



MEDIUM TERM PLANNING

Subject	Topic/Key Question	Year Group	Term	Time Allocation
Design Technology	Making Mini Greenhouses	4	Spring 1	6 weeks
End of lower key stage 2 objectives	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at individuals or groups.</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</p> <p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</p> <p>Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.</p> <p>Investigate and analyse a range of existing products.</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p> <p>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures</p>			
Stable structures				
End of unit objectives	<p>I know what a greenhouse is and how they work.</p> <ul style="list-style-type: none"> • I can explore a range of different greenhouses. • I know how greenhouses are used today. • I can explain how the shape of a structure affects its stability. • I know that the weight of the structure needs to be evenly spread on the base to make it secure. 			

	<ul style="list-style-type: none"> • I know that the wider a structure's base is, the more stable it will be. • I can use 3D nets to explore potential structures for a greenhouse, assessing their stability. • I can investigate ways of making a structure more stable, e.g. by inserting dowelling or adding triangles at the joins. • I can experiment with a range of materials to test which would be most appropriate for making the structure of a mini greenhouse. • I can design a mini greenhouse using specific design criteria. • I can select appropriate tools and materials to make a mini greenhouse. • I can follow my design to make a mini greenhouse. • I can evaluate my finished mini greenhouse for stability, effectiveness, and visual appeal. 	
Vocabulary	Design	Influence, Designers, Produce, Plan, Explain, Persevere, Adapt, Original, Communicate, Idea/s, Sketch, Draw, Annotated, Suggest, Improvements
	Make	Tools, Task, Knowledge, Material, Best outcome, Attempt, Product, Strong, Measure, Accurate, Advanced techniques, Shape, Mould, Finishing, Awareness of audience
	Evaluate	Evaluate, Suggest, Improve, Purpose, Appearance, Altered, Checking, Successful
	Structures	Strengthen, Product, Stiffening, Reinforce, Structure

Lesson Sequence	Time Allocation	Key Question/WALT	Teaching Activities	Resources
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<p>Technical knowledge</p> <p>Lesson 1</p>	<p>1 hour</p>	<p>To explore existing greenhouses</p>	<ul style="list-style-type: none"> • What is a greenhouse? What is it used for? Think, pair, then share your ideas. • Explain that a greenhouse is a building in which plants (including flowers, fruit and vegetables) that need protection from cold weather are grown. Greenhouses allow more control over the environment that plants grow in, and can protect them both from bad weather and harmful insects. Greenhouses also enable some plants to be grown throughout the winter months, as the temperature can be regulated. • How does a greenhouse help plants to grow? (Hint: think about what plants need in order to survive!) • Allow children time to think, pair, then share their ideas. • Tell them that in order to survive, plants need light, heat, air, water and nutrients. Which of these requirements do you think a greenhouse can help with? • Greenhouses provide light and heat for plants. Using the diagrams on the next two slides, explain that because greenhouses are mostly made from glass or clear plastic, sunlight can shine through and warm both the air and the plants inside. The glass or plastic helps to trap the heat inside the greenhouse, so that it stays warm and continues to get warmer throughout the day. Explain what ventilation is, and why this is an important consideration for a greenhouse. • Briefly discuss the history of greenhouses using the slides. How important do you think the invention of the greenhouse has been for the world, and why? • Explain that today, one use of greenhouses is in the mass production of plants as food. Technological advances in modern greenhouses have given us greater control over the growing process. This means we can have a constant supply of fruit 	<p>Slides</p> <p>Worksheet IA/IB/IC</p>
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<p>Technical knowledge Lesson 2</p>	1 hour	To investigate stable structures	<ul style="list-style-type: none"> • Can you remember how a greenhouse helps a plant to grow? Explain it in as much detail as you can. • Tell the children that today we are going to look at what makes a structure stable. Do you know what this means? Think, pair, then share your ideas. • Explain that if a structure is stable, it is steady, strong and safe. It is unlikely to collapse or fall over. Look at some pictures of objects and ask the children if they think they are stable. What would make them • more stable? Why? • Explain that the stability of a structure depends on many aspects, but the one we will be focusing on today is shape. Use the slides to look at some everyday objects and discuss which are the most and least stable and why, then apply this knowledge to greenhouses. • Show the children diagrams of the sides of two different greenhouse designs. Which will be the most stable and why? Which will let in the most sunlight and why? Use the following slide to help discuss the 	<p>Slides Instructions Cards 3D Shape Templates A/B/C/D Scissors, glue</p>

			<ul style="list-style-type: none"> • children's ideas. Explain that a successful greenhouse needs to be stable and allow the maximum amount of sunlight to enter. • Tell the children that they are going to investigate how to successfully include both of these requirements in a design by exploring the frame sizes of different 3D shapes. • Key questions include... • Do children understand the term 'stable'? Can they identify factors that make a structure stable? Can they discuss how to make a structure more/less stable? 	
<p>Technical knowledge</p> <p>Lesson 3</p>	1 hour	To investigate materials for making a mini greenhouse	<ul style="list-style-type: none"> • Remind the children that, as we found out in the first lesson, some people have mini greenhouses in which they grow seeds or keep small plants. • Display the statement: A mini greenhouse will not be as effective as a full-size greenhouse. Do you agree or disagree with this statement? Why? Think, pair, then share your opinions. • Explain that a mini greenhouse will work in exactly the same way as a full-size greenhouse. Look at the advantages and disadvantages of mini greenhouses. • If you were making a mini greenhouse, what materials could you use for the frame and the sections within the frame? Remind the children that the frame needs to be strong enough to keep the structure • stable, and the sections within the frame need to be transparent. Record some of their ideas on the next slide and discuss. Which do you think is the best combination? • Tell the children that today they are going to be exploring a range of different materials and assessing how suitable they would be for making a mini greenhouse. • Key questions include... 	Slides Worksheet 3A/3B/3C

			<ul style="list-style-type: none"> • Can children identify suitable materials for a mini greenhouse? Can children explain why these materials are suitable? Can children discuss ways of joining these two materials together? 	
<p>Design Lesson 4</p>	1 hour	To design a mini greenhouse	<ul style="list-style-type: none"> • Tell the children that today they are going to design a mini greenhouse. They need to take into consideration all that you have learnt about the stability of structures, and the most suitable materials • with which to build them. • Split the children into mixed ability groups (size of your choice) give each group a set of the Discussion Cards. Children use these to share opinions and generate ideas about what the best design for a mini • greenhouse should include, and how. They could be given paper or mini whiteboards for the recording of ideas and sketches. • When the children have completed their discussions/the allocated amount of time has ended, gather the class back together and use the slides to collate their opinions and ideas about each question on the • Discussion Cards. • Tell the children that it is now time to design their mini greenhouses. Remind them to make sure that they take into consideration all of the different ideas that that discussed as a group and class. • Explain that they will each find specific design criteria on their worksheets – these are goals that they need to work towards including in their design so that their product is successful! • Key questions include... • Can children apply their knowledge of stable structures and suitable materials when designing a mini greenhouse? Can children follow specific design criteria? Can children identify 	<p>Slides Discussion Cards Worksheet 4A/4B/4C Paper/mini whiteboards (optional)</p>

			possible challenging parts of their design/help others to find solutions?	
Make Lesson 5	1 hour	To make a mini greenhouse	<ul style="list-style-type: none"> • Tell the children that today they will be making their mini greenhouse. • Remind them to be organised by gathering all of the equipment and materials that they will need. • Encourage them to refer to their plan regularly, and think carefully about each step in the process. • Explain to the children that if they need to change part of their design during the making process, they can. Explain that most designers alter their plans along the way in order to improve the finished product. • Before they begin, discuss any safety tips or issues with the children when using the various tools and materials today. • Children independently follow their plan to create their mini greenhouse. • Can children follow a design to create a successful product? • Key questions to ask... • Can children amend their design to improve a product/give suggestions to others as solutions to problems? Can children work safely and sensibly with a range of materials and tools? • Consider growing a crop in the mini greenhouse such as garlic, carrot tops or seeds. Carrot tops are ideal to show quick growth, 	<p>Slides Equipment such as scissors, sellotape, glue, staplers Children's worksheets from Lesson 4 Materials (refer to children's designs from the previous lesson as to what specific materials will be required). Comment Cards</p>
Evaluate Lesson 6	1 hour	To evaluate a finished product	<ul style="list-style-type: none"> • Now that we have finished making our mini greenhouses, we need to evaluate them. What does this mean? Why is it important that we do this? Think, pair, then share your ideas. • Explain that when we evaluate a finished product, we need to look at how successful it is. It is important to do this so that we know what worked well, and how we could improve on our design next time. One of the most crucial questions we need to 	<p>Slides Evaluation Question Cards Worksheet 6A/6B Pitch It! Prompt Cards Whiteboards/paper (optional)</p>

			<p>ask ourselves is, 'Does it meet the design criteria?' Can you think of any other questions we could ask about our mini greenhouses in addition to this?</p> <ul style="list-style-type: none">• What other questions did you think of? Jot down the children's ideas on the slide.• Before the children evaluate their mini greenhouses, remind them that it is important that they are honest when evaluating their product. It is rare that any completed design is perfect the first time round!• Designers usually spend a lot of time looking at their products and improving them. This making and adjusting process can be repeated several times until a designer and their clients are completely happy with the finished product, and it is the best it can be.• Key questions to ask...• Do children understand the importance of evaluating a finished product? Can children identify what has been successful with their design? Can children identify any improvements that could be made to the design?	
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