitor student progress and give assistance as required.</p> <p>Recap the shapes and patterns of Memphis designs. Model drawing shapes, combinations of shapes and patterns. Emphasise these do not have to be put into ideas at this stage.</p> <p>In the space in their work booklets students have a go at drawing a range of shapes and patterns.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p> <p>Design ideas</p> <p>Information on woods</p>	<p>Year 8 pencil box</p> <p>powerpoint</p> <p>Printed work booklet</p> <p>Example pencil boxes</p> <p>H&S - see Room 5 risk assessment</p>	

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	<p>Monitor student progress and give assistance as required.</p> <p>Explain and model how to produce design ideas.</p> <p>Recap on drawing in pencil, colouring in coloured pencil, labelling the design decisions, labelling how the design links to Memphis design, explaining the points in the labelling. Remind students they need to think about the space available, the colours, shapes and patterns used.</p> <p>Monitor students progress as they produce their ideas giving assistance as required.</p> <p>Discuss identifying the strengths and weaknesses of the designs. This should focus on how well it links to Memphis design, how easy/ hard it would be to manufacture and whether the layout works well not on the neatness of drawing, colouring etc.</p> <p>Students evaluate the strengths and weaknesses of their designs in their work booklets.</p> <p>Students explain which idea they plan to make and why.</p> <p>Discuss the three categories of timber, focus on the differences between softwoods and hardwoods, examples of each categories, the advantages of manufactured boards.</p> <p>Students fill in the tables in their work booklets about the three categories of wood.</p> <p>Monitor students progress and assist as required.</p> <p>Recap on the information learnt about the three categories of wood using random questioning.</p>			
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2	<p>To understand the different categories of wood. To be able to make a lap joint and comb joint and evaluate the skills used. To be able to mark out the sides of the box.</p>	<p>Starter - Students look at the picture of the pencil box and answer the questions. use random questioning to feedback.</p> <p>Recap information on the three categories of timber. Show students the slide of different products made from wood. Using their knowledge of different woods students try to identify which wood each product is made from and whether it is a softwood, hardwood or manufactured board.</p> <p>Monitor student progress and assist if required. use random questioning to get students to feedback their answers.</p> <p>Discuss the materials being used to make the pencil box from. Discuss different wood joints and the ones that are going to be used to make the box. Explain students can choose between the lap joint and comb joint to join the sides of the box, and they will make a practise one of each.</p> <p>Demonstrate how to make a lap joint. Focus on the accuracy of marking out, the names and uses of the tools and the safety points of using the different tools. Students make a lap joint.</p> <p>Modify student progress and give individual/ class assistance as required.</p> <p>Recap the stages of making the lap joint and the tools needed.</p> <p>Students fill the record of production for the lap joint in their work booklet.</p> <p>Monitor student progress and give assistance as required.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p>	<p>Year 8 pencil box powerpoint Printed work booklet Example pencil boxes Example lap and comb joints Pine Tenon saw bench hook Flat file Glass paper Marking gauge Metal ruler Try square Pencils Coping saw Green pens</p> <p>H&S - see Room 5 risk assessment</p>	
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		<p>Demonstrate how to make a comb joint. Focus on the accuracy of marking out, the names and uses of the tools and the safety points of using the different tools. Students make a comb joint.</p> <p>Modify student progress and give individual/ class assistance as required.</p> <p>Recap the stages of making the comb joint and the tools needed.</p> <p>Students fill the record of production for the comb joint in their work booklet.</p> <p>Monitor student progress and give assistance as required.</p> <p>Discuss what a peer assessment is and the criteria for assessing the lap and comb joint.</p> <p>Students swap their work and carry out a peer assessment of the joints.</p> <p>Students swap back, read their assessment and then respond in green pen.</p>			
3	<p>To be able to mark out the sides of the box.</p> <p>To be able to make the joints and assemble the box.</p>	<p>Starter - What are the names of these tools? What are they used for? Think, pair, share.</p> <p>Demonstrate how to mark out the the sides of the box, focus on the accuracy of measuring, leaving spaces for the saw cuts and the safety of using the tools.</p> <p>Students mark out and cut the sides of their box, ensuring they are all equal lengths.</p> <p>Monitor and give individual/ class assistance as required.</p> <p>Recap on how to make the lap joint and the comb joint. Emphasise on which end of the sides the different parts of the joints will be cut.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p>	<p>Year 8 pencil box powerpoint</p> <p>Printed work booklet</p> <p>Example pencil boxes</p> <p>Example lap and comb joints</p> <p>Pine</p> <p>Plywood</p> <p>Tenon saw</p> <p>bench hook</p> <p>Flat file</p>	

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		<p>Students work through making the lap and comb joints. Monitor progress and give individual/class assistance as required. Demonstrate how to assemble the box, dry fitting the box first and making any adjustments needed, gluing together the sides and bottom and clamping in the vice. Students assemble their boxes as they finish. Monitor student progress and give assistance as required. Discuss how to produce the designs for the box lid. Model making part of a design. remind students the designs should be the idea they have chosen from their work booklet and should link to Memphis design. Students work on producing the designs for their box lid. Monitor student progress and give assistance as required.</p> <p>Use random questioning to recap names and uses of tools.</p>		<p>Glass paper Marking gauge Metal ruler Try square Pencils Coping saw PVA</p> <p>H&S - see Room 5 risk assessment Focus on use of scissors</p>	
4	<p>To understand the different finishes available for wood and their uses. To be able to make the joints and</p>	<p>Starter - Show students the photos of the products and ask them to identify the joints that have been used to make them. Think, pair, share. Discuss how the assembled box will need a finish and the reasons for applying a finish. Students answer the questions in their booklets on finishes. Monitor progress and give assistance as required.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p>	<p>Year 8 pencil box powerpoint Printed work booklet Example pencil boxes Example lap and comb joints</p>	

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	<p>assemble the box.</p>	<p>Demonstrate how to apply varnish, wax, stain and paint, focus on applying them in the direction of the grain, the characteristics of each and the advantages of using them.</p> <p>Students apply the finishes to a sample of pine. In their work booklets they write up the characteristics of each finish and what they have found out about them. Monitor and give assistance as required.</p> <p>Demonstrate how to file and sand the edges of the assembled box. Explain how the box needs to be perfect before any finishes are applied, how any drops of glue will prevent the finishes working on those pieces of the pine.</p> <p>Students work on filing and sanding the edges of their assembled boxes. When this is done they apply their chosen finish.</p> <p>Recap on making the designs for the box lid. Remind them to apply the finish to their pieces before gluing them in place.</p> <p>Students make the designs for their lid and apply the finishes when ready.</p> <p>Students by this point will be at different stages, some will need to finish assembling their boxes, some will be filing and sanding their boxes down and applying the finishes, some will get on to making the lid designs. Monitor progress and give individual or groups of pupils assistance as required.</p> <p>Pupils discuss in pairs the progress they have made in the lesson and set themselves a target for the next</p>		<p>Pine Plywood Tenon saw bench hook Flat file Glass paper Marking gauge Metal ruler Try square Pencils Coping saw PVA Varnish Wax Paint Stain Paint palettes Paintbrushes Water pots</p> <p>H&S - see Room 5 risk assessment</p>	
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		lesson. Use random questioning for students to share their targets.			
5	To be able to use CAD and CAM to manufacture the box lid.	<p>Starter - Questions about prior knowledge of CAD and CAM. Use random questioning to find out knowledge.</p> <p>Demonstrate how to open a file in Techsoft design and how to save it as a new name. All pupils open the pencil box lid file and save a copy using their name. Talk through the main tools and show pupils where to find them. Explain the importance of students regularly saving their work. Pupils have a go at the 2 techsoft design exercises, drawing a bird and a house. Monitor and give individual assistance as required.</p> <p>Pupils work on transferring their design idea from their booklet to their techsoft design page. Monitor and give individual assistance as required. For pupils sharing computers, one works on their lid design and the other works on the CAD/CAM comprehension task.</p> <p>Demonstrate how to save their file as a duplicate file, this time saved with their name and parts to laser cut. Explain the use of different colours, black for parts to be engraved and red for parts to be cut out.</p> <p>Demonstrate how to change the outside edge of the box lid on their original drawing.</p> <p>On the parts to be laser cut file, pupils change the colour of the parts they want to be cut out to red. Any parts left on the box lid to be engraved can be deleted. Monitor pupils' progress and give assistance as required.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p> <p>Completed box lid.</p>	<p>Year 8 pencil box powerpoint</p> <p>Printed work booklet</p> <p>Techsoft design instruction sheets</p> <p>Example pencil boxes</p> <p>Music computer room - techsoft design programme</p> <p>Laser cutter</p>	

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		<p>If pupils were working on their own at a computer as they finish they need to complete the CAD/CAM comprehension task.</p> <p>Demonstrate how the laser cutter work, explain the different settings that are needed to cut and engrave sections.</p> <p>Check understanding of CAD and CAM through random questioning using the questions on the comprehension sheet.</p>			
6	<p>To be able to assemble the box.</p> <p>To be able to use files and glass paper to make the sides of the box smooth.</p> <p>To be able to apply a finish to the box.</p>	<p>Starter - Questions about finishes, students circle the correct answers in their work booklets. Use random questioning for students to feedback the answers.</p> <p>Recap on the stages of making the box. Most students will have an assembled box and be filing and sanding the sides, applying the finish or working on the box lid. Demonstrate how to attach the lid to the box. Focus on the use of a dowel joint, accurate marking out to ensure the lid fits accurately, safety of using the pillar drill. Demonstrate how to glue the stopper on top of the dowel avoiding gluing the lid in place. Students continue working through the stages of making the box including attaching the lid. Students by this point will be at different stages, some will need to finish assembling their boxes, some will be filing and sanding their boxes down and applying the finishes, making the lid designs, attaching the lid. Monitor progress and give individual or groups of students assistance as required.</p>	<p>Highlight learning objective, must, should or could in the booklet.</p>	<p>Year 8 pencil box powerpoint Printed work booklet Example pencil boxes Example lap and comb joints Pine Plywood Tenon saw bench hook Flat file Glass paper Marking gauge Metal ruler Try square Pencils Coping saw PVA</p>	

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		<p>When students finish their box they can answer the questions on materials and processes in their work booklet.</p> <p>Use random questioning to recap knowledge of materials and processes and why they are suitable for the box.</p>		<p>Pillar drill 6mm drill bit 6mm dowel Varnish Wax Paint Stain Paint palettes Paintbrushes Water pots</p> <p>H&S - see Room 5 risk assessment</p>	
7	<p>To be able to apply a finish to the box.</p> <p>To be able to evaluate the finished box.</p>	<p>Starter - If you were told to add a finish to your box what would that mean? What reasons are there for adding a finish to a completed product?</p> <p>As students complete their box they can work through the questions about materials and processes. Monitor student progress and give assistance as required.</p> <p>Explain why it is important to carry out an evaluation. Discuss the questions in the evaluation and the level of detail needed in the answers.</p> <p>Recap on why it is useful to find out other people's opinions of a completed product. Discuss what would be useful to know about the final product to work out how successful it is. Give some examples. Discuss</p>	<p>Highlight learning objective, must, should or could in the booklet.</p> <p>Completed pencil box</p>	<p>Year 8 pencil box powerpoint Printed work booklet Varnish Wax Paint Stain Paint palettes Paintbrushes Water pots</p> <p>H&S - see Room 5 risk assessment</p>	

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	<p>how this can show you what improvements could be made to the box if you were to make it again.</p> <p>Discuss what kind of responses are suitable when feeding back to somebody about their work and give some examples.</p> <p>Students ask 3 people to feedback on their completed door stop using the questions written.</p> <p>Monitor student progress and give assistance as required.</p> <p>Students consider their evaluation against the specification and feedback from other people and suggest improvements they would make if they were to make the pencil box again.</p> <p>Using random questioning students feedback one thing they have learnt while making the pencil box.</p>			
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