

# Normal Force Warm-Up

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

Recall that the normal force is a “contact force.” It acts perpendicular to the surface in contact and is a result of Newton’s 3<sup>rd</sup> Law.

- You must write your forces with subscripts and show all work!

## Problems

1. Consider Gangsta Lama...he’s a lean, mean physics machine!
  - a) Gangsta Lama has a mass of 120kg and is standing on a scale. Calculate the normal force (you must include the FBD).



- b) Gangsta Lama has some additional forces acting on him. A person is pushing up on him with 40  $N$  of force and another person is pushing down with 90  $N$  of force. Calculate the normal force (you must include the FBD).



2. Kinematics Kong is doing a physics experiment to determine his own mass on Earth, however when he stands on the scale some pesky friends play a joke on him. One friend pushes down on him with  $50N$  of force, another friend pushes up on him with  $20N$  of force and a third person also pushes down with  $120N$  of force. Kinematics Kong looks down at the scale and sees that it reads  $2000N$ . Calculate his mass.

