

Coding the Serum Run

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Recommended Grade(s): Grade 3 – Grade 6

Time Needed – Preparation: 15 minutes (preparing copies and gathering materials)

Time Needed – Execution: one week (45-60 minutes per day)

Objectives:

By the end of this lesson, students will be able to:

- *Identify the main details in a larger event*
- *Create a map to retell a story*
- *Create a coding sequence to retell a story*

Materials and Preparation Needed:

- National Geographic Tabletop Map of Alaska from the United States MapMaker Kit (at least one needs to be assembled ahead of time/ having copies for partners is ideal): <https://www.nationalgeographic.org/maps/united-states-mapmaker-kit/>
- Chips or other items to mark the large map
- Reading from Shaynee Traska - included with lesson plan
- Highlighters
- Planning worksheet (one copy per partnership) – included with lesson plan
- Research sources for students:
- Readings on each leg of the race :
<http://www.alaskaweb.org/disease/1925serumrun.htm>
- http://wikivisually.com/wiki/1925_serum_run_to_Nome#Relay_participants_and_distances
- BLM Trail Map: http://commons.wikimedia.org/wiki/File:Iditarod_Trail_BLM_map.jpg o Balto and the Legacy of the Serum Run:
http://www.cmnh.org/CMNH/media/CMNH_Media/Balto/Balto-and-the-Legacy-of-the-Serum-Run.pdf
- Ozobot EVO robots and markers
- Ozobot Color Codes: <https://files.ozobot.com/stem-education/ozobot-color-codes.pdf>
- Strips of paper for coding (we used 11x14 sheets cut in have lengthwise)
- Scissors and tape
- iPad or other device to film and create the final movie
- NOTE: Depending on the number of partner pairs, the Serum Run will have to be broken into sections for each pairing to work on.

Directions:

Background: Prior to this lesson, the students have been working on a book study of the novel Dog Diaries: Togo written by Kate Klimo. That unit began with a “See/Think/Wonder” primary source analysis of the telegram that got the message out that there was a diphtheria epidemic in Nome, Alaska. A relay by dog team was used to rush the antitoxin serum to Nome in order to save the town’s mostly native residents. The telegram can be found at:

<http://aramink.wordpress.com/2007/07/29/iditarod-trail-1925-the-serum-run-part-ii/>

In the course of the novel study, the students utilized several other National Geographic video resources as they investigated how sled dogs are trained and used by people even today. These videos allowed the students to see the dogs in action, which helped them visualize things they had been reading about. Those video resources that were used included: Sled Dogs: More Than Meets the Eye: <https://www.youtube.com/watch?v=6nVfFNbxX7s&t=55s>

Nat. Geographic Kids: Canada-Dog Sledding/Are We There Yet?

<https://www.youtube.com/watch?v=2w1nnnA0AjA&t=248s> Sled Dogs/ Live Below Zero (show til 1:13 minute mark): <https://www.youtube.com/watch?v=Nj1p02iE0t4&t=84s> Seavey vs.

Seavey (episodes 2, 4, 9, and 10):

https://www.youtube.com/results?search_query=seavey+vs+seavey

- **Day One:**

- Have the students gather around the prepared National Geographic Table Top map of Alaska. Give them some time to observe the map using the See/Think/Wonder strategy. What do they see when they look at the map? What do they think they know about it? What do they wonder when looking at the map?
- Ask the children to point out some places on the map that they know. What locations are familiar to them? Use colored chips to mark known locations. They may decide to color code their chips. For example, National Park locations may be one color; Iditarod checkpoints may be a second.
- Remind the students that the Serum Run traveled across the state of Alaska and carried the antitoxin from Anchorage to Nenana by train and then onto Nome by dog sled.
- Challenge the students to lay out the route of the Serum Run on the map using a series of a new colored chip. What place names do they remember reading about in the novel? Most likely, this discussion will focus on the end of the Serum Run as Togo and his team were one of the final teams to carry the serum.
- Pass out copies of the BLM map which shows the Serum Run route and the Iditarod Trail. Have them check to see how accurately they were able to lay out the trail with the chips on the large map.
- Pair the students up and have them go back to their work areas and retell portions of the novel as they trace the route out on their own copies of the table

top map.

- Have the students examine the map and talk with a partner about what challenges some of the other Serum Run mushers may have faced based on the geography of the map. What effect will the natural landscape have on the trail?
- Encourage them to understand that just as Togo and his team had challenges and stories to tell, so did all of the other mushers who helped to carry the serum. Unfortunately though, not all of the stories are as well known as Togo and Balto's.
- With this in mind, have them revisit the map and trace the entire Serum Run route and discuss what challenges may be present based on just the geography.
- Introduce the challenge to the students. How could we recreate the Serum Run in a sort of moving map? How could we show the movement of the serum across Alaska in a way that shows the challenges of the trail while at the same time presents the journey as a story that engages the audience?
- Let them know that we will be using basic robots to represent the serum as it travels down the trail. Each set of partners will get several legs of the relay to represent with the robots. Each section will be narrated to tell the story of the leg. We will then put all the sections together to replay the entire Serum Run, but with robots!
- As a group, brainstorm an action plan of steps that will need to be taken to accomplish this task. What do we need to learn, to do, to remember as we set about creating this video?
- As a wrap up for today's session, have the students write a journal entry that explains which part of the Serum Run trail they think would be the most challenging to a dog sled team and why? They should refer to their map as they write.

- **Day Two:**

- (Note: If the students are already familiar with coding Ozobots, this lesson could be skipped).
- Provide the students with some time to explore the Ozobots and discover what the different codes tell the robot to do. One way to do this is to present the Hour of Code lesson as introduced on the Ozobot website:
<https://portal.ozobot.com/lessons/detail/introduction-to-programming-ozobot>

- **Day Three:**

- Distribute the Ozobot Color Code sheets and the Shaynee Traska reading to each pair of students.
- Remind the students that the challenge is to figure out a way to show the map and challenges of the Serum Run in a visual way. We clearly can't show every detail of every leg of the relay, so we will have to focus in on the main ideas.
- Give the students a few minutes to read over the Shaynee Traska reading sheet. This is a portion of a post made on Facebook about one leg of Shaynee Traska's rookie Iditarod in 2018.

- Model for the students how to read the first portion of the text and think aloud as you highlight phrases that may lend themselves to an action by a robot. Which pieces are the most important to show how this portion of the race went? Which portions show actions that could be replicated by a robot?
- When you sense the students understand the challenge, have them read and highlight the rest on their own. Discuss their choices.
- Display for the students a copy of the Great Ozobot Serum Run Chart on the board or on a chart paper.
- Again, model for the students using the Shaynee Traska article, how to record a highlight action. Then have them look at the Ozobot Color Code sheet and determine what robot action matches the text action. For example, Shaynee says, "... the team was crazed to go." A possible way to show that with the color codes is "tornado" which makes the Ozobot spin in circles. She then says, "... the team charged from the checkpoint," so perhaps a nitro boost code would reflect that.
- Have the students meet with their project partner. Give each set of partners the Serum Run Research materials, Ozobot color codes, and maps used yesterday.
- Inform each team of which legs of the relay they are responsible for.
- Have them work with their partner to read the research and study the maps to determine how to show their portion of the relay with the Ozobots. Do not give the students access to the robots at this point. This time should be spent planning. This will force them to focus on the text instead of focusing on the testing of the codes at point. Remind them that the transfer of the serum from one team to another needs to be shown. Depending on the students, you may want to set a minimum or maximum number of codes that should be included.
- Before ending class for the day, have the students check the action plan from day one to see if they are on task. Update the action plan and set goals for the next day.

- **Days Four and Five (or more as needed):**

- The students will work with their partners to create their code sheets, code the robots, and test and retest their codes. Things to keep in mind:
 - The codes need to be drawn on strips of blank white paper. The students can add as many sheets together as they need to represent their portion of the relay.
 - The code sheets should be embellished with landmarks to help tell the story and to help place the trail on the map. The more the code sheets look like an actual map, the better!
 - The Serum Run ran from east to west. They need to run their codes from right to left. This only really becomes important when they add landmarks, etc. to their coding sheets. If partners work from both sides of the coding sheets, some labels may appear upside down in the final film.
 - There will need to be a lot of tape and scissors! They will need to cut out sections of the code that don't work and tape things back together again!

- They need to test and change and test again, over and over again.
- When they are happy with their codes, they should create the narration that will accompany their run. The narration should explain what is happening that is causing the robot to behave as it is. For example, “Bill Shannon hit the ice and the team slid and slipped across the Yukon River.”
- When the teams are ready, film their runs and narrations. The video clips can then be put together to create one whole video that shows the entire Serum Run and map as created by the students.
- Be sure to plan a time to watch the final video and celebrate a job well done!

Assessment:

Due to the collaborative nature of this project, the students will be assessed informally by teacher observation. Included is a checklist for teachers to use as they observe the students working. The checklist focuses on the National Geographic Framework connections.

Opportunities for Modifications and Extensions:

Older students, or those classes with more time, may want to focus on the scale of the created codes compared to the map. If the mega map from the National Geographic Map Maker was used (<http://www.nationalgeographic.org/maps/united-states-mapmaker-kit/>), students could measure the scale on the map and create a code chain that was to the same scale. They could then use cups or blocks (or other risers) across the Serum Run trail on the Mega Map and lay the code chain on a strip of paper on top of it. When the Ozobots are then filmed from above, it would appear that the robots were actually following along on the map.

Resources: Dog Diaries: Togo by Kate

Klimo <https://www.penguinrandomhouse.com/books/228105/dog-diaries-4-togo-by-kate-klimo-illustrated-by-tim-jessell/>

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Ozobot Resources: <https://ozobot.com/stem-education> See Materials Section above for additional resources used