Solutions to Chapter 2 Exercises

- 1. The tendency of a rolling ball is to continue rolling—in the absence of a force. The fact that it slows down is due to the force of friction.
- 3. He discredited Aristotle's idea that the rate at which bodies fall is proportional to their weight.
- 6. Nothing keeps them moving. The Sun's force deflects their paths but is not needed to keep them moving.
- 8. Your friend should learn that inertia is not some kind of force that keeps things like the Earth moving, but is the name given to the property of things to keep on doing what they are doing in the absence of a force. So your friend should say that *nothing* is necessary to keep the Earth moving. Interestingly, the Sun keeps it from following the straight-line path it would take if no forces acted, but it doesn't keep it moving. Nothing does. That's the concept of inertia.
- 24. At the top of its path (and everywhere else along its path) the force of gravity acts to change the ball's motion. Even though it momentarily stops at the top, the net force on the ball is not zero and it therefore is not in equilibrium.
- 25. If the puck moves in a straight line with unchanging speed, the forces of friction are negligible. Then the net force is practically zero, and the puck can be considered to be in dynamic equilibrium.
- 26. From the equilibrium rule, $\Sigma F = 0$, the upward forces are 400 N, and the downward forces are 250 N + the weight of the staging. So the staging must weigh 150 N.
- 34. Two significant forces act on the book: the force due to gravity and the support force (normal force) of the table.