$S = \frac{1}{2} g t^2$ $v = g t$ $g_{earth} = 9.81\ m/s^2$ $g_{moon} = 1.62\ m/s^2$

Motion of a falling object (Earth & Moon) – Level 2

1. As stone is dropped from rest on Earth. Calculate the **distance** it falls in **4 seconds**.

$S = ½\ g\ t^2$

$S = ½ \times 9.81 \times 4^2 = 78.48\ m$

2. A ball is dropped on the Moon and falls for 5 seconds.

   a. What its **final velocity** (v)?

$v = g\ t$

$v = 1.62 \times 5 = 8.1\ m/s$

   b. State **ONE** reason why this **velocity** is smaller than on Earth.

Because on the Moon the gravitational pull is 6 times smaller than on Earth.

3. An object falls freely on Earth and reaches a **velocity** of 19.6 m/s.

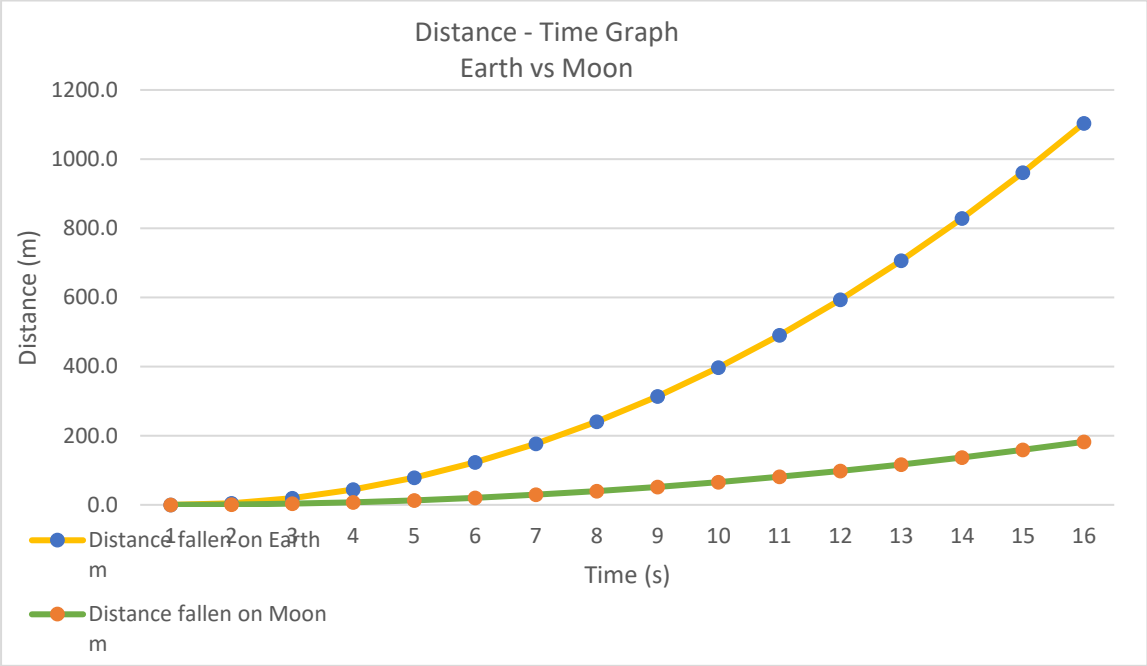
Calculate the **time** taken

$v = g\ t$

$19.6 = 9.81 \times t$

$t = 19.6 / 9.81 = 2\ s$

4. The **Distance** – **Time** Graph of a falling object on **Earth** and on the **Moon** are shown.



a. Which **graph** is steeper? Earth

b. What does this tell you about **gravity**?

The gravity on Earth is much larger than on the Moon.

5. Explain why the **Distance** – **Time** graph of a falling object is curved rather than straight.

Because the object moves with the acceleration (curved line). If it will move with the constant velocity, the line will be straight.