

# Vertical Acceleration Demonstrator

P3-3520



## KIT CONTENTS:

Launcher apparatus  
Two steel balls

## ALSO REQUIRED:

Ring stand and right-angle clamp (or other support).

## ACCESSORIES/REPLACEMENT PARTS:

Spare balls, pair (P3-3521).  
Bullseye Level (P6-2604).  
Right Angle Clamp (66-8290)  
Ring Stand, 20" (66-4220).

## INSTRUCTIONS:

1. Mount the apparatus at least 1.5m above the floor, so that both balls will land on the floor. Use a level to make sure the launched ball will be launched horizontally.
2. Pull the spring and latch the lever in one of the notches. The different spring settings will send the projected ball out at different speeds.
3. Place one ball on the platform, as close as possible to the spring plunger.

4. Place the other ball on the post. Rather than push it all the way in, let it balance near the end of the post.
5. Ask students to predict which ball will land first.
6. Release the spring as rapidly as possible and listen for the balls hitting the floor. Do you hear one simultaneous “click” or two distinct and separate “clicks”?
7. Repeat the demonstration, asking students to close their eyes and just listen.

## WHAT'S GOING ON?

First, think about why objects fall. They fall because gravity forces them down. Gravity only acts straight down, and will only affect downward motion. Since the two balls are released from the same height and fall the same distance, they cover that distance in the same time. The fact that one of them is also moving horizontally makes no difference in its travel time.

## RELATED PRODUCTS:

**Air Powered Projectile** (P4-2200). Use equations to accurately predict the motion of this “rocket.” It can go up to 100 meters!

**Marble Projectile Ramp** (P2-8490). Designed to work with a photogate so students can measure the velocity of a horizontal projectile and predict its range.

