

2.MD The Longest Walk

Task

- a. Pick two points on the outside borders of the United States map (excluding Hawaii and Alaska) so that the line between them stays within the borders. Draw the line. How far apart are the points? Measure the length of the line to find out. Do this 10 times and make a line-plot of your data.
- b. Starting anywhere on the map of the United States and drawing in a straight line until hitting a border, what is the longest line you can draw? It might help to ask your classmates what lengths they found as well.



IM Commentary

The language in this task is above the reading level of many second grade students, so it is best for the teacher to explain the task to the students verbally. After students have drawn and measured their ten line segments, it might be more useful for the class to discuss part (b) as a whole group.

It is a good idea to have the students use color to help them keep track of the connection between a line that they have drawn and the corresponding data point on the graph. If students draw 20 data points rather than 10, the lines will start to be hard to see so spare maps are recommended for students who need them.

As this is a second grade standard, students are expected to round rather than use fractions, but some classroom discussion can include how some distances might be more than others even though they round to the same thing.

The idea of the scale map is beyond this grade level but can be discussed in a holistic sense: how the longest line on the map will represent the longest line in the real United States.

If a more concrete version of the activity is desired, it can be performed in an outdoor setting -- a playground, for instance -- on any irregular shape.

Public domain US map, with different sizes:

https://commons.wikimedia.org/wiki/File:Blank_US_map_borders.svg

Doing the activity on a large wipeable mat will allow students to experiment. The size of the map and the type of units (centimeters or inches) should be chosen at the instructor's discretion to allow a reasonable difficulty level. (The example given in the answers uses the 1000px size from the link above.)

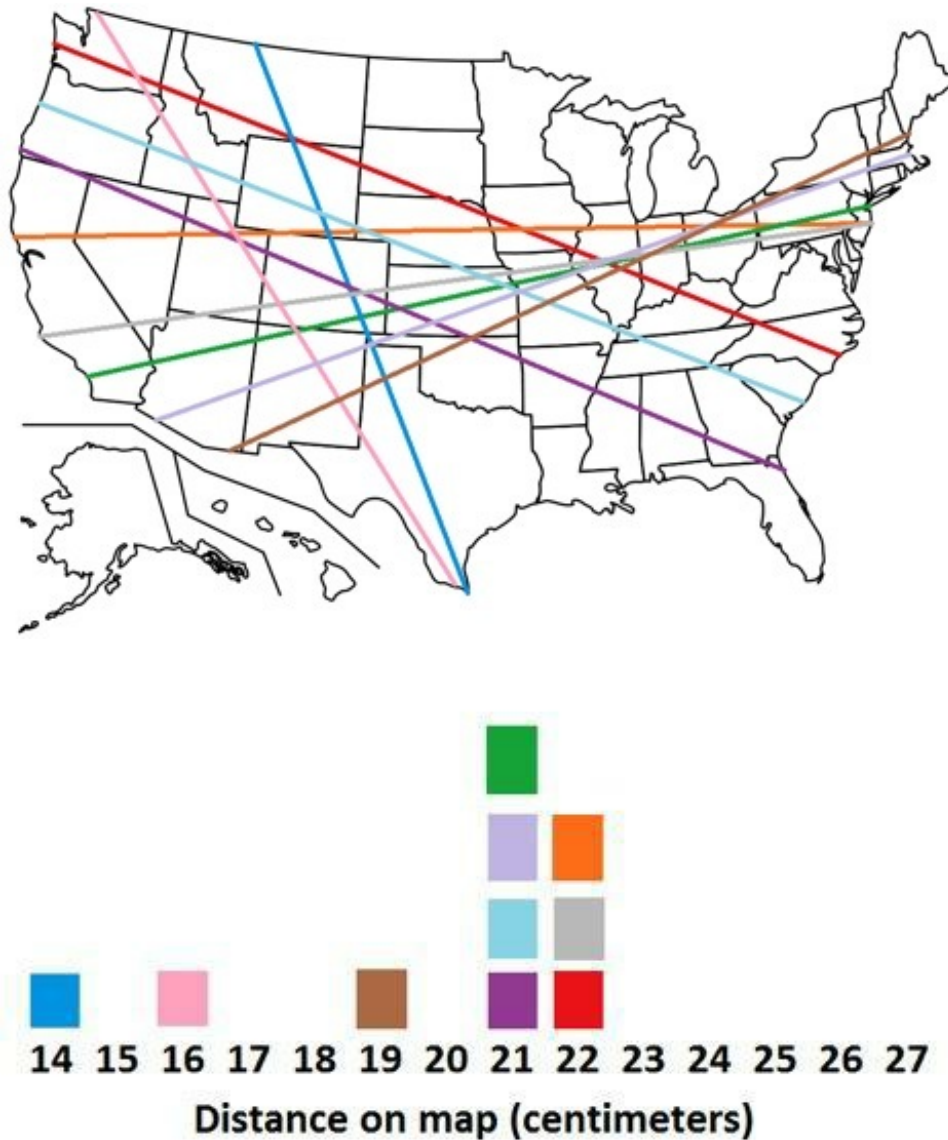
Cliff Pickover has written about the problem:

<http://sprott.physics.wisc.edu/pickover/pc/american-line.html>

Submitted by Jason Dyer for Illustrative Mathematics Task Writing Contest Jan 17 - Jan 30, 2012

Solution

a. Sample of data collection:



b. The longest walk is from Washington to Florida, although it is not marked on the map above. Note that getting the correct answer is not a trivial task, even for adults, so any sufficiently long line should be acceptable and will allow for a good classroom discussion as students will likely have alternate answers.

