Lesson Plan: Winonah Ojanen –
Ojibwe Language Teacher Shows Passion for Science

Grade Level	9–11	Time Needed	3-4 class periods

Essential Questions
• What does science look like from an Indigenous perspective? • Why is representation in science important? • How can probability and data help us understand disparities in STEM fields?

Learning Goals
• Identify the contributions of Indigenous scientists and science teachers • Explore patterns in STEM education and representation using statistics and probability • Apply data analysis and probability to investigate real-world issues • Recognize the cultural and linguistic roots of science in Ojibwe teachings

Media & Research Resources	
Type	**Title**
Video	[Native Report: Winonah Ojanen – Ojibwe Language Teacher Shows Passion for Science]()
Report	NSF NCSES: Women, Minorities, and Persons with Disabilities in Science and Engineering (2021)
Article	STEM's Racial, Ethnic, and Gender Gaps Are Still Strikingly Large – Science News
Article	[Poll: Native Americans Report Discrimination – Harvard T.H. Chan School]()

Minnesota State Standards	
Minnesota State Standards – Data Analysis and Probability (Grades 9–11)	
9.4.2.1	Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions.
9.4.3.1	Select and apply counting procedures (e.g., multiplication and addition principles, tree diagrams) to calculate probabilities.
9.4.2.3	Design simple experiments and explain the impact of sampling methods, bias, and the phrasing of questions.
9.4.3.2	Calculate experimental probabilities using simulations or experiments and analyze relative frequencies of outcomes.

Daily Lesson Outline
Day 1: Scientist Stereotypes & Representation
1. Ask students to draw a scientist. 2. Record class data on their drawings: gender, race, and age. 3. Watch Native Report video featuring Winonah Ojanen.

4. Facilitate discussion:

   - What does Winonah say about Anishinaabe science?
   - What topics does her classroom explore?
   - Why is diverse representation in science important?

Day 2: Media Literacy and Data Analysis

1. Provide selected articles with charts/graphs.
2. In small groups, students analyze how data can be used or distorted.
3. Identify source, purpose, and impact of each article's representation.

Day 3: Probability Modeling in STEM

- Introduce probability concepts: tree diagrams, sample space, multiplication rules.
- Using NCSES data, students calculate the probability of meeting professors of various races in science departments.
- Students build a simulation or experiment to test their model.

Day 4: Real-World Comparison & Reflection

1. Students contact local colleges to gather real demographic data on science faculty.
2. Compare real outcomes with simulated predictions.
3. Discuss: Does reality match the model? Why or why not?

Assessment Criteria

Category	Exceeds Expectations	Meets Expectations	Needs Improvement
Data Analysis	Clear, insightful interpretation of sources with thoughtful critique	Appropriate use of sources and interpretations	Misinterprets or overlooks key points
Probability Application	Complex calculations with correct logic	Correct basic calculations and modeling	Incomplete or inaccurate application
Cultural Understanding	Deeply connects language and science, using examples from video and text	Demonstrates understanding of Anishinaabe science and diversity	Lacks connection between culture and science
Communication	Clear, formal writing with citations and visuals	Organized and accurate responses	Lacks structure or clarity in explanation