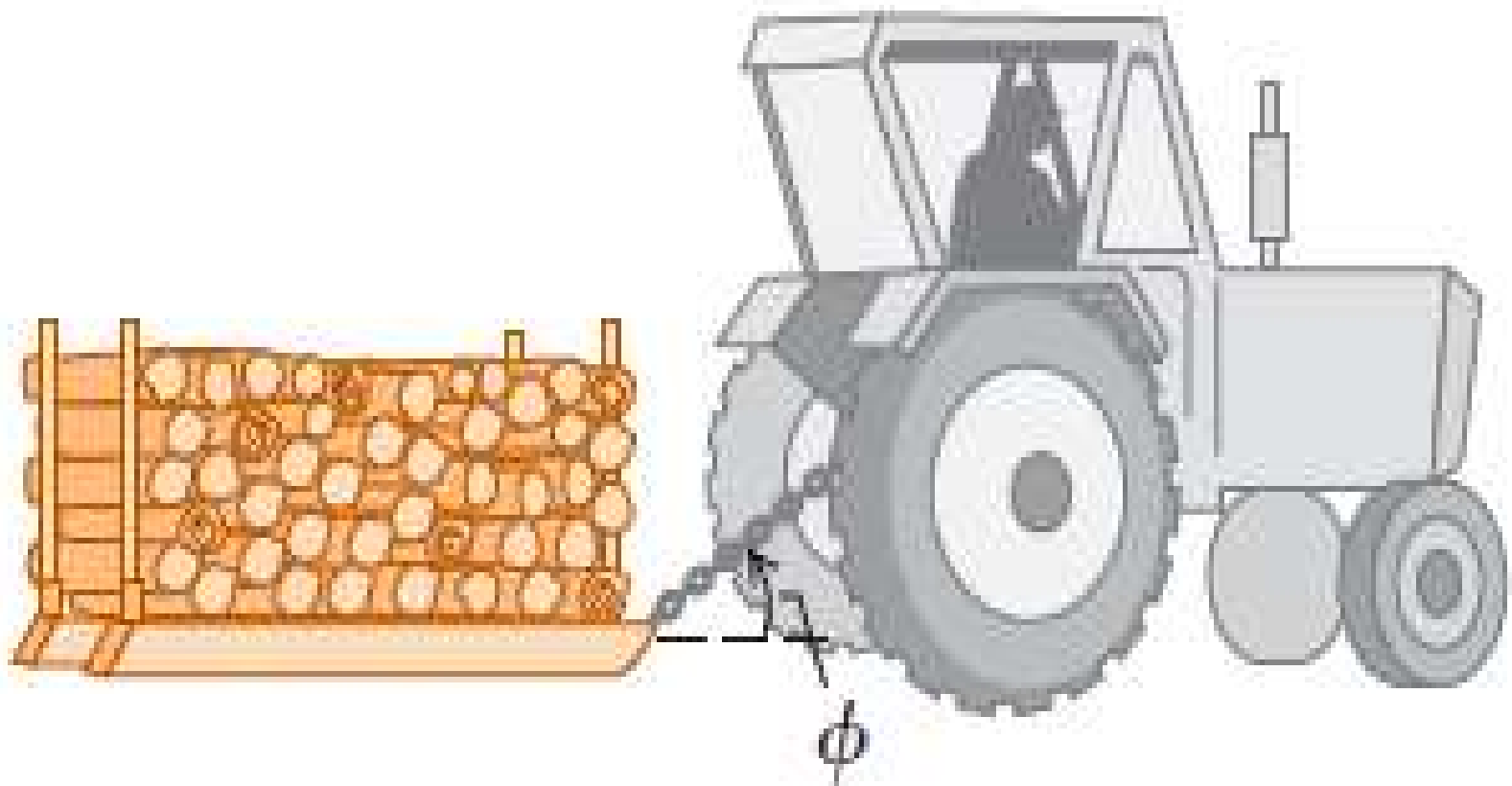


“Straight Forward” Work Problem

- Steve exerts a steady force of magnitude 210 N on a stalled car as he pushes it a distance of 18 m to the East. The car also has a flat tire, so to make the car track straight Steve must push at an angle of 30° NE. How much work does Steve do?

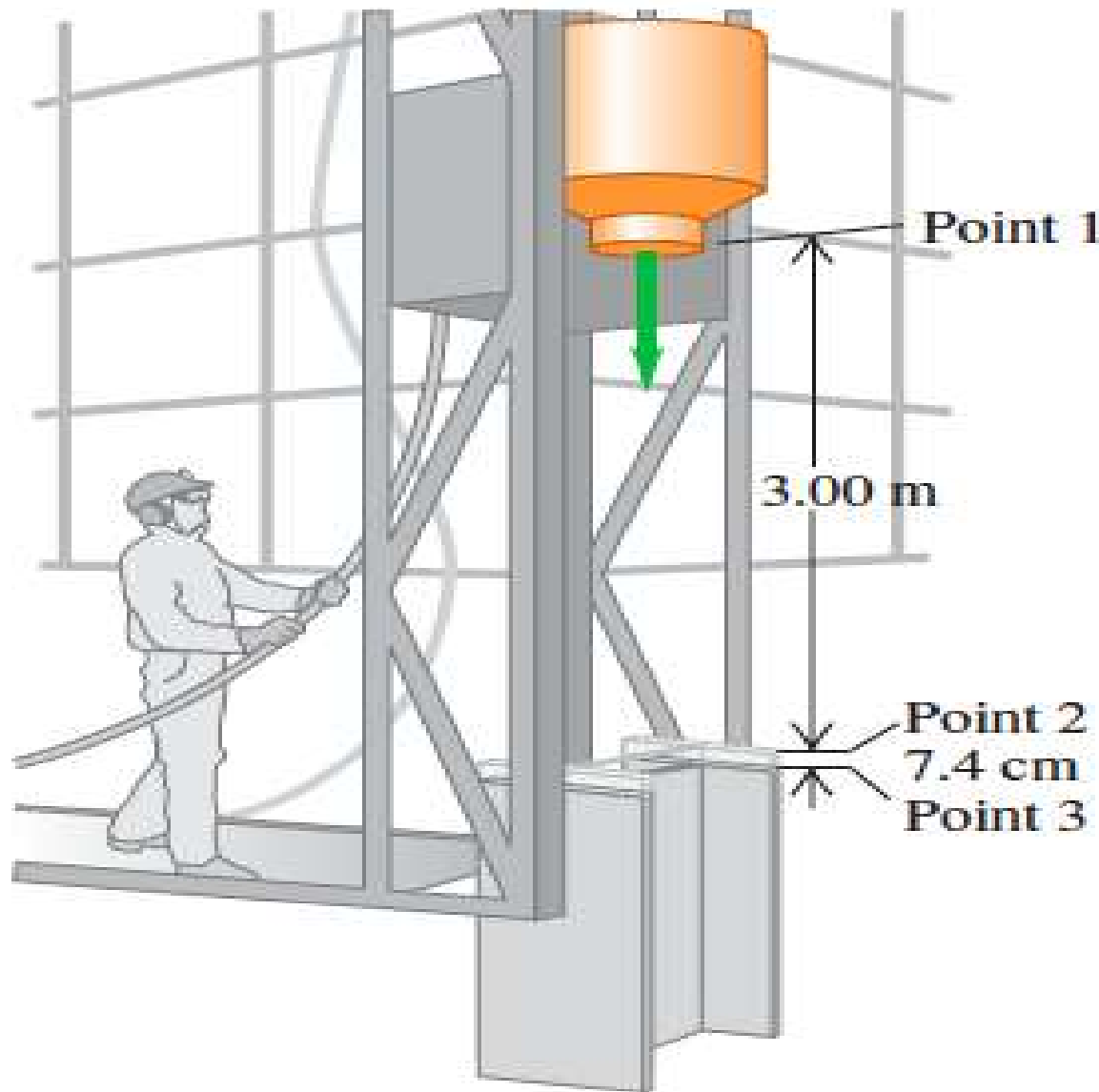
Figure



Drop the Hammer

- The 200-kg steel hammerhead of a pile driver is lifted 3.00 m above the top of a vertical I-beam being driven into the ground (see figure). The hammerhead is then dropped, driving the I-beam 7.4 cm deeper into the ground. The vertical guide rails exert a constant 60-N friction force on the hammerhead. Find the average force the hammerhead exerts on the I-beam

Figure



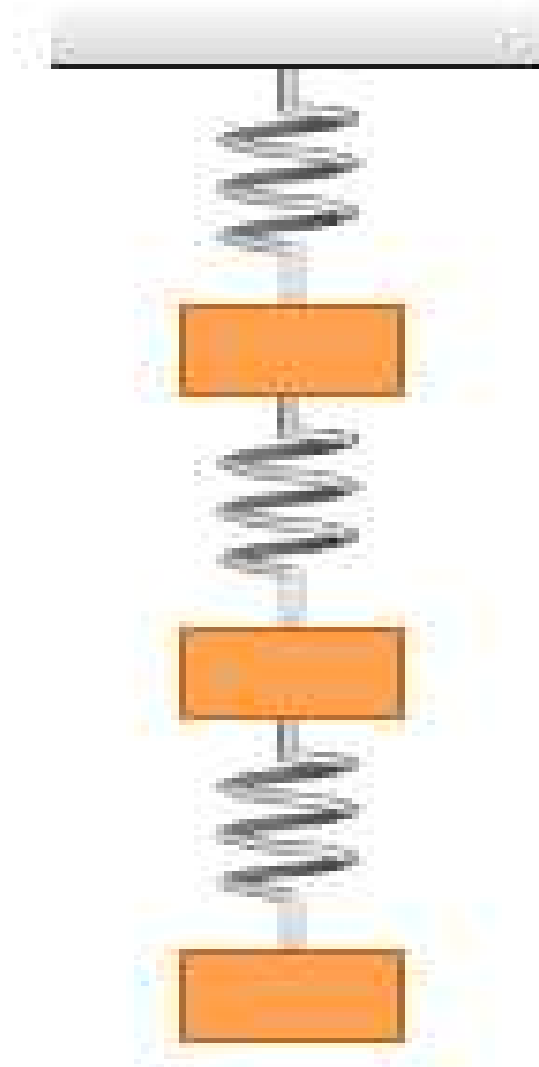
A “Powerful” Question...

- A 50.0-kg marathon runner runs up the stairs to the top of Chicago’s 443-m-tall Willis Tower, the tallest building in the United States. To lift herself to the top in 15.0 minutes, what must be her average power output?

Let's Bounce This One Around...

- Three identical 6.40-kg masses are hung by three identical springs, as shown on the next slide. Each spring has a force constant of 7.80 kN/m and was 12.0 cm long before any masses were attached to it. How long is each spring when hanging as shown?

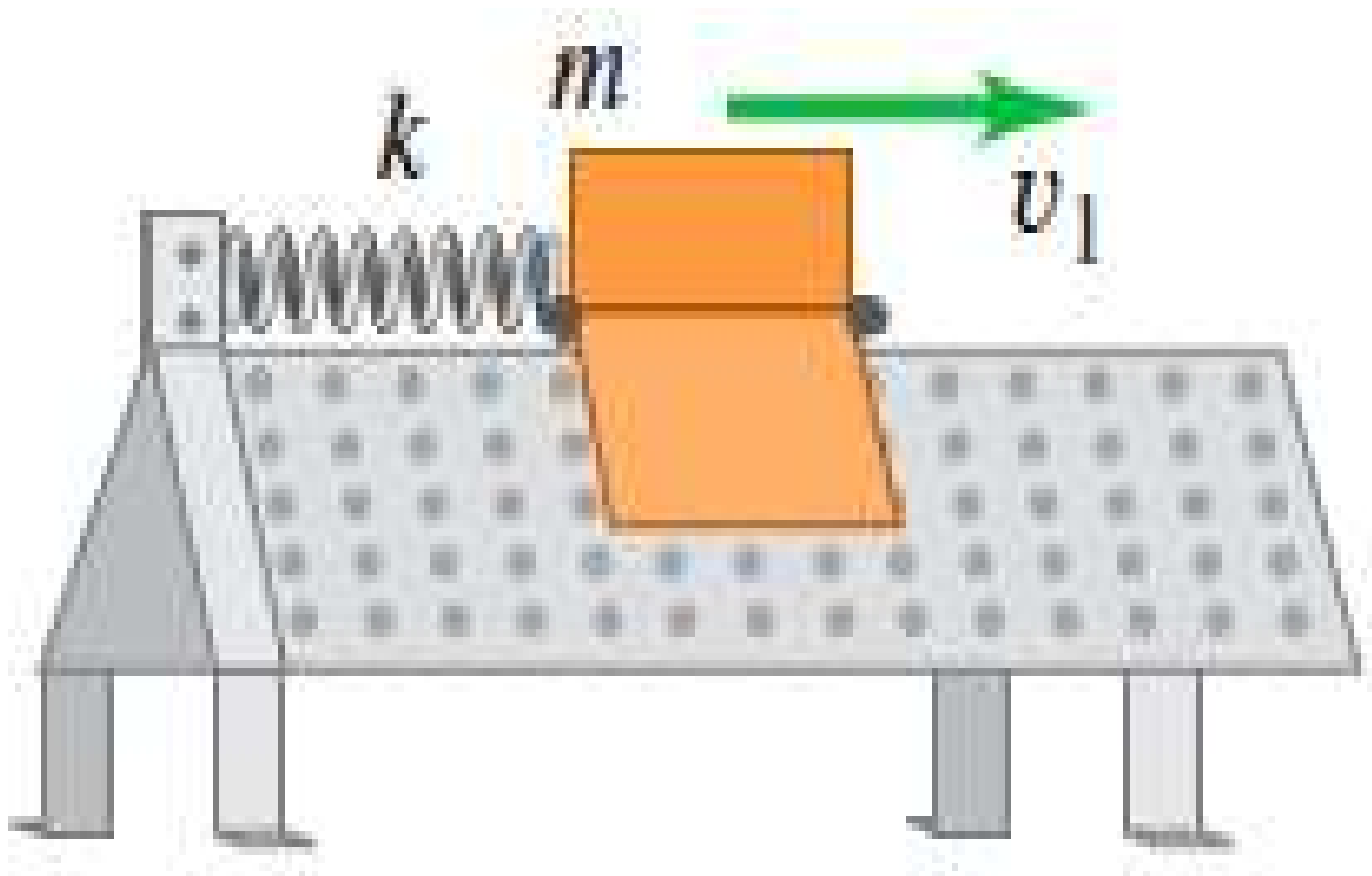
Figure



You May Not Glide Through This One...

- An air-track glider of mass 0.100 kg is attached to a spring with force constant 20.0 N/m (see Figure). Initially the spring is unstretched and the glider is moving at 1.50 m/s to the right. Find the final position that the glider reaches to the right (a) if the air track is turned on, so that there is no friction, and (b) if the air is turned off, so that there is kinetic friction with coefficient $\mu_k = 0.47$

Figure



Extension Questions

- (c) How large would the coefficient of static friction have to be to keep the glider from springing back to the left? (d) If the coefficient of static friction between the glider and the track is $\mu_s = 0.60$, what is the maximum initial speed that the glider can be given and still remain at rest after it stops

Solitaire

- You throw a 0.145-kg baseball straight up, giving it an initial velocity of magnitude 20.0 m/s.
- (a) Find how high it goes, ignoring air resistance

It's Electric

- You slide from rest down a quarter-circle ramp with radius $R = 3.00$ m. You have a mass of 65 kg. You reach the bottom of the ramp with a speed of 6 m/s. (a) Find the amount of work friction performed on you. (b) Find the normal force that acts on you at the bottom of the curve

What! Projectile Motion!

- A 0.150-kg block of ice is placed against a horizontal, compressed spring mounted on a horizontal tabletop that is 1.20 m above the floor. The spring has force constant 1900 N/m and is initially compressed 0.045 m. The mass of the spring is negligible. The spring is released, and the block slides along the table, goes off the edge, and travels to the floor. If there is negligible friction between the block of ice and the tabletop, what is the speed of the block of ice when it reaches the floor?