

Lab Framework

Text: CORD Unit 3

Unit number and title:

Short Description: In this investigation students will measure and compare yards and meters. Students will determine whether a runner running a 60m sprint is faster than a runner running a 50 yard dash.

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Lab Title

Measurement Dash

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

On the High School track students will measure off 50 yards and 60 meters, then compare the deviation between the two. Students will then time two runners running each distance to determine which runner is faster.

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

Unit 1: Learning problem-solving techniques

Unit 2: Estimating answers

- **Vocabulary**

meter, centimeter, millimeter, yard, feet, inch, average, unit conversion ratio

- **Materials List**

High School track and field Stop watch

100 yard tape measure 100 meter tape measure

- **State Standards addressed**

Math: A1.3.B -- Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations.

Communications: C2.2.2 Applies skills and strategies to contribute responsibly in a group setting.

- **Leadership Skills**

Students work together to collect measurements and must communicate in order to obtain all necessary data. Once grouped, each team will collect yard/meter measurements and running times. Each group will verify that all data collected is accurate and will be required to report their findings to the class.

- **SCAN Skills/Workplace Skills**

Mathematics- Uses quantitative data to construct logical explanations for real world situations.

Sociability- Demonstrates understanding, friendliness, adaptability, empathy, and politeness in a new and on-going group settings.

Responsibility- Works hard to become excellent at doing tasks by setting high standards, paying attention to details, working well, and displaying a high level of concentration, even when assigned an unpleasant task.

Reasoning- Applies rules and principles to a new situation, or determines which conclusions are correct when given a set of facts and a set of conclusions.

- **Set-up information**
 - ✓ Have two or more sets of 100 yard/meter tape measures.
 - ✓ Write a class data chart on front board so students can report their
 - ✓ Group's data, so that data can be shared and compared.
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)
 - ✓ Students are to work in groups, no less than 3 and no more than 4.
 - ✓ Each group will select a designated runner and team leader.
 - ✓ Data collection is collaborative and reported to the front board.
 - ✓ Students are expected to work together helping each other make measurements.
 - ✓ While in the classroom and on the field students are expected to conduct themselves in a polite manner while collecting measurements.
- **Teacher Assessment of student learning** (scoring guide, rubric)
 - ✓ Each student will turn in a completed lab sheet, with data chart completed, and written equation solving for the faster runner.
- **Summary of learning** (to be finished after student completes lab)
 - **Real World Application**
Workers in almost every industry need the ability to measure with accuracy.
 - Opportunity for students to share/present learning**
Students may find that they prefer one form of measurement over the other. Discussion may develop over which form or measure is more accurate.
- **Optional activities**
Students could extend data collection to include longer distances or heights (like a pole vault cross bar or high jump cross bar).
- **Career Applications**
As stated in the introduction to the unit, workers in almost every industry need the ability to measure with accuracy. Some of the more obvious professions would include the following.

Auto mechanic/repair	Construction trades
Manufacturing	Surveyor
Architect	Machining
Laboratory Sciences	Aero Space Sciences

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LAB TITLE: Measuring Dash

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
What runner is faster? The runner running a 100 yard dash, or the runner running a 60 meter sprint?
- **Grouping instructions and roles**
3-4 individuals to a group, each group will select a runner.
 - ✓ **Recorder-** group designates 1 student to record data sharing the data with group members. The other members of the group will verify data to insure accuracy.
 - ✓ **Measurer-** group will designate 2 students to take measurement data.
 - ✓ **Subject-** Student designated runner.
- **Procedures** – steps to follow/instructions
 1. Pass out lab sheet
 2. Go through Pre-lab expectations
 3. Group students
 4. Work time for students
 - a. Students are to measure off and mark 50 yards and 60 meters, then compare the two and calculate the unit conversion ratio.
 - b. Students groups will pair with another group and decide which of their runners will run yards or meters.
 - c. Designated runner will run the distance decided on 3 times.
 - d. Data collector will record run times on data sheet.
 - e. After times are recorded students will calculate an average of the times.
 - f. Paired groups will share collected data and group members will share and complete data collection information.
- **Outcome instructions**
 1. After all data is collected students will work in their group to develop and solve an equation to determine which runner was faster.
 2. Student groups will enter data, equation and results on board.
- **Assessment instructions** (peer-teacher)
Each student is to turn in a completed lab sheet with all collected data including equation deriving their answer.

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Lab Data Collection

Student: _____ Date: _____

Unit: 3 Measuring in English and Metric units

Lab Title: Measurement Dash

Criteria: Write the problem/objective in statement form

Determine which runner was faster runner (A) running 50 yard dash or runner (B) running a 60 meter sprint.

Data Collection: Record the collected/given data

1. Measure and mark 50 yards and 60 meters, then calculate unit conversion ratio.

2. Runner A (running 50 yard dash) run times _____ Ave _____

3. Runner B (running 60 meter sprint) run times _____ Ave _____

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

Working in your group develop an equation using data collected and unit conversion ratio to determine which runner was faster.

Summary Statement:

Other Assessment(s)

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