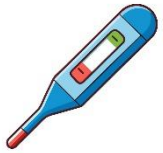
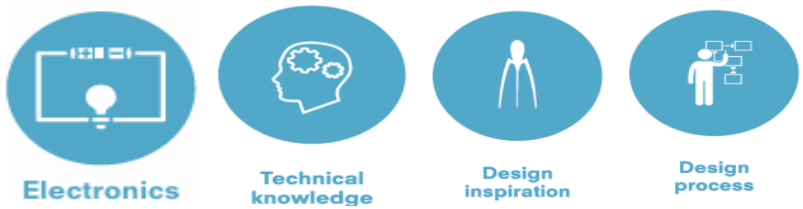


QUESTION – IF ANIMALS CAN'T SPEAK, HOW CAN WE USE TECHNOLOGY TO CARE FOR THEM BETTER?

THEME: DIGITAL WORLD– MONITORING DEVICES



WEEKS OF TEACHING	LINE OF ENQUIRY	THRESHOLD CONCEPT	SUBSTANTIVE KNOWLEDGE	DISCIPLINARY KNOWLEDGE	CURRICULUM ENDPOINT
1	HOW CAN WE USE RESEARCH TO DEVELOP DESIGN CRITERIA?	• Design, make, evaluate and improve • Take inspiration from design throughout history	• A monitoring device is an electronic device that observes and records data over time using sensors. • Examples devices: thermometers, smart watches and security devices. • Thermometers are a type of monitoring device used to measure temperature. • Thermometers have developed over time, from early thermoscopes to modern digital thermometers, to improve accuracy and safety. • Animals have specific environmental needs, including optimal temperature ranges • These needs can be identified through research using books and the internet, and information should be checked across multiple sources. • Design criteria describe the key features a product must have and are developed from research.	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Create innovative designs that improve upon existing products.	**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,
2	HOW CAN WE WRITE A PROGRAM TO	• Master practical skills: computing	• A program can monitor the temperature and respond with alerts when conditions fall outside a specified range.	• Write code to control and monitor models or products.	

	MONITOR TEMPERATURE?		• Alerts can be visual (LED display) or audible (sound) to inform the user. • Variables and values store and represent data (e.g., temperature readings). • Loops allow repeated checking of conditions (e.g., continuous temperature monitoring). • Boolean logic (true/false) enables the program to make decisions, such as triggering an alert. • Testing and debugging are essential to ensure programs work correctly; simulators can be used before installing code on physical devices. • Programming an animal monitor supports animal care by alerting owners when the environment is too hot or cold. • Understanding the design criteria and prior animal research ensures the program meets the needs of a specific animal.		pattern pieces and computer-aided design. **Evaluate:** •Understand how key events and individuals in design and technology have helped shape the world. •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. •Apply their understanding of computing to program, monitor and control their products.
3	HOW COULD YOU DESIGN A MICRO:BIT HOME THAT'S BOTH CLEVER AND CREATIVE?	• Design, make, evaluate and improve	• Plastics: artificial, versatile, widely used; single-use plastics cause pollution. • Sustainability: use materials responsibly; follow the six Rs (Refuse, Reduce, Reuse, Repair, Recycle, Rethink). • Building bricks allow easy, flexible modelling. • Create multiple designs and improve them through iteration. • Models must fit the Micro:bit and not block buttons or LEDs. • Animal Monitor Product: secure, functional, and creative solutions support the device's design criteria. • Evaluation: describe favourite design, explain why it works, and suggest improvements.	• Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. • Make products through stages of prototypes, making continual refinements. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.	
4	HOW DO I USE 3D CAD?	• Master practical skills: computing	• CAD is easy to edit, precise, and reusable. • Physical models are tactile but harder to change. Key CAD Skills: • Place, move, rotate, and resize objects on a work plane. • Group and ungroup objects. • Change object properties like size, colour, and shape. • Build models in layers, like stacking building bricks.	• Write code to control and monitor models or products.	

			• Recreate building brick designs virtually. • Ensure models fit the Micro:bit and meet design criteria. • Compare CAD and physical models. • Identify improvements and new features.		
ASSESSMENT OPPORTUNITY: USING THE KAPOW WEBSITE, CHILDREN TO COMPLETE END OF TOPIC QUIZ.					