

## Investigating Projectile Motion

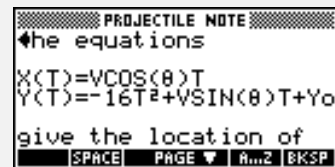
For the Teacher

### Objectives:

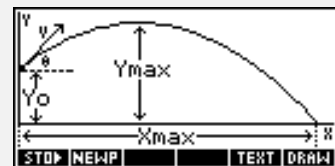
Using the **PROJECTILE** applet, the student will investigate the kinematics equations that govern the motion of an object which is fired at an angle with a given velocity.

### Functionality:

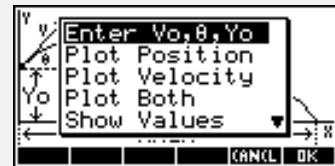
When the student selects **START** the **PROJECTILE NOTE** will be displayed.



The student should then view the **SKETCH** for a visual explanation.

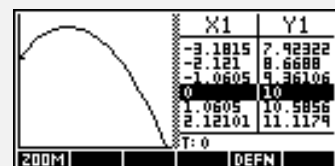


Pressing **VIEWS** and then **ENTER  $V_0$ ,  $\theta$ ,  $Y_0$**  allows the student to enter the initial velocity, the initial height, and the angle at which the projectile is fired.

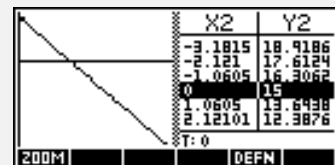


*The following example is based on a projectile fired at  $\theta=30^\circ$ , with  $V_0=30$  m/s, and  $Y_0=10$  m.*

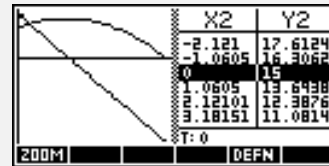
**Plot Position** will display the path of the project in a split-view window with a corresponding data table. Using the right and left arrow keys, the student may trace along the path and the table will update the position and the time.



**Plot Velocity** will display a graph of the vertical velocity versus the horizontal position along with the corresponding data table.



**Plot Both** will display both graphs along with the corresponding data table. The up and down arrows make the cursor hop from one curve to the other. The table will update to correspond to the current curve.



	X2	Y2
	-2.121	17.6124
	-1.0605	16.3062
	0	15
	1.0605	13.6438
	2.12101	12.3876
	3.18151	11.0814
	T: 0	

ZOOM DEFN

**Show Values** displays the initial conditions and the maximum time, horizontal and vertical distances traveled by the projectile.

```

Vo=30
θ=30
Yo=10
Ymax=13.515625
at T=.46875
Tmax=1.38784007312
Xmax=36.0571427913
  
```

Ideas can be applied to:

Precalculus, Calculus, Physics

Programs associated with this applet:

.PR.SV, .P.PV, .P.PO, .P.VE, .P.BO, .P.VA, .P.S