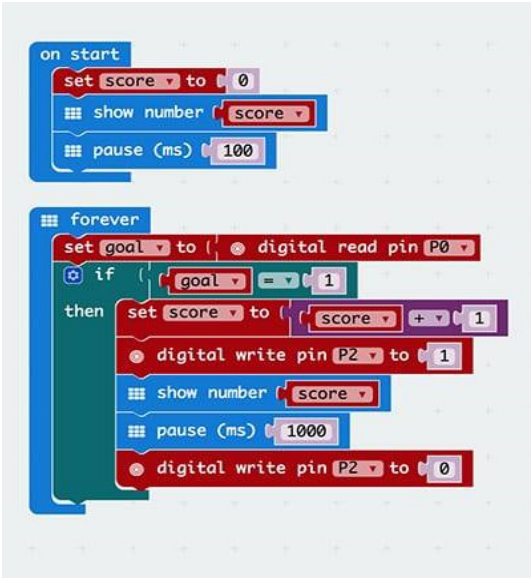
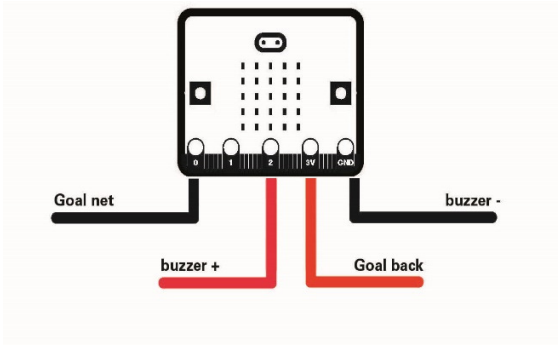
Willerby Carr Lane Primary School – Design and Technology		
Topic:	**Year: 6**	**Strand: Electrical Systems**

What should I already know?
•

What will I know / be able to do by the end of the unit?	
What products/toys use programmable electrical systems?	• Children will research different applications of programming. • Simple electrical systems are used in products all around us. For example: a steam iron uses only electrical compartments, there are no computer-controlled parts inside; whereas a washing machine is complex and are controlled by computer systems. • Microcontrollers can be used as they are small and are often built for one specific purpose. They can be programmed to perform functions, using written instructions (algorithms) which are turned into computer code (coding).
Ho6w can coding be used for programmable electrical systems?	• Children will be shown Football game which uses BBC Microbit as a scoreboard whilst creating a sound when a goal is scored. • Children will practise using the Microbits, developing knowledge and skills as they go. • They will begin to code the Microbit (beginner), then progress the complexity of algorithms (advanced). This will form the basic knowledge needed to programme their game.
How can I make sure I create an effective programmable game?	• Children will plan their game using the coding they have practised. • The game must include a scoreboard and a buzzer, but the sound/design will be personal. • Children will create their own design criteria – this will be influenced by their target market.
How can I apply my knowledge to create a programmable product/toy?	• Children will need to apply their knowledge when creating their game, including debugging any coding issues which may arise. • Construction must be solid and must also ensure that a complete circuit is created to allow the Microbit to connect effectively.

Vocabulary	
Design	
Code	the set of instructions forming a computer program which is executed by a computer
Computer program	is written in programming language; programs stored in the memory of a computer enable the computer to perform tasks.
Consumer	a person who purchases goods and services for personal use.
Target market	a particular group of consumers at which a product or service is aimed.
Make	
Complete (closed) circuit	An electrical circuit is a path or line through which an electrical current flows. A closed circuit makes electrical current flow possible.
debug	identify and remove errors from computer hardware or software.
Incomplete circuit	An open circuit is a circuit where the path has been interrupted or "opened" at some point so that current will not flow.
Knowledge and Understanding	
algorithm	a process or set of rules to be followed - especially by a computer.
Microbit	A microcontroller which has multiple coding opportunities.
Microcontroller	A small computer which is dedicated to perform one task and execute one specific application.
Programmable	When a computer or other machine is able to be provided with coded instructions for the automatic performance of a task.

Key Design Decisions & Skills
• Children will learn and analyse what products use computer programming. • Children will learn about microcontrollers and how they are used to perform simple tasks. • They will use this knowledge to code simple programmes, developing to more advanced processes. • Using this knowledge, they will plan and design their own game which must have a scoreboard and buzzer, but the design and specific code will be their own. • The criteria will be written by each child, deciding on target market, materials, aesthetics and programmability. • Skills children will develop: coding, debugging, measuring, cutting, joining materials, simple circuits. • Children will improve evaluative skills through reflecting on their game, particularly the process of applying coding to a product.

Pictures