Unit Plan

Unit Title It's shocking	**Stage** Three
Term Three	**Strand** Physical World
Duration 10 hours (60 minutes per lesson)	**Sub-strand** Electricity

Rationale

The unit 'It's Shocking' supports students to build knowledge about the learning concept, electricity, which features in the strand 'Physical World' in the science curriculum.
The unit works with the NSW K-10 Science Syllabus and incorporates a constructivist teaching and learning approach. Students will actively engage in the processes of working scientifically and working technologically (Board of Studies).

Students will develop knowledge, understanding of and skills in applying the processes of working scientifically and working technologically through hands on experiences.

In compliance with the Australian Curriculum Science and Technology K-10 Syllabus, this unit of work implements a constructivist approach to all teaching and learning, so students are the centre of interactive and inquiry based experiences. Student's sense of wonder and curiosity about the world is fostered through engagement in the processes of Working Scientifically and Working Technologically.

The unit will allow students to develop an understanding of the relationships and significance of the 'Physical World' through questioning and problems solving. In this unit of work, Kath Murdoch's inquiry based learning approach is addressed throughout (Wilson & Murdoch, 2004). This allows students to pose questions, test their ideas, and develop arguments and present reasoning and justification for their responses.

'It's shocking' is based on Bybee 5E model, which features engage, explore, explain, elaborate and evaluate. This teaching and learning strategy encourages students to engage with the topic activate their higher order thinking skills and transfer new knowledge to other contexts.

Outcomes

KLA – Science and Technology

Outcomes / Performance Indicators

ST3-6PW: Describes how scientific understanding about the sources, transfer and transformation of electricity is related to making decisions about its use
ACSSU097: Electrical circuits provide a means of transferring and transforming electricity
Students:

- Identify potential risks and demonstrate safe use when using electrical circuits and devices
- Demonstrate the need for a circuit to be complete to allow the transfer (flow) of electricity
- Construct simple circuits incorporating devices, eg switches and light globes
- Observe and describe how some devices transform (change) electricity to heat, light, sound or movement, eg hair dryers, light globes, bells and fans

ACSSU219: Energy from a variety of sources can be used to generate electricity and this knowledge can inform personal and community-based decisions about using these sources sustainably
ST3-4WS: Investigates by posing questions, including testable questions, making predictions and gathering data to draw evidence-based conclusions and develop explanations
ST3-5WT: Plans and implements a design process, selecting a range of tools, equipment, materials and techniques to produce solutions that address the design criteria and identified constraints
ACSHE098: Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena.
ACCHE099: Important contributions to the advancement of science have been made by people from a range of cultures
ACSHE100: Scientific understandings, discoveries and inventions are used to solve problems that directly affects peoples lives
A**CSHE220:** Scientific knowledge is used to inform personal and community decisions
ACSIS232: What guidance, pose questions to clarify practical problems or inform a scientific investigate, and predict what the findings of an investigation may be
ACSIS103: With guidance, plan appropriate investigation methods to answer questions or solve problems
ACSIS104: Decide which variables should be changed and measure in fair tests and accurately observe, measure and record data, using digital technologies as appropriate
ACSIS105: Use equipment and materials safely, identifying potential risks

<table>
<tr><td colspan="2">ACSIS107: Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate
ACSIS221: Compare data with predictions and use as evidence in developing explanations
ACSIS108: Suggest improvements to the methods used to investigate a question or solve a problem
ACSIS110: Communicate ideas, explanations and process in variety of ways, including multi-modal texts</td></tr>
<tr><td>KLA: English
Outcomes / Performance indicators

ACELA1515: Understand that different social and geographical dialects or accents are used in Australia in addition to Standard Australian English
ACELA1516: Understand that strategies for interaction become more complex and demanding as levels of formality and social distance increase
ACELA1517: Understand the uses of objective and subjective language and bias
ACELA1524: Identify and explain how analytic images
ACELY1709: Participate in and contribute to discussions, clarifying and interrogating ideas, developing and supporting arguments, sharing and evaluating information, experiences and opinions
ACELY1816: Use interaction skills, varying conventions of spoken interactions such as voice volume, tone, pitch and pace, according to group size, formality of interaction and needs and expertise of the audience
ACELY1710: Plan, rehearse and deliver presentations, selecting and sequencing appropriate content and multimodal elements for defined audiences and purposes, making appropriate choices for modality and emphasis
Interpreting, analysing and evaluating</td><td>KLA: Mathematics
Outcomes / Performance indicators

ACMSP147: Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables
A student:
Describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions MA3-1WM
Selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations MA3-2WM
Orders, reads and represents integers of any size and describes properties of whole numbers MA3-4NA</td></tr>
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ACELY1711: Analyse how text structures and language features work together to meet the purpose of a text **ACELY1712:** Select, navigate and read texts for a range of purposes, applying appropriate text processing strategies and interpreting structural features, for example table of contents, glossary, chapters, headings and subheadings **ACELY1713** Use comprehension strategies to interpret and analyse information and ideas, comparing content from a variety of textual sources including media and digital texts Creating texts **ACELY1714** Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience	
KLA: HSIE Outcomes / Performance indicators **HT3-1:** Describes and explains the significance of people, groups, places and events to the development of Australia **HT3-2**: Describes and explains different experiences of people living in Australia over time	**KLA:** Creative Arts Outcomes / Performance indicators VAS3.2: Makes artworks for different audiences assembling materials in a variety of ways DRAS3.3: Devises, acts and rehearses drama for performance to an audience

Assessment	
Assessment - Formative (during learning engagements) Formative assessment occurs in the Explore and Explain phases in the unit. This will include: discussion, observing students conversations, teacher-student conversations, and samples of students' work. This will allow the teacher to monitor the developing understanding of the	**Assessment -** Summative (at the end) Summative assessment of the students' achievement developed will be conducted at the Elaborate phase for the Science Inquiry Skills and in the Evaluate phase for the Science Understanding.

students and be able to provide feedback that can extend and deepen students' learning.	

Evaluation of the Unit

Evaluation of the unit will be based on:
Were each lessons teaching and learning activities effective?
Did the students' develop an understanding of the concept?
Were the lesson engaging and interesting for the students?
Was there anything that could be changed or altered to make the lesson more interesting or effective?
Were the resources used throughout the unit appropriate and useful for students to achieve the outcome?
Were the students using scientific language and the correct terminology throughout the unit?
Were those who struggled provided with resources and help to improve their knowledge?
What worked well throughout the unit of work?
Was the overall unit of work successful?
Were the outcomes and indicators achieved in each lesson?
Did the unit of work follow the 5E model?
Were appropriate assessment tasks used for the unit of work?
Did the unit incorporate Aboriginal and Torres Strait Islanders

Students

Number
There are 25 students in the stage 3 class

Differentiation needs	Skills, interests, prior knowledge
Learning experiences will cater to all readiness levels as well as students existing prior knowledge, experiences and preconceptions. Students will be grouped with children of the same ability and also within mixed ability groups. Lessons activities will be carried out through a constructivist approach where the children will be working together as whole group, in pairs or individual. Differentiation will be evident throughout the lessons. This caters to the gifted and talented students, the	Activities in this unit will engage students prior knowledge and spark their interest in scientific concepts that are connected to their world, as well as testing their pre conceptions around different scientific ideas.

hearing impaired and aboriginal and Torres Strait Islander students. Some examples include: Lesson 1*: 'Building a circuit*' The gifted and talented students will be given more equipment to challenge and extend their own knowledge and understanding of how a circuit works and are able to explore different forms of current electricity. Lesson 2: *Light up my life* Extension - Challenge students who have quickly created a functional circuit using two wires to create a functional circuit using only one wire (which they can do if they connect the remaining connection point on the light bulb directly with the remaining connection point on the battery). Lesson : *8 ways learning framework*. Aboriginal and Torres Strait Islander students are catered to through the use of the 8 ways learning framework. The unit incorporates elements of the framework for example using symbols and gestures, non-verbal teaching and learning, deconstructing and reconstructing and learning maps. Lesson 9: *Switch on* *Optional:* Conduct this lesson as an open investigation by asking the teams: 'How can we make a switch?'. *Optional:* Students could substitute an electric buzzer, electric motor or mini-fan for the bulb.	

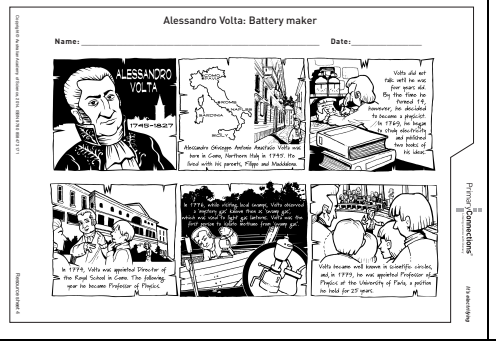
Learning Matter	
Essential understandings	**Essential skills**
Students will learn about …. • How a circuit works • How to construct a simple circuit incorporating devices • Observe and describe how some devices transform electricity to heat energy, light, sound or movement • The variety of sources that generate electricity	Students will learn to: Investigate, predict, observe, classify, explore, discover, experiment, document, plan, design and make and record findings. Examples of this include: • Conducting guided investigations of how to create a circuit

• How a battery works • What is in a light bulb and how it works • Different battery sizes • Different battery operated devices • How a switch works • How to construct different types of switches • The impact on what electricity has had on technology • What materials are conductors and inductors • How a circuit works • How to construct a simple circuit incorporating devices • Observe and describe how some devices transform electricity to heat energy, light, sound or movement • The variety of sources that generate electricity • How a battery works • What is in a light bulb and how it works • Different battery sizes • Different battery operated devices • How a switch works • How to construct different types of switches • The impact on what electricity has had on technology • What materials are conductors and inductors	• Predicting, observing and recording outcomes of simple circuits • Classifying conductors and insulators • Design and construct a simple circuit
Related text types • Science journals • Diagrams – Cutaways, Circuit, Labeled diagrams, Annotated diagrams • Word Walls • Biographies • Chronological lists	

- Role-play
- Tables
- Procedural texts

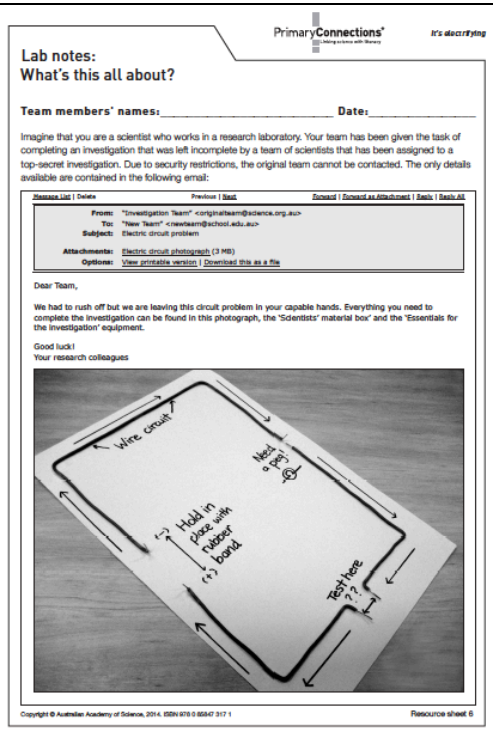
Learning Sequence				
5E Model	**KLA**	**Lessons**	**Resources**	**Assessment**
Engage	ACSSU097 ACSHE098 ACSHE100 ACSIS105 ACSIS107 ACSIS110 ACELA1515 ACELA1516 ACELA1517 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ST3-4WS ST3-5WT	***Lesson 1*: *What makes it go?*** *1.* Introduce the concept of electricity and briefly explain what students will learn through the unit. *8 Ways – Learning Maps* 2. Observe and record information about different battery-operated devices in teams (Use roles students are familiar with - Director/Manager/Speaker) 3. Teams respond using questions of inquiry. 4. Introduce science chat-board explaining that it is designed for students to record words, pictures, questions, ideas and reflections about the unit as it progresses. 5. Discuss students' observations and record their ideas on chat-board 6. Students draw a cutaway diagram of how they think a torch works - imagining they can see inside the torch and draw it in their science journal a cutaway diagram. 7. Brainstorm the role of electrical energy in students' lives. 8. Students' share and record key vocabulary.	For the class: - Class journal - Chat-board – Large sheets of paper/card - 3 or 4 torches - Collection of battery-operated devices (eg, toy, music player, doorbell, handheld computer game, mobile phone, walkie-talkies, megaphones) For each team: - Role badges for directors, manager and speaker – used throughout - Each team member's science journal	*Diagnostic:* - Science journal entries - Class discussions - Class scientists' chat board contributions - Cutaway diagrams
Explore	ACSSU097 ACSHE098 ACSIS105 ACSIS107 ACSIS221 ACSIS110 ACELA1515 ACELA1516	***Lesson 2* - *Light up my life*** 1. Review previous lesson 2. Use the Predict, Reason, Observe, Explain (PROE) strategy. Supply a copy of 'PROE record: Lighting up my life' resource sheet to students. 3. Students complete the 'P' and 'R' section of the 'PROE sheet. Share prediction and reasons with their team and the class.	For the class: - Class science journal - Class science chat-board - 1 enlarged copy of 'PROE record: Lighting up my life' resource sheet - Stripping pliers or knife - Spare light bulbs and	*Formative*: Giving feedback and monitoring students' developing understanding. Assessment opportunities: PROE record, explanations

	ACELA1517 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ST3-4WS ST3-5WT	4. Construct and test circuits – record processes including the 'O' and 'E' steps on the 'PROE' sheet. *8 ways – Non verbal* 5. Team speakers create a drawing on the board to show how their teams made the light bulb light up and also a way that did not make it light up. Compare team drawings and discuss. 6. Introduce the term 'circuit' – add a class-generated description of 'electrical-circuit' to the class chat-board. 7. Review drawings, discuss similarities and differences in the way that the students have represented equipment and electrical circuits and how confusion could occur. 8. Introduce and discuss the symbols used to represent the equipment students have already used. *8 Ways – Symbols & Images* 9. Review their cutaway diagram of how a torch could work from Lesson 1. Update or redraw this diagram to include what they now know, such as names/symbols of parts and the need for a complete circuit for the torch to light. 10. Update the class science chat-board resource sheet.	batteries for replacements, if necessary For each team: - Role badges - Each team member's science journal - 1 copy of 'PROE record: Lighting up my life' resource sheet per team member Essential Electrical kit including: - 1 battery (size C or D) - 1 light bulb (1.5 V) - 2 pieces of insulated wire (15 cm long), with ends stripped of insulation; or folded foil wires	to the class, circuit diagrams, science journal entries.

Explore	ACSSU097 ACSHE098 ACSHE100 ACSIS105 ACSIS107 ACSIS110 ACELA1515 ACELA1516 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ACELY1711 ACELY1712 ACELY1713 ST3-4WS ST3-5WT	***Lesson 3 Light Bulb Explorer*** 1. Draw a light bulb from memory - students imagine and draw a light bulb in their science journals 2. Students work in teams to explore and record observations of a light bulb. Explain that students can add to or change their first diagram using a different colour, or start a new diagram. 3. Use student suggestions to label the diagram on 'Inside a light bulb' resource sheet. *8 Ways – Symbols and Images* 4. Compile a class list of the interesting or unfamiliar words that students marked on the resource sheet 'Inside a light bulb'. 5. In teams or individually students use dictionaries to locate the meaning of the marked vocabulary, share meanings and record chat-board.	For the class: - Chat-board - Collection of light bulbs of different sizes and shapes - 1 enlarged copy of 'Inside a light bulb' sheet - Dictionaries For each team: - Role badges - 1 light bulb (eg, 1.5 V bulb) - 1 magnifying glass or hand lens - 1 copy of 'Inside a light bulb' sheet for each team member	*Formative:* Giving feedback and monitoring students' developing understanding. Assessment opportunities: labeled diagrams, 'Inside a light bulb' resource sheet. Science journal entries.
Explore	ACSHE098 ACSHE099 ACSHE100 ACSIS105 ACSIS110 ACELA1515 ACELA1516 ACELA1517 ACELA1524 ACELA1526 ACELT1613	***Lesson 4: Alessandro Volta (Battery maker)*** 1. Introduce various batteries and ask students to identify differences in the battery sizes and labeled voltages. Ask students to suggest what 'V' or 'volts' represent, and record ideas in the class journal. Ask students if  	For the class: - Class science chat-board - Collection of batteries of different sizes and voltages (eg, 1.5 V battery, watch battery, large torch battery such as a D size) - 1 enlarged copy of 'Alessandro Volta: Battery maker' sheet. For each student:	*Formative:* Giving feedback and monitoring students' developing understanding. Assessment opportunities: Literacy product based Alessandro Volta, Chronological list.

	ACELY1709 ACELY1816 ACELY1710 ACELY1711 ACELY1712 ACELY1713 ACELY1714 ST3-4WS ST3-5WT HT3-1 HT3-2	they know any information about the history of the battery, and record it in the class journal. 2. Read and discuss a biography of Alessandro Volta resource sheet. 3. Discuss the way scientists develop and change their ideas 4. Represent their ideas about the biography. a. Create a chronological list to represent significant events in Volta's life b. Consider why the events are significant. c. Teams to role-play an interview with Volta d. Role play of Galvani or Volta in a debate about who is correct. 5. Explore perceptions of scientists and their contributions to the development of ideas in science. Students have only four words to describe a scientist. Ask them to draw a scientist and record four words in their science journals. Use the Think/Pair/Share strategy: 6. Introduce a new heading on the class science chat-board—'Batteries'—students to explore their homes to identify battery-operated devices.	- 1 copy of 'Alessandro Volta: Battery maker' *optional:* 1 copy of 'Chronological list: Alessandro Volta'	
Explore	ACSIS110 ACELA1515 ACELA1516 ACELA1526 ACELY1709 ACELY1816 HT3-1 HT3-2	***Lesson 5: Time Machine*** Invite an Aboriginal elder of the community to the class to share stories about a time in their life when electricity was not readily available. Students to ask questions and explore ways that people got power and/or lived without electricity. Students create timelines from a day in their life exploring how they could function without electricity. *8 ways – Story sharing, community links and land links.*	For the class: - Organised meeting with Elder. For the students: - Science journal	*Formative*: Giving feedback and monitoring students' developing understanding. Assessment opportunities: Discussion with aboriginal elder

Explain	ACSSU097 ACSHE098 ACSHE100 ACSIS107 ACSIS110 ACELA1515 ACELA1516 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ST3-4WS ST3-5WT DRAS3.3 * 8 Ways – Symbols and Images	***Lesson 6 – Enacting electrons*** 1. Review the unit. 2. Participate in a whole-class role-play of an electric circuit 3. Discuss what was represented in the role-play. **Batteries** contain chemicals, which possess chemical energy. When chemicals react with each other, they generate electrical energy. The battery is the source of electrical energy and provides the 'push' to make the electrons move. E**lectrons** carry the electrical energy from the battery to the bulb—this is energy transfer. **Bulbs** changes the electrical energy into light and heat energy—this is energy transformation. 4. Model and explain the purpose and features of an annotated diagram. 5. Draw an annotated diagram of the role-play and to explain each part of the circuit. 6. Share representations and develop a class circuit diagram with annotations. Review and discuss ways of improving them, making any changes. 7. Update the class science chat-board	For the class: - Class science chat-board 1 decorated container (eg, a bucket decorated with tinsel, cellophane or crepe paper) for the 'bulb' - 50–60 (twice as many as the number of students) packets of energy (eg, pegs, counters) - Container labelled battery to represent the battery. For each student: - Science journal	*Summative:* Assessment opportunities: Discussion about what question to investigate, 'Problem Solvers: Investigation planner', science journal entries.
Elaborate	ACSIS232 ACSIS103 ACSIS104 ACSIS105 ACSIS221 ACSIS108 ACSIS110	***Lesson 7: Problem solvers: What's it all about?*** 1. Students will work in teams to solve a mystery. Introduce an enlarged copy of 'Lab notes: What's this all about?' template for planning investigations.	For the class: - Class journal - Chat-board - 1 enlarged copy of 'Lab notes: What's this all about' sheet. - 1 enlarged copy of	*Summative:* Discussion on switches. science journal entries

	ACELA1515 ACELA1516 ACELA1517 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ACMSP147 ST3-4WS ST3-5WT	2. Construct their own version of the circuit set-up. Use the 'Essentials Electrical Kit' and the 'Scientists' material box' equipment to solve the problem stated on the resource sheet. 3. Share ideas about what they thought the scientists could have been investigating. Record the ideas in class journal. 4. Students take the place of the scientists. Discuss investigation process and decide on investigation questions. 5. Discuss and check materials that might be needed to investigate the question. 6. Teams construct their circuits, test the materials and record their findings. 7. Discuss the investigations and associated vocabulary. 8. Introduce the terms 'conductors' and 'insulators' as scientific words that are used to describe the two groups of	 PrimaryConnections* It's electrifying Lab notes: What's this all about? Team members' names:_____ Date:_____ Imagine that you are a scientist who works in a research laboratory. Your team has been given the task of completing an investigation that was left incomplete by a team of scientists that has been assigned to a top-secret investigation. Due to security restrictions, the original team cannot be contacted. The only details available are contained in the following email: Message List | Delete Previous | Next Forward | Forward as Attachment | Reply | Reply All From: "Investigation Team" <originalteam@science.org.au> To: "New Team" <newteam@school.edu.au> Subject: Electric circuit problem Attachments: Electric circuit photograph (3 MB) Options: View printable version | Download this as a file Dear Team, We had to rush off but we are leaving this circuit problem in your capable hands. Everything you need to complete the investigation can be found in this photograph, the 'Scientists' material box' and the 'Essentials for the investigation' equipment. Good luck! Your research colleagues Wire circuit Hold in place with rubber band Test here Copyright © Australian Academy of Science, 2014. ISBN 978 0 85847 317 1 Resource sheet 6	'Problem solvers: Investigation planner' sheet. - Team roles chart - Team skills chart For each team: - Role wristbands or badges for Director, Manager and Speaker - Each team member's Science journal - 1 copy of 'Lab notes: What's it all about? sheet - 1 copy of 'Problem solvers: Investigation planner' sheet per team member: - Essential Electrical kit - Self-adhesive tape - 1 clothes peg - 1 piece of A4 card 1 'Scientists' material box' containing: - Wood (eg, popsticks, toothpicks) - Plastic (eg, straws, plastic cutlery) - Rubber (eg, balloons,	

		materials. 9. Students summarise and record their findings and evaluate their investigation. 10. Share and discuss students' ideas and discuss improvements that could be made to their investigation. 11. Add pictures, questions, ideas and reflections to the class science chat-board and new words to the keywords section, formulate a question for investigation, construct a circuit and test their question for investigation, observe, record and share results, discuss materials that conduct electrical energy. 12. Students role play the features of conductors and insulators. 13. Discuss why or why not they conduct electricity.	rubber bands) - Metal (eg, paperclips, cutlery) - Paper and/or cardboard - Pencils (sharpened at both ends) - Gardening wire or twist-ties - Insulated copper wire with the ends stripped	
Elaborate	ACSSU097 ACSHE098 ACSIS105 ACSIS110 ACELA1515 ACELA1516 ACELA1517 ACELA1524 ACELA1526 ACELY1709 ACELY1816 ST3-4WS ST3-5WT VAS3.2	***Lesson 8 – Squishy Circuits*** 1. Review class journal and chat-board 2. Introduce salt dough and sugar dough – class predicts which will conduct electricity and which will insulate and discuss reasons and record predictions in the class journal and add to chat-board. 3. Explore creating circuits with both salt dough and sugar dough. 4. Discuss why sometimes the light did not work and why? *8 Ways – Deconstruct/Reconstruct* 5. Teacher explicitly explains short circuits using a diagram 6. Students create short circuits and record diagrams. 7. Images are shown of other squishy as inspiration and teams create their own squishy circuits. *8 Ways – Non verbal*	For the class: - Class science journal - Class science chat-board For each team: - Role wristbands or badges for Director, Manager and Speaker - Salt dough - Sugar dough - Essential Electrical kit - 12 LED lights - Small electrical fans	*Formative:* Discussion on circuits, squishy circuit creations, science journal *Summative:* Rubric attached

Elaborate	ACSSU097 ACSHE098 ACSHE220 ACSIS105 ACSIS110 ACELA1515 ACELA1516 ACELA1517 ACELA1526 ACELY1709 ACELY1816 ACELY1712 ACELY1715 ST3-4WS ST3-5WT	***Lesson 9 – Switched on*** 1. Discuss the role of switches in an electric circuit 2. Read through an enlarged copy of 'Making switches' sheet (Resource sheet outlines how students can construct different switches) and explain the purpose and features of procedural texts. 3. Explain that the teams will make both types of switch, shown on 'Making switches' sheet, one at a time. 4. Discuss why a switch is a useful component in an electrical circuit. 5. Discuss how the switches constructed by the teams reflect switches that are used in devices and in households. 6. Review symbols used in circuit diagrams and introduce the circuit symbol for a switch. *8 Ways – Symbols and Images* 7. Draw in their science journals a circuit diagram that includes a switch, using electrical symbols, annotating diagram to describe the role of the switch in a circuit.	For the class: - Class science journal - Class science chat-board - 1 enlarged copy of 'Making switches' - Collection of battery-operated devices - Team roles chart - Team skills chart For each team: - Role badges - Science journal - 1 copy of 'Making switches' - Essential Electrical kit - Optional: Light bulb holder - Optional: a small electric buzzer or motor of the bulb - Electrical switch 1 - 1 piece of A4 card - 1 metal paperclip - 2 metal split pins or thumbtacks - Self-adhesive tape - Electrical switch 2 - 3 corrugated-card squares (10 cm x 10 cm)	

			- Aluminum foil A4 sheet	
Evaluate	ACSSU097 ACSHE100 ACSIS105 ACSIS107 ACSIS110 ACELA1515 ACELA1516 ACELA1517 ACELA1526 ACELY1709 ACELY1816 ACELY1710 ACELY1714 ACELY1715 ST3-4WS ST3-5WT * 8 Ways – Symbols and Images	***Lesson 10 – Bright sparks*** 1. Introduce the word loop (Class is familiar with word loops) activity using the scientific vocabulary of the unit. After word loop, organise the completed word loop cards for display on the class science chat- board. **Note:** It is important that symbols are used only when requested. Use chat-board to review the unit and how students' ideas have changed and developed during the unit. 2. Teams construct a model of a torch using a supplied paper torch net and creating a circuit displaying their understanding of electric circuits. Students will also prepare a description. For example, students could: • Write a procedure for constructing an electric circuit • Create a mini-dictionary of key terms and ideas associated with the model • Create a mini-poster that can be displayed with the model • Make a computer-based presentation. 3. Review the activities and discuss what type of information students could include. 4. Discuss the information that you will be looking for to assess students' models and descriptions 5. Students plan and construct their models and descriptions. 6. Students to share their models and descriptions with their peers.	For the class: - Class science journal - Class science chart-board - Team roles chart - Team skills chart - 'It's electrifying Word loop cards resource sheet - 1 large sheet of paper for affinity diagram For each team: - Role badges - Science journal - Optional: 1 copy of 'Torch template' net resource sheet - Optional: a small electric buzzer or motor of the bulb - Essential Electrical kit - 1 metal paperclip - 2 metal split pins or thumbtacks - Self-adhesive tape - Materials for circuit description - 1 copy of 'Bright sparks:	*Summative:* Presentations based on models, science journal entries. 'Bright sparks: Reflecting on my learning' resource sheet. Teacher looks for evidence of the extent to which students understand: That electric circuits provide a means of transferring and transforming electricity, scientific understandings can solve problems that directly affect peoples lives.

		7. Class reflection and evaluates on what they have learned, adding pictures, questions, ideas and reflections to the class science chat-board and new words to the keywords section. 8. Provide students with time to reflect on their learning in the unit and complete their copy of 'Bright sparks: Reflecting on my learning' sheet (rubric attached).	Reflecting on my learning' sheet per team member Several self-adhesive notes per team member	

Lesson 8 Squishy Circuits - Electric Circuit Assessment Rubric

Name: **Date:**

	Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
Prediction	A prediction has been stated and is reasonable based on what has been studied.	A prediction has been stated clearly.	A predicted has been stated, but is unclear.	A prediction has been stated, but does not say what will happen when the circuit is constructed.
Construction	The model is constructed using all necessary parts and as shown in the diagram.	All parts are in the model but the model is not constructed as shown in the diagram.	All but one part are in the model and the model is not constructed as shown in the diagram.	Several parts are missing AND the model is not constructed as shown in the diagram.
Response	The response shows an accurate and thorough understanding of the scientific concepts of the lesson.	The response shows an accurate understanding of most scientific concepts of the lesson.	The response shows a limited understanding of the scientific concepts of the lesson.	The response shows an inaccurate understanding of the scientific concept of the lesson.
Spelling, Punctuation and Grammar	One or fewer errors in spelling, punctuation and grammar in the response.	Two or three errors in spelling, punctuation and grammar in the response.	Four errors in spelling, punctuation and grammar in the response.	More than 4 errors in spelling, punctuation and grammar in the response.

(Rubriclibrary.com, 2014)

Bright Sparks reflecting on my learning Name:			
Bright sparks: Reflecting on my learning	**I need help with this**	**I can do this myself**	**I can help others with this**
I can construct a model of an electric circuit to make a blub light up.			
I can describe the components of an electric circuit and their roles			
I can describe what happens in a circuit.			
I can describe the characteristics of conductors and insulators, and explain their roles in electric circuits			
I can use written and visual language to describe an electric circuit. For example, scientific language, symbols and diagrams			
I can present my written and visual information in an effective and well-organised manner.			
I can use effective oral presentation skills to demonstrate my knowledge and understanding of an electric circuit. For example, scientific language and a clear, audible voice.			
My Comments			
Teacher Comments			

	Risk Assessment				
Lesson	**Potential Risk**	**Who is at risk?**	**Control measures**	**Likelihood of it happening**	**Severity of risk**
1	Student could swallow batteries	Students	Advise students not to place the batteries in their mouth	2/10	10/10
2	Students could burn themselves on high voltage wires	Students	Advise students of the different wires and the precautions they need to take	2/10	8/10
3	Could be exposed to lithium hydride and alkaline	Students / Teacher	Students are advised not to cut up batteries	1/10	10/10
4	Students could hurt others	Student	Advise students of the correct behaviours when participating in whole group activities	7/10	2/10
6	Students could harm one another whilst moving around the classroom.	Students	Advise students of the correct behaviours whilst participating in whole group activities and role plays	8/10	3/10
7	Students could burn themselves due to batteries & globes overheating	Student	Advise students to take caution with batteries & globes in the circuit if they have been on for a period of time.	7/10	4/10
7	Students could cut their fingers on paper, copper wires, thumbtacks & paper clips	Students	Advise students to take care around paper, copper wires, thumbtacks and paper clips	7/10	6/10
8	Students could allergic reactions to plasticine	Students	Advise students not to eat the plasticine, especially if they have any intolerances to gluten and/or lactose	9/10	1-6/10 (dependent on allergies)
9	Students could injury themselves whilst using equipment	Students	Advise students of the correct way to use all equipment prior to commencement	6/10	6/10
9	Students could cut themselves on broken globes (glass)	Students	Advise students of classroom rules. Advise the teacher if there is a breakage of glass.	2/10	2/10

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