

Lab Framework

Text: CORD Applied Math

Unit number and title: Unit #2

Short Description: This unit and lab will assist and help students to estimate distances more effectively in the future.

Developed by: Jack Seymour –

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Date 6-29-11

Lab Title

Estimating distances with movement

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

The objective is to have students demonstrate how to estimate different distances by establishing their step length and their average timed walking speed and comparing the results of both.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

Measurement, Problem Solving, Time and Task Management, Teamwork skills, Calculation Skills Using Formulas

- **Vocabulary**

Approximate value; approximation; digit; estimate; exact value; reasonable answer; rounding; units place; whole numbers

- **Materials List**

Measuring tape(s); stopwatch(s); calculator(s)

- **State Standards addressed**

Math: 7.2.I – Solve single and multi-step problems involving conversions within or between measurements system and verify the solutions.

Reading: 1.1 - Use word recognition skills and strategies to read and comprehend text.

2.1. Demonstrate evidence of reading comprehension.

3.1. Read to learn new information

Writing: 2.2. Writes for different purposes

- **Leadership Skills**

Students will participate in teams of three with each member responsible for specific and rotating tasks. Each student will get a chance to be the walker, the recorder, and the person responsible for measurement/and stop watch duties. All must oversee to make sure the job is done properly.

- **SCAN Skills/Workplace Skills**

A. Performs basic computations

C. Makes reasonable estimates without a calculator

- **Set-up information**

Known distances can be pre-measured and marked with stakes or pins or chalk lines.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)

1. 5-10 minutes directions/grouping

2. 35 minutes lab activity
 3. 5-10 minutes wrap up- gather tools, share results
- **Teacher Assessment of student learning** (scoring guide, rubric)
Submit results from groups. If time compare and discuss; follow up next day.
 - **Summary of learning** (to be finished after student completes lab)
 - discuss real world application of learning from lab
 - opportunity for students to share/present learning
 - **Optional activities**
There are many spin off that could be done for estimation. Literally any part of the school could be estimated for size...playgrounds, different classrooms, cafeteria. Use your creativity and imagination.
 - **Career Applications**
Surveying, Construction, Realtors, etc.

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LAB TITLE: Estimating distances through movement

STUDENT INSTRUCTIONS:

• **Statement of problem addressed by lab**

Students will first walk off set distances at a constant pace and will calculate their average step length and their average time needed for the same distance.

They can use either or both of these methods to estimate the length of common distances, such as the length of the hallway once they know what their average step length and/or average time for the distance.

• **Grouping instructions and roles**

Students will be placed three per group. Each student within the group will be able to rotate into each job: 1. The walker 2. The person recording the data 3. The student counting the steps walked/and time walked.

• **Procedures** – steps to follow/instructions

1. Assign initial group assignments to each member of the groups.
2. The walker needs to verbally count out how many steps it takes to go 100' and give the results to the recorder.
3. While doing this the timer needs to start and stop the stopwatch appropriately. Results are also communicated to the recorder.
4. The recorder then needs to write in the results for the walker on the lab sheet: 1. The number of steps taken 2. The amount of time needed
5. The team then rotates duties so that each person does each duty one time.

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Lab Data Collection

Student: _____ **Date:** _____

Unit: #2

Lab Title: Estimating distances through movement

Criteria: Write the problem/objective in statement form

Students will learn to judge or estimate distances by pacing/ walking and counting and/or timing their steps.

Data Collection: Record the collected/given data

Group Members	# of STEPS at 100' each	AVERAGE OF Group. Steps = Total /3	AVERAGE STEP LENGTH = 100/Group Avg.	TIME EACH 100'	AVERAGE Time for the GROUP = Total/3	AVERAGE FT./SEC. = 100/ Group. Avg.
1.						
2.						
3.						

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

Once each group has determined its average step length (Ex- 2.9ft/step) and its average timed ft./sec (Ex- 100 ft./23.3 seconds =4.3ft./sec.) they can begin to estimate other distances.

For example: If your classroom=12 steps at 2.9ft./step then your estimated distance = 34.8 or 35 feet.

If the group averages 4.3 ft. for every second and it takes 10 seconds to walk down your hall then an estimated distance of 43 feet could be obtained.

I plan to have them pace off the distance of an outside field, the perimeter of my Tech. Lab facility, and circumference of the discuss ring.

Summary Statement:

This is a great real life skill that when done with practiced accuracy can prove very valuable in a lot of situations whether it be trying to estimate the size of a home or pacing off the size of a piece of property.

Other Assessment(s)

Grade as group/ rubric problem activity.

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Lab Framework

Text: CORD Applied Math

Unit number and title: Unit # 6

Short Description: This lab will be used to brief students in the use of traditional drafting tools by drawing various lines and angles with basic equipment. Students afterward will learn to draw geometric shapes using lines and angles on the computer using computer aided drawing and design software. Afterward they can produce products using the CNC Laser.

Developed by: Jack Seymour –

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Date 6-29-11

Lab Title

Drawing Lines and Angles with Traditional Drafting

Equipment

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

To have students learn about various types of lines and angles while also learning to use basic drafting equipment.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

Measurement skills, Drafting fundamental knowledge

- **Vocabulary**

T-square, 30-60-90 Triangle, 45-45-90 Triangle, Protractor, Lines, Angles, Parallel, Perpendicular, Horizontal, Vertical

- **Materials List**

T-square, drafting triangles, drafting paper, masking tape, protractors

- **State Standards addressed**

Math: G.2.D - Describe the intersections of lines in the plane and in space, of lines and planes, and of planes in space.

Reading: 1.1 - Use word recognition skills and strategies to read and comprehend text.

2.1. Demonstrate evidence of reading comprehension.

3.1. Read to learn new information

Writing: 2.2. Writes for different purposes

- **Leadership Skills**

Students will help each other as needed

- **SCAN Skills/Workplace Skills**

A. Performs basic computations

C. Makes reasonable estimates without a calculator

- **Set-up information**

Having sample sheets of what students will be doing. Show students what to expect for line quality as well as the angles and lines they will be drawing.

Samples of varying grades of work help students to see what it takes to do a great job.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)

Leaders assigned to pass out and collect equipment used during activity.

- **Teacher Assessment of student learning** (scoring guide, rubric)
Use drafting scoring rubric
- **Summary of learning** (to be finished after student completes lab)
- Review of all vocabulary; discussion about drafting and Computer aided drafting and design (C.A.D.D)

- **Optional activities**

Have students do the same activity except by sketching the lines. Could be done with only a protractor if other drafting equipment is not available.

- **Career Applications**

Drafting, CADD, Engineering, Designing, Architecture, Construction, Manufacturing

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LAB TITLE: Drawing lines and angles with drafting equipment

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

Draw lines as shown by the sample copy by using your drafting tools to produce the given angles. All lines in each quadrant should be drawn 1/2" apart and should be either parallel or perpendicular to each other as shown.
- **Grouping instructions and roles**

Accomplished individually or if necessary with a partner.
- **Procedures** – steps to follow/instructions
 1. Carefully tape each corner of your drafting paper so that it is perfectly straight and aligned horizontally and vertically with your desk. (Watch teacher demo.)
 2. Divide your paper in half vertically and horizontally with dividing lines. (Again watch teacher demo.)
 3. Your paper should be divided into four equal rectangles. Draw different angled lines within each quadrant being sure to keep lines 1/2" away from each other and by keeping lines within each section parallel to each other. (Follow sample copy)
 4. Carefully print your name and period number on the first line drawn parallel to the edge of your paper.

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Lab Data Collection

Student: _____ **Date:** _____

Unit: #6

Lab Title: Drawing lines and angles with drafting equipment.

Criteria: Write the problem/objective in statement form

To follow the directions for drawing lines and angles from the teacher led demonstrations and the sample worksheet handed out.

Data Collection: Record the collected/given data

Assignment completed on drafting paper sheet.

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

Angles are thought out before drawing the actual lines. Students will need to be able to draw angles needed by using one edge of the triangle or a combination of the two triangles combined with the T-square kept horizontal at all times. Angles other than in 15 degree intervals would need to be drawn using the protractor.

Summary Statement:

Other Assessment(s)

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