

**Knowledge "Standard":**  
MST #3.5-Intermediate-estimate, make and use measurements in real world situations

**ACADEMIC CHALLENGE**  
**High School**  
Regents Earth Science

**C-DOS Essential Skill/Disposition "Standard":**  
**A. Managing Resources** – identify, organize plan and allocate human resources to accomplish goals

**Earth Science Curriculum** –  
topographic map reading, profile construction, gradient calculation

**Question/Issue:**

**How are topographic maps important to hikers?**

**Challenge:**

The Whaupanaucan State Forest Department of Environmental Conservation (DEC) Rangers are asking you to create a trail guide of the trails for hikers and cross country skiers to use. Use model trail guides like the Adirondack Mountain Club series as models of quality. Besides the elements that standard trail guides provide, the DEC has requested 1) calculations of maximum gradient for each trail to assist people in making the best decision of trail difficulty 2) a profile of each trail and 3) any other improvements that you might deem helpful.

Should you choose to accept the challenge, we will have two half days (three hrs. each) in which to collect all necessary data for the guidebook. Upon returning you will have an additional two days for production of the final draft of the trail guide.

**Product Criteria:**

**Profile**

Form Criteria:

- β Horizontal scale given
- β Elevation axis labeled with units
- β All points plotted and visible on graph
- β Tops of hills and bottoms of valleys have pairs of points
- β Points are connected with a smooth line

**Narrative Trail Description**

Content Criteria:

- β Includes directions by car to trailhead
- β Includes directions to beginning of trail from parking lot
- β Describes trail surface (material, roughness)
- β Mentions landmarks at appropriate trail location (lean to, parking lot, swamps, brooks, ponds)
- β Describes topography along trail (hills, dips, inclines, turns)
- β Provides distances between points along trail
- β Includes compass directions of travel along trail
- β Includes maximum change in elevation
- β Includes maximum gradient from each trail
- β Provides total distance traveled along trail

**Scientific Labels**

Form Criterion:

- β All directions, numbers, quantities and distances are labeled with the correct units (North, km, ft, °)

**Evidence of:**

- β Knowledge
- β Skill
- β Disposition

**Targeted Standard/Indicator(s):**

- Develops a plan with roles for each and every person during both the data collection and production phases
- Quiz on gradient
- Test on nine topographic map reading skills
- Test on profile construction