Electricity: Unit Overview

SNC1W, Grade 9 Science (De-streamed), Unit 4. 16 classes of 75 minutes, plus a test day and summative work time (about four weeks).

The big question

How do we produce, use and conserve electrical energy, and who is affected by those choices?

Students move from static charge to circuits they build with AA cells, discover Ohm's law from their own data, solve circuit problems by hand and in Python, and compare series and parallel circuits. They calculate power, energy, cost and efficiency, examine Ontario's electricity sources and their impact on communities (including the First Nations–led Wataynikaneyap Power project), explore storage technologies, and finish with an energy audit and action plan. All data and problems are original.

Lessons

#	Lesson	Classes	Question	Expectations	What's inside
1	**Static Charges**	1	How do objects become charged?	D2.1, A1.2	Balloon lab; laws of charges; charging sequence
2	**Charging and Discharging**	1	Where does charge go?	D2.1, A1.2, A1.3	Electroscope; contact, induction, grounding
3	**Conductors and Insulators**	1	Which materials let charge move?	D2.2, D2.1, A1.5	Conductivity tester; ten materials
4	**Circuit Components**	1	What makes a circuit?	D2.3, D2.1, A1.5	Circuit parts; symbols; current direction
5	**Current, Voltage and Resistance**	1	What do I, V and R mean?	D2.3, A1.2	SI units; conversions; meters
6	**Ohm's Law Lab**	1	How are V and I related?	D2.4, A1.2, A1.5	Measure, graph and model V = IR
7	**Ohm's Law in the Real World**	1	How do we solve circuit problems?	D2.5, D2.4	GRASS method; body resistance; breakers
8	**Code a Circuit Calculator**	1	How can code model circuits?	D2.5, A1.4	Python functions and loops
9	**Series Circuits**	1	What happens with one path?	D2.6, D2.5, A1.5	Series lab; rules; problems
10	**Parallel Circuits**	1	What happens with many paths?	D2.6, D2.5, A1.3	Parallel lab; kitchen circuit; model room design
11	**Electricity vs Electrical Energy**	1	What do we pay for?	D2.7, D1.2	P = VI; kWh; bulb vs LED; standby

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12	**Efficiency and Energy Transformations**	1	Where does the energy go?	D2.8, D2.7	Device stations; kettle; efficiency; labels
13	**Generating Electricity**	1	Where does Ontario's power come from?	D1.1, A2.4	Generators; supply mix; expert jigsaw; Pine Ridge
14	**Energy and Communities**	1	Who gets power, and who decides?	D1.2, A2.3, D1.1	Diesel communities; Wataynikaneyap; four cases
15	**Storing Tomorrow's Energy**	1	What technologies are coming?	D1.4, A2.2, A1.5	Storage stations; impact analysis; battery safety
16	**Energy Action Plan**	1	How can we conserve?	D1.3, D1.2, D2.7	Model audit; summative launch

Assessment

Type	In this unit
Assessment for learning	Lab sheets, problem sets, case studies, exit tickets and quick checks
Assessment as learning	Prediction checks, self-checks against success criteria, peer checks of calculations
Assessment of learning	Energy Action Plan and rubric (suggested 10%); Unit Test and answer key (8%)

What's included

In the Start Here folder:

- **Summative Task and Rubric:** the Energy Action Plan (home or school energy audit)
- **Unit Test and Answer Key:** 15 questions, from multiple choice to calculations, with worked answers

Safety: AA cells (four at most) or a 9 V battery only, never wall outlets. No meters? Use the free PhET Circuit Construction Kit. Supply mix: Ontario Energy Board, 2024.

What's in each lesson

- Teacher lesson plan with expectations, timed sequence, differentiation, look-fors and answer guides
- Slides with speaker notes
- Student handouts and organizers
- Editable Word and PowerPoint files, plus PDFs

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