International System of Units (SI)

Basic SI units:

Meter	Second	Kilogram	Kelvin	Mole
m	s	kg	K	mol

$F = ma$

Force, Newton

$$1N = 1\frac{kg \cdot m}{s^2}$$

$W = Fd$

$E_{kin} = \frac{mv^2}{2}$

Work & Energy, Joule

$$1J = 1N \cdot m = 1\frac{kg \cdot m^2}{s^2}$$

$P = \frac{F}{A}$

Pressure, Pascal

$$1Pa = 1\frac{N}{m^2} = 1\frac{kg}{m \cdot s^2}$$

$Power = \frac{\Delta W}{\Delta t}$

Power, Watt

$$1W = 1\frac{J}{s} = 1\frac{kg \cdot m^2}{s^3}$$

Homework

Use dimensional analysis to find the speed of sound in air at room temperature. It may depend on the following parameters (pick three that look relevant):

- Universal gas constant: R=8.1 J/(mol K);
- Absolute temperature: T=300 K
- Molar mass or air: m=29 g/mol = 0.029 kg/mol
- Gravitational constant: $G \approx 6.7 \cdot 10^{-11}$ $m^3/(s^2 \cdot kg)$

Remember that Joule J= $kg \cdot m^2/s^2$; 'mol' is mole, and 'K' is degree Kelvin.