

Worksheet 2 | Lower Secondary

Stage (6-8)

1st Semester | 2023-2024

Name:




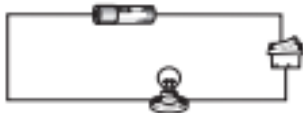
Subject: Physics -Chapter 1: Energy
Class: 6 CS

Objectives:

- Be able to construct energy transfer diagrams.
- Identify the input energy and the useful and dissipated energy in different systems.
- Calculate useful and dissipated (wasted) energy based on the law of conservation of energy.
- Be able to draw and analyze a Sankey diagram for different systems.

Question 1:

State the useful energy transformation that takes place in each case.

object	energy from	energy to
car 	chemical	kinetic
light bulb 	electrical
wood-burning fire 	chemical
battery in a circuit 	electrical

Question 2:

Select the appropriate word from the list below to show the energy transfer taking place in each part of the hair dryer shown in the picture:

chemical

elastic potential

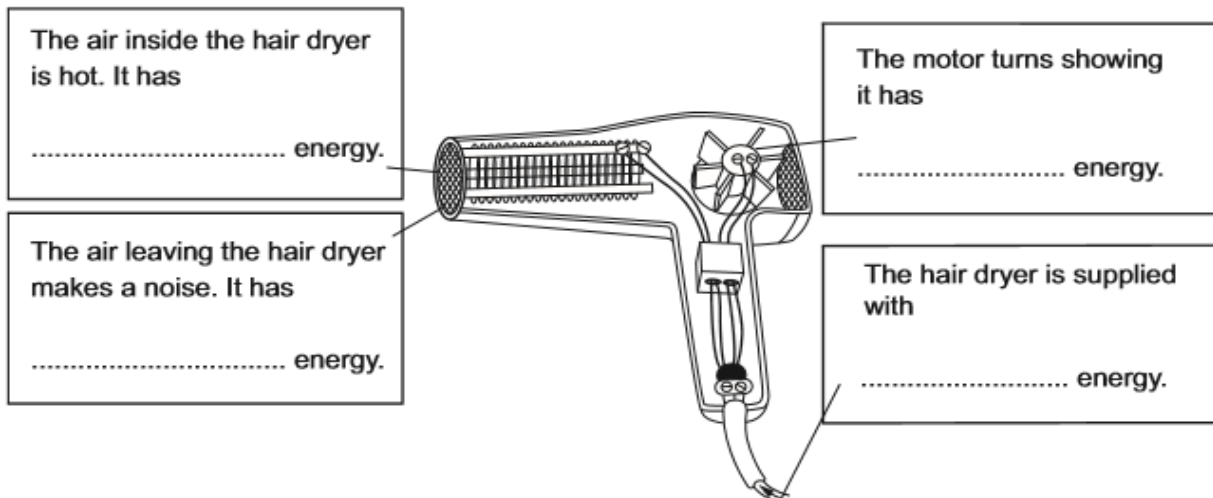
electrical

kinetic

nuclear

sound

thermal



Question 3:

The diagram shows some electrical appliances:



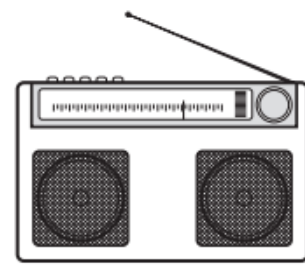
A



B



C



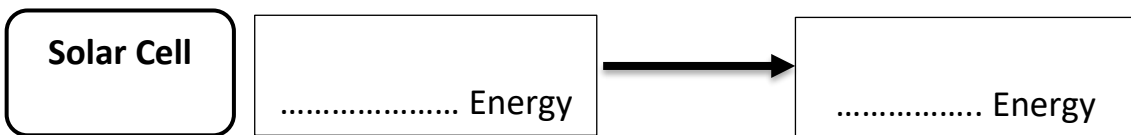
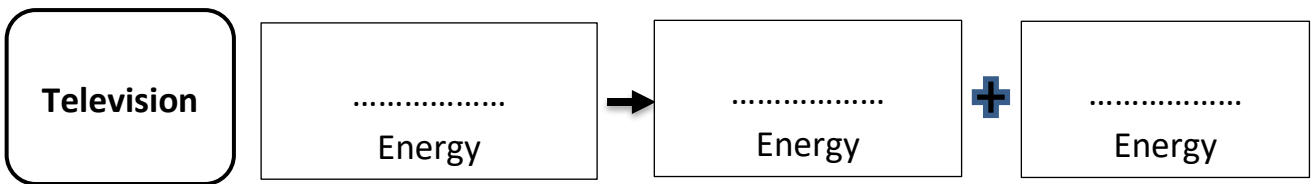
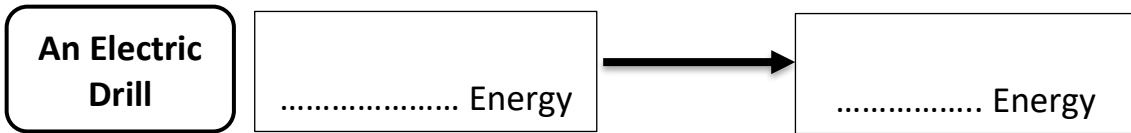
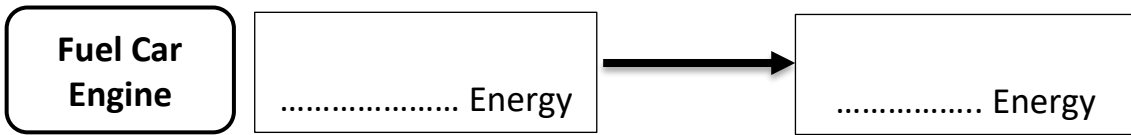
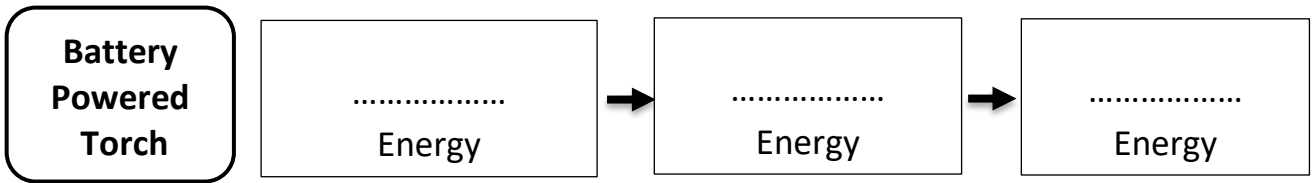
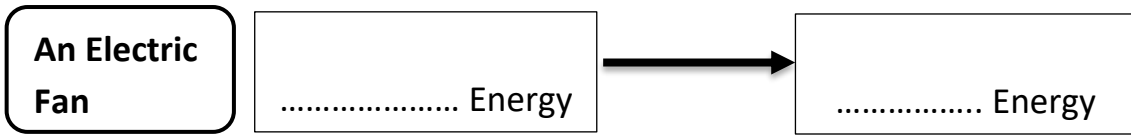
D

Write down the letter of the appliance that is designed to:

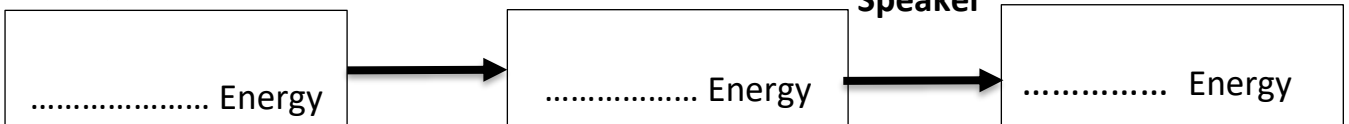
- a) Transfer electrical energy to **thermal energy**?.....
- b) Transfer electrical energy to **kinetic energy**?
- c) Transfer electrical energy to **sound energy**?
- d) Transfer electrical energy to **light energy**?

Question 4:

Identify the useful energy transformation taking place in each of the following devices:



Microphone



Question 5 :

For the following devices, **identify the form** of Energy of the input energy and the produced useful and dissipated energy:

Chemical Kinetic Thermal Sound Electrical Light

Light bulb:

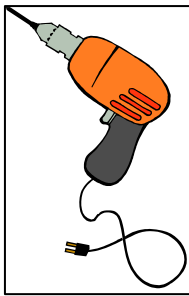


Input Energy: _____

Produced Useful Energy: _____

Dissipated (Wasted) Energy: _____

Electric Drill:



Input Energy: _____

Useful Energy: _____

Dissipated (Wasted) Energy: _____ + _____

TV:



Input Energy: _____

Useful Energy: _____ + _____

Dissipated (Wasted) Energy: _____

Electric Car engine:



Input Energy: _____

Useful Energy: _____

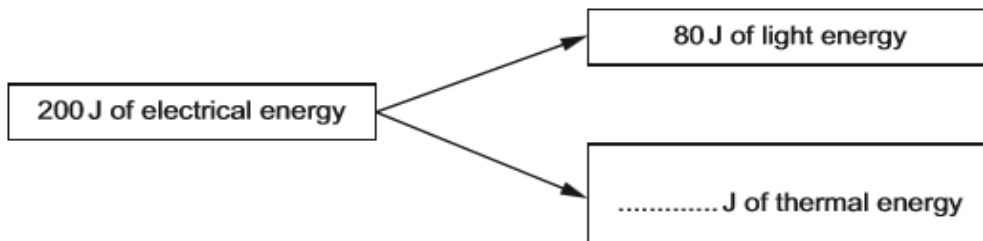
Dissipated (Wasted) Energy: _____ + _____

Question 6:

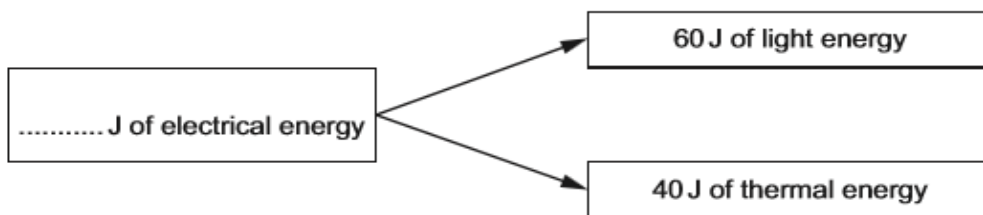
Energy is always conserved.

Complete the energy diagrams to show that energy is conserved.

(a)

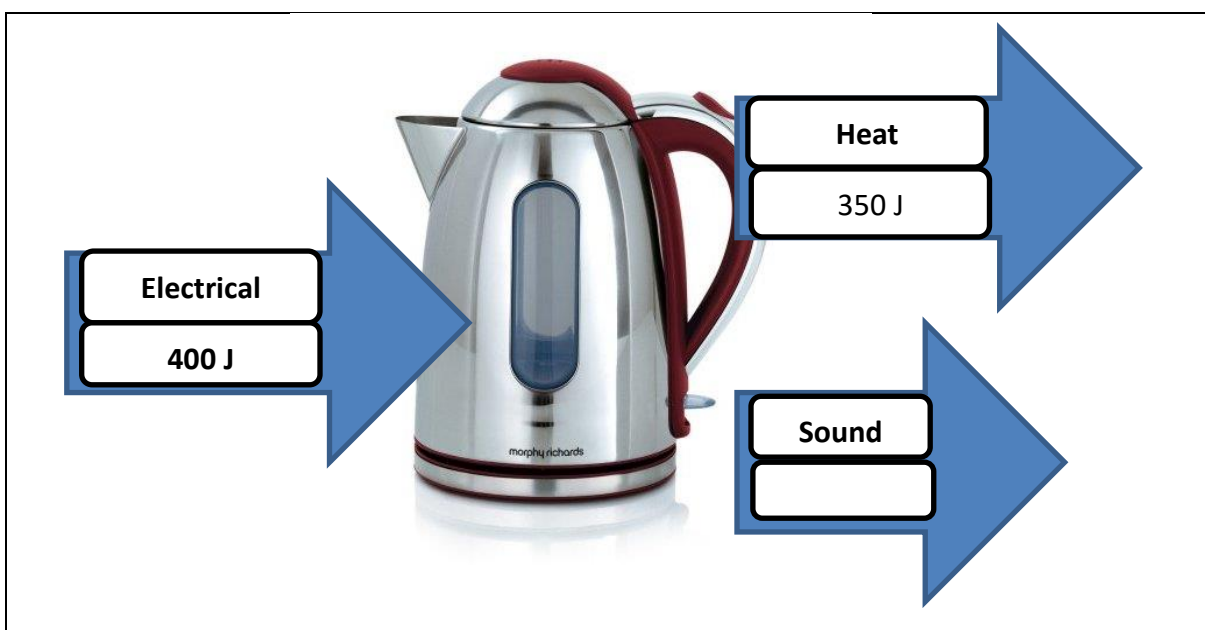


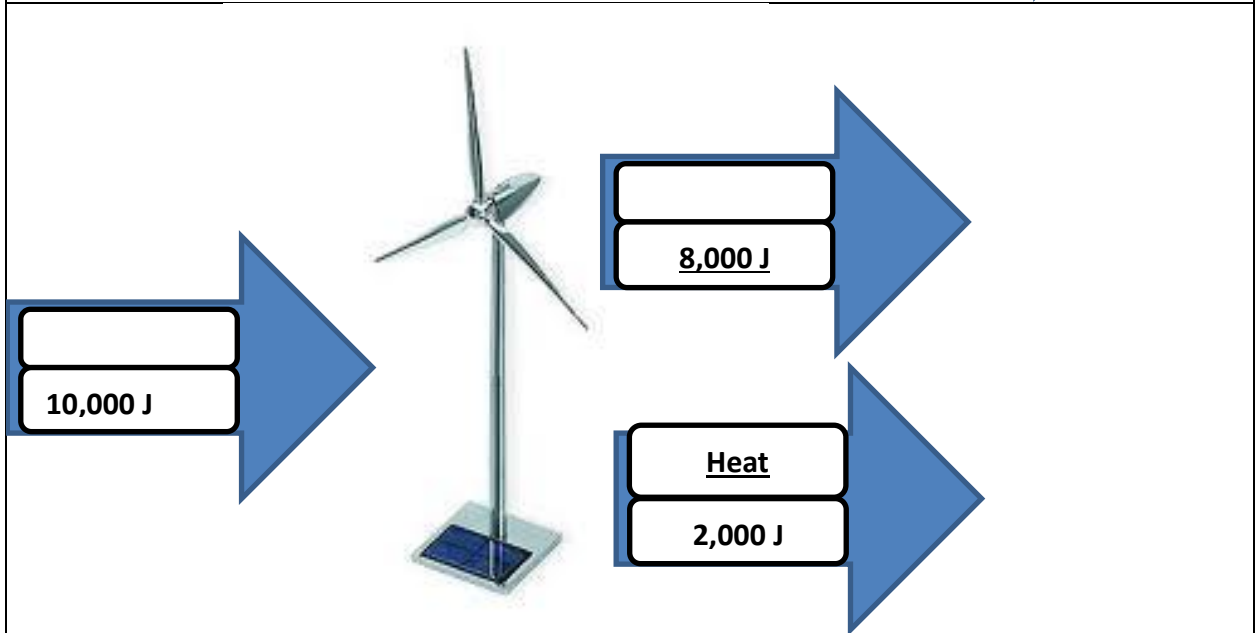
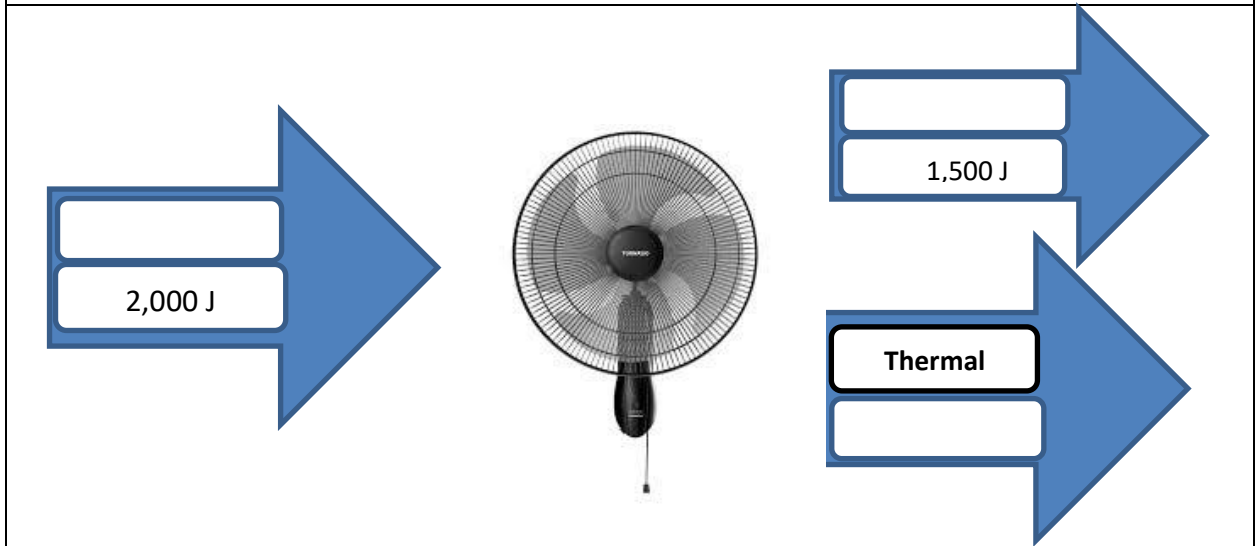
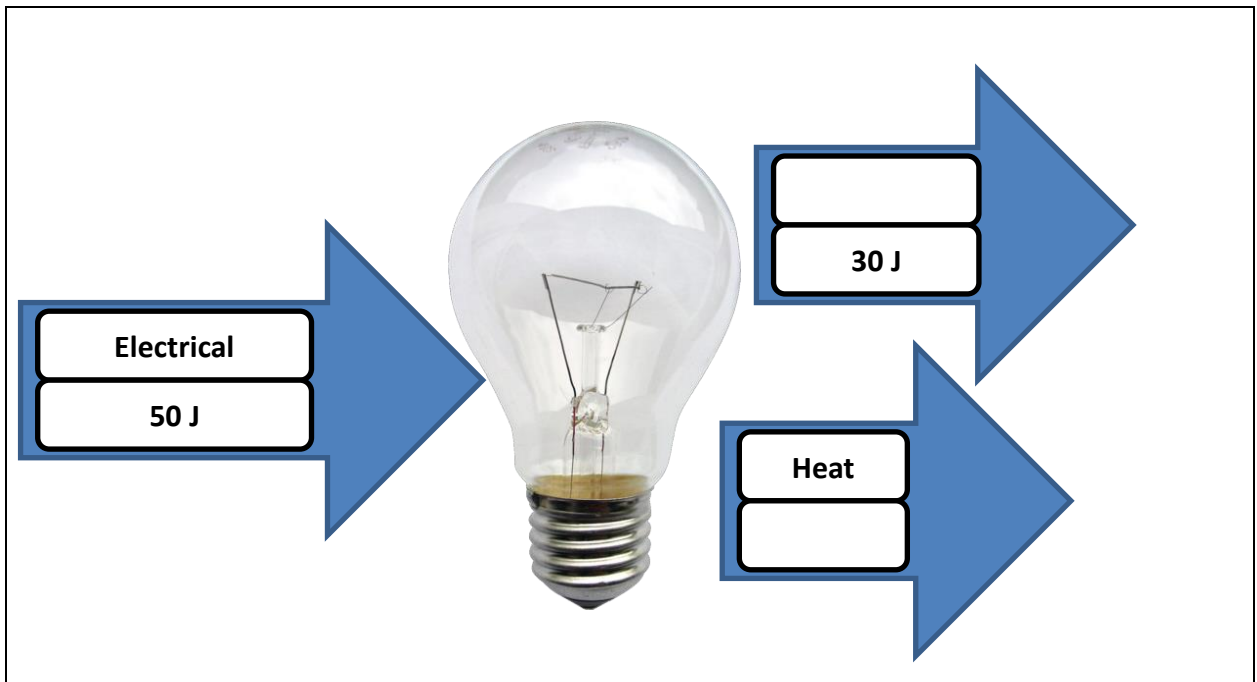
(b)



Question 7:

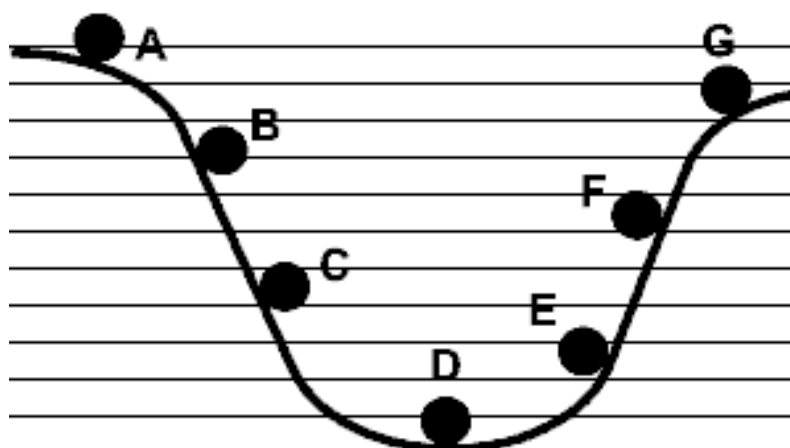
For each example of an energy transfer, fill in the missing boxes with the **energy type** and the **amount** of **energy** it takes up.





Question 8: This diagram shows a ball rolling from A to G.

Study the diagram and answer the following questions:



- a) Which letter shows the ball when it has the maximum kinetic energy? _____.
- b) Which letter shows the ball when it has the maximum gravitational potential energy? _____.
- c) Which letter shows the ball when it has the least gravitational potential energy? _____.
- d) Which letter shows the ball when it has the least kinetic energy? _____.

Note: at any of the points, the total energy of the ball is the same and equals to:

Gravitational potential energy (GPE) + Kinetic Energy

Question 9:

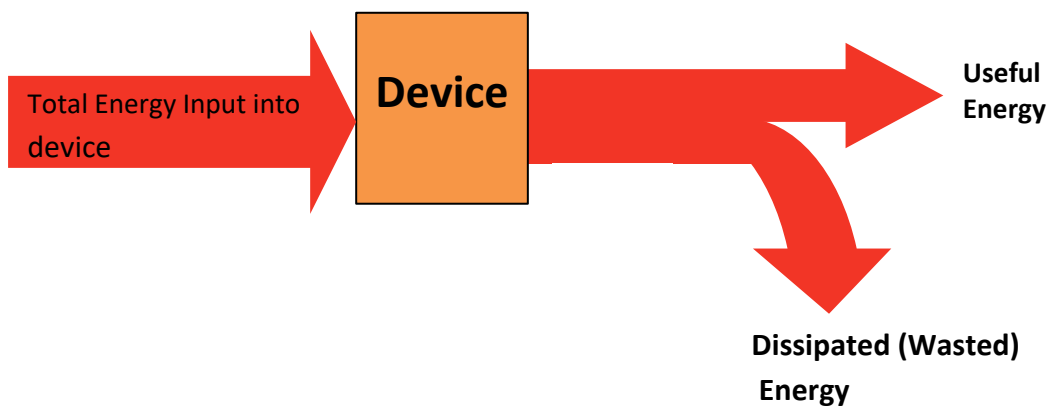
A Sankey diagram represents the energy transfer through a device.

Knowing that energy **cannot be created or destroyed**, energy input must equal the total energy output:

$$\textit{Total input energy} = \textit{useful energy delivered} + \textit{energy wasted}$$

A Sankey diagram shows this:

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



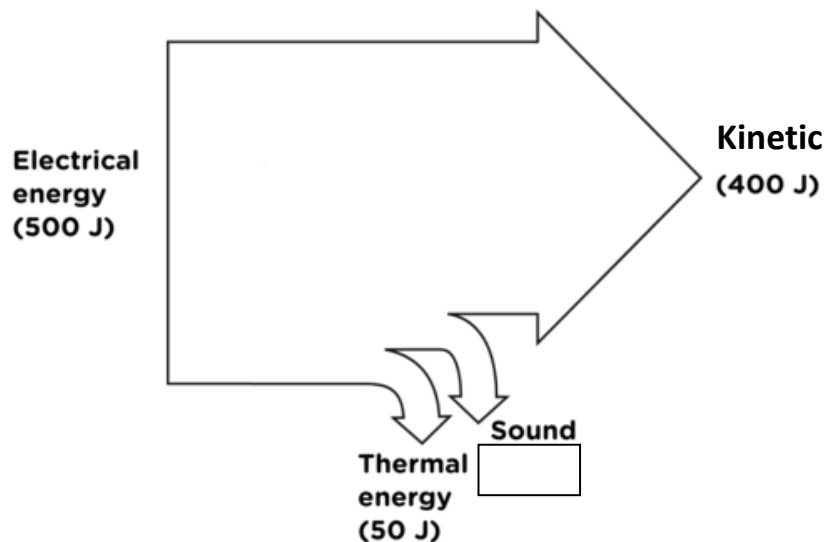
Draw your own Sankey diagram for a 60 J Light bulb given that:

- Total input energy = 60 J
- Useful (light) energy = 10 J
- Dissipated (heat) energy = 50 J

Use the squares below as a guide for drawing your arrows.



Question 10: The following **Sankey diagram** shows the energy transfer in an electric device.



Study the Sankey diagram shown above, and answer the following questions accordingly:

- What is the **useful form/ forms of energy** produced by this device?
_____.
- What is the amount of **useful energy** produced? Include the Unit.
_____.
- What is the **dissipated (wasted) form/ forms of energy** produced by this device?
_____.
- Calculate the amount of **sound energy** produced by this device.
_____.
- What is the total amount of **dissipated (wasted) energy** produced by this device?
_____.
- What is the **input** energy for this device? _____.
- Think of a device that this Sankey diagram may represent.
_____.
- Is this device efficient or inefficient? Explain your answer.
_____.