

Unit 3 Worksheet 10: Last of this type

1. Stacy stubs her toe on the coffee table and applies a force of 100 N. A) What is the acceleration of Stacy's 1.8 kg foot? B) What is the acceleration of the table if it has a mass of 20 kg?
2. Daniella, who's mass is 48200 g, is on her way to school when she slips on a patch of doggy do which has coefficient of sliding friction of 0.032. (a) What force of friction will eventually bring Daniella to a stop? (b) How does the frictional force change if the mass of Daniella is doubled? Justify your answer.
3. Bethany is slip and sliding down a hill inclined at an angle of 15 degrees with the horizontal when she crashes into a tree and breaks a pom pom. If Bethany has a mass of 958 kg, (a) what is the force pulling her down the hill before this injury? (b) If the angle of the incline increases, how does your answer to (a) change? Justify your answer.
4. While chopping down his father's cherry tree, George discovered that if he swung the axe with a speed of 25 m/s, it would embed itself 2.3 cm into the tree before coming to a stop. A) If the axe head had a mass of 2.5 kg, how much force was the tree exerting on the axe head upon impact? B) How much force did the ace exert back on the tree?
5. While at the zoo this Friday night (what kind of high schooler goes to the zoo on a Friday night), Kris watches a 300 kg elephant slide down a tree that is inclined 25.0 degrees to the horizontal. The coefficient of friction between the elephant and the tree is 0.0500. (a) What frictional force impedes the elephant's motion down the tree and what is the elephant's acceleration? (b) How does your answer to (a) change if the angle is decreased? Justify your answer.
6. Stephanie was walking down a ramp when she slipped on a banana peel. The ramp had an angle of 18.0 degrees to the horizontal. Stephanie has a mass of 350kg. The banana has a mass of .5kg. The ramp was 18 ft long. The cement was very muddy from the rain and had a coefficient of sliding friction of 0.0900. (a) What force of friction impedes Stephanie's motion down the ramp? (b) If the ramp were steeper, how would this affect the sliding friction? (c) What is Stephanie's acceleration?
7. Noah is loading the ark and the last animal on board is a stubborn 1500 kg elephant that refuses to budge. Noah and his family pull the elephant at a constant speed up the 10° incline with a force of 10,000 N. (a) What is the coefficient of sliding friction between the elephant and the loading platform? (b) How would motion of the elephant change if the force was doubled? Justify your answer.
8. A 15.0 g bullet is shot out of a rifle. The bullet is going 120 m/s right before the bullet enters the target. If the bullet goes 6.8 cm into the target, what force did the target apply on the bullet?
9. A boy pulls a steady and constant force of 20 N on a 30 kg wagon. A) What is the acceleration of the wagon? B) How far will it move in 2 s assuming the wagon started from rest?

