

# Homework 1 answers

Table:

- Chemical
- Kinetic
- Gravitational potential
- Elastic
- Thermal
- Magnetic
- Electrostatic
- Nuclear

**Total: /8**

# Homework 1 extension answers

1. Energy cannot be created or destroyed
2. Joules (J)
3. Mechanically, electrically, heating and radiation

**Total: /6**

# Homework 2 answers

1. Heating
2. Mechanical
3. Mechanical and radiation
4. Mechanical

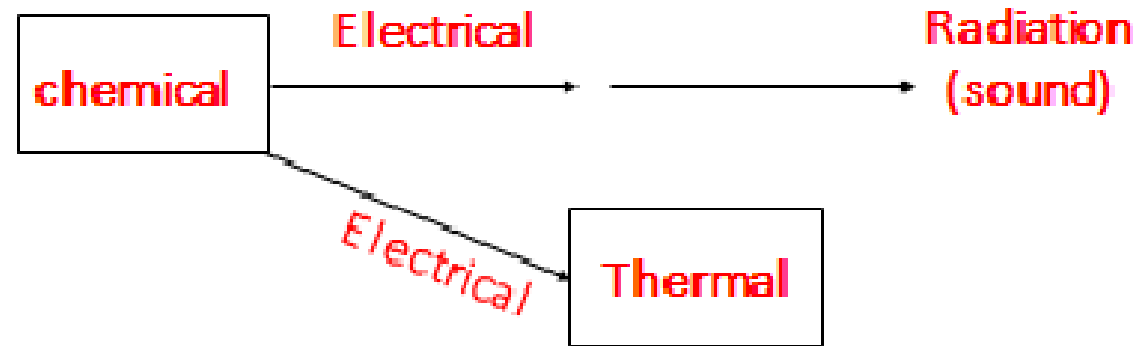
1. Kinetic → thermal via heating

**Total: /7**

# Homework 2 answers

## Question 1

Draw an energy transfer diagram to show how the energy is transferred in an electric radio.

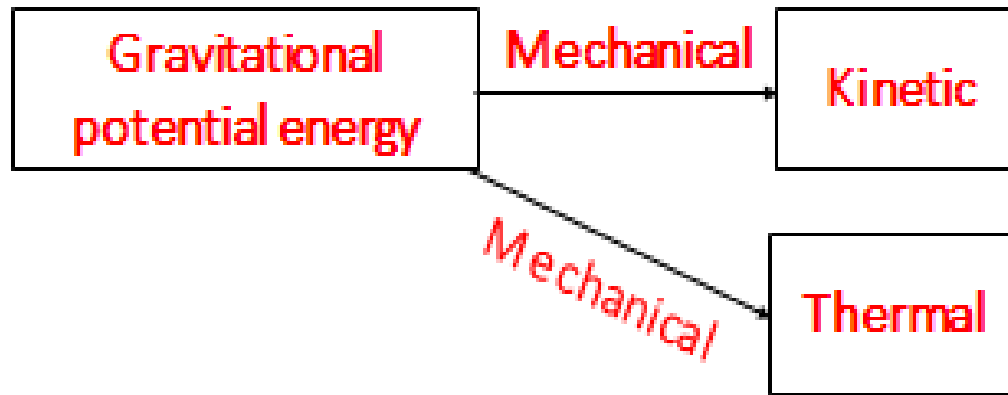


Total: /5

# Homework 2 answers

## Question 2

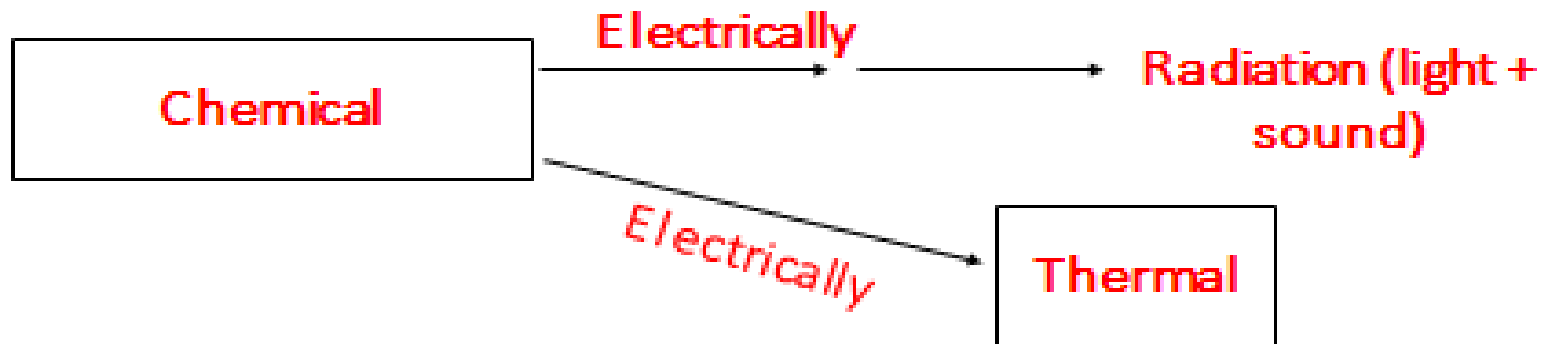
Draw an energy transfer diagram to show how the energy is transferred in a ball at the top of a slope that rolls down



**Total: /5**

# Homework 2 answers

## Question 3



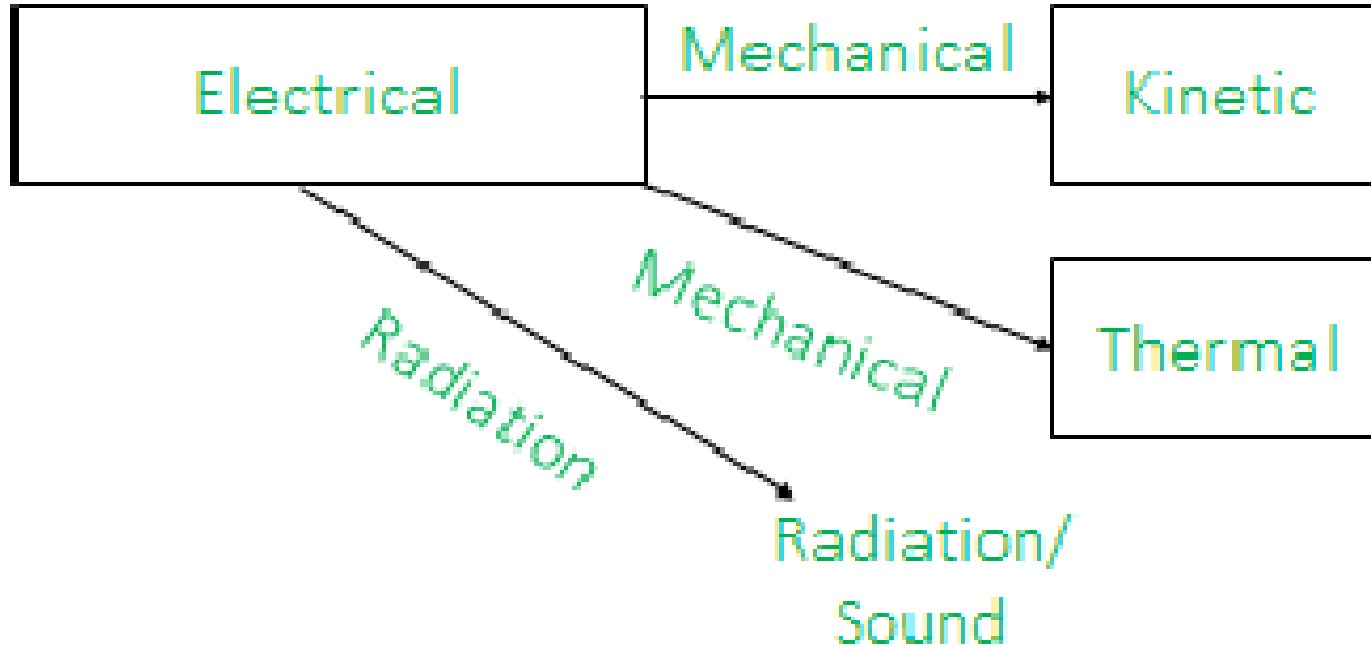
2) Energy is wasted via heating to the thermal energy store of the surroundings.

**Total: /7**

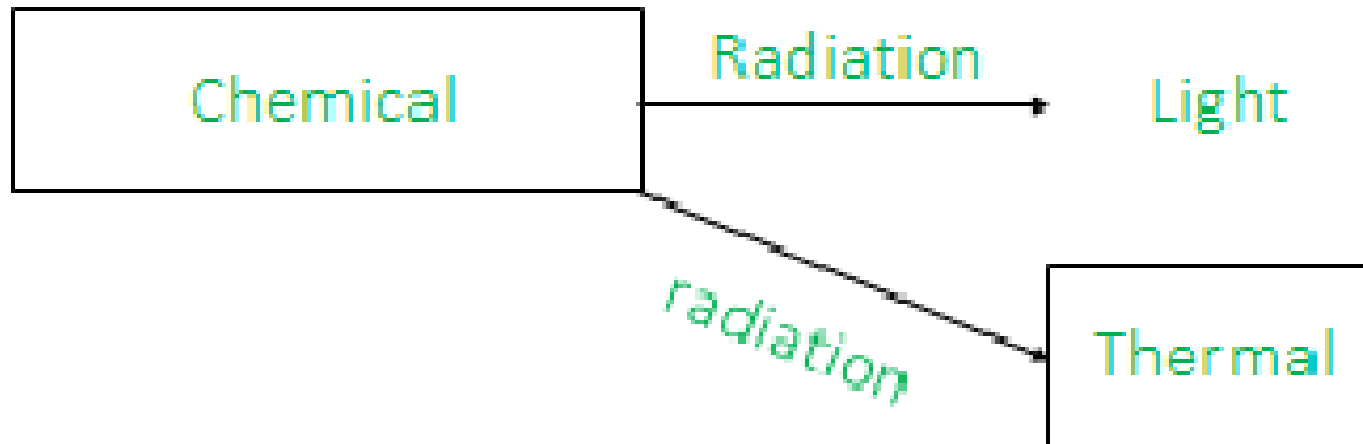
# Homework 2 extension answers

## Question 4

Electric drill:



Bunsen burner:

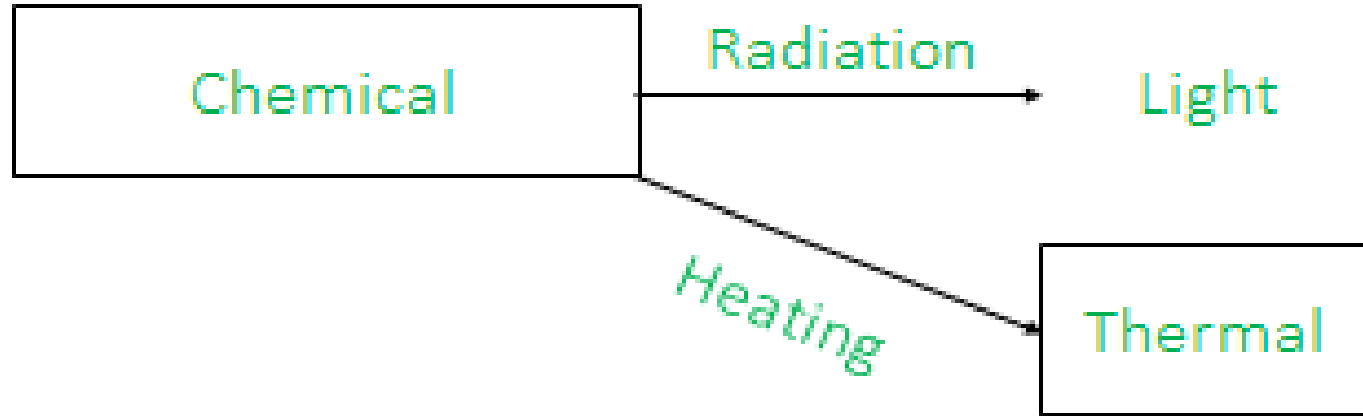


**Total: /2**

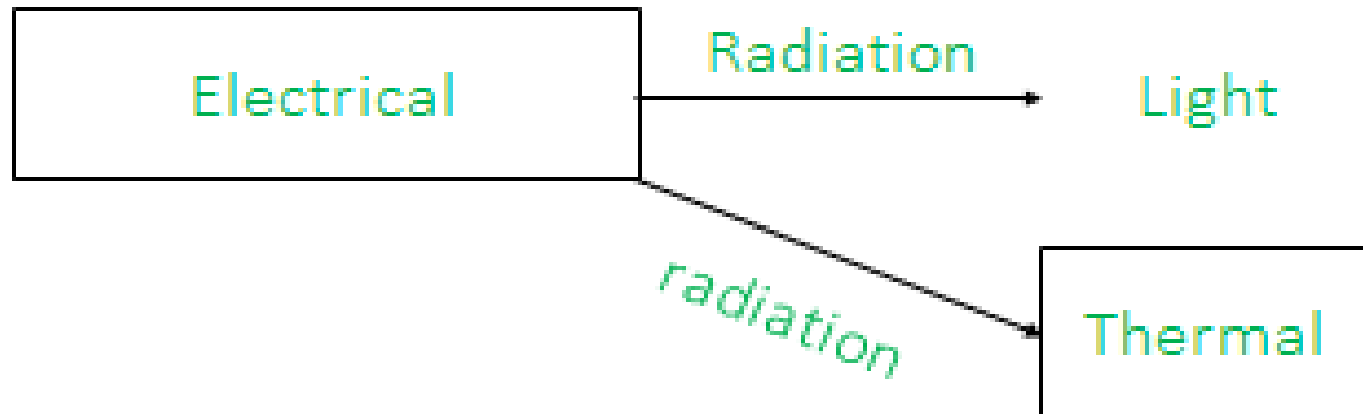
# Homework 2 extension answers

## Question 4

Candle:



Desk lamp:



**Total: /2**



# Homework 3 answers

1. Kinetic

2. Thermal

3. 10J

4. 8J

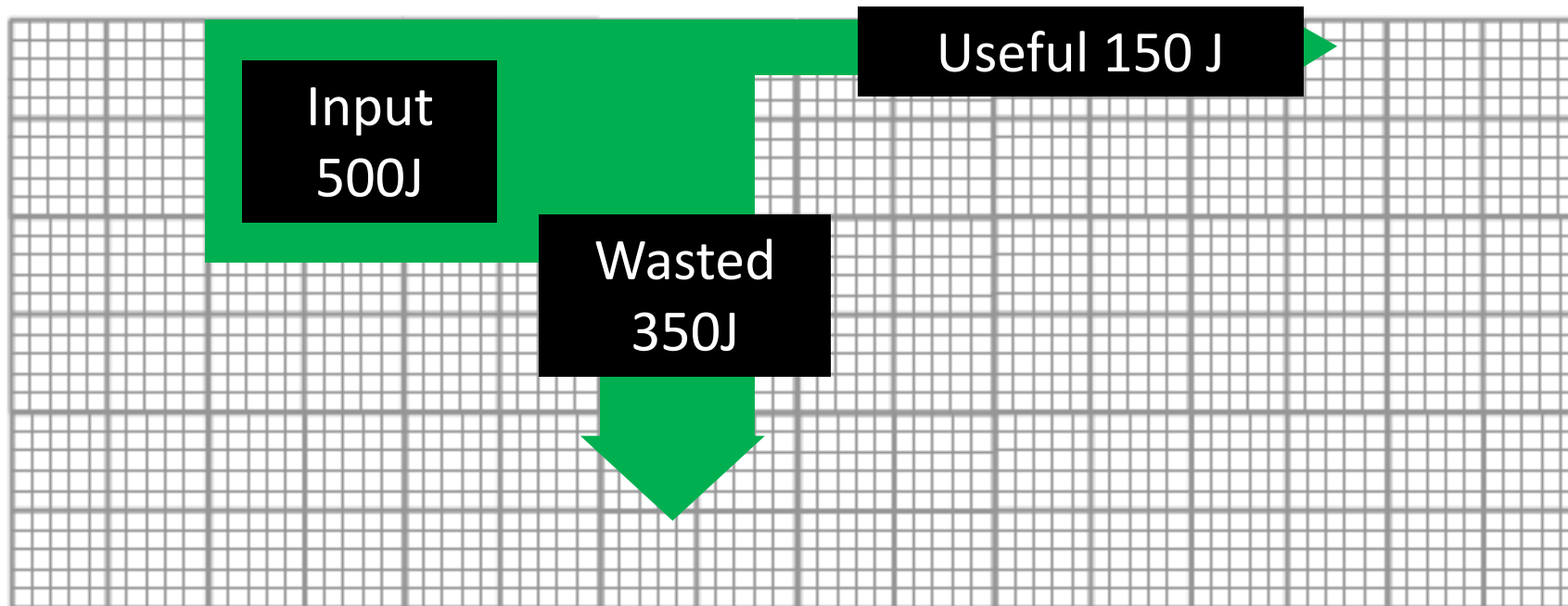
5. 32J

**Total: /5**

## Question 6 answer

1.

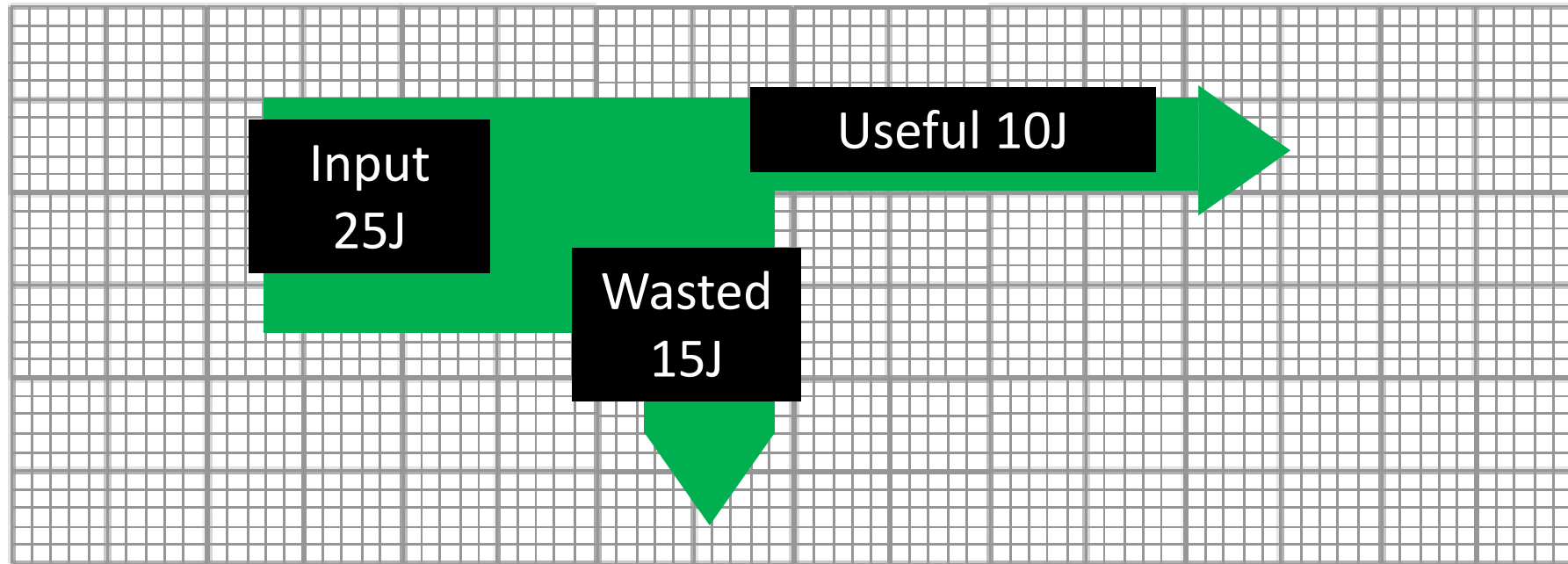
A kettle uses 500J of energy and converts it to 150J of useful energy.  
How much is wasted?



**Total: /3**

## Question 6 answer

2. In one second, a lightbulb uses 25J of electricity. It produced 10J of light and the rest is wasted as heat.



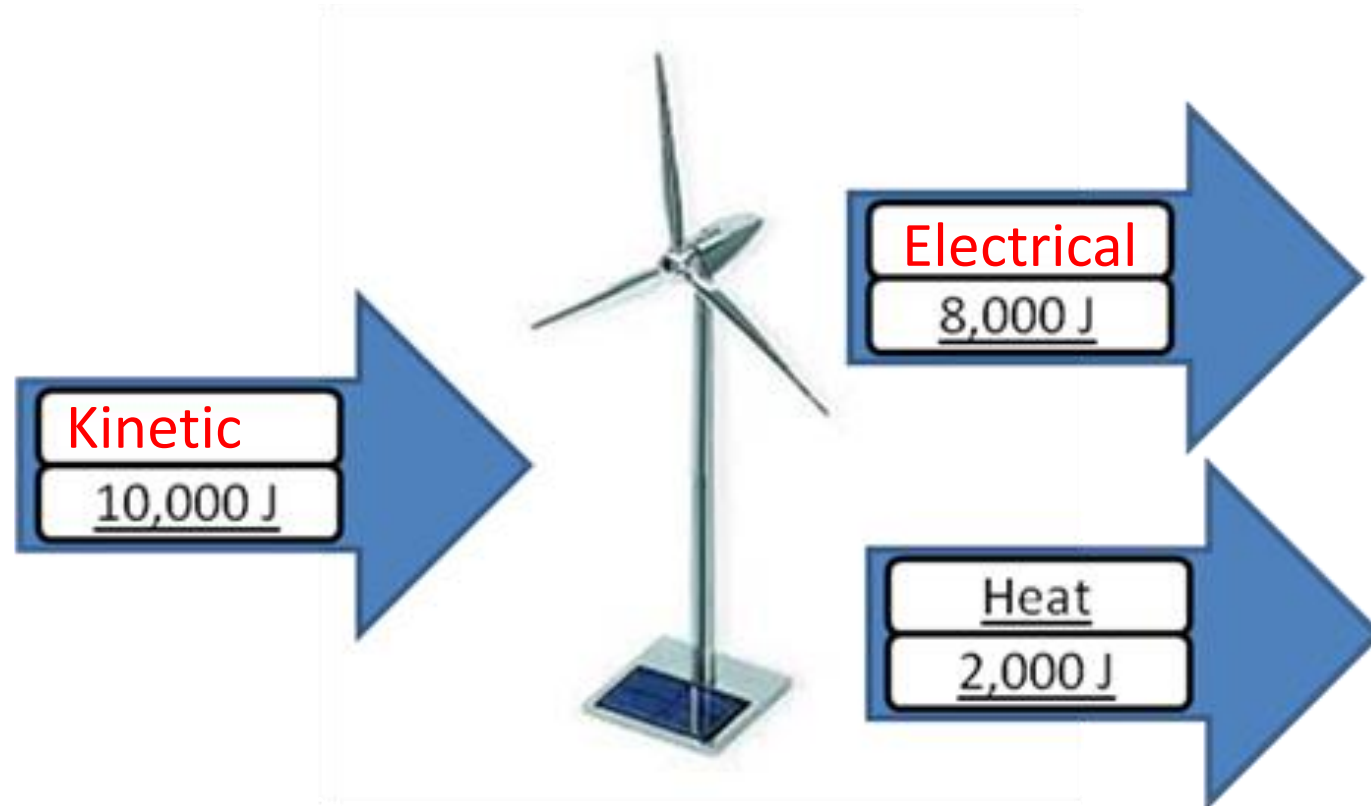
**Total: /3**

## Homework 3 answers for efficiency

1.

The wind turbine is an (*efficient*) energy source.

10,000 Joules of kinetic energy goes in and 8,000 Joules of energy is transferred to electrical therefore only 2,000 Joules of heat energy is dissipated.



**Total: /4**

## Homework 3 answers for efficiency

2.

100J of energy is transferred electrically to a filament bulb, of which 45J are radiated usefully as light. Calculate its efficiency as a percentage.

1. Annotate with Symbols

2. Write the EQUATION      Efficiency =  $\frac{\text{usefully energy output} \times 100}{\text{total energy input}}$

3. Check the Units

$$= \frac{45 \times 100}{100}$$

4. Rearrange if needed

5. Sub in

$$= 45\%$$

6. ANSWER WITH UNITS

**Total: /3**

## Homework 3 answers for efficiency

3.

250J of energy is transferred electrically to a filament bulb, of which 150J are radiated as light and 100J stored thermally in the filament. Calculate its efficiency as a percentage.

1. Annotate with Symbols

2. Write the EQUATION  $\text{Efficiency} = \frac{\text{usefully energy output} \times 100}{\text{total energy input}}$

3. Check the Units

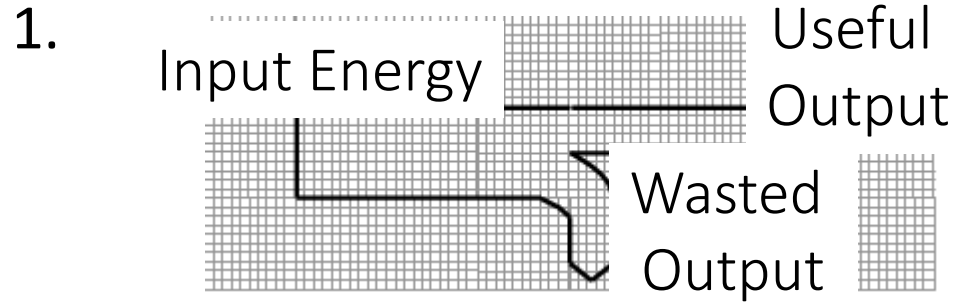
4. Rearrange if needed  $= \frac{150 \times 100}{250}$

5. Sub in  $= 60\%$

6. ANSWER WITH UNITS

**Total: /3**

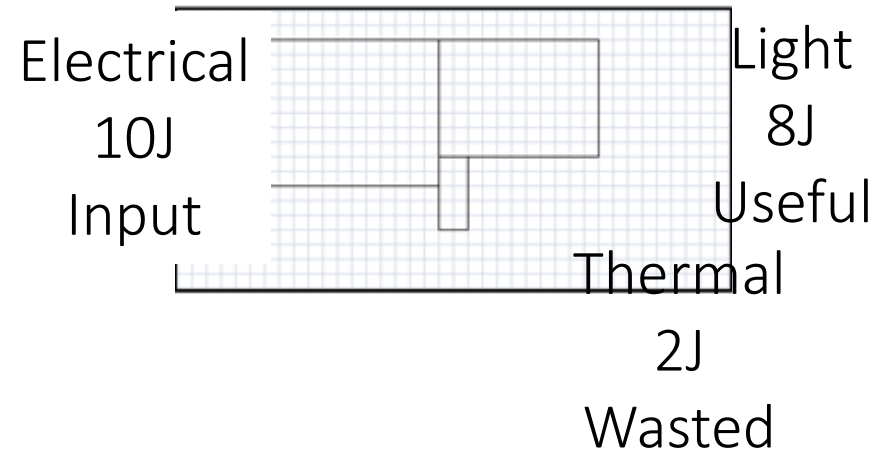
# Extension worksheet on Sankey diagrams- answers



2) 30%  
50%

3) 5%

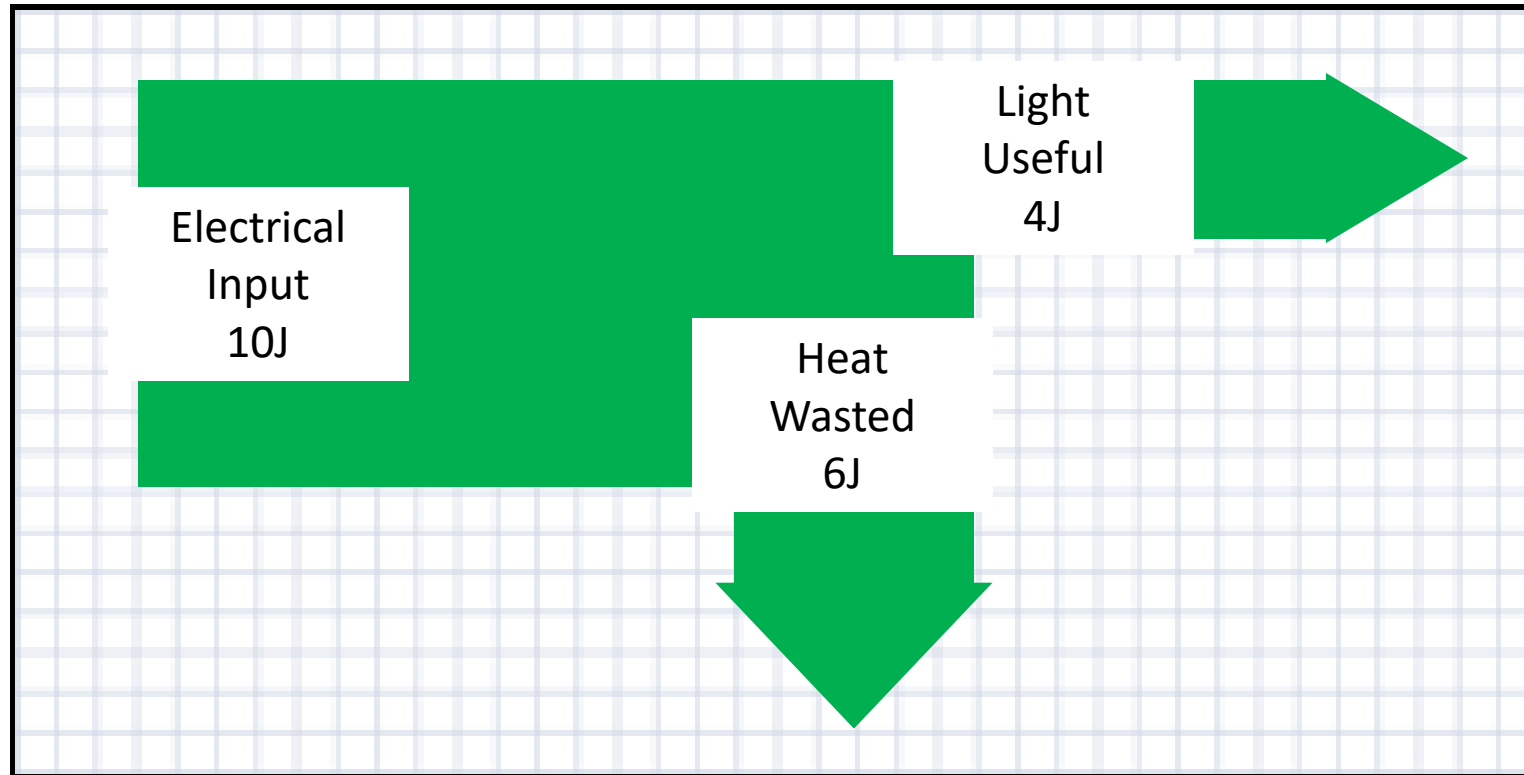
4.



**Total: /9**

# Extension worksheet on Sankey diagrams- answer

5)



**Total: /3**