Science Curriculum INTENT

The Science curriculum at Nethergate intends to take pupils on a voyage of discovery and to provide pupils with the foundations for understanding the world through investigation and experimentation. It intends to provide pupils with the insight of the role Science plays within society and how Science has changed our lives. Enabling the children to develop, apply and embed their skills through curiosity, excitement and engagement. We recognise Science as a key driver to support our pupils to understand the world in which we live. Through hands on exploration, pupils are able to ask questions, test their ideas and in turn develop a greater understanding of the world around them. Pupils asks questions of each other, engage in a more pupil led discussion and can consolidate prior learning through a truly multisensory experience.

Long Term Plan for Science

	Informal	Semi-formal	Formal
Communication	Pupils will communicate through augmentative and alternative communication, gestures, and signs and symbols to make choices and express their likes and dislikes of a variety of scientific based objects. An explorative experience where pupils will have the opportunity to explore and discover. Pupils will be involved in practical first-hand experiences and special events designed to inspire and engage.	Pupils will communicate through key words and will begin to use some scientific vocabulary. This will include making predictions to develop their scientific knowledge and understanding.	Pupils will communicate their predictions orally, signed or written down (and or symbols) and will explain their findings and results. Pupils will use scientific vocabulary and communicate through discussion and debate.
Independence	Pupils will independently engage with and explore a range of scientific materials, living things and physical processes enabling them to discover science through a multisensory experience.	Pupils will independently investigate, observe and begin to predict scientific outcomes and information for themselves to develop their scientific knowledge.	Pupils will independently use their previous learnt knowledge from a range of sources to inform their scientific investigation and experimentation deepening their scientific knowledge and understanding.
Safety	Pupils will engage and explore safe behaviour in and around their familiar surroundings including outside. Pupils will demonstrate safe behaviour around water, for example in the allotment's pond.	Pupils will develop and further inform their knowledge of safety in their familiar surroundings and in the local community. Pupils will develop their knowledge of safety rules in practical science lessons and in around the community.	Pupils will deepen their theoretical understanding and knowledge of safety in science and its purpose and impact on the world around them. Pupils will deepen their knowledge of the importance of personal safety, including suitable equipment to use and wear and explain its importance.
Wellbeing	Pupils will feel a deeper connection to the world around them. Pupils will feel a sense of community and ownership through sensory experience and play	Pupils will develop and further understand the world around them by understanding and feel a sense of belonging through person centred activities	Pupils will deepen their knowledge of scientific concepts, making them more confident to access the wider world.

In **Science**, pupils will be expected to know, understand and apply the following by the end of each learning stage;

Informal	Semi-formal	Formal
Animals, including humans Pupils will discover an awareness of different types of animals and their habitats. Pupils will have the opportunity to go out in to the community to experience animals – Activity – visit the local farm/pet shop/allotment Pupils will discover an awareness of respect and ownership for their immediate environment . for example, tidying up their classroom and looking after their belongings. Pupils will discover an awareness of themselves in relation to others Activities – looking in the mirror/eye contact with others/noticing facial features	Pupils will develop their knowledge of different types of animals, their habitats and life cycles. For example, identifying and labelling basic parts of the human body and describing and comparing the structure of a variety of common animals. Pupils will develop their understanding of the local community and environment though observations e.g. discussing ways of helping the environment, respond to local issues - litter picking, recycling, respecting local environment. (Eco award activities) Pupils will develop their knowledge of the human body Activities – Begin to sequence the human life cycle Label basic parts of the human body – recognise which part of the body is associated with what sense Healthy lifestyle and nutrition	Pupils will deepen their understanding and knowledge of a range of animals, their habitats. How animals adapt to their environments; their food chains e.g. constructing and interpreting a chain using producers, predator and prey etc. They will deepen understanding of reproduction, identification and classification (herbivores, carnivores, vertebrates/invertebrates); the features of a habitat and how and why an animal is suited to their environment including how adaptation may lead to evolution Pupils will deepen their knowledge and understanding of the positive and negative impact on living things of changing environments worldwide e.g. deforestation, climate change, forest fires etc. Pupils will deepen their understanding of the human body Activities – how the body functions Human life cycle Digestive system Skeletal system

Informal	Semi-formal	Formal
Everyday materials Materials (incl. rocks and soils) Pupils will discover a range of materials in their environment Materials - wood, metal, and plastic Activities - handling and testing different materials in the classroom (tough spots), water play, and sand play.	Pupils will develop their knowledge of properties and uses of a range of materials through observation and describing what they see using scientific vocabulary Activities - taking part in investigations/filling containers/experimenting with paper/hard/soft, light/heavy, float/sink.	Pupils will deepen their scientific knowledge and understanding of everyday materials through scientific enquiry Activities – identifying/comparing and grouping Describing properties (transparency, conductivity, magnetism) Identifying solids (hold their shape), liquids (form a pool) and gases (gases escape through gaps).

Rocks Pupils will discover natural materials including a range of rocks and soils through sensory experiences Activities - nature walk around the school grounds/handling different rocks.	Pupils will develop their knowledge of rocks and soils through identification of similarities and differences of various properties Activities - grouping based on colour	Pupils will deepen their knowledge of rocks and soils by comparing and describing their varied uses, properties, processes and what they consist of e.g. formation of fossils and how they give us information on living things that existed millions of years ago and how some have changed over time,. Pupils will group rocks based on their appearance, texture etc. Knowledge that soil is made from organic matter, recognition and identification of different forms of rocks

Informal	Semi-formal	Formal
States of matter Pupils will discover and notice changes in state through experiments and exploratory experiences Activities – Sand/corn flour/water/hot/cold	Pupils will develop their ability to work scientifically by raising questions and carrying out fair tests Activities - solids and liquids (melting) different surfaces and gathering and recording data.	Pupils will deepen their ability to know properties of materials through scientific experiments and predictions of the changes that will occur e.g. texture, appearance, solid, liquids and gases. Water cycle evaporation and condensation, reversible and irreversible changes.

Informal	Semi-formal	Formal
Seasonal changes Pupils will discover different types of weather in their local environment Activities – Going outside in different weather conditions wind/sun/rain **Earth and Space** Pupils will discover space life Activities - experiencing stars/moon/sun in the sky Handling model planets Day and night – sensory room experience	Pupils will develop their ability to identify different types of weather this will include around the world. Pupils will develop and begin to recognise seasonal changes Activities - Identify weather through looking out the window during group time, matching common weather to certain countries by looking at pictures. Sun safety – not to look directly at the sun Pupils will develop their knowledge of the solar system and planets Activities – The sun is a star at the centre of our solar system and it has eight planets The moon is a celestial body Developing the knowledge of the Earth's rotation to understand day and night	Pupils will deepen their knowledge and understanding of seasonal changes through observing and describing variations in weather and day length and making comparisons around the world Activities – Make tables and charts about the weather Create scientific weather charts and compare them in different countries Make displays about what happens in the world around them, including day length as the seasons change Pupils will deepen their knowledge and understanding of the solar system by using previous knowledge to inform. Activities – Describe the movement of the Earth, and other planets, relative to the sun in the solar system

Informal	Semi-formal	Formal
Light and sound Pupils will experience and explore different light and sound sources Activities – Exploring shadows (overhead projector) Light/dark Sensory toys/music cues/loud and quiet in our environment	Develop understanding of uses of light and sound sources and where they come from Light activities – Mirror games to observe light behaviours Sun safety – don't look directly at the sun (how to protect yourself) Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes Sound activities – Musical instruments/movement/vibration	Deepen their knowledge using scientific enquiry to identify a range of light and sound sources. Activities – exploring light phenomena Refraction – using a prism Design a periscope Design and make a shadow puppet Sound activities – Travelling of vibrations to the human ear Link between volume and strength of vibrations

Informal	Semi-formal	Formal
Forces and magnets Pupils will discover force as a result of an action. Activities - opening a door/pushing a swing/rolling objects/pulling a toy/magnets/rolling toy cars down a ramp/rolling objects	Pupils will develop their understanding of forces through investigating, for example observation and practical activities. Activities – observe magnetic attraction/repulsion Recognise magnets have two poles Compare how things move on different surfaces Magnetic or not magnetic Explore everyday uses of different magnets	Pupils will deepen their understanding of forces through scientific enquiry and experimentation Activities – Making observations and predictions Gravity/levers/pulleys/water and air resistance – design and make products Friction – brakes on a bicycle wheel Parachutes – falling paper cones or cupcake cases (fair tests) Water resistance – making and testing boats

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Electricity Pupils will discover different sources of electricity in their own environment. Activities - sensory room, dark and light areas /light switches	Pupils will develop understanding of uses of power to create electricity. Activities – dangers and safety around electricity Knowledge of batteries and their uses	Pupils will use terminology, deepen their scientific knowledge and understanding through experimentation. Pupils will experiment safely with a variety of electrical items. Activities – open and closed circuits Identifying electrical devices

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Plants Pupils will discover plants and flowers in their Environment, for example visiting the school allotment and sensory garden. Activities – Touching plants/Plant hunting/plant seeds	Pupils will develop their ability to recognise parts of a plant and flower. Pupils begin to describe what they see. Activities – visit to the school allotment/sensory garden/local garden centre/local woodland Plant fruit and vegetables in school allotment/use magnifying glasses	Pupils will deepen their knowledge of plants by following a sequence of; studying - identifying – grouping features including classification Activities – labelling parts of a plant/record how plants have changed over time-compare and contrast

Working scientifically - Specifies the understanding of the nature, processes and methods of science for each phase (informal/semi formal and formal) and should not be taught as a separate strand

Informal	Semi-formal	Formal
Working scientifically Explore practical elements, for example experiencing sensory experiences. Working safely is paramount in Science and is embedded in each lesson. Students are taught the importance of personal safety, including suitable equipment to use and wear. There are opportunities within Science to access expertise within the field. For example, visitors during British Science week, Lab 13 scientists and trips. Students have the opportunity to explore personal safety equipment and what to use and wear.	Students will develop their skills using scientific enquiry. Develop problem solving strategies. Working safely is paramount in Science and is embedded in each lesson. Students are taught the importance of personal safety, including suitable equipment to use and wear. There are opportunities within Science to access expertise within the field. For example, visitors during British Science week, Lab 13 scientists and trips. Students are taught the importance of personal safety, including suitable equipment to use and wear.	Deepen their knowledge and ability to record findings, make observations, deepen problem solving strategies and take measurements. Working safely is paramount in Science and is embedded in each lesson. Students are taught the importance of personal safety, including suitable equipment to use and wear. There are opportunities within Science to access expertise within the field. For example, visitors during British Science week, Lab 13 scientists and trips. Students are taught how to recognise complex or hazardous situations and how to respond to them.