Name _____ Date _____

# 104
# Friction Stops an SUV
F = ma

Sport utility vehicles or SUVs vary in weight. The one pictured is probably over 8ooo lbs. Some residential areas have restrictions for vehicle weight. You are designing a pedestrian crosswalk for a town that has a vehicle weight limit of 6000 lbs. What factors will affect the stopping time of 6000 lb SUV?

How are these factors different than the factors affecting a 2000 lb car?

Determine the mass of a 6000 lb SUV. (1 kg = 2.2 lb)

Assume the top speed limit is 30 mph. What is this speed in m/s? (1 mile = 1609 m)

You determine that 10 seconds is a reasonable stopping time. If this is the case, what is the acceleration of the SUV?

What is the braking force needed to cause this acceleration? This is also the force of friction.

What is the normal force acting on the SUV?

Assume the braking force and the force of friction are the same. What is the coefficient of friction (*u*) between the SUV's tires and the road?

How would the braking force change if the stopping time was doubled?

Given this half of the equation, fill in the side after the "=" sign.

Ft =

If the braking force was a weight, how many pounds would it be?