

What is an Average Leg? Fairbanks Start

Developed by: Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **UPDATED 12/17**

Discipline / Subject: Math

Topic: Mean, Median, Mode, and Range

Grade Level: Fourth, others with modifications

Resources / References / Materials Teacher Needs:

Lesson Summary:

Students will determine what an “average” leg on the Iditarod Trail is in terms of length.

Standard’s Addressed: (Local, State, or National)

Common Core Sixth Grade:

6-SP: Develop understanding of statistical variability. Understand that a set of data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape.

Learning Objectives:

TLW calculate the average distance of a leg on either the Northern or Southern Route.

TLW compare the average distance of a leg on the two routes.

Assessment:

Students can be assessed on their class assignment sheets.

Procedural Activities:

Prior Knowledge:

Students need to have an understanding of how to calculate the mean, median, mode and range. This assignment could be an assessment of those skills.

Introduction:

1. Remind the students that there are actually TWO routes for the race that alternate every year.
2. Refer to the Iditarod page to explain the reason for the two trails:

Why does the trail go one way in even years (*northern*) and the other way in odd years (*southern*)?

Both sections of trail are a part of the Iditarod National Historical Trail which was used in early years for all winter travel. Dog sleds delivered the mail, the preacher, the groceries, and hauled out gold and furs all the way to Anchorage or Fairbanks.

During the early years of the Iditarod Race, the mushers only traveled the northern trail. After several years, the Iditarod Board of Directors realized that the smaller villages were being heavily impacted by the race coming through their village year after year. It was decided to use both sections of the trail.

This decision had a threefold effect. The northern villages of Ruby, Galena and Nulato only had to deal with the large group of mushers, press, and volunteers every other year. The second effect was that the race was able to pass through the actual ghost town of Iditarod. Lastly, the villages of Shageluk, Anvik, and Grayling were able to participate in the race.

3. 2015 & 2017 were unusual years, in those years, the race actually started in Fairbanks and included some towns that had previously not been a part of either route.
4. Explain that today we are going to determine the length of an “average leg.”

Procedure:

1. Split the class into three groups.
2. One group will find the mean, median, mode, and range of the legs on the Northern Route. The second group will do the same for the Southern Route. The third group will do the same for the Fairbanks route.

**** Note:** Golovin is not an official checkpoint, but it was at one point. It remains an important village on the trail, but no official records are kept there.**

3. When all of the calculations have been completed, have the students share their findings with the other group.

Summary:

Have the students explain in writing which route they would most like to race on and why. I ask them to take into consideration the data they have analyzed today, but they may include other information they have learned in their reasoning.

Alternatively, they could write about the third route. Many people have suggested that the Fairbanks route be maintained and rolled into the rotation of Iditarod routes so that the routes would each be used every three years. Given what they have learned about the average of a leg, does that seem to be a valid idea?

Materials Students Need:

- Route Maps
- Checkpoint distances charts
- Student worksheets (attached)

Technology Utilized to Enhance Learning:**Other Information:**

Here is another mean, median, mode, range activity dealing with dogs. In this activity, the students are testing dogs intelligence in four different tests:

<http://files.pbslearningmedia.org/dlos/tpt/landmarks/index.html>

Modifications for Special Learners/ Enrichment Opportunities:

More advanced students could calculate both the Northern and Southern Routes instead of just one or the other.

Older students could use this theme to spur a discussion about why the legs aren't even. Could they replan the race course so that the legs are all the same?

Additional Information

What's The Average? Vocabulary

Range:

The range is the difference between the highest and the lowest numbers in a set of data.

Mean:

The mean is the average of a set of numbers. To find this, add the numbers and then divide by the number of addends.

Median:

The median is the middle number in the set of numbers when the numbers are arranged in order from the least and greatest.

Mode:

The mode is the number that occurs most often in a set of numbers. It is sometimes easier to find the mode if the numbers are arranged in order from least to greatest.

What is an Average Leg?

Your challenge today is to determine what an “average leg” on the Iditarod run is. Using the data, complete the chart. Remember, you are looking at the distance BETWEEN checkpoints. All data taken from the Iditarod website:

<http://iditarod.com/race-map/>

Northern Route



Checkpoints	Distance between Checkpoints
Anchorage to Campbell Airstrip	20
Campbell Airstrip to Willow	29
Willow to Yentna Station	52
Yentna Station to Skwentna	34
Skwentna to Finger Lake	45
Finger Lake to Rainy Pass	30
Rainy Pass to Rohn	48
Rohn to Nikolai	75
Nikolai to McGrath	54
McGrath to Takotna	18
Takotna to Ophir	25
Ophir to Cripple	59
Cripple to Ruby	112
Ruby to Galena	52
Galena to Nulato	52
Nulato to Kaltag	42
Kaltag to Unalakleet	90
Unalakleet to Shaktoolik	42
Shaktoolik to Koyuk	48
Koyuk to Elim	48
Elim to Golovin	28
Golovin to White Mountain	18
White Mountain to Safety	55
Safety to Nome	22

Record your final answers here:

What is the mean distance between checkpoints on the Northern Route?	
What is the median distance between checkpoints on the Northern Route?	
What is the mode distance between checkpoints on the Northern Route?	
What is the range of distances between checkpoints on the Northern Route?	

Southern Route



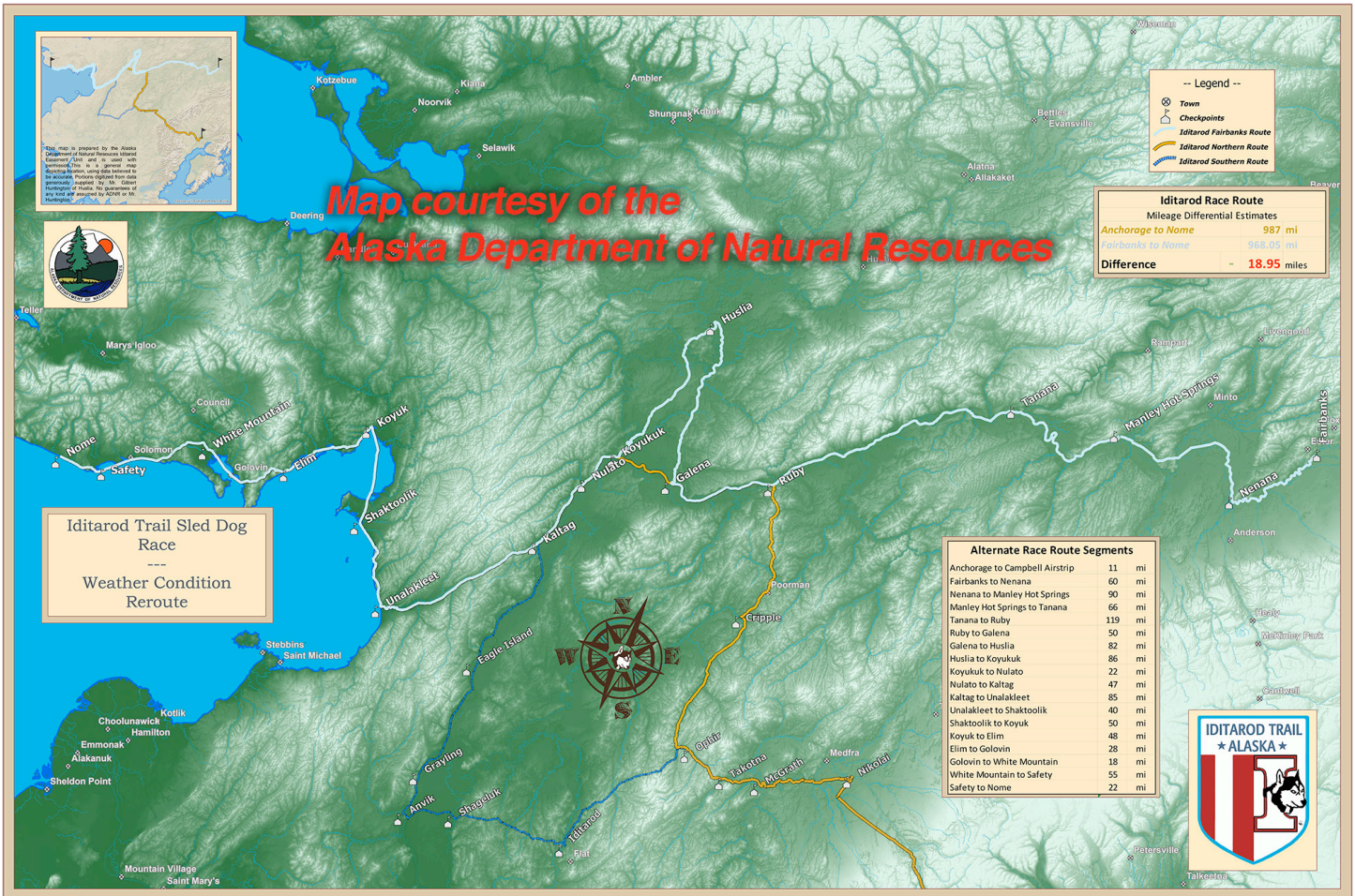
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Yentna Station to Skwentna	34
Skwentna to Finger Lake	45
Finger Lake to Rainy Pass	30
Rainy Pass to Rohn	48
Rohn to Nikolai	75
Nikolai to McGrath	54
McGrath to Takotna	18
Takotna to Ophir	25
Ophir to Iditarod	90
Iditarod to Shageluk	65
Shageluk to Anvik	25
Anvik to Grayling	18
Grayling to Eagle Island	60
Eagle Island to Kaltag	70
Kaltag to Unalakleet	90

Checkpoints	Distance between Checkpoints
Unalakleet to Shaktoolik	40
Shaktoolik to Koyuk	58
Koyuk to Elim	48
Elim to Golovin	28
Golovin to White Mountain	18
White Mountain to Safety	55
Safety to Nome	22

Record your final answers here:

What is the mean distance between checkpoints on the Southern Route?	
What is the median distance between checkpoints on the Southern Route?	
What is the mode distance between checkpoints on the Southern Route?	
What is the range of distances between checkpoints on the Southern Route?	

Fairbanks Route



Checkpoints	Distance between Checkpoints*
Anchorage to Campbell Airstrip	11
Fairbanks to Nenana	60
Nenana to Manley	90
Manley to Tanana	66
Tanana to Ruby	119
Ruby to Galena	50
Galena to Huslia	82
Huslia to Koyukuk	86
Koyukuk to Nulato	22
Nulato to Kaltag	47
Kaltag to Unalakleet	85
Unalakleet to Shaktoolik	40
Shaktoolik to Koyuk	50
Koyuk to Elim	48
Elim to Golovin	28
Golovin to White Mountain	18
White Mountain to Safety	55
Safety to Nome	22

Record your final answers here:

What is the mean distance between checkpoints on the Fairbanks Route?	
What is the median distance between checkpoints on the Fairbanks Route?	
What is the mode distance between checkpoints on the Fairbanks Route?	
What is the range of distances between checkpoints on the Fairbanks Route?	

Based on the information you have gathered today, if you were going to enter the Iditarod, would you rather run on the northern route, southern route, or Fairbanks route? Why?
