ST LUKE'S CHURCH SCHOOL

Design Technology Curriculum

Year 1 to Year 6

Summer 1

Design Technology Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS (Expressive Arts)	Junk Modelling		Bookmarks		Design & Make A Rainbow Salad	
Year 1	Eat More Fruits and Vegetables		Stable Structures			Moving Mini Beasts
Year 2	Puppets		Vehicles			Perfect Pizzas
Year 3		Story books		Pencil Cases		Mini Castles
Year 4		Seasonal Stockings		Torches		Seasonal Food
Year 5	Building Bridges		Fashion and textiles (bags)		Slingshot Car	
Year 6	Programming Pioneers		Birdhouse Builders		Burgers	

Cookery Textiles Structures Electronics Mechanisms

The Aims of the National Curriculum for Design and Technology

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Intent

Through high-quality design and technology teaching, our pupils will acquire a broad range of subject knowledge, which is developed each year from Reception through to Year 6. Our pupils will be inspired to use their creativity and imagination to design, make and evaluate within a variety of contexts. Through disciplines such as mathematics, science, engineering, computing and art, our pupils will solve real and relevant problems whilst taking risks and being resourceful. Our innovative projects will ensure that our pupils become citizens capable of contributing to the creativity, culture, wealth and well-being of the nation, whilst displaying a critical understanding of design and technology through history to the present day.

Implementation

The St.Luke's Design and Technology curriculum takes influences from planning provided by Plan Bee and Kapow as this serves to support non-specialists while providing the backbone to an ambitious curriculum. We have taken the planning to form the basis of a curriculum which has been uniquely developed for us. Each year our pupils will refine the necessary skills to become capable citizens in design and technology, carefully developing these skills each year as they progress through school. In order to develop a critical understanding of the history of the subject, our curriculum has incorporated the teaching of some of the world's most influential people, as well as including some individuals from closer to home.

Reception

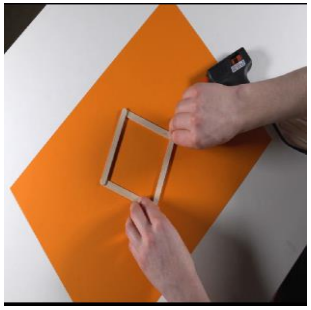
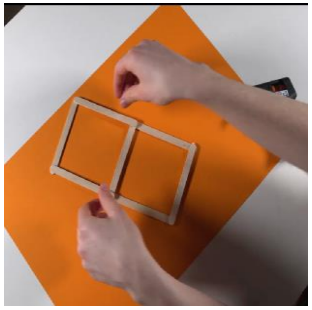
For further information about the knowledge content taught in Reception please refer to the separate EYFS curriculum document.

Summer 1 Year 5	Focus of Study: Slingshot Car
NC Objectives	Key Knowledge and Vocabulary
Designing • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and CAD *Making* • 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 *Evaluating* • 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	Context for study: This unit follows on from the Year 3 'Story Books' mechanisms unit where pupils consolidated their knowledge of sliding and wheel mechanisms, levers, pivots, concertina and window flaps. In this unit the children will be creating a slingshot car, which uses a chassis, axels and launch mechanism. It is recommended that you create a slingshot car of your own prior to the delivery of this unit. This will support you in recognising potential pitfalls that may need addressing depending the abilities of the class. It will also provide you with practical continued professional development a complete example of your own to show the pupils. You will need: • 3mm wooden dowel or rod (30cm recommended) • Wheels (50mm with central holes) • Drinking straws (two per pupil) • Paperclips (one per pupil) • Lollipop sticks (nine per pupil) • Elastic bands (one per pupil) • Masking tape • Glue guns (one per available adult to supervise children's use) Knowledge Content:

Technical knowledge and understanding • apply their understanding of how to strengthen, stiffen and reinforce more complex structures	To evaluate existing products. To design individually using a criteria. To identify appropriate mechanisms for propulsion. . Technical knowledge Chassis – the frame, wheels & mechanism of a motor vehicle upon which the body is supported. Axel – the bar upon which a pair of wheels rotates. Mechanism – the working or moving part of a process. Apply understanding of how to strengthen, stiffen and reinforce structures. Understand and use mechanical systems in products. All moving things have kinetic energy (the energy that something has by being in motion). Share examples of different car designs (click here). Ask pupils to consider what they already know about cars and the development that has occurred over time e.g. horse and cart to engine-powered cars. Show the class your demonstration piece and explain the design brief: to make a self-powered 'slingshot car' to race against those of my classmates. Tell the class the winner will be the car that travels a set distance in the quickest time. Building the chassis and launch mechanism

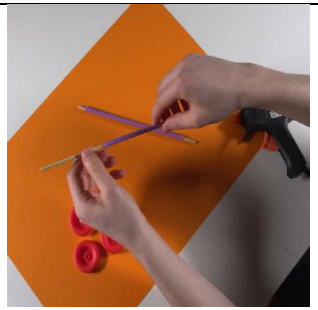
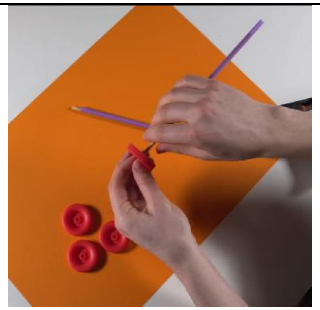
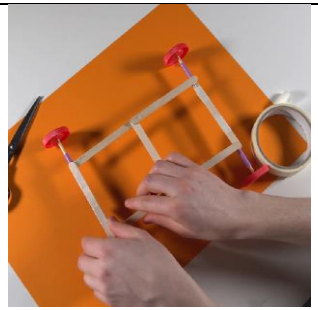
Before the lesson, watch the video which demonstrates building the chassis of the car as (for the video click here). There is a pupil video that can be found here.

To make the chassis, lay four lollipop sticks in a square with the ends overlapping each other. Place a small blob of glue to secure each corner where they overlap. Then add three more lollipop sticks to one end of the square to make a second square and secure with glue.

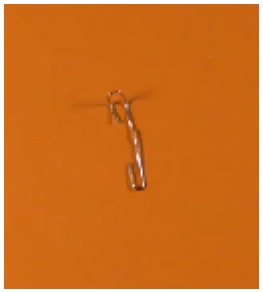
Attaching the wheels and the axles

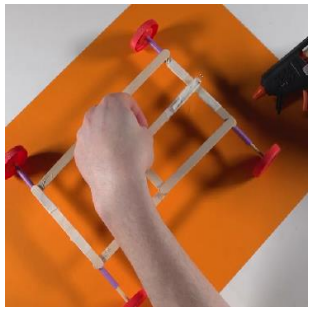
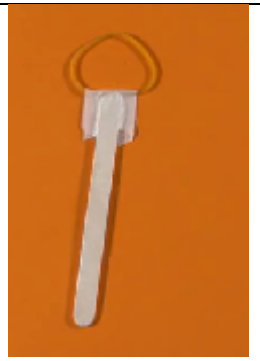
Next, slot each each dowel rod inside a straw and slot the wheels over either end of the dowel. The wheels should be a snug fit so they don't come lose. If they do need extra securing, a blob of glue can be used. Just ensure they don't accidentally fix the dowel to the straw because this needs to be able to spin freely. Using masking tape to attach each straw along the short edge of the chassis.

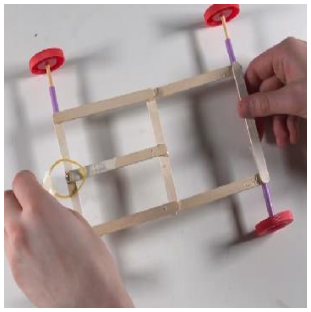




Making the launch mechanism:

Unfold a paper clip to lay it as a flat loop with about a 1cm gap between the ends. Gently bend one end of the loop to sit upright at a right angle to the rest. Use masking tape to secure this to the end of a lollipop stick. Glue the stick to the centre end of the chassis with the paperclip hook. Sticking upwards. Finally, you need to make the launcher to send the car flying. Do this by securing an elastic band to the end of another lollipop stick with tape. To launch the car, hook the end of the elastic band over the paperclip hook. Pull back to store the energy and release.





Designing the car body

Technical knowledge: understand that the shape of a car body can either increase or decrease the speed it travels (slow it down or speed it up).

Air resistance: an opposing force known as friction that happens between air and another object. To introduce the concept of air resistance, watch this video here or conduct the explanation yourself.

	Explain to pupils that their task for today is to design the car body only. Children will be making their car panels out of nets that they will design and create, so they need to bear this in mind when creating their designs and be aware of any limitations of their design. To see how the car panels are made, see the teacher video here. Use the car body design template, found here. Use the presentation here to help you, Discuss whether the cars are designed for purpose (i.e. a land rover) or speed (a race car) and how this affects the design of the body. Children could even bring their own toy cars (or acquire them from school) and discuss the air resistance of these cars as a class. Explain to pupils why larger objects move slowly through the air than smaller ones (because smaller objects have a smaller surface area for air resistance to push against so they can move quicker. Ask pupils to identify five design criteria for their car bodies based on the design brief. E.g. it must not slow the car down, it must fit securely onto the chassis, it must have a fun, engaging design. Making the car body Show pupils how to draw the nets that will form the bodies of the cars – use one of the children's designs to do this. Emphasise to the children that the measurements of their

	chassis will dictate the measurement of the side panels and so they need to be accurate for the other panels to attach neatly to these e.g. avoid large panels on a small chassis and vice versa. Remind children of the importance of including tabs on all edges to enable thew affixing of the panels to one another and the chassis. For SEND pupils it may be worth creating panels ahead of the lesson to scaffold their learning. Finally, children should apply colour and graphic designs. Remind them to think about which way up/around their pieces will be when assembled as a finished car. To construct the car, assemble each panel one at a time using a glue gun. Remind children of health and safety hazards – the wire can be a trip hazard and the gun gets hot. Assembly of the chassis, testing and evaluating. After attaching the nets that they have made previously. Watch the teacher video here and the pupil video here. Pupils assemble their car bodies to the chassis. Use the time trials and evaluation sheet found here. In their groups, pupils should carry out the time trials and record the results. If you have longer, you can hold different competitions; for example, the best graphics, the furthest distance travelled, the straightest line travelled etc. Health and Safety: Emphasise safety issues surrounding the glue gun and elastic bands, as well as classroom behaviour. Before the children start using the glue guns, discuss how to work safely with

	them, including ensuring that the cord isn't a trip hazard. Ideally, an adult should supervise their use. You can use PVA glue but it doesn't stick as well.

Year 6 Summer 1	Cookery - Burgers
NC Objectives	Key Knowledge and Vocabulary
Designing • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and CAD *Making* • 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 *Evaluating*	Context for study: This is the final cookery unit that students will study at St. Luke's. Pupils have previously looked at seasonal food and explored baking, cooking and preparation of a variety of foods including a fruit salad and pizza. They will hone their skills and be able to chop, slice and grate using a variety of grips. **AS CHILDREN WILL BE USING SHARP KNIVES IN THIS UNIT, ENSURE YOU READ AND UNDERSTAND THE HEALTH AND SAFETY PRECAUTIONS BEFORE ATTEMPTING ANY FOOD PREPARATION. SEEK ADVICE IF YOU ARE UNSURE.** Watch this video here for the knife techniques we will be using. For the recipe, ingredients & method, click here. Knowledge Content: That nutritional guides help us to make informed choices around the food we eat That carbohydrates, fats and proteins are three types of nutrient that our body needs in order to function. Click here for the Eatwell guide. That carbohydrates are found in bread, rice, pasta and grains.

• 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 and understanding* • apply their understanding of how to strengthen, stiffen and reinforce more complex structures	That fats are found in lots of foods: milk, meat & oils but also in many fried or baked foods. That proteins are found in meat, egg, fish, dairy products, seeds, nets, beans and lentils. That all foods can be part of a healthy-balanced diet and too much or too little of the same type of nutrient (e.g. fat) can be harmful to our health. Fats, proteins and carbohydrates are the three main nutrients our body needs for energy, The energy they provide is measured in calories. When we eat and drink more calories than we use up, our bodies store the excess as body fat. If this continues, over time we may put on weight. Do we think there are a lot of calories in most burgers? Why? Fats – a natural, oily substance that helps prevent disease in our body. Protein – large molecules that assist muscle and hair growth in our body. Carbohydrate – a nutrient that changes food into sugar and provides energy for organs.

Technical knowledge – cutting techniques

- **The cross chop**. Using a firm grip with the dominant hand, place the other hand on top of the knife with fingers away from the blade and keeping the tip of the knife down on the board. Lift the knife up and down to chop herbs or small items. Use the other hand as more of a guide without applying any weight. The level of speed shown is not required.

- **The rock chop.** Using a similar grip as above to hold the knife, use a rocking motion while keeping the tip of the knife down on the cutting board. With the other hand, use your fingertips to face the knife and then slowly curl them in. The lose thumb is tucked underneath. This is known as the claw grip and allows the item to be pushed into the cutting motion of the knife. Ensure as the knife is lifted that it rests up against the knuckles and never lifts higher than the knuckles to avoid cutting.

- **The bridge method**. Hold the food to be cut between the fingers and thumb, creating a 'bridge'. The knife should go through the bridge to cut the food. This method ensures that fingers are out of the way as the knife cuts through the food.

	Explain that you will be working towards cooking your own burger and start by exploring different types of burgers and their nutritional content. Discuss which burgers they prefer and why. Explore whether children think burgers are healthy meal options. How do we check the nutritional value of food? NB: it is now law for all food establishments to offer nutritional information and this can also be checked on most packaging at home. Explain to children what nutrition fact labels are and ask them to predict why they might help us. Do they know what calories are? Explain that the amount of energy in an item of food or drink is measured in calories. When we eat and drink more calories than we use up, our bodies store the excess as body fat. If this continues, over time we may put on weight. Do we think there are a lot of calories in most burgers? Why? Explain to children that not all burgers are unhealthy for you and discuss the importance of a balanced diet. Show children a picture of a 'Big Mac' and ask them to make some changes so it could be nutritious. Explain to children that we can make burgers at home, which can make burgers a nutritious meal option NB: Our bodies need energy to keep us alive and our organs functioning normally. When we eat and drink, we put energy (calories) into our bodies. Our bodies use up that energy through everyday movement, which includes everything from breathing to running. An important part of a healthy diet is balancing the energy you put into your bodies with the energy you use. Nutrition labels tell us how many fats, proteins and carbohydrates there are in the food we eat. They also tell us the salt level, amount of sugar and if there are any traces of nuts or wheat for those people who have allergies. There are guidelines to tell us if food is high in fat, sugar and salt. We can check these guidelines and read the nutrition facts of food to make good food choices.

Explore the nutrition labels on a variety of foods.

Nutrition Facts
Valeur nutritive

Per Sandwich (209 g) / par sandwich (209 g)

Amount / Teneur	% Daily Value / % valeur quotidienne
Calories / Calories 540	
Fat / Lipides 29 g	45 %
Saturated / saturés 10 g + Trans / trans 0.5 g	**53** %
Cholesterol / Cholestérol 70 mg	
Sodium / Sodium 1,020 mg	**43** %
Carbohydrate / Glucides 44 g	15 %
Fibre / Fibres 3 g	**12** %
Sugars / Sucres 9 g	
Protein / Protéines 24 g	
Vitamin A / Vitamine A	10 %
Vitamin C / Vitamine C	4 %
Calcium / Calcium	25 %
Iron / Fer	35 %

This is a McDonald's Big Mac burger nutrition label. Discuss the four highlighted facts. Explore what the label is telling us and whether they think the burger is a healthy option.

NB: You cannot really say whether this burger is good or bad for you. It depends on your general diet and what you usually eat during a day and over the week. A balanced diet is the key. Trying to balance the amount of sugar, salt, protein and fat in your diet is how you stay healthy. However, fast food burgers are generally high in fat and sugar, so can be unhealthy for you if you eat them regularly.

What changes could you make to this big mac to make it more nutritious? What would you add? Take away?

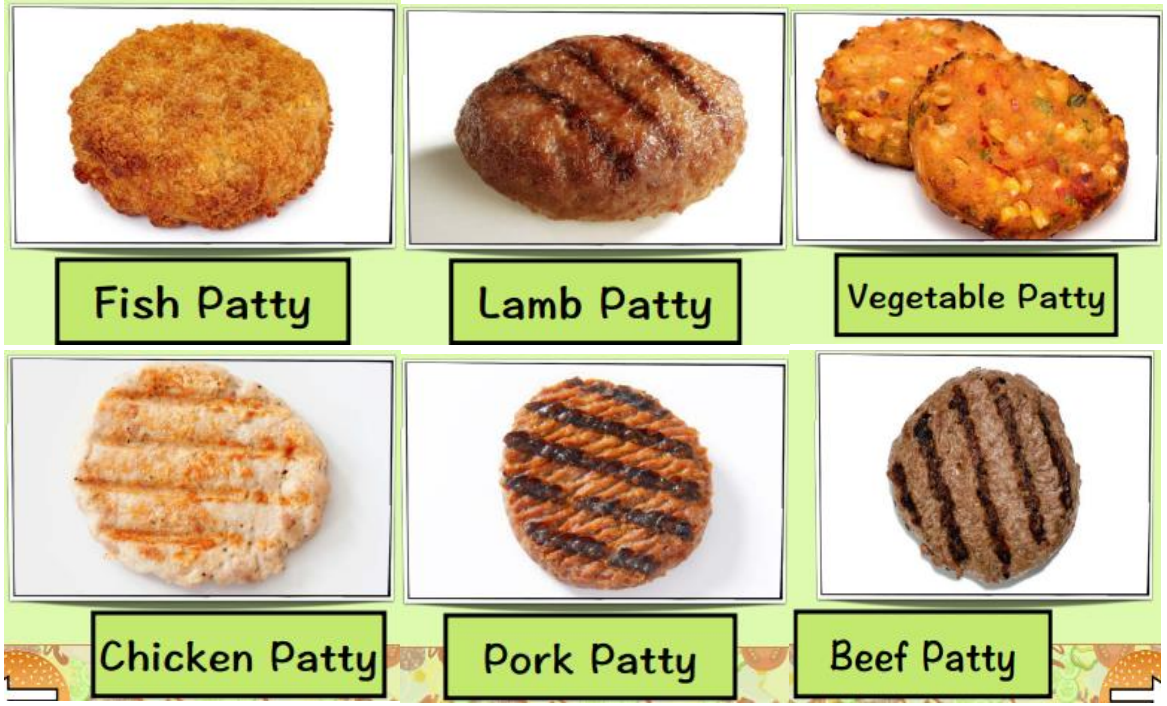
Explain that we can make burgers at home instead of buying them from fast food restaurants. Explore whether this makes burgers a healthy meal option.

Designing

Challenge pupils to design an advertisement poster to promote a particular type of burger e.g. Children use fact cards and compare burgers and decide which burger to recommend to the public and why.

Making

Burger patties – burgers can be chicken, beef, lamb, pork and vegetarian:



Explain that most meat-based patties are made from minced meat which makes them easier to share into patties. and they can be cooked in a variety of ways e.g. pan-frief, grilled, oven-baked, barbecued and even steamed.

Depending upon the dietary requirements (e.g. halal, vegetarian, vegan) you may need to make more than one type of patty (e.g. chickpeas for vegetarian). Explore the step-by-step instructions for mince meat patties:

Put the mince, chopped onions, mixed herbs, garlic, chilli and egg into a mixing bowl and mix together with a spoon.

Grab chunks of the mixture and roll it in your hands. Using both palms, squash the patties until they are slightly flat.

With adult supervision take your patties to a stove. Put the pan on the hot plate and pour some oil in. Place the patties carefully in the pan.

After about five minutes, flip your patties with an egg flip to cook the other side. Cut the burgers in half to check they are cooked.

Evaluating

Did you like the burgers? What would you do differently if you were to do it again? What could you add to the mixtures?

Health and Safety:

- Ensure when preparing food that surfaces and hands are thoroughly washed, particular prior to and after handling raw meat.
- Ensure that cutting boards are stable and not moving around while using a knife. Place a wet paper towel beneath the cutting board to avoid movement.
- Ensure the knife moves in an upwards and downwards motion, parallel with the knuckle so as to prevent injury.
- Ensure foods (e.g. apples, carrots and tomatoes) are not able to roll around on the cutting board by cutting one side off so it has a flat end. This will prevent it from rolling around, making it a lot safer to cut.

	Dietary requirements and allergies Be aware of the dietary requirements of pupils in your class e.g. halal, vegan or vegetarian and gluten-free. Some alternatives include vegan meat-free alternatives, quorn and gluten-free buns. Always check the dietary requirements and/or any allergies of your pupils before the lesson where you will come into contact with food. Resources needed: Chopping board Knife Bowl