Science Essential Knowledge

Rationale for assessment

There are relatively few assessment statements as these knowledge statements should be what pupils remember for ever.
In other words, this knowledge should be retained in long term memory.
There is a difference between knowledge which should be retained close to the point of teaching and knowledge which will be retained for ever.
These statements **should not** therefore be assessed directly after the point of teaching, but at a spaced interval to check if it has been embedded in long-term knowledge.

Year 1	
Biology	**Chemistry**
Know how to classify a range of animals by amphibian, reptile, mammal, fish and bird.	Know the properties of everyday materials.
Know how to classify animals by what they eat (carnivore, herbivore and omnivore).	Know the name of the material common objects are made from e.g wood, plastic.
Know to how to identify living and non-living things.	**Physics**
Know the parts of the human body that can be seen.	Know the names of the seasons and the type of weather in each season.
Know and name a variety of common wild and garden plants.	Know that it is not safe to look directly at the sun even when wearing dark glasses.
Know and identify the petals, stem, leaves and root of a flowering plant.	
Know and identify the trunk, roots, branches and leaves of a tree.	

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Year 2	
Biology	**Biology (continued)**
Classify things by living, dead or never lived.	Know and explain how seeds and bulbs grow into plants.
Know how a specific habitat provides for the basic needs of things living there (plants and animals).	Know what plants need in order to grow and stay healthy (water, light & suitable temperature).
Match living things to their habitat.	**Chemistry**
Name some different sources of food for animals.	Know how materials can be changed by squashing, bending, twisting and stretching.
Know about and explain a simple food chain.	Know why a material might or might not be used for a specific job.
Know the basic stages in a life cycle for animals, (including humans).	
Know why exercise, a balanced diet and good hygiene are important for humans.	

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Year 3	
Biology	**Physics**
Know about the importance of a nutritious, balanced diet.	Know about and describe how objects move on different surfaces.
Know how nutrients, water and oxygen are transported within animals and humans.	Know how a simple pulley works and use to on to lift an object.
Know about the skeletal and muscular system of a human.	Know how some forces require contact and some do not, giving examples.
Know the function of different parts of flowing plants and trees.	Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason.
Know how water is transported within plants.	Know that dark is the absence of light.
Know the plant life cycle, especially the importance of flowers.	Know that light is needed in order to see and is reflected from a surface.
Chemistry	Know and demonstrate how a shadow is formed and explain how a shadow changes shape.
Compare and group rocks based on their appearance and physical properties, giving reasons.	Know about the danger of direct sunlight and describe how to keep protected.
Know how soil is made and how fossils are formed.	
Know about and explain the difference between sedimentary, metamorphic and igneous rock.	

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Year 4	
Biology	**Physics**
Identify and name the parts of the human digestive system.	Identify and name appliances that require electricity to function.
Know the functions of the organs in the human digestive system.	Construct a series circuit.
Identify and know the different types of human teeth.	Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
Know the functions of different human teeth.	Predict and test whether a lamp will light within a circuit.
Use and construct food chains to identify producers, predators and prey.	Know the function of a switch.
Use classification keys to group, identify and name living things.	Know the difference between a conductor and an insulator; giving examples of each.
Know how changes to an environment could endanger living things.	Know how sound is made, associating some of them with vibrating.
Chemistry	Know how sound travels from a source to our ears.
Group materials based on their state of matter (solid, liquid or gas).	Know the correlation between pitch and the object producing a sound.
Know the temperature at which materials change state.	Know the correlation between the volume of a sound and the strength of the vibrations that produced it.
Know about and explore how some materials can change state.	Know what happens to a sound as it travels away from its source.
Know the part played by evaporation and condensation in the water cycle.	

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Year 5	
Biology	**Chemistry (continued)**
Know the life cycle of living things e.g. mammal, amphibian, insect and bird.	Know how some changes result in the formation of a new material and that this is usually irreversible.
Know the differences between different life cycles.	**Physics**
Know the process of reproduction in plants.	Know what gravity is and its impact on our lives.
Know the process of reproduction in animals.	Identify and know the effect of air and water resistance.
Create a timeline to indicate stages of growth in humans.	Identify and know the effect of friction.
Chemistry	Explain how levers, pulleys and gears allow a smaller force to have a greater effect.
Compare and group materials based on their properties (e.g. hardness, solubility, transparency…) and response to magnets.	Know about and explain the movement of the Earth and other planets relative to the Sun.
Know and explain how a material dissolves to form a solution.	Know about and explain the movement of the Moon relative to the Earth.
Know and show how to recover a substance from a solution.	Know and demonstrate how night and day are created.
Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating).	Describe the Sun, Earth and Moon (using the term spherical).
Know and demonstrate that some changes are reversible and some are not.	

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Year 5	
Biology	**Biology (continued)**
Identify and name the main parts of the human circulatory system.	Know how animals and plants are adapted to suit their environment.
Know the function of the heart, blood vessels and blood.	Link adaptation over time to evolution.
Know the impact of diet, exercise, drugs and lifestyle on health.	Know about evolution and can explain what it is.
Know the ways in which nutrients and water are transported in animals, including humans.	**Physics**
Classify living things into broad groups according to observable characteristics and based on similarities and differences.	Compare and give reasons for why components work and do not work in a circuit.
Know how living things have been classified.	Draw circuit diagrams using correct symbols.
Give reasons for classifying plants and animals in a specific way.	Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
Know how the Earth and living things have changed over time.	Know how light travels and how simple optical instruments work e.g. periscope.
Know how fossils can be used to find out about the past.	Know and demonstrate how we see objects.
Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).	Know why shadows have the same shape as the object that casts them.