Convert energy to "lost" mass using $E = mc^2$.

TNT

$$|\Delta m| = \frac{10 \text{ eV} \cdot (1.6 \times 10^{-19} \text{ J/eV})}{(3 \times 10^8 \text{ m/s})^2}$$

$$= 1.78 \times 10^{-35} \text{ kg}$$

U^{235}_{92} Fission

$$|\Delta m| = \frac{173 \times 10^6 \text{ eV} \cdot (1.6 \times 10^{-19} \text{ J/eV})}{(3 \times 10^8 \text{ m/s})^2}$$

$$= 3.08 \times 10^{-28} \text{ kg}$$

Now compute the fraction of the initial mass which was "lost".

TNT

$$\text{fraction lost} = \frac{\text{mass lost}}{\text{starting mass}}$$

$$= \frac{1.78 \times 10^{-35} \text{ kg}}{(227 \text{ nucleons}) \cdot (\frac{1.67 \times 10^{-27} \text{ kg}}{\text{nucleon}})}$$

$$= \frac{1}{21.3 \times 10^9}$$

U^{235}_{92} Fission

$$\text{fraction lost} = \frac{\text{mass lost}}{\text{starting mass}}$$

$$= \frac{3.08 \times 10^{-28} \text{ kg}}{(236 \text{ nucleons}) \cdot (\frac{1.67 \times 10^{-27} \text{ kg}}{\text{nucleon}})}$$

$$= \frac{1}{1281}$$

The fraction $\frac{1}{1281}$ is larger than the fraction $\frac{1}{21.3 \times 10^9}$ by a factor of

$$\frac{21.3 \times 10^9}{1281} = 16.6 \times 10^6$$

or 16.6 million, so that the energies of nuclear explosions are given in ktons of TNT.

1 metric ton = 1000 kg, so 1 kton = 1 million kg