**Energy and Electromagnetism Overall Key Ideas**

**Key Ideas for Investigation 1: Energy and Circuits Key Ideas**

* An Electric Circuit is a system that includes a complete pathway through which electric current flows from an energy source to its components.
* In order for a light bulb to light, the circuit must be connected to two contact points on the bulb, the side and the base.
* Electric current flows from the negative end of the D-cell, through the circuit, and to the positive end.
* Conductors allow electric current to flow (metals) and insulators prevent the flow of electric current.
* There are different sources of energy, including D-cells, solar cells, food, and fuel.
* A solar cell is a technology that produces electricity using energy from light.
* The energy of electric current can produce light, motion, heat, and sound.
* Energy is present when you observe light, sound, heat and objects in motion.
* Energy can transfer from place to place.
* Energy can be generated by burning fossil fuels or harnessing renewable energy sources such as the Sun’s light, moving air, or water and the heat generated inside Earth. As the need for energy increases and fossil fuels decrease, the use of renewable sources will be required to help meet energy needs.

**Key Ideas for Investigation 2: Series and Parallel**

* An electric circuit is a system that includes a complete pathway for current to flow from a source (battery) to one or more components (bulbs or motors).
* In a series circuit, there is a single pathway from the energy source to the components. If one light burns out, all the lights burn out.
* Two bulbs can be lit dimly using a series circuit.
* In a parallel circuit, each component has its own direct pathway to the energy source. If one light burns out, the other lights continue to shine.
* Two bulbs can be lit brightly using a parallel circuit.

**Key Ideas for Investigation 3:**

**The Force of Magnetism**

* Magnets interact with each other and SOME materials
* Magnets attract to objects that contain iron. Iron is the only common metal that sticks to magnets
* All magnets have 2 poles (north and south). Like poles repel and opposite poles attract
* Magnets are surrounded by an invisible magnetic field, which attracts through space and through most materials
* When an iron object enters a magnetic field, the field induces magnetism in the iron object, and the object becomes a temporary magnet
* The magnetic force acting between magnets declines as the distance between them increases
* Earth has a magnetic field