Roughly 900 mosses are found in northwestern North America. In coastal old growth forests of the Pacific Northwest, mosses and lichens may contribute nearly half of the primary productivity (Vitt, Marsh, and Bovey 1988). Mosses play important roles in forest water and nutrient cycles. In some PNW forests, mosses in the canopy contribute to the formation of canopy soils, creating unique resources and habitats. Mosses provide important habitat structures for many forest wildlife. Moss establishment and growth can enhance processes of forest restoration, soil retention, and maintaining hydrological regimes. Clearly, understanding determinants of moss cover and growth is important to basic ecology and applications to forest management, riparian restoration, and wildlife conservation. In this project, you will compare moss cover on several kinds of surfaces in Sehome Arboretum.

Research Question
How does moss cover differ among trunks of coniferous trees, deciduous trees, rocks, and logs?

Hypothesis
Moss coverage corresponds with water availability and time since establishment. Moss cover will be greatest on horizontal surfaces of large rocks because those surfaces collect most water and have been available for moss growth longest. Upper surfaces of logs will support the second most extensive moss cover, because those surfaces retain more water than vertical surfaces. Trunks of bigleaf maple trees will support the third most extensive levels of moss cover, because their vertical surfaces drain water rapidly, but not so rapidly as furrowed bark as Douglas fir trees. Moss cover will be least on trunks of Douglas fir trees, because their vertically oriented and furrowed bark drain water rapidly.

Note that this study is observational, rather than experimental. You will collect data on moss coverage on surfaces that differ in many factors beyond your control. You will attribute differences in your samples to differences in some of the factors, but you will not determine whether or how those factors actually caused the observed differences. In particular, effects of surface orientation on moss growth and coverage may be confounded with proximity to forest canopy gaps, proximity to other forest edges, nutrient availability, proximity to source populations of mosses, and orientation to climatic factors such as exposure to sun and prevailing winds.

Field Methods
Find one or two partners and walk to Sehome Hill Arboretum.
1 Select a random starting point.
2 From that point, identify the nearest surface of the following four types:
   (1) top (horizontal orientation) of a large rock
   (2) upper surface (horizontal orientation) of a log
   (3) vertically oriented trunk of a bigleaf maple tree
   (4) vertically oriented trunk of a Douglas fir tree
3 For each surface, locate a random sampling point.
4 Place your quadrat frame on that point, and record the %moss cover within your frame.
5 Repeat steps 1-4 nine more times.