



### Science

Our **intent** for Science is that every child develops an enthusiasm and enjoyment of scientific learning and discovery. Science is an integral part of all learning. As one of the core subjects we give the teaching and learning of Science the profile it requires. Children have individual Science books, a working wall in the classroom to scaffold and support their learning and displays in the corridors to celebrate learning and achievement.

Our **intent** is for children to:

- Develop understanding of the nature, processes and methods of Science through the five different types of enquiries
- Achieve their absolute potential by having the highest expectations of their learning
- Be confident to ask questions, take risks and extend their scientific knowledge
- Develop the essential scientific enquiry skills to deepen their scientific knowledge
- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner.
- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop Science Capital to understand the importance of Science in today's world and inspire them for their future.

We **implement** our Science approach through:

- In EYFS, we implement science through enhancing provision for children to explore scientific concepts such as melting, freezing, floating and sinking. Enquiry Areas are supported by teacher input, as well as children's independence to choose ways to investigate and promote their curiosity. In EYFS, we encourage outside visitors to come and speak to the children to promote opportunities for awe and wonder!
- Science is taught for one afternoon a week through focus groups and challenges
- Each of the 5 types of enquiry (Research, Comparative and Fair Tests, Pattern Seeking, Grouping and Classifying, Observing Over Time) is taught at least once every term.
- Working walls reflect what is being taught, vocabulary, relevant diagrams, photos and display the 5 types of science enquiry characters
- Books that are high quality and show a range of evidence. Teachers have the **highest expectations** and children are proud of their work!
- Regular practical experiments focusing on scientific enquiry
- A **creative and innovative** approach using a range of high quality resources and teaching methods
- Excellent teacher subject knowledge and high order questioning
- Excellent **nurture and relationships** between teacher and children allow them to take risks in their learning, allowing all children opportunities to access Greater Depth learning
- Working scientifically skills are embedded into every lesson to ensure these skills are being developed throughout
- Learning across the curriculum is sequentially planned to build on knowledge and skills



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

The National Curriculum and the North Yorkshire

NySol scheme, provides a structure and skills development for the Science curriculum being taught. This is, where possible, linked to our aim to provide a creative approach, which reflects a balanced programme of study.

The **impact** of our Science approach is children are inspired to demonstrate their scientific knowledge and skills. They are curious to find out how? and why?

### Here's what our children say:

" Science is so fun! Especially when we went outside to do 'super sneezes' "

"This was a strange lesson because we were just given the rocks and not told to do anything. So my group decided to group then in different ways. I liked making up my own mind about what I was going to do."

"I like that in my lessons now I get told the skill that I am going to be using in the lesson because it helps me with my learning."

"You can even do Science in PE and it will help if you want to be a keep fit person or a doctor!"



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

EYFS	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Understanding of the world focus - linking with Animals Including and Humans Seasonal Changes (Y1)</b> Shows care and concern for living things and the environment. Look closely at similarities, differences and patterns and change. Describe weather associated with the Seasons and how the length of the day varies.	<b>Understanding of the world focus – linking with Materials (Y1)</b> Experience and explorations of why things happen and how things work in the 'natural' and 'made' world. Properties of materials. Look closely at similarities, differences and patterns and change.	<b>Understanding of the world focus – linking with Plants and Animals (Y1)</b> Make observations of animals and plants and explain why some things occur, and talk about changes. Can talk about some of the things they have observed such as plants, animals, natural and found objects	<b>Understanding of the world focus – linking with Living Things and their Habitat (Y2)</b> Develop an understanding of growth, decay and changes over time. Know that living things grow and die.	<b>Understanding of the world focus – linking with Seasonal Changes (Y1)</b> Look closely at similarities, differences and patterns and change. Describe weather associated with the Seasons and how the length of the day varies.	<b>Understanding of the world focus – linking with Plants and Animals (Y1)</b> Shows care and concern for living things and the environment. They talk about the features of their own immediate environment and how environments might vary from one another.
<b>Materials Vocabulary</b>	Material, wood, plastic, metal, water, rock, paper, card/cardboard, soft, stretchy, hard, bendy, floppy, waterproof, rough, smooth, shiny, dull.					
<b>Animals, including humans Vocabulary</b>	Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue Head, body, mouth, teeth, leg, tail, wing, claw, feathers, fur, beak, paws, hooves. Names of common animals – cat, dog sheets etc					
<b>Plants Vocabulary</b>	Leaf, flower, fruit, root, seed, branch.					



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Seasonal Changes Vocabulary	Weather (sunny, rainy, windy, snowy etc.) , Seasons (winter, summer, spring, autumn), Sun, Day length					
Working scientifically Vocabulary	Question, look, group, sort, draw.					
KS1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y1	<u>Materials</u> - 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	<u>Materials-</u> 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	<u>Animals</u> 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 - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	<u>Animals</u> 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 - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)  <u>Seasonal Changes</u> Observe changes across the four seasons *Observe and describe weather associated with the seasons and how day length varies	<u>Plants</u> - identify and describe the basic structure of a variety of common flowering plants, including trees identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	<u>Plants</u> - identify and describe the basic structure of a variety of common flowering plants, including trees Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.  <u>Seasonal Changes</u> Observe changes across the four seasons *Observe and describe weather associated with the seasons and how day length varies
	<u>Animals including Humans.</u> - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense  <u>Seasonal Changes</u> Observe changes across the four seasons	<u>Animals including Humans.</u> - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	<u>Plants</u> - identify and describe the basic structure of a variety of common flowering plants, including trees	<u>Plants</u> - identify and describe the basic structure of a variety of common flowering plants, including trees identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	<u>Materials</u> 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	



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

	*Observe and describe weather associated with the seasons and how day length varies					
<b>Materials Vocabulary</b>	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through					
<b>Animals, including humans Vocabulary</b>	Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue, (testicles, vulva – from joint ASE and PHSE Association document) Head, body, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group N.B. The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics. The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals not just meat.					
<b>Plants Vocabulary</b>	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area Names of garden and wild flowering plants in the local area.					
<b>Seasonal Changes Vocabulary</b>	Weather (sunny, rainy, windy, snowy etc.) , Seasons (winter, summer, spring, autumn), Sun, sunrise, sunset, Day length					
<b>Working scientifically Vocabulary</b>	Question, look, group, sort, table, draw, chart,					

National Curriculum Note \* Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

KS1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y2	<u>Plants</u> - 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	<u>Plants</u> - observe and describe how seeds and bulbs grow into mature plants	<u>Plants</u> - observe and describe how seeds and bulbs grow into mature plants	<u>Animals Including Humans</u> - notice that animals, including humans, have offspring which grow into adults	<u>Animals Including Humans</u> - notice that animals, including humans, have offspring which grow into adults	<u>Plants</u> - 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
	<u>Uses of everyday materials</u> - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses  - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching		<u>Animals Including Humans</u> - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	<u>Living things and their habitats</u> - 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 - 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 - explore and compare the differences between things that are living, dead, and things that have never been alive		<u>Living things and their habitats</u> - identify and name a variety of plants and animals in their habitats, including micro-habitats
						<u>Uses of everyday materials</u> - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
Materials Vocabulary	Materials – wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber Properties – rough/smooth, flexible/rigid, strong/weak reflective/non-reflective, transparent/translucent/opaque Changing Shape - squashing, bending, twisting and stretching, pushing and pulling					
Animals, including humans Vocabulary	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)					
Plants Vocabulary	As for year 1 plus - light, shade, sun, warm, cool, water, grow, healthy, (Yr 1 Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area Names of garden and wild flowering plants in the local area.					



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Living Things Vocabulary	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.
Working scientifically Vocabulary	Questioning, observe, record, identify, group, classify, predict, diagram, label, chart, bar chart, table, data.

National Curriculum Note \* Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.





# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Lower KS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Y3</b>	<u><b>Rocks and soils</b></u> Compare and group different rocks based on their properties. Describe how fossils are formed when living things are trapped in rocks. Recognise that soils are made from rocks and organic matter.	<u><b>Forces</b></u> Compare how things move on different surfaces. Notice that some forces need contact but magnetic forces act at distance.	<u><b>Magnets</b></u> .Observe how magnets repel and attract and attract some materials but not others Compare and group materials based on if they are attracted to a magnet, identify magnetic materials. Describe magnets as having two poles. Predict whether two magnets will repel or attract, depending on which poles are facing..	<u><b>Animals, Including humans ( DT Link)</b></u> <i>Identify that animals and humans need the right type and amount of nutrition from the food they eat.            Identify that animals and humans have skeletons and muscles for support protection and movement</i>	<u><b>Plants ( DT Link)</b></u> Name and describe the functions of root, stem, leaves and flowers. Explore the requirements for life and growth. Investigate how water is transported. Life cycle of flowering plant - pollination, seed formation and dispersal.	<u><b>Light</b></u> Recognise that we need light to see and dark is the absence of light. Light reflects from surfaces. Light from the sun is dangerous. How shadows are formed Find patterns in the way that the size of shadows change.
<b>Rocks and soils Vocabulary (Materials)</b>	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil					
<b>Forces Vocabulary</b>	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole					
<b>Animals, including humans Vocabulary</b>	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints					
<b>Plants Vocabulary</b>	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal					
<b>Light Vocabulary</b>	Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous					
<b>Working Scientifically Vocabulary</b>	Sensible questions, predict, observation, research, fair test, accurate, measure, classify, diagrams, graphs, tables, charts, conclusion, explain					





# **Gladstone Road Primary School   Science**

## **Curriculum design, LTP & Vocabulary Progression 2020/2021**

National Curriculum Note\* Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Lower KS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y4	<u>Sound</u> How sounds are made, associating them with something vibrating. Vibrations from sound travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Sounds gets fainter as the distance from the source increases.	<u>Electricity</u> Identify appliances that run on electricity. Construct simple circuits, naming parts, cells, wires, bulbs, switches and buzzers. In a simple circuit identify if the lamp will light. Switches open and close a circuit and associate this with whether or not a lamp will light. Recognise common conductors and insulators and associate metals with being good conductors.	<u>States of matter.</u> Compare and groups materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled. Identify the art played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		<u>Animals, including humans</u> 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.	<u>Living Things and their habitats</u> Living things can be grouped in a variety of ways. Use classification keys to group and identify living things in the local and wider environment. Recognise that environment can change and this can pose danger to living things.
Sound Vocabulary	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation					
Electricity Vocabulary	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol,					
Materials Vocabulary	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle					
Animals. Including humans Vocabulary	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, herbivore, carnivore, omnivore, producer, predator, prey, food chain					
Living Things Vocabulary	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate					



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

### Working Scientifically Vocabulary

Relevant questions, predication, plan, observations, record, research, enquiry, comparative, precise, thermometer, data logger, classify, keys, charts, graphs, conclusion, explanations.

National Curriculum Note\* Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Upper KS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Y5</b>	<u>Properties and changes of Materials</u> Compare and group material on the basis of their properties, including hardness, solubility, transparency, conductivity and responses to magnets. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including sieving, filtering and evaporating. Give reasons based on comparative and fair test, for particular uses of materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible Some changes result in the formation of a new material, and are not reversible.		<u>Earth and Space</u> Describe the movement of the earth and other planets relative to the sun. Describe the movement of the moon relative to earth. Describe the sun, earth and moon as spherical bodies. Use the ideas about the earth's rotation to explain day and night and the apparent movement of the sun across the sky.	<u>Forces</u> Explain that unsupported objects fall towards earth because of gravity acting between earth and the 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 greater effect.	<u>Animals, Including humans</u> Describe the changes as humans develop to old age.	<u>Living things and their habitats</u> Describe the differences in lifecycles of mammals, amphibians, insects and birds. Describe the life process of reproduction in some plants and animals.
<b>Materials Vocabulary</b>	thermal/electrical insulator/conductor, thermal conductivity, burning, melting, solid, liquid, gas, dissolve, solution, soluble, change of state, mixture, insoluble, filter, sieve reversible/non-reversible change, rusting, new material					
<b>Earth and Space Vocabulary</b>	Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune Spherical, Solar system, rotates, star, orbits, planets, axis					
<b>Forces Vocabulary</b>	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears					
<b>Animals, including humans Vocabulary</b>	Puberty, the vocabulary to describe a range of sexual characteristics (Taken from joint ASE/PSHE Ass briefing) gestation period, pregnancy, live birth, sexual reproduction, sperm, ovum, internal fertilisation, external fertilisation, egg					
<b>Living Things Vocabulary</b>	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings					



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

### Working Scientifically Vocabulary

Predication, plan, change variables, observations, record, identify, comparative, precise, scientific diagrams, classification keys, present, Graphs ( line and bar), interpret, evidence, conclusions, patterns.

National Curriculum Note \* Pupils should read, spell and pronounce scientific vocabulary correctly.



# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

Upper KS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Y6	<p><u>Light</u></p> <p>Recognise that light travels in straight lines. Explain that object can be seen because they give out or reflect light into the eye. Use idea that light travels in straight lines to explain why shadows have the same shape as the object that cast it.</p>	<p><u>Electricity</u></p> <p>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 brightness of bulbs, loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.</p>	<p><u>Living Things and their habitats</u></p> <p>Describe how living things are classified into broad groups according to common characteristics and based on similarities and differences, including micro-organisms plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p>	<p><u>Adaptation and evolution</u></p> <p>Recognise that living things have changed overtime 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.</p>	<p><u>Animals, including humans</u></p> <p>Identify and name the main parts of the human circulatory system, describe the function of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their body functions. Describe the ways in which nutrients and water are transported within animals, including humans.</p>	
Light Vocabulary	Straight lines, Light rays. (Y3 vocabulary - Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous)					
Electricity Vocabulary	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage <u>NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably</u>					
Living Things Vocabulary	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering					
Evolution and Inheritance Vocabulary	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils					





# Gladstone Road Primary School Science

## Curriculum design, LTP & Vocabulary Progression 2020/2021

<b>Animals, Including humans Vocabulary</b>	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle
<b>Working Scientifically Vocabulary</b>	Variables to change and keep same, observations, record, repeat, comparative, fair, precise, quantitative measurements, present, systematic, graphs ( scatter, line, bar) patterns, interpret, explanations, relationships, refute, validity

National Curriculum Note \* Pupils should read, spell and pronounce scientific vocabulary correctly.

	Biology		Physics		Chemistry
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