

Villa Real School Design and Technology Big Picture

Design Technology Scheme of Work for Villa Real School

The following overview has been compiled using the National Curriculum guidelines for EYFS to Key Stage 3. The activities planned ensure a full curriculum coverage for each Key Stage throughout the year. Activities increase in difficulty and depth of knowledge required as students move through the key stages. Class managers are expected to apply differentiation within all aspects of their D&T lessons to ensure appropriate levels of challenge. The following activities simply outline the key elements of the lessons for each Key Stage.

Design Technology Overview Early Years Foundation Stage

EYFS Framework Requirements: Physical development, Understanding the World and Expressive Arts and Design

There are seven areas of learning and development that must shape educational programmes in Early Years settings. All areas of learning and development are important and inter-connected. These are stipulated in the 'Statutory framework for the Early Years foundation stage'. The EYFS classes follow the Early Years Curriculum guidance in their topic plans. They include cooking and food preparation, using a range of tools, using structures and constructing with different materials.

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Design Technology Overview Key Stage 1

Evaluation questions and ideas are very basic, the following MUST be included in the evaluation process within Key Stage 1:

- Explore and evaluate a range of existing products.
- Evaluate their ideas and products against design criteria.

TERM	Autumn	Spring	Summer
Year 1	Focus: Mechanical Systems Project: Sliders and leavers – Christmas cards Designing: Look at different Christmas cards with moving parts, talk about the mechanism and materials. Decide what materials and tools you will need. Making: Cutting, joining materials to make the card. Evaluation: Did it work well? Evaluate the ease of movement of the card. What would you change? What materials did you use? What did you find easy/hard?	Focus: Structures Project: Free standing Structure link to class texts (Literacy) Designing: Choosing materials based on strength and durability. Making: Key skills here are joining and cutting materials. Evaluation: The strength of the structure and how it could be made stronger.	Focus: Cooking and Nutrition Project: Preparation - Healthy Snacks Designing: Thinking about healthy balanced diets. Discussing likes and dislikes. Making: Cutting, peeling, grating. Healthy, safety and hygiene in the kitchen. Evaluating: How did it taste? What would you change? Was it healthy?
Year 2	Focus: Textiles Project: Templates and joining techniques – Christmas tree decoration Designing: Look at different Christmas decorations and talk about materials.	Focus: Mechanical Systems Project: Wheels and axels - Cars/Carts (VEX Go and crumble robotics kits available as building resources)	Focus: Cooking and Nutrition Project: Fruit Salad Designing: Where do the different fruit

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	Decide what shape and what materials you will need. Look at which parts need to be joint and what techniques you will use. Making: Joining materials to make the decoration. Evaluation: Did it work well? What would you change? What materials did you use? What did you find easy/hard? AI software can be used in the design process, for example creating multiple designs based on student's ideas. Suggested prompt – Create 3 Christmas tree decoration designs. Include the colours red, green and gold. The decoration must be round shape.	Designing: Focussing on the element of movement. Looking at how wheels move and what the cart would need to work. Testing existing model cars. Which is the best and why? Making: Key skills here are joining components to ensure movement. Evaluation: The ease of movement of the cart. Students could race their carts to see which moves the furthest or the fastest.	come from? What will you use? What do you like/dislike? (Use talking mats) Making: Cutting and peeling. Food hygiene and kitchen safety. Evaluating: Was it nice? What would you change? Was it healthy?
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Design Technology Overview Key Stage 2

To fully achieve all aspects of the Design Technology curriculum, some aspects of ICT will be support by our ICT technician. Teachers will liaise with him to ensure the software we have available is current and appropriate for our students and curriculum.

Evaluation questions and ideas are very basic; the following MUST be included in the evaluation process within Key Stage 2:

- **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.**

TERM	Autumn	Spring	Summer
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25 - 26	Focus: Electrical Systems Project: Simple Circuits and switches – Torch/Battery Operated Lights Design: Look at different light systems and circuits. Discuss, analyse and explore how they work. Design your own circuits including lights. What are lights used for? Make: Test your circuits to see if they work. Evaluate: What does a circuit need to work? How do circuits work? What does the light do? How does the light work? AI can be used in the design process to generate different images of circuits. Suggested prompt – Create an image of a simple circuit with a toggle switch and 2 bulbs.	Focus: Mechanical Systems Project: Levers and Linkages – Moving/waving hand Design: Look at the different activity sheets. What will you make? What will it look like? What will you need to make it? What will it do? Practice making different levers and choose your favourite. Make: Create your lever using a range of materials. Focus on problem solving how the materials will be joint to allow movement. Evaluate: Did it work? What worked well/what could be changed? What would you do differently? Support learning with VEX Go Stem Lab – Animal Rescue. https://docs.google.com/document/d/1OfH8KUhfOWdX-JXmhEAFJTzoVyzm24gjafQBcJxpoQ/edit?usp=sharing	Focus: Cooking and Nutrition Project: Making Ice Cream and Ice Lollies Design: Use talking mats to try different fruit. Talk about healthy and unhealthy food. How can you make healthy alternatives to your favourite food? Plan how you are going to make your ice cream or ice lollies and what you will need. Make: Make your ice cream or ice lollies. Discuss the process of freezing. Use a blender and a range of other equipment or utensils. Focus on health and safety in the kitchen. Think about food hygiene and how to ensure your food is safe to eat. Evaluate: What did they taste like? Were they healthy? How could they be better? What would you change?
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26-27	Focus: Mechanical Systems Project: Pulleys and gears - Making a Flagpole Design: Look at how pulleys work and what you will need to make yours. What will your pulley be? Make: Make your pulley and focus on the mechanism that makes it move. Ensure it moves effectively and smoothly. Evaluate: Did it work? What worked well? What could you change? Support learning with VEX Go Stem Lab – Helping Hand. https://education.vex.com/stemlabs/go/helping-hand	Focus: Cooking and Nutrition Project: Making Soup Design: Taste different soups; what do you like/dislike? What could you put in your own soup? Try making a range of different soups. Make: Make your soup (a range of) using many different cooking techniques. Evaluate: Taste your soup. Was it nice? What would you change? What do others think of your soup? Is it healthy? Look at current chefs and their views on healthy eating. AI software can be used in the design process for example making a recipe or shopping list after ingredients have been chosen. Suggested prompt – Create a simple recipe for a carrot and sweet potato soup.	Focus: Mechanical Systems Project: Cams mechanism or Pneumatic system – Moving monster Design: Investigate different cams or pneumatic mechanism and how they work. Design your own; how do you think it will move? What are cams, pneumatic systems used for? Make: Try making different cams and pneumatic mechanism, compare see how each move and work. Evaluate: What worked well? Describe the movement. How did you make it? Did it work? What would you change?
27-28	Focus: Structures Project: Shell Structure - Packaging Designing: Look at different boxes, shoe box, food box etc. Use colour or collage. Cut out the	Focus: Cooking and Nutrition Project: Making Pizza Design: Look at healthy and unhealthy food options. What food do you like/dislike (talking	Focus: Using CAD – 3D Printing Project: Making a keyring

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	shape of a model. Think about how the box will stand up. Where applicable use measurements. Making: Create your box. Focus on joining the materials and making it structurally strong. Evaluate: Test them out. Did they work? What was good/bad about them? How could they be improved?	mats) How could you make pizza healthier? Decide what you want to put on your pizza. Draw your pizza; what will it look like? What will you need to make it? Make a shopping list. <i>Extension: Design packaging for your pizza. Brand your new healthy pizza.</i> Make: Create your pizza practising a range of cooking skills. Focus on health and safety in the kitchen. Think about food hygiene and how to ensure your food is safe to eat. Evaluate: Try your pizza; was it nice? What would you change? Was it healthy? AI software can be used in the design process for example making a recipe or shopping list after ingredients have been chosen. Suggested prompt – Create a simple recipe for a mushroom and pineapple pizza.	Design: Look at 3D printers and how they work. Visit a 3D printing workshop. Use CAD (computer aided design) to design a keyring. What will you need? What will it look like? How will it work? Make: Create your prototype. Evaluate: What did you enjoy about this? What would you change? Did it work or not? Does it match the design brief?
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Design Technology Overview Key Stage 3

Evaluation questions and ideas are very basic; the following MUST be included in the evaluation process within Key Stage 3:

- Analyse the work of **past and present professionals** and others to develop and broaden their understanding.
- **Investigate new and emerging technologies.**
- Test, evaluate and **refine** their ideas and products against **a specification**, taking into account the views of **intended users** and other interested groups.
- Understand **developments in design and technology**, its **impact** on individuals, society and the environment, and the responsibilities of designers, engineers and technologists.

TERM	Autumn	Spring	Summer
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25-26	Focus: Textiles Project: 2D shapes to 3D product – ‘bag for life’ Design: Think about features of a bag and for what would you like to use it. Look at different types of bags e.g. shopping bag, draw bag, swimming bag. Look at your favourite colours etc. and design your bag based on your research. Use CAD where appropriate. Make: Use suitable materials and techniques to make your bag. Decorate the bag based on your design. Evaluate: Do you like it? Would you use it? What could you improve? Look at the current issues within the fashion industry, how would you tackle these? Study other designers and gather their views. Carry out market research to gain views on your design. Challenge students to make a name badge for their bag using  micro:bit https://microbit.org/get-started/getting-started/power-up-and-play/	Focus: Cooking and Nutrition Project: A Healthy Main Meal Design: Think about what you could make for a healthy main meal. Plan it and make a shopping list (go and buy ingredients if possible, if not budget for them) Make: Make your main meal. Think about how it will taste and look. Evaluate: Was it good? Did it taste nice? Was it healthy? How could it be improved? Link to healthy eating in Science/PSHCE Demonstrate the NHS Food Scanner app. To help make healthy food choices. https://www.nhs.uk/healthier-families/food-facts/nhs-food-scanner-app/	Focus: Using CAD/CAM Project: Making a kite Design: Use a computer programme to design your kite. What will you need to make your kite? Make: Make your kite focussing on using the correct materials for the purpose of the kite and the joins used. Evaluate: After flying your kites, discuss what happened. Did your kite work? What was good about it? What would you change? Did it match the design? Did anything change during the making process?
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26-27	Focus: Cooking and Nutrition Project: A Healthy Desert Design: Think about what you could make for a healthy desert. Plan it and make a shopping list (go and buy ingredients, if possible, if not budget for them) Make: Make your desert. Think about how it will taste and look. Evaluate: Was it good? Did it taste nice? Was it healthy? How could it be improved? AI could support this lesson by; Recipe Suggestions (Pupils can ask AI for healthy dessert ideas based on dietary needs e.g. dairy-free), Ingredient Substitutions, Shopping List Generator, Budgeting Help (estimate costs and compare prices), Nutritional Info.	Focus: Textiles Project: Combining different fabric shapes – Make, do and mend, Designing and Making your own T-Shirt Design: Think about your favourite things and your favourite colours etc. Design your t-shirt based on this. Use CAD where appropriate. Make: Use premade t-shirts if it is not possible to make your own. Decorate the t-shirts based on your design. Evaluate: Do you like it? Would you wear it? What could you improve? Look at the current issues within the fashion industry, how would you tackle these? Study other designers and gather their views. Carry out market research to gain views on your design. AI, robotics and fashion - Make students aware of Smart clothing and its implications e.g. health and fitness, security and sustainability.	Focus: Using CAD/CAM and 3D printing Project: Design, print and package a Jigsaw puzzle for an identified audience Design: Look at different Jigsaws, think about shapes, materials etc. Think about an audience, what they like, what are their interest, market research. Use a computer programme to design your jigsaw puzzle. What will you need to make a playable jigsaw? Make: Make your jigsaw puzzle focussing on using an interesting design. Evaluate: Try your puzzle with the chosen audience, discuss what happened. Did it work? What was good about it? What would you change? Did it match the design? Did anything change during the making process?
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27-28	Focus: Structure Project: Frame structure – bird hide Designing: Look at photos of different bird hides/boxes/cages. Draw your own bird hide. Look at the features (stable structure, cover etc) and decide what you would need to make a bird hide. Making: Make using a range of materials. Students to focus on how they will join the materials to make the structure stable. How tall can you make it? Does it still stand? Evaluating: Who built a weatherproof bird hide? Are they strong? What could you use to make it stronger?	Focus: Electrical Systems Project: Complex Circuits/ Monitoring and control - Night Light Design: Think about the user. What will it look like? What will it be made of? What is its purpose? Make: Make the light focussing on the use of circuits. Evaluate: Did it work? What would you change? Was it easy/difficult? Visit: Electrifying Newcastle - Workshop at the Life Centre	Focus: Cooking and Nutrition Project: A Healthy Starter Design: Think about what you could make for a healthy starter. Plan it and make a shopping list (go and buy ingredients, if possible, if not budget for them) Make: Make your starter. Think about how it will taste and look. Evaluate: Was it good? Did it taste nice? Was it healthy? How could it be improved? Does it match the specification? What do current chefs think of healthy food? What do other people think of your product?
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Design Technology at Key Stage 4 and 5 '14-19' Provision

Students will work on a curriculum devised by the '14-19' Coordinator taking into account external accreditation and qualifications where possible. These may include:

ASDAN Towards Independence

- Baking
- Craft making
- Creativity
- Meal preparation and nutrition
- Photography, multimedia
- Pottery and ceramics

ASDAN Transition Challenge

Food Technology through Life Skills

VEX Go after school clubs and competitions will be offered during Spring/Summer Term.

Useful websites:

<https://education.vex.com/stemlabs/go>

<https://microbit.org>

<https://www.getseteatfresh.co.uk/resources>

[VEX GO STEM Labs](#)

[Micro:bit Educational Foundation | micro:bit](#)

Other ideas incorporating **AI**:

- Images can be uploaded at the design or evaluate stage for suggested edits.
- Step by step guides could be create based on a student's design.
- Students could design a brief, enter it into AI and look at design possibilities.