Yale Physics Olympics

Team Name:_____ **Animal #:**_____

Weight in Sea

MATERIAL: 1 Plastic animal on string (DO NOT REMOVE STRING)
1 Meter stick
1 Knife-edge pivot on meterstick (DO NOT REMOVE PIVOT)
1 Hanger
1 10gm weight
1 20 gm weight
1 Beaker of water
Pencil

OBJECT: To determine the volume of the animal to as high a precision as possible.

USEFUL EQUATIONS: Provided the meterstick balances with no weights attached, the ruler will rebalance when the following condition (for masses on opposite sides of the pivot) is met:

$$M_L \Delta d_L = M_R \Delta d_R$$

where $\Delta d_{L.R}$ is the positive distance from the pivot point to the location of the mass $M_{L,R}$ on the left or right respectively.

The change in mass when submerged is given by: $\Delta M = \rho_w V_0$ where ρ_w is the density of water (1 gm/cc) and V_0 is the volume of the object in cubic centimeters.

SCORING: The percent difference of your volume, or: $\left| \frac{\left(V_{\text{measured}} - V_{\text{measured better}}\right)}{V_{\text{measured better}}} \right|$

Your volume (in cc) to at least 4 significant figures:

Absolute Percent difference ----------