



Warm up

- All objects fall at the same...
 - Speed or acceleration
- Give three examples of projectiles.
- What makes something a projectile?



2D Motion

- In 2D motion the directions are **independent** of each other.
- Otherwise our equations of motion can keep being used.
- The directions are linked by **time**

Finding Time in the air

● To find how long something is in the air we have to use the y direction

- a_g always = 10 m/s^2
- If the projectile is moving *horizontally* then $v_i = 0$

$$t = \sqrt{(2D_y / a_y)}$$



Example

- A marble rolls off of a 2 m tall table at 4 m/s. How long does it take to reach the ground?



Practice

- A marble rolls off of an 8 m tall building at 9 m/s. How long does it take to reach the ground?



Practice

- A rock rolls off of a 20 m tall building at 1 m/s. How long does it take to reach the ground?

Worksheet





Range

- The distance a projectile goes in the air is called the **range**
- The range can be found using only the velocity in the x direction and the time in the air
- $D = v_{ix} * t$



Example

- A marble rolls off of a 2 m tall table at 4 m/s. Far does it go in the air?



Practice

- A marble rolls off of an 8 m tall building at 9 m/s. How far does it go in the air?



Practice

- A rock rolls off of a 20 m tall building at 1 m/s. How far does it go in the air?



Practice

- A rock rolls off of a 49 m tall building at 3 m/s. How far does it go in the air?