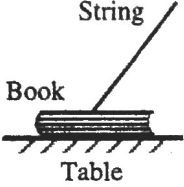


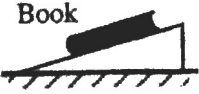
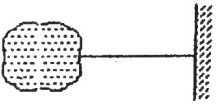

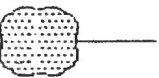

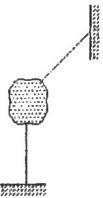
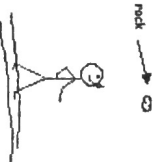


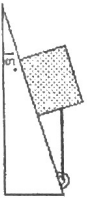


DRAWING FREE BODY DIAGRAMS

<p>EXAMPLE 1:</p> <p>A string is tied to a book and pulled at an angle as show below. The book remains in contact with the table and does not move.</p>  <p style="text-align: center;">String Book Table</p>	<p>FBD</p>	<p>Statement of forces in x-direction</p> <p>Statement of forces in y-direction</p> <p>Compare the normal force acting on the book in this example to the normal force acting if no string was present.</p>
<p>EXAMPLE 2:</p> <p>A book on a level tabletop is being pressed straight down by a hand with a force equal to one half the weight of the book.</p> 	<p>FBD</p>	<p>Statement of forces in x-direction:</p> <p>Statement of forces in y-direction:</p> <p>Compare the normal force acting on the book in this example to the normal force acting if no hand was present.</p>
<p>EXAMPLE 3:</p> <p>A book is pushed against the wall so that it does not move. The book is being pushed horizontally by a hand with a force equal to twice the weight of the book.</p> 	<p>FBD</p>	<p>Statement of forces in x-direction:</p> <p>Statement of forces in y-direction:</p>
<p>EXAMPLE 4:</p> <p>A book remains at rest on an incline.</p>  <p style="text-align: center;">Book</p>	<p>FBD</p>	<p>Statement of forces in x-direction:</p> <p>Statement of forces in y-direction:</p> <p>Compare the normal force acting on the book in this example to the normal force acting if it were on a level surface.</p>

MORE FREE BODY DIAGRAMS

<p>Exercise 1: A light string is used to suspend a rock from the ceiling so that it cannot move.</p>			<p>Exercise 6: A person uses a rope to pull a box across a level surface. The box is speeding up. The surface is <u>not</u> frictionless.</p>		
<p>Exercise 2: A light string is used to accelerate a rock upwards.</p>			<p>Exercise 7: A girl is pulling her sled through the snow at constant speed. The rope makes an angle of 20° with the horizontal.</p>		
<p>Exercise 3: Two light strings are used to tie a rock between two walls so it cannot move.</p>			<p>Exercise 8: A boy throws a rock straight up into the air. Consider an instant when the rock has left the boy's hand on its way up but is not yet at the top of its flight.</p>		
<p>Exercise 4: A person uses a rope to pull a box across a level surface with constant velocity. The surface is <u>not</u> frictionless.</p>			<p>Exercise 9: A block is observed sliding down a surface which is inclined at 20° to the horizontal. The block is slowing down. The surface is not frictionless.</p>		
<p>Exercise 5: A block is held in place on a frictionless incline by a horizontal, massless string. The plane is inclined 15° to the horizontal.</p>			<p>Exercise 10: A coin is rotating without slipping on the surface of a disk that is spinning with constant angular speed. Draw your diagram as a side view.</p>	