

Ch. 5

- 5.1 basics of energy
 - importance of energy
 - all living things
 - stay alive
 - carry out their daily activities
 - example
 - animals and plants
 - grow
 - human
 - power appliances and machines
 - forms of energy
 - sound energy
 - chemical energy
 - light energy
 - thermal energy
 - kinetic energy
 - potential energy
 - electrical energy
 - units of energy
 - joules(J)
 - kilojoules(kJ)
 - =1000J
 - calorie (cal)
 - kilocalories (kcal)
 - =1000 calories
- 5.2 energy conversion
 - Converting energy from one form into another
 - sound energy
 - given out (by)
 - chemical energy
 - stored in

- light energy
 - from the
- thermal energy
 - given out (by)
- kinetic energy
 - of the
 - have
- potential energy
 - gain
- electrical energy
 - supplied to
- conservation of energy
 - law
 - energy can be converted from one form into another
 - can't be created or destroyed
- efficiency of energy conversion
 -

$$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}} \times 100\%$$

• 5.3 heat transfer

- conduction
 -
 - take place in an object or between two objects in contact
 - heat can be transferred by conduction through an object from the hot end to the cold end
 - conductor of heat
 - good
 - metals
 - bad
 - non-metals
 - water
 - air
 - ranking list

- 1. copper
 - 2. aluminium
 - 3. iron
 - 4. stainless steel
 - 5. glass
 - 6. glass
 - 7. wood
 - 8. plastic
- applications of conductors & insulators of heat
 - good conductors
 - example
 - cooking utensils
 - made iron or copper
 - reduce cooking time
 - heat sink
 - made of metal
 - conduct heat away
 - prevent the computer from overheating
 - bad conductors
 - example
 - handles of cooking utensils
 - made of poor conductors of heat
 - convection
 - the transfer of heat from one place to another by movement of liquid or gas
 - can't take place in solids
 - the movement of water (or gas) forms a convection current of water (or gas)
 - application and effects
 - electrical appliances
 - heating element of electric kettle
 - be placed at the bottom
 - heat can be transferred by a convection current
 - air conditioner installed near the ceiling

- cold air blown out & sink while hot air
 - replace it
 - a convection current is formed
 - room is cooled
 - nature
 - during the day
 - land absorbs heat from Sun faster than sea water
 - land becomes hotter than sea
 - hot water from land & cold air blows in from sea
 - replace the hot air that has risen
 - results in sea breezes
 - night
 - land cools down faster than sea & cool air blows from land to sea
 - form land breezes
- radiation
 - heat transfer
 - space between Sun and Earth
 - vacuum
 - heat can't be transferred through by conduction & convection
 - both processes require medium → transfer heat
 - radiation can take place in vacuum
 - heat is transferred by radiation
 - absorption and emission
 - absorption
 - temperature increases when absorb radiation
 - example
 - stand under Sun, body absorb radiation from Sun → body temperature increase
 - **good absorbers** of radiation
 - **dull black** surfaces
 - **poor absorbers** of radiation
 - **shiny silver** surfaces
 - emitter

- good emitters
 - **dull black** surfaces
- bad emitters
 - **shiny silver** surfaces

- application
 - heat radiator behind a refrigerator is painted black
 - loses heat easily
 - cooking utensils with shiny surfaces
 - can help keep water/ food hot for a longer period