



In this lab, you will be calculating how far the horizon is from where you are standing. Please read the following article taken from the web site "[How Stuff Works](#)".

Start by printing out this page (there are two pages).

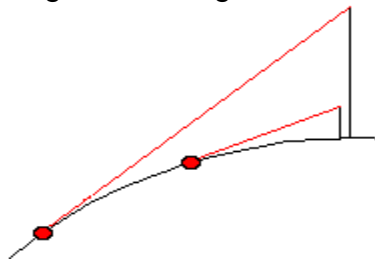
Question

I was standing on the beach yesterday looking at the ships on the horizon, and I started wondering how far away the horizon was. Is there an equation to work out how far away the horizon is based on how high your eyes are above sea level?

Answer

One of the funniest things about the ocean is the fact that its surface is curved! We tend to think about water forming large flat sheets, but the surface of a large body of water actually is not flat at all - it follows the curvature of the earth.

Because of the curvature of our planet, the distance you see when you look out at the ocean depends on your height above the surface of the ocean. The following diagram shows you how the distance of the horizon can change depending on the height of the observer:



So the distance of the horizon depends on the height of your eyes above the water. If your eyes are 8 inches (20 cm) above the water, the distance of the horizon is about one mile away (1.6 km).

A rough formula you can use is

$$100,000 \sqrt{\frac{\text{height}}{6.752}}$$

Where *height* is the height of your eyes above the ground when you are standing **in centimeters**.

Start by recording the height of your eye level. Do this by subtracting 6.0 inches from your total height (in inches). For example, if you were 6 feet tall, your total height would be 72.0 inches – and your eye height would be 66.0 inches (6 inches shorter than your total height). Record your height in the table on the next page.

Next, convert that number to cm and record that number into the table.

Use the formula above to calculate the distance to the horizon. Take the *eye height* (in centimeters) and divide it by 6.752. Then take the square root of that number and multiply that answer by 100,000. The answer will be in centimeters.

Convert your answer to kilometers and record your answer in the table.

Next, convert your answer into miles and record that answer in the table.

Now that your data table is complete, send me your answers electronically. Click on the "**Submit Lab Assignment Answers**" located on the left side of the screen (on either my homepage or the Computer Lab page) and

RHP 9th Grade Physical Science

Science9 Lab 1: Calculating distance to horizon



fill in the proper information. Make sure to use your regular name. The assignment number is **1**.

When you are finished, you can either practice typing, or you might want to go to my home page and explore the “Big Button that doesn’t do anything” link located in the lower left corner.

DATA TABLE for Experiment 1	
Your eye level height in inches	
Your eye level height in cm	
Distance from horizon in cm	
Distance from horizon in km	
Distance to horizon in miles	