



SCIENCE

Vision & Aims

At Moorthorpe, Science will help us to understand the world.

Our Science curriculum aims to ensure that all pupils:

- experience the subject in a practical, hands on way.*
- use scientific language and vocabulary to communicate their understanding.*
- develop curious, enquiring minds that seek to ask questions.*
- are confident enough to make predictions and test them methodically through experiments and observations.*
- recognise the power of rational explanation.*
- show a sense of excitement about natural phenomena.*
- apply scientific thinking such as classifying and grouping across the wider curriculum.*
- are aware of the key scientific thinkers that have shaped our understanding of the world.*
- understand the uses and implications of science, today and for the future.*



High-quality provision for all

Thriving children. Engaged parents. Skilled staff. Remarkable outcomes.



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LONG TERM PLAN

KSI	Cycle 1	Cycle 2
Autumn 1	Plants - Cress Heads	Seasonal Changes - Summer & Autumn
Autumn 2	N/A	N/A
Spring 1	Animals - Pets	Plants - Beanstalks
Spring 2	Seasonal Changes - Winter & Spring	Animals - Farms
Summer 1	Materials - Natural & Man Made	Living Things - Global Habitats
Summer 2	Living Things - Minibeasts	Materials - Recycling

LKS2	Cycle 1	Cycle 2
Autumn 1	Animals - Digestive System	Plants
Autumn 2	N/A	N/A
Spring 1	States of Matter	Light
Spring 2	Electricity	Forces & Magnets
Summer 1	Sound	Rocks
Summer 2	Living Things	Animals - Skeleton & Muscles

UKS2	Cycle 1	Cycle 2
Autumn 1	Electricity	Evolution & Inheritance
Autumn 2	N/A	N/A
Spring 1	Animals - Circulatory System, Diet & Exercise	Materials
Spring 2	Earth & Space	Forces & Magnets
Summer 1	Light	Living Things - Classification
Summer 2	Living Things - Life Cycles	Animals - Changes to Old Age



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WHOLE SCHOOL ENRICHMENT MAP

Term	Cycle 1	Cycle 2
Autumn 1	LKS2: Digestive System - Eureka UKS2: Electricity - Magna	KSI: Tree identification with Frickley Country Park visitors
Autumn 2		
Spring 1	UKS2: Circulatory System - Yorkshire Ambulance First Aid Training.	LKS2: Light. - National Media Museum
Spring 2	UKS2: Space. - Planetarium	KSI: Piglets Adventure Farm UKS2: Forces - National Railway Museum.
Summer 1		LKS2: Rocks - National Coal Mining Museum
Summer 2	KSI: Living Things. RSPB Pond Minibeasts	



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Year	Animals including Humans, Evolution & Inheritance
EYFS	<p><i>Make observations of animals and explain why some things occur, and talk about changes.</i></p>
KSI	<p>Animals including Humans</p> <ul style="list-style-type: none"> - Identify and name a variety of common animals including fish, amphibians, reptiles, mammals and birds - Identify and name a variety of common animals that are carnivores, herbivores and omnivores - Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, and mammals, including pets) - Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. - Notice that animals, including humans, have offspring which grow into adults - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
LKS2	<p>Animals including Humans</p> <ul style="list-style-type: none"> - Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - Identify that humans and some other animals have skeletons and muscles for support, protection and movement - Describe the simple functions of the basic parts of the digestive system in humans - Identify the different types of teeth in humans and their simple functions - Construct and interpret a variety of food chains, identifying producers, predators and prey
UKS2	<p>Animals including Humans</p> <ul style="list-style-type: none"> - Describe the changes as humans develop to old age - Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function - Describe the ways in which nutrients and water are transported within animals, including humans <p>Evolution & Inheritance</p> <ul style="list-style-type: none"> - 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.



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Year	Earth, Space, Seasonal Change, Forces & Magnets
KSI	<p>Seasonal Changes</p> <ul style="list-style-type: none"> - Observe changes across the four seasons - Observe and describe weather associated with the seasons and how day length varies
LKS2	<p>Forces and Magnets</p> <ul style="list-style-type: none"> - Compare how things move on different surfaces - Notice that some forces need contact between two objects, but magnetic forces can act at a distance - Observe how magnets attract or repel each other and attract some materials and not others - 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 - Describe magnets as having two poles - Predict whether two magnets will attract or repel each other, depending on which poles are facing
UKS2	<p>Forces and Magnets</p> <ul style="list-style-type: none"> - Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces - Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect <p>Earth and Space</p> <ul style="list-style-type: none"> - Describe the movement of the Earth, and other planets, relative to the Sun in the solar system - Describe the movement of the Moon relative to the Earth - Describe the Sun, Earth and Moon as approximately spherical bodies - Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky



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Year	Electricity, Light and Sound
LKS2	<p>Electricity</p> <ul style="list-style-type: none"> - Identify common appliances that run on electricity - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers - Recognise some common conductors and insulators, and associate metals with being good conductors - Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery - Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit <p>Light</p> <ul style="list-style-type: none"> - Recognise that they need light in order to see things and that dark is the absence of light - Notice that light is reflected from surfaces - Recognise that light from the sun can be dangerous and that there are ways to protect their eyes - Recognise that shadows are formed when the light from a light source is blocked by a solid object - Find patterns in the way that the size of shadows change <p>Sound</p> <ul style="list-style-type: none"> - Identify how sounds are made, associating some of them with something vibrating - Recognise that vibrations from sounds travel through a medium to the ear - Recognise that sounds get fainter as the distance from the sound source increases - Find patterns between the pitch of a sound and features of the object that produced it - Find patterns between the volume of a sound and the strength of the vibrations that produced it
UKS2	<p>Electricity</p> <ul style="list-style-type: none"> - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a 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 - Use recognised symbols when representing a simple circuit in a diagram <p>Light</p> <ul style="list-style-type: none"> - 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



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Year	Materials, Rocks and States of Matter
EYFS	Know about similarities and differences in relation to objects and materials.
KSI	<p>Materials</p> <ul style="list-style-type: none"> - Distinguish between an object and the material from which it is made - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock - Describe the simple physical properties of a variety of everyday materials - Compare and group together a variety of everyday materials on the basis of their simple physical properties - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching - Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
LKS2	<p>Rocks</p> <ul style="list-style-type: none"> - Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - Describe in simple terms how fossils are formed when things that have lived are trapped within rock - Recognise that soils are made from rocks and organic matter. <p>States of Matter</p> <ul style="list-style-type: none"> - 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.
UKS2	<p>States of Matter</p> <ul style="list-style-type: none"> - Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets - Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - Demonstrate that dissolving, mixing and changes of state are reversible changes - Explain that some changes result in the formation of new materials and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic



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Year	Plants, Living Things & Their Habitats
EYFS	<p>Make observations of animals, discuss similarities and differences in living things, and talk about how environments vary from one to another.</p>
KSI	<p>Plants</p> <ul style="list-style-type: none"> - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - Identify and describe the basic structure of a variety of common flowering plants, including trees. - Observe and describe how seeds and bulbs grow into mature plants - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <p>Living Things & Their Habitats</p> <ul style="list-style-type: none"> - Explore and compare the differences between things that are living, dead, and things that have never been alive - Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - Identify and name a variety of plants and animals in their habitats, including micro-habitats - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
LKS2	<p>Plants</p> <ul style="list-style-type: none"> - Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - Investigate the way in which water is transported within plants - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>Living Things & Their Habitats</p> <ul style="list-style-type: none"> - Recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - Recognise that environments can change and that this can sometimes pose dangers to living things.
UKS2	<p>Living Things & Their Habitats</p> <ul style="list-style-type: none"> - Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - Describe the life process of reproduction in some plants and animals - 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



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Year	Working Scientifically
EYFS	<ul style="list-style-type: none">- Look closely at similarities, differences, patterns and change.- Talk about the features of their own environment.- Explain why some things occur.
KSI	<ul style="list-style-type: none">- Ask simple questions, observe closely and use observations to answer questions.- Perform simple tests.- Identify and classify into given and self-generated groups.- Begin to notice and discuss patterns and relationships.- Gather, record and communicate findings.
LKS2	<ul style="list-style-type: none">- Set up simple practical enquiries, comparative and fair tests.- Make systematic and careful observations, using tables to support.- Take accurate measurements using a range of equipment, including thermometers.- Classify and present data in a variety of ways.- Use results to draw simple conclusions, make predictions and raise further questions.- Look for naturally occurring patterns and relationships.- Know when secondary sources might help them to answer questions.
UKS2	<ul style="list-style-type: none">- Recognise and control variables where necessary when planning scientific enquiries.- Take measurements with increasing accuracy and precision, taking repeat readings when appropriate.- Present data of increasing complexity using a range of scientific diagrams.- Discuss causal relationships and explain the degree of trust in the results.- Use test results to make predictions to set up further tests. develop a new line of enquiry.- Explore and talk about their own ideas.- Recognise that scientific ideas change over time.



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Year	Vocabulary	
EYFS	<i>patterns, change, environment, test, look, see, question, count, measure</i>	
KSI	<p><u>Animals including humans</u> <i>fish, reptiles, mammals, birds, amphibians, herbivore, omnivore, carnivore, leg, arm, elbow, head, ear, nose, back, wings, beak, survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, exercise, hygiene</i></p> <p><u>Plants</u> <i>deciduous, evergreen trees, leaves, flowers, blossom, petals, fruit, roots, bulbs, trunk, stem, branches, seeds, bulbs, water, light, temperature, growth</i></p> <p><u>Seasonal changes</u> <i>summer, spring, winter, autumn, sun, day, moon, night, light, dark</i></p>	<p><u>Everyday materials</u> <i>wood, plastic, glass, paper, water, material, rock, hard, soft, bendy, rough, smooth, stretchy, stiff, shiny, dull, waterproof, absorbent, opaque, transparent, brick, fabrics, squashing, bending, twisting, stretching, elastic, foil</i></p> <p><u>Living things and their habitats</u> <i>living, dead, habitat, energy, food chain, predator, prey, woodland, pond, desert</i></p> <p><u>Working scientifically</u> <i>identify, classify, notice, communicate, observe, relationships, gather, record</i></p>
LKS2	<p><u>Animals including humans</u> <i>movement, muscles, bones, skull, nutrition, skeletons, Mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, herbivore, carnivore, omnivore, canine, incisor, molar</i></p> <p><u>Plants</u> <i>air, light, water, nutrients, soil, reproduction, transportation, dispersal, pollination, flower</i></p> <p><u>Rocks</u> <i>fossils, soils, sandstone, granite, marble, pumice, crystals, absorbent</i></p> <p><u>Light</u> <i>light, shadows, mirror, reflective, dark, reflection</i></p> <p><u>Forces and Magnets</u> <i>magnetic, force, contact, attract, repel, friction, poles, push, pull</i></p>	<p><u>Living things and their habitats</u> <i>vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, environment</i></p> <p><u>States of matter</u> <i>solid, liquid, gas, evaporation, condensation, particles, temperature, freezing, heating</i></p> <p><u>Sound</u> <i>volume, vibration, wave, pitch, tone, speaker</i></p> <p><u>Electricity</u> <i>cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators</i></p> <p><u>Working scientifically</u> <i>accurate, equipment, present, conclusions, enquiries, comparative, fair, systematic, classify, predictions, naturally occurring</i></p>



<p>UKS2</p>	<p><u>Animals including humans</u> <i>foetus, embryo, womb, gestation, baby, toddler, elderly, growth, development, puberty, circulatory, heart, blood vessels, veins, arteries, oxygenated, deoxygenated, valve, exercise, respire</i></p> <p><u>Evolution and inheritance</u> <i>fossils, adaptation, evolution, characteristics, reproduction, genetics</i></p> <p><u>Living things and their habitats</u> <i>mammal, reproduction, insect, amphibian, bird, offspring, classification, vertebrates, invertebrates, micro-organisms, amphibians, reptiles, mammals, insects</i></p> <p><u>Properties and changes of materials</u> <i>hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing</i></p>	<p><u>Earth and Space</u> <i>earth, sun, moon, axis, rotation, day, night, phases of the moon, star, constellation</i></p> <p><u>Forces</u> <i>air resistance, water resistance, friction, gravity, Newton, gears, pulleys</i></p> <p><u>Light</u> <i>refraction, reflection, light spectrum, rainbow, colour</i></p> <p><u>Electricity</u> <i>cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators, amps, volts, cells</i></p> <p><u>Working scientifically</u> <i>variables, precision, causal relationships, repeat readings, complexity, scientific enquiry</i></p>
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