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| Science Knowledge Map |
| **Upper Key Stage 2 Cycle A** |
| Autumn 1: Evolution and inheritance |
| * I know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
* I know that living things produce offspring of the same king, but that offspring can vary and are not identical to their parents
* I know that variations in offspring may affect their ability to survive
* I know that animals and plants adapt to suit their environment
* I know that adaptation lead to the theory of evolution
* I know about the work or Charles Darwin and Alfred Wallace in the development of the Theory of Evolution

**Working Scientifically*** I can recognise when secondary sources will be most useful to their research ideas and begin to separate opinion from fact, identifying scientific evidence that has been used to support or refute ideas or arguments and how scientific ideas have developed over time.
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| Autumn 2: Electricity |
| * I know that there is an association in the brightness of a lamp with the number and voltage of cells used in the circuit
* I know that component functions can vary including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
* I know what symbols stand for in a simple circuit

**Working Scientifically** |
| Spring 1: Living things  |
| Year 5* I know the differences in the life cycle of mammals, amphibians, insects and birds
* I know the process of reproduction in some plants and animals

Year 6* I know that living things are classified into groups according to common observable characteristics and based on similarities and differences including micro-organisms, plants and animals
* I know that these broad groups (micro-organisms, plants and animals) are subdivided
* I know how to classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals)
* I know reasons why living things are placed into groups and not anther
* I know about the significance of Carl Linnaeus
* I know how to give reasons for classifying plants and animals based on specific characteristics

**Working Scientifically*** I can use my science experiences to raise a variety of my own relevant scientific questions about the world around me.
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| Spring 2: Forces  |
| * I know that gravity is the force that pulls objects down towards the centre of the Earth.
* I know that gravity stops things floating away into space.
* I know when things such as a football go up into the air gravity pulls them down.
* I know that friction happens when two surfaces touch each other
* I know that friction works in the direction opposite to the direction in which the object is moving.
* I know that more friction is produced by rougher surfaces and less friction is produced on smoother surfaces.
* I know that water and air resistance are forms of friction.
* I know that air resistance slows objects down because air slows you down when you move through it.
* I know that air resistance can be helpful, for example to stop a skydiver plummeting to Earth.
* I know to travel faster through air things need to be streamlined.
* I know that water resistance slows objects down because water slows you down as you move through it.
* I know to travel faster through water things need to be streamlined.
* I know that pulleys can be used to make a small force lift a lighter road.
* I know that the more wheels in a pulley the less force is needed to lift a weight.
* I know gears can be used to change the speed, force or direction of a motion.
* I know a lever can be used to make a small force lift a lighter load.

**Working Scientifically*** I can set up and perform increasingly complex scientific enquiries
* I can make their own decisions about what observations to make, which measurements to use, how long to make them for and whether to repeat them.
* I can take increasingly accurate and precise measurements to gather data, choosing from a range of scientific equipment, repeating readings when appropriate and explaining how to use it accurately.
* I can decide how to record observations and data from a choice of familiar approaches.
* I can present their results using increasingly complex scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs
* I can look for different causal relationships in their observations and data, identifying scientific evidence that refutes or supports their ideas
* I can use and develop keys and other information records to identify, classify and describe objects, materials and living things, and identify patterns that may be found in the natural environment
* I can use results to draw conclusions, raise further questions and identify when further tests and observations may be needed, making predictions to set up further comparative and fair tests.
* I can report on results and conclusions of enquiries, including oral and written explanations, displays or presentations, using relevant and increasingly detailed scientific language to discuss, communicate and justify their scientific ideas, including the degree of trust in their results
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| Summer 1 & 2: Light  |
| * I know that light travels in straight lines
* I know that objects are seen because they give out or reflect light into the eye
* I know that we see things because light travels from the light sources to our eyes from light sources to objects and then to our eyes
* I know that shadows have the same shape as the objects that cast them because light travels in a straight line

**Working Scientifically** |

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| **Upper Key Stage 2 Cycle B** |
| Autumn 1 & 2: Animals inc. Humans |
| Year 5:* I know that fertilisation is when male and female sex cells fuse together
* I know that prenatal is the stage where cells grow into a foetus in the nine months prior to being born.
* I know that during infancy there is rapid development. We learn to sit up, walk, talk, and eat.
* I know that during childhood, we continue to grow physically and we develop new skills such as learning to read, swim and ride a bike.
* I know that during adolescents our bodies undergo changes both physically and emotionally.
* I know these physical changes are to enable reproduction during adulthood.
* I know during adulthood
* I know that during old age our hair may go grey and we may lose some of our physical abilities/fitness
* I know that gestation is the period in which a mammal carries her offspring in her body before giving birth
* I know that asexual reproduction is the process where one parent produces new life
* I know that offspring from asexual reproduction are clones
* I know that sexual reproduction is a process where two parents, one male and one female, are needed to produce new life

Year 6:* I know about the main body parts and internal organs (skeletal, muscular and digestive system)
* I know and can identify the main parts of the human circulatory system ()
* I know the function of the heart is to
* I know the function of the blood vessels are to
* I know the function of the blood is
* I know that diet can have an impact on the way the body functions
* I know that exercise can have an effect on the way the body functions
* I know that lifestyle can have an effect on the way the body functions
* I know how nutrients are transported through the body through the process of osmosis

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| Spring 2: Properties and changes of materials |
| * I know that different materials are better suited to particular jobs based upon their properties. For example, a window is glass as it is hard and transparent.
* I know the properties of materials are hardness, transparency, flammable, insulator, conductivity, magnetism and flexibility.
* I know to turn a solid to a liquid it melts, for example ice to water.
* I know to turn a liquid to a solid it freezes, for example water to ice.
* I know that materials can be separated by sieving by separating larger particles from smaller particles such as flour and raisins.
* I know that materials can be separated by filtration where solids get left on the filter paper and liquid goes through such as sand and water
* I know that materials can be separated by evaporation where the liquid turns into a gas leaving the solid particles behind such as salt and water.
* I know a solution is made when solid particles mix with liquid particles.
* I know that materials that dissolve are called soluble, such as sugar and materials that do not dissolve are insoluble, such as sand.
* I know that an insulator does not let heat or electricity travel through it.
* I know that a reversible change is when the material can be changed back to what it was before the change, such as ice melts to form water and can be frozen again to form ice.
* I know that an irreversible change is when something cannot be changed back to its original form and usually a new material is formed, such as taking a raw egg and cooking it-you cannot recover the raw egg.

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| Summer 1 & 2: Earth and Space |
| * I know there are 8 planets in our Solar System (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet.
* I know they all orbit the Sun, which is a star, and they all have moons.
* I know there are also asteroids, meteoroids and comets in the Solar System.
* I know the Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day).
* I know the Earth’s rotation causes day and night.
* I know different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have time zones.

• I know as the Earth rotates, shadows that are formed change in size and orientation.* I know that a solar eclipse occurs when the moon covers part of the earth.
* I know the Earth takes 365 and a quarter days to orbit the Sun.
* I know because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year.
* I know the Moon orbits the Earth anticlockwise and takes approximately 28 days.
* I know the Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon.
* I know the Moon has different phases depending on where it is in its orbit.

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