

Force, Vectors and
Projectile Motion Activity

Vin Diesel Motorcycle Leap

- 1.) How fast is Vin Diesel and his motorcycle moving vertically the instant after losing contact with the ground? (hint: use the time-independent kinematic equation where $v_f = 0$) height = 9m
- 2.) Draw a force diagram for Vin and his bike the instant before losing contact with the ground. Assume Vin is moving at a constant horizontal velocity.
- 3.) Write an equation for ΣF on Vin and his bike.
- 4.) Use your equation from #3 to solve for F_N . Assume Vin's feet are in contact with the ground for .25 seconds. Use $a = \Delta v / \Delta t$ and the answer from #1. Mass of Vin and bike is 280 kg.
- 5.) How much force is required for Vin to reach a height of 9m while on his bike?

6.) Determine the total time Vin spent in the air.

7.) Sketch the three kinematic graphs of Vin and his bike below. Only consider his vertical motion.

