**North East School Division Planning Organizer**



**Science Grades 6 - 9**

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| **Stage 1 – Begin With the End in Mind** |
| **Big Ideas** What do we want students to remember 40 years from now? |
| **The science “behind the walls” and “under your sheets”!** |
| **Outcomes** (Circle the verbs or skills, underline the qualifiers |
| **EL6.1 – Assess** personal, societal, economic, and environmental impacts of electricity use in Saskatchewan and propose actions to reduce those impacts.**EL6.2 – Investigate** the *characteristics* and *applications* of static electric charges, conductors, insulators, switches and electromagnets.**EL6.3 – Explain** and **model** the properties of simple series and parallel circuits. |
| **Understandings** What do we hope students will come to understand as a result of learning? Think: Students will understand that… | **Essential Questions** Questions for deeper understanding that invite deep thinking about the ideas and issues throughout the unit. |
| 1. Electricity impacts our lives at school, at home, and in our community,
2. Electricity has resulted in many technologies we use daily.
3. Static electricity and electromagnets have various applications in our world.
4. Electricity has potential dangers that society must be aware of.
5. Electricity is produced in many ways. These resources all have various benefits and drawbacks that must be considered..
6. First Nations and Métis lives have been impacted by electricity production.
7. Series and parallel circuits can be created using everyday conductors.
8. Electrical pathways require a source of energy, a closed path and a load to convert the electrical energy into another form of energy.
9. Electrical energy produces light, heat, sound, motion and magnetic effect.
10. Insulators are used to keep society safe from electrical use.
11. Switches are used to open and close a circuit.
12. Electrical drawings show the wiring requirements.
13. Many careers are related to electrical energy generation, distribution and conservation in Saskatchewan.
 | 1. How has electricity impacted your life? The lives of those in our province of Saskatchewan?
2. What are the benefits and disadvantages of various electrical energy production sites? Does it really matter what type of energy we use in Saskatchewan?
3. How can I create an electrical circuit to turn on a light?
4. Why are atoms (electrons) the foundation of electricity?
5. Why must a circuit be made of conductors, not insulators?
6. Can electricity create a magnet?
7. Why do we have fuse boxes in our house?
8. How do switches work in our walls?
9. Is a short circuit dangerous?
10. Why are wall outlets dangerous if we misuse them?
11. How can an electrical circuit be created? Altered? Re-routed?
12. Can I create a circuit with simple, every day supplies?
13. How is my house wired for electricity?
14. How does an electrician represent how they will wire a house?
15. Where do we see different types of electricity in the world around us every day?
16. What is the “use” of a simple circuit?
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| **Students need to know:** What is essential knowledge for students to have in order to demonstrate their understanding of the outcomes?  | **And be able to do:** What should they eventually be able to do as a result of their learning experiences in order to achieve the outcome? Should reference the indicators. Think: verb.  |
|  * Electricity based technologies have changed the way people work, live, and interact with the environment in Saskatchewan
* Vocabulary – renewable and non-renewable
* Renewable and non-renewable energy sources (solar energy, wind energy, geothermal energy, wind energy, biomass, nuclear energy, coal, natural gas, hydro energy)
* Static electricity is a result of friction which results in a charged object due to electron movement.
* Static electricity is seen when opposite charged objects attract.
* Vocabulary (simple circuit, parallel circuit, short circuit, pathways, electricity, static electricity, troubleshooting, load, source, electromagnets)
* Simple circuit is a complete circuit
* An incomplete circuit is when their is a break in the “circular connection”, which stops electron movement
* How to create electrical ‘drawing’ and representations
* How to use wires, batteries and light source to create a simple circuit
* Appropriate materials, tools and instruments one may use when investigating electrical properties and the safety precautions that must be followed.
* Switches and how they work
* Energy conversions.
* Electromagnets versus magnets
* Required characteristics of a simple circuit, closed circuit and a parallel circuit
* Steps of troubleshooting
 |  1. Provide examples of types of energy sources.
2. Describe how electrical energy is generated from hydroelectric, coal, natural gas, nuclear, geothermal, biomass, solar and wind sources and categorize these resources as renewable or non-renewable..
3. Explore through debate various renewable and non-renewable sources of energy and their impact on our lives.
4. Locate the large-scale electrical energy generation facilities in Saskatchewan.
5. Explain how we receive electricity into our homes.
6. Identify factors that affect electrical energy consumption.
7. Identify ways that our society can conserve natural resources and protect the environment.
8. Explain potential dangers of electricity and suggest ways to minimize these dangers
9. Reserach careers related to electrical energy generation, distribution and conservation in Saskatchewan.
10. Conduct investigations to determine the attraction and repulsion of electro-statically charged materials.
11. Identify natural and man-made sources of static electric charge and discharge..
12. Create circuits, alter designs and make predictions according to posed questions about conductors, insulators, simple circuits, and electromagnets.
13. Investigate, explain, pose questions and make predictions according to gained knowledge.
14. Explain the role of switches in electrical circuits.
15. Describe the operation of common technologies based on properties of static electricity, current electricity or electromagnetism.
16. Contrast magnets and electromagnets.
17. Construct simple circuits and state the required characteristics of this type of electricity.
18. Compare and contrast a closed circuit, open circuit a short circuit.
19. Propose and solve questions to investigate simple and parallel circuits.
20. Determine similiarities and differences between series and parallel circuits.
21. Draw electrical circuit diagrams to represent simple series and parallel circuits using appropriate symbols.
22. Construct simple circuits to demonstrate how electrical energy can be controlled to produce light, gheat, sound, motion and magnetic effects.
23. Troubleshoot an electrical circuit.
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