



## Elementary A+ for Energy Application

### YOUR A+ FOR ENERGY PROJECT

**What is the title of your A+ for Energy Project?**

Wind Power - Past, Present and Future

**Briefly describe your project idea. This summary communicates the overall intent and outcomes of your project.**

Students will learn about the history of wind power in Alberta, what current wind power operations exist in our province as well as how to design and build their wind-energy capture technology (using Lego Education Spike Prime Sets).

This project will focus on our students' understanding of how wind power works and how it was developed, allowing them to have real-world context for when they build their wind-energy capture models. By capitalizing on a year-long project that has numerous touch points, scheduled revisiting of the design and building of a wind capture system, and engaging with outside experts in this field, this project will increase the capacity of our students both in their STEM subjects and in their other school subjects as it creates a foundation of success through multi-modal, self-editing and revising projects as new information is integrated by the students.

**Approximately how many students will be directly involved in the A+ for Energy project?**

0-50

**Approximately how many students will be indirectly impacted by the A+ for Energy project?**

251-500

**What grades will participate directly in the project?**

K-3, 4-6

**Which subject areas will you incorporate into your A+ for Energy Project? (By selecting a**

**subject, you are indicating that you will be meeting learning objectives from the curriculum for this subject.)**

Science, Social Studies, Language Arts, Math, Aboriginal Studies

**Identify the energy topic(s) that will be the focus of your project**

Renewable/Alternative Energy Sources, Energy Technology & Innovation

## STUDENT LEARNING & EXPERIENCE

### **How will this A+ for Energy Project enhance student learning about energy?**

Our Wind Power - Past, Present, and Future will learn about the history of wind power in Alberta, what current wind power operations exist in our province as well as how to design and build their own wind-energy capture technology. This will focus on our student's understanding of how wind power works and how it was developed, allowing them to have real-world context for when they build their wind-energy capture models. This will involve inquiry and critical thinking skills in the research and development as well as skill development and critical thinking skills in the design and build stages of the project.

During this project, our students will have opportunities to direct how the project will be shared through round table discussions on these topics. Given that this project is targeted for grades 3-5 students with Learning Disabilities and other diagnoses, our teaching staff will create the appropriate structure for the project to ensure a scaffolded skill development model appropriate for both ages and diagnoses. At the end of this project, our grade 3-5 students will share their projects with our entire school (grades 3-12) through a celebration of learning - science fair model.

### **Explain how your energy project connects to and enhances curriculum outcomes.**

#### **Grade 3:**

Human activities that can change the Earth's surface include living on the land building towns and cities getting and using resources growing crops and farming (agriculture) polluting stewardship Plant and animal activities can change Earth's surface, such as overpopulation using resources parasite infestation; e.g., mountain pine beetle animals burrowing Plant, human, and other animal activities can cause changes to Earth's surface. Relate human activities to changes in Earth's surface. Relate activities of plants and animals to changes in Earth's surface. Discuss the interconnectedness between human activities and responsibilities for maintaining Earth. Investigate how changing Earth's surface by farming and growing crops contributes to daily life in Alberta.

This will enhance our grade 3 students in creating a real-time model of the connectedness between human activities (and the need for energy) and the responsibility needed for maintaining the earth. These students will also explore how indigenous people are currently using wind as energy - Kainai

Reserve - and how this is parallel to the traditional ways of Canada's indigenous people's relationship to the earth.

**Grade 4:**

Conservation can be practiced through personal actions, including the use of electricity; e.g., turning off lights when leaving a room use of water e.g., taking shorter showers reducing waste e.g., using reusable packaging Conservation can be practiced through community or global actions, such as use of energy-efficient alternatives; e.g., solar panels supplying water to support crops (irrigation) community recycling or composting programs Conservation of Earth's systems involves personal, community, and group efforts. This project will enhance the grade 4 curriculum outcomes by giving a hands-on opportunity to practice these tasks and create systems that will support the global actions component of energy-efficient alternatives - in this case, wind power.

**Grade 5:**

Energy resources are renewable or non-renewable. Renewable energy resources are not depleted over time as they can be naturally replenished if handled responsibly. Renewable energy resources include solar wind biomass geothermal tidal water and hydro Non-renewable energy resources are depleted over time because they will not be naturally replenished for thousands or millions of years. Non-renewable energy resources include nuclear and fossil fuels. Alberta relies on both renewable and non-renewable energy resources to fulfill energy needs, including fossil fuels water, and hydro wind biomass. This project will enhance the grade 5 curriculum outcomes by giving a hands-on opportunity to create a renewable energy resource that will support energy-efficient alternatives - in this case, wind power.

**How will this A+ for Energy project enhance student experience?**

Students will be involved in hands-on learning both in and outside of the classroom, with the integration of virtual speakers, field trips to multiple wind farms in Alberta, as well as the creation of a wind power capture project using the Lego Spike sets to integrate STEM learning into the final products. Our students will be engaged in numerous facets of this project from September to May, both in a communal and holistic learning space (round table discussions and inquiry, speakers and field trips), as well as supporting independent learning journeys and leadership (individual and small group building of wind capture projects).

The students will hold a Celebration of Learning fair for other students and families to attend to share their learnings. We also have a strong relationship with a long-term care facility, which serves seniors aged 65 and older, many of whom are Canadian military veterans. We intend to either invite the care facility patrons to our school or set up a small celebration of learning at their facility to support our caring connection with their residents.

## CREATIVITY

### **What's different? What's innovative? How will the A+ for Energy grant allow you to inspire and engage your students in a new, exciting way?**

The primary difference in this application is the population that we will be serving. All of our students have been diagnosed with one or more Learning Disabilities, as well as additional diagnoses such as ADHD, Autism (Level 1), and associated mental health diagnoses such as Anxiety and Depression. Due to the specialized population that we serve through our school program, we have seen these students not be pushed toward their full academic potential, as academics are an overall challenge for them. So by harnessing their creativity and strong passion for building and creating through this project, we can have our students deeply engage with both their curriculum surrounding renewable energy as well as with their STEM classes.

Our students are often in a challenging learning cycle due to these diagnoses and the associated academic challenges and therefore are typically seen struggling to sustain engagement through the longevity of a school project or academic pursuit. By targeting our youngest students with this project, we will be changing the nature of their academic experience early on and increasing their resilience and perseverance by supporting them through hands-on learning and external recognition and celebration of their successes.

For our students, the external sharing of their projects and successes gives a tangible goal and timeline that will also increase their ability to have sustained effort and resilience in their academics.

### **What inspired you and/or your students to develop this idea?**

This spring (2023) our Jr High students are having their first science fair since 2019, due to the pandemic. Due to this, our elementary school students are keen to have a similar experience and be able to share their learning with our community. We are keen to support this desire of our students and have thus developed a year-long project that will support their goal by also integrating the curriculum as well as working on academic resilience to create long-term academic successes.

## PROJECT PLANNING & IMPACTS

Please list the total amount of money you are requesting from the A+ for Energy Program.

(\$) 4924.95

Please complete and attach the budget template available on the Inside Education A+ for Energy webpage.

Item	Quantity	Source	Brief Description of how the item is aligned with project activities	Cost/Item	Total
Lego Education Spike Prime Set	5	Lego.com	These sets include LEGO building elements, easy-to-use hardware, and an intuitive drag-and-drop coding language based on Scratch, SPIKE Prime continuously engages students through playful learning activities to think critically and solve complex problems, regardless of their learning level.	\$564.99	\$2,824.95
Transportation to Field Trips	2	Southland Busing	This will have our students explore their learning outside of the classroom by visiting wind farms on two occasions, firstly to enhance their learning and secondly to support the revision of their building plans for their final project.	\$800	\$1,600
Field Trip Admissions	2	Multiple	Costs associated with visiting wind farms - tour guides, and interpreters.	\$250	\$500
<b>TOTAL</b>					<b>\$4,924.95</b>

## PROJECT TIMELINE (MONTHLY)

### **September 15 - October 31 - Idea Generation and Research**

Using inquiry-based methods, our students will begin to research the past and present of wind energy technology in Alberta, including how our indigenous populations are engaged in this renewable energy resource. School staff to contact wind farms in Alberta both on indigenous land and owned by private companies, to set up a virtual visit for November with students.

### **November 1 - 30 - Connect with Current Wind Farm Operations and plan Spring Field Trips**

Students will have their virtual meeting with an industry professional to speak about current wind capture technology and begin considering their design work. School staff will confirm field trips and transportation for the spring.

### **December 1 - 20 - Design Thinking Learning**

Students will engage in the initial planning for their wind capture design project and begin capacity building in their initial research and planning.

### **December 15 - Progress Report submitted to A+ for Energy**

### **January 10-31 - Capacity Building**

Begin creating capacity with Lego Spike kits and coding basics to increase the capacity of students to use the systems for their design and project. School staff will begin planning the Celebration of Learning event.

### **February 1- 29 - Initial Building**

Students will begin constructing and programming the initial builds of their wind capture Technology. School staff will complete final confirmations for Spring field trips.

### **March 1- 31 - Field Trip**

Students will go on two field trips - one to a wind farm that is associated with an indigenous group, and one that is part of a private company. School staff will confirm the date and location of the Celebration with Learning for the school, parents, and community partners.

### **April 1- 30 - Revise Builds**

Students will revise building projects based on feedback and in-person experiences from the field trip in March. Students will prepare to present their final projects in the Celebration of Learning events. School staff will publicize the date and location of the Celebration of Learning.

### **May - Date TBD - Celebration of Learning**

### **June 15 - Final Video Report submitted to A+ for Energy**

**Is this A+ Project application an extension of a previous project?**

No

**Is this grant the sole funding resource for your project? If you are augmenting this grant with others please let us know which ones and how they will work together.**

This is the sole funding resource for this project at this time.

**Who else will be involved in your project?**

Parents & family members, Community members, and Others

**If other, please describe:**

Wind farms that we visit for field trips

**Briefly describe how those listed above will be involved in your project.**

Parents, family members, and Community members - the celebration of learning

Wind farms - field trip locations and virtual consulting visits.

**How do you plan to measure the impact of this project on student learning?**

Survey students about wind power knowledge before and after the project. By reviewing final projects and having the ability to explain concepts at the Celebration of Learning.

**What opportunities will there be for project expansion and longevity?**

Longevity - due to capital costs being covered by the grant, we will be able to replicate this project, year after year for approx 10 years (life cycle of Lego). We can cycle through different renewable resources annually to ensure the project is different and unique, but replicable - wind, solar, water, biomass, etc.

**Anything else you want to tell us?**

Thank you so much for considering our submission!