

**CODE/MOE/UOIT Makerspaces Project--Lesson Planning Template**

**School Board: Lakehead Public Schools**

**Grade 7 & 8 Science: Structure and Mechanism – Form and Function**

**& Grade 8 Geography–Global Inequalities: Economic Development & Quality of Life** - **Bike Project**

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| **BIG IDEAS:**  Issues related to inequalities in global development and quality of life can have social, environmental, political, and/or economic implications. In this lesson, students will procure, strip, paint, acquire parts, re-assemble, and test bikes before sending them off to another community (Armstrong Public School).  **Science and Technology Specific Curriculum Expectations:**  2.4 use technological problem-solving to investigate a system that performs a function or meets a need;  2.6 use appropriate science and technology vocabulary, including mechanical advantage, input, output, friction, gravity, forces, and efficiency;  **Geography Curriculum Expectations:**  B3 Understanding Geographic Context: demonstrate an understanding of significant patterns in and factors affecting economic development and quality of life in different regions of the world. | |
| **Learning Goals:**  Students will acquire, strip, prepare for powder coating, buy parts (or repurpose), reassemble, and test the bikes that will be sent to students at Armstrong Public School. | **Success Criteria:**  We will be successful when we complete the bikes, test them and send them up to Armstrong. |
| **Lesson Overview:**  After acquiring the bikes, the students will examine the bike and its components and determine which parts that they will be able to keep and which parts they will need to purchase or repurpose from other sources. After the bikes are stripped down, they will be sent to Pelletier’s Autobody who have donated their time and resources to sandblast and Powder Coat the bike frame and forks. The bikes will be brought to a local high school and they will be rebuilt by the students. Bike experts from local business’ will help troubleshoot and test the finished bikes to ensure that they are safe to ride. | |
| **Materials and Technology:**   * Bike * Repurposed or new parts * Tools (some specialty bike tools) * Brake cables * Gear cables * Cable end caps * Cable sheathing * Stickers/decals for decorating the finished product | |
| **Student Accommodations/Modifications:**   * One to one support * Quiet space * Extra time * Small group instruction * Modelling * Allow students to use tablets to view how to videos | **Lesson will be differentiated by:**   * **Content, specifically:** * **Process, specifically:**   - EA support with reading and fine motor assembly  - Allow time for practice/review/repetition  - Rewording/rephrasing of instructions   * **Product, specifically:** * No assessment of product * **Environment, specifically:** * Students can be offered a quieter work space, one to one support |
| **MINDS ON: Getting Started** | |
| The students will create their working groups. Each group will consist of a Project Manager, Purchaser, Engineer, and Creative designer. After the students decide on their roles, the engineers while be heading to a local bike shop to get basic bike maintenance instruction over a 3 day period. They will bring that knowledge back and be the engineering facilitators for the groups during the project. | |
| **ACTION: Working on it** | |
| Students will acquire their bikes and start the process of examining parts, deciding which ones to repurpose and which components they will have to buy or acquire. Groups will take their bikes apart using tools, sorting a labeling parts and storing them in a bin for reassembly later. Once they get the bikes back, they will reassemble and have them tested to ensure they are safe to drive. | |
| **CONSOLIDATION: Reflecting and Connecting** | |
| To conclude this unit, students will take their bikes on a test run, and once deemed completed (by a certified bike technician) the bikes will be stored until the whole group has completed their project. Bikes will be sent to Armstrong Public School. Students will reflect on the process and project through their journals and on Seesaw. | |