

Developing research and communication skills using electrical circuits

This strategy was developed as part of an Applied Technology CPD 2020/2021 workshop which took place during the 2020/2021 school year. All materials used during this workshop can be viewed in the Technologies section of www.jct.ie within the 'CPD Workshops' tile.



Who is this strategy for?

This strategy is for all Junior Cycle students to support the development of research and communication skills.



What is this strategy?

This strategy encourages students to develop research and communication skills in the context of electrical circuits. It encourages students to explore both primary and secondary research methods and to communicate learning and understanding using different mediums.



When can students use this strategy?

This strategy can be used to develop an understanding of electrical control at the start or during a unit of learning. It can also be used to assess learning at the end of a unit. The format is designed to be accessible and quick for students to complete.



Where can I find this strategy?

This strategy was used in the context of a unit of learning in the Applied Technology 2020/2021 CPD workshop which can be found [here](#). It also features in the **Teaching and Learning Classroom Supports** in the **Resources** section of the JCT website, found [here](#).



Why should I use this strategy?

This strategy encourages students to recognise the value of both primary and secondary research. It also allows students to experience and appreciate different mediums of communication in the context of electrical circuits.



How can I apply this strategy?

It is encouraged to use this strategy as a starting point and to adapt each task to suit your students and your context. Students should also be encouraged to recognise the value of communicating using different methods.

Digital modelling a circuit diagram

Task 1: LED Light



Exercise is very important for your health. Walking is one of the simplest things we can do. It can help you to lift your mood and lower your risk for a number of diseases. Early morning or late in the evening can be dangerous without a light to guide you.



Your task is to **design, build and test** a circuit that will provide a solution to this real-world problem above.



Research and Development – Use this space to make notes, sketch ideas, add cut-outs from articles and websites and other relevant information you find as part of your research.



Add more sheets if needed to develop your ideas and further explore your research

This resource was created to support a Professional Development workshop facilitated by Jct4 during the 2020-2021 school year and sits within the context of the discussions that took place during this workshop.



Components' List – Can you list all the components needed for this task, include quantity, part name, symbol and a picture of the component.

Quantity	Part Name	Symbol	Component picture



Hand drawn circuit diagram



When drawing out your electrical circuit use the correct symbol for each component used. Use notes and labels to explain your circuit to help you when you move on to digital modelling on the computer.



Scan QR code for link to TinkerCAD



Digital modelling a circuit diagram

When working on the computer it is important to have this completed sheet to help you.

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Task 2: Irish Coast Guard Helicopter

Scan the QR code to watch the video of
an Irish Coast Guard helicopter starting up



The Irish coast guard operate a number of Search and Rescue helicopters from bases in Dublin, Waterford, Shannon and Sligo. The helicopter is fitted with several lights for night flying.



Your task is to **design, build and test** a circuit that will display a red warning light when the DC motor is running.



Research and Development – Use this space to **make notes, sketch ideas**, add cut-outs from articles and websites and other relevant information you find as part of your research.



Add more sheets if needed to develop your ideas and further explore your research

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Components' List – Can you list all the components needed for this task, include quantity, part name, symbol, and component cost.

Quantity	Part Name	Symbol	Component Cost
Total cost			€



Hand drawn circuit diagram



When drawing out your electrical circuit use the correct symbol for each component used. Use notes and labels to explain your circuit to help you move on to digital modelling on the computer.



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Task 3: Toll Bridge Barrier



Most roads are built with local or national government money raised from taxes. Tolls are like a tax that applies only to the users of the toll road. Toll roads allow new roads to be built and maintained without raising taxes on the general public.



Your task is to **design, build and test** a circuit that will help the toll booth operator to raise and lower the barrier.

Research and Development – Use this space to make notes, sketch ideas, add cut-outs from articles and websites and other relevant information you find as part of your research.



Add more sheets if needed to develop your ideas and further explore your research

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Components' List – Can you list all the components needed for this task, include quantity, part name, symbol, and a picture of the component.

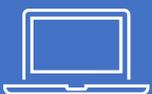
Quantity	Part Name	Symbol	Component Picture

Hand drawn circuit diagram

When drawing out your electrical circuit use the correct symbol for each component used. Use notes and labels to explain your circuit to help you when you move on to digital modelling on the computer.

Micro:bit code

Add/paste a screenshot of the code used to programme the micro:bit.



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