

DOINGWHATWORKS



SAMPLE MATERIAL

Student Assignment: Acme Landscaping Closure Activity

Kettle Moraine High School, Wisconsin

Topic: How to Organize Your Teaching

Practice: Abstract-Concrete Connections

At Kettle Moraine High School, math teachers use scenarios to introduce abstract algebraic and geometric concepts in a more concrete way. At the end of the unit, these concrete scenarios are used in closure activities that assess students' understanding of the material. This example from a geometry course requires students to measure a tall tree using a clinometer and the tangent ratio, and using a mirror and proportional triangles. Students must then write a memo to the landscaping company explaining their approach and work.

MEMORANDUM

At Acme, we put the G in Green!

Date: _____

Ch 4 Geometry Comiskey

From: Marvin Gardens,
President, Acme Landscaping

Due:

Dear _____,

The Acme Landscaping Company needs to do some serious tree trimming in your neighborhood. Before we arrive at our final cost estimates for your parents and neighbors, we need your help measuring one of the really tall trees. As we discussed on the phone yesterday, you agreed to do the following:

First, find a tall tree (or other object) in your neighborhood or home.

NOTE: It MUST be tall enough that you cannot measure the height of it (even with a ladder)

PART 1: The Clinometer

1. Build a clinometer. Neatness and accuracy counts. The instructions are attached. You will need to turn this in.
2. Calculate the height of your object using your Clinometer and the trigonometry you have learned in your Geometry class.
3. On the top half of page one, report your Clinometer findings, including:
 - a. A detailed, labeled diagram of the situation. **The diagram must include all known lengths and angles. Be sure to mark unknown lengths (that need to be found) with a variable. Be sure to include yourself and the tall object (identify it) in your diagram.**
 - b. Calculate the height of your tall object. Show all work in an organized fashion!!

PART 2: The Mirror

Since we are potentially risking a lot of time and money with this project, we want you to measure that same tall object a second time using a different method. Here's what will work:

1. Find a mirror.
2. Calculate the height of your object using your mirror and the techniques involving similar triangles you have learned in your Geometry class.
3. On the bottom half of page one, report your Mirror findings, including:
 - a. A detailed, labeled diagram of the situation. **The diagram must include all known lengths and angles. Be sure to mark unknown lengths (that need to be found) with a variable. Be sure to include yourself and the tall object (identify it) in your diagram.**
 - b. Calculate the height of your tall object. Show all work in an organized fashion!!

PART 3: The Memo

We need (especially our project manager, Darla Driver) a memo which explains how you did both parts 1 and 2. Darla is a smart woman, but she admits she has forgotten geometry. So you have to explain it in language she and I will understand. This is page two of your report. If you need a third page, fine, but don't go longer than two pages on the memo. It will likely be presented at our next planning meeting, so professional, grammatical work is REQUIRED. Anything less than that will have to be redone and won't even be evaluated.

At the end of your memo, include a bill for your time. Keep track of all of your hours, and bill us \$15.00 / hour.

Finally, to make sure you covered all that we will need, grade your work, in pencil, with the rubric on the back.

Thanks again. Have fun on this one, kid. You're young, but we at Acme think you have a bright future! ☺

Attach the rubric (with your self-assessment on it) and your clinometer to your project.

Clinometer/Mirror Project Rubric

Name: _____ Hr: _____

Your project must be neat and professional. There should be no scribbles, eraser marks etc. You may use a computer for all or part of the project.

Your project will be rejected by Acme if it is not done in a professional manner.

Concept/Task	4	3.5	3	2	1	0
Clinometer <ul style="list-style-type: none"> • Correct and neatly constructed 						
Clinometer Diagram <ul style="list-style-type: none"> • Situation is correctly drawn. • You and the object are in your diagram. • The diagram is completely labeled with all known lengths and angles. • Unknown lengths marked with a variable. 						
Clinometer Calculations <ul style="list-style-type: none"> • The height of the object is correct based on your drawing. • All calculations are shown 						
Mirror Diagram <ul style="list-style-type: none"> • Situation is correctly drawn. • You and the object are in your diagram. • The diagram is completely labeled with all known lengths and angles. • Unknown lengths marked with a variable. 						
Mirror Calculations <ul style="list-style-type: none"> • The height of the object is correct based on your drawing. • All calculations are shown 						
Memo / explanation: Clinometer <ul style="list-style-type: none"> • Explanation for the experiment and why you set it up that way. Be specific. • Someone who is not in math class should be able to understand. • Include in this part an explanation for the calculations you used and why you used that process to find the height. 						
Memo / explanation: Mirror <ul style="list-style-type: none"> • Explanation for the experiment and why you set it up that way. Be specific. (hint: include similar triangles) • Someone who is not in math class should be able to understand. • Include in this part an explanation for the calculations you used and why you used that process to find the height. 						
TOTAL	/ 28					