Substantive knowledge curriculum map

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Electricity
Know how to construct simple series circuits.
Know how to represent simple circuit diagrams using symbols.
associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches

Light
Recognise that light appears to travel in straight lines
Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Evolution and Inheritance
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Animals including humans
Know how to name and describe the main parts of the human circulatory system.
Describe how the different blood vessels have different functions.
Explain how body function is affected by diet, exercise, drugs, lifestyle.
Know the ways nutrients are transported around the body.

Living things and their habitats
Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
Give reasons for classifying plants and animals based on specific characteristics.

Earth and Space
Movements of the moon relative to earth
Movement of Earth and other planets relative to the Sun
Sun, Earth and Moon as approximately spherical bodies
Why there is night and day

Materials and their properties
All materials have properties
Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials
What solubility is and how mixtures might be separated.
What electrical and thermal conductivity is
Reversible and irreversible change

Forces
That gravity is a force
Air resistance, water and friction are forces and their effects
Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

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Living things and their habitats
The life cycles of a mammal, amphibian, insect and bird.
The life process of reproduction in some plants and animals.
The impact of David Attenborough.

Animals including huimans
The differences in the life cycles of a mammal, an amphibian, an insect and a bird
The life process of reproduction in some plants and animals.
Describe the changes as humans develop to old age.

Sound
How sounds make vibrations
Sound travels through medium to ear
Patterns between pitch, volume and strength of vibrations
Sound gets fainter as distance increases

States of Matter
Compare and group materials together, according to whether they are solids, liquids or gases
Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

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Animals including humans
Children learn that the Earth is constructed in layers, and the crust is divided into tectonic plates. They study the formation and distribution of mountains, volcanoes and earthquakes and use Mount Etna to identify how human interaction shapes a volcanic landscape.

Living things and their habitats
Group living things in a variety of ways.
Explore and use classification keys to help group.
Identify and name a variety of living things in the local and wider area.
Recognise that environments can change and that this
can sometimes pose dangers to living things.

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Forces and Magnets
How things move on different surfaces
Some forces need contact
Magnets repel, attract
Compare and group materials based on their magnetic properties.
Magnets have two poles

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Use of everyday materials
Materials can be changed by squashing, twisting, bending and stretching
What materials are best for which uses

Living things and their habitats
Functions of different parts of plants
Explore life and growth.
Investigate water transported in plants
Life cycle- flowering plants

Animals including humans
Animals need the right nutrition and cannot make their own food.
Functions of the skeleton/ muscles: support, protect, movement

Rocks and Soils
Different types of rocks and the names of them based on their appearance and physical properties.
How to describe how fossils are formed
Soils made from rocks and organic matter

Lights
Need light to see
Reflection
Light from sun can be dangerous
Shadow formation and changes

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Animals including humans
That offspring grow into adults
Basic needs of humans and animals
Importance of exercise, balanced diet and hygiene

Living things and their habitats- Animals
Differences between living, dead and never alive
Certain habitats provide different needs
Know a variety of plants, animals including micro-habitats
Idea of food chains and sources of food

Living things and their habitats- Plants
Seeds and bulbs grow into plants
Know the different needs of plants

Everyday Materials
Difference between an object and the material it is made from
Name a variety of everyday materials: wood, plastic, metal
Describe the simple physical properties, compare and group a variety of everyday materials.

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Living things and their Habitat-plants
Name, common, wild and garden plants Inc. trees
Identify/ describe the basic structure of a variety of common flowing plants Inc. trees.

Animals including humans
Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
Identify and name a variety of common animals that are carnivores, herbivores and omnivores
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

Seasonal changes
The four seasons and name them
Identify different weathers and links to seasons
Length of day varies each season

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Understanding the World
Use all their senses in hands in hands-on exploration of natural Material.
Explore collection of materials with similar and/or different properties.
Talk about what they see, using a wide vocabulary.
Begin to make sense of their own life-story and family history.
Explore how things work.
Plant seeds and care for growing plants.
Understand the key features of the life cycle of animal and plant.
Begin to understand the need to care and respect for the natural environment and all living things.
Explore and talk about the different forces they can feel.
Talk about the differences between materials and changes they notice.

Personal, Social and Emotional Development
Make healthy choices about food, drinks, activity and toothbrushing.

Communication and Language
Asking and understanding why questions, like: "Why do you think the caterpillar got so fat?"
Learn new scientific vocabulary.
Ask questions to find out more and to check what has been said to them.
Articulate their ideas and thoughts into well formed sentences
Describe events in some detail.
Use talk to help workout problems and organize thinking and activities, and to explain how things work and why they might happen.
Use different vocabulary in different context.

' Learning, growing and living with Jesus '