

# “Mathing” Down the Trail... Iditarod Math

## Grades 2-6



Created by:  
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2014 Iditarod Teacher on the Trail

revised  
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# Iditarod Math Unit: Grades 2-6

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# Filling the Dog Yard!

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Revised 08/2023**

**Discipline / Subject:** Math, Getting to Know You

**Topic:** Glyphs, Data Sharing

**Grade Level:** Second-Fifth; K-1 and 6-12 with modifications

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

Teacher created model of completed glyph  
Legend to display on chart or Smartboard

**Lesson Summary:**

This lesson should be presented in the first few days of school. The students will create a glyph (a pictorial representation of data) as a way to introduce themselves to their teacher and other students and set the stage for the classroom Iditarod/mushing theme.

**Standards Addressed: (Local, State, or National)**

NCTM Data Analysis and Probability Standard:

- *Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them*
- *Select and use appropriate statistical methods to analyze data*

**Learning Objectives:**

- TLW create a glyph displaying data about themselves
- TLW analyze others' glyphs to identify similarities and differences
- TLW present their glyphs as a way to introduce themselves to the class and teacher

**Assessment:**

1. The glyph will serve as a way to assess the students' ability to collect, organize and display data.
2. Since this lesson occurs so early in the school year, it could lay a baseline or pre-assess students' abilities to:
  - to read and perform a task
  - present information to classmates
  - identify adjectives
3. It could also serve as an Interest Inventory.

## Procedural Activities

### Day One

#### **Introduction:**

Tell the students that you are going to share some information about yourself with them. Display your completed glyph. Ask the students what information they have learned about you. You will probably get some confused looks in response!

#### **Procedure:**

1. Tell the students that your dog face is actually a glyph.
2. Define a glyph as a way to display data in a picture form. Many professions also use glyphs as a quick way to record information. For example, dentists can record data on a picture of teeth or a chiropractor might record data on a picture of a skeleton.
3. Since our classroom is “going to the dogs” this year, we are going to record our data as a picture of a dog!
4. Display the chart with the questions and responses for the students and again ask the students what they can learn about you from your glyph. The answers should be much more accurate this time!
5. The students will then use the patterns to create their own glyphs. They read the question, choose the correct response, and then make their glyph by following the directions. I have the students trace the pattern pieces onto construction paper, cut them out and assemble them into the dog faces. You could also have them color the pieces and then cut out and assemble.

#### **Summary:**

Have the students compare glyphs with the other students at their tables. Have table groups share similarities and differences in interests that they observed.

### Day Two

#### **Introduction:**

Return the students’ glyphs to them. Ask them to swap glyphs with the person sitting across from them. Have students identify one piece of data they can learn about their friend by analyzing their glyph. I also ask them to find things that are similar and dissimilar among their table. They seem to always want to talk about the physical glyphs, “We all have brown eyes.” I use this time to remind them that a glyph is a representation of data and so they need to talk in terms of the data, “We all enjoy reading fantasy books.”

#### **Procedure:**

1. Tell the students that many of the mushers we will be meeting and talking about this year have large kennels of dogs.
2. In naming the dogs, the mushers sometimes name the litters in groups. For example, Brent Sass has a Game of Thrones litter ( Yara, Brienne, Bronn, etc.), Matt Failor has a "luxury car "litter (Benz, Cadillac, DeLorean ), and Jeff Deeter has a "mistakes" litter (Whoopsie, Risk, and Lucky). Why would this be a good idea? It helps them remember which puppies belong to which litter.
3. Today we are going to name the puppies they created yesterday. Have them brainstorm a list of topics they could use as a theme for the litter’s names. Use 2023 Teacher on the Trail Juli’s lesson: "[It's All in the Name](#)" as a preparatory lesson for this.
4. We brainstorm a list of categories and then vote for our favorite one. In the past few years we have had the Breakfast Cereal Litter, The Weather Words Litter, and the Soda Litter!
5. Each student will choose a name related to the theme for his or her dog and create a dog tag for the glyph with the name on it. I have been using the metal key tags like this:  
<http://www.officedepot.com/a/products/681277/Office-Depot-Brand-Round-Key-Tags/>
6. Each student will then complete the “Introducing.....” sheet about their puppy.

#### **Summary:**

Over the next few days, as time allows, the students will introduce themselves to the class using their puppy glyph and worksheet as a guide. I then display the completed glyphs on a bulletin board with a sled that says “Jump On The Sled and Head Off On a Great Adventure!” When the bulletin board is taken down, I bind the glyphs and introduction sheets in a book for the classroom library.

**Materials Students Need:**

Construction paper – black, brown, white, red, blue, green, yellow, orange  
Scissors  
Glue or glue sticks  
Craft foam sheets in white to cut tags or metal key tags  
Templates to trace or color and cut (attached)  
Copies of the legend (attached)  
Copies of Introduction sheets (attached)

**Technology Utilized to Enhance Learning:**

- The teacher could take students on a virtual trip to Brent Sass’s kennel to “meet” the various litters. His a page that introduces the dogs and mentions their litter themes. - <https://wildandfreealaska.com/wild-and-free-dogs-all-dogs/>
- I use the Web 2.0 Tool Youplisher - <http://www.youplisher.com/> - to create a digital copy (with flippable pages) of the completed book. The book is then shared with the parents via my classroom web page.

**Other Information:**

Someone always wants to have more than one answer to a question; I allow it as long as they can find a reasonable way to display more than one answer. For example, the dog could have two different colored eyes or be spotted instead of solid colored.

**Modifications for Special Learners/ Enrichment Opportunities**

- The types of questions asked could be altered to meet your needs
- Some students benefit from reading through all the questions first and highlighting their choices on the legend prior to beginning to build their glyph
- The number of questions and/or choices could be altered to meet individual needs. You could add a question to determine the shape of the ID tag or make a glyph of the whole dog to allow for more questions.
- Instead of creating a “getting to know you” glyph, students could create a glyph to show data about the musher they are going to track, a specific checkpoint, kennel, or any other topic.

**Additional Information:****Alternatives for Older Students:**

1. Digital Glyphs – Instead of having the students create a picture glyph from paper, they could create a digital glyph from an avatar creation program which could be used as their classroom avatar for classroom discussion boards, wikis, etc. Instead of creating a dog picture, they could create a musher.
  - a. I have used DoppMe - <http://www.doppelme.com/> with my third graders and have found it easy to use.
  - b. Portrait Illustrator Maker - [http://illustmaker.abi-station.com/index\\_en.shtml](http://illustmaker.abi-station.com/index_en.shtml) works well with this. The answers to the questions could determine the hairstyle, hat, facial hair, glasses, and even the type of item held in their hands. The avatars can be downloaded or printed (defaults to a bit smaller than a 1.5” square).
2. Alternative to Glyphs – These activities could also be used to show answers to a set of problems. Instead of questions, the teacher would give the students a set of problems. Each alternative choice would be a different answer. In this case, the design of the picture or avatar would be determined by the correct answers to the questions. The picture or avatars would all match at the end (hopefully). This would allow for modification in terms of difficulty of problems presented and could even be modified for individual students as needed.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Filling the Dog Yard!

## Glyph Legend

Dog Face and Neck Color	<b><u>When do you usually do your homework?</u></b>  Brown – right after school Black – after dinner White – some other time
Ear Style	<b><u>What is your favorite type of book to read?</u></b>  2 floppy ears – fantasy 2 perky ears – historical 2 sideways ears - mystery 1 floppy and 1 perky – realistic fiction 1 floppy and 1 sideways – non-fiction 1 perky and 1 sideways – humorous fiction
Collar Color	<b><u>What is your favorite type of writing to do?</u></b>  Red – realistic stories (things that really happened) Blue – non-fiction (reports) Green – poetry Yellow – fiction stories Orange – journal writing
Nose Color	<b><u>What is your favorite topic in math?</u></b>  Pink – operations (addition, subtraction, multiplication, division) Black – geometry Brown – measurement and data
Eye Color	<b><u>What is your favorite subject in school?</u></b>  Black – Math Green – Reading Blue – Social Studies Brown - Writing

# Introducing...

This is my puppy \_\_\_\_\_

He is a part of the \_\_\_\_\_ litter.

Five adjectives that describe my puppy's personality are:

---

---

---

---

---

Three facts you can learn about me from my puppy glyph are:

1. \_\_\_\_\_

---

2. \_\_\_\_\_

---

3. \_\_\_\_\_

---

My favorite activity to do with my puppy is...

---

---

By: \_\_\_\_\_



# Drafting a Fantasy Iditarod Team!

**Developed by:** Jen Reiter, 2014 Iditarod Teacher on the Trail™, **Revised 08/2023**

**Discipline / Subject:** Science (adaptations of sled dogs) & Math (calculations)

**Topic:** Adaptations

**Grade Level:** 2-8; others with modification

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

List of appropriate Iditarod kennel sites

Denali Distance Learning – Science of Sled Dogs materials

<https://www.nps.gov/teachers/classrooms/the-science-of-sled-dogs-distance-learning-program.htm>

**Lesson Summary:**

Students will analyze the adaptations that sled dogs have which allow them to thrive in the Arctic. They will learn the parts of a dog team and the characteristics of the various team members in order to draft their own fantasy Iditarod team.

**Standards Addressed: (Local, State, or National)**

*Common Core Math Standard (Grade 4):*

Use the four operations with whole numbers to solve problems.

*Next Generation Science Standard:*

3. Interdependent Relationships in Ecosystems: Environmental Impacts on Organisms

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

**Learning Objectives:**

1. TLW identify adaptations that sled dogs have that enable them to survive in harsh conditions
2. TLW identify the positions of dogs in a team
3. TLW identify desirable characteristics for dogs in each position

**Assessment:**

The students will use their knowledge to draft sixteen dogs for their Fantasy Iditarod Team.

**Procedural Activities:****Day One: Adaptations of Sled Dogs**

**Note:** If you can participate in the Denali Distance Learning Program The Science of Sled Dogs prior to this lesson, a lot of this can be review. If not, the program resources materials provided by Denali for the program give a great explanation of both the adaptations and the characteristics the kids will be looking for. Information on joining a program and the program materials can be found here:

<https://www.nps.gov/teachers/classrooms/the-science-of-sled-dogs-distance-learning-program.htm>

1. Mood Setting Video: [http://www.youtube.com/watch?feature=player\\_embedded&v=MKtVqn3jefA](http://www.youtube.com/watch?feature=player_embedded&v=MKtVqn3jefA)
2. Tell the students that today they will begin drafting their Fantasy Iditarod Team!
3. Introduce/Review the adaptations that they will be looking for in their dogs: tongue, feet, fur, circulation, tail (see Denali Science of Sled Dog materials for details).
4. Introduce/review the team positions and brainstorm a list of desired characteristics for each position. Example: Leader – smart, confident, enthusiastic; Swing – team player, smart, perceptive; Team – strong; Wheel – biggest on team, calm and steady, strong
5. Explain that the students will need to draft 16 dogs for their team (2 lead, 2 swing, 10 team, and 2 wheel). Sixteen (16) is the maximum number of dogs allowed at the start. Discuss different strategies for planning the team. Do you want some extra leaders in your team dogs just in case?
6. Introduce the scoring for the Fantasy Team: points are awarded for dogs that “complete” the race. “Completing” the race, in this case, means that the musher/kennel completes the race since it is often difficult to tell which dogs are returned. The place that the team finishes determines the number of points earned. Points are awarded for EACH dog. (See the scoring sheet for details) Students will also earn points for the musher they are officially tracking, but that is another lesson in a few days!

**Day Two: Draft Your Team**

1. Introduce the students to the kennels they will be choosing their dogs from. This takes a bit of planning on the teacher’s part. Find a few kennels that do a good job of talking about their dogs on their websites for the students to explore. I had 8 mushers at 6 different kennels for my kids to explore. You could give them more or less. (See attached table for examples)
2. Distribute the Planning Sheet (attached) for the students to choose their dogs. This is also a good strategy discussion point. Do you pick a lot of dogs from one kennel in the hopes that kennel does well? Or do you spread dogs out so that if one musher scratches it doesn’t have a huge impact on your scoring? Remind them to take into consideration the adaptations and characteristics they have discussed.
3. Teachers will collect the planning forms at the end and return them at the end of the race to total the scores!

**Materials Students Need:**

Internet access

Fantasy Iditarod Team Planning Sheet

**Technology Utilized to Enhance Learning:**

Iditarod Kennel websites (see attached for a starting point)

Distance Learning Skype opportunity through Denali National Park

**Other Information:**

### Modifications for Special Learners/ Enrichment Opportunities

- The scoring can be as easy or difficult as you wish to make it depending on the math skills your students practice.
- Students can work in pairs or teams to draft their teams. It can also work as a cooperative learning group project with students taking on different roles in the project (researcher, scribe, etc).
- Once students have “drafted” their team, they can complete the paperwork to officially “register” for the race. Paperwork for this can be found on the official Iditarod website. We complete the Application Form: [Race Application](#) and the [Microchip Form](#) But, there are several other forms that could be used in the "Race Center" "2024 Musher Information" section of the website. An interesting discussion to have is why there are so many forms and what the purposes behind them are. Is it for safety? For whom? Is this something the mushers casually decide to do?

### Additional Information

Below is a list of kennels and mushers in this year's race that are examples for this assignment, but they are not the ONLY mushers you could use. You can find links to all of this year's mushers' websites in their biographies on the Iditarod website: <https://iditarod.com/race/2024/mushers/>

Musher	Kennel	Website	Comments
Deeter, Jeff	Black Spruce Dogsledding	<a href="https://blacksprucedogsledding.com/meet-the-dogs/">https://blacksprucedogsledding.com/meet-the-dogs/</a>	Both Jeff and KattiJo have run the Iditarod.
Hall, Matt	Smokin' Ace Kennels	<a href="http://www.smokinacekennels.org/smokin-ace-athletes">http://www.smokinacekennels.org/smokin-ace-athletes</a>	Click on each picture for information.
Hennessey, Anna	Anna in Alaska	<a href="https://www.annainalaska.net/">https://www.annainalaska.net/</a>	Trains at Shameless Huskies Kennels.
Otto, Amanda	Husky Homestead	<a href="http://www.huskyhomestead.com">http://www.huskyhomestead.com</a>	Trains with Jeff King.
Ryan, Redington	Redington Mushing	<a href="http://www.redingtonmushing.com">http://www.redingtonmushing.com</a>	2023 Iditarod Champion
Sass, Brent	Wild and Free Mushing	<a href="https://wildandfreealaska.com/the-team/">https://wildandfreealaska.com/the-team/</a>	2022 Iditarod Champion

# Fantasy Team Scoring

- For EACH Dog (technically, 160 points possible):
  - Kennel/Musher finishes in place 60-69 = 1 point
  - Kennel/Musher finishes in place 50-59 = 2 points
  - Kennel/Musher finishes in place 40-49 = 3 points
  - Kennel/Musher finishes in place 30-39 = 4 points
  - Kennel/Musher finishes in place 20-29 = 5 points
  - Kennel/Musher finishes in place 10-19 = 6 points
  - Kennel/Musher finishes in place 4-9 = 7 points
  - Kennel/Musher finishes in third place = 8 points
  - Kennel/Musher finishes in second place = 9 points
  - Kennel/Musher finishes in first place = 10 points

For chosen Musher, points above times 5

## Kennel Codes

Black Spruce Dog Sledding - BSD  
Smokin' Ace Kennels – SAK  
Shameless Huskies Kennel - SHK  
Husky Homestead - HUH  
Redington Mushing - RRM  
Wild and Free Mushing – WFM

Musher – Jeff Deeter (JD)  
Musher – Matt Hall (MH)  
Musher – Anna Hennessey (AH)  
Musher – Amanda Otto (AO)  
Musher – Ryan Redington (RR)  
Musher – Brent Sass (BS)

## Microchip Code

2024 – Kennel Code – Musher Initials

Example: Jeff Deeter's Yentna would be coded: 2024-BSD-JD

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Fantasy Iditarod Team Planning Sheet

Position #	Position	Name	Kennel Code	Musher	Age	Sex	Reason Chosen	Points Awarded
1	Lead							
2	Lead							
3	Swing							
4	Swing							
5	Team							
6	Team							
7	Team							
8	Team							
9	Team							
10	Team							

11	Team							
12	Team							
13	Team							
14	Team							
15	Wheel							
16	Wheel							

# Who Runs the Iditarod?

**Developed by:** Jen Reiter, 2014 Iditarod Teacher on the Trail™ Revised 09/01/23

**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 choose a musher to track during the race.

**Standards 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: (Note – If you have been discussing the Iditarod all year long, the results of this warm-up may be skewed. I have resorted to doing this on the first or second day of school and then revisiting it to remind them of their first impressions for this warm-up.)
  - 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?
  - 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.

The teacher can collect the entries and enter them to create a [word cloud](#) ( Use [Wordart.com](#), [WordClouds.com](#), or [WordItOut](#)) that describes what the students think about Iditarod mushers.(I have repeated this activity at the end of the race and compared the two word clouds –the students’ opinions can really change!)

2. Divide class into 2 groups.

*experience:* rookie vs. veteran

*gender:* male vs. female

*residency:* Alaska vs. all other states

- 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: a 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 characteristics 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

male – rookie – Alaska

male – veteran – other state

male – rookie – other state

male – veteran – foreign

male - rookie – foreign

female – veteran - Alaska

female – rookie - Alaska

female – veteran – other state

female – rookie – other state

female – veteran - 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
    - other state = red
    - foreign = green
3. 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.*
  - *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.*
  - *Members of the press then interview them. I have parents come in and “represent” the Alaskan Dispatch News and the Nome Nugget. When it is a Fairbanks start, I also have the Fairbanks Daily News Miner represented. You could even have the Iditarod Insider present.*

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 musher's bib number. I have tried it several different ways, but trust me – this is the easiest!

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:**

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.
- Add an additional color Unifix cube for any past champions, creating an additional identity combination.



**Part Three:**

There are many different identities a musher can fall into; veteran, rookie, man, woman, from Alaska, from another state, 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.

<b>Gender</b>	<b>Experience</b>	<b>Residency</b>	<b>Rank</b>

***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.

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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?

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

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

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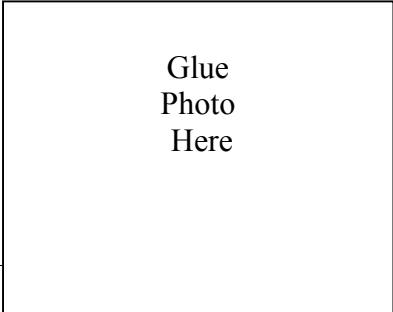
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**Part Five:**

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

# Musher Biography Card



Musher's Name: \_\_\_\_\_

Veteran or Rookie? \_\_\_\_\_ Male or Female? \_\_\_\_\_

Hometown: \_\_\_\_\_

Other Interesting Facts:

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Tracker's Name: \_\_\_\_\_

Pin Number: \_\_\_\_\_

# How Big is That Yard?

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ Created 9/15

**Discipline / Subject:** Math

**Topic:** Area and Perimeter

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

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

Math Playground Activity: [http://www.mathplayground.com/area\\_perimeter.html](http://www.mathplayground.com/area_perimeter.html)

**Lesson Summary:**

Students will calculate area and perimeter of regular and irregular rectangles.

**Standards Addressed: (Local, State, or National):**

CCSS.MATH.CONTENT.3.MD.C.5

Recognize area as an attribute of plane figures and understand concepts of area measurement.

CCSS.MATH.CONTENT.3.MD.C.7.B

Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

**Learning Objectives:**

TLW calculate the area and perimeter of rectangles.

TLW find the area of combined rectangles.

TLW find the measurement of a missing side when given the area and perimeter.

**Assessment:**

The students can be assessed on their class assignment and homework sheets.

**Procedural Activities:****Day One:**

1. As an introduction to calculating the area and perimeter of rectangles, I like to use the lesson from Math Playground found at [http://www.mathplayground.com/area\\_perimeter.html](http://www.mathplayground.com/area_perimeter.html)

I use it on my Smartboard as a whole group activity, but the students could also work through it independently in a lab setting. This lesson is a perfect fit for the upcoming lessons because the kids in the lesson are building a pen for their dog!

2. After working through the problems on the lesson, I challenge the students to find the area and perimeter of several rectangles located in the classroom.

**Day Two:**

1. Give each student a paper rectangle of a different size. Have them calculate the area and perimeter of their shape as a warm-up. They should write their answers on their rectangle and put it to the side to be used again later.
2. Share with the students the picture depicting the dog yard made of combined rectangles. Challenge the students to calculate the perimeter of the yard.
3. Have the students discuss with others some strategies they could come up with to calculate the area of the rectangles. If they get stuck, suggest that they think about breaking the yard into shapes they do know how to deal with.
4. Have them practice (or prove it's true!): With a partner have them combine their two rectangles from the warm-up together and find the area and perimeter of their new shape.
5. The included worksheet covers finding the area of combined rectangles and finding unknown measures. You could work through the problems together, or use the assignment as independent practice.
6. As a summary, or extra challenge, the students could create larger pens with all of the rectangles from their table group. They can glue them onto construction paper in an interesting shape (they all must be connected in some way). Have them calculate the area and perimeter of their combined rectangles. They can then "finish" their design by drawing in details such as a dog house, sled dog, etc.

**Materials Students Need:**

Day One: worksheet (included), ruler, pencil

Day Two: paper rectangles of various sizes, worksheets (included), construction paper, drawing tools

**Technology Utilized to Enhance Learning:**

[http://www.mathplayground.com/area\\_perimeter.html](http://www.mathplayground.com/area_perimeter.html)



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

- An online image search of “dog yard blueprints” displays some kennel designs that could be printed and used for extra practice finding area and perimeter of regular shapes.
- More advanced students could use shapes other than rectangles.

**Additional Information**

# Area and Perimeter Formulas

To Find:	Formula:
Perimeter of a rectangle	Add the sides $P = 2(l+w)$
Perimeter of a square	Add the sides $P = 4s$
Area of a rectangle	$A = l \times w$
Area of a square	$A = s^2$

# Examples in Our Space

Find five squares or rectangles in our classroom. For each one, list the object's name, draw a sketch and label the measurements, and then calculate the area and perimeter.

Name of Object	Sketch (sides labeled)	Perimeter (label)	Area (label)

## Now We're Getting FANCY Yards!

How would we calculate the area and perimeter of this yard?



Scale:

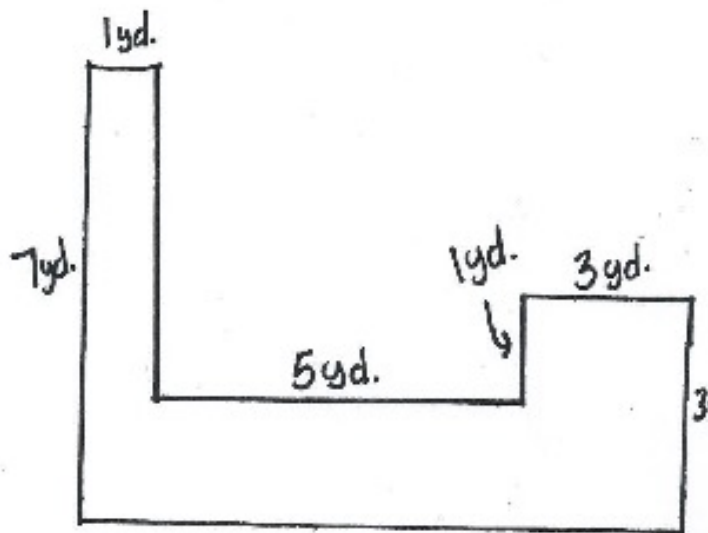
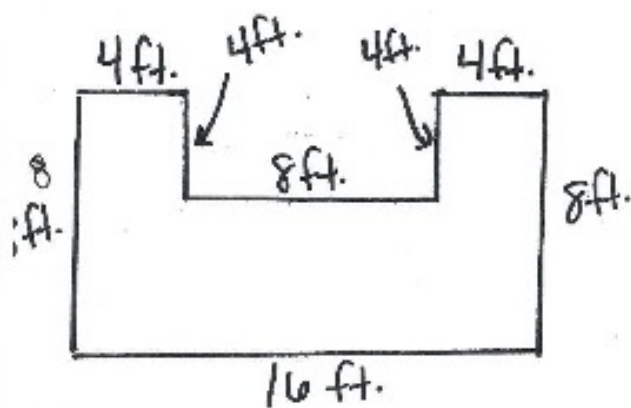
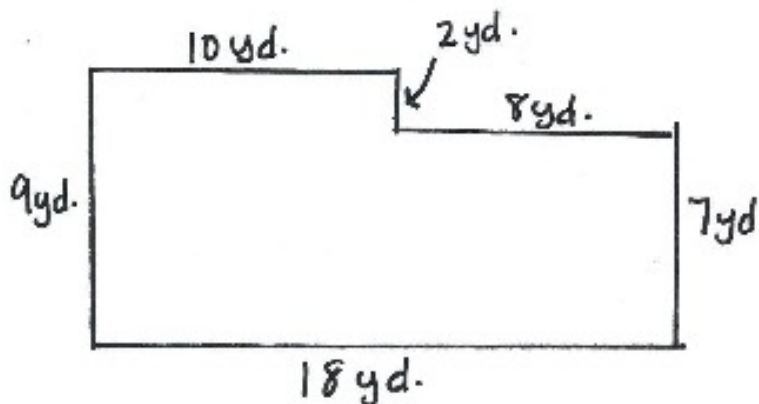
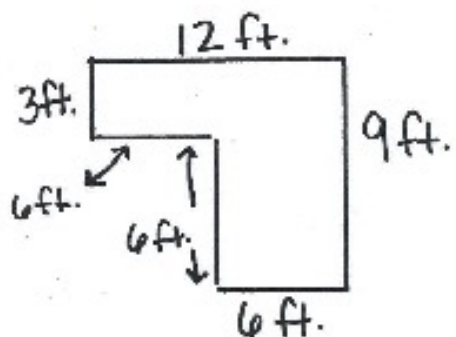
One inch = 1 yard

## How Big Is That Yard?

Not all dog yards are evenly sized rectangles. How would we find the area of an unusually shaped yard?

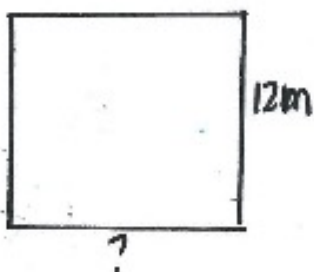
One way is to use the area formula of combined rectangles. We can divide the shape into squares or rectangles, find the area of each, and then add the areas together to get the total area for the entire figure.

Find the area and perimeter of each of these dog yards. Be sure to label your answers.



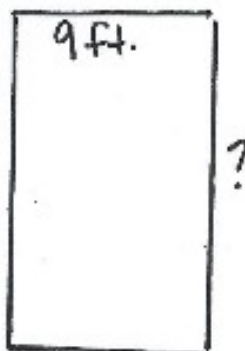
We can also use our knowledge of area and perimeter to find unknown measures.

Try these:



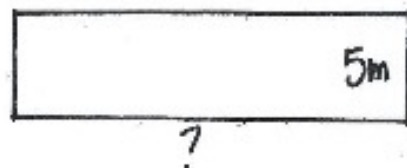
Perimeter = 44 m

Width = \_\_\_\_\_



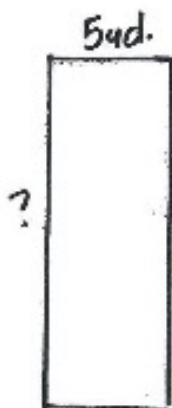
Area = 108 sq. ft

height = \_\_\_\_\_



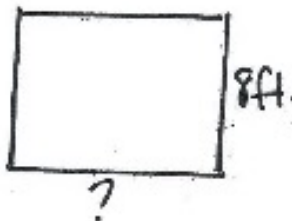
Area = 90 m

base = \_\_\_\_\_



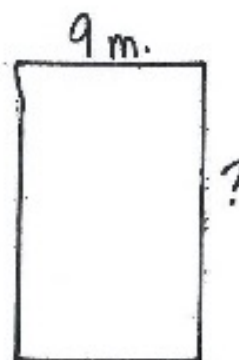
Perimeter = 34 yards

Length = \_\_\_\_\_



Area = 96 sq. ft

base = \_\_\_\_\_



Area = 126 sq. m

height = \_\_\_\_\_

# Dog Yard Dilemma

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Revised 9/15**

**Discipline / Subject:** Math

**Topic:** Area and Perimeter

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

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

**Lesson Summary:**

Students will design dog runs and calculate their area and perimeter.

**Standards Addressed: (Local, State, or National):**

CC.4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

**Learning Objectives:**

TLW calculate the area and perimeter of rectangles.

TLW find the area of combined rectangles.

TLW find the measurement of a missing side when given the area and perimeter.

**Assessment:**

The students can be assessed on their class assignment sheets.

**Procedural Activities:**

**Day One:**

1. Present the following scenario to the students:
  - *You are a musher and kennel owner. You have been lucky enough to gain a fencing company as a sponsor. Instead of staking your dogs to their houses, you wish to build a run or pen for each dog so you can promote your sponsor's product.*
  - *The company says they will provide you with 100 feet of fencing per dog.*
2. The students will experiment with various ways to use 100 feet of fencing to build a pen for one dog. For each pen they create, they will record a sketch of the pen and calculate the perimeter and area for each fence.
3. When students start to get stuck, remind them that they don't have to use all the fencing offered!

## **Day Two:**

1. Ask the students to return to the chart they completed yesterday. What is the largest area of space they could provide a dog with using 100 feet of fencing? After discussing and comparing their discoveries with their classmates, have the students determine the largest area they are going to work with for today. This number will be important and they will be using it for the rest of the activity.
2. Present the students with the new challenge:
  - ***You have 16 dogs in your kennel and each dog needs to be given the same area of space to run in.***
  - ***What is the LEAST amount of fencing you could use to build pens for all sixteen of your dogs?***

\*\*\*Things to think about (you may or may not want to share these at this point).

- They can put pens next to each other and thus only need one run of fence for the sides of two pens.
  - Someone always puts the pens together in such a way that there is no access to the interior pens! How will this dog get fed? How will he get out when he needs to? As long as the student can justify their reasoning, I usually accept the answer!
3. Introduce the idea of scale at this point for diagramming their kennel on the graph paper. Each square on the graph paper can be worth certain footage of fencing (2 feet or 5 feet per square depending on the size of your graph paper).
  4. Provide lots of graph paper to experiment with.
  5. The students must create a final sketch, to scale, on a clean sheet of graph paper. All the measurements must be labeled.
  6. In addition, the students must explain with a number sentence and a description, the total amount of fencing they would need and how they arrived at their answer.
  7. They are then challenged to create two additional puppy pens with the extra fencing and calculate the area of the combined rectangles.
  8. There is an EXTRA bonus for early finishers where they can use their extra fencing to build items for their kennel.

### **Materials Students Need:**

Graph paper, scrap paper, rulers, worksheets (included)

### **Technology Utilized to Enhance Learning:**

See Teacher Materials section



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

More advanced students may be able to experiment with shapes other than rectangles. Students could use and calculate the area and perimeter for parallelograms, triangles, etc.

**Additional Information**

# Dog Yard Dilemma

## Part One

You are a musher as well as the owner of a kennel. You have been lucky enough to gain a fencing company as a sponsor. Instead of staking your dogs to their houses, you wish to build pens or runs for your dogs so you can promote your sponsor's product.

The company says they will provide you with 100 feet of fencing per dog.

Experiment to discover all of the ways you can use 100 feet of fencing to build a run for one of your dogs. Use the chart below to document your experimentation.

Shape of Fence (Sketch with Dimensions)	Perimeter of Fence	Area of Fence


# Dog Yard Dilemma

## Part Two

Yesterday you experimented with the dimensions of a dog run. Given 100 feet of fencing per dog, what is the largest area of space you could provide for the dog? Draw a diagram and explain your response in words.

Today's challenge:

1. At your kennel you have a total of 16 dogs. If each dog is provided with the same area to run in, what is the least amount of fencing material you could use to build all the pens? Using the graph paper, draw a diagram of your dog yard and label all of the measurements for each dog run. In the space below, record the total amount of fencing you will need and explain how you arrived at your answer.

2. With your leftover fencing, create two larger rectangular puppy pens in your kennel. The puppy pens should be adjacent to each other.

a. How much fencing did you use for the puppy pens? \_\_\_\_\_

b. Find the area of the combined rectangles. \_\_\_\_\_

Bonus: If you STILL have fencing left over.... You could add other things to your dog yard plan. Some mushers have separate runs for dogs who are ill or injured or need extra attention. Some have runs for retired dogs. What would you add to your dog yard? Just make sure that you don't go over your allotment of fencing from your sponsor!

# Galena Checkpoint Challenge

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** Area and Perimeter

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

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

Alaska Kids – Galena Checkpoint on Iditarod Trail Northern Route:

<http://www.alaskakids.org/index.cfm/know%20alaska/Alaska%20Geography/Community%20Profiles/2864>

Indian Country Today – Galena Struggles to Rebuild After Yukon River Ice Jam Causes Devastating Flood

<http://indiancountrytodaymedianetwork.com/2013/06/17/galena-alaska-struggles-rebuild-after-yukon-river-ice-jam-causes-devastating-flood-149945>

Alaska Dispatch News – Wedding Plans Mean Galena Checkpoint Gets Moved

<http://www.adn.com/article/20150220/itarod-notebook-wedding-plans-mean-galena-checkpoint-gets-moved>

Padlet - <https://padlet.com/>

Remember to set the needed Padlet up prior to the lesson!

## **Lesson Summary:**

Students will design a checkpoint and calculate the area and perimeter of various areas within the design.

## **Standards Addressed: (Local, State, or National):**

CC.4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

## **Learning Objectives:**

TLW calculate the area and perimeter of rectangles.

TLW find the area of combined rectangles.

TLW find the measurement of a missing side when given the area and perimeter.

## **Assessment:**

The students can be assessed on their class assignment sheets.

**Procedural Activities:**

1. Remind the students that the mushers are not the only people who are busy preparing for the Iditarod at this point. The volunteers are hustling around just as much to get the checkpoints ready to receive the onslaught of mushers, fans, press, and volunteers that are getting ready to descend upon them.
2. Tell the students that many Iditarod Checkpoints are housed in community centers, schools, or other spaces that are open to the public. \*\* Note: If your students are not familiar with the role of a checkpoint in the race, you may need to review that. Karin Hendrickson wrote a wonderful description of what happens in checkpoint, which you can find here: <http://blueonblackdogs.com/documents/CheckpointRoutine.pdf>
3. Instruct the students to open the Padlet that you have created for them. The Padlet should pose a question like “What do you think goes into setting up an Iditarod Checkpoint? What supplies are needed? What needs to happen in the space prior to the first musher arriving?”
4. Galena has had an interesting couple of years as an Iditarod checkpoint. In the spring of 2013, the town suffered devastating floods that destroyed over 90% of the town’s buildings. Amazingly, the town was able to rebuild and was ready to welcome the Iditarod in 2014. In 2015, Galena was not expecting to be a checkpoint as it was an odd numbered year, and hence the race should have taken the southern route. Due to weather, the race was rerouted and Galena was called on to serve as a checkpoint. The town had one small problem though, the Community Center, which is the usual location for the checkpoint was hosting a huge wedding the same week that Iditarod was due in. But, once again, the town rallied and came together for the race, moving the checkpoint to a location across town!
5. Tell the students that today they are going to assume the role of a resident of Galena. They have been called upon to help design the layout of this year’s checkpoint. Review the directions on the assigned worksheets with the students. Have them revisit the Padlet to see if they included everything that is needed!

**Materials Students Need:**

Graph paper, scrap paper, rulers, worksheets (included)

**Technology Utilized to Enhance Learning:**

Padlet - <https://padlet.com/>

**Other Information:**

### **Modifications for Special Learners/ Enrichment Opportunities:**

More advanced students may be able to experiment with shapes other than rectangles. Students could use and calculate the area and perimeter for parallelograms, triangles, etc.

Students who need support could work in teams or small groups.

Galena Interior Learning Academy is a boarding school that also supports the Iditarod. Students create and display banners in the checkpoint for their favorite mushers (like GILA alum Mike Williams, Jr.). The culinary arts students cook pizza and other treats for the volunteers and mushers. Students could use one inch squares to create banners for their favorite mushers and calculate the area and perimeter of their musher's names.

<http://gila.galenaalaska.org/about.html>



### **Additional Information**



# Galena Checkpoint Design

## Checkpoints

There are currently 26 checkpoints on the northern route and 27 on the southern route where mushers must sign in. Some mushers prefer to camp on the trail and immediately press on, but others stay and rest. Mushers purchase and pack their supplies and equipment and have them flown ahead to each checkpoint by the Iditarod Air Force. The gear might include food, extra booties for the dogs, headlamps for night travel, batteries (for the lamps, music, or radios), tools and sled parts for repairs, and even lightweight sleds for the final dash to Nome. There are three mandatory rests that each team must take during the Iditarod: one 24-hour layover, to be taken at any checkpoint; one eight-hour layover, taken at any checkpoint on the Yukon River; and an eight-hour stop at White Mountain.

Galena is a checkpoint on the Northern Route. Galena is a town with a population of 527. The town was founded in 1920 when Natives moved down river from the old town site of Loudon because of the availability of firewood. A man could cut 250 cords a winter and sell it for \$8.00 a cord to the steam wheelers that worked the rivers in the summer. In 2013 the town suffered from devastating floods. In May of that year there was an ice jam in the Yukon River that forced the river to overflow and ultimately destroyed over 90 percent of the town's buildings. Amazingly, the town rebuilt and was ready and eager to welcome the Iditarod for the 2014 race!

They set up the checkpoint in the community hall. The space is a large rectangular shaped room with built in benches along all four walls. Pretend they have asked for your help in setting up the checkpoint for this year's race.

Your graph paper represents the bird's eye view floor plan of the main space in the building.

- You need to divide the space so that all of the following things can be fit into the space.
- Be sure to label every item you put on the map! You can write on the map or code it and include a key.
- You also need to complete the area/perimeter chart so that the race volunteers can be sure to make the space match your design.

**Scale: One square = 2 Feet**

### **Required Elements:**

1. The volunteers who do the checking in need an area near the door. They need a desk that is at least 5 feet long and 2 feet wide to house the computers the volunteers use to update the race information as mushers check in and out.
2. The vets need a large space. They need a space of at least 10 feet by 10 feet to examine dogs. They also need space to house at least 8 dogs in case dogs need to be dropped at the checkpoint. Each dropped dog should have at least a space three feet by three feet.
3. The volunteers need to put up some tables to serve food to the mushers (and themselves!). They have 6 tables that are six feet long and two feet wide. At least 3 need to be used to serve food, but the others can be put around for mushers to relax and eat.

- There needs to be space for mushers (and sometimes volunteers) to lay out their sleeping bags in case they choose to sleep inside during their layover. You should plan for there to be ten mushers at the checkpoint at a time. Each musher's sleeping bag needs a space that is 6 feet long and 4 feet wide.

***Area/Perimeter Table:***

Item/Space	Area	Perimeter
Checkers' desk		
Vets' examination space		
Each dropped dog space		
Each food table		
Each sleeping bag		

# What's Your Angle?

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail <sup>TM</sup> **Revised 9/15**

**Discipline / Subject:** Math

**Topic:** measuring and classifying angles

**Grade Level:** Fourth, others with modifications

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

<http://www.brainpop.com/math/geometryandmeasurement/angles/>

<http://www.mathplayground.com/measuringangles.html>

<https://www.youtube.com/watch?v=qcEa7wqqDyg>

<http://www.youtube.com/watch?v=jqXixGfqoo>

iPad app Kids Angle Measuring from CTT Source Technology Group

**Lesson Summary:**

Students will practice measuring angles found on dog sleds.

**Standards Addressed: (Local, State, or National)**

Grade 4 Common Core State Standards:

**CCSS.Math.Content.4.MD.C.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.

**CCSS.Math.Content.4.MD.C.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

**Learning Objectives:**

TLW measure angles in whole number degrees using a protractor.

**Assessment:**

Students can be assessed on the two class assignment sheets.

## Procedural Activities

### Day One:

Vocabulary: clockwise, counterclockwise, degree, protractor, acute angle, obtuse angle, ray, right angle, vertex

1. Play the following BrainPop Introduction to Angles video to introduce the idea of angles to the students: <http://www.brainpop.com/math/geometryandmeasurement/angles/>
2. Demonstrate how to measure angles using a protractor. Introduce the vocabulary of obtuse, acute, and right angles. You can use Math Playground on the Smartboard (or the students could work through the activity independently) as an interactive tool to demonstrate using a protractor: <http://www.mathplayground.com/measuringangles.html>
3. Students practice using the iPad app Kids Angle Measuring from CTT Source Technology Group. If the iPad application is not available, students can practice measuring angles either found in the classroom or provided by the teacher. An online alternative can be found at [https://www.khanacademy.org/math/on-sixth-grade-math/on-geometry-spatial-sense/on-angles-polygons/e/measuring\\_angles](https://www.khanacademy.org/math/on-sixth-grade-math/on-geometry-spatial-sense/on-angles-polygons/e/measuring_angles)
4. Play the following video to introduce the process of building a dog sled: <https://www.youtube.com/watch?v=qcEa7wqqDyg> (Note: The first 28 seconds or so are a little strange, you may want to skip to where he actually starts building!)
5. Students complete the “What’s Your Angle?” assignment pages by measuring the angles found on the dog sled diagram and classifying them as obtuse, acute, or right.

### Materials Students Need:

worksheets, protractors, iPads

### Technology Utilized to Enhance Learning:

See Teacher Material List

### Other Information:

### Modifications for Special Learners/ Enrichment Opportunities:

Students could work in partners as needed.

Older students could research and/or experiment to see if the angles that are in the sleds are for practical or cosmetic reasons. Does changing the angles affect the sled?

This activity could also lead into a science investigation on runner plastic and the idea that different types of runner plastic are best suited for different kinds of snow. Dallas Seavey has a video that addresses this at his website: <http://www.dallasseavey.com/video-photo-gallery> Choose the video entitled “Changing the Runners on Dog Sled.”

### Additional Information

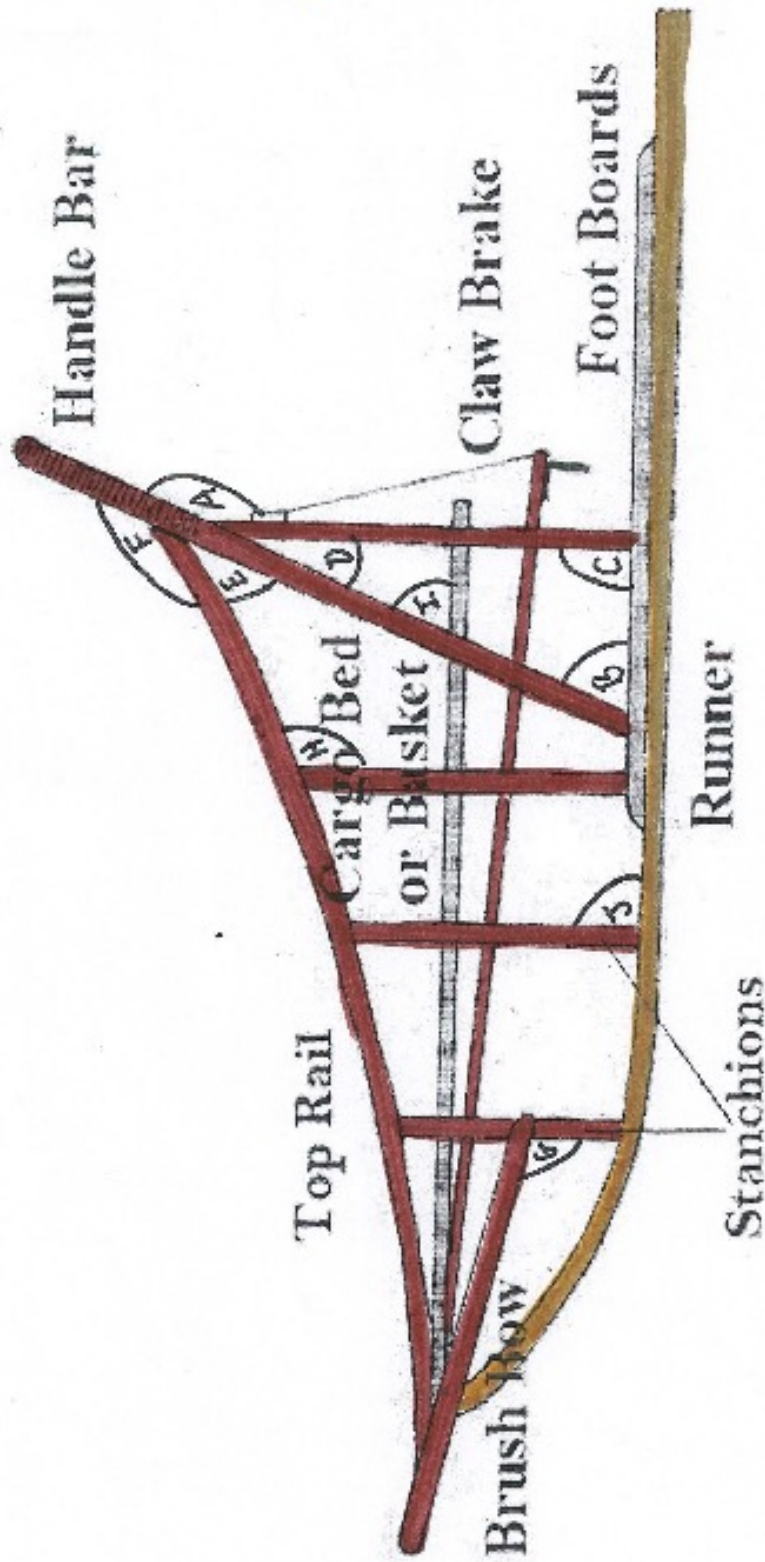


Image from: <http://iditarodoutsider.files.wordpress.com/2015/02/slec1.jpg>

# What's Your Angler?

ANGLE	DEGREES	CLASSIFICATION (ACUTE, OBTUSE, RIGHT)
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		

# Harness Maker

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail <sup>TM</sup> **Revised 9/15**

**Discipline / Subject:** Math

**Topic:** measuring and creating angles

**Grade Level:** Fourth, others with modifications

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

<http://www.youtube.com/watch?v=jqXixGfqoo>

**Lesson Summary:**

Students will practice measuring angles found on a dog harness and then will create an original harness design by measuring and creating their own angles.

**Standards Addressed: (Local, State, or National)**

Grade 4 Common Core State Standards:

**CCSS.Math.Content.4.MD.C.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.

**CCSS.Math.Content.4.MD.C.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

**Learning Objectives:**

TLW measure angles in whole number degrees using a protractor.

TLW create angles when given a specific measurement.

**Assessment:**

Students can be assessed on the assignment and the optional homework assignment.

**Procedural Activities**

1. Play the following video to introduce students to fitting dog harnesses:  
<http://www.youtube.com/watch?v=jqXixGfqoo>
2. Have the students review measuring and classifying angles by measuring the angles of a traditional x-back harness on the included "Harness Maker" worksheet.
3. Have the students create their own dog harness that includes a set of given angle measurements. Provide them with a paper copy of the model dog to experiment and sketch their design on. The final copy should be created with thin strips of cardstock on a separate dog that can then be displayed.
4. The assignment sheet, "Sled Dog Angles," could be assigned for homework at this point.

**Materials Students Need:**

dog outlines (two copies per student), thin strips of cardstock, glue, scissors, protractors

**Technology Utilized to Enhance Learning:**

See Teacher Material List

**Other Information:**

How to put the harness on a dog: <https://www.youtube.com/watch?v=o8xZt5GmrAc>

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

Students could work in partners as needed.

The required angles in the harness could be altered to fill the needs of various students. Or, the students could be required only to make two right angles, two obtuse angles, and two acute angles.

If possible, students could measure and compare angles on actual harnesses of various styles.

Older students could research and/or experiment to see if the angles that are in harnesses are for practical or cosmetic reasons. Does changing the angles affect the harness?

**Additional Information**



# Harness Maker

Harnesses are a required element for dog sledding and are constantly being redesigned, updated, and improved to help make things better for the dogs.

1. Here is a standard x-back harness. Measure and record the angles shown.

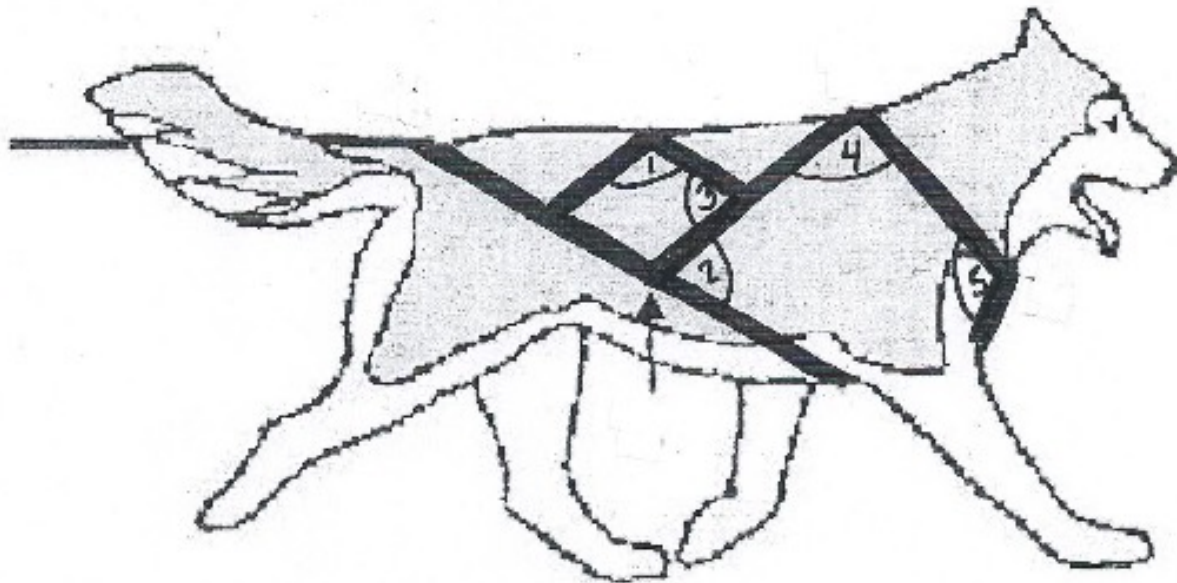


Image from: <http://www.windchill.com.au/images/Xback%20diagram.jpg>

Angle:	Degrees:	Classification:
1		
2		
3		
4		
5		

1. Design your own harness. Your harness must include the angles listed below. You can use the dog sketch on the next page as your rough copy. On your rough copy you can sketch your harness lines using a ruler and protractor. Your final copy will be completed using strips of colored paper.

Required angles to INCLUDE and LABEL on your harness:

Measurement	Completed?
$90^{\circ}$	
$90^{\circ}$	
$120^{\circ}$	
$60^{\circ}$	
$150^{\circ}$	
$180^{\circ}$	
$45^{\circ}$	



# Sled Dog Angles



Image from: <http://www.nordkyn.com/images/frtharn.gif>

Look at the ten angles located in the diagrams above. Complete the chart on the next page with the necessary information.

Angle:	Degrees:	Classification:
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		

# Shop 'Til You Drop

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail <sup>TM</sup> **Created 9/15**

**Discipline / Subject:** Math

**Topic:** making change

**Grade Level:** Fourth, others with modifications

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

[http://www.mathplayground.com/making\\_change.html](http://www.mathplayground.com/making_change.html)

Items for the "shop," price cards, play money

**Lesson Summary:**

Students will practice making change for various purchases.

**Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.3.NBT.A.2

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.5.NBT.B.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

**Learning Objectives:**

TLW calculate the amount of change that should be given for a purchase.

**Assessment:**

Students can be assessed on the assignment sheets.

**Procedural Activities**

1. Set up a role playing situation where you portray a shopkeeper. Set up a few display items (mushing supplies if possible) and prices. Provide a few students with some play money.
2. Invite a student to the “shop” and have them purchase an item and hand you some “cash.” For the first student, just say thank you. Do not give him change. Lead the class in a discussion of what should have happened. {The cashier should have provided change to the customer.}
3. One at a time, invite the remaining students who have cash to come to the front and choose an item to “purchase.” Have the class help you decide how to calculate the change. Explain that cashiers frequently use the counting up strategy when counting out change.
4. Have the students practice independently using the online game “Making Change” which puts the students to work at a pet shop and asks them to make change using the fewest number of bills and coins possible. You may want to allow the students to play in partners, as the idea of using the FEWEST number of bills and coins can be a bit tricky at first.
5. Introduce that change can also be calculated by using subtraction of decimals.
6. The students can complete the worksheet “Starting Line Snacks!” for independent work.
7. The students can complete the worksheet “Iditarod Shop” for extra practice or homework.

**Materials Students Need:**

Play money

**Technology Utilized to Enhance Learning:**

See Teacher Material List

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

Students could set up their own “shop” and price some of their own items to practice buying and selling with a partner or group.

Students could compare prices at Alaskan grocery stores to prices at their own stores. Introduce the students to the photos at this site:

<https://www.flickr.com/photos/senatorlisamurkowski/sets/72157630782007502/> Have each student choose an item to work with. Have them find the identical item (or as close as possible) at their own local grocery store and have them find the difference in the two prices.

**Additional Information**

# Starting Line Snacks!

Jeff and his friends went to the ceremonial start of the Iditarod on Saturday. Each of them bought a snack. Figure out how much change each person received.

## FOOD CART MENU

Reindeer Hotdogs . . . . .	\$1.97
Pizza with Reindeer Sausage . . .	\$3.80
Chips . . . . .	\$0.65
Soft Pretzel . . . . .	\$1.20
Popcorn . . . . .	\$0.54
Can of Soda . . . . .	\$2.20
Bottle of Water . . . . .	\$2.25
Hot Chocolate . . . . .	\$0.88



Jeff ordered a reindeer hot dog and paid \$2.00. How much change did he get?

Gina ordered a bag of chips and paid \$5.00. How much change did she get?

Bridget ordered a can of soda and paid \$3.00. How much change did she get?

Ellen ordered a slice of pizza and paid \$10.00. How much change did she get?

John ordered a hot chocolate and paid \$1.00. How much change did he get?

Josh ordered a bottle of water and paid \$3.00. How much change did he get?

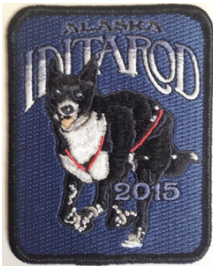
Sarah ordered a bag of popcorn and paid \$1.00. How much change did she get?

Calvin ordered a soft pretzel and paid \$2.00. How much change did he get?



# Iditarod Shop

A group of friends knew they wanted to bring some souvenirs back from their trip to the Iditarod for their family and friends. They visited the temporary store that is set up each year in the Lakefront Hotel lobby. The hotel serves as Iditarod Headquarters during the race! Use your math skills to help them figure out a good plan!



Small Patch: \$3.50



Youth T-Shirt: \$14.95



Dog Leash: \$7.00



Adult Shirt: \$19.95



Husky Puppy: \$25.95



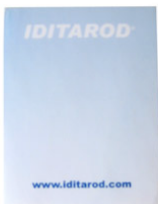
Pencils: 35 cents each



Baseball Hat: \$15.00



Sweatshirt: \$34.95



Notepad: \$1.75 each



Ornament: \$6.25



Ruler: \$1.50 each



Socks: \$8.75

1. Jen decides to purchase a youth t-shirt and a stuffed husky to bring home for her son. She pays with a \$50 bill. How much change should she get?
2. Ellen decides to buy an adult t-shirt for her son Ryan, and socks for each of her two daughters. She pays with two \$20 bills. How much change should she get?
3. Carly decides to buy a dog leash for each of her two dogs. She pays with a \$20 bill. How much change should she get back?
4. Joe decides to buy an ornament for his Christmas tree to help commemorate the trip. He pays with \$10.00. How much change should she get?
5. Thomas decides to buy some school supplies for two of his coworkers. He decides to give each coworker a pencil, a notepad, and a ruler. He pays with a ten-dollar bill. How much change will he get?
6. Jessica is a teacher and, knowing how much her students like to collect patches, decides to buy each student of the eighteen students in her homeroom a small patch. She gives the clerk four twenty-dollar bills. How much change should she get?
7. Michael decides it is really, really, cold in Alaska, so he treats himself to a sweatshirt. He gives the cashier a fifty-dollar bill. How much change should he get?

# Supplied for Success and Survival

## Lesson Plan and Teacher Notes

**Note:** This lesson is based on the Musher Mall Gazette Lesson that was published by the Iditarod Education Department in Iditarod Activities for the Classroom. I have modified and chunked it for use with my third graders. I have also found several companies who have been willing to share information and resources with me!

### **Materials:**

Student worksheets (attached)

Internet access or print catalogs and/or price sheets

Calculators (optional)

### **Prior Knowledge:**

Students have “drafted” a team of sixteen dogs for their Iditarod Race.

### **Introduction:**

1. Have students revisit their created teams of dogs.
2. Mention that the dogs are not the ONLY supplies they will need to take with them to find success and survival on the trail.
3. Remind them of the adage, “If you fail to plan you plan to fail.”

### **Procedure:**

1. Give the students five minutes to brainstorm with their team a list of everything they think they would need to successfully and safely complete the race from Anchorage to Nome.
2. Tell them that over the next few days, they will be discovering what supplies are really needed, will be shopping for their own supplies, and will be analyzing their finances.
3. Students need to keep the following guidelines in mind as they are planning:
  - a. They have \$20,000 from their sponsors to spend.
  - b. They need to plan for 15 days on the trail (it may not take them that long, but it could).
  - c. They need to plan for 16 dogs (they might drop a dog, but then again they might not).
  - d. They also need to pay the race entrance fee (found in the official rules).
4. **Day One:**
  - a. The students will shop for their sled and its components.

- b. Refer to rule #15 from the race rules:

**Rule 15 -- Sled:** A musher has a choice of sled subject to the requirement that some type of sled or toboggan must be drawn. The sled or toboggan must be capable of hauling any injured or fatigued dogs under cover, plus equipment and food. Braking devices must be constructed to fit between the runners and not to extend beyond the tails of the runners. No more than three (3) sleds can be used by a musher during the race after the re-start. No more than two (2) sleds can be shipped beyond the re-start. Should a musher use another musher's sled for any reason that will be considered one (1) of the three (3) allowable sleds. These sleds may be used at the musher's discretion. Sleds or mushers may not be assisted with sails or wheels. Ski poles are allowed. No other sled exchanges are permitted except that a sled damaged beyond repair may be replaced if approved by an official. Once a sled has been left behind, it cannot be transported along the trail. It cannot be used again unless approved by the Race Marshal as a replacement for a broken sled.

- c. The students will need to determine how many sleds they wish to purchase for the race.
- d. This post from Karen Ramstead's website has a great diagram showing the lines:  
<http://northwapiti.blogspot.com/2013/08/ensembles-bet.html>
- e. Review the sled diagram with the students and have them label the towline/gangline, neck lines, and tug lines. Source: <http://up200.org/about/faq-on-sled-dog-racing/>
- f. Create a list of all of the supplies that will need to be purchased.
- i. Sled (between 1 and 3)
  - ii. Sled bags (a bag needs to be purchased for each sled purchased)
  - iii. Towline/gangline (for 16 dogs)
  - iv. Snow hook
  - v. Harnesses (1 per dog)
  - vi. Necklines (1 per dog)
  - vii. Tuglines (1 per dog)
- g. Introduce the students to the resources they will be using for their shopping (you may want to limit their store choices to less than four):
- i. Adanac Sleds: <http://stores.adanacsleds.com/> (use for sled, sled bag, harnesses)
  - ii. Black Ice: <http://www.blackicedogsledding.com/> (use for ganglines, snow hooks, necklines, and tuglines)  
\*\*\*\* Teacher Note: I found these companies in Mushing Magazine and have contacted them about using their information. For some I have physical copies of their catalogs and price sheets, for others I use the website. You could use any sources you have access to!\*\*\*\*
  - iii. Other sites that could be used include:  
Alpine Outfitters: <http://www.alpineoutfitters.net/secure/usermods/products.asp>  
Mountain Ridge: <http://www.mtnridge.com/>
- h. Introduce the students to the ordering sheets and model how to order an item on the ordering sheet.
- i. The students must order the remaining items on the brainstormed list.

## 5. **Day Two:**

- a. Today the students will order the mandatory items required by the Iditarod Race Committee.

b. Refer to rule #16:

**Rule 16 -- Mandatory Items:** A musher must have with him/her at all times the following items:

- Proper cold weather sleeping bag weighing a minimum of 5 lbs.
- Ax, head to weigh a minimum of 1-3/4 lbs., handle to be at least 22" long.
- One operational pair of snowshoes with bindings, each snowshoe to be at least 252 square inches in size.
- Any promotional material provided by the ITC.
- Eight booties for each dog in the sled or in use.
- One operational cooker and pot capable of boiling at least three (3) gallons of water at one time.
- Veterinarian notebook, to be presented to the veterinarian at each checkpoint.
- An adequate amount of fuel to bring three (3) gallons of water to a boil.
- Cable gang line or cable tie out capable of securing dog team.
- Functional non chafing harness for each dog in team.

When leaving a checkpoint adequate emergency dog food must be on the sled. (This will be carried in addition to what you carry for routine feeding and snacking.)

Gear will be checked at the Re-Start and during the 24 hour layover for conformity to minimum standards as set forth above. Gear may be checked at any other time during the Race at the discretion of the Race Marshal and or the Race Judges. Gear may be checked at all checkpoints except Safety. Vet books will be signed by a veterinarian or in the absence of a veterinarian may be signed by a designated race official. **The musher will also sign the vet book.**

c. Dallas Seavey runs through the mandatory gear and packing the sled via video on his website: <http://www.dallasseavey.com/video-photo-gallery> Choose "Packing for Iditarod."

d. Today the students will be shopping for their mandatory items. Refer to the article to create a master list for the them to shop from:

- i. Sleeping bag
- ii. Ax
- iii. Snowshoes
- iv. Booties ( this one will require some discussion -while the requirement is 8 booties per dog on the sled, those will be used and need to be replaced – most estimates I've read say a musher will use 2,000 booties during the race, so the students should prepare for that many)
- v. Cooker
- vi. Fuel (fuel will be provided by the ITC, so they do not need to purchase)

e. Sites to use:

- i. <http://stores.adanacsleds.com> (add to yesterday's total: use for dog booties and cooker)
- ii. Cabela's Outdoor: <http://www.cabelas.com> (use for sleeping bag, ax, snowshoes)

f. They will also need to plan for the mandatory vet care for each dog. Each dog is required to have the following:

- i. Microchip implant (included in race fee along with a blood panel and EKG)
- ii. Distemper/ hepatitis/ leptospirosis/ rabies/ bordetella vaccinations
- iii. Deworming
- iv. Kennel cough vaccination

- g. I have consulted with Iditarod musher Angie Taggart. She explained that mushers can give their own dogs the five way (ii above) and kennel cough vaccine. The microchip, EKG, and blood panel are included in the race fee.
- h. Students must calculate the costs for their team of dogs. I used [www.valleyvet.com](http://www.valleyvet.com) to get my prices. I decided to pull the information for my kids because the site was a little overwhelming! You could challenge your higher level students to find the cost per dog and to not have “leftovers.” Or, they can just keep the leftovers for other dogs they may have. Some students may even decide to split the cost with a fellow musher!
  - i. 5 Way Vaccine – 25 doses - \$83.50
  - ii. Kennel Cough Vaccine – 25 doses - \$89.40
  - iii. Syringes for dogs – 100 count - \$21.95

6. **Day Three:**

- a. Today is all about the food! No one is going to make it very far without food!
- b. Here is a good article about dog food on the trail:  
  
<http://voyce.com/blog/medical-monday/what-do-dogs-eat-during-itarod-trail>  
  
 You could read it online or print and read it.
- c. Based on this article, if each dog needs 10,000 calories per day, and a pound of dog food has 2,500 calories, how many pounds of food would we need to plan for each dog each day?
- d. Lead the students through the discussion to arrive at the fact that each dog will need four pounds of food per day.
- e. Depending on the ability of your students, they may be able to work independently to find the amount and total cost of dog food. Or you may need to work the following steps together:
  - 1. If we have 16 dogs and each dog needs four pounds of food a day, how much food will we need total each day?  $16 \times 4 = 64$  pounds
  - 2. If we need 64 pounds of food a day, and we are planning to be on the trail for 15 days, how much food do we need total?  $64 \times 15 = 960$  pounds
- f. Remind the students that the mandatory item rule also states “When leaving a checkpoint adequate emergency dog food must be on the sled. (This will be carried in addition to what you carry for routine feeding and snacking.)”
- g. Therefore, we also need to plan for “extra, emergency” dog food. You may wish to lead a discussion about what constitutes an “adequate” amount of extra food and come to a consensus. Or, you could leave it up to individual students to determine for their teams.
- h. Introduce the students to the new source for shopping for dog food:

- i. <http://redpawdogfood.com/>

\*\*\*\*Teacher Note: I chose this source because they can make choices about what type of food they will choose based on the activity level of their dogs. They can get prices right online. They can also choose to purchase treats, if their time/money allow. There are many, many sources to choose from.\*\*\*\*

7. **Day Four:**

- a. Today the students will put it all together.
- b. Have them transfer their totals for each section to the master price list.
- c. Have them calculate their totals and see how they did in keeping to their budget.
- d. Discuss what has NOT been taken care of in our shopping? What else do mushers need to take into account?
  - i. Musher food
  - ii. Musher clothing
  - iii. Replacement parts
- e. There is a good video about the drop bag process at:  
<https://www.youtube.com/watch?v=CtyWrwdxZRo>

**Summary:**

As a summary, students could write a letter to their “sponsor” thanking them for their support and explaining what they have spent their money on in preparation for the race.





## Part One: Sleds

The ITC rules state:

**Rule 15 -- Sled:** A musher has a choice of sled subject to the requirement that some type of sled or toboggan must be drawn. The sled or toboggan must be capable of hauling any injured or fatigued dogs under cover, plus equipment and food. Braking devices must be constructed to fit between the runners and not to extend beyond the tails of the runners. No more than three (3) sleds can be used by a musher during the race after the re-start. No more than two (2) sleds can be shipped beyond the re-start. Should a musher use another musher's sled for any reason that will be considered one (1) of the three (3) allowable sleds. These sleds may be used at the musher's discretion. Sleds or mushers may not be assisted with sails or wheels. Ski poles are allowed. No other sled exchanges are permitted except that a sled damaged beyond repair may be replaced if approved by an official. Once a sled has been left behind, it cannot be transported along the trail. It cannot be used again unless approved by the Race Marshal as a replacement for a broken sled.

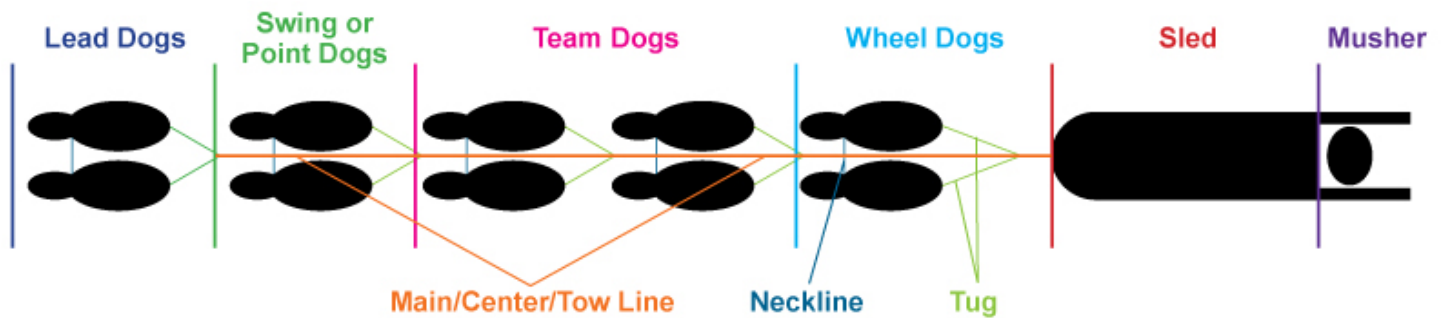


Diagram Source: <http://www.lifewithsleddogs.com/the-dog-sled-team/>

## Today's Shopping List:

Ordered:	Mandatory Item:
	Sled – between 1 and 3
	Sled bags – a bag must be purchased for each sled purchased
	Gangline – for 16 dogs
	Snow hook
	Harnesses – 1 per dog
	Necklines – 1 per dog
	Tuglines – 1 per dog

## Part Two: Mandatory Supplies

### A. The ITC rules state:

**Rule 16 -- Mandatory Items:** A musher must have with him/her at all times the following items:

- Proper cold weather sleeping bag weighing a minimum of 5 lbs.
- Ax, head to weigh a minimum of 1-3/4 lbs., handle to be at least 22" long.
- One operational pair of snowshoes with bindings, each snowshoe to be at least 252 square inches in size.
- Any promotional material provided by the ITC.
- Eight booties for each dog in the sled or in use.
- One operational cooker and pot capable of boiling at least three (3) gallons of water at one time.
- Veterinarian notebook, to be presented to the veterinarian at each checkpoint.
- An adequate amount of fuel to bring three (3) gallons of water to a boil.
- Cable gang line or cable tie out capable of securing dog team.
- Functional non chafing harness for each dog in team.

When leaving a checkpoint, adequate emergency dog food must be on the sled. (This will be carried in addition to what you carry for routine feeding and snacking.)

Gear will be checked at the Re-Start and during the 24 hour layover for conformity to minimum standards as set forth above. Gear may be checked at any other time during the Race at the discretion of the Race Marshal and or the Race Judges. Gear may be checked at all checkpoints except Safety.

Vet books will be signed by a veterinarian or in the absence of a veterinarian may be signed by a designated race official. **The musher will also sign the vet book.**

### B. Vet Requirements:

From the Iditarod website....

Iditarod dogs have some of the most intensive health checkups in the animal athletic world. Mandatory pre-race evaluations commence in the early part of February, which include blood testing and ECG recordings. All dogs are permanently identified with a microchip implant as part of the screening process. (Testing and microchip implants are provided for the mushers at no charge to them). Each dog's microchip number is scanned before starting the race, to verify their eligibility.

In addition to the extensive pre-race testing, every dog is required to have a veterinary physical exam within fourteen days of the race start, and all vaccinations must be current. Last but not least, each must be dewormed (medications provided through the ITC) within ten days of beginning their trip to Nome.

The dogs are usually very calm for these tests. They are used to being handled a lot and typically lie quietly while the procedures are completed.

During the race, the dogs are examined by the veterinarian teams who work at the checkpoints. When a musher and team arrive at a checkpoint, the veterinarians are there to

observe and examine the dogs and to visit with the musher. The musher must also present the vet book to the veterinarians. The dogs are priority 1 for Iditarod!

### **Today's Shopping List:**

<b>Ordered:</b>	<b>Mandatory Item:</b>
	Sleeping Bag
	Ax
	Snowshoes
	Booties (most mushers estimate 2,000)
	Alcohol Cooker
	5 Way Vaccine – 1 dose per dog
	Kennel Cough Vaccine – 1 dose per dog
	Syringes for dogs – 1 per dose given

### **Part Three: Food, Food, Food!!**

The canine athletes running the Iditarod need to have an enormous amount of food each day in order to perform at their peak. While on the trail, each dog will need to consume about 10,000 calories a day as well as drink lots of water for hydration. If you wanted to eat that much in one day, you would need to eat 50 Big Macs! Top premium dog food has about 2,500 calories per pound of food.

#### **Think about it:**

1. If each dog needs 10,000 calories of food a day and there are roughly 2,500 calories per pound of food, how many pounds of food will one dog need in one day?
  
  
  
  
  
  
  
  
  
  
2. If you have 16 dogs, how much food will you need total for all the dogs each day?
  
  
  
  
  
  
  
  
  
  
3. If you will be on the trail for 15 days, how much food will you need total?
  
  
  
  
  
  
  
  
  
  
4. Remember, the ITC Rules state:  
  
    “When leaving a checkpoint adequate emergency dog food must be on the sled. (This will be carried in addition to what you carry for routine feeding and snacking.)”  
  
    How many pounds extra do you think you will need? Explain your reasoning.
  
  
  
  
  
  
  
  
  
  
5. How many pounds of food do you need to order total?













# Supplied for Success and Survival

## Summary Sheet

1. Complete the chart below to summarize your expenses:

Store/Service:	Total Amount Spent:
Iditarod Entrance Fee	
Adanac Sleds	
Black Ice	
Cabela's	
Vet Services	

**Total Amount Spent:** \_\_\_\_\_





# Prize Money Mind Bender

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail <sup>TM</sup> **Created 9/15**

**Discipline / Subject:** Math

**Topic:** problem solving with money

**Grade Level:** Fourth, others with modifications (two versions of the assignment are included)

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

2015 Prize Money Breakdown Press Release – included

Photo from this article: <http://www.akbizmag.com/Alaska-Business-Monthly/March-2015/Iditarod-Trail-Sled-Dog-Race/>

**Lesson Summary:**

Students will take the role of the ITC Board of Directors and determine how the prize money should be distributed among the Iditarod finishers.

**Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

**Learning Objectives:**

TLW determine how to divide a sum of money among race finishers.

**Assessment:**

Students can be assessed on the assignment sheets.

**Procedural Activities**

1. Display for the students the photo found at the following link:  
[http://www.akbizmag.com/images/cache/cache\\_e/cache\\_5/cache\\_9/Idit1-30dee95e.jpeg?ver=1426542929&aspectratio=1.5](http://www.akbizmag.com/images/cache/cache_e/cache_5/cache_9/Idit1-30dee95e.jpeg?ver=1426542929&aspectratio=1.5) which shows Dallas Seavey with the “key” to the truck he was presented for winning the 2015 Iditarod.
2. Ask the students to describe what they see and what we can learn from the photo. {That the winner of the Iditarod receives a new truck.}
3. Inform the students that the new truck is just one of the prizes the winner receives. He or she also receives a financial prize. And in fact, the Iditarod financially rewards every single musher who finishes the race. The top 30 mushers “finish in the money” and any musher who finishes outside of the top thirty receives \$1,049. Have the students make the connection between the \$1,049 finishing money and the 1,049 miles that is the ceremonial length of the trail. The 1,049 number comes from the idea that the Iditarod is a 1,000 mile sled dog race and the fact that Alaska was the 49<sup>th</sup> state that joined the US.
4. Ask the students to predict the amount of money that the first place finisher receives. You may want to record their predictions to revisit later as the true numbers are revealed.
5. In 2015, the Iditarod purse was raised. The rest of this lesson is based on the numbers for that race.
6. Share the Mind Bender problem with the class. There are two versions included. Choose the appropriate one based on your students’ needs.
7. Once the students have come up with their division, have them share with others their solution and the explanation behind it.
8. You may want to share the actual 2015 Prize Money breakdown with the students (attached) and have them compare their solutions.

**Materials Students Need:**

Worksheet, scrap paper

**Technology Utilized to Enhance Learning:****Other Information:****Modifications for Special Learners/ Enrichment Opportunities:**

Students could work in teams.

**Additional Information**

# Prize Money Mind Bender (A)

Each year the Iditarod Trail Committee has to decide how to divide the prize money purse among the finishers of the race. Mushers who finish in the top thirty finish “in the money.” Everyone who finishes the race is rewarded with a check for \$1,049. In 2015, the total purse was \$725,100.

Suppose you were on the Board of Directors and were asked to divide the prize money for this year’s race. They have \$636,000 to divide among the top 20 finishers. The first place finisher will receive \$70,000.

How will you divide the rest of the money among the other top twenty finishers? Explain in writing how you arrived at your answer.

# Prize Money Mind Bender (B)

Each year the Iditarod Trail Committee has to decide how to divide the prize money purse among the finishers of the race. Mushers who finish in the top thirty finish “in the money.” Everyone who finishes the race is rewarded with a check for \$1,049. In 2015, the total purse was \$725,100. (The purse total is an estimate since the number of actual finishers is never known until the very end!)

In 2015, there were 78 mushers who registered for the race and therefore had to be accounted for in the prize money. The winner was awarded \$70,000.

If you were the Iditarod Trail Committee, how would you have divided the money among the 78 finishers?

Keys to remember:

- The winner receives \$70,000
- The top 30 finishers finish “in the money”
- Everyone who finishes is give at least \$1,049

Be sure to show your solution and fully explain your thinking in writing!





# Iditarod Trail Sled Dog Race®

2100 South Knik Goose Bay Road - Wasilla, Alaska 99654  
 907.376.5155 (voice) - 907.373.6998 (facsimile)  
[www.iditarod.com](http://www.iditarod.com)

## PRESS RELEASE

**For further information contact:**

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 Stan Hooley, CEO, (907) 352-2204 or [shooley@iditarod.com](mailto:shooley@iditarod.com)

### Largest Payout in History For Iditarod Champion in 2015

Wasilla, Alaska – December 2, 2014 – The Iditarod Trail Committee announced today that winning the Iditarod this next March will pay \$70,000.00, the largest payout in the history of the race. This is an increase of \$19,600.00 over the amount paid out for first place in each of the last five years. Additionally, second through fifth places will see substantial increases as well. All told, an additional \$50,000.00 will be distributed from first through fifth.

Place	2014	2015	DIFFERENCE
1st	\$50,400.00	\$70,000.00	\$19,600.00
2nd	\$47,600.00	\$58,600.00	\$11,000.00
3rd	\$44,900.00	\$53,900.00	\$9,000.00
4th	\$42,400.00	\$48,400.00	\$6,000.00
5th	\$39,900.00	\$44,300.00	\$4,400.00
6th	\$37,500.00	\$37,500.00	\$0.00
7th	\$35,300.00	\$35,300.00	\$0.00
8th	\$33,100.00	\$33,100.00	\$0.00
9th	\$31,000.00	\$31,000.00	\$0.00
10th	\$29,000.00	\$29,000.00	\$0.00
11th	\$27,000.00	\$27,000.00	\$0.00
12th	\$25,200.00	\$25,200.00	\$0.00
13th	\$23,400.00	\$23,400.00	\$0.00
14th	\$21,700.00	\$21,700.00	\$0.00
15th	\$20,000.00	\$20,000.00	\$0.00
16th	\$18,400.00	\$18,400.00	\$0.00
17th	\$16,900.00	\$16,900.00	\$0.00

- more -

<b>Place</b>	<b>2014</b>	<b>2015</b>	<b>DIFFERENCE</b>
<b>18th</b>	\$15,500.00	\$15,500.00	\$0.00
<b>19th</b>	\$14,100.00	\$14,100.00	\$0.00
<b>20th</b>	\$12,700.00	\$12,700.00	\$0.00
<b>21st</b>	\$11,400.00	\$11,400.00	\$0.00
<b>22nd</b>	\$10,200.00	\$10,200.00	\$0.00
<b>23rd</b>	\$9,000.00	\$9,000.00	\$0.00
<b>24th</b>	\$7,900.00	\$7,900.00	\$0.00
<b>25th</b>	\$6,800.00	\$6,800.00	\$0.00
<b>26th</b>	\$5,700.00	\$5,700.00	\$0.00
<b>27th</b>	\$4,700.00	\$4,700.00	\$0.00
<b>28th</b>	\$3,700.00	\$3,700.00	\$0.00
<b>29th</b>	\$2,800.00	\$2,800.00	\$0.00
<b>30th</b>	\$1,900.00	\$1,900.00	\$0.00
<b>Top 30</b>	\$650,100.00	\$700,100.00	\$50,000.00
<b>Other Finishers *</b>	25,000.00	25,000.00	
<b>Total Prize Money</b>	<b>\$ 675,100.00</b>	<b>\$ 725,100.00</b>	<b>\$50,000.00</b>

\*Each musher who finishes the race outside of the Top 30 receives a check for \$1,049.00. The total prize money is only an estimate as the amount paid to “Other Finishers” will be known at the conclusion of the 2015 race.

Currently seventy eight (78) mushers are entered in Iditarod XLIII, which will get underway at 10:00 a.m. on Saturday, March 7 in downtown Anchorage at the corner of 4<sup>th</sup> Avenue and D Street.

- end -

# Prized Dogs Pictographs

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** reading, interpreting, and creating pictographs

**Grade Level:** third, others with modifications

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

Brain Pop, Jr. video: <https://jr.brainpop.com/math/data/pictographs/>

On-line practice: <https://www.ixl.com/math/grade-3/interpret-pictographs>

Graph paper – you can print your own here: <http://www.printfreegraphpaper.com/>

List of Golden Harness Winners: <http://iditarod.com/about/champions-records/>

This article has some additional information about Lolly Medley: <http://www.classof1963.com/id54.htm>

**Lesson Summary:**

Students will create a pictograph that displays information.

**Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.2.MD.D.10

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

CCSS.MATH.CONTENT.3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

**Learning Objectives:**

TLW create a pictograph to display data.

**Assessment:**

Students can be assessed on their finished pictograph.

## Procedural Activities

1. Show the photo of Dallas Seavey's dog Beatle at the 2014 Iditarod Finisher's Banquet in Nome. Have the students make some predictions about what is happening in this picture. Where is Beatle? Why is he there?
2. Tell the students that they will discover later in the lesson if their predictions are correct. Share with them that today they are going to learn about a way to display data called a pictograph.
3. Share with the students the BrainPop, Jr. video on Pictographs to introduce the concept.
4. The IXL site has a game that the students can play to practice reading and interpreting pictographs. If it is not possible for them to practice on a computer, here is a link to a winter focused pictograph you could print and use for practice: [https://docs.google.com/file/d/0B-orThff\\_zb4YTk5NjYwNmItNWE2MS00NjVklTlMmMmQtMjFIYWQwODUyMGly/edit](https://docs.google.com/file/d/0B-orThff_zb4YTk5NjYwNmItNWE2MS00NjVklTlMmMmQtMjFIYWQwODUyMGly/edit)
5. Bring the students back together and revisit the photo of Beatle. Share with the students the following story behind the picture:

***The City of Nome Lolly Medley Golden Harness Award is given to an outstanding lead dog selected by the mushers. Lolly Medley was a harness maker from the town of Wasilla and one of the first two women to compete in the Iditarod in 1974. The golden harness was awarded to Beatle, one of Dallas' lead dogs. Beatle came in to get his award and Dallas joked, "This is the hardest part of the Iditarod for him!" and in fact he did look a little stunned by the crowd of people and the flashbulbs going off!***

***Dallas also talked about his other lead dog Reef. Reef had been training all year with Christian Turner, who was running Dallas' puppy team. At the last minute Reef graduated from the puppy team to the A-Team and ended up hitting the trail with Dallas! Imagine being called up to the major leagues and then going on to win the World Series! Wow!***

***Taken from the 2014 Iditarod Teacher on the Trail Blog:  
<http://itteacheronthetrail.com/2014/03/17/recognizing-the-accomplishments/>***

6. Explain that the Lolly Medley Golden Harness is just one of the special awards that is given out each year during the Iditarod. Here is the press information about the award:

***City of Nome Lolly Medley Memorial Golden Harness Award***

***∅ Originally presented by the late Lolly Medley, Wasilla harness maker and one of two women to***

***run the second Iditarod in 1974***

***∅ Embroidered gold colored harness***

***∅ Goes to an outstanding led dog, chosen by the mushers***

***∅ Presented at the Nome banquet***

7. Since the award was first given in 1976, about 49 dogs have been given the award. Only Martin Buser's dog, Blondie, has won twice!
8. Show the students the names of the winners from the first five years. Have them vote on their favorite name and complete a tally chart as each student makes their vote.

9. Then have the students guide you as you create a pictograph using their votes. When the pictograph is complete discuss both the creation of the graph and what type of data can be learned from it.
10. Repeat the voting step, but with the most recent five years. Challenge the students to create their own individual pictograph using the new data.

**Materials Students Need:**

Graph paper

**Technology Utilized to Enhance Learning:**

See Teacher Resources

**Other Information:**

Lolly Medley's sons, Ramey and Cim Smyth are frequent Iditarod competitors. Becca Moore, Ramey's wife, has also competed the last couple of years.

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

The pictograph could be created as a class, team, or individual as needed.

For an extra bonus, present the students with the attached list of Golden Harness winners. Have them mine the chart for other information they could create a pictograph of. For example, how many men and female winners, number of golden harness winners each year, or multiple race winners.

To add a writing component, students could do a journal entry about what characteristics they think all of the Golden Harness winners have in common.

**Additional Information**



## Golden Harness (Outstanding Lead Dogs)

Year	Lead Dog	Musher
2015	Reef	Seavey, Dallas
2014	Beattie	Seavey, Dallas
2013	Tanner	Seavey, Mitch
2012	Guinness	Seavey, Dallas
2011	Snickers & Velvet	Baker, John
2010	Maple	Mackey, Lance
2009	Kuling	Royer, Jessie
2008	Babe	Smith, Ramey
2007	Larry	Mackey, Lance
2006	Salem	Jeff King
2005	Kvitsokk (Whitesock)	Sørli, Robert
2004	Tread	Seavey, Mitch
2003	Tipp	Sørli, Robert
2002	Bronson	Buser, Martin
2001	Pepi	Swingley, Doug
2000	Red Dog	Gebhardt, Paul
1999	Elmer	Swingley, Doug
1998	Red	King, Jeff
1997	Blondie and Fearless	Buser, Martin
1996	Blondie	Buser, Martin
1995	Vic	Swingley, Doug
1994	D2 and Dave	Buser, Martin
1993	Herbie and Kitty	King, Jeff
1992	Dusty	Garnie, Joe
1991	Goose and Major	Swenson, Rick
1990	Tip	Barve, Lavon
1989	Ferlin	Runyan, Joe
1988	Granite	Butcher, Susan
1987	Blackie	Nayokpuk, Herbie
1986	Sister	Garnie, Joe
1985	Axle and Dugan	Riddles, Libby
1984	Red and Bullet	Osmar, Dean
1983	Preacher and Jody	Mackey, Rick
1982	Brandy	Baumgartner, Ernie
1981	Silver	Smith, Larry
1980	Trooper	Nayokpuk, Herbie

<b>Year</b>	<b>Lead Dog</b>	<b>Musher</b>
1979	Digger	Peters, Emmitt
1978	Nuggett and Blackie	Anderson, Ralph
1977	Pilot	Chase, Ken
1976	Puppy and Sugar	Riley, Gerald

Taken from the Iditarod Website: <http://iditarod.com/about/champions-records/>



# Population Along the Trail

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** reading, interpreting, and creating bar and double bar graphs

**Grade Level:** third, others with modifications

## Resources / References / Materials Teacher Needs:

Graph paper – you can print your own here: <http://www.printfreegraphpaper.com/>

Iditarod Media Guide: <http://iditarod.com/resources/press-media/>

Discovery Channel Video on Checkpoints: <http://www.discovery.com/tv-shows/other-shows/videos/iditarod-checkpoints-and-trailblazers/>

IXL site for interactive bar graph practice: <https://www.ixl.com/math/grade-3/interpret-bar-graphs>

BrainPop, Jr. Video: <https://jr.brainpop.com/math/data/tallychartsandbargraphs/>

ELT Base site for double bar graph practice: [http://www.elibase.com/quiz/508\\_01.htm](http://www.elibase.com/quiz/508_01.htm)

## Lesson Summary:

Students will create a bar graph that displays information about the population of the checkpoints along the trail.

## Standards Addressed: (Local, State, or National)

CCSS.MATH.CONTENT.2.MD.D.10

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

CCSS.MATH.CONTENT.3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

## Learning Objectives:

TLW create a bar graph to display data.

## Assessment:

Students can be assessed on their finished bar graph.

## Procedural Activities

1. Show the Discovery Channel video on checkpoints to give the kids a feel for what an Iditarod Checkpoint is and why they are crucial for the race.
2. Explain to the students that all of the communities that house the Iditarod checkpoints along the trail are unique and different. Some are set in large communities, some are set in small villages, and some locations only spring to life when the race comes through.
3. If you haven't already discussed the idea that there are two different routes and the reasons behind that decision, now would be a good time! The following explanation comes from the Iditarod Trail Committee Website (<http://iditarod.com/about/the-iditarod-trail/>):

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 three fold 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.

4. Tell the students that today they will be investigating and comparing the populations of the checkpoints on this year's route. A bar graph is a great tool to show the relative sizes of many things.
5. Share with the students the BrainPop, Jr. video on Bar Graphs to introduce the concept.
6. The IXL site has a game that the students can play to practice reading and interpreting bar graphs. If it is not possible for them to practice on a computer, there is a bar graph about enrollment at Iditarod Elementary at this link, [http://www.trulia.com/schools/AK-Wasilla/Iditarod\\_Elementary\\_School/](http://www.trulia.com/schools/AK-Wasilla/Iditarod_Elementary_School/), that could be printed out and used as a review of how to read a bar graph. The "test score" link at the same site is a good example of a triple bar graph.
7. As a class, use the information found in the Iditarod Media Guide about the checkpoints to identify the population of each checkpoint on this year's trail. I've also included a chart of the data with this lesson plan if you don't have time for the students to locate the data on their own.
8. Calculate the range of population and determine how to best set up the graph to reflect the needed data. You may want to start with Yentna Station and only do the locations where actual *checkpoints* are set up.
9. Use the data collected by the students to complete the bar graph as a class. Alternatively, the students could complete this bar graph in small groups.
10. Explain to the students that sometimes we can also use bar graphs to show or compare more than one kind of data.
11. Use the activity about cats and dogs at the ELT site to practice reading and interpreting double bar graphs.
12. Challenge the students to compare the population changes in Willow and Nome throughout history in a double bar graph (direction sheet included). \*\*Note: if you begin the scale with 1,650 people, go by increments of 200, and finish at 3,850 people; you can complete the graph in twelve divisions.

**Materials Students Need:**

Graph paper

**Technology Utilized to Enhance Learning:**

See Teacher Resources

Students could create the bar graphs digitally at <http://nces.ed.gov/nceskids/createagraph/>

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

The bar graph could be created as a class, team, or individual as needed.

To add a writing component, students could do a journal entry about whether they think it's better for the ITC to try to set up a checkpoint in a more or less populated community. What are the pros and cons of each?

If you are looking for some more advanced data and graphing opportunities, there are some pretty wild graphs included in this document on Alaska Population Projections:

<http://laborstats.alaska.gov/pop/projected/pub/popproj.pdf>

**Additional Information**

# Population Along the Trail

## Northern Route

Checkpoint	Population
Anchorage	291,826
Willow	1,658
Yentna Station	8
Skwentna	30
Finger Lake	2
Rainy Pass	2
Rohn	0
Nikolai	101
McGrath	341
Takotna	49
Ophir	0
Cripple	0
Ruby	173
Galena	487
Nulato	275
Kaltag	205
Unalakleet	692
Shaktoolik	258
Koyuk	347
Elim	332
White Mountain	199
Safety	0
Nome	3,695

# Population Along the Trail Southern Route

Checkpoint	Population
Anchorage	291,826
Willow	1,658
Yentna Station	8
Skwentna	30
Finger Lake	2
Rainy Pass	2
Rohn	0
Nikolai	101
McGrath	341
Takotna	49
Ophir	0
Iditarod	0
Shageluk	83
Anvik	79
Grayling	189
Eagle Island	0
Kaltag	205
Unalakleet	692
Shaktoolik	258
Koyuk	347
Elim	332
White Mountain	199
Safety	0
Nome	3,695

# Population Changes Over Time

Create a double bar graph to show how the population of the starting and ending points of the Iditarod Sled Dog Race has changed over time.

## Willow Data

Year	Population
2000	1,658
2002	1,718
2004	1,860
2006	1,959
2008	2,142
2010	2,102
2012	2,012 (estimated)

## Nome Data

Year	Population
2000	3,497
2002	3,503
2004	3,616
2006	3,566
2008	3,623
2010	3,617
2012	3,725

# Comparing Hours of Daylight

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** reading, interpreting, and creating line and double line graphs

**Grade Level:** third, others with modifications

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

Graph paper – you can print your own here: <http://www.printfreegraphpaper.com/>

Midnight Sun in Barrow Alaska video: [https://www.youtube.com/watch?v=DY1hS\\_Aulpo](https://www.youtube.com/watch?v=DY1hS_Aulpo)

Midnight Sun Article: <http://www.alaskacenters.gov/midnight-sun.cfm>

Susan Butcher Graph Story: <http://www.ck12.org/book/CK-12-Middle-School-Math-Grade-7/section/11.7/>

IXL Line Graph practice interactive activity: <https://www.ixl.com/math/grade-5/interpret-line-graphs>

USNO Site – Hours of Daylight: [http://aa.usno.navy.mil/data/docs/Dur\\_OneYear.php](http://aa.usno.navy.mil/data/docs/Dur_OneYear.php)

Number of Hours of Daylight in Alaska Table: <http://www.absak.com/library/average-annual-insolation-alaska>

## **Lesson Summary:**

Students will create a line graph that displays information.

## **Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.5.G.A.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g.,  $x$ -axis and  $x$ -coordinate,  $y$ -axis and  $y$ -coordinate).

CCSS.MATH.CONTENT.5.G.A.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

## **Learning Objectives:**

TLW create a line graph to display data.

## **Assessment:**

Students can be assessed on their finished line graph.

**Procedural Activities**

1. Share with the students that one of Alaska’s nicknames is “The Land of the Midnight Sun.” Have them discuss what they think that means.
2. Share the quick video of the midnight sun in Barrow, Alaska.
3. Have the students read and discuss the article about the Midnight Sun from the Public Lands Office.
4. Tell the students that today they will be investigating and comparing the hours of sunlight per day in various Alaskan communities. To show changes over time, they need to learn about a new form of graphs.
5. Share with the students the Susan Butcher Graphing Story. The girls in the story also had to learn about a new kind of graph. After reading the story to the students, display for them (either via projection or by printing it out) the graph created by the girls in the story. Tell them that a line graph is a good way to show data or information that changes continuously over time.
6. The IXL site has a game that the students can play to practice reading and interpreting line graphs. If it is not possible to have the students practice online, there is a line graph showing winning Iditarod times that you could print and practice with here: <http://www.alaskaone.com/iditarod/history.htm> .
7. As a whole group create a line graph showing the hours of daylight for the first day of each month in your hometown using data from the USNO site.
8. Challenge the class to create a line graph of the hours of sunlight in a town in Alaska using the data found in the table at the link in the resources section. Assign students to work in small groups to create graphs for the communities on the chart that the Iditarod Sled Dog Race passes through: Anchorage, McGrath, Nome and Wasilla.
9. To introduce the students to the idea of double line graphs, begin a long-term project with your class. For one month, create a graph that compares the temperatures in your hometown, Anchorage, and Nome. Use a different color for each town. We like make a special note of when it snows in each location also!

**Materials Students Need:**

Graph paper

**Technology Utilized to Enhance Learning:**

See Teacher Resources

Students could create the line graphs digitally at <http://nces.ed.gov/nceskids/createagraph/>

**Other Information:**



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

The line graph could be created as a class, team, or individual as needed.

To add a writing component, students could do a journal entry about how they think they would live in an area where the sun never goes down. What would be the pros and cons? More hours to do outdoor activities, but hard to sleep? What about when the sun never comes up in winter?

You could also have the students research the daylight hours of your hometown to compare to Alaska.

**Additional Information**

# What's Your Coordinate?

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail <sup>TM</sup> **Created 9/15**

**Discipline / Subject:** Math

**Topic:** reading and interpreting coordinate graphs

**Grade Level:** third, others with modifications

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

Alaska Map with Latitude and Longitude: <http://www.mapsofworld.com/usa/states/alaska/lat-long.html#>

Coordinate Graphing Song: <https://www.youtube.com/watch?v=VdahdGaFiFs>

Alien Coordinate Game: [http://www.mathplayground.com/locate\\_aliases.html](http://www.mathplayground.com/locate_aliases.html)

Bug Coordinate Game: <http://www.oswego.org/ocsd-web/games/BillyBug2/bug2.html>

## **Lesson Summary:**

Students will use the coordinates to locate points on a coordinate graph.

## **Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.5.G.A.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g.,  $x$ -axis and  $x$ -coordinate,  $y$ -axis and  $y$ -coordinate).

CCSS.MATH.CONTENT.5.G.A.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

## **Learning Objectives:**

TLW locate points on a coordinate graph.

## **Assessment:**

Students can be assessed on the coordinate graph drawing.

**Procedural Activities**

1. Share with the students the map of Alaska with the latitude and longitude lines. Ask them to locate the following communities on the map and determine their latitude and longitude location:

Anchorage: the home of the Iditarod Ceremonial Start

Kotzebue: the home of Iditarod champion John Baker

Fairbanks: the home of famed Iditarod mushers Aliy Zirkle and Allen Moore as well as many others

2. Have the students talk through the process that they used to determine the latitude and longitude points of the communities.
3. Let them know that in math, we use a similar strategy to locate points on a coordinate graph.
4. Choose one of the two online games to play either via a projection device or on the students' individual devices.
5. Put the students in pairs to play the included Trail Spill Game. This game is an Iditarod themed version of Battleship. You will need to spend some time with the students to ensure they set their boards up correctly. They MUST cover the number of points shown in the key. It is helpful if they use a small tape ball to hold each item down.
6. After they have had a chance to practice with game, they can complete the individual coordinate graph picture as a wrap up.

**Materials Students Need:**

Coordinate Grid Paper (3 per student): <http://www.mathworksheets4kids.com/grid/20by20-all-scale1.pdf>

Set of Iditarod Object Pictures (included)

Iditarod Object Picture Key (included)

Coordinate Grid Points (included)

**Technology Utilized to Enhance Learning:**

See Teacher Resources

**Other Information:**

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

Instead of having the students cut out and place the items, you could create two different versions of the board for the students to play on.

The coordinate graph picture could be created as a class, team, or individual as needed.

To add a writing component, students could do a journal entry about the process they went through to locate items on the coordinate graph. As an alternative, they could write a creative story about how they lost their things on the trail and how they were able to find them in the snow!

If more practice is needed, here's another version of a husky/wolf:

[http://mathcrush.com/graph/ws\\_graph\\_wolves\\_a.pdf](http://mathcrush.com/graph/ws_graph_wolves_a.pdf)

**Additional Information**

# Trail Spill Game

Oh No! Spill on the Trail! Two mushers have spilled some of the contents of their sled all over the trail! Can you be the first to find all of your missing belongings and rejoin the race?

## Prepare for Cleanup:

- Cut out and secretly place your partners five missing items on your grid.
- You may put the items vertically or horizontally, but not diagonally.
- Do not place any of the items in a way that overlaps another item or goes off the edge.
- You may not change the location of any item once the game has begun.

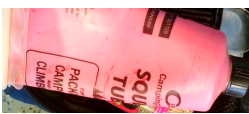
## How to Play:

- Decide who will go first. You and your opponent will alternate turns, calling out one location per turn trying to find your missing objects.
- On your turn, pick a target location and call out a location by coordinate grid pairs. Your opponent must tell you if your shot is a hit or a miss.
- Keep track of your results on the blank grid paper.
- When your opponent locates all the squares of an item, hand the item to them. They have found one of their objects!

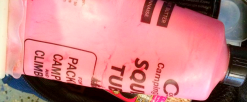
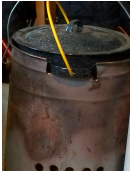



## Winning the Game:

The first person to collect all five of their items is the winner!

## Trail Spill Object Pictures



# Trail Spill Key

Item:	Name:	Number of "Hits" Required to Collect:
	Pink Foot Cream	4 hits
	Dog Food Cooker	6 hits
	Vet Book	1 hit
	Harnesses	6 hits
	Snow Hook	4 hits

# What's Your Coordinate?

Plot the points on the graph. Connect the points with line segments as you plot them. Keep connecting the points until you see LINE ENDS. Then start the next group. Color it in when finished.

1. (0, 3)
2. (-2, 3)
3. (-3, 4)
4. (-3, 3)
5. (-4, 2)
6. (-7, 1)
7. (-8, -4)
8. (-7, -5)
9. (-4, -5)
10. (0, -4)
11. (4, -5)
12. (5, -5)
13. (8, -4)
14. (8, -2)
15. (7, 1)
16. (4, 2)
17. (3, 3)
18. (3, 4)
19. (2, 5)
20. (0, 5)

Stop Line

1. (5, 5)
2. (7, 5)
3. (8, 6)
4. (8, 8)
5. (7, 8)
6. (5, 7)
7. (5, 5)

Stop Line

1. (3, 7)
2. (3, 9)
3. (2, 10)
4. (1, 9)
5. (1, 7)
6. (3, 7)

Stop Line

1. (-1, 8)
2. (-1, 9)
3. (-2, 10)
4. (-3, 9)
5. (-2, 7)
6. (-1, 8)

Stop Line

1. (-5, 5)
2. (-5, 8)
3. (-6, 9)
4. (-7, 8)
5. (-7, 6)
6. (-6, 5)
7. (-5, 5)

Stop Line

# The Story Behind the Graph

**Developed by:** Jen Reiter, 2014 Iditarod Teacher on the Trail™ **Revised 9/15**

**Discipline / Subject:** Math

**Topic:** Graphing

**Grade Level:** 2-5

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

Student worksheets, attached

**Lesson Summary:**

The students will write a story to match the set of data shown on a graph.

**Standards Addressed: (Local, State, or National)**

*Third Grade Math Common Core:*

**CCSS.Math.Content.3.MD.B.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.

*Third Grade English/Language Arts:*

**CCSS.ELA-Literacy.W.3.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

**Learning Objectives:**

TLW add missing key elements to a graph.  
TLW write a story to match a set of data recorded on a graph.

**Assessment:**

The students’ stories can be assessed.



**Procedural Activities:****Prior Knowledge:**

Students should be familiar with pictographs and line graphs. They should know the basic parts of a graph.

**Introduction:**

Review with students the role of graphs and why we use them. There is a good reference tool here: [http://nces.ed.gov/nceskids/help/user\\_guide/graph/whentouse.asp](http://nces.ed.gov/nceskids/help/user_guide/graph/whentouse.asp)

**Procedure:**

1. Tell the students that today you are going to present them with two graphs that have some problems.
2. Display the two graphs for the students to see.
3. Challenge the students to identify problems with the graphs.
  - a. They are missing titles and labels
  - b. You can't determine what the data is trying to tell you
4. Tell the students that their job today is to determine the solutions to the problems they have just identified.
5. I would have them choose one assignment to work on. You may want to require them to complete both, or break the assignment up into two days. Or, one could be a class assignment and the other a homework assignment.

**Summary:**

Have several students share their stories. The other students can listen to the story and then guess which graph it matches.

**Materials Students Need:**

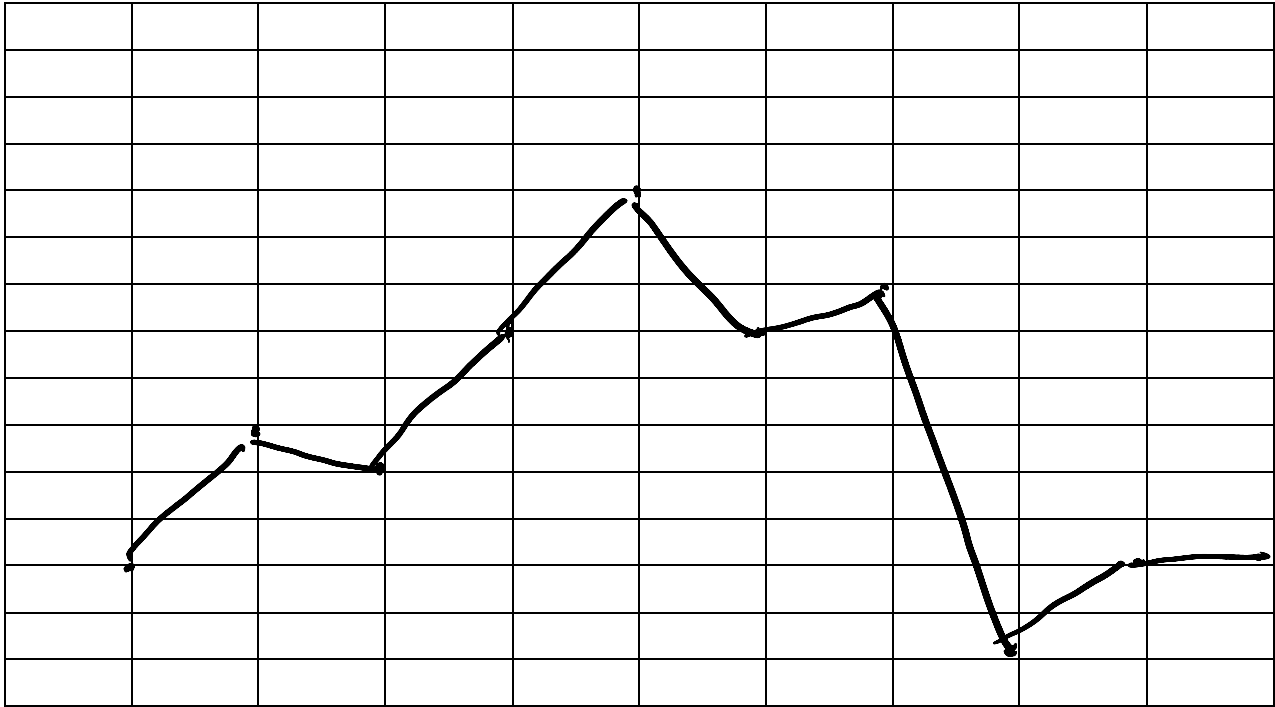
Worksheet, attached

**Technology Utilized to Enhance Learning:****Other Information:****Modifications for Special Learners/ Enrichment Opportunities:**

- Students could work with a partner.
- Students could tell their stories orally and have a recorder or use a digital voice recorder.
- As an extension, students could create a graph and then trade it with a partner to have the story written by a classmate.

# Interpreting the Graph

Below you will find a line graph that tells information about something related to the Iditarod.... Well sort of. It's missing several elements. Complete the graph by adding the missing elements. On the following page, write the story that goes with the graph. The story should explain the highs and lows of the graph as well as what it is measuring. Remember, line graphs are usually used for showing change over time. Be prepared to share your graph and story with the class.





# Interpreting the Graph

Below you will find a pictograph that tells information about something related to the Iditarod.... Well sort of. It's missing several elements. Complete the graph by adding the missing elements. On the following page, write the story that goes with the graph. The story should explain the highs and lows of the graph as well as what it is measuring. Remember, pictographs are usually used for comparing things between different groups or showing change over time.

Be prepared to share your graph and story with the class.





# Time on the Trail

**Developed by:** Jen Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** Military and Civilian Time

**Grade Level:** 3-5; others with modification

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

2015 Finishing Times: <http://iditarod.com/race/2015/checkpoints/19-Nome/>

How to Tell Military Time Video: <https://www.youtube.com/watch?v=-Rflqtdk5ag>

Military Time Conversion Chart: <http://militarytimechart.com/>

**Lesson Summary:**

The students will convert 2015 Iditarod finishing times from military time to civilian time.

**Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.3.MD.A.1

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

**Learning Objectives:**

TLW convert time from military time to standard time.

**Assessment:**

The students' worksheets can be assessed.

**Procedural Activities:**

1. Display for the students the data found at: <http://iditarod.com/race/2015/checkpoints/13-Unalakleet/>
2. Explain that this is data from the 2015 Iditarod that was taken at the checkpoint of Unalakleet. With a partner, have them make some observations about what they see within the data.
3. Draw the students attention to the in and out times of the leaders. Have they ever heard of 19 o'clock? What is the meaning behind that time?
4. Share with the student the video about Military Time.
5. Discuss what the advantages would be for reporting race data in military time: no need to record am or pm, less likelihood for mistakes to be made by tired volunteers, etc.
6. Review with the students about adding or subtracting 12 to make the conversions and practice several times.
7. As a classwork assignment, have the students complete the included worksheet that has them convert the finishing times of the 2015 top ten finishers.
8. As a follow up, or the following day, have each student keep a sticky note on his or her desk. Periodically during the day, ring a bell. When they hear the bell, the students need to stop what they are doing and record the time in both civilian and military time. Check their work at the end of the day.

**Materials Students Need:**

Worksheet, attached

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

This is a fine time to introduce additional clocks into you classroom. In addition to our regular clock, I have an analog clock that is set to the time in Alaska, and a digit clock that is set to military time.

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

Students could work with a partner.

If more practice is needed, the students could convert additional finisher times. The complete list of finisher times can be found at: <http://iditarod.com/race/2015/checkpoints/19-Nome/>

# Time on the Trail

## Converting Military to Standard Time

Checkpoint times along the trail are reported in military time instead of standard time.

Think about:

- What would the advantage be to using military vs. standard time in reporting checkpoint times?
- How do we convert those times to standard times for ourselves?

The chart below shows the times the first ten mushers checked into the final checkpoint in Nome, Alaska during the 2015 Iditarod. Convert the times into standard time. Don't forget to include am or pm when labeling your final answer!

Arrivals into Nome

<b>Musher:</b>	<b>Days:</b>	<b>Time Checked In:</b>	<b>Standard Time:</b>
<b>Dallas Seavey</b>	<b>3/18</b>	<b>04:13:06</b>	
<b>Mitch Seavey</b>	<b>3/18</b>	<b>08:22:56</b>	
<b>Aaron Burmeister</b>	<b>3/18</b>	<b>09:47:31</b>	
<b>Jessie Royer</b>	<b>3/18</b>	<b>11:51:09</b>	
<b>Aliy Zirkle</b>	<b>3/18</b>	<b>14:44:25</b>	
<b>Joar Leifseth Ulsom</b>	<b>3/18</b>	<b>15:21:01</b>	
<b>Jeff King</b>	<b>3/18</b>	<b>15:47:50</b>	
<b>Wade Marrs</b>	<b>3/18</b>	<b>18:15:17</b>	
<b>Ken Anderson</b>	<b>3/18</b>	<b>20:38:54</b>	
<b>Nicolas Petit</b>	<b>3/18</b>	<b>21:19:20</b>	



# Passing Time at Checkpoints

**Developed by:** Jen Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** Calculating Elapsed Time

**Grade Level:** 3-5; others with modification

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

2015 Iditarod Trail Map: <http://iditarod.com/2015-restart-fairbanks-press-release-and-information-about-checkpoints/>

Huslia Welcomes the Iditarod Video: <http://www.adn.com/file/huslia-half-way-checkpoint-iditarod-2015>

Huslia Prepares for Its First Iditarod: <http://www.adn.com/article/20150216/long-history-mushing-tiny-huslia-prepares-its-first-iditarod>

George Atlla: <http://indiancountrytodaymedianetwork.com/2015/02/17/alaskans-mourn-passing-george-atlla-mushing-legend-and-mentor-159254>

George Atlla: <http://atllamakingofachampion.com/>

DeeDee Jonrowe in Huslia: <http://www.knom.org/wp/blog/2015/03/15/in-huslia-dee-dee-jonrowe-pauses-to-savor-the-moment/>

2015 Checkpoint Date from the Huslia Checkpoint: <http://iditarod.com/race/2015/checkpoints/9-Huslia/>

## **Lesson Summary:**

The students will use race data to calculate elapsed time.

## **Standards Addressed: (Local, State, or National)**

CCSS.MATH.CONTENT.3.MD.A.1

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

## **Learning Objectives:**

TLW calculate elapsed time.

## **Assessment:**

The students' worksheets can be assessed.

**Procedural Activities:**

1. Tell the students that the 2015 Iditarod Race was very unique in that due to weather issues, the normal route could not be used. For only the second time in the race's history, the race restart was held in Fairbanks, Alaska.
2. Display for the students the 2015 race route map. Have them identify the new villages that were given the opportunity to participate in the Iditarod.
3. Point out the village of Huslia that served as the halfway point of the race. Huslia has a long and storied history with mushing as it was the home of famed spring musher George Attila.
4. Share with the students the video of Huslia preparing for the race.
5. Many mushers were honored to be in Huslia and were touched with how excited the villagers were for them to be there. Many may have stuck around longer than they intended to just to soak it all in.
6. You could at this point, share with the students about DeeDee Jonrowe's arrival and visit to Huslia. \*\* PLEASE preview the article and audio clip prior to sharing. It may not be appropriate for all students.\*\*
7. Tell the students they are going to take a look today at how long various mushers stayed at the checkpoint and how busy the checkers were checking mushers in and out.
8. To do this, they will need to learn how to calculate elapsed time. Please use whatever strategy or method works best for you. With my third graders we use the Mountains, Hills, and Rocks strategy that is similar to the one found here: <http://www.scholastic.com/teachers/top-teaching/2013/01/teaching-elapsed-time-strategies-work>
9. When the students are ready for independent practice, they complete the assignment using real world data. \*\*Note: Real world data isn't always pretty! They will need to carefully look not only at the times the mushers arrived and departed, but the dates as well! It can be tricky!\*\*

**Materials Students Need:**

Worksheet, attached

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

The problems that the students create as part of the assignment could be assigned as homework the next night!

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

Students could work with a partner.

**Legend**

- Town
- Checkpoints
- Iditarod Fairbanks Route
- Iditarod Northern Route
- Iditarod Southern Route

**Iditarod Race Route**

Mileage Differential Estimates

Anchorage to Nome	987 mi
Southern to Nome	945.05 mi
<b>Difference</b>	<b>- 18.95 miles</b>

**Alternate Race Route Segments**

Anchorage to Campbell Airstrip	11 mi
Fairbanks to Nenana	60 mi
Nenana to Menley Hot Springs	90 mi
Menley Hot Springs to Tanana	66 mi
Tanana to Ruby	119 mi
Ruby to Galena	50 mi
Galena to Huslia	82 mi
Huslia to Koyukuk	86 mi
Koyukuk to Nulato	22 mi
Nulato to Kaltag	47 mi
Kaltag to Unalakleet	85 mi
Unalakleet to Shaktolik	40 mi
Shaktolik to Koyuk	50 mi
Koyuk to Elim	48 mi
Elim to Golovin	28 mi
Golovin to White Mountain	18 mi
White Mountain to Safety	55 mi
Safety to Nome	22 mi



**Iditarod Trail Sled Dog Race**

**Weather Condition Reroute**

Data for this map was provided by the Alaska Department of Transportation. The Iditarod Trail Sled Dog Race is a registered trademark of the Iditarod Trail Sled Dog Race. All other trademarks are the property of their respective owners.



# Passing Time at the Checkpoints

The volunteers who work at each checkpoint need to wait for all of the mushers to come through and must carefully record all of their data and report it to the race committee. While awaiting mushers, there may be some down time, as there could be days that pass between the first and the last musher. Below is a PARTIAL chart of data from the Huslia Checkpoint during the 2015 Iditarod. In 2015, the race was rerouted do to weather, and the people of Huslia were called on to help the race... which they did in spectacular fashion! Use the chart to answer the questions on the next page.

Musher	Bib	In		Out	
		Time	Dogs	Time	Dogs
Aliy Zirkle	32	3/13 20:08:00	16	3/13 20:20:00	16
Mitch Seavey	18	3/13 20:36:00	13	3/13 21:07:00	13
Jeff King	59	3/13 15:39:00	16	3/13 21:27:00	16
Aaron Burmeister	63	3/12 21:47:00	13	3/13 22:20:00	13
Dallas Seavey	46	3/12 23:40:00	14	3/14 00:46:00	14
Jason Campeau	70	3/14 03:01:00	16	3/14 03:30:00	15
Thomas Waerner	8	3/13 01:21:00	14	3/14 03:43:00	13
Michelle Phillips	6	3/14 03:35:00	13	3/14 04:02:00	13
Joar Leifseth Ulsom	16	3/13 22:18:00	14	3/14 04:08:00	13
Peter Kaiser	54	3/13 22:14:00	15	3/14 04:10:00	14
Jessie Royer	3	3/13 20:05:00	15	3/14 04:17:00	15
John Baker	78	3/13 22:07:00	15	3/14 06:12:00	15
Wade Marris	65	3/13 22:19:00	14	3/14 06:21:00	13
Kelly Maixner	9	3/14 01:05:00	15	3/14 06:43:00	14
Nathan Schroeder	26	3/13 22:55:00	12	3/14 07:25:00	11

1. How long did Kelly Maxiner spend at the checkpoint?
2. How much time passed between the departure of Jeff King and the arrival of Joar Leifseth Ulsom?
3. How long did Nathan Schroeder spend at the checkpoint?
4. How long passed between the arrival of Peter Kaiser and the arrival of Jessie Royer?
5. Which two mushers arrived the closest together? How close were they?

Make up and solve two of your own elapsed time questions based on this chart.

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Mushing On By: More Elapsed Time Practice

How much time has elapsed?

1. 7:45 am to 11:05 am

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2. 2:35 pm to 7:05 pm

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3. 7:00 am to 1:45 pm

---

4. 1:15 pm to 10:53 pm

---

5. 1:25 am to 10:03 am

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6. 9:05 pm to 6:49 am

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7. 2:40 am to 5:08 am

---

8. 6:20 pm to 7:45 pm

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# As the Trail Turns: Elapsed Time

## Review

Mike Williams, Jr. is a second-generation Yupiaq musher. His dad introduced him to mushing, a sport that had deep roots in their culture. You can learn more about how he is carrying on the family mushing legacy here: <http://www.adn.com/article/20140225/mike-williams-jr-carries-family-legacy-itarod-racing>

His official biography from the Iditarod website is here:

### Biography

Michael Williams, Jr., 29, was born and raised in Alaska. Michael says, "I grew up mushing out of the remote village of Akiak. My dogs are prime Alaskan huskies and proven Iditarod veterans. I could not do this without the continued support of my sponsors and the endless support of my family. And most of all, I want to thank God!" Michael graduated from the Galena Charter School and attended the Alaska Vocational Technical Center in Seward for a year and FMCT, studying carpentry. He is now doing commercial fishing as well as dog mushing.

Mike has finished the Iditarod five times. His best finish was eighth in 2012. Use the information below to calculate his time on the trail during that race.

Time Leaving....	Time Arriving....	Time Elapsed on the Trail...
Willow 3/4 15:38	Yentna 3/4 19:38	
Yentna – 3/4 20:33	Skwentna 3/4 22:54	
Skwentna 3/5 2:53	Finger Lake 3/5 7:42	
Finger Lake 3/5 8:13	Rainy Pass 3/5 11:38	
Rainy Pass 3/5 16:42	Rohn 3/5 20:51	
Rohn 3/6 3:00	Nikolai 3/6 12:19	
Nikolai 3/6 18:03	McGrath 3/7 1:15	
McGrath 3/7 2:06	Takonta 3/7 4:55	
Takonta 3/8 5:27	Ophir 3/8 8:17	
Ophir 3/8 8:20	Cripple 3/8 19:52	
Cripple 3/9 3:59	Ruby 3/9 14:14	
Ruby 3/9 22:16	Galena 3/10 4:11	
Galena 3/10 7:05	Nulato 3/10 12:58	
Nulato 3/10 17:58	Kaltag 3/11 22:25	



Kaltag 3/11 6:52	Unalakleet 3/11 18:07	
Unalakleet 3/12 0:41	Shaktoolik 3/12 7:16	
Shaktoolik 3/12 7:17	Koyuk 3/12 13:51	
Koyuk 3/12 19:37	Elim 3/13 2:23	
Elim 3/13 2:44	White Mtn. 3/13 10:18	
White Mtn. 3/13 18:18	Safety 3/14 1:12	
Safety 3/14 1:15	Nome 3/14 4:12	

Bonus Question:

According Mike's biography, his total Iditarod prize money is \$83,900.00. If he has completed 5 races, how much money has he won on average per race? Be sure to show your work!

# Meet the Rookies

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Created 9/15**

**Discipline / Subject:** Math

**Topic:** Mean, Median, Mode, and Range

**Grade Level:** Fourth, others with modifications

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

Current Year Musher Roster: <http://iditarod.com/race/2016/mushers/list/>

Rookie story to share: <http://www.adn.com/article/20150312/18-year-old-rookie-learning-fast-frigid-iditarod-race-trail>

Brain Pop Video: <https://www.brainpop.com/math/probability/meanmedianmodeandrange/preview.weml>

Number of dogs leaving the starting line in 2014: <http://iditarod.com/race/2014/checkpoints/4-Yentna-Station/>

Paperwork required for mushers: <http://iditarod.com/resources/mushers/>

**Lesson Summary:**

Students will determine mean, mode, median, and range of ages among this year's rookie mushers.

**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 mean, median, mode and range of a set of data.

**Assessment:**

Students can be assessed on their class assignment sheets.

**Procedural Activities:**

1. Have the students create a working definition of the word rookie as it is applied to the Iditarod.
2. Lead a discussion about the unique challenges that face rookie mushers as they attempt to complete their first race.
3. Share with the students the article about one rookie's 2015 Iditarod.
4. Explain that each year the rookies are a varied bunch – different genders, hometowns, and ages. The only requirements are that they are at least 18 years old and that they have completed their required qualifying races.
5. Today we will be focusing on the ages of the rookies to see what information we can gather from that data.
6. Explain to the students that there are four ways we can analyze a series of data like a list of the rookie mushers' ages. Introduce and define mean, median, mode, and range. Alternatively, you could show the BrainPop video listed above.
7. Practice the calculations with the following set of data:

Number of Dogs Starting the Iditarod (2014)	Mushers Who Started with Less Than 16 Dogs
15	Aaron Burmeister
14	Lisbet Norris
14	Katherine Keith
14	Cindy Abbott
15	Ellen Halverson

8. When the students are comfortable with the calculations, challenge them to determine the same information regarding the ages of this year's race rookies.
9. They will need to begin by gathering the ages of the rookies. They can visit the list of registrants shown above and create a list of the ages of the rookies and then find the mean, median, mode, and range with that new, larger data set.
10. As a summary, ask the students if they were surprised by what they found? Did they anticipate that the average rookie musher age would be higher or lower? When and why would you want to know the different mean, median, mode and range numbers?

**Materials Students Need:**

- Rookie musher age data – either from website or printed: <http://iditarod.com/race/2016/mushers/list/>
- Scrap paper

**Technology Utilized to Enhance Learning:**

See Resources list above

**Other Information:**

You may want to take this time to explain that rookie mushers have additional requirements above and beyond veteran mushers. They have to complete a series of qualifying races and have report cards completed at each race. These musher report cards are a great way to have students self-assess their work as well. I have included a modified Musher Report Card for students at the end of this lesson.

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

As an added writing component, students could write about the pros and cons for being older or younger as a rookie. Is more experience key? Or is youth and athleticism key?

Students could use calculators to do the calculations.

**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.

# Student Musher Assessment Form

Name: \_\_\_\_\_ Date: \_\_\_\_\_

In order to be prepared for the Iditarod, mushers have to complete a series of qualifying races and be evaluated by the judges of each of those races. Many of the skills the judges hope the mushers will demonstrate are also skills that we demonstrate in the classroom. Think back over your week and see how you did with these skills. Are you ready to meet the challenge?

	Always	Most of the Time	Some of the Time
General Attitude <ul style="list-style-type: none"><li>Was I an eager and enthusiastic student?</li></ul>			
Compliance with Rules and Policies <ul style="list-style-type: none"><li>Did I follow the classroom rules?</li></ul>			
Organization and Efficiency <ul style="list-style-type: none"><li>Was my work completed neatly and on time?</li></ul>			
Equipment Care <ul style="list-style-type: none"><li>Were my desk and locker kept neat?</li></ul>			
Preparedness <ul style="list-style-type: none"><li>Was I prepared for class with completed assignments and needed materials?</li></ul>			
Interaction with People <ul style="list-style-type: none"><li>Did I work well with my classmates?</li></ul>			

What was your biggest accomplishment this week?

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Additional Comments:

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# What is an Average Leg?

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Revised 9/15**

**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. Explain that today we are going to determine the length of an “average leg.”

**Procedure:**

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

**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?

## The Most Common Question Asked About the Trail

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.

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.

## 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



Checkpoints	Distance between Checkpoints
Anchorage to Campbell Airstrip	20
Campbel 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 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
Unalakleet to Shaktolik	40
Shaktolik to Koyuk	58

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

All data from: <http://www.iditarod.com/learn/iditarodtrail.html>

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?	

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

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# What is an Average Leg? Fairbanks Start

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

**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 was an unusual year, in that 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

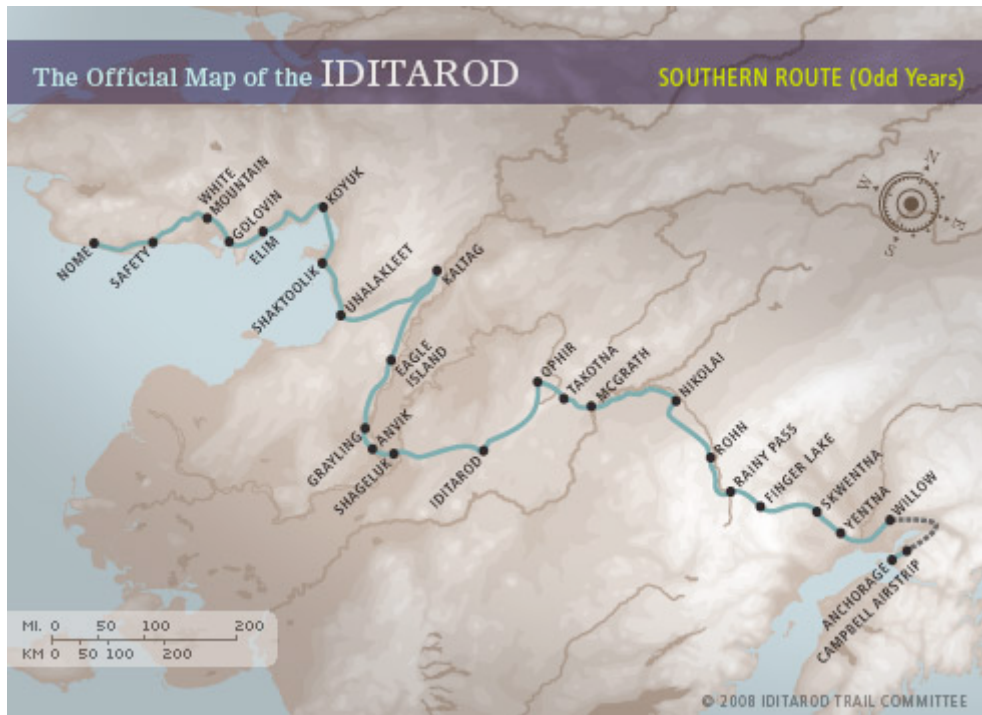


Checkpoints	Distance between Checkpoints
Anchorage to Campbell Airstrip	20
Campbell Airstrip to Willow	29
Willow to Yentna Station	52
Yentna Station to Skwentna	34
Skwentna to Finger Lake	45
Finger Lake to Rainy Pass	30
Rainy Pass to Rohn	48
Rohn to Nikolai	75
Nikolai to McGrath	54
McGrath to Takotna	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



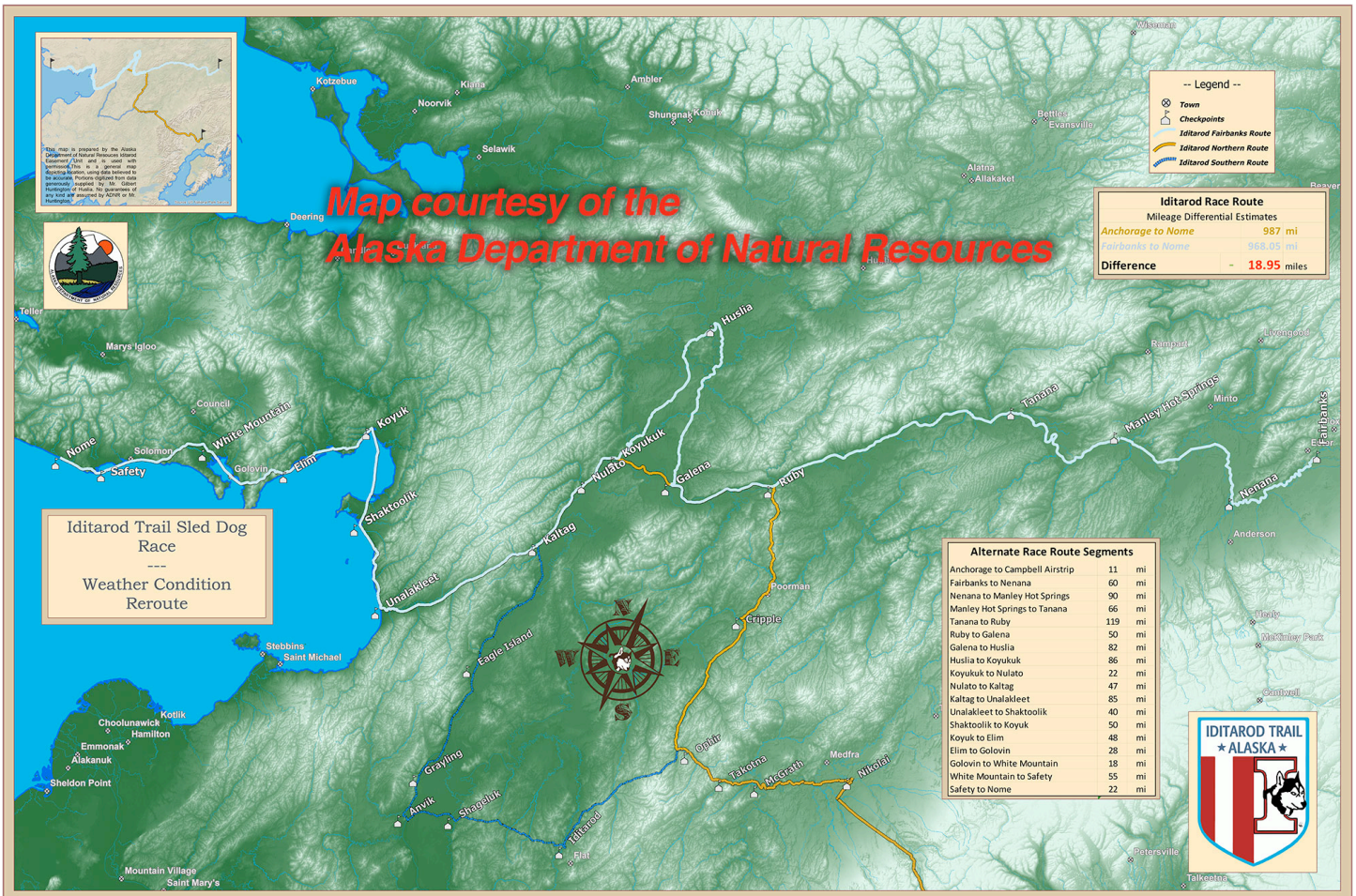
Checkpoints	Distance between Checkpoints
Anchorage to Campbell Airstrip	20
Campbel Airstrip to Willow	29
Willow to Yentna Station	52
Yentna Station to Skwentna	34
Skwentna to Finger Lake	45
Finger Lake to Rainy Pass	30
Rainy Pass to Rohn	48
Rohn to Nikolai	75
Nikolai to McGrath	54
McGrath to Takotna	18
Takotna to Ophir	25
Ophir to 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?

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# As the Trail Turns: Elapsed Time Averages

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ **Revised:** 9/15

**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 that mushers spent on several legs of the Iditarod and compare them.

**Standards 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 mushers 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 two mushers.

**Assessment:**

The students can be assessed on the included worksheets.

## **Procedural Activities:**

### **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 not 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 Monica Zappa’s average time on the first seven legs of the 2014 race.
2. Students complete the second portion of the chart for Nathan Schroeder.

Note: Both Monica and Nathan were rookies in the 2014 Iditarod. Nathan went on to become Rookie of the Year, while Monica was in the mix for the Red Lantern.

3. Students then compare the two and make a judgment about who has the better time.

### **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:**

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 Monica Zappa's 2014 race for the first few checkpoints and complete the chart below:

<b>Time Leaving...</b>	<b>Time Arriving...</b>	<b>Time Elapsed on Trail...</b>
<b>Willow – 3/2 14:32</b>	<b>Yentna – 3/2 18:21</b>	
<b>Yentna- 3/2 22:17</b>	<b>Skwentna- 3/3 1:14</b>	
<b>Skwentna – 3/3 9:22</b>	<b>Finger Lake –3/3 13:57</b>	
<b>Finger Lake- 3/3 19:07</b>	<b>Rainy Pass- 3/3 22:59</b>	
<b>Rainy Pass – 3/4 7:58</b>	<b>Rohn – 3/4 12:50</b>	
<b>Rohn – 3/4 17:01</b>	<b>Nikolai – 3/5 9:37</b>	
<b>Nikolai – 3/5 18:39</b>	<b>McGrath – 3/6 00:21</b>	

What was Monica's average time for the first seven legs of her rookie race?

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

Look at the data for Nathan Schroeder's race last year and complete the chart below:

<b>Time Leaving...</b>	<b>Time Arriving...</b>	<b>Time Elapsed on Trail...</b>
<b>Willow – 3/2 14:46</b>	<b>Yentna – 3/2 18:25</b>	
<b>Yentna – 3/2 18:30</b>	<b>Skwentna – 3/2 21:23</b>	
<b>Skwentna- 3/3 3:10</b>	<b>Finger Lake – 3/3 7:37</b>	
<b>Finger Lake- 3/3 11:02</b>	<b>Rainy Pass – 3/3 14:22</b>	
<b>Rainy Pass- 3/3 18:36</b>	<b>Rohn- 3/3 23:25</b>	
<b>Rohn- 3/4 5:15</b>	<b>Nikolai- 3/4 15:06</b>	
<b>Nikolai- 3/4 20:33</b>	<b>McGrath- 3/5 1:55</b>	

What was Nathan's average time for the first seven legs of his rookie race?

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

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

# Scaling It Up!

**Developed by:** Jennifer Reiter, 2014 Iditarod Teacher on the Trail™ Revised 9/15

**Discipline / Subject:** Math, Art

**Topic:** Measurement, Scale

**Grade Level:** 3+

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

Cut Down to Size at High Noon, A Math Adventure by Scott Sundby

Video: How to Enlarge a Drawing Using a Grid –

[http://www.ehow.com/video\\_5238667\\_enlarge-drawing-using-grid.html](http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html)

Go Out and Get Creative – Jon Van Zyle explains his painting process –

<https://www.youtube.com/watch?v=kjWKPXn2tnQ>

Copy of Jon Van Zyle’s print “Nod to the Past” - <http://www.jonvanzyle.com/IditarodPrints.html>

## **Lesson Summary:**

Students will work as a team to enlarge a piece of artwork to six times its original size.

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

### **Grade Two:**

CCSS.MATH.CONTENT.2.MD.A.1

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

### **Grade 5:**

CCSS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

### **Grade 7:**

CCSS.MATH.CONTENT.7.G.A.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

<p><b>Learning Objectives:</b></p> <ul style="list-style-type: none"> <li>• TLW measure accurately to determine the actual size of the artwork</li> <li>• TLW multiply by six to determine the size of the reproduction</li> </ul>	<p><b>Assessment:</b></p> <p>The students can be assessed on the accuracy of their measurements and conversions. Once the artwork is complete, it's pretty easy to see where the errors are!</p>
<p><b>Procedural Activities:</b></p> <p>Introduction to enlarging using grids:</p> <ul style="list-style-type: none"> <li>• Share the picture book <u>Cut Down to Size at High Noon</u> with the students.</li> <li>• Display for students a copy of the art print that they will be enlarging. Explain that the challenge is to enlarge the art work to six times the current size.</li> <li>• Have the students identify the method that was used in the picture book that would help with this challenge – using a grid.</li> <li>• There is a demonstration of this technique here: <a href="http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html">http://www.ehow.com/video_5238667_enlarge-drawing-using-grid.html</a></li> </ul> <p>Introduction to the artwork:</p> <ul style="list-style-type: none"> <li>• Introduce Jon Van Zyle as the official Iditarod artist. Explain that he creates a unique poster and print each year. There is a good interview with him here: <a href="https://www.youtube.com/watch?v=kjWKPXn2tnQ">https://www.youtube.com/watch?v=kjWKPXn2tnQ</a></li> <li>• Discuss the artwork with the students. Discuss how the title helps tell the story of the print. Look at the Iditarod references in the print. What can we infer about the man in the print? My kids were fascinated that there was a cat in the scene and created lots of stories about why he was there.</li> </ul> <p>Challenge 1: Preparing to enlarge</p> <ul style="list-style-type: none"> <li>• Tell the students that we will be working as a full class team to accomplish this task. The three things they need to know for now are: Everyone needs a square, squares have to be the same size and shape, and how many kids will be working on the project.</li> <li>• Provide students (or groups of students) with b&amp;w photo copies of the art print and challenge them to brainstorm ways to divide the artwork into squares in order to meet the three criteria above.</li> </ul> <p>Challenge 2: Enlarging the art</p> <ul style="list-style-type: none"> <li>• As a class (or teacher directed) decide on a set of squares that will be used to divide the original artwork so that each student can have one square to enlarge. We settled on a grid that was five squares wide by six squares tall. We didn't allow students to choose squares that were "empty" on the first choice; instead we gave those to early finishers as a second square.</li> <li>• Model with the students how to measure something on the original art, multiply it by six and then draw it on their enlargement square. This is a big difference between the MATH project and the video show above. They MUST measure everything!</li> <li>• Each student creates his enlarged square, colors it, and then compiles it with his classmates squares to create the finished project.</li> </ul> <p>Things to think about:</p> <ul style="list-style-type: none"> <li>• Centimeters work better than inches. Small rulers (six inches) work better than full length rulers.</li> <li>• It's important to discuss what to do if something on the original art measures a fraction of a centimeter.</li> <li>• We encourage the kids to meet with the squares on the sides of them to compare the measurements and see if they match up. They have had some amazing discussions investigating their measurements.</li> <li>• We encourage the kids to meet with the squares around them to discuss color choices. This will (hopefully) create more consistency in color.</li> </ul>	



**Materials Students Need:**

- Copy of Jon Van Zyle’s print “Nod to the Past” - <http://www.jonvanzyle.com/IditarodPrints.html>
  - One without grid lines and one with
- Square of drawing papers – you will need to make this square six times as large as the squares in the grid on the original copy
- Crayons, markers, or colored pencils
- Ruler





**Technology Utilized to Enhance Learning:****Other Information:****Modifications for Special Learners/ Enrichment Opportunities:**





- Early finishers can complete a second square to finish out the print.
- This assignment can be simplified by choosing a less detailed piece of art. Maybe they could enlarge the Iditarod shield or logo. Maybe a logo from an Iditarod racing kennel could be used as well.





**Additional Information**



Every row, column, and mini-grid must contain the numbers 1-4. Don't guess – use logic!



**P A W P R I N T S U D O R U 2**

Every row, column, and mini-grid must contain the numbers 1-6. Don't guess – use logic!

2	1			4	3
		6	2		
		3	4		
3	4			5	6





































		2	4		
4					2
	2			3	
	4			6	
1					6
		3	5		

		1	6		
6					1
	2			6	
	5			3	
4					
		5	4		



**P A W P R I N T S U D O K U B O N U S**

Every row, column, and mini-grid must contain the numbers 1-6. Don't guess – use logic!



# Mathematical Morning Meal Challenges

## Iditarod Version

### Teacher Notes:

When the weather turns colder and my kids start complaining about having to go outside for morning recess (yes, we need to have a talk about recess in Alaska in the winter), I know it's time to start our MMM Challenges!

MMM stands for Mathematical Morning Meal. Each Monday the students are presented with a challenging math problem for them to work on for extra credit. They take them home and have a week to try to come up with a solution. On Friday morning during morning recess before school they are invited in to share their thinking and a doughnut while we go over the problem.

The problems are intentionally tough... I love to hear the kids talk about how their whole family discussed the problems at dinner or how a father thought one thing but the student had his own ideas.

My rule is that if they have given the problem an honest try, they can come to the breakfast.

Even if you don't want the students to do the problems at home, maybe they would make good problems of the day or week to hang in your room and discuss.

Enjoy!

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

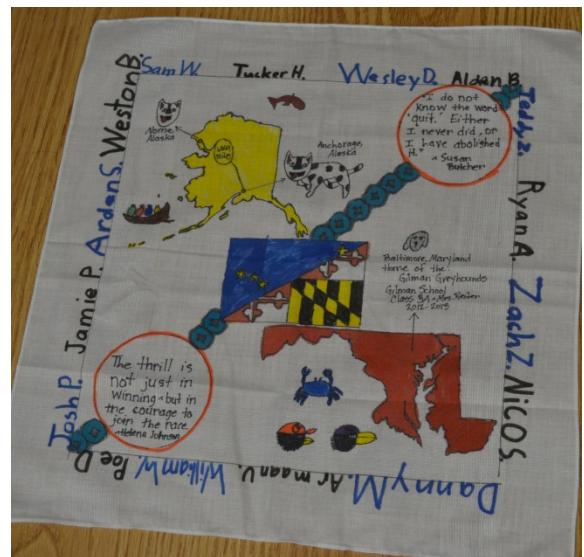
#### Challenge #1: Blocking the Next Quilt

Terrie Hanke, the seamstress who puts together all of the Iditarod Traveling Quilts, has enough squares from schools to build a new quilt. She says:

“I have twelve quilts squares from schools. Each square is sixteen by sixteen inches. I want to put the quilt on a large piece of fleece. I want a three inch border on all sides of the quilt and three inches between all of the squares. How much fleece will I need to buy?”

Can you help her out?

Extra, extra challenge: If fleece is on sale this week at Joann Fabrics for \$3.99 a yard, how much money will it cost her to buy the fleece she needs?



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #2: Puppy Paw Power!

Several weeks before the start of the Iditarod, a large group of volunteers gets together at headquarters to make the foot ointment that the vets will use along the trail. The formula for the ointment is 3 parts zinc oxide, 2 parts thuma-zinc oxide, 1 part triamcinalone, and 875cc mineral oil.

The volunteers have a two quart pitcher to use to measure out the ingredients. They need to make a batch for each checkpoint along the trail.



(Hint: the two quart pitcher = 1 part)



Calculate how much of each ingredient is going to be needed to make the ointment for this year's race. Be sure to document and explain your thinking. Also be certain to label your answers.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #3: Timing is Everything!

At the checkpoint you have to melt snow to make food for your dogs. Suppose you have to boil the melted snow for exactly 15 minutes, but you have no watch or clock. You have only a seven minute and an eleven minute hourglass. How could you time exactly fifteen minutes using only these two hourglasses?



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #4: The Case of the Missing Tang!

Apparently one of the favorite things for volunteers and mushers to drink at checkpoints is Tang! In fact, there are stories about what happens when the Tang runs out that are not pretty! One day at a Yentna, the Communications (Comms) person put out a tray of glasses filled with Tang and went off to check her computer. By the time she came back, there was no Tang left for her!

The vet drank half of the glasses. A musher came in and drank a fourth of the glasses. The Teacher on the Trail was there, but she only drank one glass. The Race Judge had three glasses.

How many glasses had the Comms person put on the tray to start with?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #5: Filling Up the Tank!

Martin Buser estimates that he eats 6,500 calories a day during the race. If you wanted to eat only at McDonald's for one day and eat as many calories as Martin Buser eats in a race day, what would you order?

You can see a menu with calories at this link:

[http://www.mcdonalds.com/us/en/full\\_menu\\_explorer.html](http://www.mcdonalds.com/us/en/full_menu_explorer.html)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #6: Chores Galore!

As you can imagine, there are chores galore at any Iditarod musher's kennel. Here is one kennel's schedule:

Give dogs a bath: every four days

Clean out dog houses: every six days

Wash and rinse dog bowls: every two days

Make repairs to harnesses: every three days

How many times in twelve weeks will all four chores need to be done on the same day?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #7: Feet to the Line!

On Sunday, March 3<sup>rd</sup>, 65 teams departed Willow to embark on the 41<sup>st</sup> Iditarod! The sixty-sixth musher, Ed Stielstra, scratched due to an injury that happened in training prior to the race. Mikhail Telpin started with 12 dogs. Cindy Abbott, Bob Chulpach, and Rudy Demonski each started 14 dogs and Charley Bejina started with 15 dogs. All of the other mushers fielded full teams of sixteen dogs!

How many feet crossed the starting line and started down the trail to Nome on restart day?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #8: Filling the Tank, Part 2

Iditarod dogs consume about 10,000 calories a day during the race! How many of your favorite candy bars would you have to eat to equal the same number of calories?

Here's a link that has the calories of many candy bars. Be sure to take note of the size of each bar. <http://calorielab.com/foods/candy-bars/108>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #9: Managing the MPHs

Dallas Seavey is planning to leave Shaktoolik at 11:00pm and camp at a spot seventeen miles down the trail. He is travelling at a speed of four miles per hour. He passes Aily Zirkle who is camping on the trail at 12:45. If he wants to make it to his camp site by 2:00am, how fast does he need to travel from his Aily's campsite to his campsite?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #10: Tight Parking

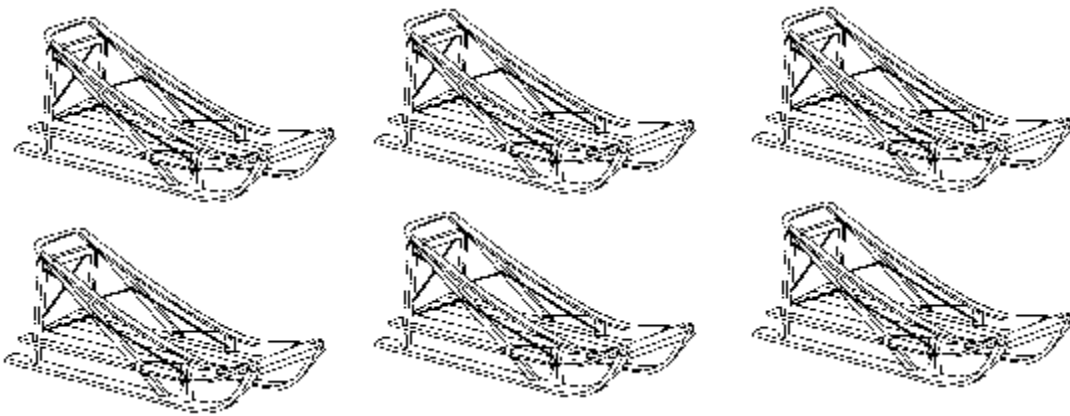
Six sleds are parked in front of the Takotna checkpoint for their twenty-four hour rest. You are looking at the sleds from the front. Can you figure out which musher is parked in which spot?

Jeff King is parked in front of Dee Dee Jonrowe.

Aaron Burmeister is parked between Dee Dee Jonrowe and Monica Zappa.

Jason Mackey is parked on the right side of Jeff King.

Jake Berkowitz is parked in front of Monica Zappa.



Front

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mathematical Morning Meal Challenge

### Iditarod Edition!

#### Challenge #11: Pie, Pie, Pie!

Each checkpoint has its own trait that makes it unique and different on the trail. Takotna's claim to fame is how well they feed the mushers. When a musher pulls into Takotna, they are checked in by the checker and then are asked, "How do you like your steak?" Yes. The village cooks each and every musher who arrives, no matter what time of the day or night, a steak! Takotna is a popular place to take the 24 hour layover, due in part, to the hospitality the mushers find there. If the musher decides not to stay, they are provided with a bagged lunch to take with them!

In addition to the steaks, Takotna is known for pies. Each year, the people of the village bake about 80 pies to feed all of the mushers and volunteers who arrive with the race. This is pretty impressive given that the total population of village is about only fifty people!

For this MMM, you will need to find a pie recipe. Ask if there is a pie recipe that is special to your family, or find one on line for your favorite type of pie. Look carefully at the list of ingredients. Now, calculate how much you would need of each ingredient to make 80 pies!

Next, imagine that you can fit two pies into your oven at one time. Calculate how long it would take you to bake all 80 of those pies!





# Iditarod Themed Mental Math Challenges

## Monday:

Start with the maximum number of dogs who can start on an Iditarod team

Plus 9

Minus 1

Add 5

Add half a dozen

Subtract 3

Plus the number of sides on a triangle

You should be on \_\_\_\_\_

## Tuesday:

Start with Dallas Seavey's age when he became the youngest musher to win the Iditarod

Double the number

Divide by 5

Multiply by 1

Add 8

Divide by 3

Add 1

Double the number

You should be on number \_\_\_\_\_

## Wednesday:

What is the least amount of dogs you can finish the race with? Start with that number.

Double it.

Double it again.

Divide by 6.

Multiply by 10.

Subtract the number of the month the Iditarod starts in.

Add the two digits in the number together.

Divide by 5.

You should be on number \_\_\_\_\_

## Thursday:

Start with the minimum number of dogs you can have to start the Iditarod.

Double the number.

Subtract the number of sides on a quadrilateral.

Take half of that number.

Minus 1.

Times 3.

Plus 7.

Plus 6.

You should be on number \_\_\_\_\_

## Friday:

Start with the number of times each musher will start the Iditarod this year.

Multiply by 9.

Divide by 6.

Multiply by 3.

Add the number of months in a year.

Divide by 3.

Multiply by 6.

Subtract the number of times each musher will finish the Iditarod this year.

Double it.

You should be on number \_\_\_\_\_

## Create a Number Challenges

### Iditarod Style!

**Teacher Directions:** Remove the face cards and jokers from a deck of cards. Deal five cards to each student. They must use at least three of the cards to form a number sentence that equals the numbers shown below. They can use any operation to make their equations.

Monday:

This is the \_\_\_\_\_ time that the Iditarod Race has been run. Make an equation to show the number.

Tuesday:

There are \_\_\_\_\_ checkpoints on this year's race. Make an equation to show the number.

Wednesday:

If a musher begins with sixteen dogs and has booties on each of their feet, how many booties will they need to start with total? Make an equation to show the number.

Thursday:

There are \_\_\_\_\_ mushers entered in this year's race. Make an equation to show the number.

Friday:

What bib number did your musher draw? Make an equation to show the answer.

# Iditarod: Northern Route Musher Tracking Sheet

Student Name: \_\_\_\_\_



Musher Name and Bib Number: \_\_\_\_\_

Checkpoint	Position	Date In	Time In	# Dogs In	Date Out	Time Out	# Dogs Out	# dropped
Anchorage								
BLM								
Willow								
Yentna								
Skwentna								
Finger Lake								
Rainy Pass								
Rohn								
Nikolai								
McGrath								
Takotna								
Ophir								
Cripple								
Ruby								
Galena								
Nulato								
Kaltag								
Unalakleet								
Shaktoolik								
Koyuk								
Elim								
White Mountain								
Safety								
Nome								

# Iditarod: Southern Route Musher Tracking Sheet

Student Name: \_\_\_\_\_

Musher Name and Bib Number: \_\_\_\_\_

Checkpoint	Position	Date In	Time In	# Dogs In	Date Out	Time Out	# Dogs Out	# dropped
Anchorage								
BLM								
Willow								
Yentna								
Skwentna								
Finger Lake								
Rainy Pass								
Rohn								
Nikolai								
McGrath								
Takotna								
Ophir								
Iditarod								
Shageluk								
Anvik								
Grayling								
Eagle Island								
Kaltag								
Unalakleet								
Shaktoolik								
Koyuk								
Elim								
White Mountain								
Safety								
Nome								

# Iditarod: Fairbanks Start

## Musher Tracking Sheet



Student Name: \_\_\_\_\_

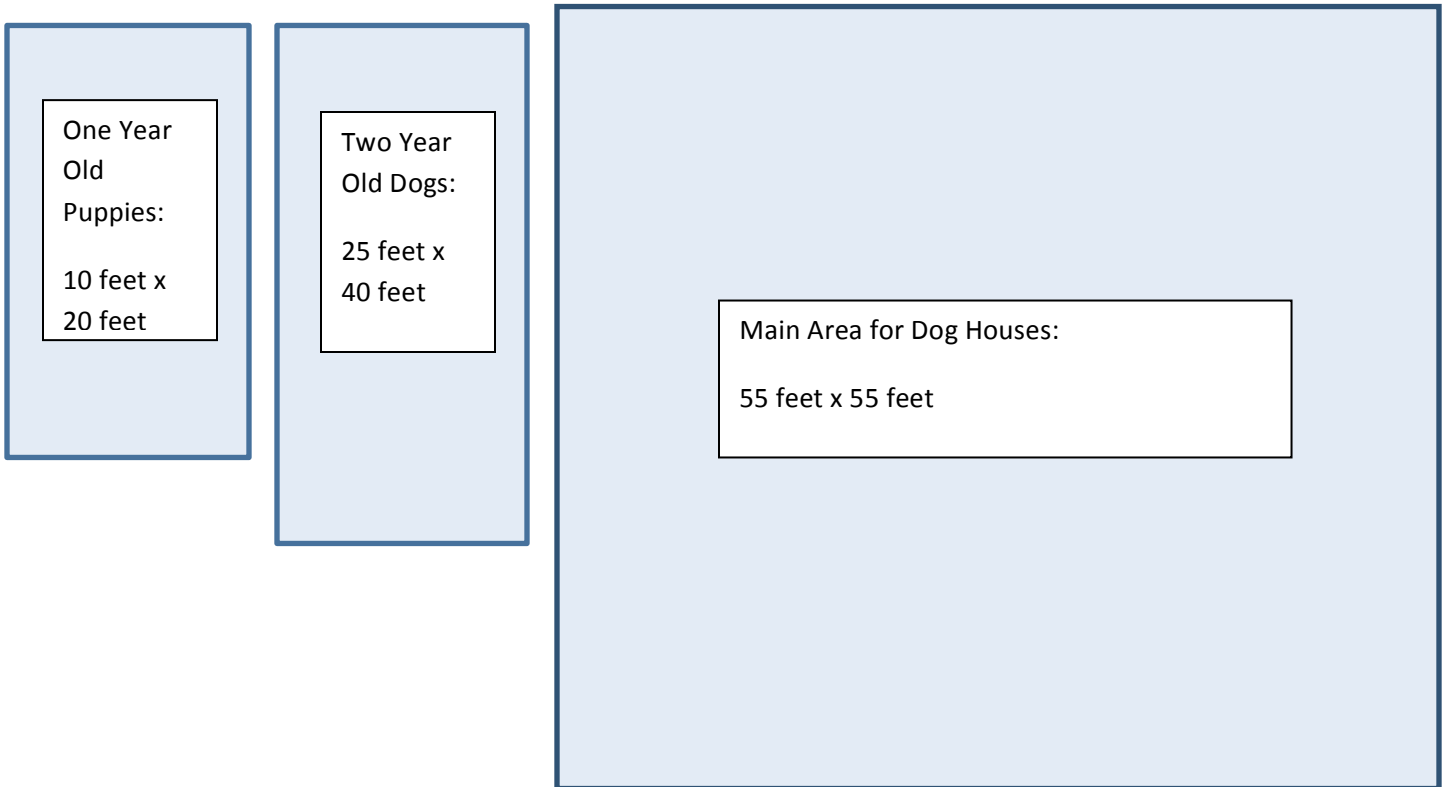
Musher Name and Bib Number: \_\_\_\_\_

Checkpoint	Position	Date In	Time In	# Dogs In	Date Out	Time Out	# Dogs Out	# dropped
Anchorage								
BLM								
Fairbanks								
Nenana								
Manley								
Tanana								
Ruby								
Galena								
Huslia								
Koyukuk								
Nulato								
Kaltag								
Unalakleet								
Shaktoolik								
Koyuk								
Elim								
White Mountain								
Safety								
Nome								

# Iditarod Math Practice Test

## **Section One: Area and Perimeter**

When Mrs. Reiter and Mrs. Rizzuto visited Dallas Seavey’s kennel, it was arranged sort of like this:



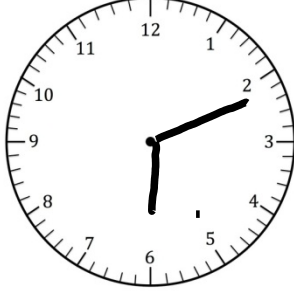
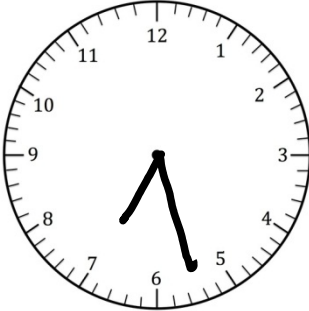
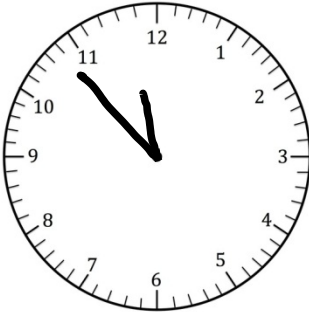
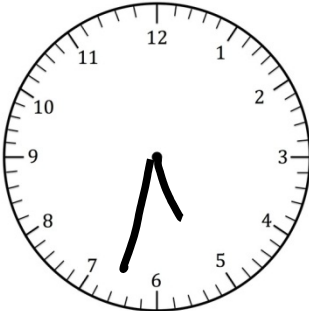
Complete the chart below to show the area and perimeter of each pen.

	Area	Perimeter
One Year Old Pen		
Two Year Old Pen		
Main Area for Dog Houses		



## Section Two: Telling Time

Help the checkers record the times the mushers arrived in Ruby.

Musher Name:	Clock:	Time Arrived:
Martin Buser	 An analog clock face with numbers 1 through 12. The hour hand is positioned between 6 and 7, closer to 6. The minute hand is pointing exactly at the 3 o'clock position.	
Dallas Seavey	 An analog clock face with numbers 1 through 12. The hour hand is positioned between 7 and 8, closer to 7. The minute hand is pointing exactly at the 6 o'clock position.	
Monica Zappa	 An analog clock face with numbers 1 through 12. The hour hand is positioned between 10 and 11, closer to 11. The minute hand is pointing exactly at the 11 o'clock position.	
John Baker	 An analog clock face with numbers 1 through 12. The hour hand is positioned between 6 and 7, closer to 7. The minute hand is pointing exactly at the 9 o'clock position.	

### **Section Three: Elapsed Time**

Help the volunteer update this data chart for the Rainy Pass checkpoint.

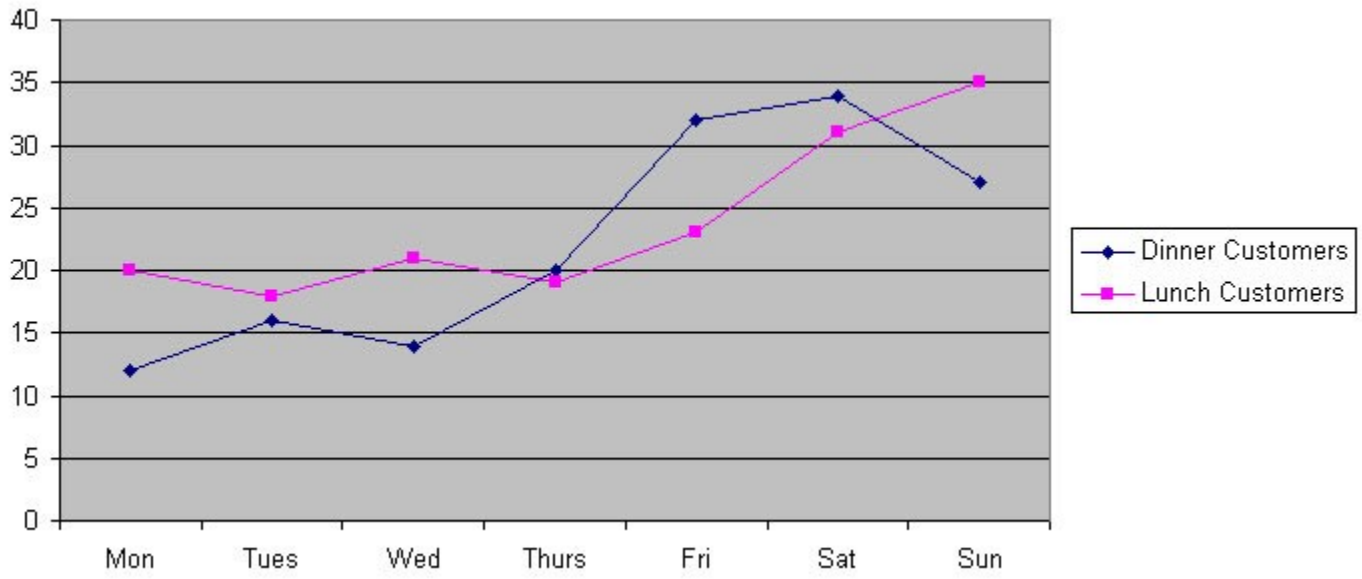
Musher:	Time In:	Time Out:	Time Spent in Rainy Pass:
Jake Berkowitz	12:43pm	12:49pm	
Mike Santos	3:36pm	11:52pm	
Dee Dee Jonrowe	11:32am	2:45pm	
Scott Janssen	04:34am	3:09pm	
Nicholas Petit	6:52am	7:10pm	

### **Section Four: Military and Civilian Time**

As we learned, the official race times are recorded in military time. Complete the conversion chart below to show the official finishing times in civilian time.

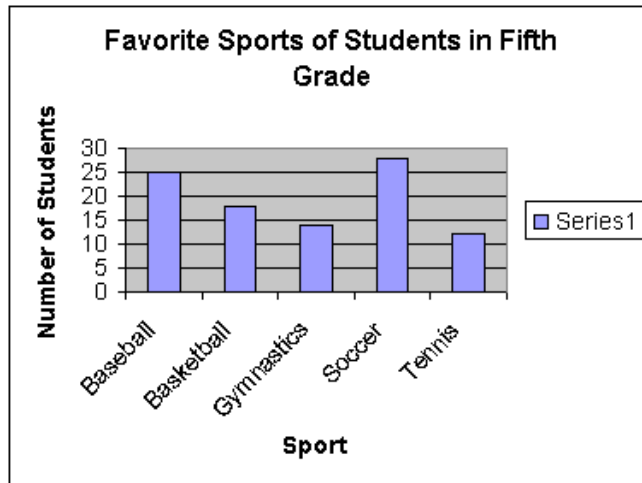
Finisher:	Official Finishing Time:	Civilian Time:
Ray Redington Jr.	19:11:10	
Martin Buser	15:58:58	
Matt Failor	07:42:30	
Aaron Burmeister	20:46:14	
Nathan Schroeder	08:52:51	

## Section Five: Graphing



Use the graph above to answer the following questions:

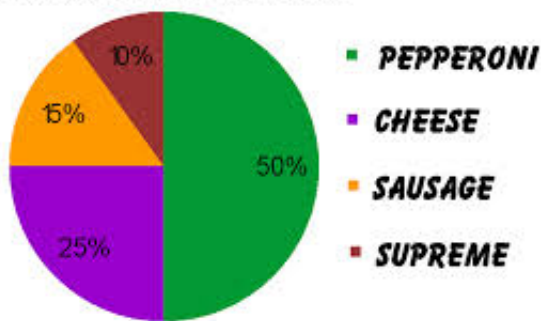
1. What type of graph is pictured?
2. What would be a good title for the graph?
3. What would be good titles for the horizontal axis and vertical axis?
4. What day of the week was most busy for lunch?
5. If you didn't want to wait for a table for dinner which night should you eat out?
6. Which day of the week is this restaurant most busy for both lunch and dinner?



Use the graph above to answer the following questions:

7. What type of graph is pictured?
8. Which sport do most fifth graders play?
9. List something else you can learn from this graph.

**FAVORITE PIZZA TOPPINGS**



Use the graph above to answer the following questions:

10. What type of graph is shown?
11. Which pizza topping is the favorite?
12. Which topping is liked the least?

**Section Six: Median, Mode, Range, Average (Mean)**

Use the information below to calculate the median, mode, range and average number of dogs that the first ten mushers finished with in last year’s race.

Pos	Musher	Bib	Checkpoint	Time In	Dogs In	Total Race Time	Average Speed	Time Enroute	Previous Checkpoint	Time Out
1	Dallas Seavey	14	Nome	3/11 04:04:19	7	8d 13h 4m 19s	4.70	2h 48m	Safety	3/11 01:16:00
2	Aliy Zirkle	10	Nome	3/11 04:06:41	10	8d 13h 6m 41s	4.70	2h 31m	Safety	3/11 01:35:00
3	Mitch Seavey	6	Nome	3/11 07:39:40	11	8d 16h 39m 40s	4.62	3h 29m	Safety	3/11 04:10:00
4	Joar Leifseth Ulsom	47	Nome	3/11 10:01:01	9	8d 19h 1m 1s	4.57	2h 26m	Safety	3/11 07:35:00
5	Sonny Lindner	70	Nome	3/11 11:50:49	10	8d 20h 50m 49s	4.53	3h 10m	Safety	3/11 08:40:00
6	Martin Buser	36	Nome	3/11 15:58:58	12	9d 0h 58m 58s	4.44	3h 11m	Safety	3/11 12:47:00
7	Jessie Royer	27	Nome	3/11 19:03:25	10	9d 4h 3m 25s	4.38	2h 24m	Safety	3/11 16:39:00
8	Ray Redington Jr	51	Nome	3/11 19:11:10	10	9d 4h 11m 10s	4.38	2h 24m	Safety	3/11 16:47:00
9	Hans Gatt	58	Nome	3/11 19:40:25	11	9d 4h 40m 25s	4.37	2h 50m	Safety	3/11 16:50:00

Median:







Mode:

Range:

Mean (average):

## Section Seven: Money, Money, Money!

A. Vendors: Help the Iditarod souvenir vendors count their sales by writing the total amount of money in each box.

1.	
2.	
3.	
4.	
5.	
6.	

**B. Nathan Buys Supplies:** Nathan needs your help as he goes shopping for some supplies for the race. Help him by calculating the change he should receive.

1. Snowhook with rollover bar

Costs: \$44.79

Pays with: \$50.00 bill

Change: \_\_\_\_\_

2. X-back Harness

Costs: \$22.48

Pays with 2: \$20.00 bills

Change: \_\_\_\_\_

3. Snow Shoes

Costs: \$156.29

Pays with two: \$100.00 bills

Change: \_\_\_\_\_

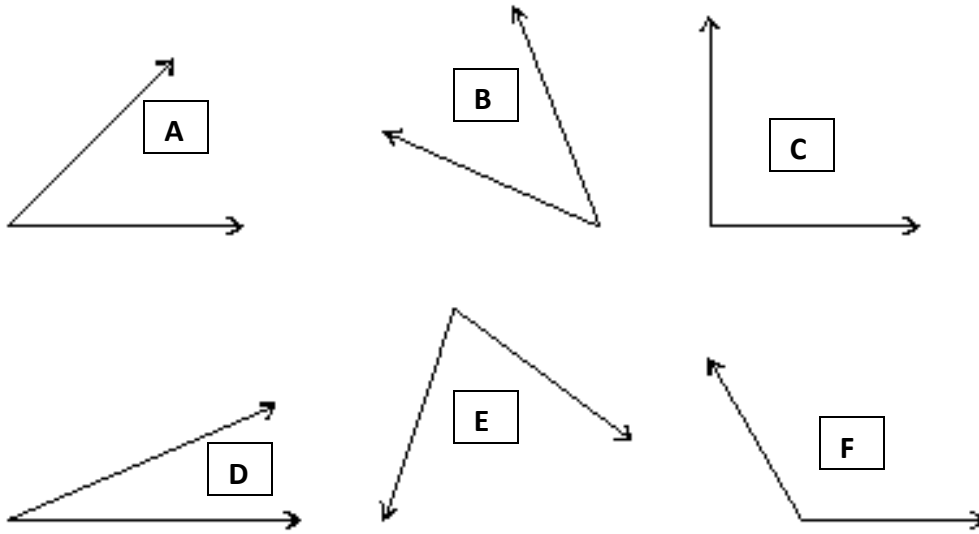
4. Wool hat

Costs: \$27.99

Pays with: \$50.00 bill

Change: \_\_\_\_\_

Section Eight: What's Your Angle?



Use your pencil to draw in and label 6 angles above. Use the chart below to write the measurement and classification of each angle.

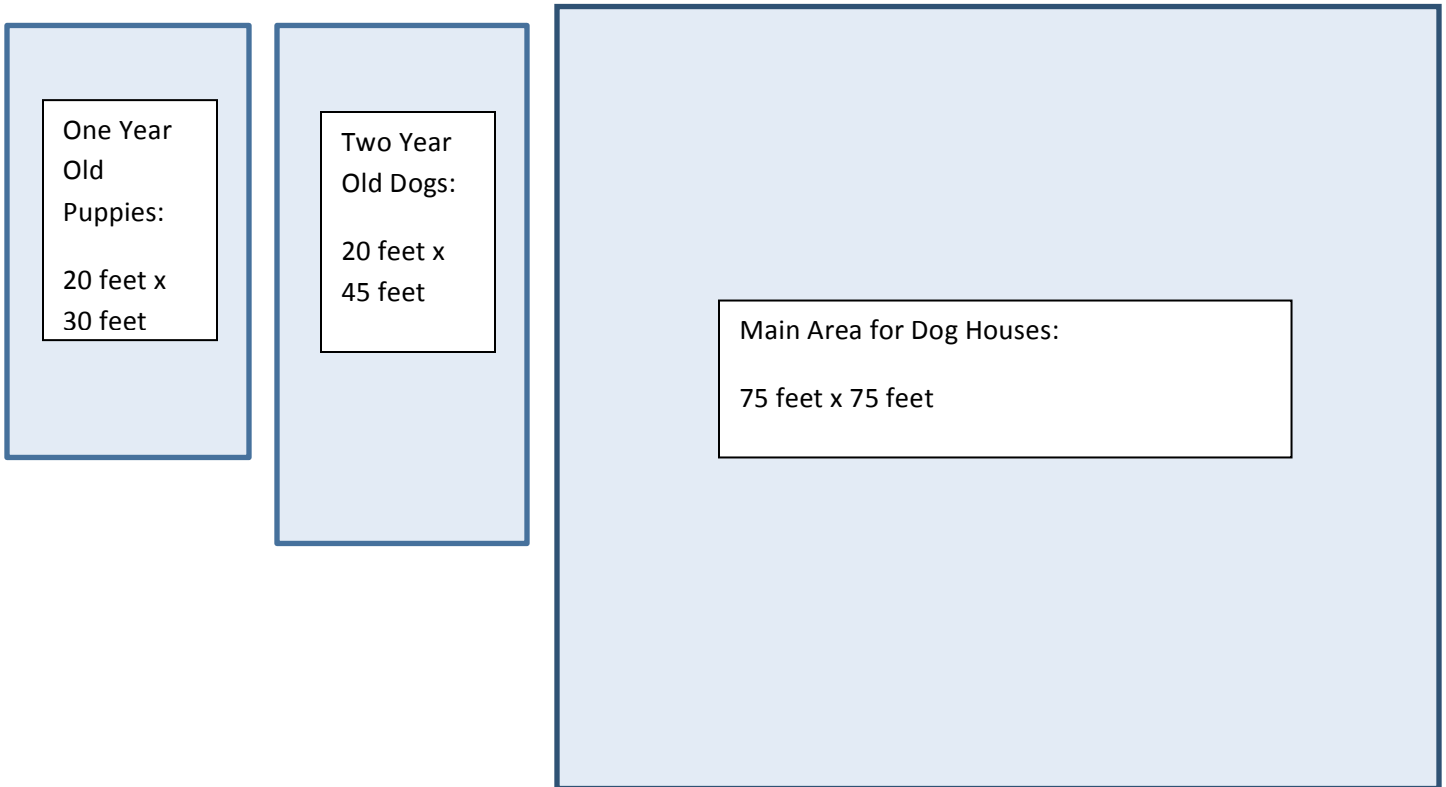
Label:	Measurement:	Type of Angle:



# Iditarod Math Test

## Section One: Area and Perimeter

When Mrs. Reiter and Mrs. Rizzuto visited Dallas Seavey's kennel, it was arranged sort of like this:

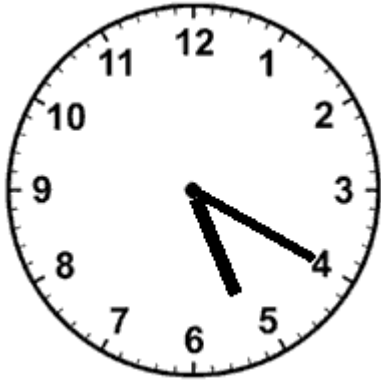


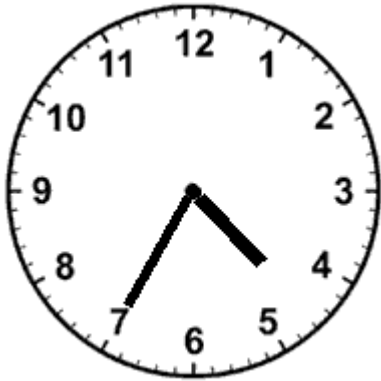


Complete the chart below to show the area and perimeter of each pen. (2points each)

	Area	Perimeter
One Year Old Pen		
Two Year Old Pen		
Main Area for Dog Houses		

## Section Two: Telling Time

Help the checkers record the times the mushers arrived in Ruby. (2 points each)

Musher Name:	Clock:	Time Arrived:
Martin Buser	 An analog clock face with numbers 1 through 12. The hour hand is between 4 and 5, closer to 4. The minute hand points exactly to the 5.	
Dallas Seavey	 An analog clock face with numbers 1 through 12. The hour hand is between 1 and 2, closer to 2. The minute hand points to the 11.	
Monica Zappa	 An analog clock face with numbers 1 through 12. The hour hand points exactly to the 10. The minute hand points exactly to the 12.	
John Baker	 An analog clock face with numbers 1 through 12. The hour hand is between 4 and 5, closer to 5. The minute hand points to the 7.	

### **Section Three: Elapsed Time**

Help the volunteer update this data chart for the Ophir checkpoint. (2 points each)

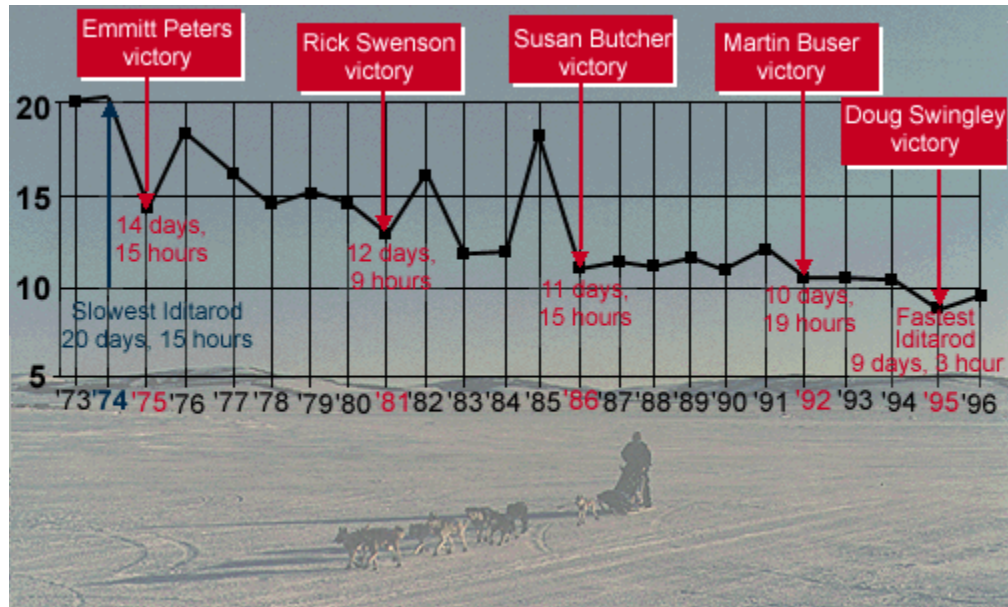
Musher:	Time In:	Time Out:	Time Spent in Ophir:
Paige Drobney	8:14pm	12:54am	
Aliy Zirkle	6:41am	9:33am	
Nicolas Petit	12:37am	2:24pm	
Ramey Smyth	11:34am	4:31pm	
Brent Sass	7:46am	11:27am	

### **Section Four: Military and Civilian Time**

As we learned, the official race times are recorded in military time. Complete the conversion chart below to show the official finishing times in civilian time. (2 points each)

Finisher:	Official Finishing Time:	Civilian Time:
Dallas Seavey	19:29:26	
Mitch Seavey	04:10:58	
Ken Anderson	09:56:03	
Hugh Neff	23:41:52	
Jeff King	14:44:06	

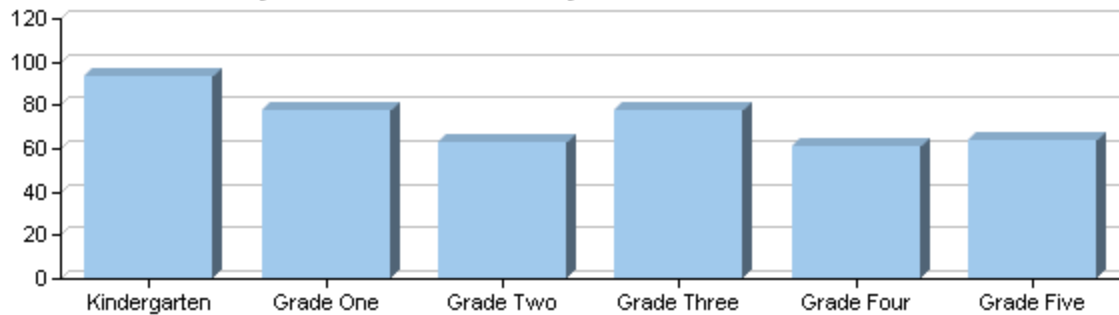
## Section Five: Graphing



Use the graph above to answer the following questions: (2 points each)

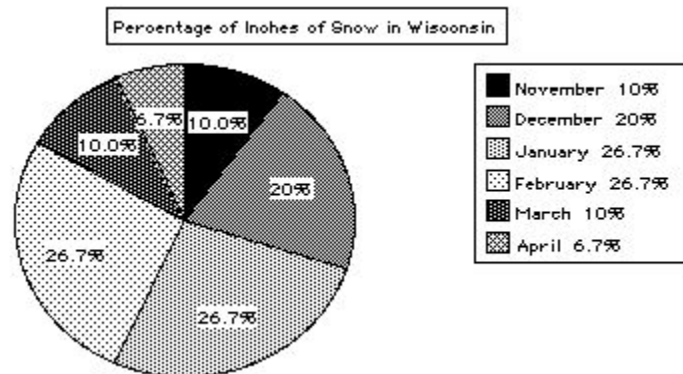
1. What type of graph is pictured?
2. What would be a good title for the graph?
3. What would be good titles for the horizontal axis and vertical axis?
4. In what year did Martin Buser have his victory?
5. Who won the race in 1981?
6. How long did it take Susan Butcher to complete the race?

**Iditarod Elementary School Enrollment by Grade**



Use the graph above to answer the following questions: (2 points each)

7. What type of graph is pictured?
8. Which grade has the highest enrollment?
9. List something else you can learn from this graph.



Use the graph above to answer the following questions: (2points)

10. What type of graph is shown?
11. Which month or months had the largest amount of snowfall?
12. Which month or months had the smallest amount?

**Section Six: Median, Mode, Range, Average (Mean)**

Use the information below to calculate the median, mode, range and average number of dogs that the first ten mushers finished with in last year's race. (4 points each)

Pos	Musher	Bib	Checkpoint	Time In	Dogs In	Days	Hours	Minutes	Seconds	Average Speed	Time Enroute	Previous Checkpoint	Time Out
1	Mitch Seavey	36	Nome	3/12 22:39:56	10	9	7	39	56	4.41	3h 2m	Safety	3/12 19:37:00
2	Aliy Zirkle	27	Nome	3/12 23:03:35	10	9	8	3	35	4.41	3h 1m	Safety	3/12 20:02:00
3	Jeff King	18	Nome	3/13 00:21:56	11	9	9	21	56	4.38	2h 45m	Safety	3/12 21:36:00
4	Dallas Seavey	19	Nome	3/13 01:20:51	7	9	10	20	51	4.36	2h 42m	Safety	3/12 22:38:00
5	Ray Redington Jr	52	Nome	3/13 02:04:54	9	9	11	4	54	4.35	2h 56m	Safety	3/12 23:08:00
6	Nicolas Petit	16	Nome	3/13 02:39:13	10	9	11	39	13	4.34	2h 55m	Safety	3/12 23:44:00
7	Joar Leifseth Ulsom (r)	32	Nome	3/13 03:34:00	10	9	12	34	0	4.32	2h 48m	Safety	3/13 00:46:00
8	Jake Berkowitz	44	Nome	3/13 03:34:16	15	9	12	34	16	4.32	2h 49m	Safety	3/13 00:45:00
9	Sonny Lindner	67	Nome	3/13 04:11:02	9	9	13	11	2	4.31	3h 4m	Safety	3/13 01:07:00
10	DeeDee Jonrowe	28	Nome	3/13 04:24:39	10	9	13	24	39	4.30	2h 59m	Safety	3/13 01:25:00

Median:































Mode:

Range:

Mean (average):

## Section Seven: Money, Money, Money!

A. Vendors: Help the Iditarod souvenir vendors count their sales by writing the total amount of money in each box. (2 points)

1.							
2.							
3.							
4.							
5.							
6.							

**B. Dallas Buys Dog Supplies: Dallas needs your help as he goes shopping for some supplies for the kennel. Help him by calculating the change he should receive. (2 points each)**

1. Self - Adherent Pet Bandage Wrap

Costs: \$4.79

Pays with: \$5.00 bill

Change: \_\_\_\_\_



2. Aussie Gear Doggie Booties

Costs: \$28.04

Pays with: TWO twenty dollar bills

Change: \_\_\_\_\_



3. Wool Dog Coat

Costs: \$38.24

Pays with: \$50.00 bill

Change: \_\_\_\_\_



4. Toothbrush and Toothpaste

Costs: \$2.99

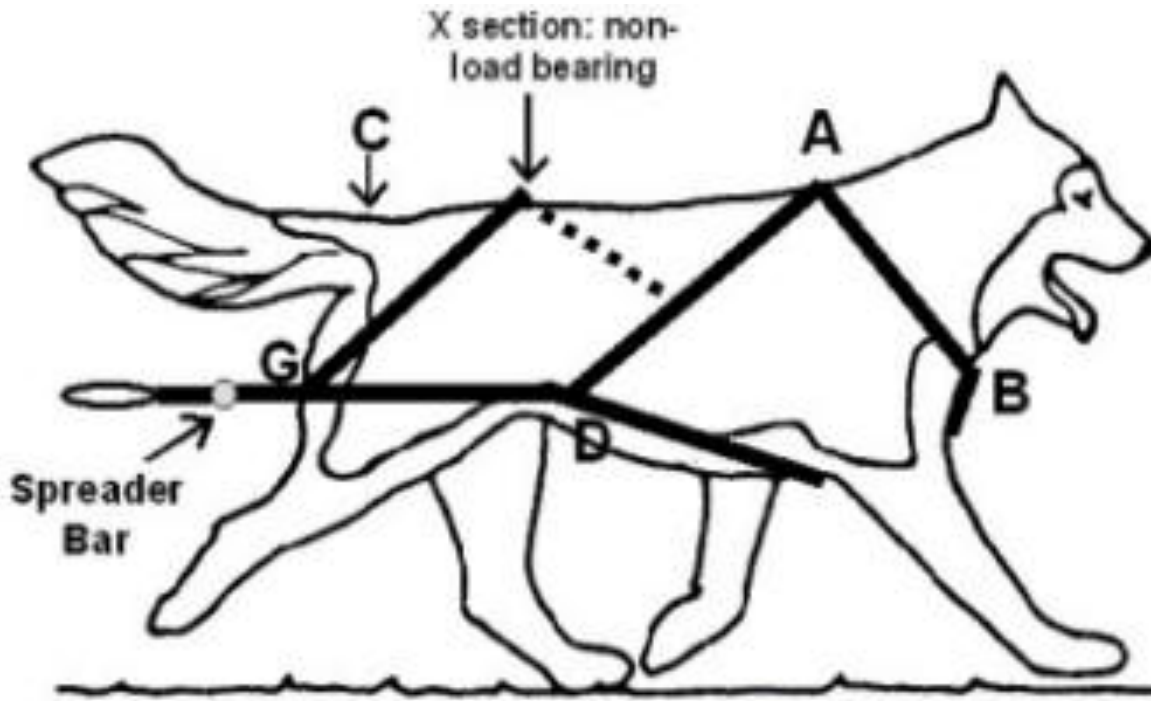
Pays with: \$10.00 bill

Change: \_\_\_\_\_





Section Eight: What's Your Angle?



Use your pencil to draw in and label 4 angles in the harness above. Use the chart below to write the measurement and classification of each angle.

Label:	Measurement:	Type of Angle: