

Work Sheet

Student Name: _____

Team members:

1.- _____ 2.- _____

3.- _____ 4.- _____

Instructor: _____

Introduction¹

Analysis

Acceleration Along an Air Track

1. Draw the free body diagram for this experiment. Be sure to label the masses and the forces.

2. Use $a_{\text{ideal}} = g \left(\frac{m_2}{m_1 + m_2} \right)$ to calculate the theoretical acceleration.

3. Find the error percentage. This quantity is caused by the frictional force.

4. Use $f = (m_1 + m_2)(a_{\text{ideal}} - a_{\text{measured}})$ to calculate the frictional force. Explain what can cause this frictional force in this experiment.

String Tension Along an Air Track

1. Draw the free body diagram for this experiment. Be sure to label the masses and the forces.

2. Use $a_{\text{ideal}} = g \left(\frac{m_2}{m_1 + m_2} \right)$ to calculate the theoretical acceleration.

3. Find the error percentage. This quantity is caused by the frictional force.

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4. Use $f = (m_1 + m_2)(a_{\text{ideal}} - a_{\text{measured}})$ to calculate the frictional force. Explain what can cause this frictional force in this experiment. How is it different compared to the previous experiment?

 5. Use $T = m_2(g - a_{\text{measured}})$ to calculate the tension in the string.

 6. Find the error percentage for the tension. Why is it different? Explain.

Conclusion

¹This is an adaption from S. Sugaya's original version