Medium Term Plan – Design and Technology – Year 4 – Structures

Teachers must use in conjunction with Design and Technology Progression document (Prior Knowledge and Skills).

Lesson	National Curriculum links	Objective	Substantive knowledge	Disciplinary knowledge	Specific Vocabulary	Activities and resources
1/12	**Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	To explain how key events and individuals in design and technology have helped shape the world.	To talk about bridges I know. To know there are different bridge designs.	I can name bridges. I can name and explain the function of a bridge.	Bridge	Name bridges they know Why do we have bridges? What are the made of? Why? Find out about famous bridges. (Ironbridge) Challenge - make own bridge using paper and tape
2/12	**Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design	To research bridges.	To carry out research on bridges. To recognise and name different types of bridges. To know there are different bridge designs.	I can name bridges. I can talk about what bridges are made of and why. I can talk about which bridge I think	Suspension bridges Arch bridges Cable stayed bridge Cantilever bridge Beam bridge	Children research bridges (purpose, size, location, building material, design)

	and technology have helped shape the world			is better and why.		
3/12	**Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	To investigate bridge shapes.	To know there are different bridge designs. To compare bridges.	I can talk about different bridge shapes. I can explain why I think bridges have different shapes.	Suspension bridges Arch bridges Cable stayed bridge Cantilever bridge Beam bridge	Draw different bridge shapes
4/12	**Design** • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes,	To know how to design a bridge	To know what materials I will need to use to make my bridge.	I can talk about my design.		Design own bridge

	pattern pieces and computer-aided design •					
5/12	**Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and	To join and combine materials.	To understand how to strengthen, stiffen and reinforce more complex structures.	I can investigate different ways to strengthen structures. I can talk about ways I can strengthen a structure and which I think is best.	Strengthen Stiffen Reinforce Structures Join	Look at ways to strengthen materials

	components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities					
6/12	**Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example,	To know ways to strengthen a structure.	To understand how to strengthen, stiffen and reinforce more complex structures.	I can investigate different ways to strengthen structures. I can talk about ways I can strengthen a structure and which I think is best	Strengthen Stiffen Reinforce Structures Join	Look at ways to strengthen materials

	cutting, shaping, joining and finishing], accurately • 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					
7/12	**Design** • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design . Wheel Mechanisms Explore and use mechanisms (for example levers), in their products in the context of using a lever to make a picture move.	To plan a design for a bridge	To plan and design a bridge. To name different ways to strengthen a structure,	I can design a working product thinking about who it is for and what it needs. I can make decisions about my product design and use an annotated sketch to show them.		Go through initial design – is there anything you want/need to change? How will you strengthen bridge? Design bridge and decide how they will join and strengthen structure.

8/12	**Design** • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]	To create a prototype.	To design a bridge To join materials together.	I can design a working product thinking about who it is for and what it needs. I can talk about what worked and how I may improve my design.		To draw round, cut and join materials

	• apply their understanding of computing to program, monitor and control their products **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • 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					
9/12	**Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their	To make a bridge.	To use my plan and design to create a bridge To use ways to strengthen a structure.	I can make a product.		Apply skills and knowledge to make a bridge.

	products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • 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					
10/12	**Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their	To make a bridge.	To use my plan and design to create a bridge To use ways to strengthen a structure.	I can make a product. I can test out my product.		Apply skills and knowledge to make a bridge.

	products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • 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					
11/12	**Evaluate** • investigate and analyse a range of existing products	To evaluate my work.	To compare the finished product to my design.	I can evaluate my product		Evaluate structure made

	• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world		To identify what went well and not so well.	against design criteria. I can identify what went well and what I would change next time.		What worked? What would improve?
12/12	**Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	To alter and improve my design.	To compare the finished product to my design. To make any alterations and improvements to my design from my evaluation.	I can identify what went well and what I would change next time. I can make improvements to my design from my evaluation.		Evaluate structure made What worked? What would improve? How would I improve it?