

The Serum Run

5th
grade

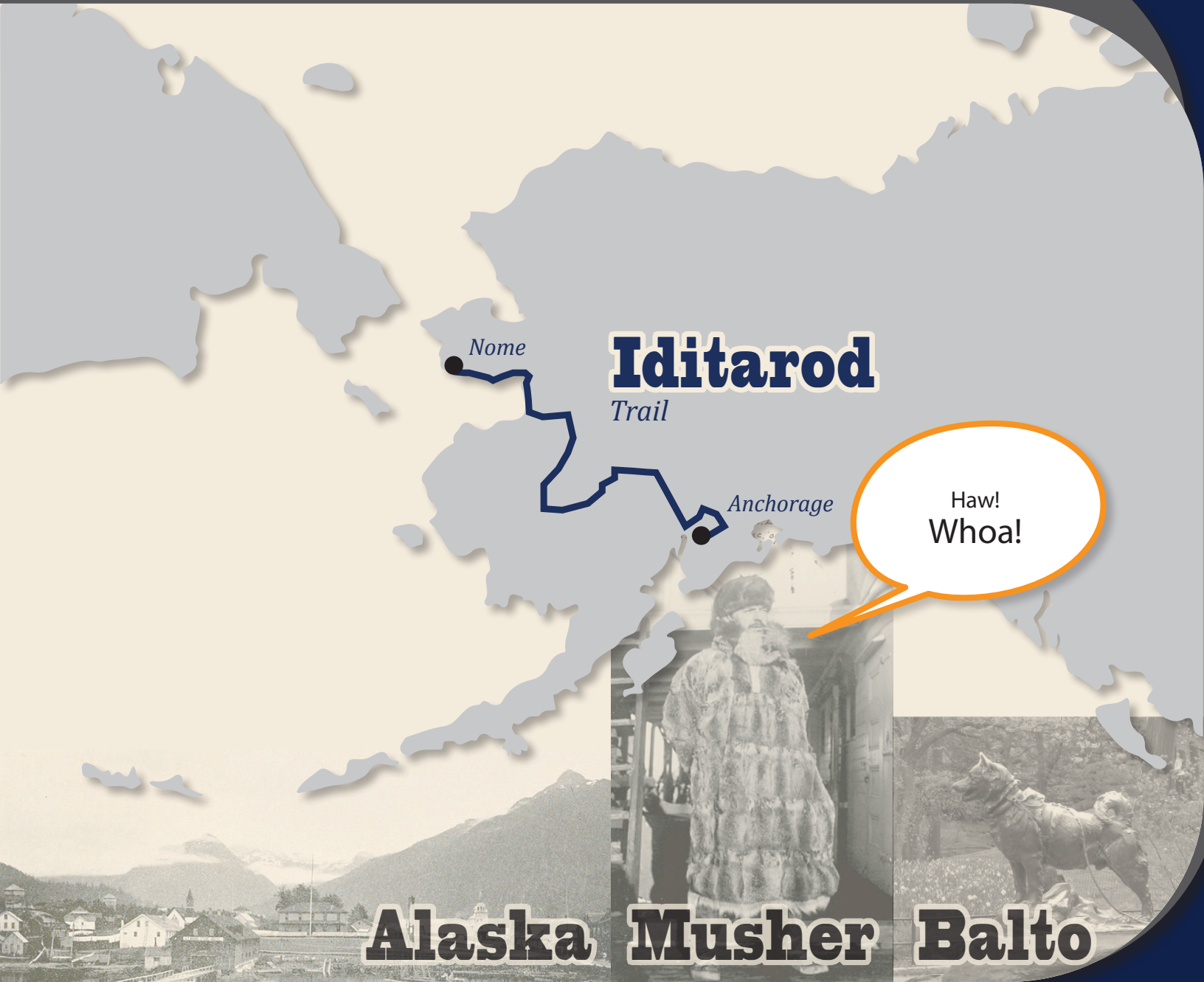


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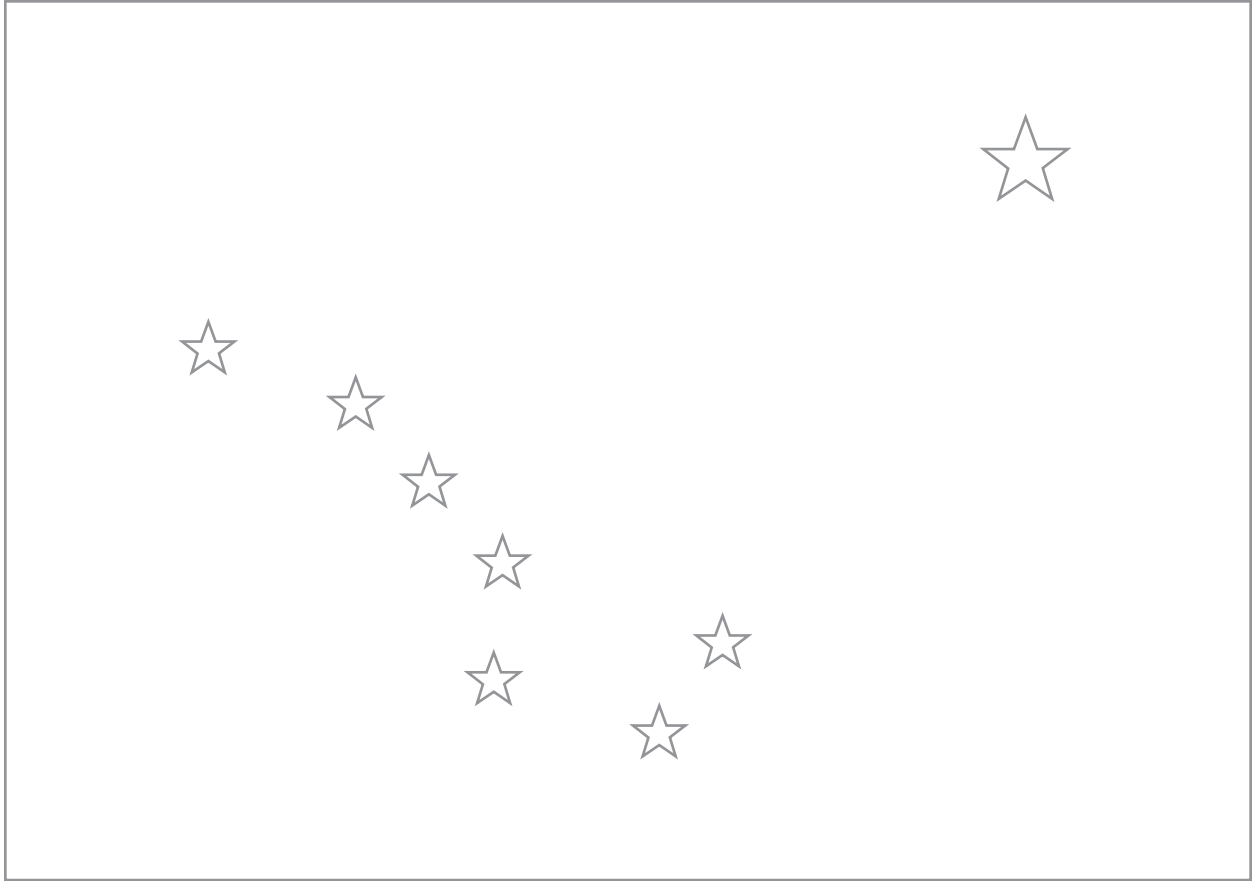
Musher Math Word Problems *

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Answer Sheets

** Has an Answer Sheet*

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Questions to Research

Color the Alaska state flag with the right colors.

What does the eighth star in the upper-right corner of the flag symbolize?

What is the state flower?

What is the state capital?

Alaska is state number ____.

What is the state postal abbreviation?



The **Great Race** of **Mercy**

Locate and label the following places and things on the map of Alaska above.

RUSSIA ARCTIC CIRCLE

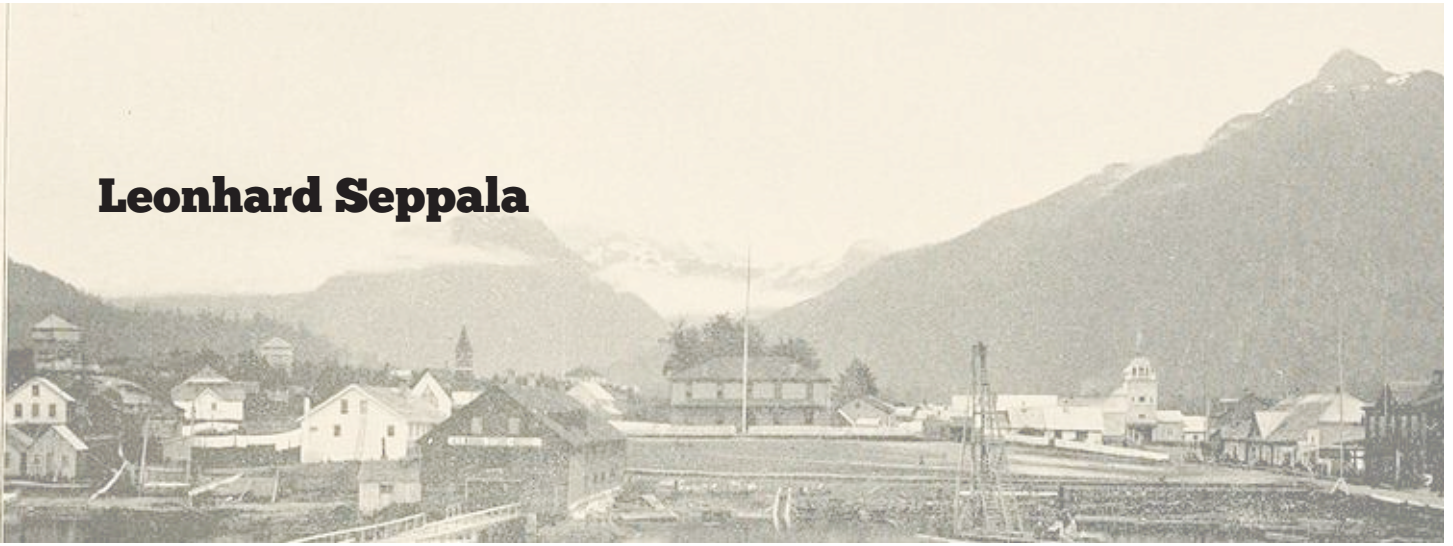
NORTON SOUND IDITAROD TRAIL

NOME JUNEAU ANCHORAGE

ARCTIC OCEAN PACIFIC OCEAN

THE GREAT RACE OF MERCY was a race to deliver serum that would save the lives of hundreds of people at risk of catching diphtheria in Nome, Alaska in 1925. The serum, relayed over 600 miles with 20 sled dog teams and their mushers, was delivered successfully.

Leonhard Seppala



L EONHARD SEPPALA played a crucial role in the serum run to Nome. Born in Norway, he immigrated to Alaska in the early 1900s when a friend convinced him to work for a mining company there.

Seppala's first team of sled dogs fell into his lap by chance. Seppala's friend had purchased the dogs, Siberian huskies, for someone else but ended up giving them to Seppala. "I literally fell in love with them from the start," he later said. "I could hardly wait for sledding snow to start their training." In 1915, Seppala won the All Alaska Sweepstakes, the first of three back-to-back victories in the 408-mile race. He built a name for himself as one of Alaska's best mushers.

At the time of the diphtheria outbreak, Seppala was delivering mail and freight by dogsled through the Alaskan wilderness. Seppala still favored Siberian husky dogs and had trained a strong team for competition. Leading the team was Togo, a husky with impressive grit and speed.

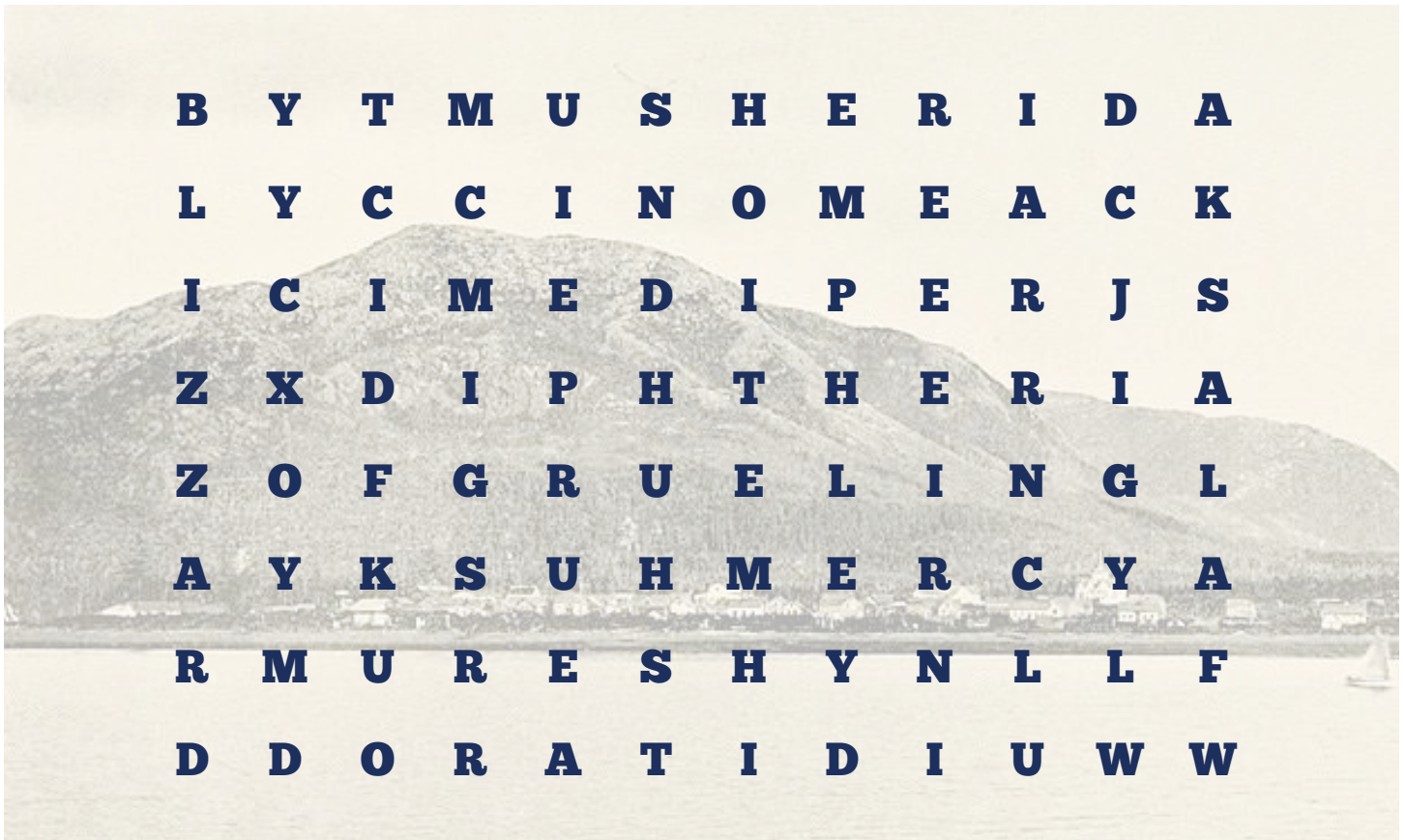
The star husky had a questionable beginning on the team. Togo was a thin, scrappy pup who did not look promising. In fact, Seppala tried multiple times to sell him, but each time, Togo found his way back home! Though he looked scrawny, Togo proved that he was a

fast, powerful racer and won himself a place as Seppala's lead dog.

In the Great Race of Mercy, Togo and Seppala transported the serum for almost twice the length of any other team. When the serum was passed to Seppala at night, he made the decision to brave the high winds and blistering cold in the dark in order to pass the Norton Sound. He did not want to waste time waiting for daybreak, even if it meant greater danger. The conditions on the Sound were risky because the ice was thin in certain parts. This meant risking his own and his dogs' lives, as well as the lives of the citizens of Nome: all would be lost if something should go wrong for him and his team.

Even after the team crossed the perilous Norton Sound in a blizzard, they still had to face the final challenge—ascending a ridge with steep, dangerous grades. Sleep deprived and practically freezing, the team reached Golovin in record time. From there, only 78 miles stood between the serum and Nome.

Thanks to this death-defying feat, the serum arrived to the citizens of Nome in record time. In total, Seppala and Togo traveled 91 miles, almost twice the distance of any other team on the relay.



Word Search

ALASKA – the largest but most sparsely populated U.S. state. Bordering Canada, the Arctic Ocean, and the Pacific Ocean, it is unconnected to the lower 48 states.

BLIZZARD – an extreme snowstorm with strong winds, intense cold, and low visibility.

DIPHTHERIA – a highly contagious bacterial disease that can be fatal.

EPIDEMIC – a widespread, rapid growth of a disease affecting a large number of people at the same time.

GRUELING – exhausting, very tiring, demanding.

HUSKY – a breed of strong, medium-sized dogs often used in arctic regions for hunting and pulling sleds.

IDITAROD – an Alaskan town that flourished in the early 1900s but is now

abandoned. It is also the namesake of the Iditarod Trail Sled Dog Race, which takes place every year with a route that goes from Anchorage to Nome, Alaska. It was inspired by the 1925 serum run.

MERCY – an act of compassion or kindness.

MUSHER – a person who races with a dog team and sled. Mushers used to be professional deliverers, but nowadays, they compete for sport.

NOME – a city in Alaska with a population of roughly 3,600. It is located on the southern Seward Peninsula coast on Norton Sound of the Bering Sea.

SERUM – a liquid usually used to create immunity against an infection or disease. Synonyms for serum: antigen, antitoxin, vaccine.

Interview Assignment

Pretend you are Seppala and a reporter wants to interview you about the serum run. Answer the interview questions based on the information that you just read.

1. I understand you are not a Native Alaskan. Where were you born and why did you immigrate to Alaska?

2. How did you initially feel about training your first team of sled dogs? What kinds of dogs were you training?

3. What was Togo like as a puppy?

4. You tackled the hardest and riskiest part of the 674-mile journey from Nenana to Nome. Describe what the conditions were like as you traveled 91 miles from Shaktoolik to Golovin to complete your part of the journey. Can you highlight one of the life-threatening events that you faced.

Mutter Like a Musher!

Try out these common commands for a dog team!

ALTHOUGH DOG TEAM DRIVERS are often referred to as "mushers" and "mush" is thought by many to be the standard word to get dogs moving, "mush" actually isn't often used. It's considered too soft-sounding for a distinctive command.

The word likely came from the early French explorers and the French word "marche" (go, run), used as a command to a team to start pulling.

HIKE Get moving. ("Mush" and "all right" are sometimes also used.)

HAW Turn to the left.

GEE Turn to the right. (said with a hard G sound, as in "go")

EASY Slow down.

(kissing sound) Speed up, faster.

WHOA Stop.

ON BY Pass another team or other distraction.

LINE OUT Used to tell your lead dog to face forward, straighten the line, and keep it tight (A good lead dog that holds the line tight will prevent tangles as well as help enforce order in the dog team.)

HAW OVER Move over to the left of the trail.

GEE OVER Move over to the right of the trail.

COME GEE An advanced command used to turn around a dog team by having them make a U-turn to their right. If learned and executed properly, it is a very valuable command, especially when running four or more dogs in a team.

COME HAW Same as above but making the U-turn towards the left.



Balto or Togo?

IN 1925, 20 sled dog teams relayed serum that would prevent hundreds of people in Nome, Alaska from catching Diphtheria. One dog, Togo, led the pack that traveled the farthest over the most treacherous terrain. Another lead dog, Balto, led the team that brought the serum into Nome on the last leg of the relay. Even though Togo braved the most dangerous conditions in the serum run, he did not receive much fame and recognition. It was Balto who won the gratitude of the town and stole the nation's heart.

Togo was 12 years old when he ran the Great Race of Mercy. For a husky, which has a lifespan of 12 to 14 years, that's very old. With his musher Leonhard Seppala, he led the string of 20 dogs on an incredibly grueling leg of the journey, which included crossing Norton Sound, an inlet of the Bering Sea. At that time, the inlet was frozen but full of jagged ice that could break at any time. The driving snow made it difficult to see, so Seppala relied on Togo to lead the team in the right direction.

The journey went on record as 91 miles long, but Seppala and Togo actually had to travel 150 miles to meet up with the relay. The entire loop they traveled over four days was 241 miles long—an astonishing feat! Though he survived the journey, Togo could not race much after this incredible relay but lived to the ripe old age of 16. Both humans and dogs truly risked their lives to save others.

The second-longest stretch in the relay was the final leg to Nome, led by a musher named Gunnar Kaasen and his lead dog Balto. The difficult and legendary journey was 55 miles long, with the team relying on Balto's nose to lead them safely through a punishing 80-mph blizzard. Against all odds, the team successfully delivered the medicine to Nome. Balto received a hero's welcome and was honored in newspapers, ceremonies, books, and movies.

Togo received attention as well, but only much later and much less prominently. Many mushers believed that Togo was slighted, with praise and gratitude going to Balto instead.



*Statue of Balto in
New York City's
Central Park.*



TOGO

Age: 12 years

Breed: Siberian husky

Togo was a skinny pup that musher Leonhard Seppala tried to sell twice. He did not think the scrawny dog had the potential to make it on a competitive dogsled team. Both times, the clever Togo escaped and returned to Seppala's kennels.

When Togo was eight months old, he freed himself to chase after his owner's dogsled team and easily caught up with them. Seppala had to keep Togo with him to make sure he didn't get into any other mischief and, much to Seppala's surprise, Togo proved himself by the end of that day. He was on the team.

Years of being Seppala's lead dog prepped Togo for the challenges of the Great Race of Mercy.

What Do You Think?

Describe how you would honor Togo. Sketch a design for a statue, write a newspaper article, or create something else of your choice.

Research It!

Both Balto and Togo's bodies were preserved and are available for the public to see. Do some research and find out where you can see these heroic dogs.

Balto's location: Balto is at the Cleveland Museum of Natural History.
Togo's location: Togo is at the Iditarod Trail Sled Dog Race Headquarters museum in Wasilla, Alaska. (His skeleton is at the Peabody Museum of Natural History at Yale University.)

Honoring a Canine Hero

BALTO WAS THE LEAD DOG in the last leg of the Great Race of Mercy—the relay to deliver serum to the isolated town of Nome, Alaska. For his dogsled team’s success, he received heaps of praise and gratitude. A statue of Balto was erected in New York City’s Central Park in 1925.

The statue of Balto includes the following engraving:

Dedicated to the indomitable spirit of the sled dogs that relayed antitoxin six hundred miles over rough ice, across treacherous waters, through arctic blizzards, from Nenana to the relief of stricken Nome in the winter of 1925.

Endurance ... Fidelity ... Intelligence.

Replace each underlined word with one from the list below—without changing the meaning of the passage. Write the new word directly above the existing one.

AFFLICTED NORTH POLE

LOYALTY UNSTOPPABLE

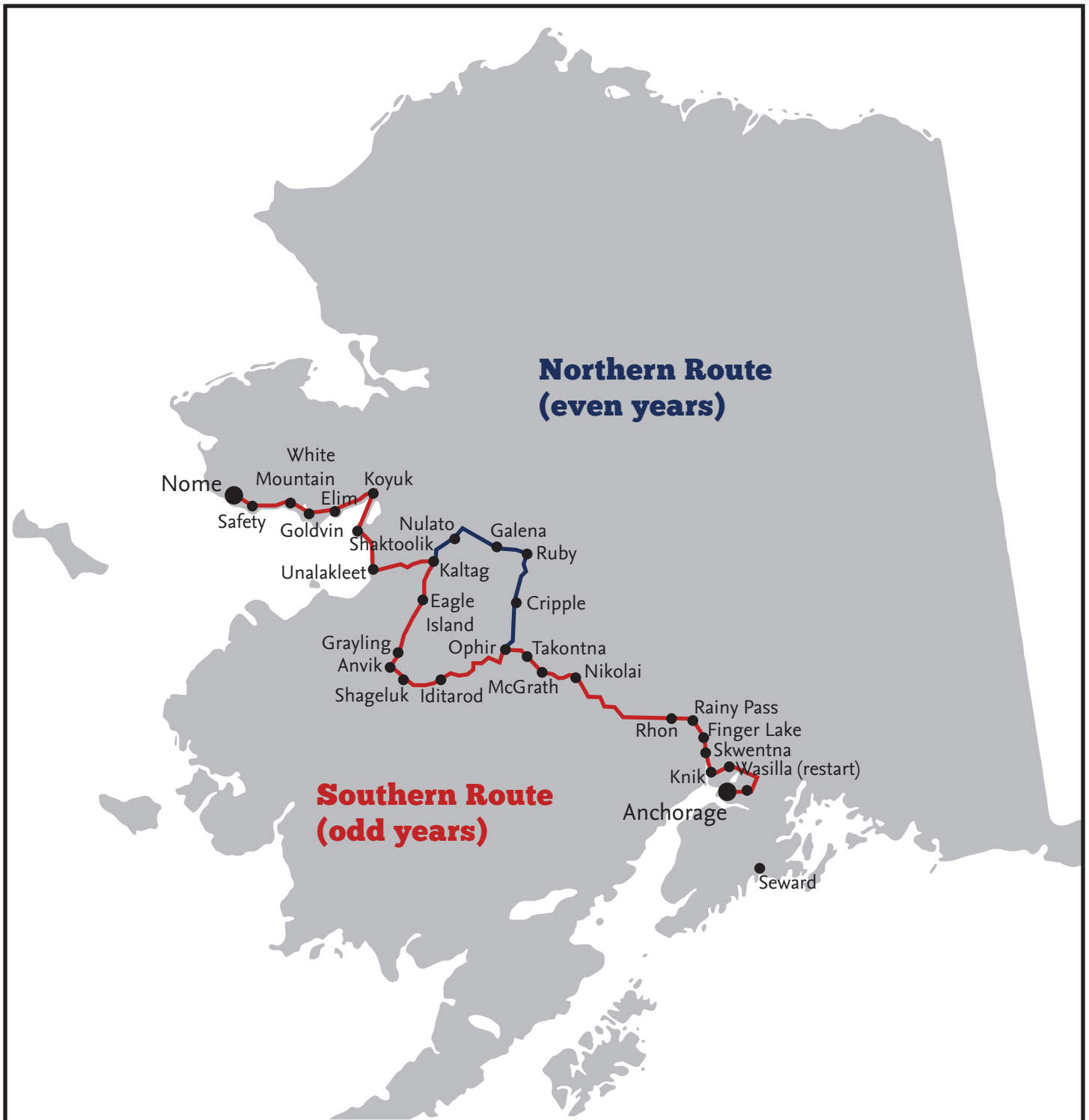
STAMINA SERUM

DANGEROUS

Describe how the dogs of the relay demonstrated intelligence.

Can you think of another word you would use to describe the heroic dogs of the relay?

(stricken), North Pole (arctic), loyalty (fidelity), unstoppable (indomitable), stamina (endurance), serum (antitoxin), dangerous (treacherous)



The Course of the Iditarod Trail

IN 1925, mushers traveled the challenging route from Nenana to Nome out of necessity. Today, a route from Anchorage to Nome, Alaska is the racetrack for an annual sporting event where dogs and people pit themselves against the elements. The Iditarod Trail Sled Dog Race as it is today has taken place yearly since the 1970s.

Thanks to a small, battery-powered satellite tracking system called the IonEarth, sled dog teams can be tracked real time as they compete in the race. Spectators and racers alike now have access to each team's whereabouts, which not only makes viewing the so-called Last Great Race on Earth much more exciting but also provides us with important statistics.

The 2014 winner of the Iditarod Race was Dallas Seavey. The table below displays his time and speed on the three longest legs of the race. With this information, calculate the distances of these routes by following the example.

Example

Step 1

Convert the elapsed time into decimal form.

$$9\text{h } 19\text{m} = 9 \frac{19}{60}$$

Change the fraction into decimal form through long division. Divide the numerator by the denominator and stop at the hundredths place.

$$19 \div 60 = 0.31$$

Elapsed time = 9.31 hours

Step 2

Round the decimal to the tenths place

9.31 rounded to the tenths place = 9.3 hours

Step 3

Solve for the distance using this formula:

$$\begin{aligned} \text{Distance} &= (\text{elapsed time}) \times (\text{rate}) \\ &= (9.3 \text{ hours}) \times (7.51 \text{ mph}) \\ &= 69.843 \text{ miles} \end{aligned}$$

Step 4

Round your answer to the nearest whole number.

$$= 70 \text{ miles}$$

LEG OF THE ROUTE	ELAPSED TIME	AVERAGE SPEED	DISTANCE
Cripple to Ruby	9h 19m	7.51 mph	70 mi
Rohn to Nikolai	14h 2m	5.34 mph	
Ophir to Cripple	11h 51m	6.16 mph	
Kaltag to Unalakleet	12h 0m	7.08 mph	

Rohn to Nikolai: 75 Ophir to Cripple: 73 Kaltag to Unalakleet: 85

Musher Math:

Word Problems

IN THE WINTER OF 1925, there was an outbreak of diphtheria in the remote area of Nome, Alaska. The townspeople and those in the surrounding area were at great risk of catching the disease. Several of Nome's 1,400 residents had already died, and 28 more were in desperate need of treatment. Unfortunately, the only doctor in the area had run out of serum. A quick delivery of serum was vital to save lives, but the port was closed for the winter. No boats could get to them. The town faced the huge obstacle of having serum delivered in the middle of the harsh Alaskan winter.

In an extraordinary feat, a relay of 20 dogsled teams delivered the serum to Nome in record time.

After the serum was transported by train from the port of Seward to Nenana, the "Great Race of Mercy" began. The first dogsled team took off from Nenana and started the 674-mile journey to Nome. Twenty mushers and their dogs worked together to relay the 20-pound package of precious cargo over 674 miles of rugged, frozen terrain. They traveled as fast as they dared in blinding snow and blizzards. Freezing temperatures ranged from -30 degrees F to -64 degrees F. Each trip was death-defying. The relay began at around 11:00 PM on January 27th and ended with the successful delivery of serum at 5:30 AM on February 2nd.

Use the account of the famous 1925 serum relay and the Musher Distances chart below to answer the questions on the next page.

MUSHER DISTANCES

DATE	MUSHER	STARTING TOWN	FINISHING TOWN	DISTANCE
01/27/25	Wild Bill Shannon	Nenana	Tolovana	52 miles
01/28/25	Edgar Kalland	Tolovana	Manley Hot Springs	31 miles
	Dan Green	Manley Hot Springs	Fish Lake	28 miles
	Johnny Folger	Fish Lake	Tanana	26 miles
	Sam Joseph	Tanana	Kallands	34 miles
	Titus Nikolai	Kallands	Nine Mile Cabin	24 miles
	Dave Corning	Nine Mile Cabin	Kokrines	30 miles
	Harry Pitka	Kokrines	Ruby	30 miles
	Bill McCarty	Ruby	Whiskey Creek	28 miles
	01/30/25	Edgar Nollner	Whiskey Creek	Galena
George Nollner		Galena	Bishop Mountain	18 miles
Charlie Evans		Bishop Mountain	Nulato	30 miles
Tommy Patsy		Nulato	Kaltag	36 miles
Jackscrew		Kaltag	Old Woman Shelter	40 miles
Victor Anagick		Old Woman Shelter	Unalakleet	34 miles
01/31/25	Myles Gonangnan	Unalakleet	Shaktoolik	40 miles
	Henry Ivanoff	Shaktoolik	Shaktoolik	0 miles
	Leonhard Seppala	Shaktoolik	Golovin	91 miles
02/01/25	Charlie Olson	Golovin	Bluff	25 miles
	Gunnar Kaasen	Bluff	Nome	53 miles

Questions

1. If 125,000 units could effectively treat six patients, how many units would the doctor need to treat the 28 new cases of diphtheria?

2. How many total hours did the journey from Nenana to Nome take?

3. Round your answer from question 2 to the nearest whole number. If the distance of the “Great Race for Mercy” spanned 674 miles, what was the average speed of a musher and his sled dogs? Round your answer to the nearest tenths place.

Hint: rate = distance/time

4. Find the mean and median for the distance data in the table on the previous page.

median:

mode:

5. Brrrrrr! The following freezing cold temperatures (F) were recorded during the Serum Run:

-50, -30, -30, -35, -40, -42, -44, -47, -43, -40, -50, -64, -58, -50, -50, -40, -30

Use these values to create a stem-and-leaf plot. What are the median and mode of this data?

median:

mode:

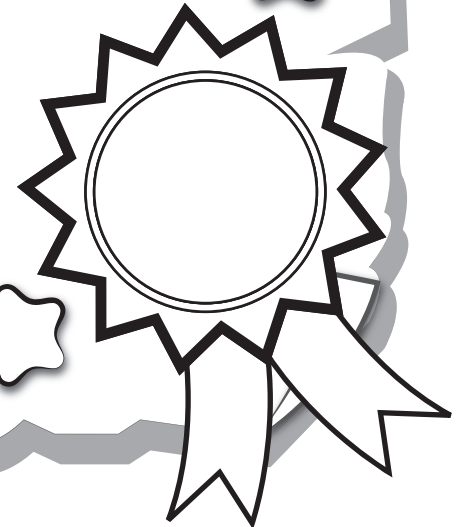
stem and leaf plot:



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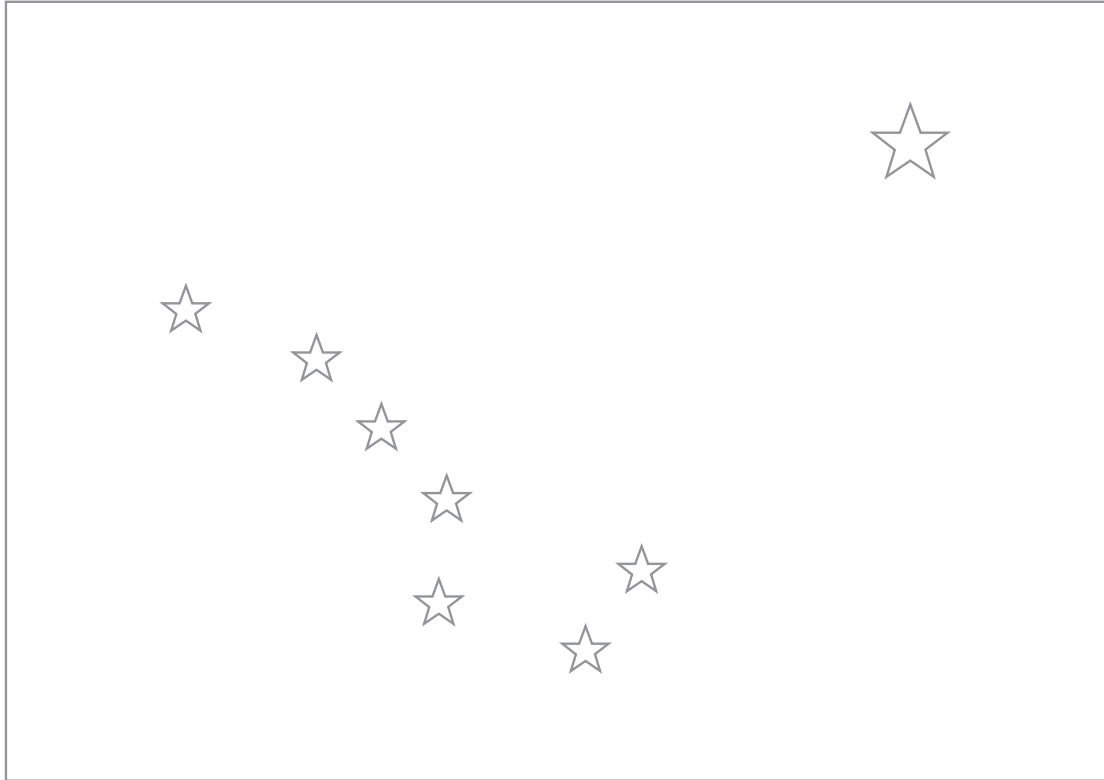
Answer Sheets

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Answer Sheet



Answers

Color the Alaska state flag with the right colors.

What does the eighth star in the upper-right corner of the flag symbolize?

The North Star, symbolizing Alaska as the most northern state

What is the state flower?

Alpine forget-me-not (*Myosotis alpestris*)

What is the state capital?

Juneau

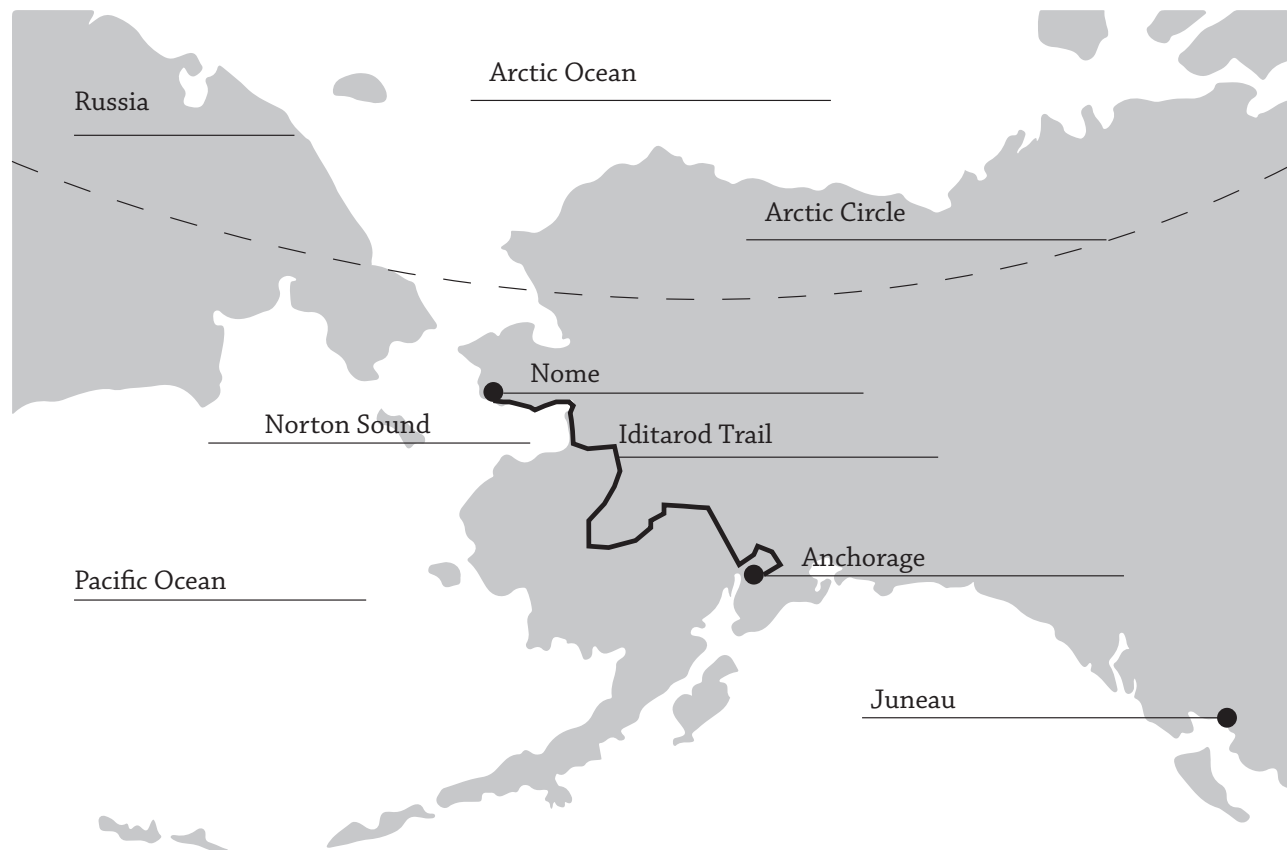
Alaska is state number ____.

49th

What is the state postal abbreviation?

AK

Answer Sheet



Answers

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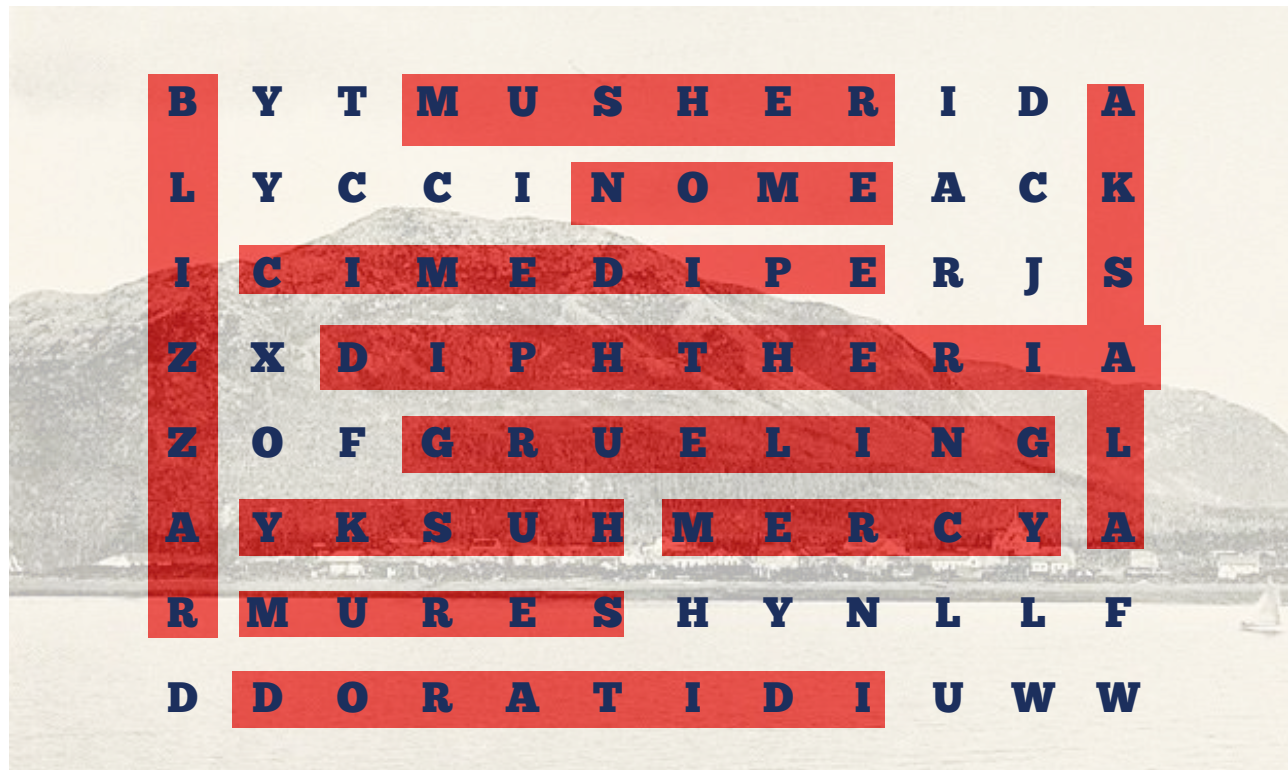
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NOME JUNEAU ANCHORAGE

ARCTIC OCEAN PACIFIC OCEAN

THE GREAT RACE OF MERCY was a race to deliver serum that would save the lives of hundreds of people at risk of catching diphtheria in Nome, Alaska in 1925. The serum, relayed over 600 miles with 20 sled dog teams and their mushers, was delivered successfully.

Answer Sheet



Word Search Answers

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Answer Sheet

Answers

1. If 125,000 units could effectively treat six patients, how many units would the doctor need to treat the 28 new cases of diphtheria?

583,333.33 (or $1/3$)

2. How many total hours did the journey from Nenana to Nome take?

126.5

3. Round your answer from question 2 to the nearest whole number. If the distance of the "Great Race for Mercy" spanned 674 miles, what was the average speed of a musher and his sled dogs? Round your answer to the nearest tenths place.

Hint: rate = distance/time

5.3 mph

4. Find the mean and median for the data in the table on the previous page.

Mean: 33.7 Median: 30

5. Brrrrrr! The following freezing cold temperatures (F) were recorded during the Serum Run:

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Use these values to create a stem-and-leaf plot. What are the median and mode of this data?

Median: -43.7 Mode: -50

-64, -58, -50, -50, -50, -50, -47, -44, -43, -42, -40, -40, -40, -35, -30, -30, -30

Stem	Leaf
-6	4
-5	0 0 0 0 8
-4	0 0 0 2 3 4 7
-3	0 0 0 5