

# Silent, Yet Restless Earth: Defining the Corridors

For Use with *Trails Across Time* Chapter 1 pages 11-19



## Description:

In this lesson students use maps and computer simulations to explore the deep wide valleys which provided transportation corridors. The objective is for students to realize, through their exploration, that these corridors are unique and are result of chunks of crust that have, through plate tectonics, docked here and fused to create the Kenai Peninsula and much of south central Alaska.

Then, using computer simulations of Google Earth, students will explore the most feasible routes for traversing this rugged terrain.

## Materials:

- Physical map of Kenai Peninsula (included)
- Computer stations with access to Google Earth
- Trails Across Time: Page 62

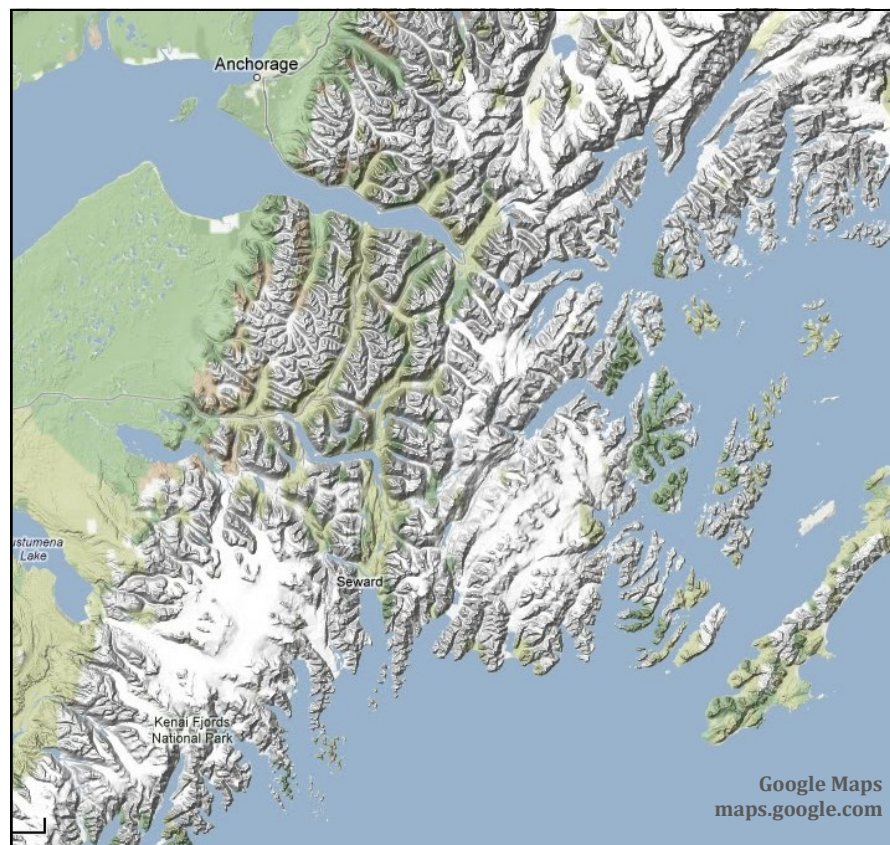
## Other Resources (Optional but Helpful)

- Map of Kenai showing trails and roads

## Alaska Content Standards:

### Geography:

- A-4** *Use graphic tools and technology to interpret physical systems.*
- A-6** *Use spatial tools and technologies to analyze and develop explanations for geologic problems.*
- C-2** *Distinguish the forces and dynamics of the physical processes that cause variations in natural regions.*



## Inquiry Based Thinking Strategies Utilized:

- Observation:** *Students will purposefully examine maps/satellite photos to observe how sutures can delineate geologic terranes.*
- Interpreting:** *Students will identify physical features and terrain elements such as elevation and slope when searching for potential transportation routes.*
- Evaluating:** *Students will critically assess which selected corridors would be the most feasible transportation routes.*

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## Back Ground Information:

If one views the Kenai Peninsula and South Central Alaska from space, it would not show the usual organized mountain ranges but rather a mish-mash of peaks thrown up in a seemingly haphazard tectonic crash. The processes that built Southcentral Alaska are unique in that these mountains are a result of chunks of crust- terranes- being carried northward and docking to become part of the North American plate.

Viewed from space, the eastern Kenai Peninsula has many broad valleys, often in right angles to one another. This is particularly evident in the zigzag shape of Kenai Lake. These regional patterns are fault controlled-- a result of how pressure was relieved from the built up pressure of tectonic movement. In time, large Pleistocene valley glaciers and streams exploited these zones of crustal weakness to create broad valleys that later provided transportation routes through the confusing jumble of mountains.

Now the best way to explore these routes is to lace the boots and hit the trails. However, considering this might be a bit time prohibitive not to mention rather exhaustive to explore the hundreds of miles of potential corridors, students can still vicariously live the life of an early day explorer through the magic of Google Earth.

## Procedure:

### 1) **Geologically Set the Stage**

*Materials: Physical map of the Kenai Peninsula*

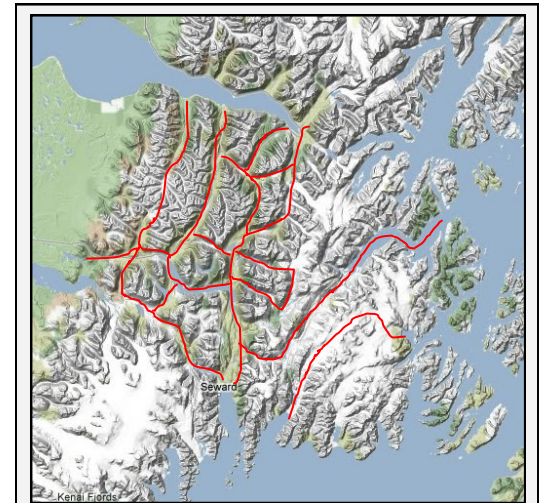
After reading Chapter 1 of Trails Across Time, provide map of Kenai Peninsula to students (either print or electronically). *You may want to include a comparative satellite map of the Rockies or Cascade Range from a similar altitude.*

What makes these mountains appear unique? *Explain the processes that created the "jigsaw " appearance of the Chugach Mountain Range.*

### 2) **Define the Sutures**

Have students trace the deep wide valleys. Note that these suture lines help explain the unique "Z " shape of Kenai Lake among other features in the Kenai Peninsula.

*At this point accuracy is probably less important than the process of critically looking at the landscape.*



*Example of how students might represent the sutures between mountains.*

### 3) **Go Exploring: Define Barriers**

*Materials: Computers with Google Earth*

Explain to students they are about to explore routes through the Kenai Peninsula (all while potentially sipping on their latte no less). Discuss what physical features (other than steep terrain) would restrict travel through the Peninsula. *Among these would be rivers, lakes, glaciers, gorges, etc.*

Using Google Earth, have students put a marker on Seward (this will be the start of all travel). Then choose a point on the northern Peninsula (*Examples: Sunrise, Hope, Cooper Landing, head of Turnagain Bay, Whittier.*) Mark this location as well.

Now, zoom out to view the Peninsula from above and use the route marking feature to draw a line from Seward to your destination. Mark this line very carefully, keeping in the middle of the valley.

**Alternative approach:** *Don't mark route with line. Rather, try to memorize a route, then proceed to the next step without benefit of a route line.*

### 4) **Now, "walk " to location**

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## Materials: Paper and Pencil

Starting in Seward, position “yourself” near ground level with the perspective on the horizon looking toward your route. Students can “hop” along the route by clicking on “route ahead.”

Note: If the route strays from the middle of the valley, it can be grabbed and readjusted.

Now remember, the students are the first ones to explore this route. Never before has this been attempted by any human. So it is important to take notes. When the route encounters an obstacle—such as crossing a gorge or river or lake—make note of it. If possible, readjust the route to safely bypass the barrier.

If by chance the route encounters a steep mountain pass or an obstacle that cannot be safely navigated, then the trip must be abandoned and another route explored.

## 5) Log and Assess Routes

Materials: Physical map of the Kenai Peninsula (paper)

Road/Trail Map of Kenai (print or electronic)

And/or refer to Map on page 62 in Trails Across Time

Plot successful routes onto map overview. Discuss impressions of routes. One thought should be how wide the valleys were compared to the rest of the country. Quick reflection about the drive to Anchorage will reinforce the idea that these corridors are very wide, particularly when comparing these valleys to the surrounding country side.

Now provide a road or trail or mining map (pg 62) of the Kenai. It's quickly apparent that the transportation routes (whether roads, rails, or trails) utilize many of these corridors.

## 6) End Product

- 1) Map showing routes chosen to get to designated destinations.
- 2) On Map: Show where obstacles would be encountered on this trail and how these would be handled
- 3) Describe the route using present day road/trail names.

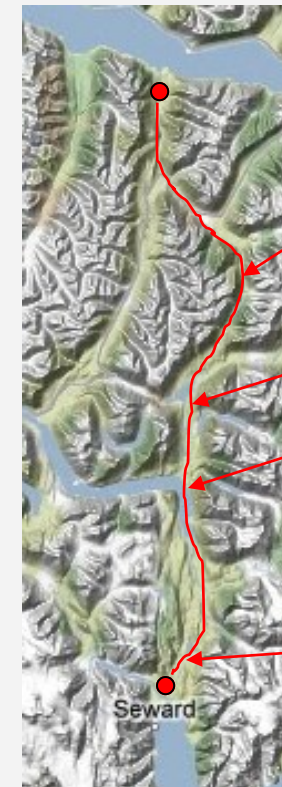
**Example: Student work would be larger and more detailed regarding obstacles and present day use.**

Route leaves Seward Highway and up Johnson Pass Trail.

Kenai Lake: Seward Highway cuts into hillside.

Seward Highway traverses gorge cutting into hillside and crossing river several times.

## Sunrise



Wide broad pass.

Tight Valley. Potential flood hazards

Encounter Lake. Must use boat or traverse on side hill. In winter lake would be frozen and crossable

Tight gorge with stream and low pass. Difficult side hill traverse.



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Google Maps  
<http://maps.google.com/>

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## Assessment Rubric:

Students will accurately analyze a map and correctly relate this to historic and current use.	Students will accurately locate distinctive wide valleys.	5	4	3	2	1
		Student draws lines that accurately depict the broad valleys.		Student lines are generally accurate but may have some errors.		Student lines are not accurate and do not show understanding of topography.
	Student identifies physical obstacles that would restrict safe or easy travel.	5	4	3	2	1
		Student accurately describes rivers, lakes, steep terrain as being obstacles and accurately evaluates how these might be navigated.		Student identifies some obstacles but is not realistic in the ability to navigate terrain.		Student has poor understanding of how to identify physical obstacles nor assess safe travel options.
	Student matches their selected route with historic and present transportation use.	5	4	3	2	1
		Student is able to relate historic and present transportation use to their selected route.		Student is able to correlate their selected route to historic present use. However their interpretation may be somewhat inaccurate or incomplete.		Student has difficulty in accurately matching their route (or portions that are within corridors) with historic and present transportation usage.

Note to teachers: Columns 4 and 2 are blank to allow for assessment that blends elements from adjacent columns. Teachers can underline criteria that describe student performance and use blank column to add comments specific to student.