

# As the Trail Turns: Elapsed Time Averages

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™

**Discipline / Subject:** Math

**Topic:** Elapsed time and averages

**Grade Level:** Four, others with modification

**Resources / References / Materials Teacher Needs:**

- Students' Musher Tracking Forms
- Copies of or internet access to all of the current race logs in case students are missing data
- Teacher copy of Musher Tracking Form (tracking Ken Anderson as an example)
- Student worksheets (attached)

**Lesson Summary:**

Students will calculate the average time their musher spent on several legs of the Iditarod and compare them to the teacher's musher.

**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.

Common Core Fourth Grade:

CCSS.Math.Content.4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

**Learning Objectives:**

TLW calculate the elapsed time of their musher on the first seven legs of the race.

TLW calculate the average time spent on the first seven legs of the race.

TLW compare the average times of their musher and a musher of the teacher's choosing.

**Assessment:**

The students can be assessed on the included worksheets.

## **Procedural Activities:**

### **Notes:**

- This lesson uses data from the first seven legs of the CURRENT year's race. Therefore you will need to wait until all (or at least most) of the mushers your students are tracking have completed the first seven legs. For mushers who have not completed the first seven legs, the math work will be slightly different, but comparing the data should still work.
- I use Ken Anderson as my musher to track and therefore this lesson has the students compare their musher to Ken. Obviously, you can track any musher you'd like to have your students compare.

### **INTRODUCTION:**

1. Discuss with the students the idea that early in the race it is often difficult to figure out who is "winning" the race. Since the mushers started at staggered times and may not have made up for the difference yet, arriving first at a given checkpoint doesn't automatically mean you are in first place.
2. One thing we can look at is the average speed for each musher on each leg of the race. We could then compare that data to get a sense of who is travelling the fastest.

### **PROCEDURE:**

1. The teacher will model finding Ken Anderson's average time on the first seven legs.
  - a. You can do this in a couple of ways – students could use their tracking sheets to calculate the time spent on each portion of the trail by using the check-out time of one checkpoint to the check-in time at the next checkpoint. Be sure to have copies of the race logs available in case students are missing data.
  - b. Or – the time enroute is shown on the race logs. In this case, it's easiest to have copies of the race logs from which the students can collect their information.
2. Students complete the second portion of the chart for their own musher.
3. Students then compare their musher to Ken Anderson and make a judgment about who has the better time.
4. As an extra challenge, the students can compare data for all of the mushers at their table or class and rank them in order.

### **SUMMARY:**

Challenge the students to analyze whether or not this method is effective for determining who is "winning" the race at this point. Make sure that the students realize that some mushers rest along the trail. They may prefer to camp on the side of the trail instead of in checkpoints for various reasons. So there are still many variables to consider before determining who is really winning! It's usually really hard to tell this early in the race.

**Materials Students Need:**

- Students' Musher Tracking Forms
- Copies of or internet access to all of the current race logs in case students are missing data
- Teacher copy of Musher Tracking Form (tracking Ken Anderson as an example)
- Student worksheets (attached)

**Technology Utilized to Enhance Learning:**

Iditarod Website for tracking mushers: <http://iditarod.com/race/>

**Other Information:****Modifications for Special Learners/ Enrichment Opportunities:**

- Students could work in partners to do the calculations
- More advanced students could do more than seven legs, or track several mushers – perhaps a veteran vs. a rookie, etc.
- Students could be provided a calculator to assist with computation
- At the end of the race, students could calculate the average time spent ON trail for the first three finishers and see if the average time on the legs of the race correlated to their final finishing order. They could analyze the reasons for that.

**Additional Information**

# As the Trail Turns: Average Elapsed Time

The mushers' ceremonial starts do not count towards their "official" race time. The official race times actually start on Sunday in Willow.

Look at the data for Ken Anderson and complete the chart below:

Time Leaving...	Time Arriving...	Time Elapsed on Trail...
Willow	Yentna	
Yentna	Skwentna	
Skwentna	Finger Lake	
Finger Lake	Rainy Pass	
Rainy Pass	Rohn Roadhouse	
Rohn Roadhouse	Nikolai	
Nikolai	McGrath	

What was Ken Anderson's average time for the first seven legs of this year's race?

Average: \_\_\_\_\_

Look at the data for your musher and complete the chart below:

Time Leaving...	Time Arriving...	Time Elapsed on Trail...
Willow	Yentna	
Yentna	Skwentna	
Skwentna	Finger Lake	
Finger Lake	Rainy Pass	
Rainy Pass	Rohn Roadhouse	
Rohn Roadhouse	Nikolai	
Nikolai	McGrath	

What was your musher's average time for the first seven legs of this year's race?

Average: \_\_\_\_\_

Who had the better average time on the first five legs? How do you know?

**Bonus Question:**

At your table, compare the data of all of the mushers being tracked. In the space below, list all of the mushers in order from the fastest to the slowest average leg time. Don't forget to include Ken Anderson.