

**AP Physics – Assignment #1**  
**Free Body Diagrams**

**Instructions:** Complete these problems on separate paper. On ALL questions (yes, even multiple choice), you must:

1. Draw a picture or diagram to visualize the problem
2. Show each step of your calculations clearly
3. Write a few sentences explaining important steps and discussing the reasonableness of your result.





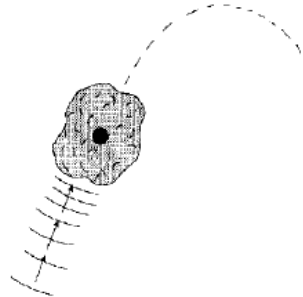
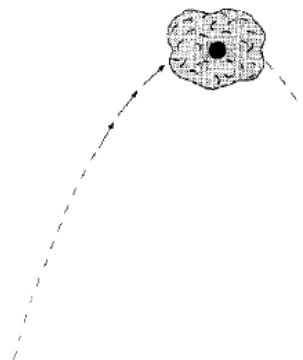
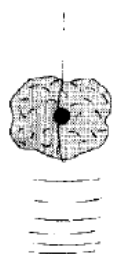
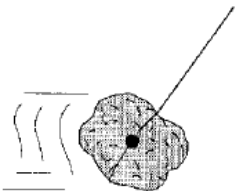
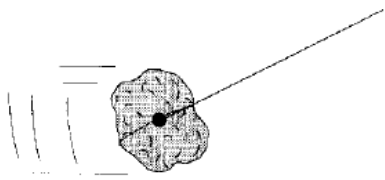
It is ok to collaborate with your peers, but the work must be your own.

*You must take assignments seriously to learn physics*

<p>LM-1. Equilibrium (Example)</p>	<p>LM-2. Equilibrium</p>	<p>LM-3. Friction prevents sliding.</p>
<p>LM-4. Equilibrium</p>	<p>LM-5. Equilibrium</p>	<p>LM-6. Equilibrium</p>
<p>LM-7. Equilibrium</p>	<p>LM-8. Equilibrium</p>	<p>LM-9. Rock is sliding on a frictionless incline.</p>

*"You don't have to be a fantastic hero to do certain things. You can be just an ordinary chap, sufficiently motivated to reach challenging goals."*

- Sir Edmund Hillary

<p>LM-10. Rock is falling. No friction.</p> 	<p>LM-11. Rock is sliding at constant speed on a frictionless surface.</p> 	<p>LM-12. Rock is falling at constant (terminal) velocity.</p> 
<p>LM-13. Rock is decelerating because of kinetic friction.</p> 	<p>LM-14. Rock is rising in a parabolic trajectory.</p> 	<p>LM-15. Rock is at the top of a parabolic trajectory.</p> 
<p>LM-16. Rock is tied to a rope and pulled straight upward, accelerating at <math>9.8 \text{ m/s}^2</math>. No friction.</p> 	<p>LM-17. Rock is tied to a rope and pulled so that it moves horizontally at constant velocity. (There must be friction.)</p> 	<p>LM-18. Rock is tied to a rope and pulled so that it accelerates horizontally at <math>2g</math>. No friction.</p> 

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