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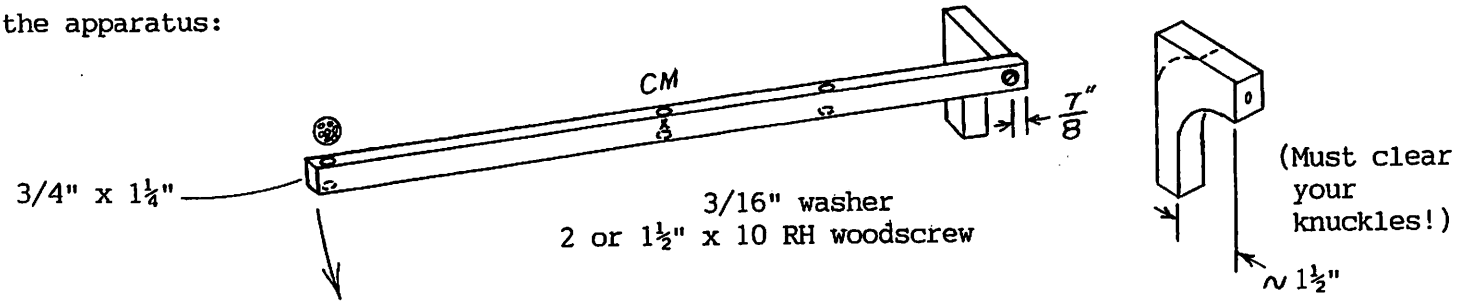
The "g" Stick - is one device that can, with natural "free fall", show values of gravitational acceleration less than, equal to, or greater than 9.8 m/sec^2.

This demonstration is usually presented using fingers, a meter stick, and pennies. I have found that this is hard on the meter stick (always hits the floor) and that the pennies are not very visible. Instead, I like to use a special pine stick about a meter or 40" long with a golf ball. The stick has ½" dia. indentations on the top and bottom at specific locations for the golf ball and a "pivot" with a handle at one end ("fixed").

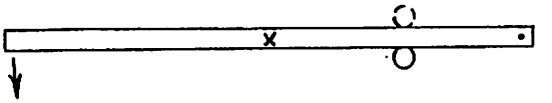
the apparatus:



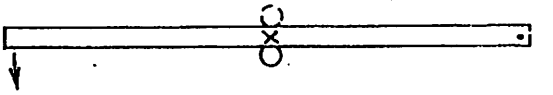
Procedure: You can start the demo anywhere you want according to your teaching objective; students can easily perform this demo, also. Close observation is essential!

the three cases:

(a) less than g - probably the most obvious since the ball is closest to the fixed (pivot) end. At this point on the stick, the ball is in free fall (g) while the stick lags behind. Place the ball below and drop and then above and drop.



(b) equal to g - its the center of mass of an object that falls at g , so at this point on the stick,the stick and ball fall at the same rate. Place the ball below and drop and then above and drop.



(c) greater than g - now the end of the stick sweeps through a greater distance than the center of mass in the same time; thus, it must be going faster and is accelerating more than g . At this point on the stick, the ball is in free fall (g) but lags behind the stick. Place the ball below and drop and then above and drop.