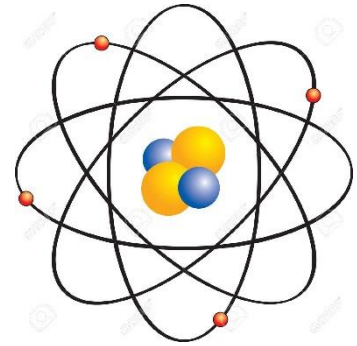
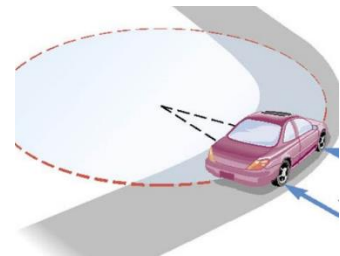


Circular Motion - Self Test

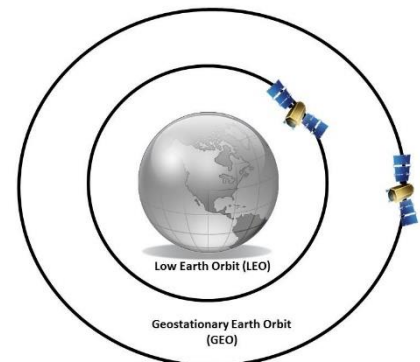
1. An electron ($m = 9.11 \times 10^{-31}$ kg) moves in a circle whose radius is 2.00×10^{-2} m. If the force acting on the electron is 4.60×10^{-14} N, what is its speed?
(3.18×10^7 m/s)



2. 6) A 925 kg car rounds an unbanked curve at a speed of 25 m/s. If the radius of the curve is 72 m, what is the minimum coefficient of friction between the car and the road required so that the car does not skid? (0.89)



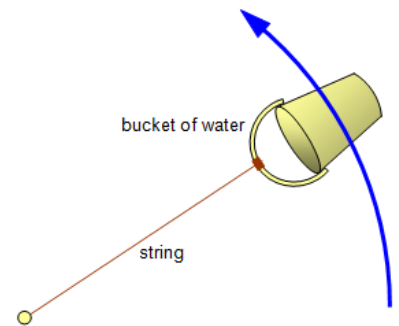
3. A 2.7×10^3 kg satellite orbits the Earth at a distance of 1.8×10^7 m from the Earth's centre at a speed of 4.7×10^3 m/s. What force does the Earth exert on the satellite? (3.3×10^3 N)



4. You are riding your bike on a track that forms a vertical circular loop. If the diameter of the loop is 10.0 m, what is the minimum speed required for you to make it around the loop? (7.00 m/s)



5. You are swinging a bucket of water in a vertical circle. Assuming that the radius of the rotation of the water is 0.95 m, what is the minimum velocity of the bucket at the top of its swing if the water is not to spill? Hint: imagine the water is a solid chunk sitting in the bucket (3.1 m/s)



6. A student has a weight of 655 N. While riding a roller coaster they *seem* to weigh 1.96×10^3 N at the bottom of a dip that has a radius of 18.0 m. What is the speed of the roller coaster at this point? (18.7 m/s)

7. A string requires 186 N of force to break. A 1.50 kg mass is tied to the string and whirled in a vertical circle with a radius of 1.90 m. What is the maximum speed that this mass can be whirled at without breaking the string? (14.7 m/s)
8. A 2.2 kg object is whirled in a vertical circle whose radius is 1.0 m. If the time of one revolution is 0.97 s, what is the tension in the string (assume uniform speed)
- a. a) at the top? (71 N)
 - b. b) at the bottom? (114 N)
9. A 915 kg car goes over a hill of circular arc. If the radius of the curve is 43 m, how fast can the car travel without leaving the road at the top of the arc? (21 m/s)

20. What is the maximum speed for a car rounding a 125 m curve on a highway under very icy (no friction) conditions if the banking angle is 20.0° . (**21.1 m/s**)

*(trick, you can do it, draw a good FBD. Start by writing down what your think is **TRUE**)*