



# The Great Coin Drop-Off

## What you need:

ONE WOODEN OR PLASTIC RULER  
(WITH AT LEAST ONE HOLE)  
CARDBOARD BOX  
PUSHPIN OR THUMB TACK  
TWO METAL WASHERS OR COINS OF  
SIMILAR SIZE/MASS  
FLAT TABLE

## What to do:

PLACE THE CARDBOARD BOX AT THE EDGE OF A FLAT TABLE.  
PLACE THE RULER ON THE BOX AND ALLOW IT TO HANG OVER THE EDGE.  
PIN THE RULER THROUGH ITS HOLE TO THE BOX SO THAT IT MAY SPIN.  
SET "COIN A" ON THE OVERHANGING EDGE OF THE RULER, AND "COIN B"  
ON TOP OF THE BOX RIGHT NEXT TO THE RULER.  
FLICK THE HANGING END OF THE RULER QUICKLY AND FIRMLY WITH YOUR  
FINGER.  
OBSERVE WHAT EACH COIN DOES AND NOTE WHEN THEY LAND. THEY  
SHOULD BOTH REACH THE GROUND AT THE SAME TIME.

## What's going on?

THIS LAB SHOWS NEWTON'S FIRST LAW AND HOW GRAVITY PULLS ON ALL OBJECTS THE SAME WAY. WHEN THE RULER IS HIT, "COIN A" DROPS STRAIGHT DOWN BECAUSE IT LOSES ITS SUPPORT, AND ITS INERTIA KEEPS IT FROM MOVING SIDeways. COIN B IS PUSHED FORWARD BY THE RULER, SO IT MOVES SIDeways WHILE IT FALLS. EVEN THOUGH COIN B IS MOVING SIDeways, GRAVITY STILL PULLS IT DOWN JUST LIKE COIN A. SINCE BOTH COINS START AT THE SAME HEIGHT AND GRAVITY ACTS THE SAME ON EACH, THEY HIT THE GROUND AT THE SAME TIME. THIS SHOWS THAT MOVING SIDeways DOESN'T CHANGE HOW FAST AN OBJECT FALLS.

