Reinventing the Wheel

Physical Science and Technology

Introduction:

The purpose of this activity is for you to demonstrate your ability to problem solve by designing and building a device *and* writing the results in a formal lab paper. Each section of this activity has multiple criteria; please finish as many criteria as you can in the time allowed. You will work in partners to complete this activity.

Day 1 (40 mins.)

→ *Design the wheel*

Work with a partner - you and your partner will calculate two numbers and estimate a third. Here are the formulas you will use for your calculations:

First number = (the number of letters in your last name + the number of letters in your partner's last name) / 4

Round this number to the nearest *hundredths* place.

Second number = (#of letters in your full first name * number of letters in your partner's full first name) / 4

Round this number to the nearest *whole number*.

The first number will represent a distance **in meters** and the second will represent a **number of rotations**. Your goal will be to build a wheel that will travel within 10% of the specified distance in exactly the specified number of rotations.

Finally, estimate how much cardboard you think you will need to build a wheel that will travel the correct distance in the correct number of rotations.

Day 2 (90 mins.)

→ *Design the wheel and collect data*

Build your wheel using the provided materials. Show your wheel to an instructor to make sure you are on the right track. Once you have built your wheel and had it approved, collect 10 trials of data – for each trial, record the exact distance your wheel traveled in the specified number of rotations.

After you have collected your data, turn your wheel in along with the following information written on one side: Your name, the distance specified, the number of rotations specified, and the radius (or diameter) of the wheel you built. Also turn in the data that you collected using your wheel.

Day 3 (60 mins.)

→ *Write a lab report documenting your progress – save this report on your H: drive as "Wheel Writeup"*

Work individually. You will use Microsoft Word on the computers in the computer labs. When you think you are done with the write-up, HAVE AN INSTRUCTOR REVIEW IT! After it has been reviewed, you can print your write-up and turn it in.

- Criteria 1: Your lab report should have your name, the period, and the date in the upper right-hand corner
- Criteria 2: Include a title centered and in bold
- Criteria 3: Include an Introduction section consisting of 2 – 3 sentences describing what we asked you to do for this project
- Criteria 4: Include a Methods section that describes how you decided how big your wheel should be, and how you tested and adjusted your wheel

Criteria 5: Include a data table, made from within Word, which has spaces for you to take 10 measurements of the distance traveled and number of rotations made by your wheel in each trial. Make sure the table is appropriately labeled and attractively formatted

Criteria 6: Include a Discussion section that addresses the following questions:

1. How easy or difficult did you find this project? What were the most difficult parts?
2. What types of things did you learn about working with a partner on this project? Describe how you and your partner made decisions when necessary.
3. What aspects of science interest you the most?
4. What aspects of technology interest you the most?