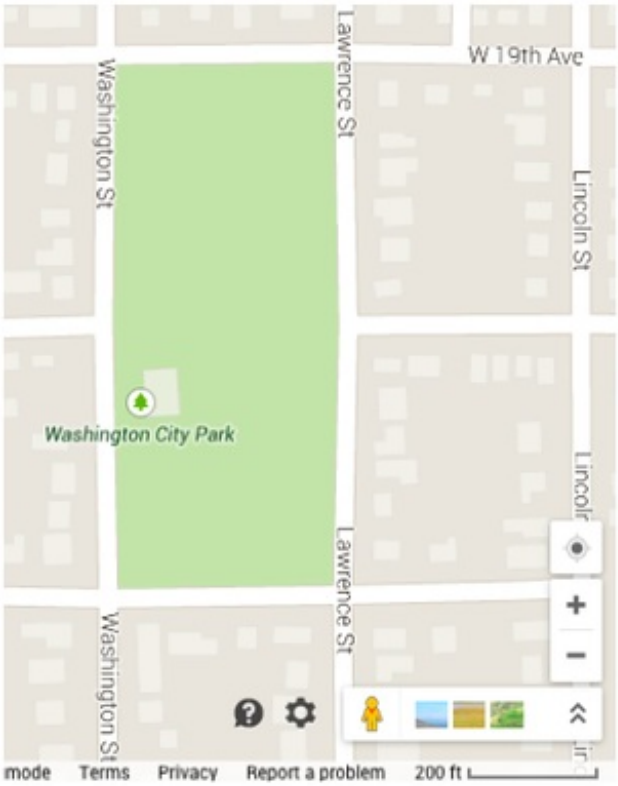
7.G Rescaling Washington Park

Alignments to Content Standards: 7.G.A.1

Task

Your computer shows you a map of Washington Park in Eugene, Oregon. The scale in the bottom right corner of the map tells us that the length of the bar represents 200 feet on the map.



Clicking a resizing button on the computer screen will result in an image of Washington Park where the exact same-sized bar now represents 150 feet.

a. Do you think the size of Washington Park under the 150 ft scale will appear smaller or larger than it was under the 200 ft scale?

b. Draw an accurate picture/map of Washington Park under this new 150 ft scale.

c. Was your guess in part a correct? Can you explain why the size of the map changed as it did?

IM Commentary

NOTE: This task has a handout to go with it, the .pdf file is under "attached resources".

The goal of this task is to get students to think critically about the effect that changing from one scaling to another has on an image, and then to physically produce the desired image. The natural guess is that by making the scaling smaller, the resulting map will also be smaller, when in fact the opposite happens.

This task hits on a few aspects of the standard, in that it involves first thinking about what the new map will look like, and then reproducing the map under a different scale to test their guess.

Teachers are invited to adapt this task to a local landmark instead, but if so, it is important that the bar representing each scale be the same size on the student's paper; not only is this the way most interactive websites work but there are also extra calculations to be made if the length of the bar changes (changing the length of the bar would amount to an additional scaling). Teachers may wish to encourage students to treat the park as a rectangle and not pay attention to the fact that it appears to ''bow out'' on the right side.

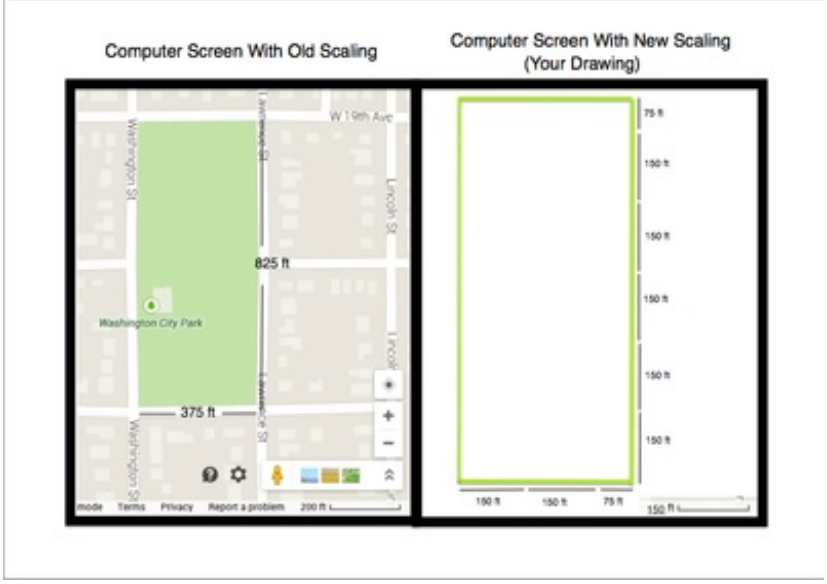
Note: This map comes from Google maps, and when at the 200 ft scale, clicking zoom once actually changes the scale to 100 ft, not 150 ft. This was changed in the task intentionally to make the comparison more challenging; it could be changed to 100 ft depending on the desired level of difficulty.

Edit this solution

Solution

a. The apparent size of Washington Park will appear larger under the new scaling (this is a good opportunity for students to share their guesses and reasoning before actually constructing and finding out the correct answer).

b. Below is a picture of the handout that should be given to students and one possible method for recreating the park under the new scaling. This method shows finding the correct dimensions of Washington Park by using a ruler or other measurement marker to see the park is approximately 375 ft by 825 ft, and then redrawing the park based on those dimensions.



Alternatively, we could reason that since the 150-foot measurement is $\frac{3}{4}$ as long as the 200-foot measurement, each dimension of the park should appear $\frac{4}{3}$ as large (much like if the ruler were half as long, each dimension would appear twice as large).

a. Student answers here will vary. Ideally, they will reason that the image does in fact appear larger under the 150 ft scaling than under the 200 ft scaling because we require more bar-lengths to measure the dimensions of the park.

For instance, less than 2 bar-lengths measured the bottom distance of the park when the bar represented 200 ft. With the bar now representing 150 ft, we require more than 2 bar-lengths to measure that same bottom distance.