Women of the Iditarod (and more): A Journey through the Data

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Discipline / Subject: Math (and Women's Studies—Women's History Month is March)

Topic: Data Collection, Graphing, and Analysis

Grade Level: Grades 5 and up

Resources / References / Materials Teacher Needs:
- Access to www.iditarod.com
- Excel, or a similar program, if utilizing graphing option (optional)

Lesson Summary: Students will learn to isolate data with a specific purpose and use that data in a variety of ways including calculating percentages, graphing and analyzing the data for a particular audience.

Standard's Addressed: (Local, State, or National)
1. National Council of Teachers of Mathematics (NCTM) **NM-DATA.3-5.1:** Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer, **NM-DATA.3-5.3:** Develop and evaluate inferences and predictions that are based on data, and **NM-NUM.6-8.1:** Understand numbers, ways of representing numbers, relationships among numbers, and number systems
2. National Council of Teachers of Mathematics (NCTM) **NM-PROB.COMM.PK-12.1:** Organize and consolidate their mathematical thinking through communication; **NM-PROB.COMM.PK-12.2:** Communicate their mathematical thinking coherently and clearly to peers, teachers, and others; **NM-PROB.CONN.PK-12.3:** Recognize and apply mathematics in contexts outside of mathematics.

Learning Objectives:	Method of assessment for learning
1. Students will correctly gather data with a specific purpose. 2. Students will use data to calculate percentage. 3. Students will present data in graph form. 4. Students will write an analysis of the data for a specific audience.	• Iditarod Data Collection Rubric • Student Self-Reflection

Procedural Activities

1. The Hook: Show any clip from the Iditarod Insider showing a brief interview with a women musher. (Alternative: Discuss mushers and pose the question: "Do you think it is easier or harder for a woman to run the Iditarod? Why?")
2. Instruction:
   - Teacher will show this year's Iditarod Musher data, including the stats on the bottom re: women mushers, etc. (2009 Iditarod, Musher Listing)
   - Teacher will ask what percentage of the mushers are women this year and model how to find the answer.
   - Teacher will then make the comment "I wonder how this compares with other years…" show the chart and introduce the "Past Race Archives" (found on the home page—"Learn About" then "Past Race Archives" type in 2008 for year.)
   - Instruct students how to read the list looking for women (keeping count). The total will be at the end of the chart. Then look at scratched mushers and add to the totals. Model as necessary.
3. Individual or Pairs: Students then use the data to complete the chart about Women Mushers. When done, they calculate the percentages.
4. Homework: Create a list of questions you have given the completed data sheet.
5. Instruction:
   - Teacher will instruct students how to create graphs (bar &/or line depending on teacher preference and student ability—there are a variety of ways to go with this activity: line graphs over time work will work well) manually or using Excel, modeling as necessary.
6. Individual: Students use the data to create a graph and (option) create questions to accompany their graph.
7. Whole group: Share generated questions and discuss who might use or be interested in this data, as well as what other data can be gleaned about women and the Iditarod from the archives. Teacher may model his/her own questions and thoughts.
8. Students write an analysis of the data: their insights, predict future trends, etc. &/or chose a specific woman musher for which to gather specific data. Analyze that data &/or create questions for that musher. Write a letter to the musher (contact information on individual musher websites) sharing data and insights or questions. (see extensions for many more ideas to chose from for your particular students' ages &/or abilities)

Materials Students Need:
- Data collection chart
- Access to Internet
- Access to Word and Excel (optional)

Technology Utilized to Enhance Learning:
- www.iditarod.com website
- Use of Word, or similar word processing software
- Use of Excel, or similar graphing software

Other Information:
Bloom's Taxonomy: Knowledge, Comprehension, Application, Analysis, Synthesis &/or Evaluation

Modifications for Special Learners/ Enrichment Opportunities:
- Modification: low/high Supply student with chart partially filled in or with a partner rather than individually OR have students create their own chart &/or column headers
- Make graphs manually rather than using Excel
- Extensions: Have students present data to a mock real-life audience, have students create questions for their graphs, have students select a woman musher to do extended research, generate a list of questions for a musher and write a letter to that musher, send the specific data created for a musher to the musher along with an analysis, predict future trends in the Iditarod in relation to women mushers, compare Libby Riddles, Susan Butcher, and DeeDee Jonrowe and (using the data) make a case for which women musher would deserve to be the first woman inducted into a Musher's hall of Fame.
- Have students do similar data research on a different topic: mushers from foreign countries, rookies, etc.

Women of the Iditarod

Racing Statistics

Year	Mushers	Women	%	Finished	Women	%
2009	73	16	22%			
2008	96	22	23%	78	18	23%
2007	82	12	15%	58	8	14%
2006	83	17	20%	71	14	20%
2005	79	16	20%	63	12	19%
2004	87	13	15%	77	12	16%
2003	64	13	20%	44	10	23%
2002	64	10	16%	55	8	15%
2001	68	8	12%	57	8	14%
2000	81	11	14%	68	8	12%
1999	56	5	9%	47	3	6%
1998	63	6	10%	51	4	8%
1997	53	7	13%	44	5	11%
1996	60	7	12%	49	6	12%
1995	59	9	15%	49	6	12%
1994	58	11	19%	50	7	14%
1993	68	13	19%	54	13	24%
1992	76	15	20%	63	15	24%
1991	76	8	11%	60	8	13%
1990	70	6	9%	61	5	8%
1989	49	9	18%	38	8	21%
1988	52	6	12%	45	6	13%
1987	63	9	14%	50	7	14%
1986	73	4	5%	55	4	7%
1985	61	5	8%	40	4	10%
1984	67	7	10%	45	6	13%
1983	68	10	15%	54	9	17%
1982	54	2	4%	46	1	2%

1981	**53**	**5**	**9%**	**38**	**5**	**13%**
1980	**60**	**7**	**12%**	**36**	**6**	**17%**
1979	**55**	**2**	**4%**	**47**	**2**	**4%**
1978	**39**	**3**	**8%**	**34**	**3**	**9%**
1977	**41**	**0**		**25**	**0**	
1976	**47**	**0**		**34**	**0**	
1975	**41**	**0**		**25**	**0**	
1974	**44**	**2**	**5%**	**26**	**2**	**8%**
1973	**35**	**0**		**22**	**0**	

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Women of the Iditarod: A Journey through the Data
Self-Analysis

Name _____   Date _____

1. What part of the data collection activity did you find most difficult?

2. How did you overcome this difficulty?

3. On a scale of 1-10 (with 10 being the most interested) how interesting did you find this activity? _____   Why?

4. What do you think was the most valuable thing you learned from this activity?

5. Do you have any suggestions for the teaching of this activity in the future? What are they?

6. Please feel free to make any additional comments about the activity below.

"Women of the Iditarod Data Research Rubric

	4	3	2	1
Data Collection Accuracy	Required data collection was achieved and the student went beyond to find additional information relevant to the topic. All facts are accurate. All fact finding was done independently.	Required data collection was achieved and the chart completed thoroughly. All facts are accurate. Most fact finding was done independently.	Required data collection was attempted, but the chart may not be thoroughly completed. Some facts may be incorrect. Some fact finding was done independently.	Required data collection was attempted, but the chart is missing key information. Many facts may be incorrect. Most fact finding was done with the aid of the teacher or another student.
Mathematical Accuracy	All percentages are complete and correctly calculated. In some cases, additional information was given.	All percentages are complete and correctly calculated.	Most percentages are correct, but there are some errors in calculation.	Some of the percentages are incorrect and there are many errors in calculation.
Creation of Mathematical Graph(s) to Present Data	There is more than one graph which accurately and clearly presents the mathematical data. The report is presented in a clean and neat manner.	The graph accurately and clearly presents the mathematical data. All work is neat.	The graph may have inaccurate mathematical work or may have errors in graphing format. Graph may be hard to read.	The graph is lacking important data &/or is hard to understand, mathematical work is unclear and hard to follow.
Analysis &/or Communication of Mathematical Knowledge	The supporting analysis &/or communication of the mathematical data shows clear, thorough, and insightful thinking.	There is clear and thorough supporting analysis &/or communication of the mathematical data.	There is an attempt at some analysis &/or communication of the mathematical data, but the message may be unclear.	There is little to no analysis &/or communication of the mathematical data.