

Lab Framework

Text: CORD

Unit number and title: Unit 3,

Short Description: We have two students in class who are claiming to be the fastest in the respective sports. The first student is a football player who can run 100 yards in a certain amount of time. The other is a track athlete who can run the 100 meter dash in a different amount of time. In this investigation the class will measure and compare yards to meters to ascertain which student is faster.

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Lab Title Who's Faster?

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

On the High School track students will measure off 100 yards and 100 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 collect 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
Manufacturing
Architect
Laboratory Sciences

Construction trades
Surveyor
Machining
Aero Space Sciences

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LAB TITLE: Who's Faster?
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
What runner is faster? The runner running a 100 yard dash, or the runner running a 100 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.
 - g. Upon return to the class room students (in their groups) will calculate unit conversion ratio for the two runners and determine which runner was faster.

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Lab Data Collection

Student: _____ Date: _____

Unit: 3

Lab Title: Who's Faster?

Criteria: Write the problem/objective in statement form

Two students who are claiming to be faster than the other, but run different distances, need to figure out which is faster.

Data Collection: Record the collected/given data

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

Summary Statement:

Other Assessment(s)

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