



Electrical Wiring 120

Acknowledgments

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Table of Contents

Acknowledgments	3
1. Introduction	5
1.1 Mission and Vision of Educational System	5
1.2 New Brunswick Global Competencies	5
2. Pedagogical Components	6
2.1 Pedagogical Guidelines	6
<i>Diverse Cultural Perspectives</i>	6
<i>Universal Design for Learning</i>	6
<i>English as an Additional Language Curriculum</i>	7
2.2 Pedagogical Guidelines	8
<i>Assessment Practices</i>	8
<i>Formative Assessment</i>	9
<i>Summative Assessment</i>	9
<i>Cross Curricular Literacy</i>	9
3. Subject Specific Guidelines	10
3.1 Rationale	10
3.2 Course Description	10
3.3 Curriculum Organizers and Outcomes	12
<i>Organizers</i>	12
<i>Outcomes</i>	12
<i>Learning Outcomes Summary Chart</i>	13
4. Curriculum Outcomes	16

	GCO 1	<i>Error! Bookmark not defined.</i>
	<i>Students will examine employment and occupational health and safety.</i>	<i>Error! Bookmark not defined.</i>
	GCO 2	20
	<i>Students will examine interdisciplinary hand tools, power tools, and fasteners.</i>	20
	GCO 3	23
	<i>Students will explore applied mathematics, working drawings, layout, measurement, and governance.</i>	23
	GCO 4	25
	<i>Students will examine and apply the Electrical Code of Canada.</i>	25
	GCO 5	26
	<i>Students will examine motor controls.</i>	26
	GCO 6	28
	<i>Students will discover remote control wiring.</i>	28
	GCO 7	29
	<i>Students will examine heating systems.</i>	29
	GCO 8	30
	<i>Students will examine raceway wiring and single-phase service entrances.</i>	30
5.	Bibliography	32
	<i>Common Content</i>	32
	<i>Subject Specific</i>	32
6.	Appendices	33
	6.1 New Brunswick Global Competencies	33
	6.2 Universal Design for Learning (UDL)	35
7.	Resources	38

1. Introduction

1.1 Mission and Vision of Educational System

The New Brunswick Department of Education and Early Childhood Development is dedicated to providing the best public education system possible, wherein all students have a chance to achieve their academic best. The mission statement for New Brunswick schools is:

Each student will develop the attributes needed to be a lifelong learner, to achieve personal fulfillment and to contribute to a productive, just and democratic society.

1.2 New Brunswick Global Competencies

New Brunswick Global Competencies provide a consistent vision for the development of a coherent and relevant curriculum. The statements offer students clear goals and a powerful rationale for school work. They help ensure that provincial education systems' missions are met by design and intention. The New Brunswick Global Competencies statements are supported by curriculum outcomes.

New Brunswick Global Competencies are statements describing the knowledge, skills and attitudes expected of all students who graduate high school. Achievement of the New Brunswick Global Competencies prepares students to continue to learn throughout their lives. These Competencies describe expectations not in terms of individual school subjects but in terms of knowledge, skills and attitudes developed throughout the curriculum. They confirm that students need to make connections and develop abilities across subject boundaries if they are to be ready to meet the shifting and ongoing demands of life, work and study today and in the future.

See Appendix 6.1.

2. Pedagogical Components

2.1 Pedagogical Guidelines

Diverse Cultural Perspectives

It is important for teachers to recognize and honour the variety of cultures and experiences from which students are approaching their education and the world. It is also important for teachers to recognize their own biases and be careful not to assume levels of physical, social or academic competencies based on gender, culture, or socio-economic status.

Each student's culture will be unique, influenced by their community and family values, beliefs, and ways of viewing the world. Traditional aboriginal culture views the world in a much more holistic way than the dominant culture. Disciplines are taught as connected to one another in a practical context, and learning takes place through active participation, oral communication and experiences. Immigrant students may also be a source of alternate world views and cultural understandings. Cultural variation may arise from the differences between urban, rural and isolated communities. It may also arise from the different value that families may place on academics or athletics, books or media, theoretical or practical skills, or on community and church. Providing a variety of teaching and assessment strategies to build on this diversity will provide an opportunity to enrich learning experiences for all students.

Universal Design for Learning

The curriculum has been created to support the design of learning environments and lesson plans that meet the needs of all learners. Specific examples to support Universal Design for Learning for this curriculum can be found in the appendices. The **Planning for All Learners Framework** will guide and inspire daily planning.

See Appendix 6.2

English as an Additional Language Curriculum

Being the only official bilingual province, New Brunswick offers the opportunity for students to be educated in English and/or French through our public education system. The EECD provides leadership from K-12 to assist educators and many stakeholders in supporting newcomers to New Brunswick. English language learners have opportunities to receive a range of instructional support to improve their English language proficiency through an inclusive learning environment. EECD, in partnership with the educational and wider communities offer a solid, quality education to families with school-aged children.

2.2 Pedagogical Guidelines

Assessment Practices

Assessment is the systematic gathering of information about what students know and are able to do. Student performance is assessed using the information collected during the evaluation process. Teachers use their professional skills, insight, knowledge, and specific criteria that they establish to make judgments about student performance in relation to learning outcomes. Students are also encouraged to monitor their own progress through self-assessment strategies, such as goal setting and rubrics.

Research indicates that students benefit most when assessment is regular and ongoing and is used in the promotion of learning (Stiggins, 2008). This is often referred to as formative assessment. Evaluation is less effective if it is simply used at the end of a period of learning to determine a mark (summative evaluation).

Summative evaluation is usually required in the form of an overall mark for a course of study, and rubrics are recommended for this task. Sample rubrics templates are referenced in this document, acknowledging teachers may have alternative measures they will apply to evaluate student progress.

Some examples of current assessment practices include:

• Questioning	• Projects and Investigations
• Observation	• Checklists/Rubrics
• Conferences	• Responses to texts/activities
• Demonstrations	• Reflective Journals
• Presentations	• Self and peer assessment
• Role plays	• Career Portfolios
• Technology Applications	• Projects and Investigations

Formative Assessment

Research indicates that students benefit most when assessment is ongoing and is used in the promotion of learning (Stiggins, 2008). Formative assessment is a teaching and learning process that is frequent and interactive. A key component of formative assessment is providing ongoing feedback to learners on their understanding and progress. Throughout the process adjustments are made to teaching and learning.

Students should be encouraged to monitor their own progress through goal setting, co-constructing criteria and other self-and peer-assessment strategies. As students become more involved in the assessment process, they are more engaged and motivated in their learning.

Additional details can be found in the Formative Assessment document.

Summative Assessment

Summative evaluation is used to inform the overall achievement for a reporting period for a course of study. Rubrics are recommended to assist in this process. Sample rubrics templates are referenced in this document, acknowledging teachers may have alternative measures they will apply to evaluate student progress.

For further reading in assessment and evaluation, visit the Department of Education and Early Childhood Development's Assessment and Evaluation site [here](#).

Cross Curricular Literacy

Literacy occurs across learning contexts and within all subject areas. Opportunities to speak and listen, read and view, and write and represent are present every day -in and out of school.

3. Subject Specific Guidelines

3.1 Rationale

This course is a complement to and extension of Electrical Wiring110. Being of interest to those students who wish to further their studies in the electrical wiring fields, this course will cover advanced electrical wiring topics including: service entrances, remote control wiring, electrical heating systems, and motor control. There will be an emphasis on current technology in the field including the use of computers and programmable logic controllers as they would be used in industry. Practical assignments will be used extensively to reinforce theory.

Electrical Wiring 120 will be of interest and value to any student wishing to pursue a career in any of the electrical trade or electrical technology related areas.

This course will incorporate the interdisciplinary skills of observation, reflection, documentation, purposeful/intentional planning, goal setting, decision making and problem solving; it will be taught using a hands-on approach of both project based and experiential learning.

3.2 Course Description

The overall aim of this course is to cultivate the need and desire of students to follow safe work practices and to develop the language and work skills of the trade by being able to:

- further develop student knowledge and practical skill in the electrical wiring area;
- develop safe and appropriate work habits for students;
- develop students' ability to troubleshoot, problem solve, and retrieve pertinent data from technical manuals;
- explore potential employment options by looking at provincial statistics and industry projections;

- increase students' awareness and to explore employment skills and career awareness in electrical and associated trades (linesman, controls, instruments, industrial electrician); and,
- identify the certification and continued education available at colleges and universities as well as an awareness of the Canadian Red Seal Certification Program and its professional designation (RSE).

3.3 Curriculum Organizers and Outcomes

Organizers

Pre-Requisite: Electrical Wiring 110

Outcomes

The New Brunswick Curriculum is stated in terms of general curriculum outcomes, specific curriculum outcomes and achievement indicators.

General Curriculum Outcomes (GCO) are overarching statements about what students are expected to learn in each strand/sub-strand. The general curriculum outcome for each strand/sub-strand is the same throughout the grades.

Specific Curriculum Outcomes (SCO) are statements that identify specific concepts and related skills underpinned by the understanding and knowledge attained by students as required for a given grade.

Learning Outcomes Summary Chart

GCO 1	Students will examine employment practices and Occupational Health and Safety legislation.
SCO 1.1	Students will examine safe and legal workplace procedures.
SCO 1.2	Students will describe ethical and legal workplace behavior.
SCO 1.3	Students examine employment opportunities, trades designations, and the Canadian Red Seal Certification program.

GCO 2	Students will examine interdisciplinary hand tools, power tools, and fasteners.
SCO 2.1	Students will identify, select and care for basic hand tools.
SCO 2.2	Students will identify, select and care for basic power tools.
SCO 2.3	Students will identify and select proper fasteners for the specific application.

GCO 3	Students will explore applied mathematics, working drawings, layout, measurement, and governance.
SCO 3.1	Students integrate fractional inch and metric measuring systems.

SCO 3.2	Students understand and interpret orthographic and isometric drawings (blueprints).
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GCO 4	Students will examine and apply the Electrical Code of Canada
SCO 4.1	Students will interpret and apply the CSA Electrical Code of Canada.

GCO 5	Students will examine about motor controls.
SCO 5.1	Students will identify, select, and install motor controls.

GCO 6	Students will discover remote control wiring.
SCO 6.1	Students will identify, select, and install remote control wiring.

GCO 7	Students will examine about heating systems.
SCO 7.1	Students will identify, select, and install electrical heating system components.

GCO 8	Students will examine raceway wiring and single-phase service entrances.
SCO 8.1	Students will identify, select, and install raceway wiring.
SCO 8.2	Students will interpret single-phase service entrances.

4. Curriculum Outcomes

GCO 1 Students will examine employment practices and Occupational Health and Safety legislation.	
SCO 1.1	Students will examine safe and legal workplace procedures.
Concepts and Content	I Can – exemplars:
<p>New Brunswick Construction Safety Association (NBCSA) online training courses in Workplace Hazardous Materials Information Systems (WHMIS) and Safety Orientation to learn safe work practices regarding WHMIS and the Employment Standards Act.</p> <p>Safe body mechanics (i.e. back safety, lifting, etc.).</p> <p>Basic First Aid.</p>	<p>I can identify potential consequences for unsafe procedures.</p> <p>I can interpret WHMIS symbols as identification for hazardous products.</p> <p>I can locate and properly use safety equipment.</p> <p>I can use Personal Protective Equipment (PPE).</p> <p>I can lockout and tag-out equipment with proper procedures.</p> <p>I can give examples of potential hazards with inappropriate clothing, footwear, and jewellery.</p> <p>I can understand back safety.</p> <p>I can use proper lifting techniques.</p> <p>I can demonstrate safe working loads.</p> <p>I can understand the importance of ergonomics and body mechanics.</p> <p>I can use proper body position when using tools.</p> <p>I can respond to potential hazard or injury.</p>

GCO 1: Students will examine employment practices and Occupational Health and Safety legislation.

Resources		
Video	Website	Document
	New Brunswick Construction Safety Association https://www.worksafenb.ca/	

GCO 1: Students will examine employment practices and Occupational Health and Safety legislation.

SCO 1.2 Students will describe ethical and legal workplace behavior.		
Concepts and Content		I Can – exemplars:
<p>Interacting with customers’ property regarding appropriate responsible resource management.</p> <p>Obligations to an owner (e.g. bonding, liability, privacy).</p> <p>Examine codes of ethics of organizations and companies.</p>		<p>I can co-construct a description of appropriate workplace behavior based on my own and my peers’ experiences.</p>
Resources		
Video	Website	Document
	<p>https://www.eca.nb.ca/about/code-of-ethics/</p> <p>http://www.cba.org/Publications-Resources/Practice-Tools/Ethics-and-Professional-Responsibility-(1)/Codes-of-Professional-Conduct</p> <p>http://www.cips.ca/ethics</p>	

GCO 1: Students will examine employment and occupational health and safety.

SCO 1.3 Students will examine employment opportunities, trades designations, and the Canadian Red Seal Certification program.		
Concepts and Content		I Can – exemplars:
Job descriptions and employment opportunities in the skilled trades		I can discuss employment opportunities and statistics for tradespeople.
Post secondary training options have grown in New Brunswick.		I can explore post secondary options or apprenticeship programs for trade training.
There are some trades that are designated.		I can identify a designated trade.
The red seal certification program has a professional designation.		I can explain the Red Seal Certification Program and its professional designation RSE.
Resources		
Video	Website	Document
	http://nbcc.ca/	
	www.eastcoasttrades.com	
	https://www2.gnb.ca/content/gnb/en/departments/post-secondary_education_training_and_labour/Skills/content/ApprenticeshipAndTrades.html	
	http://www.red-seal.ca/w.2lc.4m.2-eng.html	
	https://www.eca.nb.ca/about/code-of-ethics/	

GCO 2: Students will examine interdisciplinary hand tools, power tools, and fasteners.

GCO 2 Students will examine interdisciplinary hand tools, power tools, and fasteners.

SCO 2.1 Students will identify, select and care for basic hand tools.		
Concepts and Content	I Can – exemplars:	
Hand tool selection, use, and care.	I can identify, care for and safely use the appropriate: clamping devices, pliers, wrenches, screwdrivers, striking tools, chisels, saws, and files.	
Resources		
Video	Website	Document

GCO 2: Students will examine interdisciplinary hand tools, power tools, and fasteners.

SCO 2.2 Students will identify, select and care for basic power tools.		
Concepts and Content		I Can – exemplars:
Hand tool selection, use, and care.		I can identify, care for, and safely use the appropriate: electric saws, drills, and fastening devices. I can choose the appropriate pneumatic, electric, or battery-operated tool for the task at hand.
Resources		
Video	Website	Document

GCO 2: Students will examine interdisciplinary hand tools, power tools, and fasteners.

SCO 2.3 Students will identify and select proper fasters for the specific application.		
Concepts and Content		I Can – exemplars:
Fastener selection, use, and care.		I can identify and safely use the appropriate temporary, removable, or permanent fasteners for the application (screws, bolts and nuts, washers, clips, rivets, glues, and epoxies).
Resources		
Video	Website	Document

GCO 3: Students will explore applied mathematics, working drawings, layout, measurement, and governance.

GCO 3 Students will explore applied mathematics, working drawings, layout, measurement, and governance.

SCO 3.1 Students integrate fractional inch and metric measuring systems.		
Concepts and Content		I Can – exemplars:
Understand the need for both fractional inch and decimal inch systems in the trade area and be able to relate them with the metric system. Measurement and mathematics in application.		<p>I can use proper place values.</p> <p>I can work with equivalent fractions.</p> <p>I can convert from fractions to decimals and vice versa.</p> <p>I can use conversion charts.</p> <p>I can record dimensions in fractional inch and metric units.</p>
Resources		
Video	Website	Document

GCO 3: Students will explore applied mathematics, working drawings, layout, measurement, and governance.

SCO 3.2 Students will interpret orthographic and isometric drawings (blueprints).		
Concepts and Content		I Can – exemplars:
Technical drawing and reading.		<p>I can read drawings that are dimensioned in fractional inches and metric units.</p> <p>I can interpret drawings and specifications for single family dwellings.</p> <p>I can identify components of drawings (structural location of components and wiring schematics).</p> <p>I can Create isometric/orthographic drawings and sketch electrical drawings (cable and schematic).</p> <p>I can use a drawing to produce a practical installation project.</p> <p>I can estimate material requirements for a work plan.</p>
Resources		
Video	Website	Document

GCO 4 Students will examine the Electrical Code of Canada.

SCO 4.1 Students will interpret and apply the CSA Electrical Code of Canada.		
Concepts and Content	I Can – exemplars:	
Proper installation based on the Electrical Code of Canada. Loads on a circuit, circuit protection devices.	I can select and locate sections, tables, and appendices found in the code. I can apply the CSA code rules governing electrical installations covered in this course.	
Resources		
Video	Website	Document
	https://www.csagroup.org/codes-standards/electrical-gas/ https://store.csagroup.org/ccrz_CCPage?pagekey=content&contentkey=CADElectricalTraining_en	

GCO 5 Students will examine motor controls.

SCO 5.1 Students will identify, select, and install motor controls.	
Concepts and Content	I Can – exemplars:
Electric motors, circuits, and control devices.	<p>I can determine the size of conductors required for the motor branch circuits.</p> <p>I can determine the sizes of fuses or circuit breakers to provide starting protection.</p> <p>I can select the disconnecting means required for the motor type.</p> <p>I can determine the size of thermal overload units required for running protection.</p> <p>I can determine the size of the main feeders to the motor installation.</p> <p>I can determine the overcurrent protection required for the main feeders.</p> <p>I can select the appropriate main disconnecting means for the motor installation.</p> <p>I can recognize the need for under voltage protection.</p> <p>I can compare the salient features of manual and magnetic contractors.</p> <p>I can identify the component functions of a basic across the line starter.</p> <p>I can connect and trouble shoot the following motor control circuit arrangements:</p>

GCO 5: Students will examine about motor controls.

	<ul style="list-style-type: none"> • start-stop control from one and two stations with and without indicator lights; • start-stop-reverse including drum controllers; and, • start-stop-jog with various combinations. <p>I can explore the capabilities of circuit control made possible with PLC's through the completion of a variety of "intelligent" circuits.</p> <p>I can identify enclosure types.</p>		
Resources			
Video	<table border="0" style="width: 100%;"> <tr> <td>Website https://www.graybarcanada.com/solutions/electrical-supply/</td> <td>Document Electricity 4 Delmar, Units 12 & 13 Applications of Electrical Construction - Chapter 20 Electric Circuits and Machines - Chapter 13 Canadian Electrical Code - Section 28 Programmable Logic Controllers</td> </tr> </table>	Website https://www.graybarcanada.com/solutions/electrical-supply/	Document Electricity 4 Delmar, Units 12 & 13 Applications of Electrical Construction - Chapter 20 Electric Circuits and Machines - Chapter 13 Canadian Electrical Code - Section 28 Programmable Logic Controllers
Website https://www.graybarcanada.com/solutions/electrical-supply/	Document Electricity 4 Delmar, Units 12 & 13 Applications of Electrical Construction - Chapter 20 Electric Circuits and Machines - Chapter 13 Canadian Electrical Code - Section 28 Programmable Logic Controllers		

GCO 6 Students will discover remote control wiring.

SCO 6.1 Students will identify, select, and install remote control wiring.	
Concepts and Content	I Can – exemplars:
Remote control wiring, circuits, and devices.	<p>I can comprehend the principle of remote-control wiring.</p> <p>I can connect the following remote-control components: transformer and rectifier, relay, switches, wall plates, selector switch, convenience outlets, gang boxes and panels, remote control wire, and PLCs.</p> <p>I can design and plan remote control systems noting layout procedures, dimensions, and circuit diagrams (box mounted, zoned, ganged, and PLC).</p>
Resources	
Video	<p>Website</p> <p>Document Canadian Electrical Code - Section 16 Electrical Construction Wiring - Chapter 18 Programmable Logic Controllers</p>

GCO 7 Students will examine heating systems.

SCO 7.1 Students will identify, select, and install electrical heating system components.		
Concepts and Content	I Can – exemplars:	
Electrical heating system circuits, controls, and devices.	<p>I can install electric baseboard heating and control devices.</p> <p>I can install line voltage and low voltage relay type thermostats for electric heating.</p> <p>I can identify the features and application of heat pumps.</p> <p>I can identify the features and applications of heat exchangers.</p> <p>I can use the PLC to automate heating circuit control.</p>	
Resources		
Video	Website	Document

GCO 8: Students will examine raceway wiring and single-phase service entrances.

GCO 8 Students will examine raceway wiring and single-phase service entrances.

SCO 8.1 Students will identify, select, and install raceway wiring.		
Concepts and Content	I Can – exemplars:	
Use, type, and procedures of working with raceway wiring and conduit.	<p>I can identify—by size and type—the common types of conduit and fittings.</p> <p>I can install flexible conduit, electrical metallic tubing, and P.V.C (measure, cut, ream, thread and secure).</p> <p>I can thread and install rigid conduit.</p> <p>I can identify: underfloor raceways, busways and splitters, and wireways.</p> <p>I can install conductors in raceways.</p>	
Resources		
Video	Website	Document

GCO 8: Students will examine raceway wiring and single-phase service entrances.

SCO 8.2 Students will interpret single-phase service entrances.		
Concepts and Content		I Can – exemplars:
Single phase entrances.		<p>I can determine the appropriate size of service entrance for a specific application.</p> <p>I can utilize service entrance grounding requirements.</p> <p>I can determine type of service entrance to be used (i.e., overhead, underground, mast type, and temporary).</p> <p>I can select and install entrance equipment and materials: mechanical and electrical components.</p> <p>I can relate CSA Electrical Code requirements and NBEPC Service Entrance Standards to typical service installations.</p>
Resources		
Video	Website	Document

5. Bibliography

Common Content

Universal Design for Learning, Center for Applied Special Technology (CAST) <http://www.cast.org/>

Nelson, Louis Lord (2014). Design and Deliver: Planning and Teaching Using Universal Design for Learning. 1st Edition, Paul H. Brooks Publishing Co.

Subject Specific

Electrical Wiring 110 Course Outline, course code EIEWB (1984)

https://www.diffen.com/difference/Fluorescent_Bulbs_vs_Incandescent_Bulbs

<https://www.nbpower.com/en/save-energy>

<https://www.earthtronics.com/make-switch-cfl-led-light-bulbs-2/>

<https://www.csagroup.org/codes-standards/electrical-gas/>

https://store.csagroup.org/ccrz_CCPage?pagekey=content&contentkey=CADElectricalTraining_en

<http://nbcc.ca/>

www.eastcoasttrades.com

https://www2.gnb.ca/content/gnb/en/departments/post-secondary_education_training_and_labour/Skills/content/ApprenticeshipAndTrades.html

<http://www.red-seal.ca/w.2lc.4m.2-eng.html>

6. Appendices

6.1 New Brunswick Global Competencies

Critical Thinking and Problem-Solving	Innovation, Creativity, and Entrepreneurship	Self-Awareness and Self-Management
<ul style="list-style-type: none"> • Engages in an inquiry process to solve problems • Acquires, processes, interprets, synthesizes, and critically analyzes information to make informed decisions (i.e., critical and digital literacy) • Selects strategies, resources, and tools to support their learning, thinking, and problem-solving • Evaluates the effectiveness of their choices • Sees patterns, makes connections, and transfers their learning from one situation to another, including real-world applications • Analyzes the functions and interconnections of social, ecological, and economic systems • Constructs, relates and applies knowledge to all domains of life, such as school, home, work, friends, and community • Solves meaningful, real-life, and complex problems by taking concrete steps to address issues and design and manage projects • Formulates and expresses questions to further their understanding, thinking, and problem-solving 	<ul style="list-style-type: none"> • Displays curiosity, identifies opportunities for improvement and learning, and believes in their ability to improve • Views errors as part of the improvement process • Formulates and expresses insightful questions and opinions to generate novel ideas • Turns ideas into value for others by enhancing ideas or products to provide new-to-the-world or improved solutions to complex social, ecological, and economic problems or to meet a need in a community • Takes risks in their thinking and creating • Discovers through inquiry research, hypothesizing, and experimenting with new strategies or techniques • Seeks and makes use of feedback to clarify understanding, ideas, and products • Enhances concepts, ideas, or products through a creative process 	<ul style="list-style-type: none"> • Has self-efficacy, sees themselves as learners, and believes that they can make life better for themselves and others • Develops a positive identity, sense of self, and purpose from their personal and cultural qualities • Develops and identifies personal, educational, and career goals, opportunities, and pathways • Monitors their progress • Perseveres to overcome challenges • Adapts to change and is resilient in adverse situations • Aware of, manages, and expresses their emotions, thoughts, and actions in order to understand themselves and others • Manages their holistic well-being (e.g., mental, physical, and spiritual) • Accurately self-assesses their current level of understanding or proficiency • Advocates for support based on their strengths, needs, and how they learn best • Manages their time, environment, and attention, including their focus, concentration, and engagement

Collaboration	Communication	Sustainability and Global Citizenship
<ul style="list-style-type: none"> • Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity • Learns from and contributes to the learning of others by co-constructing knowledge, meaning, and content • Assumes various roles on the team and respects a diversity of perspectives • Addresses disagreements and manages conflict in a sensitive and constructive manner • Networks with a variety of communities/groups • Appropriately uses an array of technology to work with others • Fosters social well-being, inclusivity, and belonging for themselves and others by creating and maintaining positive relationships with diverse groups of people • Demonstrates empathy for others in a variety of contexts 	<ul style="list-style-type: none"> • Expresses themselves using the appropriate communication tools for the intended audience • Creates a positive digital identity • Communicates effectively in French and/or English and/or Mi'kmaq or Wolastoqey through a variety of media and in a variety of contexts • Gains knowledge about a variety of languages beyond their first and additional languages • Recognizes the strong connection between language and ways of knowing the world • Asks effective questions to create a shared communication culture, attend to understand all points of view, express their own opinions, and advocate for ideas 	<ul style="list-style-type: none"> • Understands the interconnectedness of social, ecological, and economic forces, and how they affect individuals, societies, and countries • Recognizes discrimination and promotes principles of equity, human rights, and democratic participation • Understands Indigenous worldviews, traditions, values, customs, and knowledge • Learns from and with diverse people, develop cross-cultural understanding • Understands the forces that affect individuals and societies • Takes action and makes responsible decisions that support social settings, natural environments, and quality of life for all, now and in the future • Contributes to society and to the culture of local, national, global, and virtual communities in a responsible, inclusive, accountable, sustainable, and ethical manner • Participates in networks in a safe and socially responsible manner.
Foundation of Literacy and Numeracy		

6.2 Universal Design for Learning (UDL)

UDL helps meet the challenge of diversity by suggesting flexible instructional materials, techniques, and strategies that empower educators to meet these varied needs. UDL research demonstrates that the challenge of diversity can and must be met by making curriculum flexible and responsive to learner differences. UDL provides guidelines to minimize barriers and maximize learning for all.

Is there a form of assistive technology that could be used to enhance/facilitate this lesson?	General Examples	Example in your subject area
Are there materials which can appropriately challenge readers to enhance this learning?	Audiobooks, EBSCO, Worldbook Online	
Are there students in this group who cannot access this learning (PLP background) and whose needs I must revisit before teaching?	PLP information/considerations	
Are there other choices that can be provided in this learning opportunity?	Differentiation models (RAFTs...)	
Is there another/a variety of media available? Only paper-based? Can it be listening? Can I add a visual component?		
Can movement be involved?	Quantum techniques	

Grouping and regrouping?	Cooperative learning; team games and tournaments	
Teacher versus non- teacher centered? Instructional design strategies –...	web based lesson... project-based, student research based	
Contracts?		
Opportunities for students to propose variations to the assignments/projects?	Tic Tac Toe	
Use of art /music / technology?	Songs, Videos, URL, YouTube	
Can I use drama? Art....	Use of improvisation; Skits; reader's theater; Can we make something? Demonstrate understanding visually? Paint a painting?	
Is there a plan to support the student/s who might already know this subject matter? Enrichment	Triad Model	
Does the language level need to be adjusted for the student to access this learning?	Link to adjust language level of text; CEFR information... SIOP techniques for EL learners; use of alternate texts...	

<p>Is there an independent or collaborative activity-project that would be better meet the needs of one or more students?</p>		
<p>Are there any experts that I could bring into the classroom electronically or as a guest speaker?</p>	<p>Speakers list, Skype contacts, media links, television documentary, archived historical documents</p>	
<p>Have I linked the goal to as current event or a cultural event in the student's lives? Can I make the learning more relevant?</p>	<p>Can this be applied in real life? TED talk, news item; societal trend, popular song? Can we start the unit and adjust or create it based on the students, interests or direction?</p>	
<p>Is there a hands-on experience that we could do to launch this lesson or this learning?</p>		

7. Resources

Electrical Wiring 110 Course Outline, course code EIEWB (1984)

<https://www.nbpower.com/en/save-energy>

<https://www.csagroup.org/codes-standards/electrical-gas/>

<http://nbcc.ca/>

https://www2.gnb.ca/content/gnb/en/departments/post-secondary_education_training_and_labour/Skills/content/ApprenticeshipAndTrades.html

<http://www.red-seal.ca/w.2lc.4m.2-eng.html>