Free Body Diagrams

Practice Problems

Name: _____

Construct free-body diagrams for the various situations described below. Use the following forces.

Forces – Frictional Force = F_F
Tensional Force = F_T
Normal Force = F_N
Air Resistance = F_{Air}
Applied Force = F_{App}
Spring Force = F_S
Gravitaional Force = F_W

1. A book is at rest on a table top. Diagram the forces acting on the book.

2. A girl is suspended motionless from a bar which hangs from the ceiling by two ropes. Diagram the forces acting on the girl.

3. An egg is free-falling from a nest in a tree. Neglect air resistance. Diagram the forces acting on the egg as it is falling.

4. A flying squirrel is gliding (no *wing flaps*) from a tree to the ground at constant velocity. Consider air resistance. Diagram the forces acting on the squirrel.

5. A rightward force is applied to a book in order to move it across a desk with a rightward acceleration. Consider frictional forces. Neglect air resistance. Diagram the forces acting on the book.

6. A rightward force is applied to a book in order to move it across a desk at constant velocity. Consider frictional forces. Neglect air resistance. Diagram the forces acting on the book.

7. A college student rests a backpack upon his shoulder. The pack is suspended motionless by one strap from one shoulder. Diagram the vertical forces acting on the backpack.

8. A skydiver is descending with a constant velocity. Consider air resistance. Diagram the forces acting upon the skydiver.

9. A force is applied to the right to drag a sled across loosely-packed snow with rightward acceleration. Diagram the forces acting upon the sled.

10. A car is coasting to the right and slowing down. Diagram the forces acting upon the car.

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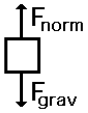
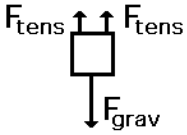
1. A book is at rest on a table top.
   Diagram the forces acting on the book.



2. A girl is suspended motionless from a bar which hangs from the ceiling by two ropes.
   Diagram the forces acting on the girl.



3. An egg is free-falling from a nest in a tree.
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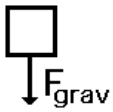
   Diagram the forces acting on the egg as it is falling.



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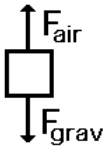

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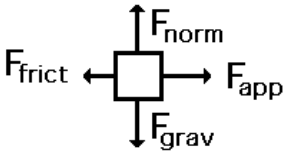

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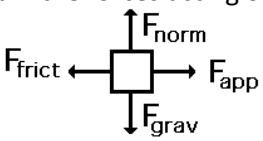

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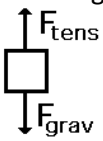
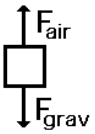


8. A skydiver is descending with a constant velocity. Consider air resistance.
   Diagram the forces acting upon the skydiver.



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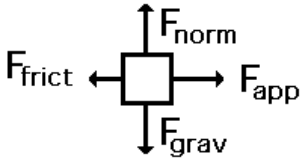

10. A car is coasting to the right and slowing down.
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