Energy Efficiency Notes

Def : _____

_____

Reminder: Energy is never created or destroyed it is just changed.

Variables for formula:

Consumed energy	
Useful energy	
Lost energy	

Energy Efficiency= <u>useful energy</u>   x100

consumed energy   **Units:** are in J, kJ or kWh.

- Consumed energy =

- Useful energy =

Practice Questions

1. A hair dryer has 12 000 J of consumed energy, but only converts it to 7 500 J of useful energy. What is its percent efficiency?

2. A stove which is 77% efficient consumes 14 000 J of energy. How much useful energy was provided?

3. A lamp has an energy efficiency of 79%. What amount of energy must the lamp consume in order to provide 7 000 J of useful energy?

4. An elevator has an energy efficiency of 64%. What amount of energy must the elevator consume in order to provide 95 kWh of useful energy?

5. The table below shows the quantity of energy required to move an elastic-propelled race car in an isolated system.

Energy provided by the elastic	0.9 J
Energy consumed by the vehicle	0.2 J
Energy lost by the system (rolling resistance and air resistance)	0.7 J

What is the race car's energy efficiency?

6. A technician examines different electrical devices to determine the one that is the most energy efficient. While conducting a test, he notes that one of these devices consumes 720 000 J of energy and loses 230 000 J at the same time. What is the energy efficiency of this device?

A) 31.9%   B) 46.9%   C) 68.1%   D) 75.8%

7. When an incandescent light bulb is turned on, most of the electrical energy is transformed into thermal energy. A 40 W light bulb provides 120 J of luminous energy when it is turned on for 1 minute. What is the energy efficiency of the light bulb?

8. Your heating system is 40 percent energy efficient:
a) What amount of energy should it consume to transform 7200 kWh into useful thermal energy for heating the house during winter?

b) By changing the thermal insulation in your house, you could increase the energy efficiency of your heating system to 75 percent. The cost of replacing the insulation is $1700 and the cost of heating is 9 cents/kWh. How many years will it take to recover your investments?