Which Way does it Fall?

How to measure slope in your yard.

Slope is a measurement of rise or fall of the land surface. Slope is related to the topography of the land and plays a role in drainage and soil moisture, which are important considerations when assessing an area for plant suitability.

Numerically speaking, slope is the change in elevation (rise) over a given distance (run). In other words, the number of feet the land rises or falls over a horizontal distance. Slope is often described in terms of percent. For example, an area that rises 12 feet over a distance of 100 feet has a 12% slope. Similarly, an area that falls 10 feet over a 30 feet distance has a 33% slope. The formula to use for this calculation is:

$$\%Slope = \left(\frac{Rise}{Run}\right) x100\%$$ Where *Rise* is the change in elevation, and *Run* is distance.

Slope may also be referred to in terms of a ratio of the distance in which the land falls one foot. For example, a 33% slope may also be described as a "3:1 slope," meaning the land falls 1 foot for ever 3 foot of distance. A 2:1 slope is also 50% slope, and a 1:1 slope is 100% slope.

Slope can be easily measured in a yard using two wooden stakes, a piece of nylon cord or twine, and a hanging bubble level (use schematic below for reference). Drive two stakes into the ground, one at each end of the area of interest. Run the rope or twine between the two stakes, using the hanging bubble level to find a taught, level line with the rope. Alternatively, use one stake at the furthest distance and run the rope to the ground at the higher end of the area. Measure height on which the rope hits the stakes and take the difference in the two (units of feet). This value is the change in elevation, or rise. If using just one stake, measure the height at which the level rope hits the stake and use this value. Divide the rise by the distance (or run) to find the slope of the area. Multiply by 100% to find the percent slope. The equations are as follows:

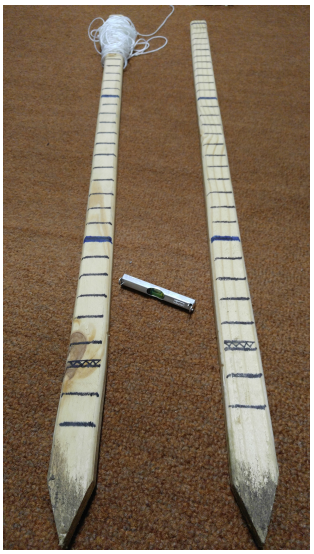
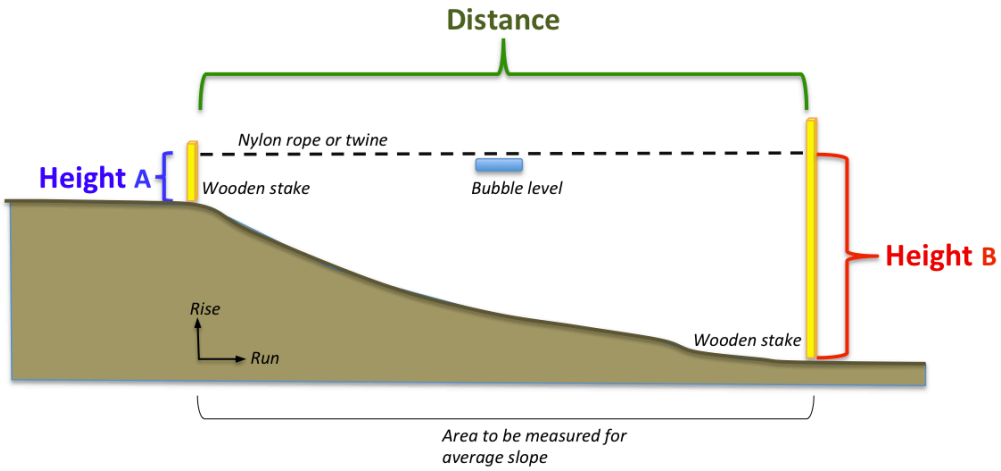


Figure 1. Two wooden stakes, nylon twine and a bubble level. The stakes have been labeled using a measuring tape for ease of measurement.

Slope = (Height B – Height A) / Distance

% slope = Slope x 100%



Tips:

- Erosion potential increases with increasing slope.
- Keep grassed slopes below 20% to protect against erosion.
- Grass swales (drainages that carry rainwater runoff) should have slopes of 1-5%. For swales with greater slopes, check dams may be used in the channel to reduce erosion potential.
- To avoid tall berms (or earthen embankments) rain gardens shouldn't be placed in areas with slopes greater than 12%.