

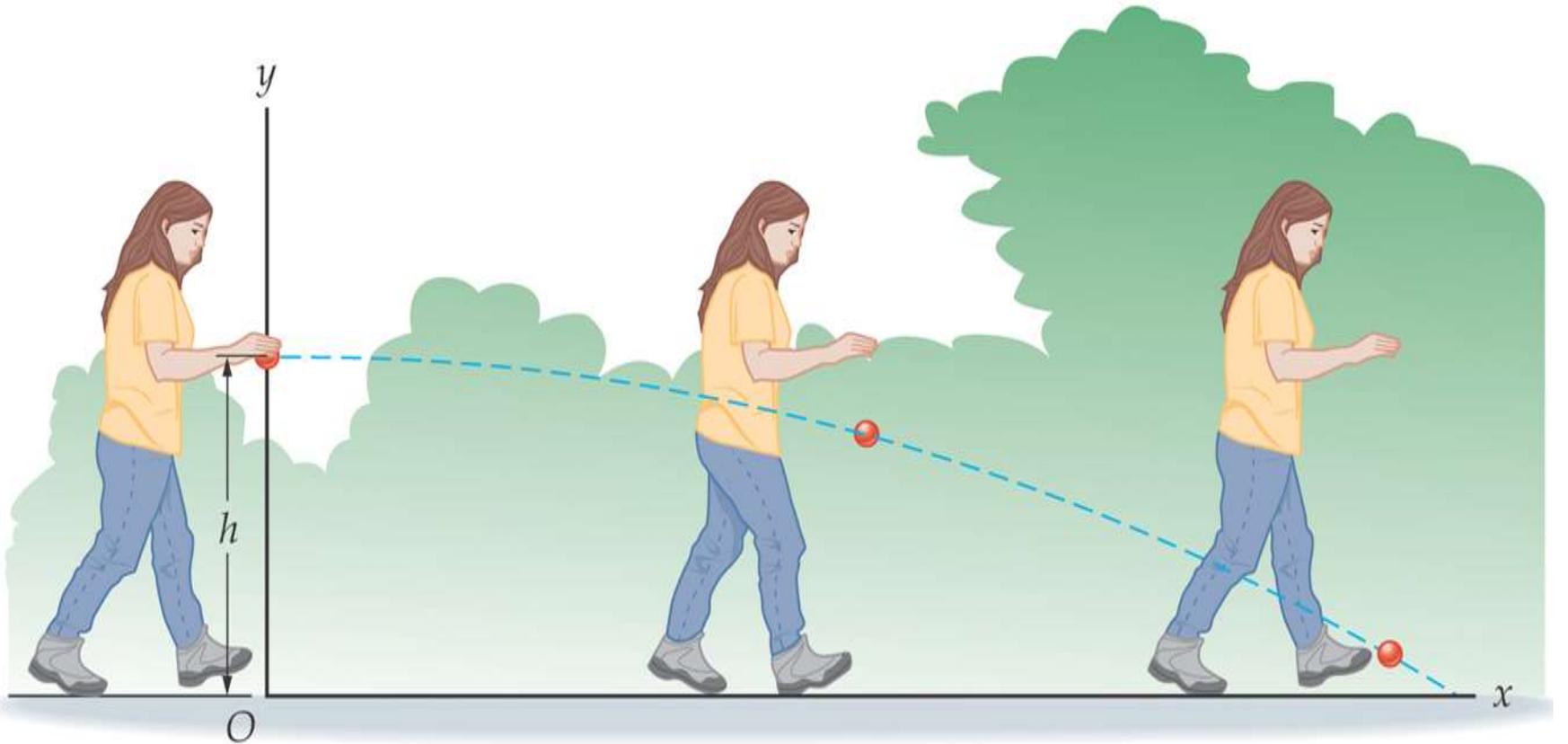
Projectile Motion

By

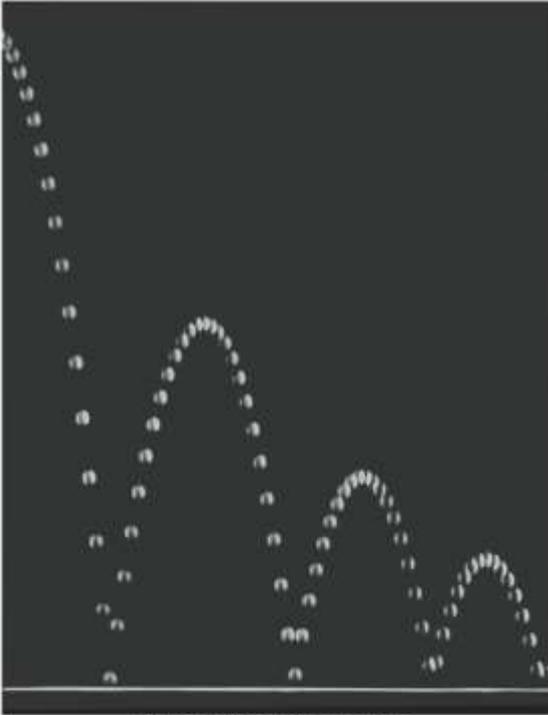
Memoona Naeem

BS Chemistry

Projectile Motion



Projectile Motion

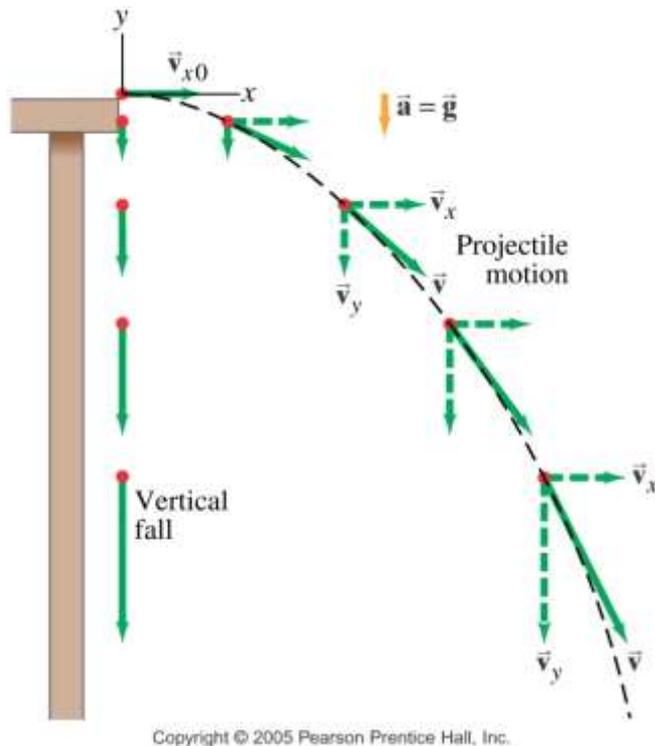


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A projectile is any object which simultaneously moves in two dimensions under the influence of gravity.

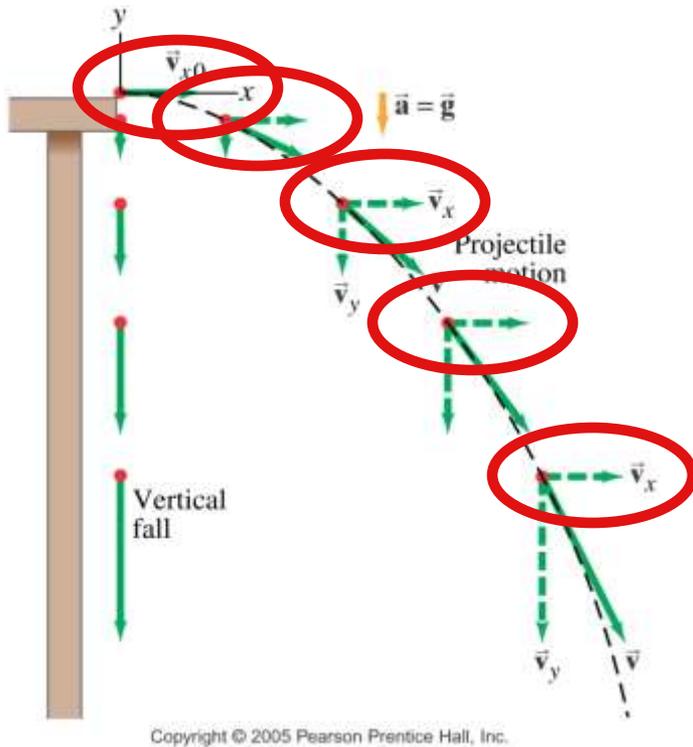
The path of the projectile is referred to as its trajectory and the shape of the path is parabolic.

Projectile Motion



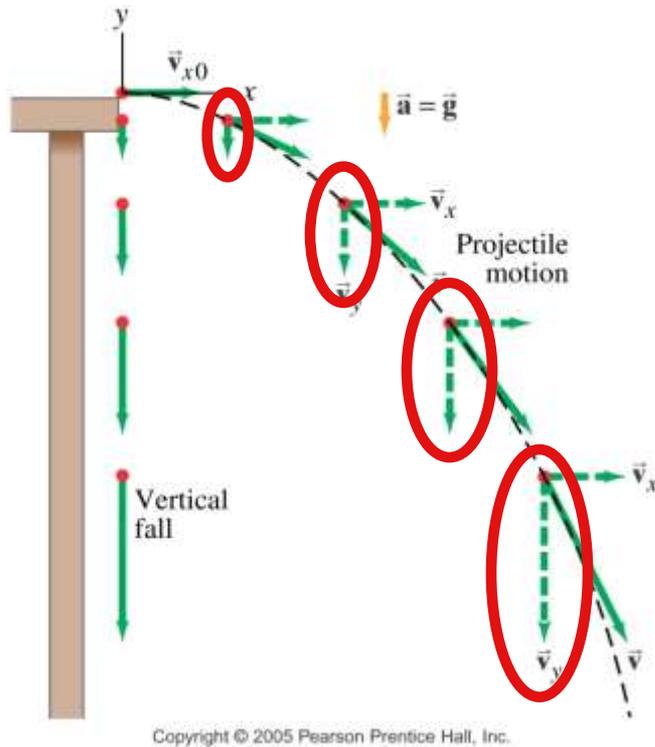
The motion of a projectile is a combination of constant velocity in the horizontal direction and constant acceleration in the vertical direction

Projectile Motion



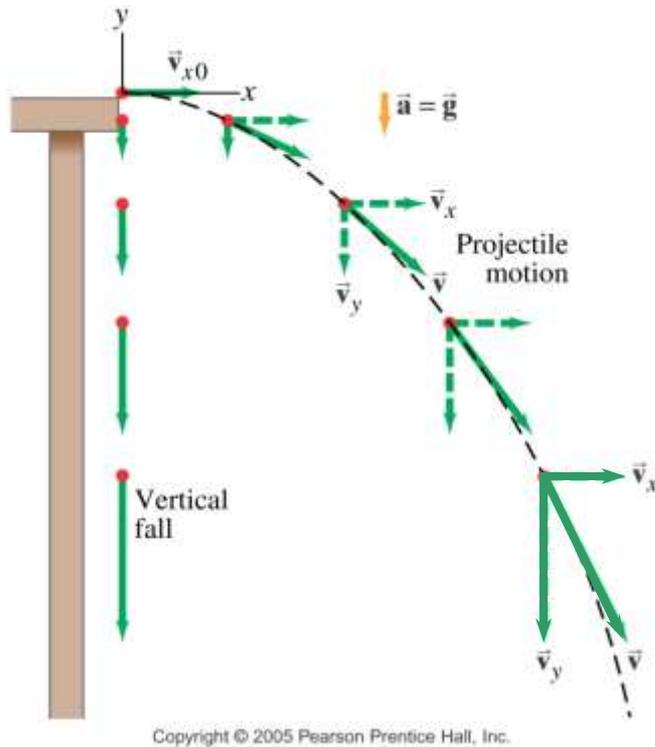
Notice the horizontal velocity vectors remain constant

Projectile Motion



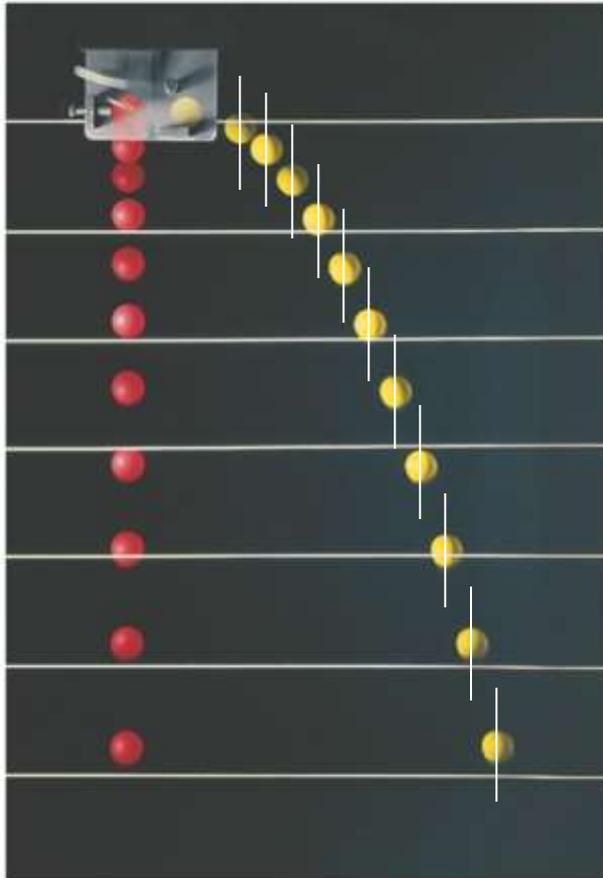
The vertical velocity vectors increase as a result of gravity

Projectile Motion



The velocity (including direction) at any given moment is found by adding the horizontal and vertical components

Projectile Motion

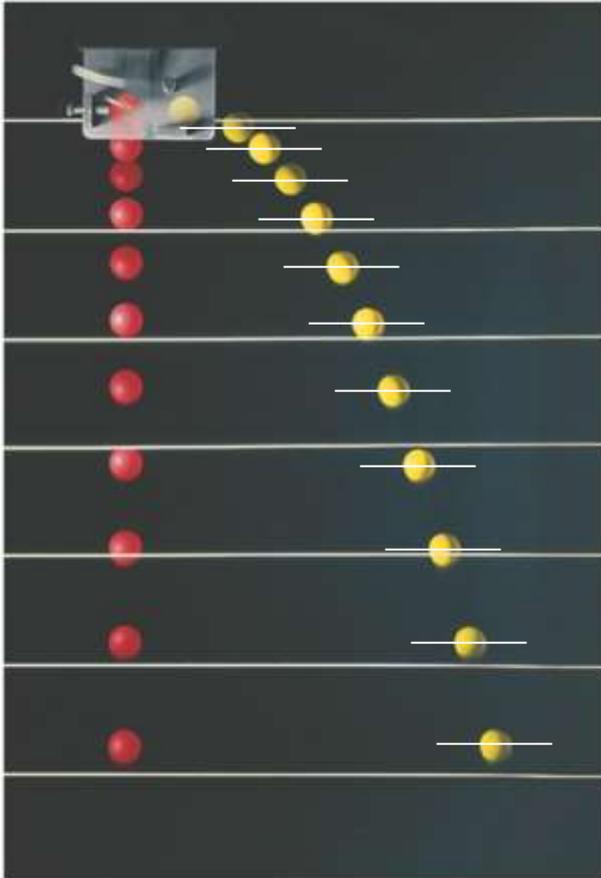


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The horizontal spacing between the images of the yellow ball remain constant.

The horizontal velocity of a projectile is constant!

Projectile Motion



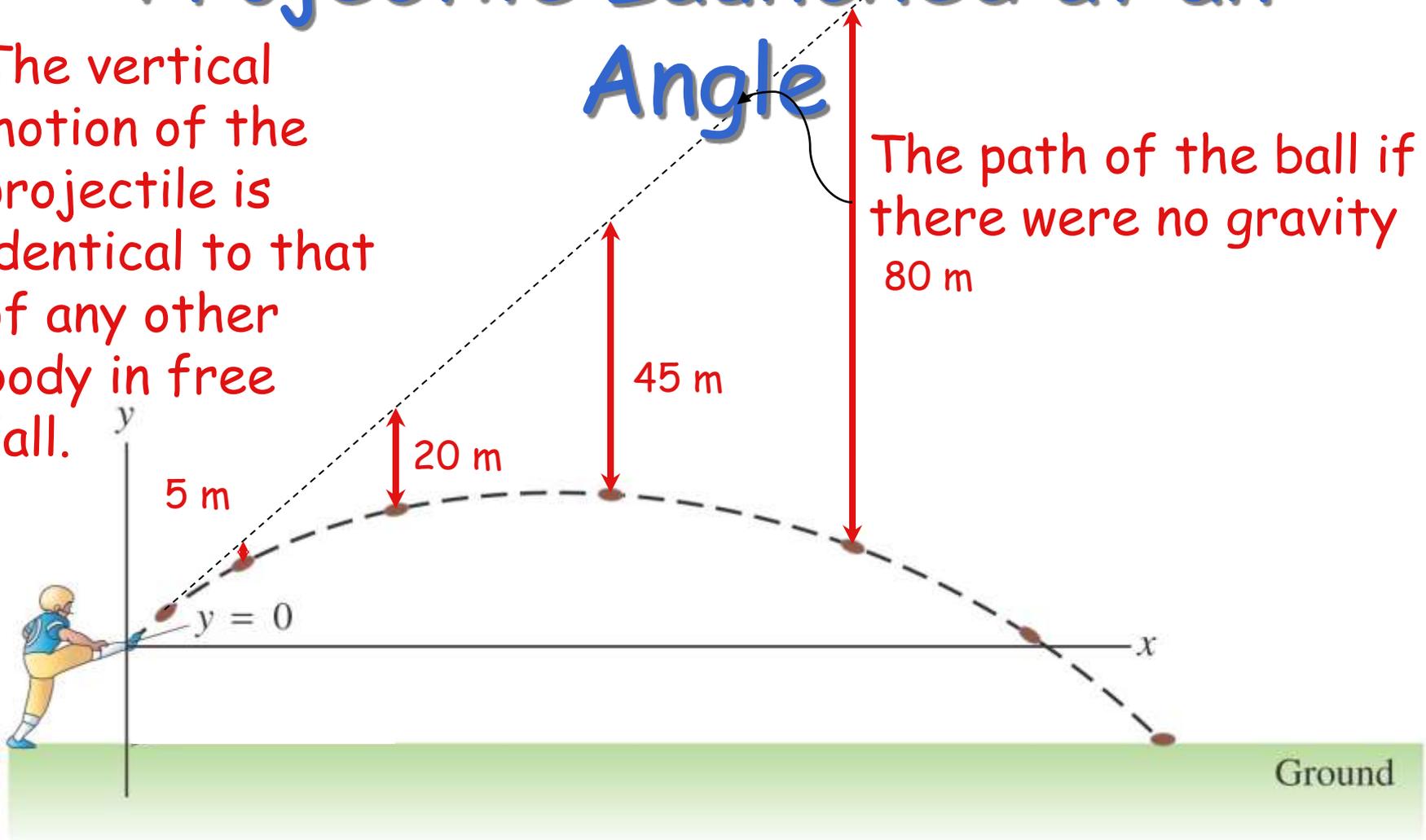
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The vertical spacing between the images of the yellow ball steadily increase.

The vertical velocity of a projectile increases due to gravity!

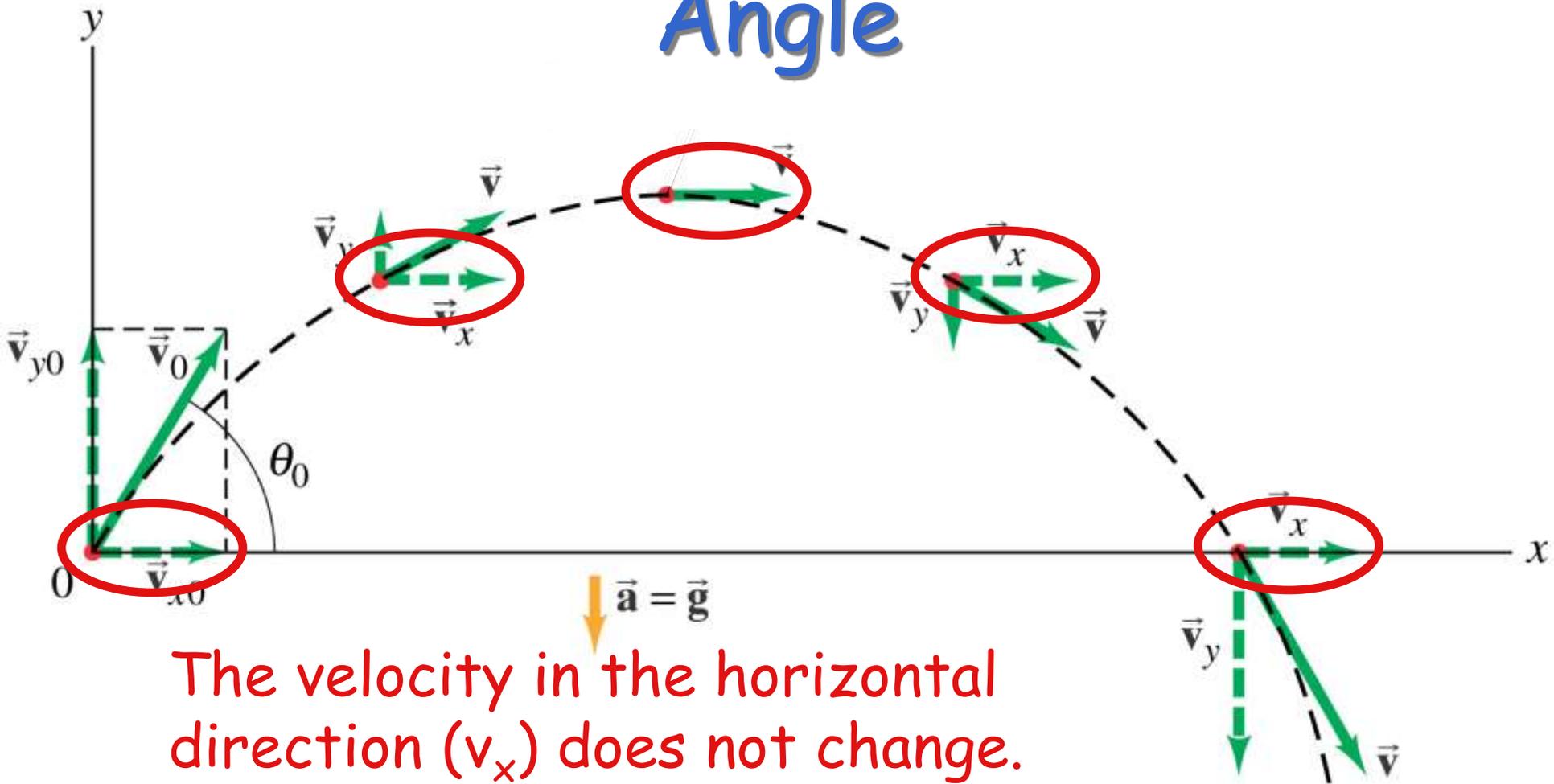
Projectile Launched at an Angle

The vertical motion of the projectile is identical to that of any other body in free fall.



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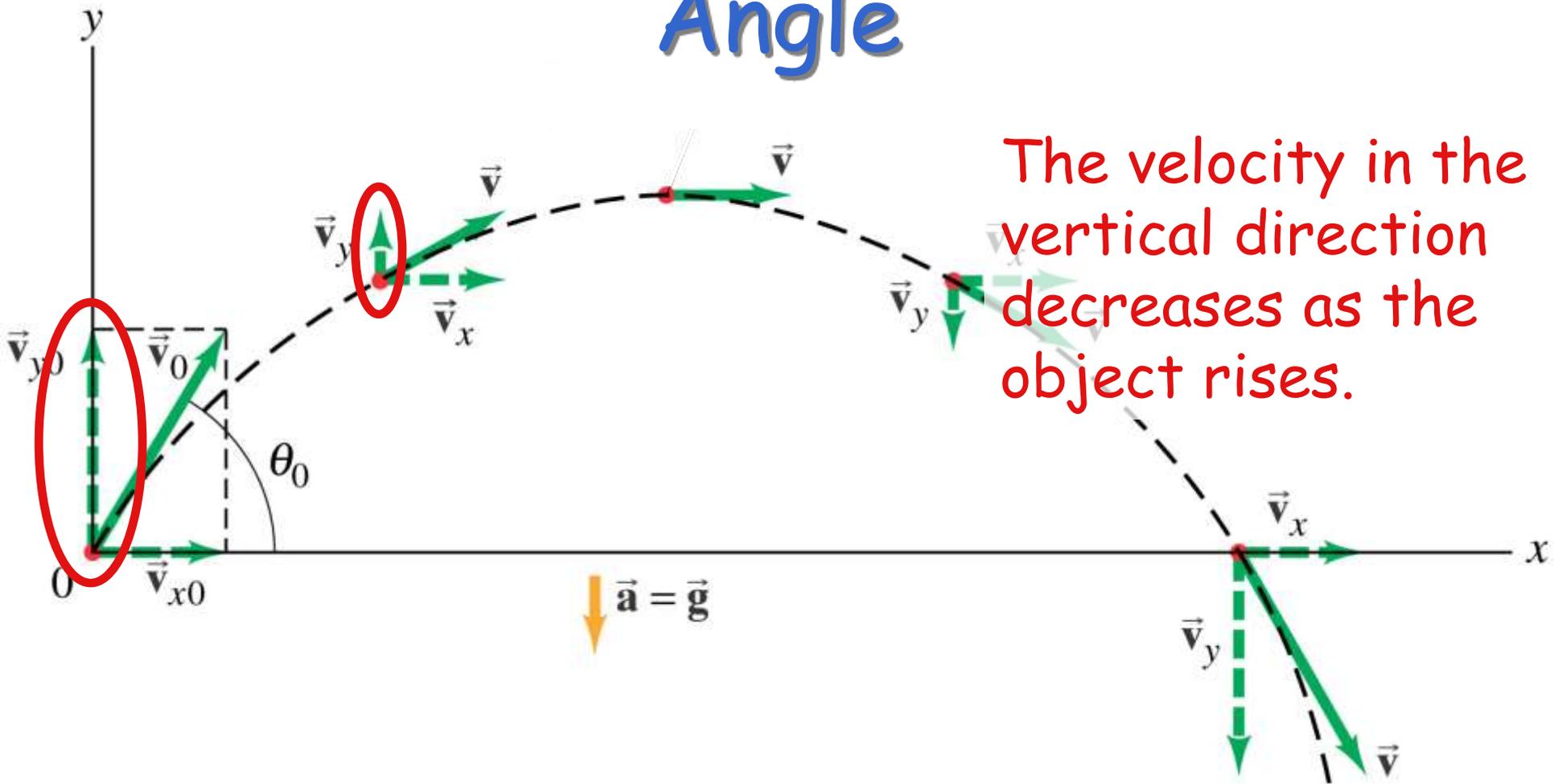
Projectile Launched at an Angle



The velocity in the horizontal direction (v_x) does not change.

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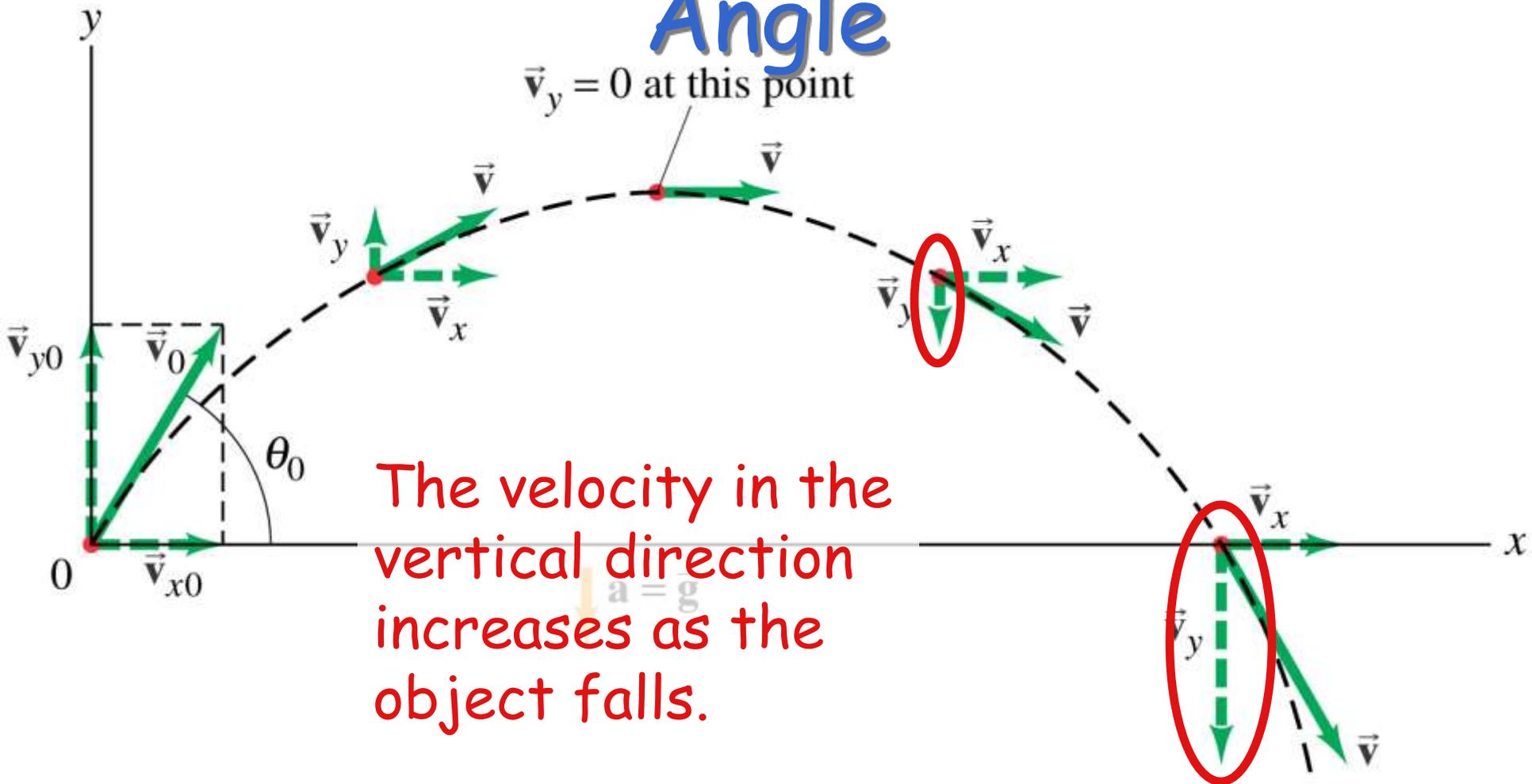
Projectile Launched at an Angle



The velocity in the vertical direction decreases as the object rises.

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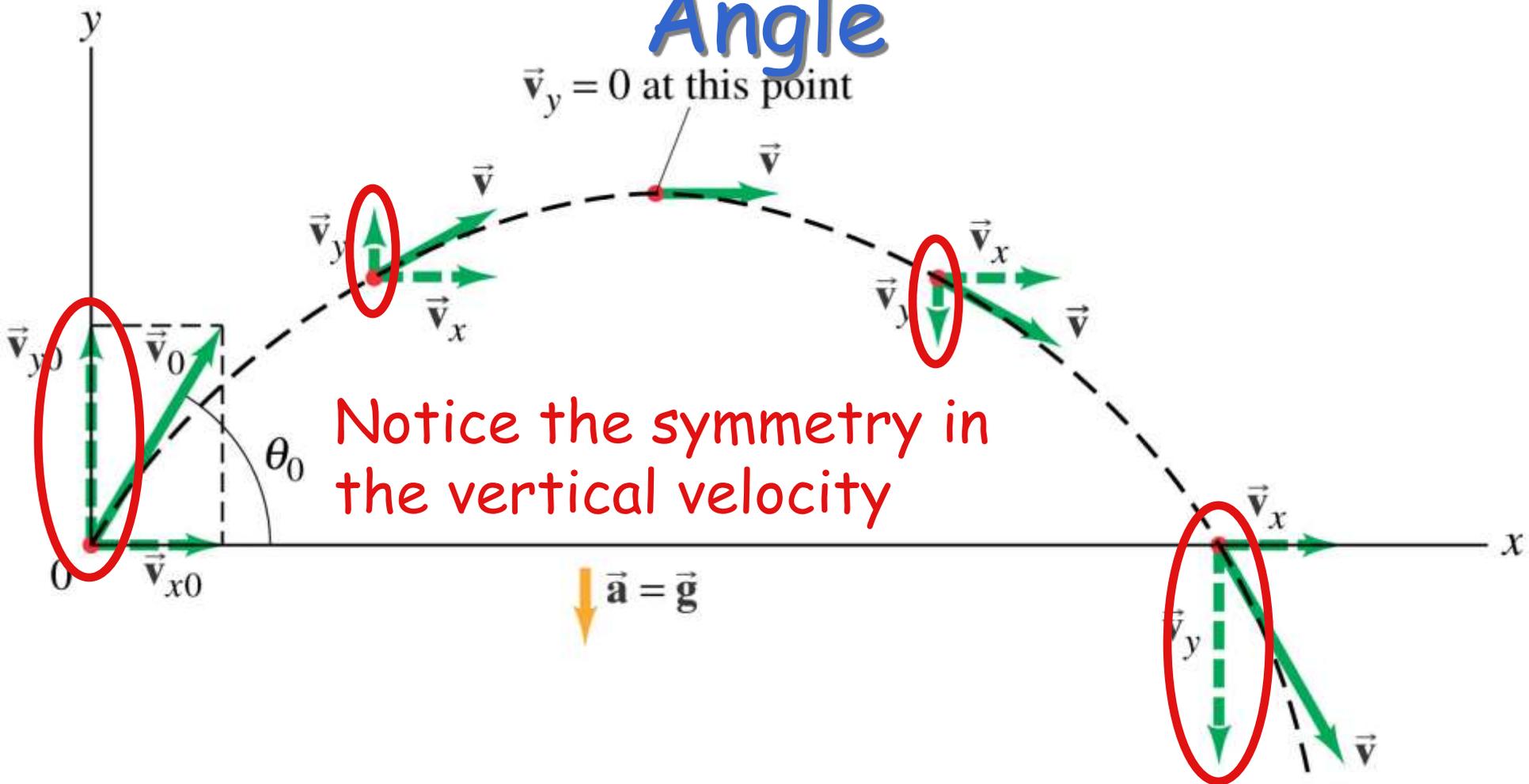
Projectile Launched at an Angle



The velocity in the vertical direction increases as the object falls.

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Projectile Launched at an Angle

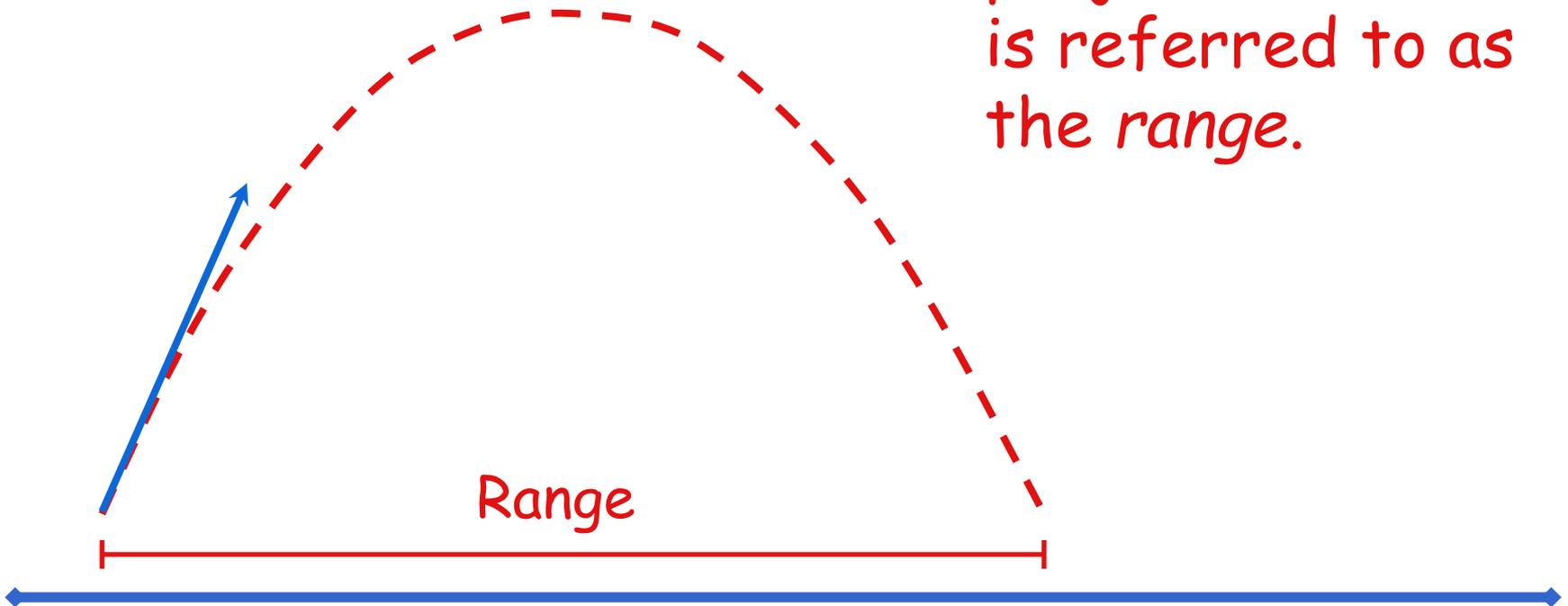


Notice the symmetry in the vertical velocity

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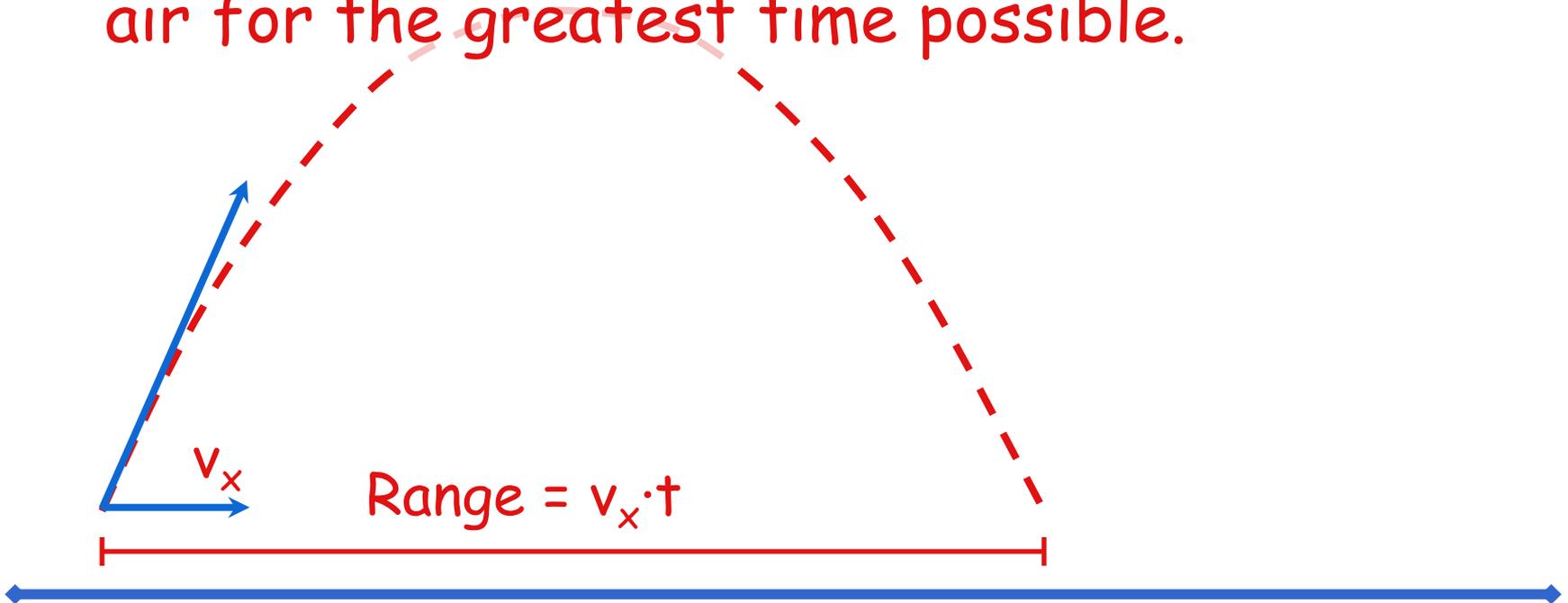
Range of a Projectile

The horizontal distance the projectile covers is referred to as the *range*.



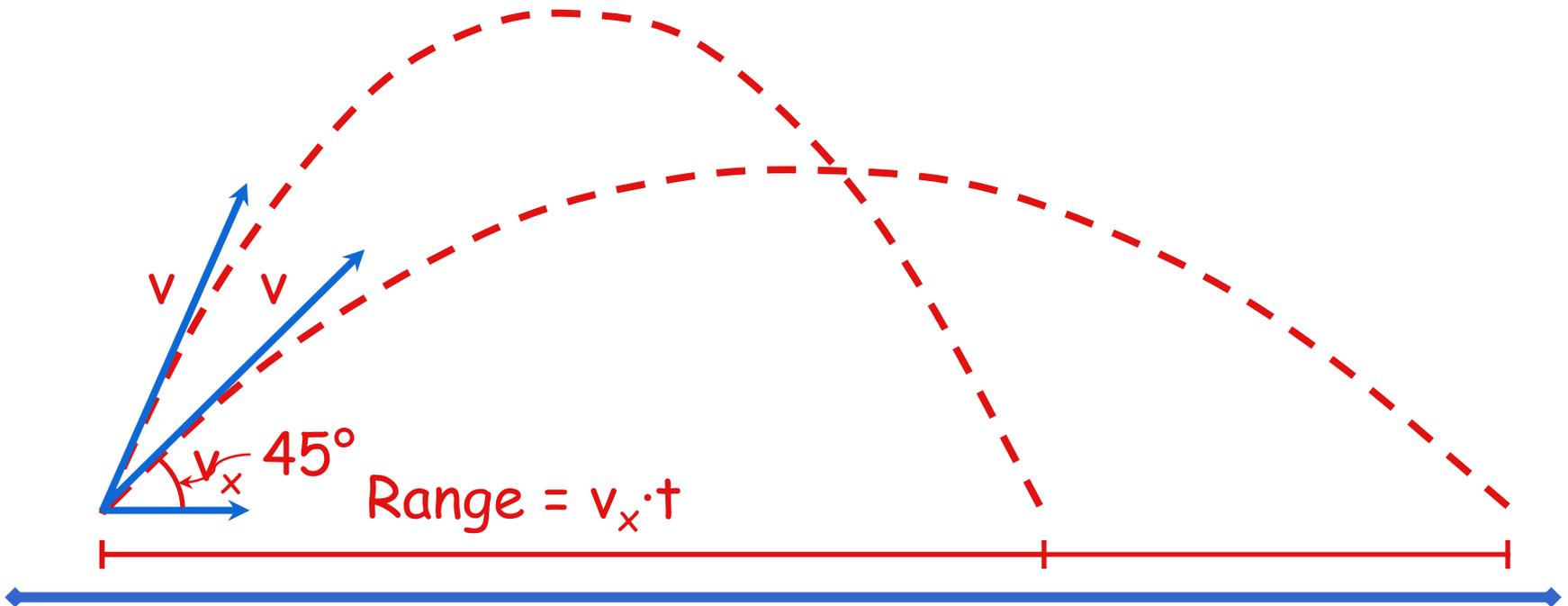
Range of a Projectile

In order to maximize the range, the projectile should have the greatest horizontal velocity and it should be in the air for the greatest time possible.

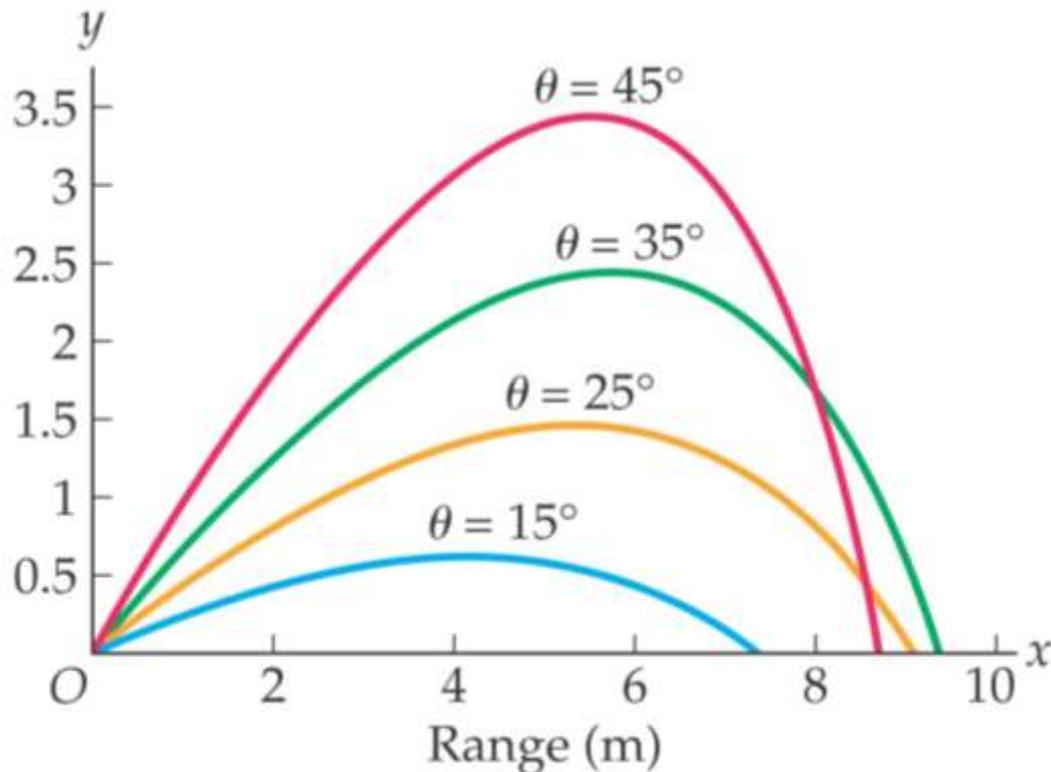


Range of a Projectile

The greatest range is produced when the product of v_x and t is a maximum.



Range of a Projectile



Air resistance reduces the height, range, and time in the air for a projectile launched at any angle.

Thank You