Fluid Capacity for Hydraulic System Device

Key terms: Volume formula for cylinder \( \pi r^2 h \)
- Millimeters
- Milliliters
- Graduated cylinder
- Predicted amount
- Actual amount
- Radius
- Diameter
- Rounding
- \( \pi = 3.14 \)

Summary
The objective of this activity will be to calculate the predicted fluid volume using the given formula. This formula is the standard for computing cylinder volume. This calculation will then be compared to the actual amount of fluid measured to the nearest milliliter using a graduated cylinder.

Directions – All measurements are to be made using millimeters

A. Predicted Fluid Amount – record information in table provided
Oral Syringe
1. Accurately measure the diameter of the oral syringe and then divide by 2 to get the radius.
2. Now measure the length of the oral syringe that contains fluid and record in millimeters.

Aquarium Tubing
1. Accurately measure the diameter of the aquarium tubing and then divide by 2 to get the radius (round to the nearest tenth).
2. Now measure the length of all the tubing used in the device for a cumulative total in millimeters.

B. Actual Fluid Amount
Oral Syringe and Aquarium Tubing
1. Using a graduated cylinder accurately measure the amount of fluid contained within each entire subsystem.
# Fluid Capacity Data Sheet

**Theoretical amount**

**Actual amount**

<table>
<thead>
<tr>
<th></th>
<th>Theoretical Amount</th>
<th>Actual Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral Syringe</td>
<td>Aquarium tubing</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius (mm) d/2=r</td>
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<td></td>
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<tr>
<td>Height/length (mm)</td>
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<tr>
<td>Cylinder Volume (mL) Pi x r^2 x height</td>
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<td></td>
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<tr>
<td>Total Volume (mL)</td>
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<tr>
<td>Extra Credit Compute % of error</td>
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</tbody>
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