

2. The relationship between displacement for uniformly accelerated motion is $d = v_0 t + (1/2) a t^2$. Here the initial velocity, v_0 , is given as zero and the acceleration is that of gravity, so we have

$$d = (0) t + (1/2) a t^2$$

$$d = (1/2) (-9.8 \text{ m/s}^2) (2 \text{ s})^2$$

$$d = -19.6 \text{ m}$$

The negative sign tells us that the displacement is downward, and the rock is 19.6 m below the starting point at a time 2 seconds after it was released.