

Project	Organized Lightning: Mechanisms Using Electricity																																
Driving Question	Can we create an electrical device that is usable in two occupational areas	Total Time	12 – 15 hours																														
Scenario	You have been accepted to the show Dragons Den at the end of the month. Your task is to create an electrical device that is usable in two occupational areas and sell your idea to the “Dragons.”																																
Interdisciplinary Learning	<p>GRADE LEVEL <input checked="" type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9</p> <p>SUBJECT AREA</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English Language Arts</td> <td><input type="checkbox"/> Mathematics</td> <td><input checked="" type="checkbox"/> Science</td> </tr> <tr> <td><input type="checkbox"/> Social Studies</td> <td><input type="checkbox"/> Religious Education</td> <td><input type="checkbox"/> Physical Education</td> </tr> <tr> <td><input checked="" type="checkbox"/> Fine Arts</td> <td><input checked="" type="checkbox"/> Health and Life Skills</td> <td><input checked="" type="checkbox"/> Languages</td> </tr> <tr> <td><input type="checkbox"/> Outdoor Education</td> <td><input type="checkbox"/> French Language Arts</td> <td></td> </tr> </table>			<input checked="" type="checkbox"/> English Language Arts	<input type="checkbox"/> Mathematics	<input checked="" type="checkbox"/> Science	<input type="checkbox"/> Social Studies	<input type="checkbox"/> Religious Education	<input type="checkbox"/> Physical Education	<input checked="" type="checkbox"/> Fine Arts	<input checked="" type="checkbox"/> Health and Life Skills	<input checked="" type="checkbox"/> Languages	<input type="checkbox"/> Outdoor Education	<input type="checkbox"/> French Language Arts																			
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CTF Program of Studies Learning Outcomes	<p>Essence 1: Career and Technology Foundations is exploring interests, passions and skills while making personal connections to career possibilities and technologies.</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> I explore my interests and passions while making personal connections to career possibilities <input checked="" type="checkbox"/> I demonstrate skills associated with occupational areas. <input checked="" type="checkbox"/> I use technologies related to occupational areas. <input checked="" type="checkbox"/> I follow safety requirements associated with occupational areas and related technologies. <p>Essence 2: CTF/FCT is designing, creating, appraising and articulating responses to challenges</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> I problem solve when creating responses to challenges. <input checked="" type="checkbox"/> I design when creating responses to challenges. <input checked="" type="checkbox"/> I make decisions when creating responses to challenges. <input checked="" type="checkbox"/> I adapt to change and unexpected events. <input checked="" type="checkbox"/> I appraise product(s), performance(s) or service(created in response to challenges). <input checked="" type="checkbox"/> I appraise the skills and technologies use to respond to challenges. <input checked="" type="checkbox"/> I articulate my learning. <p>Essence 3: CTF/FCT is working independently and with others through the exploration of careers and technology</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> I describe how my actions support learning. <input checked="" type="checkbox"/> I develop personal skills to support mutually respectful and effective relationships. <input checked="" type="checkbox"/> I work with others to achieve common goals. 																																



Plan: Organized Lightning

Competencies	<p>MINISTERIAL ORDER (#001/2013)</p> <p>2.4 Discover, develop and apply competencies across subject and discipline areas for learning, work and life to enable students to:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> know to How to Learn: to gain knowledge, understanding or skill through experience, study, and interaction with others; <input checked="" type="checkbox"/> think Critically: conceptualize, apply, analyze, synthesize, and evaluate to construct knowledge; <input checked="" type="checkbox"/> identify and Solve Complex Problems; <input type="checkbox"/> manage information: access, interpret, evaluate and use information effectively, efficiently, and ethically; <input checked="" type="checkbox"/> innovate: create, generate and apply new ideas or concepts; <input checked="" type="checkbox"/> create opportunities through play, imagination, reflection, negotiation, and competition, with an entrepreneurial spirit; <input checked="" type="checkbox"/> apply multiple literacies: reading, writing, mathematics, technology, languages, media, and personal finance; <input checked="" type="checkbox"/> demonstrate good communication skills and the ability to work cooperatively with others; <input checked="" type="checkbox"/> demonstrate global and cultural understanding, considering the economy and sustainable development; and <input checked="" type="checkbox"/> identify and apply career and life skills through personal growth and well-being.
Resources	<ul style="list-style-type: none"> - Destination Imagination - Grade 5 Edmonton Public Science Resource: Mechanisms Using Electricity - Various internet websites - Show Me application - Corkulous application - Windows Movie Maker - IPads - Electrical equipment/devices (batteries, wire, motors, lights ect.) - Building kits (lego, mechano sets etc.)

Lessons	Summary	Resources	Time
Lesson 1 (Entry Event) Safety Circuits (simple)	“Goofy Gadgets”: Students are put into their groups of four and asked to complete the “Goofy Gadgets” lesson from Destination Imagination	Destination Imagination teacher resource guide	30 minutes
Lesson 2 (Driving Question)	Group discussion to generate ideas around which occupational areas they want to investigate and what electrical device they wish to make to assist that occupational area.	- Internet sites	30 minutes
Lesson 3 Need to know Safety Short Circuits	Review safety concerns when dealing with electricity through class discussion	- Edmonton Public Schools Science 5 resource – Mechanisms Using Electricity	30 minutes
Lesson 4 work on idea Circuit diagrams including	Begin planning their electrical device and the roles that each		180minutes



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symbols	group member will have in the project completion.		
Lesson 5 work on idea Circuits (Simple and Parallel) Open and Closed Circuits Switches Adding Batteries equals more power	Build the project as per the plans and revise as needed. Work on a presentation to sell the product to the “Dragons.”	<ul style="list-style-type: none"> - wires - batteries - paper clips - light bulbs - motors - gears - lego - various other electrical equipment 	150 minutes
Lesson 6 present and feedback	Share ideas amongst the group between the different roles. Consider shifting roles as needed within the group.		Ongoing
Lesson 7 work – revise	Continue working on the final product and presentation. Present students with a self-evaluation on group collaboration.		60 minutes
Lesson 8 work – revise	Taking in to account the input from the self-evaluation, continue working on the final product and presentation.		30 minutes
Lesson 9 present and feedback Conductors and Insulators	Present individual aspects of the project within the group. Critique, using constructive criticism each aspect of the project. Write-out the ideas to improve the overall project.		30 minutes
Lesson 10 work - revise	Revise the overall project based on the feedback from the group from the previous class.		
Lesson 11 work - revise	Continue to revise and improve the project and presentation.		
Lesson 12 present and feedback	Present the entire project within the group ensuring that every group member has a role in the presentation.		
Lesson 13 work - revise	Finalize the presentation and ensure that the electrical device is working.		
Lesson 14 (Public Audience)	Present project to a panel of “investors” in hopes that they will buy their project. The panel will ask questions to clarify learning and provide feedback for the group to consider.		60 minutes



CTF Plan: Organized Lightning

Lesson 15 (Reflection and Revision)	Pick one or two questions or considerations from the panel/audience and revise where required.		
Lesson 16 (Celebration)	Allow class to vote on the device that they would purchase and the reasons why. Highlight and celebrate the learning that occurred during the process of creating the device. Ensure that the aspects of electrical science and collaboration/teamwork are included in the student learning highlights.		30 minutes