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| **Substantive knowledge Science Curriculum**Kensington Junior Academy |

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| **Autumn** |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Chemistry - Rocks***Properties of rocks, fossils and soils*.* Compare and group rocks based on their appearance and physical properties, giving reasons
* Know how soil is made and how fossils are formed
* Know about and explain the difference between sedimentary, metamorphic and igneous rock
 | **Chemistry – States of matter***Compare and group materials, Solids, liquids and gases, Changing state and Water cycle.** Group materials based on their state of matter (solid, liquid, gas)
* Know about and explore how some materials can change state
* Know the part played by evaporation and condensation in the water cycle
 | **Physics - Forces***Gravity, friction, forces and motion of mechanical devices** Know what gravity is and its impact on our lives
* Identify and know the effect of air and water resistance
* Identify and know the effect of friction
* Explain how levers, pulleys and gears allow a smaller force to have a greater effect

**Physics – Earth and space***Movement of the Earth and the planets*, m*ovement of the Moon*, n*ight and day** Know about and explain the movement of the Earth and other planets relative to the Sun
* Know about and explain the movement of the Moon relative to the Earth
* Know and demonstrate how night and day are created
* Describe the Sun, Earth and Moon (using the term spherical)
 | **Physics - Electricity***Electrical components, simple circuits, fuses and voltage** Draw circuit diagrams using the correct symbols
* Compare and give reasons for why components work/do not work in a circuit.
* Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.

**Physics - Light***How light travels, reflection, ray models of light** Know how light travels
* Know and demonstrate how we see objects.
* Know why shadows have the same shape as the object that casts them.
* Know how simple optical instruments work eg mirror, magnifying glass, periscope, telescope
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| **Spring** |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Biology - Animals, including humans***Skeleton and muscles, Nutrition, Exercise and health** Know about the skeletal and muscular system of a human and some other animals
* Know that humans and some other animals have skeletons and muscles for support, protection and movement
* Know about the importance of a nutritious, balanced diet
* Know how nutrients, water and oxygen are transported within animals and humans

**Physics - Forces***Different forces and magnets** Know about and describe how objects move on different surfaces
* Know how a simple pulley works and use to on to lift an object
* Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
* Know about and explain how magnets attract and repel
* Predict whether magnets will attract or repel and give a reason
 | **Biology – Livings things and their habitats** *Grouping living things*, *classification keys* and a*daptation of living things.** Use classification keys to group, identify and name living things
* Know how changes to an environment could endanger living things.

 **Animals incl humans*** Use and construct food chains to identify producers, predators and prey
 | **Biology – Livings things and their habitats*** Create a timeline to indicate stages of growth in humans

**Animals incl humans***Life cycles – plants and animals, reproductive processes, famous naturalists** Know the life cycle of different living things e.g. mammal, amphibian, insect and bird
* Know the differences between different life cycles
* Know the process of reproduction in animals
 | **Biology – Livings things and their habitats** *Classification of living things and the reasons for it, Identical and non identical off-spring, Fossil evidence and evolution, Adaptation and evolution** Classify living things into broad groups according to observable characteristics and based on similarities and differences
* Know how living things have been classified
* Give reasons for classifying plants and animals in a specific way

**Evolution and inheritance*** Know how the Earth and living things have changed over time
* Know how fossils can be used to find out about the past
* Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents)
* Know how animals and plants are adapted to suit their environment
* Link adaptation over time to evolution
* Know about evolution and can explain what it is
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| **Summer** |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Biology - Plants***Plant life, basic structure and functions, Life cycle and water transportation.** Know the function of different parts of flowing plants and trees
* Know how water is transported within plants
* Know the plant life cycle, especially the importance of flowers.

**Physics - Light***Reflections and shadows.** Know that dark is the absence of light
* Know that light is needed in order to see and is reflected from a surface
* Know and demonstrate how a shadow is formed and explain how a shadow changes shape
* Know about the danger of direct sunlight and describe how to keep protected.

Forces* Identify everyday materials that are attracted to magnets.
* Know about and explain how magnets attract and repel.
* Predict whether magnets will attract or repel items, and give a reason.
 | **Biology - Animals, including humans***Digestive system, teeth, food chains** Identify and name the parts of the human digestive system
* Know the functions of the organs in the human digestive system
* Identify and know the different types of human teeth
* Know the functions of different human teeth

**Physics - Sound***How sounds are made, sound vibrations, pitch and volume** Know how sound is made, associating some of them with vibrating
* Know how sound travels from a source to our ears
* Know the correlation between pitch and the object producing a sound
* Know the correlation between the volume of a sound and the strength of the vibrations that produced it
* Know what happens to a sound as it travels away from its source

**Physics - Electricity***Uses of electricity, simple circuits and switches, conductors and insulators** Identify and name appliances that require electricity to function
* Construct a series circuit
* Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers)
* Predict and test whether a lamp will light within a circuit
* Know the function of a switch
* Know the difference between a conductor and an insulator; giving examples of each.
 | **Chemistry – Properties and changes in materials***Compare properties of everyday materials, soluble/ dissolving, reversible and irreversible substances** Compare and group materials based on their properties, e.g. hardness, solubility transparency, conductivity, [electrical & thermal], and response to magnets
* Know and demonstrate how some materials can be separated, e.g. through filtering, sieving and evaporating
* Know and explain how a material dissolves to form a solution
* Know and show how to recover a substance from a solution
* Know and demonstrate that some changes are reversible and some are not
* Know how some changes result in the formation of a new material and that this is usually irreversible
 | **Biology - Animals, including humans***The circulatory system, Water transportation, Impact of exercise on body** Identify and name the main parts of the human circulatory system.
* Know the function of the heart, blood vessels and blood.
* Know the impact of diet, exercise, drugs and lifestyle on health.
* Know the ways in which nutrients and water are transported in animals, including humans.
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