Native Report Season 17 Episode 7

Ojibwe Language Teacher Shows Passion for Science

Materials Needed:

- Video: Winonah Ojanen: Teaching an Ojibwe-language-based science class and a cultural instruction lesson at a Duluth immersion school (Facebook)
- Access to the National Center for Science and Engineering Statistics (NCSES) report on Women, Minorities and Persons with Disabilities in Science and Engineering Women, Minorities, and Persons with Disabilities in Science and Engineering: 2021 | NSF - National Science Foundation (Note that the report is updated every two years, the 2021 version is attached)
- Internet access for searches
- Paper and writing utensils
- Articles using graphs and statistics

Minnesota State Standards:

Grades 9-11 Data Analysis and Probability

Standard: Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions. (9.4.2.1)

Benchmark: Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Show how graphs and data can be distorted to support different points of view. Know how to use spreadsheet tables and graphs or graphing technology to recognize and analyze distortions in data displays.

Standard: Calculate probabilities and apply probability concepts to solve realworld and mathematical problems. (9.4.3.1)

Benchmark: Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities. For example: If one girl and one boy are picked at random from a class with 20 girls and 15 boys, there are 20 × 15 = 300 different possibilities, so the probability that a particular girl is chosen together with a particular boy is 1 300.

Standard: Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions. (9.4.2.3)

Benchmark: Design simple experiments and explain the impact of sampling methods, bias and the phrasing of questions asked during data collection.

Standard: Calculate probabilities and apply probability concepts to solve realworld and mathematical problems. (9.4.3.2)

Benchmark: Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.

Procedures:

1. Before students watch the video have them brainstorm. Prompt students to draw a scientist.
2. After students each draw their scientists, take some class data on the demographics of their scientists. How many of which gender scientists? What race was their scientists? What age groupings (elders, young adults, children) was their scientist?
3. Watch the Native Report Episode: Winonah Ojanen: Teaching an Ojibwe-language-based science class and a cultural instruction lesson at a Duluth immersion school (Facebook)
4. Ask students to discuss Winonah Ojanen's views on Anishinaabe people and science:
   Suggested Questions:
   1. What does Winonah say about people believing that Anishinaabe people were not scientists?
      Teacher notes: This is around 2:18 in the video. She says, "Some people think Anishinaabe People were not scientists, but we were…Science is essentially understanding and discovering the patterns. Not just what is happening in the stars but how does light work, what is happening at different times of year with the seasons. That is deeply engrained in the culture.
   2. What kind of science topics does Winonah's immersion class study? How many of those topics have you studied?
      Teacher notes: Some things mentioned in the video water cycle, animal life cycle, solar system, properties of light, wild ricing, storytelling and legends, sugar bush, spear fishing.
   3. Winonah spoke about science fields not having a lot of different kinds of voices. She said that she is studying Astro Physics. According to Winonah, astronomy is the least represented by Native people and the least diverse of all the sciences. Why does this matter to have a different voice in science, according to Winonah?
      Teacher notes: Introducing and helping Natives become involved in science fields is important because the perspectives and unique ways of looking at things that come from language and culture, will help us to solve problems that were previously unsolvable.

5. Using media and news articles that they bring into class, or you provide. Students should evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Show how graphs and data can be distorted to support different points of view. Know how to use spreadsheet tables and graphs or graphing technology to recognize and analyze distortions in data displays. A few articles have been provided:

1. These 6 graphs show that Black scientists are underrepresented at every level | Science News
2. STEM's racial, ethnic and gender gaps are still strikingly large | Science News
3. Poll: Native Americans report discrimination | News | Harvard T.H. Chan School of Public Health

6. Introduce the research site from National Center for Science and Engineering Statistics (NCSES) report on Women, Minorities and Persons with Disabilities in Science and Engineering Women, Minorities, and Persons with Disabilities in Science and Engineering: 2021 | NSF - National Science Foundation
7. Have student review the reports on this site and explore the topic of race.
8. Have students investigate the report with race and post graduate degrees in science and engineering. The reports are downloaded and included but can also be accessed in the report.
9. Students will select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities. The probabilities using the race data on post-graduate degrees (required to be a college professor) and the number of area colleges. Working in small groups. Students should answer the question what is the probability of the professor at a particular college being a particular race?
10. Student will design simple experiments and explain the impact of sampling methods, bias and the phrasing of questions asked during data collection to answer the greater question posed to the class in number 9.
11. Students will calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes based on the classroom problem posed.
12. Students after figuring the probability model will connect with the area colleges to find out the demographics of the professors in science and engineering.
13. Discuss if the reality in their community and area fits the model designed for the probability.