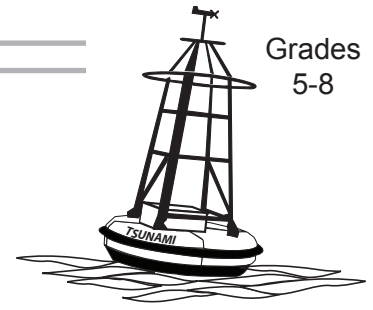


# Get to High Ground Game

Grades  
5-8



## Overview:

In this lesson students play a game to review general tsunami knowledge and emphasize the importance of working together to get to high ground when a tsunami is impending.

## Targeted Alaska Grade Level Expectations:

### *Science*

- [5-8] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [7] SD2.2 The student demonstrates an understanding of the forces that shape Earth by describing how the movement of the tectonic plates results in both slow changes (e.g., formation of mountains, ocean floors, and basins) and short-term events (e.g., volcanic eruptions, seismic waves, and earthquakes) on the surface.
- [6] SD2.3 The student demonstrates an understanding of the forces that shape Earth by describing how the surface can change rapidly as a result of geological activities (i.e., earthquakes, tsunamis, volcanoes, floods, landslides, avalanches).

## Objectives:

The student will:

- answer a wide range of review questions related to tsunamis
- model (within a board game) the importance of getting to high ground before a tsunami strikes

## Materials:

- Colored pencils (1 box per game—each game can accommodate 8 players)
- Paperclips (4 per game)
- Scissors (1 per student)
- Gallon size resealable bags (1 per game)
- STUDENT INFORMATION SHEET: “Get to High Ground Directions and Game” (12 pages including Trivia Cards)

## Whole Picture:

Alaska’s coastal communities are at risk of experiencing a locally generated tsunami. When tsunamis are locally generated there is often little or no time to issue an official warning. Alaska’s coastal residents and visitors therefore must be prepared to heed natural as well as official warnings. If you are near the coast and feel an earthquake that lasts for 20 seconds and/or makes it difficult to stand up, you must run for high ground immediately. The quake may have generated a tsunami that is headed your way. Get at least 100 ft above sea level as quickly as you can. Warn others as you go to do the same. If you cannot get to high ground, try to get at least ½ mile inland. If you are trapped near the shore, go into a reinforced concrete building and climb the stairs to at least the 3rd floor.

## Activity Preparation:

You may wish to print the game board and trivia cards on card stock, cut them in advance, and laminate them to make the pieces last longer.

## Activity Procedure:

1. Explain that students will play a game to help them review what they have learned about tsunamis and to remind them of the importance of getting to high ground when a tsunami is on the way.
2. Divide the students into groups of 4-8.
3. Provide each group with the STUDENT INFORMATION SHEET and associated trivia card and game board pages, scissors, 4 paperclips, tape, 1 box of colored pencils, and 1 resealable bag.
4. Explain how to prepare the game based on instructions on the Student Information Sheet. Provide groups with time to cut and assemble their games.
5. Explain the object and rules of the game and allow students to play the game within their groups.

## Extension Ideas:

- Have students come up with their own trivia questions based on what they have learned about local tsunamis from local Elders and other community members.
- Invite a class of younger students to play on teams with older students and thereby learn more about tsunamis and the importance of getting to high ground when one is on the way.
- Use the Tsunami Trivia Cards to play "Tsunami Jeopardy." Cards can be placed in vertical columns within a pocket chart or taped to the wall. Possible categories include: tsunami safety, waves, tsunami and culture, dynamic Earth, tsunami generation, Alaska tsunamis, etc.

## Answers:

All student questions and answers are located on the Get to High Ground Trivia Cards.

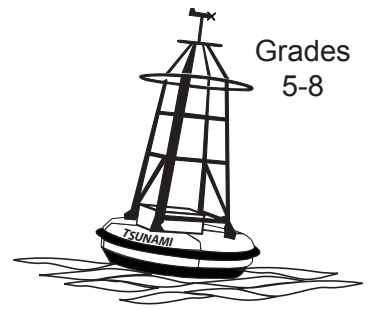
## Lesson Information Sources:

- Alaska Division of Homeland Security and Emergency Management. (n.d.). *Tsunamis in Alaska*. Retrieved 1 June, 2009. [http://www.ak-prepared.com/Poster\\_Contest\\_Files/Tsunami%20Card.pdf](http://www.ak-prepared.com/Poster_Contest_Files/Tsunami%20Card.pdf)
- Emmons, G.T. (1911) "*Native account of the meeting between La Perouse and the Tlingit.*" *American Anthropologist, New Series*, Vol. 13, No. 2. (Apr. - Jun., 1911), pp. 294-298.

# Get to High Ground Directions and Game

## Student Information Sheet

Grades  
5-8



### You will need:

- 1 direction sheet with game-pieces to cut out
- colored pencils (4 different colors)
- tape
- 4 paperclips (bent as shown)
- scissors



### Preparing the game:

1. Use colored pencils to color each game piece a different color. Cut out the game pieces, fold them, and tape them to a bent paperclip (as shown above).
2. Cut out all trivia cards, shuffle, and place face down on the table.
3. Cut the white border off the game board pages and tape the board together. Lay it on your playing surface.

### Object of the game:

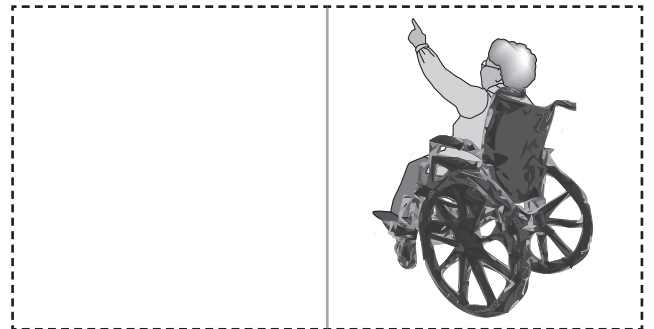
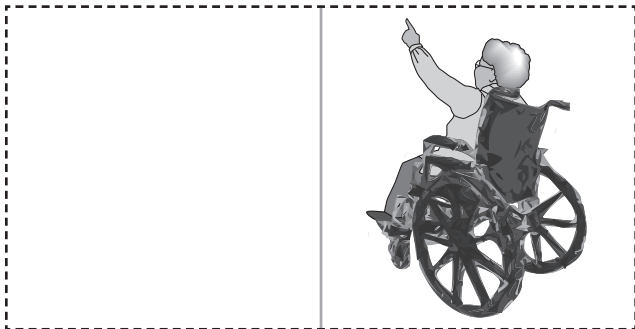
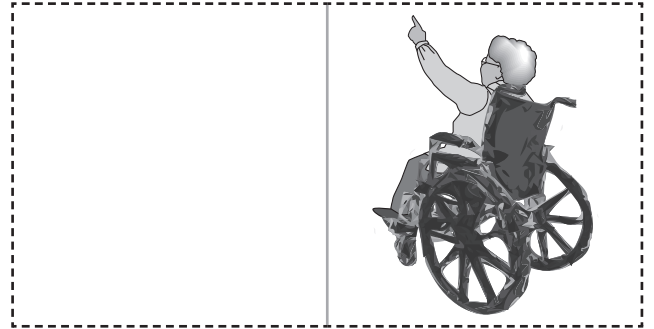
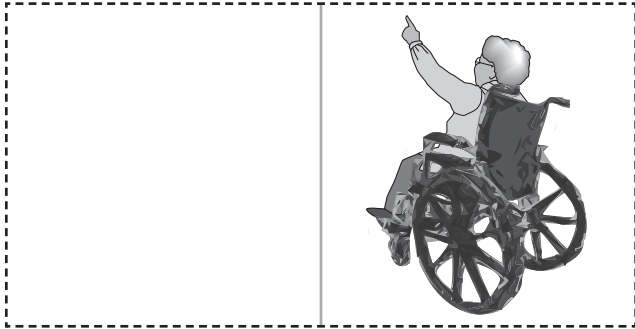
You and your friends are visiting the beach with your grandma when suddenly you feel the earth begin to shake. The ground is shaking so hard that it is difficult to stand up. Your grandma reminds you that a strong earthquake is a natural warning sign that a tsunami may be on its way. Each team must work together to get their Granny to high ground as quickly as possible by answering tsunami questions correctly. The first team to reach the tsunami shelter with their Granny wins the game. All teams must continue answering questions until they reach the shelter and are safe from the tsunami.

### How to play:

1. Select teams of 2 people. A maximum of 4 teams can play this game. Each team must select a playing piece and place their piece on the beach section of the playing board.
2. The team with the youngest player goes first.
3. On your turn, a player from the team to your right draws the top trivia card and reads the question aloud. Your team must work together to answer the question.
4. If you answer correctly, you advance 5-10 feet in elevation. If you answer incorrectly, you do not advance. The distance you advance is indicated at the bottom of the card. Move your playing piece the appropriate distance up the path toward the tsunami shelter.
5. Play proceeds clockwise, with each team taking turns answering questions to advance along the path.
6. The first team to get Granny to the shelter wins. These players then help other teams answer questions until all teams have reached the shelter.

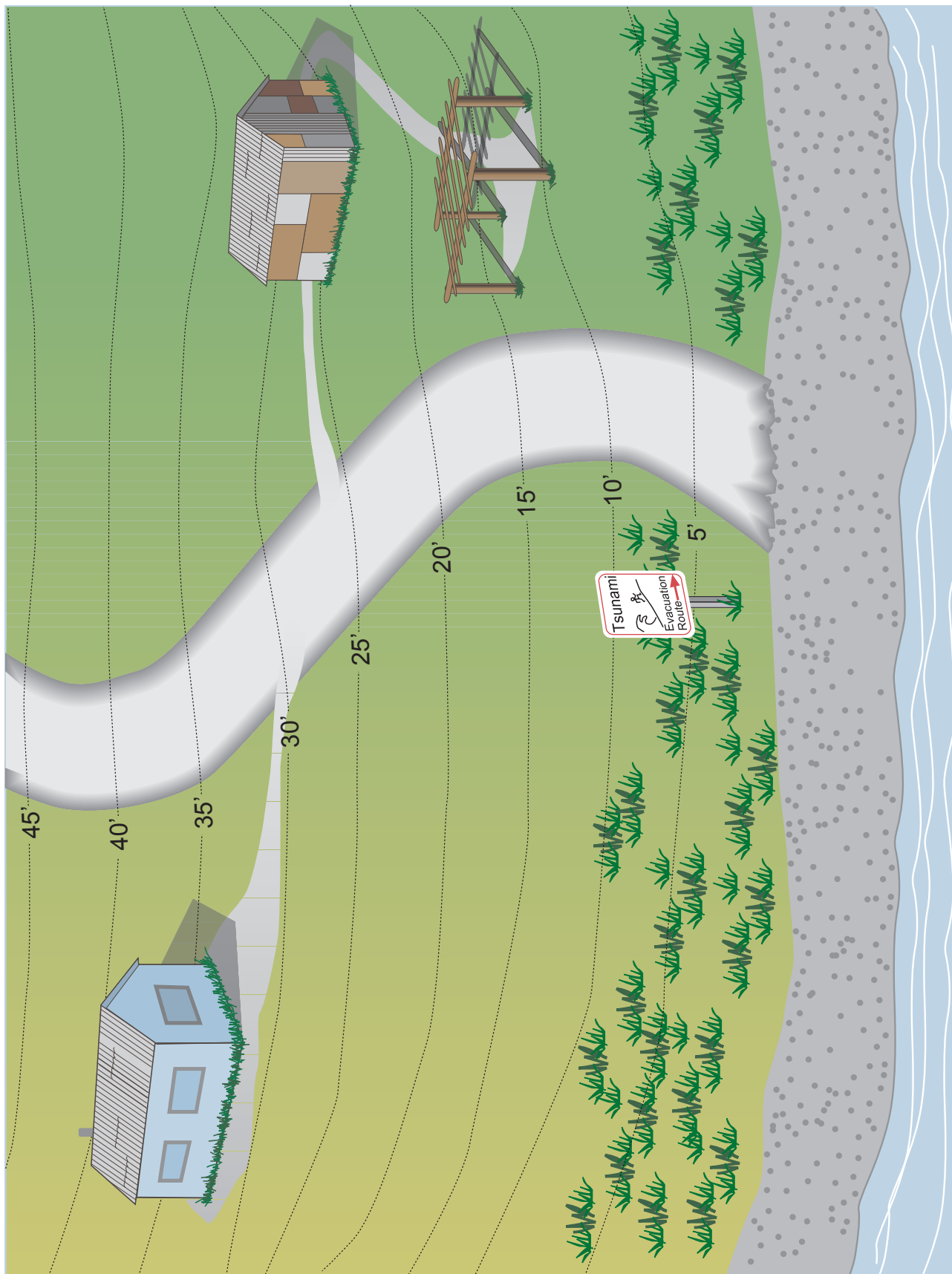
# Get to High Ground Directions and Game Student Information Sheet

## Game Pieces

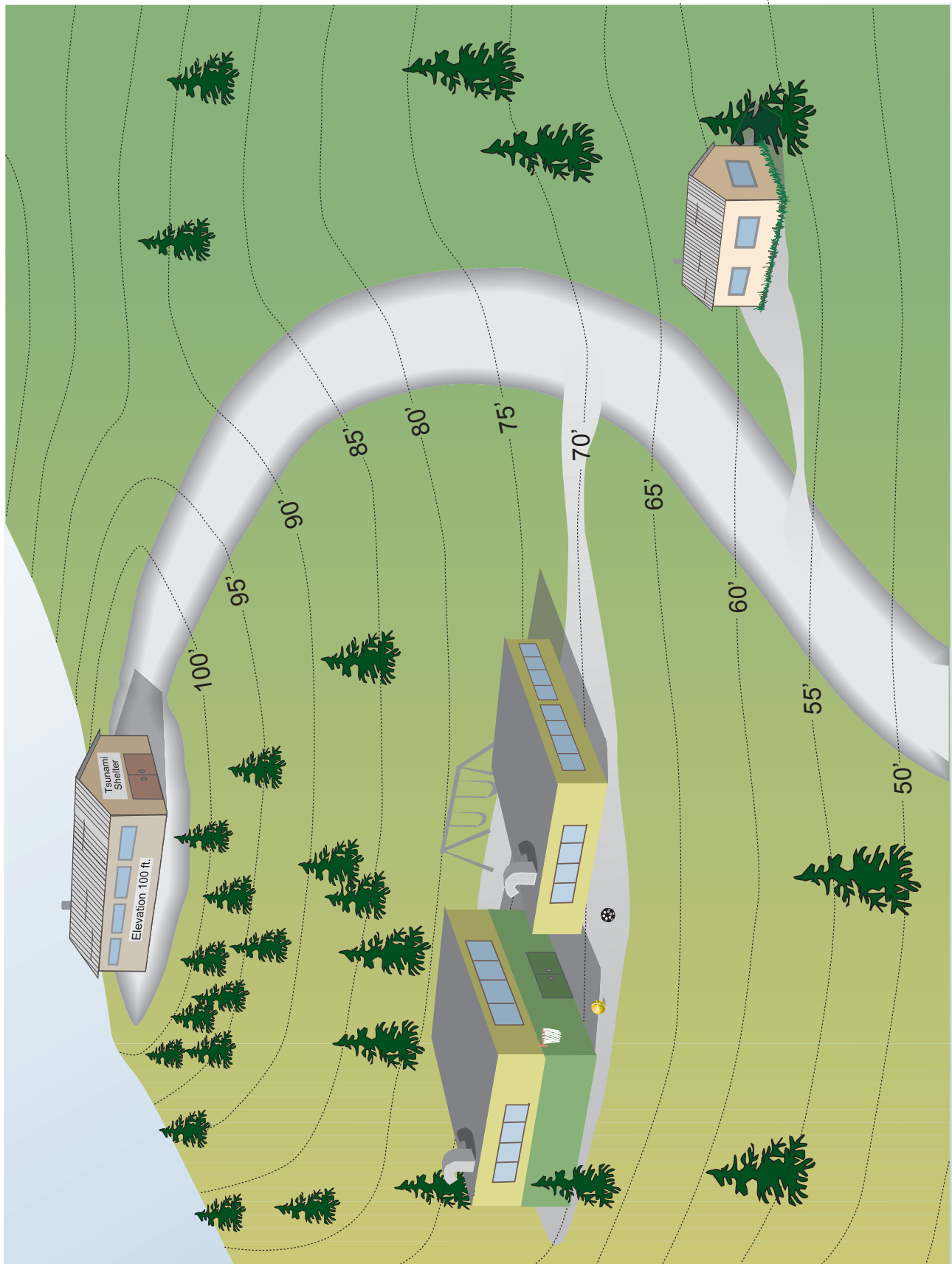


# Get to High Ground Directions and Game Student Information Sheet

## Game Board



# Get to High Ground Directions and Game Student Information Sheet      Game Board



# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> How often do large offshore earthquakes capable of generating tsunamis strike Alaska?</p> <ul style="list-style-type: none"> <li>a. Every 50-100 years</li> <li>b. Every 300-600 years</li> <li>c. Unknown, there is no way to determine when earthquakes have struck Alaska's coastal areas.</li> </ul> <p><b>Answer:</b> a. Every 50-100 years</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> Where can earthquakes occur that could cause tsunamis to strike Alaskan coastal areas?</p> <ul style="list-style-type: none"> <li>a. Alaska-Aleutian Subduction Zone</li> <li>b. Japan and Chile</li> <li>c. a and b</li> </ul> <p><b>Answer:</b> c. a and b</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> In the open ocean, how many miles per hour (mph) can tsunamis travel?</p> <ul style="list-style-type: none"> <li>a. 75 mph</li> <li>b. 200 mph</li> <li>c. 500 mph</li> </ul> <p><b>Answer:</b> c. 500 mph</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> How long can it take a tsunami generated by an earthquake in Japan to reach Alaskan coastal communities?</p> <ul style="list-style-type: none"> <li>a. 5-30 minutes</li> <li>b. 2-6 hours</li> <li>c. Unable to determine</li> </ul> <p><b>Answer:</b> b. 2-6 hours</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> When a nearby earthquake or landslide generates a local tsunami, how soon does the first wave arrive on the closest shoreline?</p> <ul style="list-style-type: none"> <li>a. 5-30 minutes</li> <li>b. 1-3 hours</li> <li>c. 5-10 hours</li> </ul> <p><b>Answer:</b> a. 5-30 minutes</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> True or False: A tsunami has nothing to do with the tide, and is most often caused by an under-sea earthquake.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>
<p><b>Question:</b> True or False: As a tsunami wave approaches the coastline and shallower water, its speed decreases and height increases dramatically.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: A person can run faster than a tsunami once it reaches the shore.</p> <p><b>Answer:</b> False</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: A tsunami is not a single wave, but a series of waves that arrive over 8-10 hours.</p> <p><b>Answer:</b> True—the second and third waves can be larger than the first.</p> <p style="text-align: center;"><b>Elevation +5</b></p>

# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> True or False: As a tsunami moves ashore, the rising water picks up debris, boats, logs, and other materials that can further destroy buildings and injure people.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: People in low-lying areas near the ocean are not at risk of tsunami flooding.</p> <p><b>Answer:</b> False</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: The last major tsunami to strike an Alaska community was in March 1964.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>
<p><b>Question:</b> Can a nearby earthquake or landslide generate a local tsunami before a warning can be issued?</p> <p><b>Answer:</b> Yes</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Alaska's southern coastal communities can experience a "distant" tsunami from an earthquake occurring elsewhere in the world.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: To escape a tsunami, sometimes evacuating inland away from the coast-line is as important as going to high ground.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>
<p><b>Question:</b> True or False: A tsunami generated by an Alaska earthquake can cause death and destruction in faraway places such as California and Hawaii.</p> <p><b>Answer:</b> True—the second and third waves can be larger than the first.</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> Where did the highest tsunami runup ever recorded take place?</p> <ol style="list-style-type: none"> <li>Lituya Bay, Alaska</li> <li>Bay of Bengal</li> <li>Hanalei Bay, Hawaii</li> </ol> <p><b>Answer:</b></p> <ol style="list-style-type: none"> <li>Lituya Bay, Alaska—In 1958, a landslide generated by a large quake resulted in a wave that surged to 1700 feet.</li> </ol> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What grid-like system helps us to pinpoint exact locations on Earth's surface?</p> <ol style="list-style-type: none"> <li>seismometer</li> <li>latitude and longitude</li> <li>International Date Line</li> </ol> <p><b>Answer:</b></p> <ol style="list-style-type: none"> <li>latitude and longitude</li> </ol> <p style="text-align: center;"><b>Elevation +10</b></p>



# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> True or False: Latitude lines are all equal in length.</p> <p><b>Answer:</b> False—<i>latitude lines vary in length, but longitude lines are all equal in length.</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> What does the term “tsunami” mean in Japanese?</p> <ol style="list-style-type: none"> <li>ocean wave</li> <li>harbor wave</li> <li>tidal wave</li> </ol> <p><b>Answer:</b> b. harbor wave</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What does DART stand for?</p> <ol style="list-style-type: none"> <li>Deep-ocean Assessment and Reporting of Tsunamis</li> <li>Daring Arctic Rescue Team</li> <li>Deep Area Response to Tsunamis</li> </ol> <p><b>Answer:</b> a. Deep-ocean Assessment and Reporting of Tsunamis</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> True or False: Traditional tsunami stories handed down from generation to generation have saved lives.</p> <p><b>Answer:</b> True—<i>Example: the Andamanese people survived the 2004 Indian Ocean Tsunami by heeding warnings passed down by ancestors. Traditional knowledge warned an earthquake could be followed by flooding waves.</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Tsunamis have very short wavelengths.</p> <p><b>Answer:</b> False—<i>A tsunami is a series of waves with very LONG wavelengths. Tsunamis can have wavelengths of more than 300 miles.</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> In a series of waves, wavelength describes the distance from:</p> <ol style="list-style-type: none"> <li>crest to trough</li> <li>crest to crest</li> <li>the first wave to the last</li> </ol> <p><b>Answer:</b> b. crest to crest (or trough to trough)</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> In a series of waves, period describes:</p> <ol style="list-style-type: none"> <li>the distance from crest to crest</li> <li>the height from crest to crest</li> <li>the time between wave crests</li> </ol> <p><b>Answer:</b> c. the time between wave crests</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> True or False: Tsunami waves usually have very short periods.</p> <p><b>Answer:</b> False—<i>Tsunami waves have long periods of 10 minutes to two hours between waves.</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Not all tsunami waves strike coastlines at devastating proportions. They range in size from inches to over a hundred feet.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>

# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> What does wave height describe?</p> <ol style="list-style-type: none"> <li>distance from crest to crest</li> <li>vertical distance from crest to trough</li> <li>maximum vertical disturbance in the water during one wave cycle</li> </ol> <p><b>Answer:</b> b. vertical distance (height) from crest to trough</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> What does tsunami wave amplitude describe?</p> <ol style="list-style-type: none"> <li>distance from crest to crest</li> <li>height from crest to trough</li> <li>maximum vertical disturbance in the water during one wave cycle</li> </ol> <p><b>Answer:</b> c. maximum vertical disturbance in the water during one wave cycle</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> True or False: Regular wind-generated ocean waves have short wavelengths.</p> <p><b>Answer:</b> True</p> <p><b>Elevation +5</b></p>
<p><b>Question:</b> True or False: All earthquakes generate tsunamis.</p> <p><b>Answer:</b> False—<i>Whether or not an earthquake can generate tsunamis depends on the location, magnitude, duration, and type of fault movement. Vertical fault movements are more likely to produce tsunamis than horizontal fault movements.</i></p> <p><b>Elevation +5</b></p>	<p><b>Question:</b> What is wave propagation?</p> <ol style="list-style-type: none"> <li>how waves move from a point of origin to more distant points</li> <li>the distance from origin to runup</li> <li>the distance from the shoreline to the limit of the area the tsunami travels onshore</li> </ol> <p><b>Answer:</b> a. how waves move from a point of origin to more distant points</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> What is tsunami inundation?</p> <ol style="list-style-type: none"> <li>how waves move from a point of origin to more distant points</li> <li>the distance from origin to runup</li> <li>the distance from the shoreline to the limit of the area the tsunami travels onshore</li> </ol> <p><b>Answer:</b> c. the distance from the shoreline to the limit of the area the tsunami travels onshore</p> <p><b>Elevation +10</b></p>
<p><b>Question:</b> True or False: There is no way to determine when and where tsunamis have struck in the past unless written or oral history accounts were kept.</p> <p><b>Answer:</b> False—Case in point—<i>Tsunamis deposit ocean water and soil on land when they inundate the shore. Scientists use soil core samples to determine when and where tsunamis have struck in the past.</i></p> <p><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Tsunami inundation and tsunami runup are the same thing.</p> <p><b>Answer:</b> False—<i>Inundation is the distance from the shoreline to the limit of the area the tsunami travels onshore. Runup is the elevation above sea level of a tsunami wave at its maximum inundation.</i></p> <p><b>Elevation +5</b></p>	<p><b>Question:</b> Which of the following do scientists use to determine tsunami inundation?</p> <ol style="list-style-type: none"> <li>testing soil salinity</li> <li>eyewitness accounts</li> <li>both a and b</li> </ol> <p><b>Answer:</b> c. both a and b—<i>scientists also observe damage to the landscape and property, and take soil core samples.</i></p> <p><b>Elevation +10</b></p>

# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> At a convergent boundary of Earth's plates:</p> <ol style="list-style-type: none"> <li>two plates slide past each other</li> <li>two plates move away from each other</li> <li>two plates move toward each other</li> </ol> <p><b>Answer:</b> c. two plates move toward each other</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> At a transform boundary of Earth's plates:</p> <ol style="list-style-type: none"> <li>two plates slide past each other</li> <li>two plates move away from each other</li> <li>two plates move toward each other</li> </ol> <p><b>Answer:</b> a. two plates slide past each other</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> At a divergent boundary of Earth's plates:</p> <ol style="list-style-type: none"> <li>two plates slide past each other</li> <li>two plates move away from each other</li> <li>two plates move toward each other</li> </ol> <p><b>Answer:</b> b. two plates move away from each other</p> <p><b>Elevation +10</b></p>
<p><b>Question:</b> Which of the following do scientists NOT consider when determining if an earthquake may generate a tsunami?</p> <ol style="list-style-type: none"> <li>magnitude of the quake</li> <li>population near the epicenter</li> <li>total area of sea floor disturbance</li> <li>amount of vertical displacement caused by the quake</li> </ol> <p><b>Answer:</b> b. population near the epicenter</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> What is the epicenter of an earthquake?</p> <ol style="list-style-type: none"> <li>the point under Earth's surface where the earthquake began</li> <li>the spot on Earth's surface directly above where the earthquake began</li> <li>the strength of earthquake shaking</li> </ol> <p><b>Answer:</b> b. the spot on Earth's surface directly above where the earthquake began</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> Which of the following volcanic activities are NOT known to produce tsunamis?</p> <ol style="list-style-type: none"> <li>volcanic earthquakes</li> <li>lava flows encountering water</li> <li>submarine explosions</li> <li>ashfall in deep ocean waters</li> <li>calderas collapsing</li> <li>volcanic landslides (slope failure)</li> </ol> <p><b>Answer:</b> d. ashfall in deep ocean waters</p> <p><b>Elevation +10</b></p>
<p><b>Question:</b> What is the second most common cause of tsunamis?</p> <ol style="list-style-type: none"> <li>earthquakes</li> <li>volcanoes</li> <li>landslides</li> </ol> <p><b>Answer:</b> c. landslides—<i>these can be triggered by natural events (erosion, earthquakes, etc.), or by human interference (excavation, blasting, etc.).</i></p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> Tlingit legend tells of a monster that shakes the surface of the water, causing tidal waves to rise and engulf the unwary. The monster is said to live in ocean caverns near the entrance of what bay?</p> <ol style="list-style-type: none"> <li>Lituya Bay</li> <li>Dry Bay</li> <li>Chiniak Bay</li> </ol> <p><b>Answer:</b> a. Lituya Bay</p> <p><b>Elevation +10</b></p>	<p><b>Question:</b> Which type of map shows faults most obviously?</p> <ol style="list-style-type: none"> <li>topographic</li> <li>political</li> <li>shaded-relief</li> </ol> <p><b>Answer:</b> c. shaded relief</p> <p><b>Elevation +10</b></p>

# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> True or False: Tlingit legends of Lituya Bay, Alaska, likely arose as a result of slope failure, earthquakes and/or violent tidal action within the bay.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> Which layer of Earth contains mostly liquid rock?</p> <p>a. crust b. mantle c. outer core d. inner core</p> <p><b>Answer:</b> c. outer core</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> Which layer of Earth is thickest?</p> <p>a. crust b. mantle c. outer core d. inner core</p> <p><b>Answer:</b> b. mantle</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> Which layer of Earth is thinnest?</p> <p>a. crust b. mantle c. outer core d. inner core</p> <p><b>Answer:</b> a. crust</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> Which layer of Earth is solid due to tremendous pressure?</p> <p>a. crust b. mantle c. outer core d. inner core</p> <p><b>Answer:</b> d. inner core</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What process in Earth's mantle drives the movement of Earth's plates?</p> <p>a. magnetic fields b. oscillation c. convection currents</p> <p><b>Answer:</b> c. convection currents</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> What powers convection current in Earth?</p> <p>a. different temperatures in Earth's layers b. earthquakes c. different elements in Earth's layers</p> <p><b>Answer:</b> a. different temperatures in Earth's layers</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> The main subduction zone in Alaska is:</p> <p>a. the Aleutian Megathrust b. the Juan de Fuca Ridge c. the Gulf of Alaska</p> <p><b>Answer:</b> a. the Aleutian Megathrust</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> True or False: A subduction zone is a region where one tectonic plate is pushed under another.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>

# Get to High Ground Directions and Game

## Student Information Sheet      Trivia Cards

<p><b>Question:</b> True or False: A spreading center is a region where one tectonic plate is pushed under another.</p> <p><b>Answer:</b> False—A spreading center is a region where two tectonic plates are moving away from each other, and new crust is forming.</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: All parts of the Pacific Plate move at the same rate.</p> <p><b>Answer:</b> False—All areas of the Pacific Plate do not move at the same rate. The evidence shows in the geomagnetic reversals that do not line up.</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Subduction zone earthquakes cannot cause tsunamis.</p> <p><b>Answer:</b> False—Large subduction zone earthquakes can cause the leading edge of the top plate to rupture and spring upward. The sea floor and water above it are pushed abruptly up, starting a tsunami.</p> <p style="text-align: center;"><b>Elevation +5</b></p>
<p><b>Question:</b> True or False: Tsunamis usually appear as a surge rather than an enormous breaking wave.</p> <p><b>Answer:</b> True</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Tsunamis and tidal waves are both long ocean waves.</p> <p><b>Answer:</b> True—but they are generated in very different ways.</p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: What is the local native language word for ocean?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the word is <i>imaq</i>. In the Eastern and Western dialects of <i>Unangam Tunuu</i>, the word is <i>alaġuġ</i>.</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> Which of the following is NOT a true difference between tsunamis and tidal waves?</p> <ol style="list-style-type: none"> <li>They are generated differently.</li> <li>One affects the whole water column while the other does not.</li> <li>They have different wave periods.</li> </ol> <p><b>Answer:</b> b. One affects the whole water column while the other does not.</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What is the local native language word for beach?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the word is <i>quta</i>. In the Western dialect of <i>Unangam Tunuu</i>, the word is <i>aguġ</i>. (Literally: the part of the beach that is left dry at low tide, washed at high tide.) In the Eastern dialect of <i>Unangam Tunuu</i>, the word is <i>tugumaġiġ</i>. (Literally: long sandy beach)</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What is featured on a bathymetric map?</p> <ol style="list-style-type: none"> <li>land elevation</li> <li>political boundaries</li> <li>the surface of the ocean floor</li> </ol> <p><b>Answer:</b> c. the surface of the ocean floor—Bathymetric maps help tsunami researchers model tsunami inundation. The shape of the ocean floor influences wave propagation.</p> <p style="text-align: center;"><b>Elevation +10</b></p>

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<p><b>Question:</b> True or False: Water drawing back from the shore and leaving a stretch of sea floor exposed is a sign that a tsunami is on its way.</p> <p><b>Answer:</b> True—<i>get to high ground immediately</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> True or False: Native Elders and others have observed the seawater becoming bubbly and heard a loud roar from the sea shortly before a tsunami struck.</p> <p><b>Answer:</b> True—<i>get to high ground if you observe either of these phenomena</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> What is the local native language word for earthquake?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the word is <i>arulauq</i>. In <i>Unangam Tunuu</i>, the word is <i>adgilaĵ</i>.</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> What is the local native language term for tsunami?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the term is <i>qangyut angsinarqut</i> (Literally: the waves are big) or <i>tung'iruaq</i> (Literally: false/fake high tide). In <i>Unangam Tunuu</i>, the word is <i>alaġulġuĵ</i> (Literally: big sea).</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What is the local native language term for wave?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the word is <i>qangyut</i>. In the Western dialect of <i>Unangam Tunuu</i>, the word is <i>hilmaĵ</i>. In the Eastern dialect of <i>Unangam Tunuu</i>, the word is <i>ilmaĵ</i>.</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> What is the local native language term for water?</p> <p><b>Answer:</b> In <i>Sugt'stun</i>, the word is <i>taangaq</i>. In <i>Unangam Tunuu</i>, the word is <i>taangaĵ</i>.</p> <p style="text-align: center;"><b>Elevation +10</b></p>
<p><b>Question:</b> True or False: Four types of waves are associated with earthquakes. These are: Primary (P) waves, Secondary (S) waves, Love waves, and Rayleigh waves.</p> <p><b>Answer:</b> True—<i>P waves and S waves are body waves, while Love and Rayleigh waves are surface waves.</i></p> <p style="text-align: center;"><b>Elevation +5</b></p>	<p><b>Question:</b> What is the equation for calculating rate?</p> <p>a. distance + time = rate b. distance - time = rate c. distance x time = rate d. distance ÷ time = rate</p> <p><b>Answer:</b> d. distance ÷ time = rate. This equation can be used to calculate tsunami speed.</p> <p style="text-align: center;"><b>Elevation +10</b></p>	<p><b>Question:</b> True or False: There is always time to issue a tsunami warning before a tsunami strikes.</p> <p><b>Answer:</b> False—<i>Locally generated tsunamis can occur within minutes of the triggering event. People on the coast must heed "natural" warnings such as strong quakes, a sudden rise in coastal water, water drawing back from the coast, and an ocean roars.</i></p> <p style="text-align: center;"><b>Elevation +10</b></p>