Design and Technology In The EYFS

Children will explore Design and Technology through Expressive Arts and Design. Throughout continuous provision for the children, they will have opportunities to make and begin to design through sharing their ideas.

Children will have access to creative areas where they can freely access materials, pens, pencils and paint to support their making, with adults scaffolding them to enable them to learn new skills. Each Term our Big Questions will allow us to spark children's interests in different techniques in D+T creating different models as well as having opportunities to cook.

Through encouraging curiosity with our big questions, we are able to expose children to ideas and key vocabulary that will support the progression of Design and Technology into year 1 and contribute to the children's readiness for the Key Stage 1 D+T Programme of study.

To support our readiness, we will: -

- Have access to a range of junk modelling materials to enable them to be creative in their making.
- Begin to learn different skills such as cutting, shaping and joining.
- Learn about being healthy and having balanced diets.
- Have opportunities to prepare and cook a variety of different items such as cakes, biscuits and fruit salads.
- Explore how food grows such as fruits and vegetables
- Learn how to safely use a variety of different tools when cooking.
- Learn how to use woodwork tools safely, building up independence and confidence
- Begin to discuss our ideas and how to create them, planning by drawing and labelling
- Explore how different devices work, discussing what they notice.
- Explore, use and refine a variety of artistic effects to express their ideas and feelings.
- Return to and build on previous learning, refining ideas and developing their ability to represent them.
- Create collaboratively, sharing ideas, resources and skills

Reception Overview			
	Autumn	**Spring**	**Summer**
Big Questions	What makes me Unique? What is a traditional tale?	How can I get there? What is my favourite animal and why?	What can I grow? Who can help me?
Literacy Links	Making houses for the 3 pigs	Creating different vehicles Using clay to make animals from our stories	Creating capes for superheroes
Cooking	Cooking a variety of different recipes throughout the year		
Key Vocabulary in Reception	Draw, paint, colour, clay, junk modelling, Materials, construct, make, tape, glue, stick, join, design Clay, mould, pull, push, roll, pinch, Scissors, snips, cut Cooking, mix, ingredients, dry, wet, stir, knead, oven, fridge, cool down, temperature, fold, roll, divide, sieve, weigh, measure		

St. Michael's Design &Technology Overview 2022

Y1		Autumn	Spring	Summer
Topic		Dips and Dippers (Healthy Eating) Cross-curricular link to Science – Healthy eating	Lunch Boxes (Structures and Materials) Cross-curricular link to Science - Materials	Vehicles (Wheels and Axles) Cross-curricular link to History - Transport; English - Cinderella
National Curriculum objectives		As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating, instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: • use the basic principles of healthy and varied diet to prepare dishes; • understand where food comes from.	**Design:** • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make:** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate:** • explore and evaluate a range of existing products; • evaluate their ideas and products against design criteria. **Technical knowledge:** • build structures, exploring how they can be made stronger, stiffer and more stable; • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	**Design:** • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make:** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate:** • explore and evaluate a range of existing products; • evaluate their ideas and products against design criteria. **Technical knowledge:** • build structures, exploring how they can be made stronger, stiffer and more stable; • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
Whole unit	Expected outcomes	• To explore different dips and dippers. • To understand where foods come from. • To select appropriate tools and equipment. • To understand basic principles of healthy eating. • To design an appealing dip. • To follow their plan. • To evaluate their ideas.	• To explore and evaluate a range of baskets and lunch boxes. • To select appropriate materials. • To build a strong and stable lunchbox. • To evaluate their design and product against the design criteria.	• To explore different vehicles. • To consider how to make a vehicle move. • To understand how to make wheels and axles. • To design a Cinderella carriage. • To evaluate their design.
	Fieldtrips/ Workshops/ enrichment	None	None	None

	Vocabulary	Ingredients, ***dips, evaluate***, senses, taste, ***texture***, smell, ***appearance, dipper,*** explore, ***sensory***, ***evaluating***, crunchy, dry, hard, sweet, juicy, ***protein***, dairy, fruit, vegetables, ***carbohydrate,*** balanced, diet, ***varied, hygiene, blend, grate, crush, mix, peel, chop, slice, layered, marbled, The Bridge, The Claw, context***, equipment, ***method***, design, ***design criteria, plan.***	Evaluate, ***product, existing, disassemble,*** materials, *waterproof*, strong, protect, ***reclaimed,*** select, tools, equipment, safety, ***area***, join, tape, glue, structure, ***hinges***, design criteria, ***specification***, test, stronger, ***stable***, ***stiffer, retest***, improvements, ***appealing***.	Vehicles, wheel, ***axle, chassis, body, cab***, compare, similarities, differences, ***carriage***, plan, evaluate, improvements.
Weekly learning objectives specific to St. Michael' s *(progression of skills)* **key questions**		Self-portrait (Art)	I can evaluate a product's ability to do a job well. What were the problems with the design of the product? What are the positives about using a basket?	I can investigate parts of a car. (History) Why do vehicles have wheels? Do they all have the same number and size of wheels? Why are vehicles different shapes? Which vehicles have parts that move, light up or make a noise?
		I can group familiar foods like fruits and vegetables. (Science) Why is it important for us to keep healthy? What foods are good for us?	I can investigate and evaluate existing products. Which is strongest? Which would store the food the best and why? Which looks the nicest? Which would keep the food the driest?	I can draw and label a vehicle. What is the same as the car? What is different?
		I can taste different dips and describe them using my senses. Can you name any dips? What does this dip look like? What does it smell like? What does it taste like? What can you eat them with? When might you eat them? Where might this dip come from?	I can explore different materials and decide which will meet the design criteria for my Product. (Science) I can design a new product that meets the design criteria. Which materials will be waterproof and why? Which will be strong and why? Which materials might make a strong handle? Could the materials be made stronger? How? What will help keep the lunch safe?	I can draw and use templates to generate ideas to build Cinderella's carriage (Literacy) What features does a carriage need? How will you make it move? What will be the best materials to use?
		I can explore different dippers and describe them. What dipper did we use last lesson? What does this dipper look like? What does it smell like? What does it taste like? Does it work well with the dips? How can you hold the dipper and cut safely?	To build a product and think about how to make its structure meet the design criteria. Which tools and equipment will we need to select to help make the structure of our lunchboxes? Is there anything we need to add to our tools and equipment to help us make hinges?	I can make a moving vehicle, exploring mechanisms. How are the wheels made on this toy? What will you need to use?
		I can explain why I need to eat a balance and variety of food groups to stay healthy. (Science) What are the different food groups? What foods belong in each group?	I can test a product and then evaluate it. Can you talk about the design criteria and materials used? What improvements need to be made?	I can evaluate my moving vehicle. What worked with your vehicle? How could you improve it next time?
		I can plan my own appealing dip and dipper and clearly show my ideas. What event can you make your dip and dipper for? How can you make the dip appealing? What method will you use? Which food groups are represented?	I can use my evaluations to make improvements to my product and then retest and evaluate it. I can improve my product by making it stronger, stiffer, more stable and more waterproof. Do you need to make your lunch box stronger? Do you need to make it stiffer? Do you need to make it more stable?	
		I can make and evaluate my own dip and dipper. What went well? What could have been improved? Have you met the original design criteria?		

Y2		Autumn	Spring	Summer
Topic		Moving Pictures -Traditional Tales (mechanisms) Cross-curricular link to English – Traditional tales and instructions.	Salads (cooking and nutrition) Cross curricular link to science - animals including humans and plants; Maths - tally chart; English - verbs	Puppets (sewing)
National Curriculum objectives		**Design** • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate** • explore and evaluate a range of existing products; • evaluate their ideas and products against design criteria. **Technical knowledge** • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating, instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: • use the basic principles of healthy and varied diet to prepare dishes; • understand where food comes from.	**Design** • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate** • explore and evaluate a range of existing products; • evaluate their ideas and products against design criteria.
Whole unit	Expected outcomes	• Explore an existing product; • Draw a simple design; • Make a picture which has at least one moving mechanism; • Start to understand what design criteria is used for; • Evaluate what they did well on their product.	• Know how to eat a healthy and varied diet.; • Use the basic principles of a healthy diet to prepare dishes; • Follow a simple recipe with some guidance. • Work with close adult supervision to use measuring spoons, zesters and juicers to prepare dishes; • Understand that some food is grown and some food is caught.	• Have discussed their ideas as they developed and be able to say what their design has to do; • Have created a puppet that works (i.e. is the right size and reflects the character) using a given technique; • Have stitched two pieces of fabric together and added features using appropriate materials and techniques.
	Fieldtrips/ Workshops/ enrichment	None	None	None

	Vocabulary	moving, picture, book, story, traditional tale**, *lever, slider, pivot, wheel, push, pull,*** direction, up, down, left, right, evaluate, product, mechanism, ***assemble, fix, split pin,*** wheel, ***disc, reassemble***, fixed, cut, draw, ***design* criteria, annotated** sketch, idea, discuss, choose, drawing, label, ***appealing***, make, improve	fruit, vegetable, plant, root, cauliflower, cabbage, strawberries, beetroot, onions, apples, plums, broad beans, blackberries, rhubarb, marrow, gooseberries, celery, lettuce, carrots , tomatoes, radishes, runner beans, turnips, potatoes, evaluate, salad, texture, smell, appearance, taste, hygiene, ***blend***, grate, mix, peel, chop, slice, the bridge, the claw, fork, safe, protein, ***vitamins, minerals***, oily, salmon, mackerel, trout, tuna, shellfish, cut, ***combine***, fruit, recipe.	designing, user, list, label, drawing, ideas, ***mock-up,*** choose, decide, evaluate, try out ideas, standard unit, making plan, ***template,*** fabric, cutting out, sewing, needle, ***running stitch***, gluing, adding, character, puppet, seam, stitch, thread, strong, quality, features, ***strengthen,*** reflective symmetry, position, towards
Weekly learning objectives specific to St. Michael's *(progression of skills)*, key questions		I can explore and evaluate an existing product What part of the picture moved? What does the moving part do? How does it work? What effect does it have? How well does it work? Which part of the book did you choose and why? cross curricular English traditional tales and instructions	I can name different fruits and vegetables and I can explain where some food grows. Where do you think they belong (grow above the ground or grow below the ground – root vegetables)? Have you ever seen them growing? Can you name any other vegetables that haven't already been mentioned today? Do they grow above or below the ground? cross curricular science: animals including humans and plants	To investigate a range of puppets and their features. What is a puppet? What are they used for? How many different types of puppets can you think of? What kind of puppet is this? What do you think it is made from? Do you like this puppet? What questions do you think we need to ask when we are exploring different puppets? How does it move? Who was it designed for? Who would play with it? What materials is it made from? What type of puppet do you think you would most like to make and why? Would it be an animal or a person? Would it be a finger puppet, a hand puppet, a marionette?
		I can use a mechanism in my product. How smoothly does your character move? How well made is your slider? cross curricular English traditional tales and instructions	I can explore and evaluate existing products and I can explain why I need to eat fruit and vegetables. Which salad will be the classes' favourite? cross curricular science: animals including humans and plants, maths: tally chart	To be able to work with fabric to create a finger puppet. What are these puppets called and who do you think would enjoy playing with them? How do you think we could make a puppet like this? How could you make a bear finger puppet? How could you make a ladybird finger puppet? How could you make a pirate finger puppet? What do you think of your finished finger puppet? How easy was it to glue the different pieces together? Did your finger puppet turn out as you wanted it to? If not, how could you have made it better?
		I can make a lever and use it in my product. What is a lever? What is a pivot? cross curricular English traditional tales and instructions	I can prepare and make a healthy salad made from root vegetables. Can you remember what we must do before we prepare food? As I make the salad can you think of any verbs to describe my actions? cross curricular science: animals including humans and plants, English: verbs	To develop and practise sewing skills. How can we make sure we stay safe when we are sewing? How did you find the sewing you did today? What did you enjoy about it? What was tricky? How do you think you will be able to use what you have learnt to make a puppet?

		I can make a wheel mechanism and use it in my product. Which skill was the hardest to master and why? cross curricular English traditional tales and instructions	I can explain where fish comes from and why it is important to eat fish. Have you ever eaten fish? What types of fish have you tried? Do you know where the fish we eat comes from? Which group of foods does fish belong to? Why should we eat fish? cross curricular science: animals including humans and plants	To be able to design a glove puppet. How do you think you could make a glove puppet? What kind of glove puppet do you think you would like to make and why? What else could you add to your glove puppet? What do we need to think about when we are designing a product? What materials and tools will I need? Who am I designing my product for? How will I join the different parts together? Do you think your partner has included everything they need to include in their design? If not, what have they missed out?
		I can design a working product thinking about who it is for and what it needs and I can make decisions about my product design and use an annotated sketch to show them. Which parts of the story could move? Which mechanism would you use? cross curricular English traditional tales and instructions	I can prepare a tasty fish salad. Can you remember the food hygiene rules? What is this piece of equipment called? What does it do? Which piece of equipment was the hardest to use correctly and why? cross curricular science: animals including humans and plants	To be able to follow a design to make a puppet. What will you do if you have a problem while you are making your puppet? How can you make sure you stay safe while you are making your puppet? How can you make sure your puppet ends up looking like your design? Are all the seams straight? Are all the features (e.g. eyes) attached securely? Is there anything else you could add?
		I can use mechanisms to make a product.and I can evaluate my product against design criteria. What **five** things must the moving picture include? What will make our picture well-made? How will we make our picture neat? Is your picture following the design criteria? What improvements do you need to make? What are your next steps? cross curricular English traditional tales and instructions	I can explain where different fruits come from and I can prepare a tasty fruit salad. How many different types of fruit can we name? Which is your favourite fruit and why? What is the fruit called? cross curricular science: animals including humans and plants	To be able to evaluate a finished product. What does it mean to evaluate something and why is this important? What did you most enjoy about making your puppet? What did you find most difficult about making your puppet? What would you do differently if you were going to make your puppet again? What is the one thing you would do differently if you were to make another puppet?

Y3		Autumn	Spring	Summer
Topic		Moving Monsters Cross Curricular Links: Maths – Measurement; Science - Forces	Mini Green Houses Cross Curricular Link to Science – Plants; History - Romans	Packaging Cross Curricular Link to English – Harry Potter; Maths – 3D Shapes
National Curriculum objectives		**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 and, annotated sketches. **Make** • 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. **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.	**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 and annotated sketches and prototypes. **Make** • 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 • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately **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. **Technical Knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	**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 and prototypes and computer-aided design. **Make** • 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 • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately **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. **Technical Knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
Whole unit	Expected Outcomes	• Can explain how simple pneumatic systems work; • Can create a simple pneumatic system; • Know different techniques for joining and fixing components; • Can make an effective pneumatic system; • Can use their knowledge of pneumatics to create a moving part.	• Can explain what a greenhouse is used for and how it does its job; • Can discuss what makes a structure stable; • Can use their knowledge to design a greenhouse using appropriate materials; • Can make and evaluate a Mini Green House against the design criteria.	• Can explain what the purpose of packaging is and that it comes in different shapes, sizes and colours; • Can explain what information you may find on packaging and why; • Can understand the shapes comes from Nets and that they are 3D; • Can make and evaluate a package based on the design criteria.
	Fieldtrips/ Workshops/ enrichment	None	None	None

Whole unit **Weekly learning objectives specific to St. Michael's** *(progression of skills)* **key questions**	Vocabulary	air, inflatable, pump, whistle, recorder, balloon, ***pneumatic***, ***syringes***, tubing, straws, moving parts, joining, fixing, ***components***, ***forces***, pushing, pulling	greenhouse, environment, flowers, fruit, vegetables, ***protection***, ***stability***, temperature ***regulation***, ***mass production***, 3D Shape, structure, sunlight, ***ventilation, transparent***, ***dowelling***, saw, glue	***packaging***, shapes, 3D, material, customer, ***consumer***, products, design criteria, images, ***graphics***, evaluation, ***3D Net***, product, alliteration, font, colours***, colour wheel, CAD, digital design, design thinking, innovating, 2D design, prototype, refine, ideate***
		To investigate a variety of objects which use air to make them move How many objects can you think of that use air to move? How do these objects use air? Can you think of alternatives uses for the familiar objects?	To explore existing greenhouses What is a greenhouse? What is it used for? How does a greenhouse help plants to grow? Which of these requirements do you think a greenhouse can help with? How important do you think the invention of the greenhouse has been for the world, and why? What impact do you think the invention of the greenhouses has had on the world?	To investigate a range of packaging How many different types of packaging can you think of? What material do you think it is made from? What is the purpose of the packaging? What information does it tell you? What shapes can you see? Who is the packaging aimed at? How many different pieces of card have been used to make this packaging?
		To investigate techniques for making simple pneumatic systems What do you think will happen to a balloon when the syringe is pushed in? Do you know what the word pneumatic means? Can you think of any other ways to make a pneumatic system? Did you get your pneumatic system to work? How effective was it? How can we use a pneumatic system to move part of our monsters?	To investigate stable structures Can you remember how a greenhouse helps a plant to grow? What would make them more stable? Why? Which will be the most stable and why? Which will let in the most sunlight and why?	To be able to construct nets for 3D shaped packages Can you remember what a net is and what it makes? What nets and 3D shapes would you need to hold these products? How do you know those would work?
		To gather ideas for creating a pneumatic monster What ca you remember about pneumatic systems? What part of a monster can we make move? How could you use pneumatics to make them move? What materials would you need to create your system?	To investigate materials for making a mini greenhouse A mini greenhouse will not be as effective as a full -size greenhouse. Do you agree or disagree with this statement? Why? Which do you think is the best combination? What materials do you think will work best? why?	To explore the use of graphics on packaging What font has been used? Why do you think the company chose this design? What images have they used? why? What kind of font and images would you have on the following products?
		To design a monster including a movable pneumatic system What will it look like? Which part of your monster will move? What else do we need to think of when designing your monsters?	To design a mini greenhouse What materials will work best? why do you think this? How will you make your greenhouse stable? How will ventilate your green house? How will you meet the design brief?	To use computer aided design to design packaging (Using TinkerCAD) What have we learnt so far about packaging and how to create a good packaging box? What kind of packaging will you make? Who will your packaging be aimed at? What kind of 3-D net will you use to make your box? What kind of graphics will you use? What materials and tools will you need? What will your success criteria be?
		To make a monster with a moving pneumatic system How can you make sure your model looks like your final design? How will you make sure your pneumatic system works effectively? What will you do if you come across any problems while building it? Are the joins neat? Have you decorated your monster neatly?	To make mini greenhouse Where will you start? What order will you build your green house in? What tools will you use? Mini Greenhouses to be used for growing plants in science unit	To make a packaging box by following a design How will you make sure your finished product looks like your design? What will you do if you come across any problems as you are making your product? How will you ensure that your finished product is of a high standard? Children to also come up with their own evaluative questions.

		To evaluate your pneumatic monster What do you like about your monster? How well does the moving part work? What do you think of the appearance of your monster? Is there anything you think you could improve? What did you enjoy doing? What did you find difficult?	To evaluate the finished product Are you happy with your model? Is there anything you would change? What do you like/dislike? What did/did not work? What other questions did you think of? 'Does it meet the design criteria?' Can you think of any other questions we could ask about our mini greenhouses in addition to this?	To evaluate the finished product What do you like about it? What has been done well? What do you think of the graphics? Is there anything you would change about the packaging? Why is evaluation such an important part of the designing and making process? What did you enjoy most about making your packaging? What did you find hardest about making your packaging? What have you learnt whilst designing and making your packaging?

Y4		Autumn	Spring	Summer
Topic		Electrical Battery Powered Circuit Light-up Christmas Card Cross-curricular link to Electricity - Science	Construction – Containers Cross-curricular link to History – Ancient Egypt English - the children could use their work to provide a purpose for writing instructions Mathematics - practise drawing lines and angles accurately for a purpose. They will be identifying nets of simple solid shapes and visualising 3D shapes from 2D shapes. PSHE - Discussions can centre around special items and what they mean to us. How we show respect for other people's belongings and our school.	Moving Toys Cams/Gear/Levers/Linkage Cross-curricular link to Science/Geography (Rainforest Animals)
National Curriculum objectives		**Design** • To develop a design that is fit for purpose • To communicate their ideas through discussion and diagrams. **Make** • To select from and use different materials to create product. **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 **Technical knowledge** • understand and use electrical systems in their products [circuits incorporating switches and bulbs]	**Design** • To develop a design that is fit for purpose • To communicate their ideas through discussion and diagrams. **Make** • Making different boxes from nets • Exploring how lids work • Exploring surface decoration with hand techniques **Evaluate** • investigate and analyse a range of existing products. • evaluate their ideas and products against their own design criteria. **Technical knowledge** • The use of CADCAM to provide the children with precisely cut and creased nets, each child will have to assemble these carefully to achieve a pleasing final product.	**Design** • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. • generate, develop, model and communicate their ideas through discussion, prototypes. **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. **Evaluate** • investigate and analyse a range of existing products. • evaluate their ideas and products against their own design criteria. **Technical knowledge** • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].
Whole unit	Expected outcomes	• To be able to construct a simple circuit including a bulb and simple contact switch • To design a light-up Christmas Card that lights up when closed. • To create a design for the intended purpose	• To design a container that can hold one or two favourite small items safely and that, from its appearance, reflects the importance and nature of the contents.	• To investigate different Cams and the motions created. • To design and make a Automata animal (Link to Science) with moving parts.
	Fieldtrips/ Workshops/ enrichment	None	Ancient Egyptians workshop – History Off The Page. Mummies, canopic jars, pyramids and caskets	None
	Vocabulary	***Circuit, electricity, electrical, bulb, wires, connection, complete circuit,*** design, evaluate, ***switch, font, aesthetic, italic, calligraphy.***	treasure, ***possessions*****,** ***inexpensive*****,** precious, net, cube, prism, pyramid, ***tab***, stiff, ***score***, cut, lid, ***hinge***, sliding, ***integral, block printing*****,** peel off, label, ***illustrate, specification,*** evaluation	***Cam, follower, mechanism, components, rotary, linear, motion, eccentric, egg, dwell, ellipse, offset, functional, aesthetic, finish,*** design, ***prototype,*** evaluate.

Weekly learning objectives specific to St. Michael's *(progression of skills)* **key questions**		To investigate different Christmas card designs. Which type of design do you prefer? Which types of design would be easier to create?	To decide upon the 'treasure' Why is it precious? To make different boxes from nets Is the box well made? Will the box open and close easily? Can the box stand repeated use? Will the box be large enough to hold the treasure? Will the box be stiff enough to hold the treasure?	Introduction to cam/followers/levers. Investigating how different shaped cams work and making a prototype. Can you identify different parts of the moving mechanism? How are the different parts helping to create movement? How is a rotary motion transferred into a linear motion? How do different cams create different effects? Why is wood/thick card used for the mechanism?
		To investigate range of fonts and designs used in Christmas greeting cards. How are fonts most effective? Which fonts would suit different style cards? Which fonts would suit different recipicants?	To explore how lids work • How does each lid work? • How could each lid be made? • How easy is each lid to make? • How easy is each lid to use? • How well would each lid last?	
		To understand how a contact switch works and how it can be used in a card. Where would it be best to place the switch? Which switch would work in a card?	To explore surface decoration techniques • What differences are there? • What similarities are there? • Can we decide that one way is better than the other? • If so, what are our reasons?	Designing their Cam model using the movement of animals as inspiration. Considering aesthetic/ working ability. How will your design move? What type of cams will you use? What movement have you created? Who is your designed toy for?
		To design a light-up Christmas card. What materials will you need? Where will the light bulb be placed? How will we hide the electrical components? What will your front cover design be? How will it have aesthetic appeal? Who is the card for? What font will you use?	To consider how they might ensure that the treasure fits securely in the container. Would it be safer if we used layers, dividers, or drawers? Which materials or textures would protect our treasure?	Construction of their mechanism design. How will you construct your design? Can you use tools safely? Do you need to alter your design to make it successful? Is your design stable?
		To create a light-up Christmas card based on their design.	To record design decisions to meet the specification by means of quick thumbnail sketches plus notes. To create a container based on their design.	
		To evaluate a finished Christmas Card. Does the light work in the card the card? Does the bulb light up each time? Can you turn the light off/on? Can you foresee issues with the card in the future? Would you be able to replace components if they stopped working? What would you change about your design? How could you improve your finished item? What would you change on the design for next time?	To consider whether the container meets the specification by considering the following questions: • Does it keep my treasure safe? • Is it easy to open and close? • Is it carefully constructed? • Will it last well? • Does it look attractive? • Does the decoration reflect the nature of the contents?	Evaluating the finished mechanical model. Are the moving parts moving correctly? Did you change anything from your original design? How could you improve the way it looks? What advice would you give for someone else making this design? Would you change anything about your design?

Y5		Autumn	Spring	Summer
Topic		Young Chef – cooking and nutrition Cross-curricular link to Science – Materials and their properties	Building bridges - structures Cross-curricular link to History - Victorians (Brunel, Clifton Suspension bridge) Science: forces	Chinese inventions – mechanical systems Cross-curricular link to art – printing, Science materials and their properties, history ancient civilisations
National Curriculum objectives		As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: • understand and apply the principles of a healthy and varied diet; • prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques; • understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	**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. **Evaluate** • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. **Technical knowledge** • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	**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. **Evaluate** • 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; • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. **Technical Knowledge** • understand how key events and individuals in design and technology have helped shape the world; • KS2 - understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].

Whole unit	Expected outcomes	• To understand the principles of a healthy and varied diet (within the context of home and school) to improve the quality of life; • To prepare and cook a variety of dishes using a range of cooking techniques; • To understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.	• Children will learn about how simple bridges are constructed using beams, pillars or piers, then make and test beam bridge designs. • Children will learn how trusses are used in bridge design to spread out compression forces. They will then build and test model truss bridges. • Children will learn how arches are used to spread and redirect compression forces acting on bridges. They will then build and test model arch bridges. • Children will learn about how suspension bridges use tension to support bridge decks spanning large distances. They will then build and test model suspension bridges. • Having been presented with a design brief, children must develop criteria for a bridge design that will meet the terms of the brief. They will then design a bridge according to their criteria • Following on from the previous lesson, children will consider ways in which they might test their bridge design once constructed. They will then build and test their designs. • apply their understanding of computing to program, monitor and control their products (covered in Setpoint – Mission to Mars).	• Introduce China's four greatest inventions. Investigate the history of the invention of the moveable-type printing press. Reflect on how this might have changed the lives of people who used them. • Investigate gunpowder and the compass. Look at the design of simple compasses and think about advantages, disadvantages and improvements for each design. • Explore the use of water power when building early machines in ancient China. Consider the uses of machines and their components such as gears and cranks which make the machines move in different ways. Explore water clocks and water wheels which inspired Su Song's astronomical clock tower. • Use understanding of materials and their properties to predict test results and evaluate different materials to be used to make the sail and frame of a kite by making prototypes. • Choose their own materials to make a kite from. They will generate design criteria for their kites. • Children will use their designs to build and evaluate their own kite. • To improve aesthetics they will self and peer evaluate.
	Fieldtrips/ workshops/ enrichment	Children to go to Heath Mount school to use their kitchen facilities Competition to be held at local secondary school	Knex challenge – enrichment activity Or Setpoint – Mission to Mars.	None
	Vocabulary	Healthy, seasonal, prepare, ***chop, slice, peel, grate (children handling sharp knives and chopping, slicing peeling. Children using a hob to cook)***, smoothie, fresh, vitamin, protein, carbohydrate, fat, calcium, dairy, fruit, vegetables, grate, shred, taste, texture, appearance	***Suspension bridge, trusses, beams, pillars, piers, compression forces, arches,***	***Inventions, gears, cranks, prototype, sail, frame, aesthetics, kite, ancient China***

Weekly learning objectives specific to St. Michael's ***(progression of skills)*** **key questions**		To identify a range of ingredients in a dish. To peel and cut a carrot Who is your hero? How do you hold a knife safely? What do you need to do before preparing food? What are the main food groups?	To explore ways in which pillars and beams are used to span gaps. Can you use technical vocabulary to explain how beam bridges are constructed? Do you understand the impact better bridge design has had on daily life? Can you investigate and explore the effectiveness of different beam/pillar designs?	To understand how the four great inventions of China shaped the world. Can you name significant inventions? Can you describe the process of making paper? How did the invention of paper or the moveable printing press change the world?
		To learn how to peel and slice Where does our food come from? What happens when an apple is exposed to air? How do we prepare food safely? What dangers are there in a kitchen?	To explore ways in which trusses can be used to strengthen bridges. Can you use technical vocabulary to explain how truss bridges spread the load of objects travelling across them? Can you apply your knowledge of how to stiffen and strengthen structures? Can you evaluate your models against design criteria?	To investigate the inventions of gunpowder and the compass. Can you name an ancient use of gunpowder or the compass? Can you evaluate the advantages or disadvantages? Can you follow a simple method for constructing a product?
		To design and make a smoothie. Where do different fruits and vegetables come from? What comprises a healthy diet? What is a healthy food plate?	To explore ways in which arches are used to strengthen bridges. Can you use technical vocabulary to explain how arch bridges are constructed? Can you use technical vocabulary to explain how arch bridges work? Can you build and test models to find a strong bridge design?	To investigate water powered machines. Can you explain what a machine is? Can you describe hwo a transmission of gears move in comparison to each other? Can you modify a simple design to meet your needs?
		To design and make a salad using a range of equipment. What different ingredients could you use in a salad? What equipment to you need to make a salad? How do you make your salad look attractive?	To understand how suspension bridges are able to span long distances Can you explain how tension and compression forces are distributed by suspension bridges? Can you build a model suspension bridge that will support a given weight? Can you evaluate the designs of others and consider their views?	To test materials to build a kite. Can you identify different properties of a selection of materials? Are you able to select different properties of materials to fit a design? Can you evaluate a prototype's success?
		To research a range of recipes What would my hero like to eat? How do I make sure my meal is healthy? How do I lay a table? What ingredients will I use?	To develop criteria and design a prototype bridge for a purpose. Can you write design criteria according to a given brief? Can you design a prototype model according to design criteria? Can you work collaboratively to produce a prototype according to an agreed design?	To design a kite based on a set of design criteria. Can you write a set of design criteria? Can you follow your criteria when designing your kite?
		To cook a meal for my hero How will I organise my time? How will I prepare my meal? How will I keep safe in the kitchen?	To analyse and evaluate products according to design criteria Can you devise tests to analyse a product according to design criteria? • Can you evaluate their product according to design criteria? Can you consider the views of others and think of ways to improve their work?	To make and evaluate a kite Can you choose between a variety of tools to make your kite? Can you solve any problems that might arise when making your product? Can you evaluate your product based on design criteria?

Y6		Autumn	Spring	Summer
Topic		Moving Vehicles (Mechanical Systems) Cross-curricular link to Science – Electricity/electrical circuits; Maths - Measurement	Tapestries (Sewing and fabrics/other materials) Cross-curricular link to subject areas chosen by children	Temples (Structures) Cross-curricular link to History – Ancient Maya Civilisation
National Curriculum objectives		**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 and pattern pieces. **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, according to their functional properties and aesthetic qualities. **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. **Technical knowledge:** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures; • understand and use mechanical systems in their products [pulleys, linkages]; • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].	**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 and annotated sketches. **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 textiles, according to their functional properties and aesthetic qualities. **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.	**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 and computer-aided design. **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, according to their functional properties and aesthetic qualities. **Evaluate:** • investigate and analyse a range of existing structures/buildings; • evaluate their ideas and buildings 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. **Technical knowledge:** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

Whole unit	Expected outcomes	At the end of this unit children should: • have gained an understanding of how electricity is used to drive products; • have gathered information about components and used appropriate recording techniques; • know how to assemble circuits incorporating motors and switches; • have designed and accurately made a working toy vehicle using a construction kit, involving the assembly of a circuit incorporating a motor and switches, and finished it to a high standard; • have made clear and accurate drawings as a way to model ideas; • use tools safely and accurately to construct a simple frame; • have considered the purpose/user of the toy in their design and produced a quality product with an appropriate theme; • have an understanding of the use of electricity in controlling movement; • have evaluated their vehicle according to the design criteria, identifying the extent to which particular features of their model work and what could be done to improve them.	At the end of this unit children should: • have collect visual and other information to help them develop ideas; • have investigated, combined and organised visual and tactile qualities and applied their knowledge of materials and processes to communicate their ideas; • have compared and commented on ideas, methods and approaches in their own and others' work in the context of the events of the telling of a story; • adapted and improved their work to realise their intentions; • Have evaluated their final product against the success criteria.	At the end of this unit children should: • have collect visual and other information to help them develop ideas; • have investigated, combined and organised visual and tactile qualities and applied their knowledge of materials and processes to communicate their ideas; • have compared and commented on ideas, methods and approaches in their own and others' work in the context of the events of the telling of a story; • adapted and improved their work to realise their intentions; • have evaluated their final product against the success criteria.
	Fieldtrips/ Workshops/ enrichment	Electronic Games workshop Cross-curricular with Science – Electricity.	None	None
	Vocabulary	***Pulley, wheel, Drive belt, Axle, chassis, Bearing,*** switch, ***series and parallel circuits, Short circuit, motor, design proposal, diagrams, construction, components, construction equipment.***	***Tapestry, Bayeaux Tapestry, tapestry panel, visual qualities, tactile qualities, observations,*** materials, form, texture, ***media,*** tools, design, evaluation.	***Architecture, Maya architecture, architectural style, purpose, construction techniques, materials,*** design, materials.

Weekly learning objectives specific to St. Michaels ***(progression of skills),*** **key questions**		Children should learn: To revise electrical parts, symbols and circuits and understand how these can be used to achieve functional results; To understand how a vehicle moves using wheels and axles; To generate and model ideas through discussion and drawing, considering the audience (who the toy is being made for) and theme of the design; To communicate through labelled drawings; To understand how to control the speed and direction of movement using pulleys; To plan the main stages of making; To select appropriate tools, materials, components and techniques; To use tools safely and accurately; To start to assemble components to make working models. What are the main components in an electrical circuit? How might these be used to design a moving vehicle? How can I best communicate my design ideas, in this instance? Who is my moving toy for? What theme should I follow for the body design and purpose? How could I control speed and direction using pulleys? What equipment will I need to construct my vehicle? How can I use tools safely and accurately?	Children should learn: To question and make thoughtful observations about starting points for work. *To analyse the features, content and subject of a famous tapestry to inform my own tapestry design.* What is a tapestry? What is its purpose?	Children should learn: To deduce information about the Ancient Maya way of life from pictures of buildings; To combine information from several sources; To carry out architectural research to inform their own design ideas; To relate the way things are built to their intended purpose, how materials and components have been used, and people's needs. *To carry out research about Ancient Maya architecture and its design, construction and purpose.* What is Maya architecture like? What kinds of buildings did The Maya build and what was their purpose? What do the buildings tell us about their way of life?
		To complete assembly components to make working models; To make vehicle 'bodies' to own designs; To evaluate their work according to their design criteria and to suggest improvements. What questions could I ask about design, function and fitness for purpose when evaluating my moving vehicle toy?	Children should learn: To collect visual and other information to help develop ideas. *To produce a research sheet including ideas for a final tapestry design, and produce a final design, as a group.* What topic could be used for the tapestry design? What form could the tapestry take? How can individual designs be combined? (Two weeks)	Children should learn: To identify the purpose of their building; To use research to help with their design; To produce a detailed, annotated design, indicating colour, thinking about possible construction whilst designing. *To produce a design for an Ancient Maya style building with a modern purpose.* What is the purpose of my building? What type of Ancient Maya building will it be based on?
			Children should learn: To collect visual and other information to help develop ideas. *To produce a research sheet including ideas for a final tapestry design, and produce a final design, as a group.* What topic could be used for the tapestry design? What form could the tapestry take? How can individual designs be combined?	Children should learn: To develop a clear idea of action, planning how to use materials, equipment and processes; To select appropriate materials, tools and techniques and indicate these on a planning document; *To produce a planning sheet to outline how the model will be constructed.* How will the model be constructed? What materials will be needed and where will you get them from?

			Children should learn: To show awareness of the potential of tools and materials appropriate to embody ideas and serve needs; To consciously select appropriate media to suit the task; To show awareness of dark and light, form and texture; To represent natural found objects like shells, tree bark, water, using a variety of materials; To show awareness of the potential of the uses of material; To develop the ability to choose appropriate tools, material and methods of working. *To select a variety of materials and practice techniques for the final tapestry panel.* What materials and techniques could be used for the tapestry panel? How could these techniques & materials be applied effectively?	Children should learn: To construct a model of their building following design & planning sheets, continually evaluating/adapting the model as it is build; To apply appropriate finishes based on the initial design. *To construct a model of my Ancient Maya style building.* What will be needed to help with construction? What methods and materials will be needed?
			Children should learn: To show awareness of the potential of tools and materials appropriate to embody ideas and serve needs; To consciously select appropriate media to suit the task; To show awareness of dark and light, form and texture; To represent natural found objects like shells, tree bark, water, using a variety of materials; To show awareness of the potential of the uses of material; To develop the ability to choose appropriate tools, material and methods of working. *To begin production of a final tapestry panel, as a group.* How can the tapestry design be transferred from paper to fabric using the materials and techniques tested?	Children should learn: To construct a model of their building following design & planning sheets, continually evaluating/adapting the model as it is build; To apply appropriate finishes based on the initial design. *To construct a model of my Ancient Maya style building.* What will be needed to help with construction? What methods and materials will be needed?

			Children should learn: To show awareness of the potential of tools and materials appropriate to embody ideas and serve needs; To consciously select appropriate media to suit the task; To show awareness of dark and light, form and texture; To represent natural found objects like shells, tree bark, water, using a variety of materials To show awareness of the potential of the uses of material; To develop the ability to choose appropriate tools, material and methods of working; To evaluate a final piece of work and consider ways of improving it. *To complete production of a final tapestry panel, as a group, and evaluate it.* How can the tapestry design be transferred from paper to fabric using the materials and techniques tested? What was successful about the final panel? How well does it match the original design? What improvements could be made to the design and/or final produce, and how?	Children should learn: To evaluate a final design and model: did it match the initial design, is it fit for purpose, how has the design been changed and why, how would they change the design and construction if building it again? *To evaluate the final design and model.* Does the final model match the original design? If not, how is it different and why? Is the building fit for purpose? If it could be designed and built again, how would you change it and why?