a balancing torque act

Purpose

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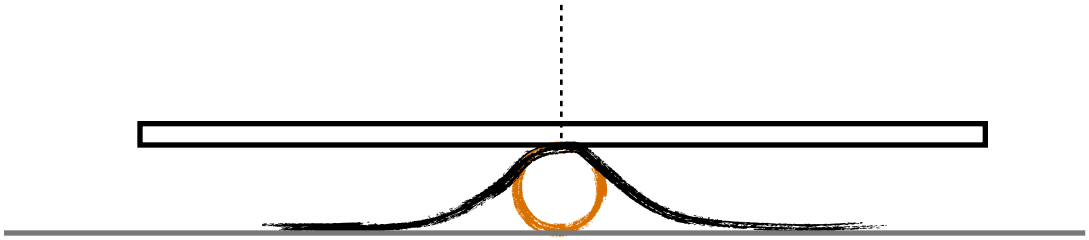
Materials

1. _____
2. _____
3. _____
4. _____
5. _____

Diagram



Procedure

1. Balance the meterstick on top of the taped-down dowel. The pivot point should be near the 50 cm mark (but not necessarily).
2. Put the unknown mass somewhere between the 10 and 25 cm mark.
3. Set two different stacks of washers on the the otherside of the meterstick. Leave about 20 cm between the stacks. Make one stack about 7-10 washers and the other stack 4-7 washers.
4. You want to get the meterstick to nearly balance, at this point. Now, move any mass to balance the the meterstick.
5. Record the masses of the stacks and the distances from the pivot point into your table.
6. Repeat this one more time with the same unknown mass but use different positions and masses.
7. Repeat steps 1-6 for a different mass.
8. Derive and calculate the unknown mass 1 and the unknown mass 2 from your torque equation.
9. Calculate the percent difference of the calculated mass and the actual mass for both unknown masses.

Physics
Period _____

Name _____
Date _____

Data Acquisition

	Measurements (Experimental)							Calculations (Theoretical)	
	Trial	**m_1(g)**	**r_1(cm)**	**m_2(g)**	**r_2(cm)**	**unknown distance $r_?$(cm)**	**Measured unknown mass (g)**	**Calculated mass $m_?$(g)**	**Percent Difference**
unknown mass 1	1								
	2								
unknown mass 2	3								
	4								

Data Analysis

$$\tau = r \; x \; F = rF \sin\theta$$

$$\Sigma\tau =$$

solve for $\tau_?$

plug in rF's

plug in mg's

cancel g

solve for $m_?$

plug in values to solve for unknown masses

unknown mass 1

$m_?$ =

$m_?$ =

unknown mass 2

$m_?$ =

$m_?$ =

Conclusion

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