Learning Journey

P1 - Energy

|  |  |
| --- | --- |
| 1  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | When a **system** (object or group of objects) changes **energy** is transferred from one store to another **mechanically**, **electrically** (both of which are ‘work’), by **heating** or **radiation**.  Energy stores include: **Thermal, kinetic, gravitational potential, elastic potential, chemical, magnetic, electrostatic and nuclear.** |
| 2  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Cover what you want to find when using formula triangle.  **Kinetic energy = movement.**  Object speeding up transfers energy to kinetic energy stores.  **Ek = ½ mv2**  **Raised object** store energy in their **gravitational potential energy** stores.  **Ep = mgh**  Falling objects transfer energy from gravitational to kinetic energy stores. |
| 3  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | **Stretching t**ransfer energy to **elastic potential energy** stores.  **Ee= ½ ke2**  This works so long as the **limit of proportionality** has not been exceeded. |
| 4  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | **Law of Conservation of Energy**- energy cannot be **created** or **destroyed** it can only be **transferred** usefully, stored or dissipated.  **Power** is the rate of doing work.  **P = E/t or P = W/t** |
| 5  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | When a force moves an object energy is transferred (Work).  **W = Fs**  When a current flows work is done against the resistance.  **E = QV** |
| 6  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | The heat energy transferred when an object is heated or cools can be found using:  **∆E = mcѲ**  **Specific Heat Capacity** ‘c’ = amount of energy needed to heat 1kg of a substance by 1˚C.  The higher ‘c’ the better they are as an energy store. |
| 7  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Know a method for how calculate the specific heat capacity of an object experimentally.  (**Required Practical)** |
| 8  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | **Conduction** solids only, vibrating particles transfer energy to neighbouring ones.  Collisions transfer energy between kinetic stores.  **Thermal conductivity** is a measure of how quickly energy is transferred through a material.  **Convection** in liquids and gases, energy transferred to kinetic energy stores and this time particles move.  More heat = more kinetic energy = particles move faster = take up more space = less dense = particles rise ‘taking’ heat with them. |
| 9  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | **Streamlining** and **lubrication** reduce frictional forces, reducing unwanted energy transfers.  **Insulation** is used to prevent heat loss from homes = reduce unwanted energy transfers.  Lower conductivity = better insulation.  Know how **cavity walls, double glazing, draught excluders** and **loft insulation** work to reduce unwanted energy transfers in the home. |
| 10  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Apply knowledge and use skills to complete investigation into effectiveness of insulating materials.  **Required Practical** |
| 11  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Useful devices transfer energy from one store to another.  Some energy is wasted (often as heat or sound).  **Efficiency**=**Useful Energy or Power output/Total Energy or Power input**  Nothing is 100% efficient. |
| 12  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | For each resource (**Fossil fuels, Nuclear, Biofuels, Wind, HEP, Geothermal, Tidal, Solar and Water Waves**) pupils will need to know:  Is it renewable/non-renewable?  Is it used for transport – if so how?  Is it used for heating – if so how?  How can electricity be generated using this resource?  What are the energy transfers involved?  How reliable is it?  How expensive?  Advantages?  Disadvantages? |
| 13  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Know the trends in energy use and production taking into considerations:  Location,  Environmental Costs,  Set-up/decommissioning,  Reliability,  Set-up/Running costs for resources. |
| 14  C:\Users\rca\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\542FDEB4.tmp | Application of points of consideration when planning use of energy resources.  Group task – Ashton Island |