# First prep

A.C. Norman
ACN.Norman@radley.org.uk

## Warm-up problems

1. Find out the names of the seven base units used in the SI system of units.
2. Find out the definitions of the two base units which interest you the most.
3. Find out the prefixes used in the SI system of units e.g. m, milli-, $10^{-3}$. (You might want to lay these out in a table)

## Regular problems

4. How long does it take light to travel across a room of 6.0 m wide if the speed of light is $3.0 \times 10^8$ m s$^{-1}$
5. Find the volume of a small rectangular chip of dimension $0.50 \times 1.00 \times 0.25$ mm. Give answers in mm$^3$, cm$^3$ and m$^3$.
6. The radius of the Earth is approximately $6.4 \times 10^6$ m. Find its surface area and its volume.
7. A fine wire has a diameter of 0.14 mm. Find its area of cross section in mm$^2$ and in m$^2$.
8. One light year is the distance travelled by light in one year. The speed of light is $3.0 \times 10^8$ m s$^{-1}$. If a star is 12 light years away, find the distance to it in metres.
9. The planet Venus is approximately 110 000 000 km from the Sun.
   (a) What is this distance in metres, written in standard form?
   (b) If its orbit were circular, how many metres would it travel to complete one orbit?
10. The planet Mars is approximately $2.3 \times 10^{11}$ m from the Sun. It takes about 690 days to travel once around the Sun. If its orbit were circular, find its average speed in m s$^{-1}$.