Year 9 *Design Technology* Curriculum Overview

8 Week Rotation – 3 lessons over 2 weeks– 12 x 1-hour lessons in total	
Theory and Practical Project/Theme Orientated	**Detail of what pupils are expected to know / learn.** **Design/Making/Evaluating/ Technical Knowledge**
Workshop – Design & Make	
Week 1-8 Project – 'Maze Game'	**This unit of work is based on the theme 'Improving Dexterity and Concentration'.** **Design situations, project brief, iterative design process,** **Analysis of the problem, Research into existing products and materials, producing a range of sketched design ideas leading to a final design. Writing a design specification and a manufacturing plan.** **Designing parts using CAD/CAM that fit together with precision; to make a game that works and looks professional.** **Workshop Safety – Recall- PPE types and safe working practises, hazards and prevention and reporting of accidents.** **Identifying materials- classification (wood/metal/plastic) main types and understanding of their working properties.** **Selection of measuring equipment, hand tools, machines and processes.** **Planning of making / sequences of stages of manufacture.** **Finishing techniques – Varnishes, oil for outside use.** **Evaluating making - diary of manufacture. Quality control and quality assurance.** **Making a prototype – Marking out, using tools –wood files, pillar drill, assembly of parts.** **Evaluating finished product against final design and specification.**
Electronic Systems & Control	
Theme of unit – 'Microcontrollers **Week 1-3** **Introduction and research/investigation**	**What is a Microcontroller? Examples of products that contain a microcontroller -Appliances, games, toys, vehicles, industrial, production systems.** **Components – Circuit symbols and real life. Units of Voltage (Volts), Current (Amps), Resistance (Ohms) and Power (Watts).** **Microcontroller families (GENIE Microcontroller)** **INPUT and OUTPUT's – GPIO** **Programming a microcontroller using the flowchart method and 'basic' programming language.**

Circuit Design **'Circuit Wizard' design software** **Week 4-8** **Circuit Assembly - PCB** **#1 – Microcontroller 'breadboard' circuit** **#2- Microcontroller PCB** **Additional Learning**	**CAD - Circuit Simulation using 'Circuit Wizard' –available at home download from teams-files.** **Microcontroller circuits with a total of 5 input/outputs.** **Power supplies – 4.5v-6v power supplies.** **INPUT devices – switches (SPST/ SPDT /POTENTIOMETER) sensors (LIGHT, TEMPERATURE)** **Process Components – Resistor, capacitor, Microcontroller I.C, H-Bridge** **OUTPUT devices – LED's- colours/sizes/types, Audio- Buzzers, Piezo transducers, speakers.** **Test equipment- Voltmeter, Ammeter.** **Assembling circuits on prototyping and PCB boards.** **Handling and learning about the features of components. Using bench power supplies, cutting and stripping wires. Testing of circuits - measuring and recording values from a Multimeter.** **Building and testing a 'Microcontroller circuit. Learning about the pin arrangement and wiring of components. Using a pre-programmed microcontroller to test the INPUT and OUTPUTS then downloading a program created by pupils.** **Building and testing a 'GENIE Activity/Project' PCB board.** **Populating a PCB with components using the 'through hole method'. Soldering components to the PCB. Quality assurance and Quality control techniques when assembling and soldering circuit boards. Attaching INPUT and OUTPUT components. Downloading and testing the microcontroller circuit.** **Some pupils extend to download a user-defined programme that demonstrates their understanding of the microcontroller to solve a design brief – A 'learning game'.**
CAD **Computer Aided Design**	
Theory – Knowledge **TECH 2 / D&T**	**Pupils are involved in the CREATE Education Digital skills enrichment programme.** **SARCHS is in a partnership with Create Education and BAE Systems to provide future skills to young people. As part of this programme over year 7-9 we are committed to enriching our curriculum with CAD CAM, the use of 3d Onshape and Cura slicing / Ultimaker 3D printing and 3d scanning.** **In year 9 pupils are invited to take part in the CREATE challenge project in the Autumn term as an extra-curricular project on Monday & Friday lunchtimes.**

	The use of 2D Design and Onshape 3D Design software is included in both D&T Workshop and Electronic Systems as part of the curriculum projects.
Food & Nutrition	
Theory – Knowledge	**Hygiene and safety in the kitchen – Recall -** Utensils and cooking / baking equipment. Handling of sharps. Managing the kitchen workspace. Clean working in a kitchen. Raw and cooked ingredients. **4 C's to prevent bacteria –** Cooking, cleaning, and chilling, cross contamination, what bacteria needs to grow. **Recall - The Eat Well Guide–** Food planning, eating a healthy balanced diet. Choosing and selection of ingredients from the main food groups. **Ethical and environmental issues –** How eating meat and dairy food impact the environment, food miles, seasonality and where food comes from. **Provenance of food –** Field to fork for the main ingredients of each dish. History of ingredients, country of provenance. **Introduction to food science** – the Maillard reaction, thickening of sauces e.g. reduction and gelatinisation. **Using equipment safely-** Using the hob and oven, electric whisk, tin openers, garlic press **Evaluation** - Evaluating their practical skills and sensory evaluation of the dishes made. Comparing dishes and suggesting improvement and changes.
Practical **Pupils to bring in ingredients and make in lessons.**	Lesson 1 Activity – Baseline test and discussions of standards Lesson 2 Demonstrating– Work as a team to produce 6 different Soups Activity– following method given to cook soup. Considering - why are vegetables good for you – look at Vitamins Lesson 3 Demonstrating - taste testing and complete star analysis graph Activity – Soup analysis- using appearance, aroma, taste and texture – score them and use key sensory vocabulary then complete a sensory analysis star Lesson 4 Demonstration for **Cheese and Onion pasty** – making own shortcrust pastry Activity Practical– students use skills demonstrated to make their cheese and onion pasty Lesson 5 Activity - Practical - **Cheese and Onion Pasty**

	Lesson 6 Creaming method Demonstrating - **Victoria Sponge Cake** Lesson 7 Activity - Practical - **Victoria sponge cake** Demonstrating the creaming in method. The sponge is frozen for the decoration lesson Lesson 8 Types of cake-making methods. Demonstration –**Swiss roll** (folding method) Activity – Students write a time plan to use for independent practical Lesson 9 Activity - Practical – **Swiss roll** Activity - Students complete the Swiss roll practical demonstrating the folding in method. Lesson 10 Methods of bread making Demonstration – **Pizza** (kneading) Activity - Students write a time plan to use for independent practical Lesson 11 Activity - Practical - **Pizza** Activity – students use skills demonstrated to make their pizza and knead correctly. Lesson 12 Bread making methods Activity – Theory session on bread making, What is needed for yeast to activate? What is Gluten? Practical 1 - **Cheese and Onion Pasty** Practical 2 – **Victoria Sponge Cake** Practical 3 - **Swiss roll** Practical 4 - **Pizza**