|  |  |
| --- | --- |
| **Science Unit Six: Can you take the sugar out of a can of Coke? Properties and Changes of Materials**  **(six week mini-project)**  **Carne and Readymoney Autumn 2 2020** | |
| **What should I already know?**     * A variety of everyday materials including wood, plastic, glass, metal, water and rock. * The physical properties of a variety of everyday materials (including those that are transparent) and to compare and group materials on the basis of these properties * How materials are suitably used based on their properties. * How magnets and electrical circuits work. * Some materials which are magnetic. * How shapes of solid objects can be changed by squashing, bending, twisting and stretching. * Materials that are solids, liquids and gases and their particle structure. * Some materials change state when they are heated or cooled and the temperature at which this happens. * The roles of melting, evaporation and condensation in the water cycle and the role temperature has on the rate of evaporation. * Some rocks are permeable. | **Key Knowledge**  Materials which are good thermal conductors allow heat to move through them easily.  Thermal conductors are used to make items that require heat to travel through them easily, such as a saucepan which requires heat to travel through to cook food.  Thermal insulators do not let heat travel through them easily. Examples of thermal insulators include  woollen clothes and flasks for hot drinks.  Electrical conductors allow electricity to pass through them easily while electrical insulators do not.    Electrical insulators have a high resistance which means that it is hard for electricity to pass through these objects.  When the particles of a solid mix with the particles of a liquid, this is called dissolving.  The result is a solution.  Materials that dissolve are soluble.  Materials that do not dissolve are insoluble.  Some materials can be separated after they have been mixed based on their properties - this is called a reversible change.  Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation.  When a mixture cannot be separated back into the original components, this is called an irreversible change. Examples of this include when materials burn or mixing bicarbonate of soda with vinegar.  **Key Experiences**  growing crystals with alum (aluminium potassium sulfate)  separating liquids based on their density |
| **Key Vocabulary**   |  |  | | --- | --- | | **Key Term** | **Definition** | | circuit | a complete route which an electric current can flow around | | condensation | small drops of water which form when water vapour or steam touches a cold surface, such as a window | | conductor | a substance that heat or electricity can pass through or along | | dissolves | when a substance is mixed with a liquid and the substance disappears | | electricity | a form of energy that can be carried by wires and in used for heating and lighting, and to provide power for devices | | evaporation | to turn from liquid into gas; pass away in the form of vapour. | | filtering | a device used to remove dirt or other solids from liquids or gases. A filter can be made of paper, charcoal, or other material with tiny holes in it. | | flexible | an object or material can be bent easily without breaking | | gas | a form of matter that is neither liquid nor solid. A gas rapidly spreads out when it is warmed and contracts when it is cooled. | | insoluble | impossible to dissolve, esp. in a given liquid. | | insulator | a non-conductor of electricity or heat | | irreversible | impossible to reverse, turn back, or change. | | liquid | a form of matter that flows easily and is neither a solid nor a gas. | | magnetic | having to do with magnets and the way they work | | melting | to change from a solid to a liquid state through heat or pressure | | particles | a tiny amount or small piece | | permeable | a substance which gas or liquid can pass through | | process | a series of actions used to produce something or reach a goal | | properties | the ways in which an object behaves | | rate | the speed with which something happens | | resistance | the opposing power of one force against another | | reversible | able to turn or change back | | solid | having a firm shape or form that can be measured in length, width, and height; not like a liquid or a gas | | soluble | able to be dissolved | | solution | a mixture that contains two or more substances combined evenly | | state | the structure or condition of something | | temperature | a measure of how hot or cold something is | | thermal | relating to or caused by heat or by changes in temperature | | transparent | If an object is transparent, you can see through it | | variable | something that can change or that has no fixed value | | water cycle | the process by which water on the earth evaporates, then condenses in the atmosphere, and then returns to earth in the form of precipitation. | |