

**East Renfrewshire Council: Education Department
Practitioner Moderation Template**



Prior to the moderation exercise, please complete the following information and submit it to your facilitator with assessment evidence from one learner that you judge to have successfully attained the Es and Os.

School Code	
Practitioner Code	S46
Curriculum Area(s)	Numeracy and Maths / Science
Level	Second
Stage(s)	Primary 6
Specific subject (if applicable)	

Experiences and Outcomes:

I have used a range of electrical components to help to make a variety of circuits for differing purposes. I can represent my circuit using symbols and describe the transfer of energy around the circuit. **SCN 2-09a**

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. **MTH 2-21a**

Learning Intentions:

- To use electrical components to make a circuit
- To represent a circuit using symbols
- To describe the transfer of energy around a circuit
- To display data in a bar graph, in a clear way using a suitable scale

Success Criteria:

- I can use crocodile clips, wire and components to connect up a circuit
- I can draw an accurate circuit diagram using Circuit Symbols
- I can discuss energy transfers for a range of different circuits: light, heat, sound, movement
- I can draw a bar graph using a suitable scale
- I can correctly draw axis, labels and title in a bar graph

Briefly outline the context and range of quality learning experiences that have been provided making reference to the chosen design principles.

Prior Learning

Pupil used a range of engineering websites to research Circuit Symbols. They used the information from their research to complete a matching worksheet containing all the basic circuit symbols.

Lesson 1

Pupil was given a range of materials to build circuits with. This included: wire, crocodile

clips, buzzers, LED lights, lamps, batteries, etc. Pupil was given the opportunity to attempt to build circuits in small groups without much teacher input. Afterwards, as a class we discussed the main learning points of creating working circuits: what electrical current is – i.e. it is the flow of charges round a circuit – these charges are called electrons. Additionally, that electrons will not flow in the circuit if there is a gap in it i.e. the wires and components are not connected continuously. Finally, we discussed the transfer of energy from the battery, via the metal wires, to the component, resulting in sound/light.

Pupil then used their pre-learning knowledge to draw **Circuit Diagrams** of the working circuits that they made. They used the appropriate Circuit Symbols when doing this.

Lesson 2

Pupil was then asked to make a more complex circuit: this time including a switch and a buzzer. The pupil was again set the task of drawing their circuit in a Circuit Diagram. Once each group had successfully created a circuit with a buzzer and a switch, they were supplied with three different types of battery: 6V, 12V, 18V. Firstly, Pupil (working in a small group) connected up their circuit to the 6V battery. Using a sound meter, they recorded the noise made by the buzzer and recorded this. Next, they did this for the 12V and 18V batteries, recording the noise level each time. The pupils had to orally describe the transfer of energy in the circuit (i.e. battery > buzzer > sound)

Lesson 3

Using a PowerPoint on drawing bar graphs correctly, Pupil was taught about the correct use of titles, labels, axis and scale. Pupil then drew a bar graph using the data collected from the science experiment. Pupil reflection at the end of the lesson focussed on the fact that the noise level was higher for higher battery voltages.

Record the range of assessment evidence that was gathered to meet the success criteria (Say, Write, Make, and Do) considering breadth, challenge and application.

Say

- Pupil discussed the flow of electricity around a circuit
- Pupil discussed the transfer of energy in a circuit

Make

- Pupil made Circuit Diagrams of various circuits
- Pupil drew an accurate bar graph using data from an experiment

Write

Do

- Pupil built working circuits using a range of different materials and components

Briefly outline the oral/written feedback given to the pupil on progress and next steps, referring to the learning intention and success criteria.

Teacher feedback – Verbal and Written

Pupil was able to discuss ways of making different circuits during Lesson 1. They were praised for their co-operation efforts and problem solving strategies during this process.

Written feedback was given on the circuit diagrams drawn by the pupil. This was done in the form of 2 Stars and a Wish.

Verbal feedback was given to Pupil to confirm they had described the transfer of energy correctly in Lesson 2.

Verbal feedback was given Pupil to confirm they had chosen a suitable scale when drawing their bar graphs.

Peer feedback - Verbal and Written

Pupil was given written feedback from peers on their completed bar graph. This feedback related to the bar graph Success Criteria and was in the form of 2 Stars and a Wish.

Pupil Voice:

What have you learned? How did you learn? What skills have you developed?

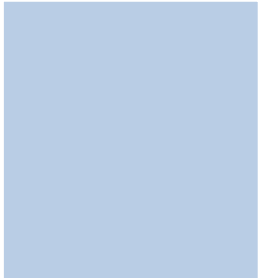
“I learned how to make a circuit with different electrical pieces and draw a circuit diagram that matched it. I learned this by trying lots of different types of wires and components and linking them to batteries to make them buzz or move or light up.

I developed skills in science and also maths. I knew how to draw a bar graph already so I developed that skill.”

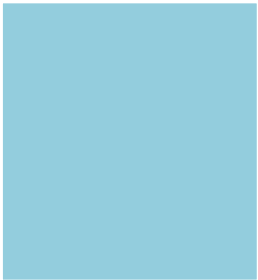
Did the learner successfully attain the outcomes? YES – However, Pupil only described the transfer of energy for SOUND. Pupil will be given more opportunities to describe different types of energy transfer in the future.



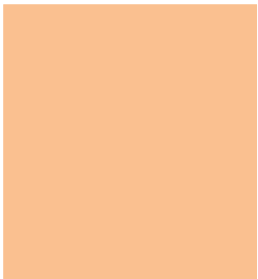
Learning Intentions and Success Criteria



Pupil/Teacher voice



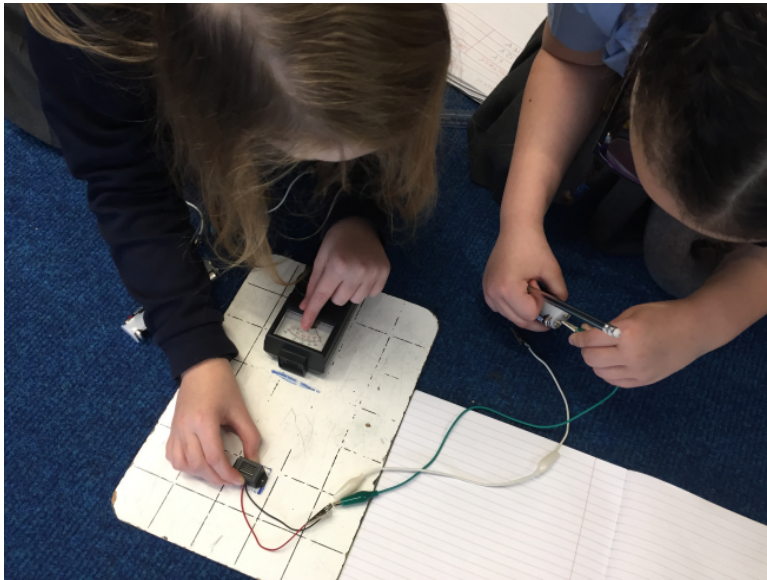
Experiences and Outcomes



Guidance/Information

Tasks: Given a variety of materials including a battery, wires and component (buzzer, light, etc) Pupil was asked to make a working circuit. Pupil did this working in a group of three.

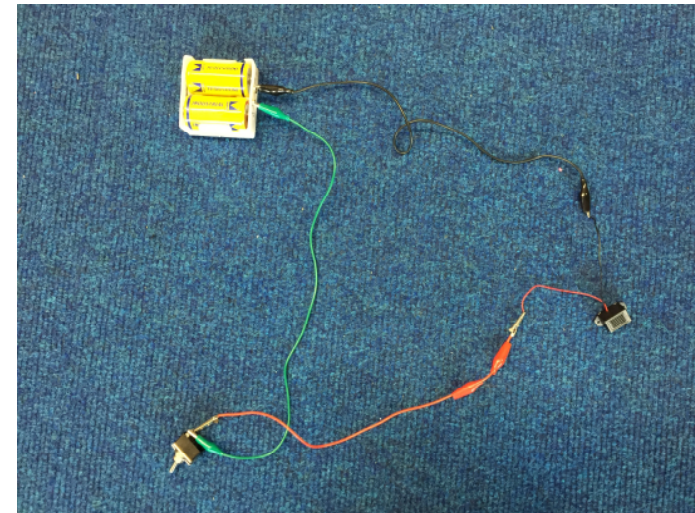
Learning Intention - To use electrical components to make a circuit



Success Criteria - I can use crocodile clips, wire and components to connect up a circuit

I have used a range of electrical components to help to make a variety of circuits for differing purposes. I can represent my circuit using symbols and describe the transfer of energy around the circuit. **SCN 2-09a**

Throughout the task the pupil showed excellent communication skills when creating the circuit with their group. They also illustrated good problem solving skills when the circuit did not initially work.



Learning Intention - To represent a circuit using symbols

Success Criteria - I can draw an accurate circuit diagram using Circuit Symbols

Pupil was asked to draw an accurate circuit diagram of their working circuit. They used their matching worksheet from Prior Learning to help them choose correct Circuit Symbols.

Teacher feedback:



You have drawn an accurate circuit diagram



You have used the correct Circuit Symbols for wire, a battery and a light bulb



Now try build a more complex circuit (maybe with a switch?)

Building Circuitry Diagram 4/12/13

Electrical circuit is the flow of electrons around a circuit

Components used

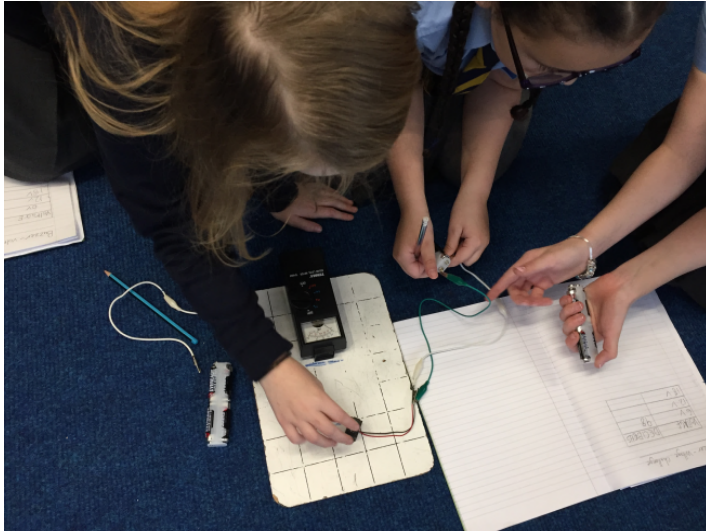
- wire
- Motor
- Battery

* You have used the correct circuit symbols for battery, motor and wire

⊕ Now try build a more complex circuit (maybe include a switch?)

✓ A lot

Learning Intention - To describe the transfer of energy around a circuit



Pupil was then given the task of creating a more complex circuit using a switch. This time the output component used was a buzzer. Pupil was asked to use a sound meter to record the sound levels (Db).

Learner Oral Comment: "The circuit that I created had a buzzer in it. It came out with [produced] sound energy. The more batteries I connect the louder the sound was. This meant there was even more sound energy"

Buzzer - voltage challenge 13/12

Voltage	DECIBELLS(db)
6v	88 Db
12v	100 Db
18v	106 Db

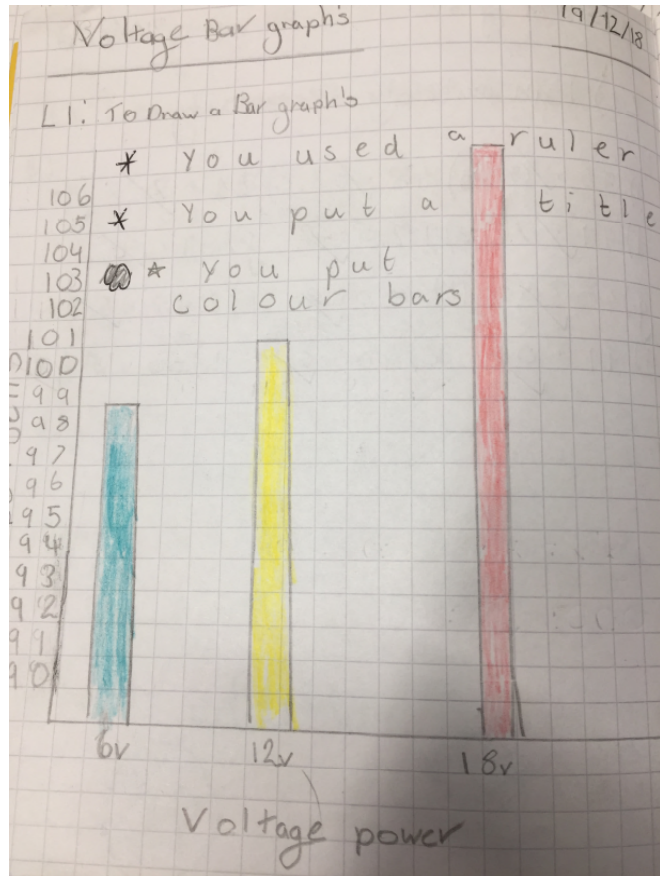
Success Criteria - I can discuss energy transfers for a range of different circuits: light, heat, sound

Pupil took readings on a sound meter to record the differences in sound level between a 6V, 12V and 18V battery input. These recordings would be used in the next lesson.

Learning Intention - To display data in a bar graph, in a clear way using a suitable scale

Pupil was asked to use the data collected from the sound meter experiment and display the results in a graph.

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. **MTH 2-21a**



PUPIL VOICE
"I am going to display my results in a bar graph because a line graph is change over time and this has not got anything to do with change over time."

Success Criteria - I can draw a bar graph using a suitable scale

Success Criteria - I can display data in a bar graph

Peer feedback:

- ★ You used a ruler
- ★ You put a title
- ★ You put colour bars