



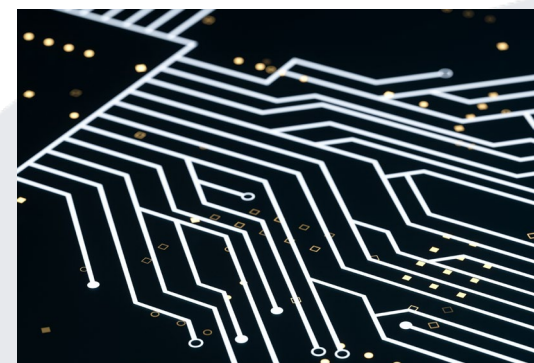
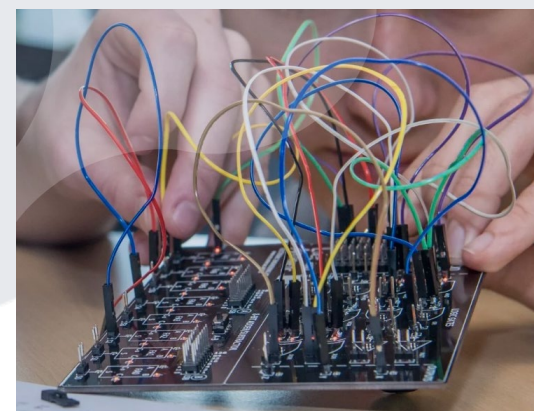
**UK Electronics
Skills Foundation**

Engineer the Future

Examples of projects and outcomes

Every group must be able to answer the following questions about their project:

- How does your project solve a problem or improve people's lives?
- What did you design or find out?
- What did you enjoy about doing your project?
- What was tricky and how did you find a solution?
- What would you change if you did a similar project again?



Climate Change: Find the best material to insulate heat



<https://microbit.org/projects/make-it-code-it/insulating-heat-experiment/>

Why? Insulating homes effectively reduces the energy needed to keep people warm

How? Use two micro:bit computers to investigate which material is the best thermal insulator

Outcome: A poster explaining reasoning, method and results, or a live demonstration plus the graph of results

Climate Change: Design an automatic lighting system



<https://education.theiet.org/secondary/teaching-resources/design-an-automatic-lighting-system>

Why? Automatic light reduces the energy usage of a household by only turning the lights on when needed

How? Use the micro:bit to develop a prototype for an LED based automatic home lighting system

Outcome: A working prototype of your lighting system or a set of instructions another group could follow (including things to avoid!)

Climate Change: Generate human-powered energy



https://www.sciencebuddies.org/science-fair-projects/project-ideas/Energy_p009/energy-power/human-powered-energy

Why? Human-generated power is a cleaner and more sustainable energy source than burning fossil fuels

How? Build a hand-powered electrical generator

Outcome: A working hand-powered generator or a cartoon strip explaining how the number of magnets affects the power generated

Climate Change: Find the best solar panel location



<https://microbit.org/projects/make-it-code-it/solar-panel-experiment/>

Why? Choosing the right location to place a solar panel can maximise the amount of renewable energy generated

How? Use micro:bit data loggers to measure sunlight on different side of a building over 24 hours

Outcome: A graph of your results, explaining the patterns or a video with your recommendation and suggestions of how that might change throughout the year

Health: Use technology without your hands

https://www.sciencebuddies.org/science-fair-projects/project-ideas/Elec_p114/electricity-electronics/adaptive-switch

Why? Small buttons can be difficult to use for some people, but adaptive switches are a more accessible and easier for control

How? Build a switch that can be activated using a chosen movement and connect it to a micro:bit to control an output

Outcome: A working prototype or a slide deck which explains how the switch works

Health: Design a personal heart monitoring system



<https://education.theiet.org/secondary/teaching-resources/design-a-personal-heart-monitoring-system-microbit>

Why? Heart rate monitoring can help people track their fitness and identify potential health issues more quickly

How? Use a micro:bit to detect heart movement and display the calculated heart rate

Outcome: A live demo of your prototype before and after exercise or labelled sketches of what you did to create it

Health: Design a step counter

<https://microbit.org/projects/make-it-code-it/step-counter/>

Why? Step counters can help people keep track of their activity levels and work toward their goals

How? Use a micro:bit to detect movements and count your steps

Outcome: A podcast describing how your design works or live demos using your prototype and showing any adaptations

Health: Build an Obstacle-Detecting Walking Stick



https://www.sciencebuddies.org/science-fair-projects/project-ideas/Elec_p107/electricity-electronics/obstacle-detecting-walking-stick

Why? Adapt a walking stick to give visually impaired users a warning before they encounter an obstacle

How? Add a distance sensor and a buzzer/ vibration motor to a walking stick

Outcome: A working prototype or an advert showing why users should choose your design

Travel: Design a safer pedestrian crossing

<https://education.theiet.org/secondary/teaching-resources/microbit-traffic-light-project>

Why? Effective pedestrian control systems can reduce the risk of danger when crossing the road

How? Use a micro:bit to programme a working scale prototype of a safer pedestrian crossing

Outcome: A model demonstrating your system or labelled photographs showing how your crossing reduces danger

Travel: Design a better railway station for growing passenger numbers



<https://education.theiet.org/secondary/teaching-resources/network-rail-fcd>

Why? Help passengers enjoy less stressful journeys with improved station management

How? Choose one aspect of increased passenger use to manage

Outcome: A presentation for Network Rail to choose your project to fund or a prototype and your technical plans

Travel: Design cabin lighting that helps passengers relax

<https://education.theiet.org/secondary/teaching-resources/cabin-mood-lighting>

Why? Mood lighting can help reduce stress of passengers on long flights

How? Build an electronic circuit to cycle through lighting colours

Outcome: A demo of your colour-changing circuit or an immersive art piece which uses your circuit to reduce stress

Entertainment: Design a new Thorpe Park attraction



<https://education.theiet.org/secondary/teaching-resources/thorpe-park-fcd>

Why? Thorpe park needs new attractions to appeal to wider audiences

How? Design a new attraction including a working electrical circuit

Outcome: A poster of your design, explaining how the attraction appeals to a wide audience or a log of your work

Entertainment: Build a mini dance game

https://www.sciencebuddies.org/science-fair-projects/project-ideas/Elec_p062/electricity-electronics/dance-mania-build-your-own-dance-pad

Why? Interactive games can create a more engaging and exciting experience for the player

How? Create switches that activate lights, sounds or game controls when stepped on

Outcome: A working dance pad which can be played, or a demonstration of how the switches and circuit respond to each step

Entertainment: Make a toy that responds to your movements



<https://microbit.org/projects/make-it-code-it/sensory-toy/>

Why? Sensory toys can support people who respond positively to stimulation through touch, light and sound

How? Use the micro:bit sensors to detect changes in position and output a custom response

Outcome: A working toy that responds to different movements or a set of illustrations demonstrating how your toy is used

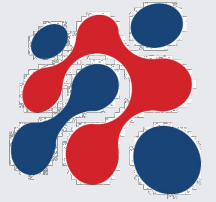
Entertainment: Make a sensor to test a waterlogged sports pitch

<https://education.theiet.org/secondary/teaching-resources/make-a-sensor-to-test-a-waterlogged-sports-pitch>

Why? Checking fields are suitable to play ensures sports games are safe

How? Create a waterlogging sensor that indicates when playing fields are too wet to be safe

Outcome: A poster of your method and your results in different moisture conditions, or a video of your sensor in action



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This list is designed to help spark your ideas

- You are welcome to choose something entirely different or to adapt anything here
- If you're not sure about a project idea, get in touch and we can help:

» education@ukesf.org

- We look forward to seeing your projects!

