

## NASC103 Physical Science

### Units of energy:

- There are many – it's a bit confusing
  - **English:**
    - 1 ft lb (foot-pound) =  $1.29 \times 10^{-3}$  Btu
    - 1 cal (calorie) = 1/1000 Cal (Calorie) =  $3.97 \times 10^{-3}$  Btu
  - **Metric:**
    - 1 J (Joule) =  $2.78 \times 10^{-7}$  kWh
    - 1 eV (electron volt) =  $1.6 \times 10^{-19}$  J
    - 1 J =  $9.49 \times 10^{-4}$  Btu
- Units of **Power**?
  - 1 Hp (horsepower) = 746 W (Watt = J/s)

### Energy Equivalents:

- **Natural gas:** tcf (trillion cubic feet)
  - 1 tcf =  $9.98 \times 10^{11}$  Btu
- **Coal:** tons
  - 1 ton bituminous =  $25 \times 10^6$  Btu
- **Oil:** bbl (barrels = 42 U.S. gallons)
  - 1 bbl =  $5.8 \times 10^6$  Btu
- **Uranium:** tons of  $^{235}\text{U}$ 
  - 1 ton  $^{235}\text{U}$  =  $70 \times 10^{12}$  Btu

### Other Conversion Factors:

#### Speed

1 m/s = 3.28 m/s = 2.24 mi/hr  
1 km/hr = 0.621 mi/hr = 0.278 m/s

#### Mass

1 kg = 6.02 x 10<sup>26</sup> amu  
1 slug = 14.6 kg

#### Dimensions

1 m = 3.28 ft = 39.4 in  
1 mi = 1.61 km = 5280 ft  
1 in = 2.54 cm  
1 ly = 9.46 x 10<sup>15</sup> m  
1 m<sup>3</sup> = 1000 L = 35.3 ft<sup>3</sup> = 264 gal