WHO RUNS THE IDITAROD?

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Discipline / Subject: Math

Topic: Data Collection, Graphing**,** Probability

Grade Level: 3-8; others with modification

Resources / References / Materials Teacher Needs:

***Parts of this lesson are based on a lesson originally found on the Cabela's Iditarod Education Expedition site.

Lesson Summary:
The students will use probability to predict the characteristics of the winner of this year's Iditarod. They will then chose a musher to track during the race.

Standard's Addressed: (Local, State, or National)
Common Core Math Standards (Grade 6)

CCSS.Math.Content.6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages*.

CCSS.Math.Content.6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

Learning Objectives:

- TLW identify and classify this year's Iditarod Mushers based on their gender, experience, and residency
- TLW create a circle graph to display data
- TLW identify the probability of the various musher characteristics winning the race
- TLW identify a musher to track during the race

Assessment:
Students can be assessed on the worksheets completed during the lesson.

Procedural Activities:

Day One:

1. Warm- Up:
    a. Have the students describe what characteristics they feel a "typical" Iditarod musher has. Are they male or female? How much experience do they have? Where do they come from?
    b. Have students share their thoughts. Explain that for the next few days, they are going to be discovering "Who Runs the Iditarod," make some predictions about the winner, and ultimately choose a musher to track during the race.
    c. The teacher can collect the entries and enter use them to create a Wordle at http://www.wordle.net/ that describes what the students think about Iditarod Mushers. (I have repeated this activity at the end of the race and compared the two Wordles – the students' opinions can really change!)

2. Divide class into 3 groups:
    Experience: rookie vs. veteran
    Gender: male vs. female
    Residency: Alaska vs. Lower 48 vs. Foreign

    Have each group sort through the current musher data to find the number of mushers who meet each of their characteristics. They should record their data in a t-chart on their worksheets. One way that works well is for one partner to read the characteristic (male, male, male, female, etc.) as the other partner records the tallies.

3. Create Circle Graph:
    Have each group create a circle for their own criteria using this site: http://nces.ed.gov/nceskids/createagraph/ Note: students can save, email, or print from this site – teacher will need to demonstrate program prior to students working independently

4. Share Data:
    a. Have each group present their findings to the whole class
    b. Keep graphs for tomorrow's lesson
    c. Graphs can then be displayed with the Musher Tracking Map

Day Two:

1. Brainstorm as a class: Using pie graphs from yesterday, determine the possible characteristic combinations for mushers. As you work, have the students record the possible combinations on their worksheets (do not complete the ranking column yet).

Male –veteran – Alaska	female – veteran - Alaska
Male – rookie – Alaska	female – rookie - Alaska
Male – veteran – lower 48	female – veteran – lower 48
Male – rookie – lower 48	female – rookie – lower 48
Male – veteran – foreign	female – veteran - foreign
Male rookie – foreign	female – rookie – foreign

2. Make models to represent actual mushers racing this year:
    a. Use unifix cube stacks to represent the mushers. There should be one stack per musher. Divide the mushers between student partners.
    b. Stack- gender on top, experience center, residency on bottom

Rookie = white
Veteran = black
Male = blue
Female = pink
Alaska = yellow
Lower 48 = red
Foreign = green

3. Sort the stacks into like groups: As a whole class, sort all of the stacks into like groups. For example all the male veterans from Alaska should be in one group.

4. Chart: Have the students return to their original charts and complete the ranking column. They should rank the characteristic combinations from the most likely to win to the least likely.

5. Have students complete the evaluation questions either independently or as a group.

6. Wrap – Up: Run a quick probability experiment. Put all the stacks in a bag and have each student choose one. Did the results of the experiment match what was expected?

Day Three (Extension):

Notes:

- *You may or may not want to teach this lesson immediately after the first two. I usually wait to teach it until the day of the pre-race musher banquet when the mushers draw for starting order.*
- *You may want to have the students read the musher biographies for homework the night before this lesson.*
- *I like to do this lesson as a "mock" banquet to simulate the actual draw/banquet.*
    - *As the students enter the classroom in the morning, their morning assignment has them sign their names on the board in the order they arrive in the morning. This gives us an order to do the "draw" during math class. The mushers draw in the order they signed up for the race.*
    - *As each student is called, they come to the front and draw a stack from the mukluk. The mushers draw a round chip from a mukluk with their starting number.*
    - *The students then announce to the class the characteristics shown on their stack and choose a matching musher. The mushers must announce their starting number and then usually make a few comments.*
    - *The mushers then exit the stage and go through the "autograph" chute. I like to have the students autograph around the edges of the map we will be using to track our mushers.*

1. Review with the students what has been discovered about the characteristics of the mushers running the race and the probability behind predicting the winners. Put unifix stacks in the bag (or mukluk).

2. One at a time, each student draws a stack.

3. They must choose a musher that matches the characteristics on the stack to follow on the trail during the race. You can do this in a couple of different ways. They can choose based on just the characteristics from a chart, or if they have read the musher biographies ahead of time to have some other basis for their choices.

4. Have students use musher biographies to write the rough draft of their musher biography card on their worksheets.

5. Have students write the good copy of their card and post them with the Trail Map.

   Note: The pin number on the biography card matches the number on the push pin that the students use to track their mushers on the map. You could use the mushers' bib numbers for this.

6. Wrap-Up: Discuss the mushers that the students pulled as a probability experiment. Did the most students pull the most common stacks? Did the least students pull the most unique stacks?

Materials Students Need:

- Current musher data sheet *** delete the summary from the bottom (available from the official Iditarod site)
- One laptop per group
- Student worksheets (included at the end of the document)
- Unifix cubes
- Bag
- Mukluk or boot to draw from
- Musher biographies from Iditarod site

Technology Utilized to Enhance Learning:

Wordle - http://www.wordle.net/
Online Graphing - http://nces.ed.gov/nceskids/createagraph/
Iditarod.com for research - http://iditarod.com/

Other Information:

The students could also complete the Race Application as if they were their musher to get an idea of what information the mushers need to have to sign up for the race. The form can be found on the Iditarod Website.

Modifications for Special Learners/ Enrichment Opportunities

- You can change the difficulty of the lesson by increasing the difficulty of the probability sections. Younger children could look at it terms of least likely, likely, most likely. More advanced students could look are the probability in terms of fractional chances.

Additional Information

Who Runs the Iditarod?

PART ONE:

In the space below, describe what you think the typical Iditarod musher is like. Is it a man or woman? How much experience do they have? Where do they come from? What characteristics do they have?

PART TWO:

In the space below, create a t-chart to record the data about the criteria your group is researching.

PART THREE:

There are many different identities a musher can fall into; veteran, rookie, man, woman, from Alaska, from the lower 48, or from a foreign country. Each musher uses three of these different identities to describe him or herself. There are twelve different identity categories for a musher to fall into.

1. First see if you can list all twelve identities.
2. Next, rank in order from the most likely identity to the least likely identity of the musher who will win

GENDER	EXPERIENCE	RESIDENCY	RANK

PART FOUR:

1. What is the most likely identity of the musher who will win the Iditarod this year? Explain why you think this is true.

2. Which set of identities is least likely to be found at the race? Why do you think not many mushers with these identities enter the race? What might keep them from participating?

3. Are there any other identities that we could have measured as well?

4. Write four other observations you can make about the data.

PART FIVE:

Complete the rough draft for the musher you have chosen to follow.

MUSHER BIOGRAPHY CARD

Glue Photo Here

Musher's Name: _____

Veteran or Rookie? _____ Male or Female? _____

Hometown: _____

Other Interesting Facts:

_____

_____

_____

_____

_____

_____

Tracker's Name: _____ Pin Number: _____