



# Plan: Project Name Goes Here

<b>Project</b>	<b>Refraction of Light through Spear-fishing (“Shooting Nemo”)</b>																																
<b>Driving Question</b>	How can prepare people, for say a survival situation, to successfully bow or spear fish?	<b>Total Time</b>	<b>10 hours</b>																														
<b>Scenario</b>	Light refracts or bends as it goes from one transparent medium to another. The key to success in bow or spear fishing is understanding the effect of refraction on the image you see versus where the fish actually is.																																
<b>Interdisciplinary Learning</b>	<p><b>GRADE LEVEL</b>  <input type="checkbox"/> 5    <input type="checkbox"/> 6    <input type="checkbox"/> 7    <input checked="" type="checkbox"/> 8    <input type="checkbox"/> 9</p> <p><b>SUBJECT AREA</b></p> <table border="0"> <tr> <td><input 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 type="checkbox"/> Fine Arts</td> <td><input type="checkbox"/> Health and Life Skills</td> <td><input type="checkbox"/> Languages</td> </tr> <tr> <td><input checked="" type="checkbox"/> Outdoor Education</td> <td><input type="checkbox"/> French Language Arts</td> <td></td> </tr> </table>			<input 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 type="checkbox"/> Fine Arts	<input type="checkbox"/> Health and Life Skills	<input type="checkbox"/> Languages	<input checked="" type="checkbox"/> Outdoor Education	<input type="checkbox"/> French Language Arts																			
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<b>CTF Program of Studies Learning Outcomes</b>	<p><b>Essence 1: Career and Technology Foundations is exploring interests, passions and skills while making personal connections to career possibilities and technologies.</b></p> <p><b>Learning Outcomes:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> I explore my interests and passions while making personal connections to career possibilities</li> <li><input checked="" type="checkbox"/> I demonstrate skills associated with occupational areas.</li> <li><input type="checkbox"/> I use technologies related to occupational areas.</li> <li><input type="checkbox"/> I follow safety requirements associated with occupational areas and related technologies.</li> </ul> <p><b>Essence 2: CTF/FCT is designing, creating, appraising and articulating responses to challenges</b></p> <p><b>Learning Outcomes:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> I problem solve when creating responses to challenges.</li> <li><input checked="" type="checkbox"/> I design when creating responses to challenges.</li> <li><input checked="" type="checkbox"/> I make decisions when creating responses to challenges.</li> <li><input checked="" type="checkbox"/> I adapt to change and unexpected events.</li> <li><input checked="" type="checkbox"/> I appraise product(s), performance(s) or service(created in response to challenges.</li> <li><input checked="" type="checkbox"/> I appraise the skills and technologies use to respond to challenges.</li> <li><input checked="" type="checkbox"/> I articulate my learning.</li> </ul> <p><b>Essence 3: CTF/FCT is working independently and with others through the exploration of careers and technology</b></p> <p><b>Learning Outcomes:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I describe how my actions support learning.</li> <li><input checked="" type="checkbox"/> I develop personal skills to support mutually respectful and effective relationships.</li> <li><input checked="" type="checkbox"/> I work with others to achieve common goals.</li> </ul>																																



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<b>Competencies</b>	<p><b>MINISTERIAL ORDER (#001/2013)</b></p> <p><b>2.4 Discover, develop and apply competencies across subject and discipline areas for learning, work and life to enable students to:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <b>know to How to Learn:</b> to gain knowledge, understanding or skill through experience, study, and interaction with others;</li> <li><input checked="" type="checkbox"/> <b>think Critically:</b> conceptualize, apply, analyze, synthesize, and evaluate to construct knowledge;</li> <li><input checked="" type="checkbox"/> <b>identify and Solve Complex Problems;</b></li> <li><input checked="" type="checkbox"/> <b>manage information:</b> access, interpret, evaluate and use information effectively, efficiently, and ethically;</li> <li><input checked="" type="checkbox"/> <b>innovate:</b> create, generate and apply new ideas or concepts;</li> <li><input checked="" type="checkbox"/> <b>create opportunities through play, imagination, reflection, negotiation, and competition, with an entrepreneurial spirit;</b></li> <li><input checked="" type="checkbox"/> <b>apply multiple literacies:</b> reading, writing, mathematics, technology, languages, media, and personal finance;</li> <li><input checked="" type="checkbox"/> <b>demonstrate good communication skills and the ability to work cooperatively with others;</b></li> <li><input type="checkbox"/> <b>demonstrate global and cultural understanding, considering the economy and sustainable development; and</b></li> <li><input type="checkbox"/> <b>identify and apply career and life skills through personal growth and well-being.</b></li> </ul>
<b>Resources</b>	<p>Video material, labs related to the behavior of light, computers for research and presentations, rubrics (peer, group, self, presentation), trough for water with fake “fish”, spear making class?? Connect to outdoor ed. Option. Possible (FNMI) connection?</p>

Lessons	Summary	Resources	Time
Lesson 1 Background	Lesson on the nature of light and light sources.	-video introducing what is light (video quiz) -skeletal notes on historical components	1 Class
Lesson 2 Entry Event	Video material on how animals deal with refraction. Don't explain anything yet just relate what is happening to light behavior.	-Kingfisher video -Archer fish video	1 Class
Lesson 3 Driving Question	“How can we help people learn spear fishing skills (for a survival situation)” -Assemble Groups -Create Need to know list. -Begin Research on Computers	-Video from “Castaway” -Computer Lab	1 Class
Lesson 4 Work on idea-Behavior of light lab.	Students will explore the behavior of light (mainly reflection) by performing a lab with mirrors. They will then look at some web applets dealing with light reflection, the law of reflection, etc.	-Mirror Lab/Exploration (Student Evaluation) -Video (quiz) -Web applets on Reflection (Peer Evaluation)	1 Class
Lesson 5 Work on idea- Refraction of light lab.	Students will explore how light bends by observing its behavior through various lenses.	-Lenses Lab (covers refraction and image formation)(Submitted to teacher...student write up) -Refraction in Materials POE -Web applets on Refraction (student evaluation) -Video (quiz)	1 Class



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		-Refraction index?	
Lesson 6 work class	Students will now work on their research and presentations for spearfishing. The students may learn about: -research into combatting refraction in water -what a refraction index is -the rules to combat refraction at various depths. -how to make a fish spear using saplings or materials available in a boreal forest -fish behavior/locations?	Computer Lab Tree line for a few saplings?	2 Classes
Lesson 7 work class	Work on above		
Lesson 8 present and feedback	Time for peer evaluation and feedback	Rubric, feedback form?	1 Class
Lesson 9 work - revise	Time to revise and finalize		1 Class
Lesson 10 and on	Presentations to various audiences		