Meaningful Measurements

How close a measured value is to...

Precise?  Precise?  Precise?  Precise?
Accurate?  Accurate?  Accurate?  Accurate?

In order to be meaningful, measurements must have both...

When taking measurements in the lab...

✓ DO read glassware so that you are at ________________
✓ DO measure to the ________________ of the ________________
✓ DO ________________ one more digit ___________________________
✗ DO NOT assume that the scale will always be marked by ____________

What is the reading in milliliters for each graduated cylinder?
**Teacher Information:**

- The second page is flaps:
  - Accuracy and Precision to cover the definition boxes at the top of the page; print this separately and have students cut them, or pre-cut them to save time.
  - Targets that can be lifted to reveal information about the accuracy and precision of each one.
- Flaps allow students to quiz themselves later when reviewing for the test
- How to fill in this page:
  - Define accuracy and precision at the top of the page – my key:
    - Accuracy is how close a measured value is to...
      - A true or accepted value
    - Precision is how close a measured value is to...
      - Other points in the data set

<table>
<thead>
<tr>
<th>Precise? ☑</th>
<th>Precise? ☑</th>
<th>Precise? ☑</th>
<th>Precise? ☑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate? ☑</td>
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<td>Accurate? ☑</td>
<td>Accurate? ☑</td>
</tr>
</tbody>
</table>

*In order to be meaningful, measurements must have both…*

*Units and the correct number of significant figures*

**When taking measurements in the lab…**

- **✓ DO** read glassware so that you are at ___eye level_____________
- **✓ DO** measure to the ___bottom________ of the ___meniscus_________
- **✓ DO** ___estimate________ one more digit past the last marked place___
- **✗ DO NOT** assume that the scale will always be marked by ___tens_________

**Graduated cylinder readings:**

- Purple = 21.20 mL  
- Green = 49.0 mL  
- Pink = 11.60 mL  
- Red = 26.7 mL