STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

SUBSTANTIVE CONCEPTS

Understanding our bodies	How things live and grow	Materials	Natural world	Forces and energy

DISCIPLINARY CONCEPTS (KS1)

Questioning	Observing and measuring	Identifying and classifying	Gathering and recording	Perform simple tests	Suggest answers to questions

PLUS FOR LOWER KS2

Testing: set up simple practical enquiries, comparative and fair tests	Report on findings and draw conclusions	Make new predictions, suggest improvements and raise further questions	Identifying differences, similarities, patterns or changes	Use scientific evidence to answer questions or support findings

PLUS FOR UPPER KS2

Testing: Plan different types of scientific enquiries (controlling variables where necessary)	Taking measurements and repeated readings when appropriate	Use test results to make predictions and set up further comparative and fair tests	From findings and conclusions, understand causal relationships and degree of trust in results	Use scientific evidence to support or refute ideas / arguments

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1			Year 2		
Animals including humans (2 half terms)	**Everyday materials (2 half terms)**	**Plants (2 half terms)**	**Animals including humans (1 half terms)**	**Uses of Everyday materials (2 half terms)**	**Plants (2 half terms)**
Understanding our bodies How things live and grow	Materials	How things live and grow	How things live and grow	Materials	How things live and grow
Seasonal changes (across the year)			**Living things and their habitats (1 half term)**		
Natural world			How things live and grow		

Year 3			Year 4		
Rocks (1 half term)	**Light (1 half term**	**Forces and magnets (1 half term)**	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Natural world	Forces and energy	Forces and energy	How things live and grow	Materials	Understanding our bodies How things live and grow
Plants (1.5 half terms)	**Animals including humans (1.5 half terms)**		**Sound (1 half term)**	**Electricity (1 half term)**	
How things live and grow	Understanding our bodies		Forces and energy	Forces and energy	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			Year 6		
Living things and their habitats (1 half term)	**Animals including humans (1 half term)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
How things live and grow	Understanding our bodies	Materials	How things live and grow	Understanding our bodies	How things live and grow Natural world
Earth and space (1 half term)	**Forces (2 half terms)**		**Light (1 half term)**	**Electricity (1 half term)**	
Natural world	Forces and energy		Forces and energy	Forces and energy	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1			
Theme	**Animals including humans (2 half terms)**	**Everyday materials (2 half terms)**	**Plants (2 half terms)**
Understanding our bodies	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		
How things live and grow	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).		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.
Materials		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.	
Natural world			
Forces and energy			

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1			
Theme	**Animals including humans (2 half terms)**	**Everyday materials (2 half terms)**	**Plants (2 half terms)**
Questioning	Use the local environment throughout the year to explore, raise their own questions and answer questions about animals in their habitat. Raise their own questions about the body and senses.	Raise and answer their own questions about everyday materials so that they become familiar with the names of materials and properties.	Use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Use magnifying glasses to observe closely. Visit and explore the Wildlife area, allotments and poly tunnel within the school grounds.
Observing and measuring	Make observations about a wide variety of animals. Use simple equipment (for example, magnifying glasses / lenses). Understand how to take care of animals taken from their local environment and the need to return them safely after study. Make observations about body parts. Trip to observe animals e.g. Tropical World in Leeds, Butterfly House in Sheffield or other localities such as Fairburn Ings Nature Reserve, a farm, the Deep and/ or a visit from a local farmer, vet or beekeeper.	Explore, observe, discuss and compare a range of everyday materials.	Where possible, they should observe closely the growth of flowers and vegetables that they have planted. Use simple features to compare growth. Observe changes over time. Use simple measurements and equipment (for example, magnifying glasses, rulers). Environment leaders to lead gardening for class 'welly to belly' projects.
Identifying and classifying	Become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes. Blindfold activities – use senses for smells, tastes, touch.	Identify and classify a range of materials by their properties. Decide how to sort and group them. Identify properties such as: hard/soft; stretchy/ stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Literacy cross curricular links with traditional tale 'The Three Little Pigs'.	Identify and classify common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). Describe how they were able to identify, sort and group them.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1			
Theme	**Animals including humans (2 half terms)**	**Everyday materials (2 half terms)**	**Plants (2 half terms)**
Gathering and recording	Use simple secondary sources to find answers about animals and the human body. Gather, record and communicate their findings and begin to use simple scientific language.	Gather and record their findings and begin to use simple scientific language. Use simple secondary sources to find answers.	Gather and record common names and plant structures. Use simple secondary sources to find answers. Begin to use simple scientific language. Draw diagrams showing the parts of different plants including trees. Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants. ***Study Horse Chestnut and Oak trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.***
Perform simple tests	Experience different types of scientific enquiries, including practical activities. Carry out a simple test. Question: Can we hear as well with one ear as we can with two? (senses and understanding our bodies)	Experience different types of scientific enquiries, including practical activities. Explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. Carry out a simple test. Question: Which is the strongest material to use for a hat for a bear?	Experience different types of scientific enquiries, including practical activities. Carry out a simple test. Question: Do plants need light to grow?
Suggest answers to questions	Answer simple questions from tests. Talk about what they found out and how they found it out.	Answer simple questions from tests. Talk about what they found out and how they found it out.	Answer simple questions from tests. Talk about what they found out and how they found it out.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1			
Theme	**Animals including humans (2 half terms)**	**Everyday materials (2 half terms)**	**Plants (2 half terms)**
Vocabulary	Fish, amphibians, reptiles, birds and mammals, senses, omnivores, carnivores, herbivores	Wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil. Hard/soft, Stretchy/stiff, Shinydull, Rough/smooth, Bendy/not bendy, Waterproof/not waterproof, Absorbent/not absorbent	Wild plants, garden plants, deciduous, evergreen, root, leaves, bud, blossoms, stem, petals, trunk, branches Horse Chestnut, Oak

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1	
Theme	**Seasonal changes (across the year)** **Natural world**
Understanding our bodies	
How things live and grow	
Materials	
Natural world	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.
Forces and energy	
Questioning	Ask questions about the seasons and weather associated with the seasons and day length.
Observing and measuring	Observe and talk about changes in the weather and the seasons. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Use a 'weather display' that is ongoing throughout the year (include for example photos of trees to observe how they change through the seasons). Observe changes over time and, with guidance, notice patterns and relationships.
Identifying and classifying	Present pictures during the seasons and ask the children to name / identify the seasons and the types of weather e.g. hail, rain, snow etc.
Gathering and recording	Find out about the weather, seasons and day length of each season. Use simple secondary sources to find answers. Record and communicate their findings and begin to use simple scientific language. Make tables and charts about the weather; and make displays of what happens in the world around them, including day length, as the seasons change. Make Simple charts about the weather. Simple graph / chart detailing given day length from four seasons.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 1	
Theme	**Seasonal changes (across the year)** **Natural world**
Perform simple tests	Experience different types of scientific enquiries, including practical activities. Take temperatures outside across the four seasons. Use simple measurements and equipment (simple thermometer).
Suggest answers to questions	Suggest answers to simple questions related to weather and day length.
Vocabulary	**Summer, Autumn, Winter, Spring, daytime, weather**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2			
Theme	**Animals including humans (2 half terms)**	**Uses of Everyday materials (2 half terms)**	**Plants (1 half term)**
Understanding our bodies	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		
How things live and grow	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).		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.
Materials		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.	
Natural world			
Forces and energy			

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2			
Theme	**Animals including humans (2 half terms)**	**Uses of Everyday materials (2 half terms)**	**Plants (1 half term)**
Questioning	Ask their own questions about what things animals need for survival and what humans need to stay healthy. Focus should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs.	Asking questions about materials e.g. will it float? Can you squash, bend, twist, stretch it? What is it used for?	
Observing and measuring	Observe through videos, photos or first-hand observation and measurement, how different animals, including humans, grow. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. Observe changes over time. Understand the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals.	Observe a wide range of materials closely. Use simple features to compare them. Observe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Use the local environment throughout the year to observe how different plants grow. Use simple features to compare their growth. Visit and explore the Wildlife area, allotments and poly tunnel within the school grounds. Environment leaders to lead gardening for class 'welly to belly' projects. Observe and understand the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Grow plants in class and observe similar plants at different stages of growth e.g. daffodils, beans. Observe changes over time. Use simple measurements and equipment (for example, magnifying glasses, rulers).

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2			
Theme	**Animals including humans (2 half terms)**	**Uses of Everyday materials (2 half terms)**	**Plants (1 half term)**
Identifying and classifying	Identify and classify stages of growth (as above e.g. egg, chick, chicken).	Identify and classify (and discuss) the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass).	Be able to identify and classify seeds, bulbs and a couple of different plants e.g. daffodils, beans. Decide how to sort and group them.
Gathering and recording	Use simple secondary sources to find answers and carry out research. Record and communicate their findings and begin to use simple scientific language.	Find out and think about the properties of materials that make them suitable or unsuitable for particular purposes and think about unusual and creative uses for everyday materials. Gather, record and compare the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs) Record and communicate their findings and begin to use simple scientific language. Find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Use simple secondary sources to find answers and carry out research.	Record, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb. Begin to use simple scientific language. ***Study Ash and Willow trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.***

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2			
Theme	**Animals including humans (2 half terms)**	**Uses of Everyday materials (2 half terms)**	**Plants (1 half term)**
Perform simple tests		Experience different types of scientific enquiries, including practical activities. Carry out simple tests. Question: Which materials float? Question: What materials work best for elf shoe sculptures? Question: What material would make the best raincoat?	Experience different types of scientific enquiries, including practical activities. Carry out a simple test to show that plants need light and water to stay healthy. Question: What do plants need to stay healthy?
Suggest answers to questions	Suggest ways to find answers to their questions using secondary sources.	Suggest simple answers to questions posed.	Suggest simple answers to questions posed.
Vocabulary	**Offspring, Adults, Survival, Hygiene, Exercise, Nutrition, Reproduction, growth.** **Choose one or two processes of growth examples from the list below to focus on:** **egg, chick, chicken;** **egg, caterpillar, pupa, butterfly;** **spawn, tadpole, frog;** **lamb, sheep.** **baby, toddler, child, teenager, adult.**	Same materials as Year 1 vocabulary focus plus: **squashing, bending, twisting, stretching.** **John Dunlop, Charles Macintosh, John McAdam**	**Seeds, bulbs, mature plants, germination, grow, healthy, survival, reproduction, Ash, Willow**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2	
Theme	**Living things and their habitats (1 half term)** **How things live and grow**
Understanding our bodies	
How things live and grow	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.
Materials	
Natural world	
Forces and energy	
Questioning	They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat. Learn, through questioning, the difference between 'habitat' and 'micro-habitat' and ask questions about this. Learn, through questioning, that all living things have certain characteristics that are essential for keeping them alive and healthy. Raise questions about food chains.
Observing and measuring	Observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Observe animals in familiar habitats and compare these with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Explore the wildlife area and school fields for observing and investigating local habitats and micro-habitats. Use simple equipment (for example, magnifying glasses).
Identifying and classifying	Sort and classify things according to whether they are living, dead or were never alive.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 2	
Theme	**Living things and their habitats (1 half term)** **How things live and grow**
Gathering and recording	Record their findings using charts according to whether they are living, dead or were never alive. Learn about simple food chains and construct a simple food chain that includes humans (e.g. grass, cow, human). Describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there. Use simple secondary sources to find answers. Begin to use simple scientific language.
Perform simple tests	
Suggest answers to questions	Describe how they decided where to place things in a chart of living, dead or never alive, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. Suggest answers to other simple questions.
Vocabulary	**Living, dead, never alive, food chain, human,** **'habitat' (a natural environment or home of a variety of plants and animals)** **'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter).**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Understanding our bodies	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. Identify the different types of teeth in humans and their simple functions.		
How things live and grow			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 plant. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Materials			

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Natural world		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.	
Forces and energy			
Questioning	Ask their own questions about healthy lifestyles. What do we need to keep healthy? Ask about hygiene, changing clothes and brushing teeth. Ask questions about the body (skeleton, muscles and teeth).	Linked with work in geography, pupils should explore and raise questions about different kinds of rocks and soils, including those in the local environment.	Explore their own questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Ask their own questions to understand the relationship between structure and function: the idea that every part has a job to do.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Observing and measuring	Observe and compare movement of animals; exploring ideas about what would happen if humans did not have skeletons.	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe rocks (using a hand lens) including those used in buildings and gravestones, and explore how and why they might have changed over time. Trip to Scarborough to observe different types of rocks and how certain types of rocks e.g. sandstone can be susceptible to landslides and coastal erosion. Observe sea defences and types of rocks used for these.	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe the different stages of plant life cycles over a period of time. Observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.
Identifying and classifying	Identifying and group animals with and without skeletons. Group different animals according to what they eat. Identify the different types of teeth in humans and their simple functions (talk from a local nurse / dentist if possible	Identify and classify rocks (using a hand lens to help them) according to whether they have grains or crystals, and whether they have fossils in them.	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Gathering and recording	Gather and record information to help them compare and contrast the diets of different animals (including their pets). Research different food groups and how they keep us healthy and design meals based on what they find out. Compare the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. Learn about the importance of nutrition and be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Use relevant scientific language to discuss and communicate their ideas/ findings.	Gather and record through research and discussion the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Gather, collect and record data from their own observations and measurements, using notes, simple tables and help to make decisions about how to record and analyse this data. Use relevant scientific language to discuss and communicate their ideas/ findings.	Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use secondary sources to explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Use relevant scientific language to discuss and communicate their ideas/ findings. ***Study Apple and Elder trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.***

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Testing: set up simple practical enquiries, comparative and fair tests		Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Explore different soils and investigate what happens when rocks are rubbed together or what changes occur when they are in water. Raise and answer questions about the way soils are formed. Question: Which rocks are permeable and which wear?	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser. Question: Will my plants thrive in various different conditions? Will my plant thrive if? (children choose various different conditions).
Report on findings and draw conclusions		Report on findings from test and draw conclusions.	Report on findings from test and draw conclusions. Look for naturally occurring patterns and relationships.
Make new predictions, suggest improvements and raise further questions			With support, identify new questions arising from the data. Make new predictions based on testing, suggest improvements and raise further questions... what if? Find ways of improving what they have already done.
Identifying differences, similarities or changes		Identify similarities and differences between soils. Identify and compare differences between rocks found in Scarborough to those found in our local area.	Look at different ways seeds are dispersed.
Use scientific evidence to answer questions or support findings		Use scientific evidence to answer questions from testing.	Use scientific evidence to answer questions from testing.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3			
Theme	**Animals including humans (1.5 half terms)**	**Rocks (1 half term)**	**Plants (1.5 half terms)**
Vocabulary	Nutrition, carbohydrates, protein, fats, fibre, sugars, vitamins, minerals, skeleton, bones, joints, vertebrate, invertebrate, contract / relax, muscles, incisors, canines, molars	Properties, fossils, sedimentary rock, soils, organic matter, grains, crystals	Flowering plants, roots, stem/trunk, leaves, flowers, nutrients / nutrition, transport, pollination, seed formation, seed dispersal, fertiliser, Apple, Elder

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3		
Theme	**Light (1 half term**	**Forces and magnets (1 half term)**
Understanding our bodies		
How things live and grow		
Materials		
Natural world		
Forces and energy	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.	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.
Questioning	Ask questions about shadows. Ask questions about why it is important to protect their eyes from bright lights.	Raise their own questions about how different things move on different surfaces. Raise their own questions about magnets.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3		
Theme	**Light (1 half term**	**Forces and magnets (1 half term)**
Observing and measuring	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe and measure shadows when the light source moves or the distance between the light source and the object changes. Find out how they are formed and what might cause the shadows to change. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Observe and explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves.	Help to make decisions about what observations to make and the type of simple equipment that might be used. Observe and measure (using equipment) how far a toy car can travel on a range of different surfaces. Observe how magnets attract or repel each other and attract some materials and not others. Observe that some forces need contact between two objects, but magnetic forces can act at a distance. Observe that magnets have two poles. Observe how magnets can attract or repel. Observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). Observe and explore the behaviour of different magnets (for example, bar, ring, button and horseshoe). Observe and explore the strengths of different magnets and find a fair way to compare them.
Identifying and classifying		Identify the everyday uses of different magnets (for example, bar, ring, button and horseshoe). Sort / classify materials into those that are magnetic and those that are not. Group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Talk about criteria for grouping, sorting and classifying. Identifying how magnets' properties make magnets useful in everyday items and suggesting creative uses for different magnets.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3		
Theme	**Light (1 half term**	**Forces and magnets (1 half term)**
Gathering and recording	Gather and record data and look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language to discuss and communicate their ideas/ findings.	Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data to help answer questions. Use secondary sources to find out about everyday uses of different types of magnets. Use relevant scientific language to discuss and communicate their ideas/ findings.
Testing: set up simple practical enquiries, comparative and fair tests	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Question: Which materials are transparent, opaque and translucent?	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Carry out tests to find out how far things move on different surfaces. Investigations using ramps and cars for forces. Question: On which surface will the car travel furthest down the ramp?
Report on findings and draw conclusions	Report on findings from test and draw simple conclusions and answer questions.	Report on findings from test and draw simple conclusions and answer questions. With help, look for naturally occurring patterns and relationships.
Make new predictions, suggest improvements and raise further questions		With support, identify new questions arising from the data. Make new predictions based on testing, suggest improvements and raise further questions...what if? Find ways of improving what they have already done
Identifying differences, similarities, patterns or changes	With help, identify differences in shadows depending on the time of day / time of year.	With help, look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 3		
Theme	**Light (1 half term**	**Forces and magnets (1 half term)**
Use scientific evidence to answer questions or support findings	Use scientific evidence to support findings.	Use scientific evidence to support findings.
Vocabulary	**Reflect, surface, sunlight, opaque, transparent, translucent, shadows**	**Force, surface, magnet, magnetic, attract, repel, magnetic poles, North, South**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Understanding our bodies			Describe the simple functions of the basic parts of the digestive system in humans.
How things live and grow	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.		Construct and interpret a variety of food chains, identifying producers, predators and prey.
Materials		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.	
Natural world			
Forces and energy			

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Questioning	Raise and answer their own questions that help them to identify and study plants and animals in their habitat (include a visit to Stanley Nature Reserve). Raise and answer questions based on their observations of animals and what they have found out about other animals that they have researched.	Ask and find answers to questions related to solids, liquids and gases, heating and cooling, evaporation and condensation and the water cycle.	Explore their own questions that help them to understand the special functions of the main body parts associated with the digestive system. Ask their own questions related to food chains.
Observing and measuring	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe a wide variety of vertebrates and invertebrates in the local environment. Observe first hand some of the effects of humans (both positive and negative) on environments, for example, the positive effects of nature reserves, or ponds, and the negative effects of population and development and littering (linked to Stanley Nature reserve trip).	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe and explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. Carry out mini observations to observe ice melt when heat applied, boiling a kettle to observe evaporation and observe condensation when the gas cools down to a liquid again. In addition, observe chocolate as a solid and a liquid and observe the changes when it is heated or cooled. Observe evaporation over a period of time, for example, on a washing on a line. Use thermometers to measure temperatures and weighing scales to measure weight of towels before and after drying.	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe the different stages of plant life cycles over a period of time. Observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Identifying and classifying	Identify how a habitat changes throughout the year. Identify and classify a wide selection of living things that include animals and flowering plants and non-flowering plants. Classify vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. Collect information on local living things. Talk about criteria for grouping, sorting and classifying (use simple keys where appropriate).	Identify and classify a variety of different materials. Compare and group them according to whether they are solids, liquids or gases. Talk about criteria for grouping, sorting and classifying.	Identify the main body parts associated with the digestive system. Identify producers, predators and prey in a food chain. Talk about criteria for grouping, sorting and classifying

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Gathering and recording	Research, gather and record examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Research, gather and record information on how environments changing can pose dangers to living things (link this to endangered species projects). Research, gather and record information on local living things (plants and animals). Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language to discuss and communicate their ideas/ findings. ***Study Sycamore and Silver Birch trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.***	Research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Record findings of tests using bar charts and line graph results. Use relevant scientific language to discuss and communicate their ideas/ findings.	Research, gather and record information about the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and understand their special functions. Draw and discuss their ideas about the digestive system and compare them with models or images. Research, gather and record information about food chains. Use this information to construct and interpret a variety of food chains, identifying producers, predators and prey. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Use relevant scientific language to discuss and communicate their ideas/ findings.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Testing: set up simple practical enquiries, comparative and fair tests	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Question: own question around invertebrates e.g. Do woodlice prefer light or dark? What food do snails prefer?	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Test and explore the effects of temperature on substances such as chocolate, for example, melting different types of chocolate (milk, white and dark). Question: Which type of chocolate will melt the fastest? Test and explore the role played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Investigate the effect of temperature on washing drying. Question: How does temperature affect how fast something dries?	
Report on findings and draw conclusions	Report on findings from test and draw simple conclusions and answer questions.	Report on findings from test and draw conclusions. With help, look for naturally occurring patterns and relationships.	
Make new predictions, suggest improvements and raise further questions		With support, identify new questions arising from the data. Make new predictions based on testing, suggest improvements and raise further questions...what if? Find ways of improving what they have already done.	
Identifying differences, similarities or changes	Identify changes in environments and how this can pose dangers to living things (link to Stanley Nature reserve e.g. littering and to learning why some species are endangered e.g. deforestation, negative effects of population and development).	Identify differences between melting /freezing points of different materials. Identify changes in state of materials.	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4			
Theme	**Living things and their habitats (1 half term)**	**States of matter (2 half terms)**	**Animals including humans (1 half term)**
Use scientific evidence to answer questions or support findings	Use scientific evidence to support findings.	Use scientific evidence to support findings.	
Vocabulary	**Environment, dangers,** **flowering plants – including grasses, non-flowering plants – including mosses and ferns,** **plants, animals,** **vertebrates – fish, amphibians, reptiles, birds, mammals,** **invertebrates – snails, slugs, worms, spiders, insects,** **human impact (negative and positive)** **Sycamore, Silver Birch**	**Solid, liquid, gas, melt, freeze, evaporate, condense, changing state, degrees Celsius, thermometer, water cycle, temperature, water vapour**	**Digestion, mouth, tongue, saliva, oesophagus, transports, stomach, acid, small intestine, large intestine Food chain: sun, producers, consumers, prey, predators**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4		
Theme	**Sound (1 half term)**	**Electricity (1 half term)**
Understanding our bodies		
How things live and grow		
Materials		
Natural world		
Forces and energy	Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. 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. Recognise that sounds get fainter as the distance from the sound source increases.	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. 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. Recognise some common conductors and insulators, and associate metals with being good conductors.
Questioning	Ask their own questions about sound e.g. vibrations, pitch, volume	Ask their own questions about electrical circuits e.g. what if? Ask questions about electrical safety.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4		
Theme	**Sound (1 half term)**	**Electricity (1 half term)**
Observing and measuring	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe how sounds are made, associating some of them with something vibrating. Observe the relationship between the volume of a sound and the strength of the vibrations that produced it. e.g. watching rice jump as the skin of a drum vibrates with increasing strength. Observe and measure how sounds get fainter as the distance from the sound source increases. Learn how to use new equipment (data loggers) appropriately. Observe that vibrations from sounds travel through a medium to the ear e.g. can travel through a wall, through water etc. Make observations about the pitch of a sound and features of the object that produced it (notice patterns). Link to music lessons.	Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Observe patterns, for example, that bulbs get brighter if more cells are added. Observe that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. Observe that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Observe and name some common conductors and insulators, and associate metals with being good conductors.
Identifying and classifying	Identify and explore the way sound is made through vibration in a range of different musical instruments from around the world. Identify how the pitch and volume of sounds can be changed in a variety of ways. Identify patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. Link to music lessons.	Identify common appliances that run on electricity. Talk about criteria for grouping, sorting and classifying e.g. battery or mains operated. Identify and name different components in a circuit including cells, wires, bulbs, switches and buzzers. Identify how to use the components to construct simple series circuits. 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 Identify which materials are conductors and insulators of electricity.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4		
Theme	**Sound (1 half term)**	**Electricity (1 half term)**
Gathering and recording	Record how sounds get fainter as the distance from the sound source increases. Use a data logger. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language to discuss and communicate their ideas/ findings.	Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Learn / find out about precautions of working safely with electricity. Use relevant scientific language to discuss and communicate their ideas/ findings.
Testing: set up simple practical enquiries, comparative and fair tests	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Question: which material provides the best insulation against sound? Use a phone playing music. Insulate the phone using a variety of different materials to investigate which provides the best insulation against sound. Outside sound investigations – observe and record how the sounds get fainter as the distance from the sound source increases. Use a data logger.	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help decide how to set it up. Question: Own question around electrical circuits e.g. What if more bulbs are added to my circuit? Question: Which materials are conductors or insulators of electricity?
Report on findings and draw conclusions	Report on findings and draw simple conclusions.	Report on findings and draw simple conclusions. With help, look for naturally occurring patterns and relationships.
Make new predictions, suggest improvements and raise further questions	Suggest improvements and raise further questions	With support, identify new questions arising from the data. Make new predictions based on testing, suggest improvements and raise further questions...what if? Find ways of improving what they have already done

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 4		
Theme	**Sound (1 half term)**	**Electricity (1 half term)**
Identifying differences, similarities, patterns or changes	Identify differences in the ability of different materials to provide insulation against sound.	With help, look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another.
Use scientific evidence to answer questions or support findings	Use scientific evidence to answer questions or support findings.	Use scientific evidence to answer questions or support findings e.g. metals are good conductors.
Vocabulary	**Vibrate, vibration, data logger, medium, ear, sound, volume, pitch, faint /fainter, distance, loud/ louder, string, percussion, woodwind, brass, insulate, insulation.**	**Appliances, electricity, electrical circuit, current, voltage, battery/ cell, wire, bulb, buzzer, switch, danger, electrical safety, insulators, conductors.**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Understanding our bodies			
How things live and grow			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.
Materials		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. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. 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.	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Natural world			
Forces and energy	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.		
Questioning	Raise questions about the effects of air resistance, water resistance, gravity and friction. Explore ideas and raise different kinds of questions.	Ask and answer questions relating to changes of state including what if? questions. Explore ideas and raise different kinds of questions.	Raise questions about their local environment throughout the year. Raise questions about life cycles and reproduction. Explore ideas and raise different kinds of questions.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Observing and measuring	Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them: choose the most appropriate equipment to make measurements and explain how to use it accurately. Observe the effects of gravity - how different objects such as parachutes and sycamore seeds fall. Observe forces that make things begin to move, get faster or slow down (friction). Observe how some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Observe the effects of water resistance.	Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them: choose the most appropriate equipment to make measurements and explain how to use it accurately. Observe materials dissolving in liquid to form a solution, and observe how to recover a substance from a solution. Observe how mixtures can be separated, including through filtering, sieving and evaporating. Observe how dissolving, mixing and changes of state can be reversed. Observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. Note: Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them.	Make their own decisions about what observations to make. Observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times). Observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. Consider opportunities for observing changes in an animal over a period of time, comparing how different animals reproduce and grow.
Identifying and classifying	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Identify, classify and compare everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Develop keys or other information records to identify, classify and describe materials.	Identify the different stages in the life cycle of a mammal, an amphibian, an insect and a bird. Develop keys or other information records to identify, classify and describe the different stages in the life cycle of living things.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Gathering and recording	Research and find out about gravity. Understand how unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Research and find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.	Research and gather information on how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.	Research and gather information on the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Research the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Report on findings. ***Study Yew and Rowan trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.*** Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Testing: set up simple practical enquiries, comparative and fair tests	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Explore falling objects and the effects of air resistance. Explore forces that make things begin to move, get faster or slow down. Explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Explore the effects of levers, pulleys and simple machines on movement. Explore falling paper cones or cup-cake cases, and design and make a variety of parachutes. Carry out fair tests to determine which designs are the most effective. Explore resistance in water by making and testing boats of different shapes. Experiment using tin-foil boats of different surface areas to observe water resistance. Make products that use levers, pulleys, gears and/or springs and explore their effects. Outdoor learning with catapults (pulleys and levers).	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Explore and compare the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. Explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. Safety guidelines should be followed when burning materials. Carry out tests to answer questions: Question: Does change in the temperature change the saturation rate of substances in liquid?	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Testing: set up simple practical enquiries, comparative and fair tests	Question: Does a larger surface area of a parachute affect the time taken to hit the ground? (air resistance) Question: Does the shape of a boat's hull affect its buoyancy? Question: How does the material affect the force needed to pull an object over the material?		
Report on findings and draw conclusions	Report on findings of tests and draw conclusions.	Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	
Use test results to make predictions and set up further comparative and fair tests	Use test results to identify when further tests and observations might be needed, make predictions and set up further comparative and fair tests.	Use test results to identify when further tests and observations might be needed, make predictions and set up further comparative and fair tests.	
Identifying differences, similarities or changes	Identify differences, similarities or changes e.g. are there similarities / differences between the shapes of boats in those that float / don't float?	Identify differences, similarities or changes during testing.	Suggest reasons for similarities and differences in life cycles of different living things. Identify patterns that might be found in the natural environment.
From findings and conclusions, understand causal relationships and degree of trust in results.	From findings and conclusions, understand causal relationships and degree of trust in results. Discuss – how reliable are these results?	Understand 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.	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5			
Theme	**Forces (2 half terms)**	**Properties and changes of materials (1 half term)**	**Living things and their habitats (1 half term)**
Use scientific evidence to support or refute ideas / arguments	Use scientific evidence to support or refute ideas / arguments.	Use scientific evidence to support the notion that some changes are irreversible.	
Vocabulary	**Gravity, air resistance, water resistance, friction, buoyancy, force, mechanism, lever, pulley, gear, parachute, catapult, Theory of gravitation, Galileo Galilei, Sir Isaac Newton**	**Hardness, solubility, transparency, electrical conductor, thermal conductor, conductivity, response to magnets, dissolve / dissolving, solution, mixing, separating, reversible changes, irreversible changes, filtering, sieving, burning, rusting, magnetism, insulation, Spencer Silver, Ruth Benerito**	**Life cycles, reproduction, sexual, asexual, David Attenborough, Jane Goodall, Yew, Rowan**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5		
Theme	**Animals including humans (1 half term)**	**Earth and Space (1 half term)**
Understanding our bodies	Describe the changes as humans develop to old age.	
How things live and grow		
Materials		
Natural world		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.
Forces and energy		
Questioning	Ask and answer questions related to the changes humans go through from birth to old age, including puberty. Explore ideas and raise different kinds of questions.	Ask questions related to earth and space. Explore ideas and raise different kinds of questions.
Observing and measuring **Taking measurements and repeated readings when appropriate**		Observe models and diagrams of the Sun and Earth that enable them to explain day and night. Observe (through models and diagrams) that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). Observe and understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Note: If no model, use large ball and the children to demonstrate movement of Earth in solar system. 1 in middle with large ball and others at distance away showing how they orbit. Sun large football, Earth small ball, moon a marble.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5		
Theme	**Animals including humans (1 half term)**	**Earth and Space (1 half term)**
Identifying and classifying	Identify the stages in growth and development of humans. Identify puberty within this stage.	Identify on a model or diagram the sun and 8 planets.
Gathering and recording	Research the different stages in the growth and development of humans. Draw a timeline to indicate stages in the growth and development of humans. Find out about the changes experienced in puberty and in the other stages. Record their findings. Research the gestation periods of other animals and compare them with humans; find out and record the length and mass of a baby as it grows. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Find out about and describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Find out about and describe the movement of the Moon relative to the Earth. Find out about and describe the Sun, Earth and Moon as approximately spherical bodies. Find out about and use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Research about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. Find out about and compare the time of day at different places on the Earth through internet links and direct communication. Pupils could create simple models of the solar system or construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day or find out why some people think that structures such as Stonehenge might have been used as astronomical clocks. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.
Testing: Plan different types of scientific enquiries (controlling variables where necessary)		

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 5		
Theme	**Animals including humans (1 half term)**	**Earth and Space (1 half term)**
Report on findings and draw conclusions		
Use test results to make predictions and set up further comparative and fair tests		
Identifying differences, similarities, patterns or changes	Identify differences in gestation periods of other animals (compared to humans).	Identify differences and similarities between the planets e.g. number of moons.
Use scientific evidence to support or refute ideas / arguments		Use scientific evidence to support or refute ideas / arguments about earth and space.
Vocabulary	**Gestation period, growth, development, puberty**	**Earth, sun, moon, planets, stars, asteroids, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, rotate, Aristotle, Ptolemy, Galileo, Copernicus, Brahe, Alhazen, Orbit, Axis, Spherical, Heliocentric, Geocentric, Hemisphere, Season, tilt**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Understanding our bodies		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.	
How things live and grow	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.		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.
Materials			
Natural world			Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
Forces and energy			

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Questioning	Raise questions about living things including micro-organisms, plants and animals. Explore ideas and raise different kinds of questions.	Explore and answer their own questions that help them to understand how the circulatory system enables the body to function. Raise questions about the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Explore ideas and raise different kinds of questions.	Raise questions about local animals and how they are adapted to their environment. Raise questions about fossils and how they provide information about living things from the past. Explore ideas and raise different kinds of questions.
Observing and measuring. Taking measurements and repeated readings when appropriate	Make their own decisions about what observations to make. Directly observe (where possible), commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).	Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them: choose the most appropriate equipment to make measurements and explain how to use it accurately.	Observe local animals to see how they are adapted to their environment. Observe that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (this can be from observing people, photos or videos of animals). Observe fossils.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Identifying and classifying	Build on their learning about grouping living things in year 4 by looking at the classification system in more detail. Understand that broad groupings, such as micro-organisms, plants and animals can be subdivided. 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. Through direct observations where possible, classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). Discuss reasons why living things are placed in one group and not another (giving reasons for classifying plants and animals based on specific characteristics). Use classification systems and keys to identify some animals and plants in the immediate environment.	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Gathering and recording	Research and find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Research and find out about unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. ***Study Hawthorn and Hazel trees changing throughout the seasons, look at their fruit, leaves, mythology surrounding them and historical medicinal properties.*** Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.	Build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system), find out about and understand how the circulatory system enables the body to function. Research and find out about how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. Find out about and describe the ways in which nutrients and water are transported within animals, including humans. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.	Building on what they learned about fossils in the topic on rocks in year 3, research and find out more about how living things on earth have changed over time. Find out that fossils provide information about living things that inhabited the Earth millions of years ago. Research and find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Note: At this stage, pupils are not expected to understand how genes and chromosomes work. Find out about how characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. Appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Gathering and recording			Research and compare how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. Find out about the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.
Testing: Plan different types of scientific enquiries (controlling variables where necessary)		Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Carry out a fair test to recognise the impact of exercise on the way their bodies function. Question: How does a 100m sprint affect a participant's pulse rate?	

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6			
Theme	**Living things and their habitats (1 half term)**	**Animals including humans (1 half term)**	**Evolution and inheritance (2 half terms)**
Report on findings and draw conclusions		Report on findings and draw conclusions	
Use test results to make predictions and set up further comparative and fair tests		Use test results to identify when further tests and observations might be needed, make predictions and set up further comparative and fair tests.	
Identifying differences, similarities or changes	Identify differences and similarities of living things including micro-organisms, plants and animals. Identify patterns that might be found in the natural environment.	Identify patterns between the impact of exercise on heart rate.	Identifying differences, similarities or changes in the way living things have adapted over time.
From findings and conclusions, understand causal relationships and degree of trust in results.		From findings and conclusions, understand causal relationships and degree of trust in results. What is the causal relationship between exercise and heart rate?To what degree can results be trusted?	
Use scientific evidence to support or refute ideas / arguments			Use scientific evidence to support or refute ideas / arguments about evolution and inheritance.
Vocabulary	**Classify, classification, compare, Linnaean, Carl Linnaeus, Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species, Micro-organism, Hawthorn, Hazel**	**Organs, heart, circulatory system, blood vessels, blood, diet, exercise, drugs, alcohol, substances, lifestyle, nutrients.**	**Evolution, adaptation, inherited traits, adaptive traits, natural selection, Inheritance, Charles Darwin, variation, parent, offspring, fossil / fossilisation, environment, habitat, Palaeontologists, Mary Anning, Alfred Wallace, Charles Darwin**

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6		
Theme	**Light (1 half term)**	**Electricity (1 half term)**
Understanding our bodies		
How things live and grow		
Materials		
Natural world		
Forces and energy	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.	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. Use recognised symbols when representing a simple circuit in a diagram.
Questioning	Ask and answer questions about light. Explore ideas and raise different kinds of questions.	Ask and answer questions about electricity and circuits including what if? questions. Explore ideas and raise different kinds of questions.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6		
Theme	**Light (1 half term)**	**Electricity (1 half term)**
Observing and measuring **Taking measurements and repeated readings when appropriate**	Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them: choose the most appropriate equipment to make measurements and explain how to use it accurately. Observe a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, light refracting when beamed through a prism, and coloured filters (they do not need to explain why these phenomena occur). Observe the relationship between light sources, objects and shadows by using shadow puppets. Observe and understand why shadows have the same shape as the objects that cast them. Observe how light bounces off mirrors e.g. in a periscope. Observe how light appears to travel in straight lines. Understand the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Understand that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them: choose the most appropriate equipment to make measurements and explain how to use it accurately. When constructing their own circuits, observe the effects of changing one component at a time in a circuit e.g observe changes to brightness of bulb. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
Identifying and classifying		Identify how the components of a circuit are related their associated symbols (identify symbols). Systematically identify the effect of changing one component at a time in a circuit.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6		
Theme	**Light (1 half term)**	**Electricity (1 half term)**
Gathering and recording	Find out about periscopes. Design and make a periscope and use the idea that light appears to travel in straight lines to explain how it works. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Record recognised symbols when representing a simple circuit in a diagram. Gather, collect and record data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Research and find out about Thomas Edison, Michael Faraday and / or Nikola Tesla. Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.
Testing: Plan different types of scientific enquiries (controlling variables where necessary)	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. Talk about what happens and make predictions. Question: How do optical filters affect light? Question: How does water affect light refraction? Question: How do mirrors affect reflection of light?	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Building on their work in year 4, construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. Note: Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. Design and make a set of traffic lights, a burglar alarm or some other useful circuit. Question: Plan my own fair test to investigate my own question related to a circuit.
Report on findings and draw conclusions	Report on findings and draw conclusions	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. Report on findings and draw conclusions.

STANLEY GROVE ACADEMY

SCIENCE CONCEPT MAP

Ready for school. Ready for life

Year 6		
Theme	**Light (1 half term)**	**Electricity (1 half term)**
Use test results to make predictions and set up further comparative and fair tests		Use test results to identify when further tests and observations might be needed, make predictions and set up further comparative and fair tests.
Identifying differences, similarities, patterns or changes		Identifying differences, similarities, patterns or changes e.g. notice changes when more bulbs / cells are added.
From findings and conclusions, understand causal relationships and degree of trust in results.	From findings and conclusions, look for and understand causal relationships e.g. how water causes light refraction.	From findings and conclusions, look for and understand causal relationships and degree of trust in results e.g. the causal relationship between adding more cells / bulbs and its effect on the circuit. Discuss to what degree can you trust the results
Use scientific evidence to support or refute ideas / arguments	Use scientific evidence to support or refute ideas / arguments	
Vocabulary	**Light, reflect/ reflection, refract / refraction, light source, angle of incidence, angle of reflection, Periscope, Kaleidoscope, Prism, Filters**	**Series circuit, cell, buzzer, lamp / bulb, switches, motors, recognised symbols, volume, voltage, brightness, Thomas Edison, Michael Faraday, Nikola Tesla.**