Year 8 Science – Term Two KO

1. Tier 3 Vocab

- **Chemical energy store** Energy stored because of the chemical composition of an object.
- **Conduction** Method of heat transfer in solids.
- **Convection** Method of heat transfer in liquids and gases.
- **Conservation of energy** Energy cannot be created or destroyed, only transferred from one store to another.
- **Dissipation** The spreading out of energy so it is stored less usefully.
- **Energy transfer** Energy moved from one store to another.
- **Gravitational energy store** Stored because of the position of the object above ground.
- **Joule** Unit of energy
- **Kinetic energy store** Stored in a moving object.
- **Non-renewable** Energy resources that will run out.
- **Radiation** A method of heat transfer that does not require particles.
- **Renewable** Energy resources that can be replaced.
- **Temperature** A measure of how hot something is.
- **Work** Causes energy to be transferred from one store to another.

2. Energy stores and pathways

Objects can have **stored energy** either because of:

- Their chemical composition – **chemical energy**
- Their movement – **kinetic energy**
- Their temperature – **thermal energy**
- Their position in a field – **gravitational potential energy, magnetic energy, electrostatic energy**
- Compression or distortion of an elastic material – **elastic potential energy**

Energy can transfer from one store to another along one of four energy pathways:

- Mechanical - ***Force acts upon an object***
- Electrical - ***Electric current flow***
- Heat - ***Temperature difference between objects***
- Radiation - ***Electromagnetic waves or sound***

3. Energy transfers

- The unit for energy is the **joule.**
- The **law of conservation of energy** states**:**
  Energy **<u>cannot</u>** be created or destroyed, only transferred from one store to another.
- Energy can be **transferred** to other useful **energy stores** or **dissipated**.
- If energy is dissipated, it spreads out and gets transferred to less useful stores (e.g. heating due to friction).
- **Efficiency** is a measure of how much energy is usefully transferred.
- Efficiency can be increased by using ways to reduce 'wasted' energy - **insulation, streamline design, lubrication of moving parts**, etc.

4. Methods of thermal transfer

- Thermal energy can be transferred by particles using **conduction** or **convection**.
- Conduction occurs in solids. When a solid is heated, the particles vibrate and pass the energy on to the next particles through contact.
- Convection occurs in liquids and gases. Hot areas of the liquid or gas become less dense and rise upwards. Colder areas sink in to take their place.
- Heat can also be transferred without particles via **radiation.**
- Black surfaces are the best emitters and absorbers of radiation.
- Shiny white/silver surfaces are poor radiators.

5. Heat and temperature

- **Heat** is an **energy store** whereas **temperature** is a measure of how hot something is.
- Temperature is measured with a **thermometer**.
- The units for temperature are degrees Celsius (°C)
- If two objects at different temperatures are placed next to each other, the object at the higher temperature transfers **thermal energy** to the object at the lower temperature until they are both at the same temperature
- For example, a hot cup of coffee has a higher temperature than the room it is in. The coffee will transfer thermal energy to the room and cool down until they are equal temperatures.

6. Command Words

These are the key words in a question that tell you how the question should be answered.

State – requires you to recall a key fact without any further information needed.

Example:
State the law of conservation of energy.
Answer: Energy cannot be created or destroyed, only transferred from one store to another.

Describe – say what will happen, but <u>without</u> any reason why.

Example:
Describe how conduction transfers energy through a solid.
Answer: Particles vibrate when heated and pass the energy on to the next particles as kinetic energy.