5.3 heat transfer

- conduction
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    - 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
        - radiationcan 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 linger period