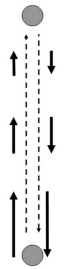
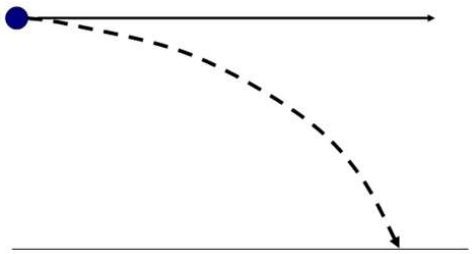
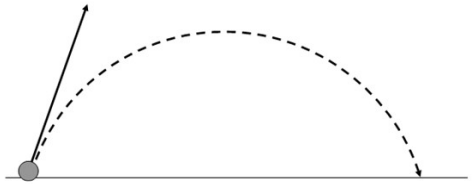
Projectile Motion Summary

	Vertical Projectile	Horizontal Projectile	Parabolic Projectile
Picture			
Vertical Motion	Free fall in the vertical direction since gravity is pulling in the vertical direction. Acts like an object thrown upward: motion in the vertical direction starts moving upward, slows down, comes to a stop at the maximum height, and speeds up as it falls back toward the Earth.	Free fall in the vertical direction since gravity is pulling in the vertical direction. Acts like an object dropped from rest: motion in the vertical direction starts at rest and speeds up as it falls downward toward the Earth.	Free fall in the vertical direction since gravity is pulling in the vertical direction. Acts like an object thrown upward: motion in the vertical direction starts moving upward, slows down, comes to a stop at the maximum height, and speeds up as it falls back toward the Earth.
Horizontal Motion	No horizontal velocity so no horizontal motion.	Constant velocity in the horizontal direction since no horizontal forces.	Constant velocity in the horizontal direction since no horizontal forces.
Time of Flight	Depends on initial velocity. More initial velocity = more time	Depends on height launched from *only*. Does NOT depend on initial velocity. Greater launch height = more time	Depends on the launch angle and the initial velocity. Greater launch angle = more time More initial velocity = more time
Range	Zero range since no horizontal motion.	Depends on initial velocity and launch height. More initial velocity = greater range Greater launch height = greater range	Depends on initial velocity and launch angle. More initial velocity = greater range Launch angle of 45° has maximum range. Above or below that angle, range decreases. Launch angles that are equal amounts off from 45° (for example, 55° and 35°) will have equal ranges.
Maximum Upward Velocity	Occurs at launch.	Never has an upward velocity.	Occurs at launch.
Maximum Downward Velocity	Occurs when hits the ground.	Occurs when hits the ground.	Occurs when hits the ground.
Maximum Height Reached	Depends on initial velocity. More initial velocity = greater max height	Depends on the launch height. Max height = launch height	Depends on initial velocity and launch angle. More initial velocity = greater max height Greater launch angle = greater max height