Predicting the Winner?: Analyzing the Data

Developed by:
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Discipline / Subject:
Math

Topic:
Statistics and Data Analysis

Grade Level: 7,8,9

Resources / References / Materials Teacher Needs:

- www.iditarod.com
- https://iditarod.com/tracker/#6/63.696/-158.400 - Page to access analytics

Lesson Summary:

- Students will collect data on the speed of a sled team then will create visual representations (box plots and histograms) to analyze and compare the different teams. Using their results, students will predict when their team will finish the race, and ultimately who will win.

Standards Addressed: (Local, State, or National)

1. 7.SP.2 Broaden statistical reasoning by using the GAISE model:
   a. Formulate Questions: Recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data.
   b. Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. (GAISE Model, step 2)
   c. Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual, and comparing individual to group. (GAISE Model, step 3)
   d. Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question. (GAISE Model, step 4)
2. 7.SP.3 Describe and analyze distributions.
   a. Summarize quantitative data sets in relation to their context by using mean absolute deviationG (MAD), interpreting mean as a balance point.
   b. Informally assess the degree of visual overlap of two numerical data distributions with roughly equal variabilities, measuring the difference

between the centers by expressing it as a multiple of a measure of variability.

Learning objectives:

- Students will take a representative sample of speeds of a sled team
- Students will represent their data on both a box plot and histogram
- Students will analyze and compare data displays of different sled teams
- Students will predict when their sled team will finish the race

Assessment:

- Check of boxplots and histograms during lesson
- Exit slip questions:
  - Prediction of when their team will finish
  - Which team(s) appears to be the fastest?
  - Which team(s) appears to be the most consistent?

Procedural Activities

1. To introduce the lesson, give a brief overview of the Iditarod race.
2. Show students the data website and discuss a sample graph of one day of the race with the class. Ask students to describe the day for the sled team as a Think-Pair-Share activity. Make sure to discuss what is happening when speed is zero, or are increasing/decreasing.
3. Break students up into partners/groups and assign each grouping a sled team. Each group will then complete the following:
   a. Collect a sample of 20 speeds of their team
   b. On their own graph paper, create a combination boxplot and histogram of their data
   c. Have their plots checked by teacher
   d. Create a poster display of their boxplot and histogram
4. When all students are finished with their posters, hang them up on the board. Give students a few minutes to quietly analyze them, then lead a class discussion focused on comparing and contrasting the different teams.
5. Have students complete the exit slip questions.
6. Share out with the class the predictions and which team is predicted to win.
7. At a future date when the actual race is completed, revisit the predictions to test their accuracy.

Materials Students Need:

- Graph paper
- Poster Board graph paper

Technology Utilized to Enhance Learning:

- https://iditarod.com/tracker/#6/63.696/-158.400 - Page to access analytics
- If this lesson is done during the race, students can use any musher by looking at their analytics on the Iditarod website https://iditarod.com/race/2022/standings/

Other Information

- This lesson should be taught only after students are already familiar with collecting samples of data and creating data displays. It is meant as a summation and formative assessment of these skills and of interpretation.

Modifications for special learners/ Enrichment Opportunities

- Students may need scaffolding and assistance with creating boxplots and histograms.
- For enrichment, students can pick a different type of data to represent and analyze about a sled team.