Measuring Slope around School

Description:

Students measure and calculate the percent slope of the landscape around your school. Students understand what slope is and how it is measured in order to recognize where and how green infrastructure projects are constructed. This activity provides students the opportunity to experience the presence of slope in their environment.

Objectives:

- Measure and calculate examples of slope around your school community
- Understand how the steepness of a slope affects the construction of green infrastructure projects, i.e. a rain garden

Vocabulary:

Slope, rain garden

Recommended for:

8th – 12th grade students

Materials (for small groups):

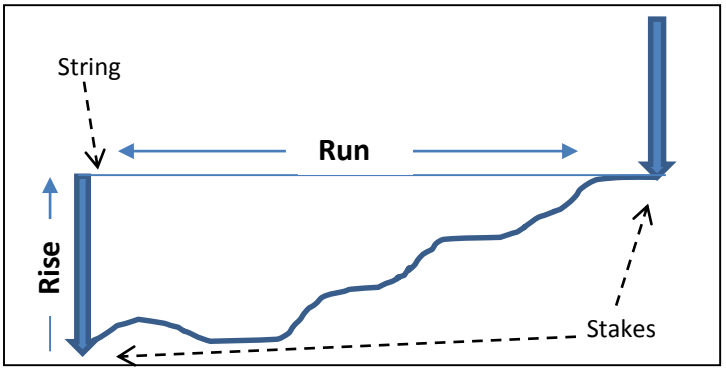
- Line level
- 15 feet of string
- 2 wooden or plastic stakes
- Ruler
- Clipboard
- Sheet of paper to record results

Background Information:

Slope is the change in elevation between two points. It is expressed as a percent change in elevation per unit of distance. The percent slope of the area will help to understand how stormwater flows. This lesson could also be used to determine how green infrastructure projects are sited, for example how deep to dig a rain garden within a selected area of land.

Method:

- Pre-Lesson (for each group):
  - Make two 1-2 foot stakes for marking.
  - Cut a 10 foot long piece of string (plus several additional inches for tying).
  - Mark the 10 foot string in 10 inch increments to make it easier for measuring rise and run in inches.
  - Tie the string to one stake (the starting point / highest point).
- Measuring Slope:
  - Find several locations with gentle slopes to allow each group to practice measuring at different sites.
  - Hold first stake with string attached at the highest point of the site. Push string down to the bottom of the stake.
  - Run string to a second, lower point. Hold or tie string taut to second stake.
  - Attach a line level to string. Adjust the string on the lower stake until the line level indicates the string is horizontal.
  - Measure length of string between stakes, record this number as the run.
  - Measure height on the lower stake between the string and ground. Record this number as the rise.
  - Percent Slope = $\frac{\text{Rise}}{\text{Run}}$ X 100



Discussion:

- Describe the steps you took to correctly measure slope. Consider the different slopes you found. Have you ever noticed runoff during a rainstorm at these places?
- Explain how slope can play a role in determining impacts of stormwater and stormwater runoff around your school community. What are these impacts?
- Consider if you were to create a rain garden or other green infrastructure project for reducing stormwater runoff. Where would be an ideal location to adequately retain water when creating your own rain garden? Why?

Extension:

- Follow up with constructing your own rain garden with your students. Research other potential green infrastructure projects for constructing a new learning environment at your school.

For more information contact:
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Also visit DEP's website at:
www.nyc.gov/dep