Name: Class:

Chapter Review quarter 1 Total Marks: /10

Energy and Efficiency Worksheet

For the following devices state what type of Energy is used from this list: (5marks)

Chemical *Kinetic* *Heat (thermal)* *Sound* *Electrical* *Light*

Light bulb: 

Input Energy _____

Useful Energy _____ Waste Energy _____

Electric Drill: 

Input Energy _____

Useful Energy _____

Waste Energy_____ & _____

TV: 

Input Energy _____

Useful Energy _____ & _____

Waste Energy _____

Car engine: 

Input Energy _____

Useful Energy _____

Waste Energy _____ & _____

Bunsen burner: 

Input Energy _____

Useful Energy _____

Waste Energy_____ & _____

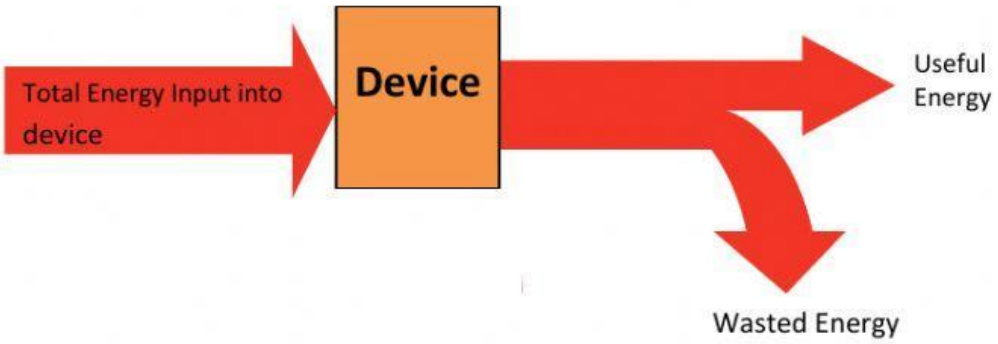
LIVEWORKSHEETS

A Sankey diagram represents the energy transfer through a device.
Knowing that energy **cannot be created or destroyed**, energy input must equal the total energy output:

$$Total\ input\ energy = useful\ energy\ delivered + energy\ wasted$$

A Sankey diagram shows this:

Note: the **width** of the arrows demonstrates the **amount** of energy.



The greater the percentage of energy that is transformed into useful energy in a device, the more efficient a device is:

$$Efficiency\ of\ Device = \frac{Useful\ energy\ transferrered\ by\ the\ device\ (output)}{Total\ energy\ supplied\ to\ the\ device\ (input)}$$

Efficiency can be written as either a number (which is never more than 1) or as a percentage (never more than 100%). Neither have units.

For example: A light bulb radiates 10J of energy as light, for every 60J of electrical energy we supply to it.

$$Efficiency\ of\ a\ lightbulb = \frac{10}{60} = 0.17\ (as\ a\ number)$$

$$Efficiency\ of\ a\ lightbulb = \frac{10}{60}\ x\ 100 = 17\%\ (as\ a\ percentage)$$

LIVEWORKSHEETS

Now **complete** the table below, **calculating the efficiency** as both a number and a percentage: (5marks)

	Energy in	Energy out	Efficiency?
Electric Drill	160J	Kinetic 90J Sound 30J Heat 40J	
Hair drier	180J	Heat 170J Sound 10J	
Mobile phone charger	1J	0.8J Electrical 0.2J Heat	
Electric hob	1500J	Heat 1300J Light 150J Sound 50J	
Kettle	2.5kJ	Heat 2.2kJ Sound 0.3kJ	

LIVEWORKSHEETS