

Greening of the Curriculum

Lesson Plan: Velocity of the River

Time Span: 2 days

Grade Level: 11th and 12th

Purpose: To have students create relationships between the velocity of the Calumet River and other parameters and understand how changes in the velocity affects these parameters.

Objective: Given motion sensor and turbidity sensor students will develop a relationship between the velocity of the river and the turbidity and determine whether the velocity causes changes in the turbidity and pH over a section from the bridge to the dam.

Student Outcomes:

Use measurements to develop an understanding of the concepts of speed, velocity, and acceleration; Use the concept of force as described by Newton's laws to predict how these quantities are influenced.

P.1.6, P.1.7, P.1.2

Materials:

Golf ball , Golf Club, Timers, Tape, Bobber or Tennis Ball attached to tether, Lab Quest Motion Detector Sensor, Logger Pro Software

(Pre-Lab Activities)

Learning Activities:

TW: Model to students how to formulate a design to measure the velocity of an object that is moving in a linear path.

TW: Separate students into groups and measure the velocity of a golf ball hit across the floor from one end of the class to another.

TW: Model how to calculate the velocity from the data gathered, the distance, time.

SW: Measure the velocity of the golf ball by timing how long it takes to for the ball to reach a certain marking.

SW: Graph the data gathered and calculate the velocity from the slope of the graph and compare the velocity calculated using the formula to the velocity calculated from the slope of the graph.

(Deep River Lab Activity)

TW: Separate students into groups of four and give each student a section of the river, from the bridge to the dam, to measure the velocity.

SW: Mark the starting and ending positions roughly 25' feet apart on the bank of the river and time how long the ball takes to travel from the start position to the end position.

SW: Record results and average the three trials to achieve an average velocity over their section of the river.

SW: Compare the results from their data charts to other groups to develop a theory on the velocity of the river.

TW: Have students measure the turbidity of the river in their section of the river and compare the samples to formulate correlations between the velocity of the river and the turbidity in various sections.

SW: Measure the turbidity in their section of the river and measure the pH of a sample of the river in their section.

TW: Have students discuss the results of their findings and brainstorm on other factors that may be affected by the velocity of the river.

SW: Develop data charts that display the results of their experiments and design a lab report that supports findings and present for the class.

Assessment:

Oral Discussion, Lab Report, Calculations

Teaching Method:

Hands On

Data Table:

Trials	Distance	Time	Velocity	Turbidity	Temperature	pH
1						
2						
3						