Text: *CORD MATHEMATICS: A Contextual Approach to Algebra I*
Unit number and title: *Unit 16: Solving Problems That Involve Linear Equations*
Short Description: *Measuring rise and run of a staircase to understand slope. http://www.youtube.com/watch?v=d9rf2N_AvXA&feature=related*
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Linear Functions Math Lab:
Staircase Slope

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

-The objective of this lab is to help students understand the concept of "slope" by measuring the rise and run of different routes up a staircase. Students will determine that climbing the stairs in a diagonal path is easier than climbing directly up the stairs due to the lesser slope.

- **Statement of pre-requisite skills needed**
  - Measurement, Problem Solving, Using Formulas
- **Vocabulary**

- Slope, Rise, Run, Horizontal, Vertical, Inches, Centimeters

- **Materials List**
  - 1 measuring tape per group
  - level
  - handout
- **State Standards addressed**

  Math: A1.1.A, A1.6.B, A1.2B
  Reading: 2.1.3, 2.1.5
  Writing: 3.3
- **Leadership Skills**

Students will work in groups of two. Students will have to work together to gather accurate measurements.

- **SCAN Skills/Workplace Skills**

  Writing B. Records information completely and accurately.
- **Set-up information**

This lab is designed for one or two class-periods (not including introduction of concepts such as formulas and vocabulary). Set-up is minimal. Find a suitable staircase (preferably below head-height). Provide students with a measuring tape.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  - Groups of two students (students will each complete a worksheet)
  - Two class periods (Day one: reviewing vocabulary/concepts/taking measurements. Day two: analyzing data/forming conclusions/class discussion on findings)
- **Teacher Assessment of student learning** Students will be scored on the following: Accuracy of measurements, correct formulas used (Slope=change in

vertical rise (y) / change in horizontal run (x). Answers must be presented in both U.S. and Metric units (inches/cm). Students must have complete explanation which includes data.

- **Summary of learning** (to be finished after student completes lab)
  - Discuss how the concepts from this lab apply to real world: hiking, biking, etc.

- **Career Applications**
  This activity provides students with an opportunity to solve problems in a group setting. These skills are valued in many walks of life.

LAB TITLE:_____
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
- **Grouping instructions and roles**
- **Procedures** – steps to follow/instructions
- **Outcome instructions**
- **Assessment instructions** (peer-teacher)

Lab Data Collection

Student: _____ **Date:** _____

Unit: _____

Lab Title:

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Calculations: Complete the given calculations to solve for an answer(s)

Summary Statement:

Other Assessment(s)

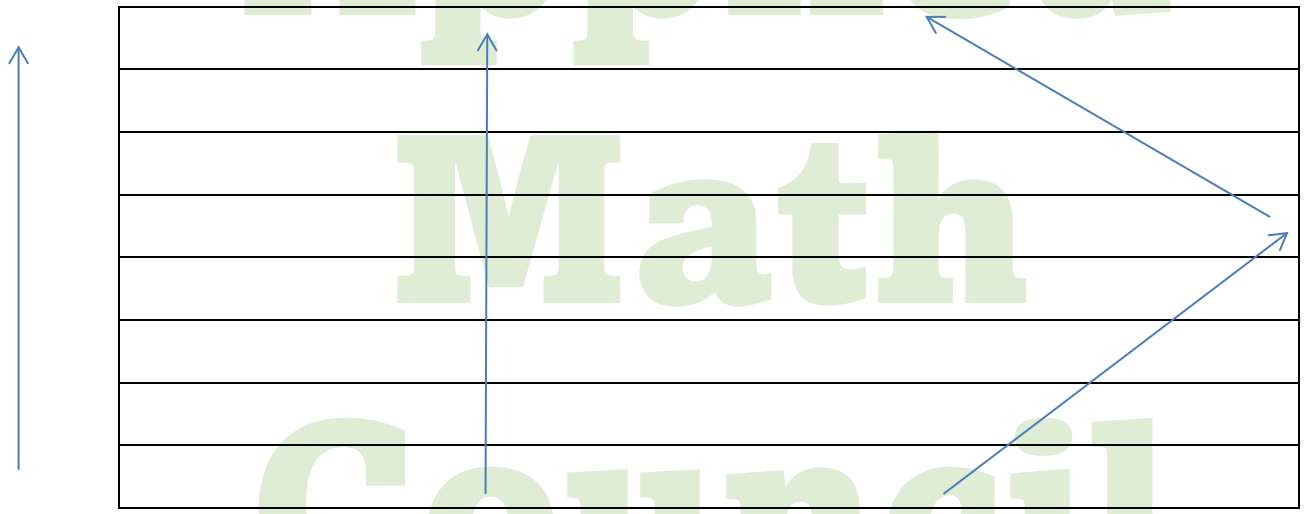
APPLIED ALGEBRA LAB
LINEAR FUNCTIONS:
SLOPE

Name:_____ Date:_____ Period:_____

Which route is easier? Why? (Explanation should include measurements, appropriate equations, and all work)

STAIRCASE

TOP



BOTTOM *Route A.* *Route B.*

RUN

RISE

Explanation (be sure to include ALL work, inc. formulas, calculations, written reasoning):