WAMC Lab Template

Math Concept(s): Trig (Finding sides and angles)

Source / Text: Old / CORE

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Attach the following documents:

Lab Instructions

Hand out outdoor activity WS. Have students group together in three (2 smallest - 4 largest) if needed. Have them read how to use a clinometer

Student Handout(s)

1 page

Outdoor Activity Trigonometry

Names: _____

_____

_____

Supplies needed:

Tape measure

Clinometer (protractor, tape, straw, string, paperclip)

Scientific Calculator

Background

Clinometers are used by foresters to calculate the height of trees. It is much easier than actually climbing them. Using a clinometer, we can calculate the angle of elevation from the ground to a tree top. Along with the distance along the ground to the base of the tree, a trig set-up can be used to find the height.

Using the below directions try to find the height to the ceiling. _____cm or m

Paste pg 78 Geo chapter 9 resource book.

Picture of a clinometer… Make sure it shows the relationship compared to horizontal/vertical.

Did you find the height to the ceiling to be about 270-280 cm high? _____

How far were you off? _____

Is your answer reasonable? _____

If not please see Mr. Paul for help finding error.

If you were close you are ready for the "Real World"

You are to measure 2 tall objects.

Object # 1 _____

Person's Height (label)	Angle of Elevation	Distance to Object	Trig Set-up	Approximate Height

Object #2 _____

Person's Height (label)	Angle of Elevation	Distance to Object	Trig Set-up	Approximate Height

Rubric and/or Assessment Tool

Indicate "*SPECIFIC*" relationship to Science, Technology, or Engineering

Science measuring tree/light post heights
Technology Basic clinometers and scientific calculators
Engineering Finding heights of buildings.

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Trig Outdoor activity

Prerequisite skills: Trig set up and use.

Lab objective: Find the heights of various items

Standards:

Mathematics K–12 Learning Standards: Geo SRT A 1

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Standards for Mathematical Practice:

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K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

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Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

☐ Global Awareness ☐ Financial/Economic/Business/Entrepreneurial Literacy ☐ Civic Literacy
☐ Health/Safety Literacy ☐ Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION
Creativity and Innovation
☐ Think Creatively
☐ Work Creatively with Others
☐ Implement Innovations
Critical Thinking and Problem Solving
☐ Reason Effectively
☐ Use Systems Thinking
☐ Make Judgments and Decisions
☐ Solve Problems
Communication and Collaboration
☐ Communicate Clearly
☐ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS
Information Literacy
☐ Access and Evaluate Information
☐ Use and manage Information
Media Literacy
☐ Analyze Media
☐ Create Media Products
Information, Communications and Technology (ICT Literacy)
☐ Apply Technology Effectively

LIFE & CAREER SKILLS
Flexibility and Adaptability
☐ Adapt to Change
☐ Be Flexible
Initiative and Self-Direction
☐ Manage Goals and Time
☐ Work Independently
☐ Be Self-Directed Learners
Social and Cross-Cultural
☐ Interact Effectively with Others
☐ Work Effectively in Diverse Teams

Productivity and Accountability
☐ Manage Projects
☐ Produce Results
Leadership and Responsibility
☐ Guide and Lead Others
☐ Be Responsible to Others

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Clinometer
- Scientific calculator
- Tape measures

Set-Up Required:

- Make enough clinometers for each group. (Extra's are nice if they get tangled or fall apart.)

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

-

Cooperative Learning:

-

Expectations:

-

Timeline:

-

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

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Career Applications

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Optional or Extension Activities

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