Exploring Electromagnets

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(adapted from 2022 NEED curriculum & 2012 adaption in collaboration with Dave Himmah, teacher-retired)

Grades or Range: 4-6

This is lesson 3 of 8 of the educators' Unit: When and Why Do We Build Dams?

Lesson 3: Electromagnets	
Lesson Preparation	Lab materials & student tasks are found in the Energy of Moving Water Student Guide, on the following pages(42-43) *Printed copy :* *Additional materials:* • *Assorted magnets & handheld compasses(4)* • *Voltmeters (6)* • *Eisco-Water Turbine (see lesson one info)* • *Handheld generators (6) https://www.amazon.com/gp/product/B0722Z4PX5/ref=ox_sc_act_title_1?smid=A2EFSDTWMPHWEA&psc=1*
Lesson Sequence	Electromagnets Slides Objective: To increase understanding of the relationship between magnets and electricity. To increase understanding of the variables that affect the force of an electromagnet. Time: 1.5 class periods Lesson sequence: 1. Gather all materials for the activities & set up six centers for each exploration—Electromagnets 1 and Electromagnets 2. 2. Divide the students into six groups and have them review the procedure for their first station, Electromagnets 1 3. Answer any questions and instruct the students to record their hypotheses in their science notebooks. 4. Instruct the students to go to the centers and complete the exploration, recording their observations and data. Then write a conclusion for their station.

	5. When students are done with their first station, have them preview the lab, 6. Electromagnets 2, gather those materials and have students complete the second station. 7. As groups complete the lab, provide students with a handheld generator/ LED to explore its components. 8. Continue explorations with overview of a voltmeter, provide groups with a voltmeter to test their batteries from the electromagnet lab with and allow groups to take their voltmeter to a hydroelectric demonstration station at the sink(s) to explore voltage output. 9. Groups waiting or finishers may work with supplied magnets & compasses and begin a search of hydroelectric dam sites in Washington State. 10. Have a class discussion to review learnings & wondering for the *day*.