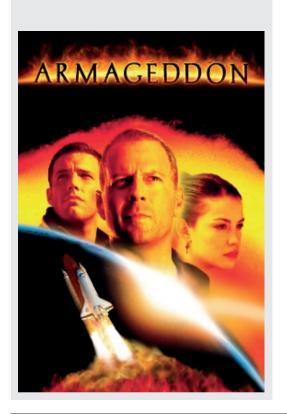
§ 18.1 ARMAGEDDON TIME?

In the 1998 film Armageddon, Bruce Willis and his team of oil drillers are asked to save the world from a massive asteroid impact by going to the asteroid, drilling down into the asteroid, and placing a nuclear weapon to blow it into two fragments that will miss the Farth.



In this lesson you will learn about asteroids and meteorites, calculate the kinetic energy of a previous Earth impact, and extend these ideas to establishing whether you think the premise of the movie is realistic or not.

ACTIVITY 1: How big was the barringer impactor?

Kinetic energy = 2500kT TNT (1kT TNT = $4.3 \times 10^{12} \text{ J}$)

Entry velocity = 12.8 km/s

Density of iron meteorite = 7g/cm³ = 7000kg/m³



 $KE = 2500 \times 4.3 \times 10^{12} = 1.075 \times 10^{16} J$

Find mass: $KE = 1/2mv^2$

so m = $\frac{2 \times 1.075 \times 10^{16}}{(12.8 \times 10^{3})^{2}}$

 $m = 1.3 \times 10^8 \text{ kg}$

p = m/V so V = m/p

 $V = 1.3 \times 10^8 / 7000 = 1.86 \times 10^4 m_3$

Rearrange volume of a sphere equation and sub in:

| Impactor diameter = 32.8m