

**vectors**  
**Hanging Mass Lab**

<p>Physics Goal</p> <ul style="list-style-type: none"> <li>Students will find the mass of objects using vector analysis.</li> </ul> <p>Behavioral Objective</p> <ul style="list-style-type: none"> <li>All students can demonstrate ability to setup lab. Ninety percent of students can perform appropriate calculations.</li> </ul> <p>Technology: ELMO/Video Projector, SmartBoard, Netbook</p> <p>Materials: Paper, Pencil, Scales, Pulleys, Masses, String, Paperclips, Washers, Scissors, Lab Sheet.</p> <p>Pacing: 55 minutes</p>	<p>State Standards</p> <p><b>P3.2C,D</b>  <b>P3.4A</b></p>
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**1. ANTICIPATORY SET (10 minutes)**

Take attendance during music. Remind students of homework due tomorrow and Practice Quiz. Load "Vector Lab" and inform students on our goal for the day. Describe procedures with pictures. **Model** the  $F_w$  and  $T$  of a hanging mass. **Model** the level protractor. Hand out lab worksheets.

**Ask students:**

- What forces are acting on this hanging mass? How is that related to the tension in the string?
- What components did we have for tension?
- What problems have we worked on that will help us solve this one? How are these problems different in one important way?

**Materials:**  
 "Vector Lab" SMART

**Thinking Levels:**  
 Application

**Learning Styles:**  
 Visual, Logic, Audio

**Checking for Understanding:**  
 Question/Answer

**3. SUMMARIZE (10 minutes)**

Students that finish the lab early should be working on homework or the practice quiz.

Class discussion on error:

- Did anyone have an error above 5%? 10%?
- What were possible causes for error?
- If we were to do the lab again, how could we avoid this error?

Labs and homework are due Friday. Practice Quiz key will be available next week. Look forward to projectiles.

**Materials:**

**Thinking Levels:**  
 Comprehension  
 Evaluation

**Learning Styles:**  
 Logic, Audio, Visual

**Checking for Understanding:**  
 Question/Answer  
 Student Discussion

**4. ASSIGNMENT GUIDE**

**Exit Slip**

- "Write down two things you have learned and one that you're struggling with."

**Assignment**

- Vector Non 90° #1
- Vector Lab

**Materials:**  
 Scrap Paper, Pencil

**Thinking Levels:**  
 Evaluation

**Learning Styles:**

**Checking for Understanding:**  
 Exit Slip