

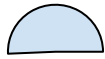
Launch Speeds: Kinetic to Potential Energy

$$E_K = \frac{1}{2}mv^2$$



$$E_P = mgh$$

1. A toy popper has an initial vertical speed of 5 ms^{-1} . It has a mass of 0.005 kg . Determine the height it reached.



2. A firework of mass 0.20 kg is launched with a speed of 20 ms^{-1} . Find the height it reached.



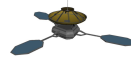
3. A flare of mass 0.5 kg is launched vertically with a speed of 30 ms^{-1} . Determine the height it reached.



4. A missile of mass 20 kg is launched into the air with speed 40 ms^{-1} . Determine the height it reached.



5. A small probe is launched on the moon with a speed of 12 ms^{-1} . It has a mass of 20 kg . How high will it go above the moon's surface. [$g = 1.7 \text{ Nkg}^{-1}$]



6. Find the height reached by a firework of mass 2 kg which is launched with a vertical speed of 30 ms^{-1}



7. Find the launch speed of a flare of mass 2 kg that reached a height of 20 m



8. Find the launch speed of a rocket of mass 12 kg which reached a height of 60 m above the Earth.



9. Determine the launch speed of a $100,000 \text{ kg}$ space rocket if it has to reach a height of $20,000 \text{ m}$

