

Building the Trail: Augmented Reality Topographic Trail Map

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Discipline / Subject: Geography, STEM

Topic: Topographic Maps, Augmented Reality

Grade Level: 3-6; others with modifications

Resources / References / Materials Teacher Needs:

Augmented Reality Sandbox: <https://arsandbox.ucdavis.edu/>

Don Bower's Trail Notes: <http://iditarod.com/about/the-iditarod-trail/>

Iditarod Trail Map available here: <https://iditarodstore.com/best-sellers/trail-map.html>

Introduction Video: On the Trail – The 2016 Iditarod Race: <https://www.youtube.com/watch?v=hd4Yi8fUld0>

Information on Trail Breakers:

Husky Talk Podcast: <https://soundcloud.com/erin-montgomery-965856200/spencer-page-episode-25>

Iditarod Trail Breakers from KTVA: <https://www.youtube.com/watch?v=tGqpA18Hz2g>

Various posts on the Iditarod Trail Facebook page

Lesson Summary:

Students will create a topographic map of the Iditarod Trail using the Augmented Reality Sandbox. They will then create a video tour of the trail that discusses the challenges facing the teams due to the various land features they will encounter.

Standards Addressed: (Local, State, or National)

National Geographic Standards:

1 – How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.

4 – The physical and human characteristics of places

Learning Objectives:

TLW create an accurate topographic map of the Iditarod Trail.

TLW identify and locate specific land features located along the trail.

TLW discuss the challenges facing the teams due to these various land features.

Assessment:

Students can be assessed on the completion of their map as well as their presentation piece.

Procedural Activities:

1. Show the students the introduction video. The video is footage taken of several different trail locations by Monica Zappa during the 2016 Iditarod. Have the students make a list of the various land features they saw in the video.
2. After discussing the brainstorm list, have the students add other features they know are along the trail from their background knowledge.
3. Discuss with the students that the Iditarod Trail is a maintained trail and discuss the work of the trailbreakers. There are a couple of ways to share this information listed above.
4. Tell the students that they have the opportunity today to make their own map of the trail that shows the various land features located along the trail in the form of a topographic map. If your students are unfamiliar with topographic maps, this video from REI may be helpful: <https://www.youtube.com/watch?v=CoVcRxza8nI&t=2s>
5. Discuss with the students the features of the Augmented Reality Sandbox and discuss how elevation changes will be shown in both the sandbox and the projected topographic map. Discuss the concept of sea level and contour lines.
6. Present the teams of students with the printed guidelines (included) about the project. Review the process and expectations and then let them get started on their planning session. In addition to the project guidelines, each team should get a copy of the Trail Map. This particular map (suggested above) is very detailed and will allow the boys to see a flat version of what they are going to create in 3D.
7. Remind the students that there are two main components to the project: the creation of the map and then a video tour of the racecourse. The video tour should present the challenges that the teams will face based on the topography of the land.
8. When working in the Augmented Reality Sandbox, teams should be provided with flags to pin the various locations, string to mark the trail, and some sort of figure to move down the trail as they take their views on a virtual tour.
9. When all teams have had the chance to create their maps and videos, have the students do a reflection on the successes and challenges they had during the project.

Materials Students Need:

Augmented Reality Sandbox
Flags for labeling key features
Red string to mark trail
Challenge sheets, included
Sketch paper for planning
Object to move down trail – dog, musher, etc.
iPad or device to record virtual tour
Trail Maps (see teacher materials for details) – one per group

Technology Utilized to Enhance Learning:

Augmented Reality Sandbox
Devices for recording video

Other Information:

If this Augmented Reality Sandbox is not available, this project could be recreated in a traditional sandbox or even using clay.

Modifications for Special Learners/ Enrichment Opportunities**Additional Information**

Team Member Names: _____

Date: _____

Augmented Reality Sandbox Iditarod Trail Map

Goals:

- Create an augmented reality topographic map of the Iditarod Trail.
- Record a video that discusses the different challenges the mushers will face as the terrain changes.

Steps & Time Limits:

1. 20 Minutes: Create a sketched plan for your augmented reality map. Be sure to pay attention to the required land features that must be represented.
2. 10 Minutes: Discuss and plan your presentation.
3. 10 Minutes: Recreate your sketch in the sand box.
4. 5 Minutes: Film your presentation.
5. 5 Minutes: Take your still photos.

Map Requirements:

Your map **MUST** use red string to show the Iditarod Trail AND show (note: locations in red **MUST** be identified by name on the map; locations in green are optional):

- The restart location of **Wasilla**
- The ending location of **Nome**
- **The Alaskan Range**
 - Bonus Points: Represent the **Happy River Steps** (after leaving **Finger Lake**)

After a mile or so of dropping down toward the valley and zigzagging through the forest, you'll plunge down a short but very steep hill; directly in front of you will be one of the warning signs and the trail will vanish over the edge of what

looks like a cliff. It is a cliff. This is the entrance to the Happy River Steps. Stop the dogs at the top, say your prayers, revise your will, and then see how gently you can get the dogs to creep down the hill. Of course, you will be standing on your brake for all you're worth.

The first "step" is a narrow ramp turning sharply to the left as you go over the lip and plunging diagonally down the face of a very steep slope. Unless you're in the very front of the pack, there will be a rut worn in the middle of the ramp into which your sled will settle; keep it there even if it means laying your sled almost over on its side. At the bottom of the first ramp (maybe 50 yards), the trail will double back to the right on a small level area. There is a 50-foot cliff dropping off your left side in the turn; don't look.

The second step is as long as the first, cutting diagonally down the hill in the opposite direction. There is a short level stretch as you turn to the right into the third step, which can be the scariest of all. You may want to lean your sled up to the right on one runner and hug the uphill bank for this one. If you reach the bottom of the third step in one piece, you will drop immediately onto the Happy River. Many drivers take a break in the sheltered Happy River Canyon and reassemble their nerves before pushing on.

- Bonus Points: Represent the **Dalzell Gorge** (after leaving **Rohn**)

Immediately beyond is a steep 200-foot hill down into Dalzell Gorge. Depending on conditions, the Gorge can be nothing more than a very scenic exercise in sled driving, or it can be your worst nightmare come true. The worst-case scenario is minimal snow and lots of glare ice and open water. Hopefully you'll have some warning if it's really bad.

- The **Yukon River** showing the entrance checkpoints and the exit checkpoints (**Grayling** to past **Kaltag**)

This leg is all on the mighty Yukon—upstream, and usually into the wind. It is long and often boring, but can just as easily be even longer and miserable when the wind is blowing and the temperatures plummet toward 40 below. This stretch has absolutely no terrain—nothing but wide-open river and bend after bend, island after island, bluff after bluff. The west bank is always the high bank, with ridges sometimes rising more than 1,500 feet within a few miles of the river (which is less than a hundred feet above sea level). The east bank is low and wooded, punctuated by sloughs and creeks and islands. The trail stays mostly close to the west bank, but can run anywhere on the river depending on conditions.

- The **Blueberry Hills** (leaving **Unalakleet**)

The trail leaves Unalakleet northbound and runs just in from the beach, turning inland after five miles to pass behind rocky 850-foot-high Blueberry Point. It comes almost back to the shore at the fishing camp of Egavik before climbing up the Blueberry Hills, reaching the thousand-foot summit at the 18-mile point.

- The **Bering Sea Coast** (leaving **Shaktoolik**)

However, winds can wipe it smooth in hours. It is well marked with Iditarod trail stakes, spruce boughs, or both. The trail can range from a groomed speedway to rough ice to drifted snow to glare ice. The wind is usually blowing, and almost always right in your face. Days with less than 20 or 30 mph breezes are uncommon. The wind can blow at hurricane velocity out here and ground blizzards can reduce visibility to zero in minutes. You MUST check the weather carefully before heading out. If you get caught in a storm on the ice, you will be in very serious trouble. Another problem is that some dogs are put off by the white expanse and won't go or will try to turn back. Every year teams stall here; some drivers are able to get their teams going after a rest, and some can get their leaders to follow another team across. Some have to scratch. This is where a "coast leader" is invaluable; these are leaders used to running in this environment and who aren't fazed by winds or wide-open spaces.

Trail Notes Take from Don Bower's Trail Notes Found Here:
<http://iditarod.com/about/the-iditarod-trail/>