

Science  
Regis Manor Primary School



Swale  
ACADEMIES  
TRUST

# Intent



We follow a bespoke science curriculum developed by teachers from across Swale Academy Trust who have a particular interest and / or specialism in science. The curriculum developed is engaging, exciting and educational for the children and staff, builds on previous skills and knowledge of the world and is accessible to all students, offering support and challenge where needed. The curriculum at KS2 is split into two cycles to afford meaningful coverage that builds on prior learning.

# Intent

The national curriculum for science aims to ensure that all pupils:

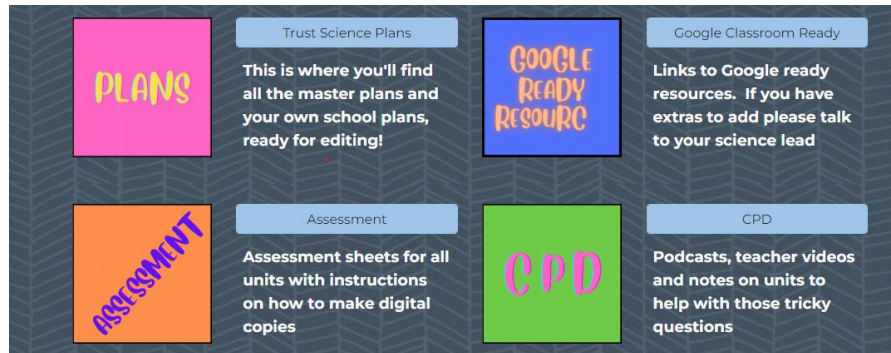
- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

The topics and knowledge/conceptual content in England (i.e. the 'what' of science) are clearly organised into a 'programme of study' for each year group. The *working scientifically* component of the curriculum in England (i.e. the 'how' of science) is organised by key stage and it sets out the practical scientific methods, processes and skills that pupils should be taught to use through their learning of the conceptual content.

# Implementation

Swale Academies Trust Science web page, created by staff across the trust, is a shared platform for all things Swale science! Lesson plans for each unit, resource lists and digital copy resources, assessment sheets and CPD notes and videos are available here and class teachers and HLTAs collaborate to plan lessons based on the program of study which has been developed.

Science lessons are taught once a week in all year groups in KS1 and 2 for a minimum of one hour.



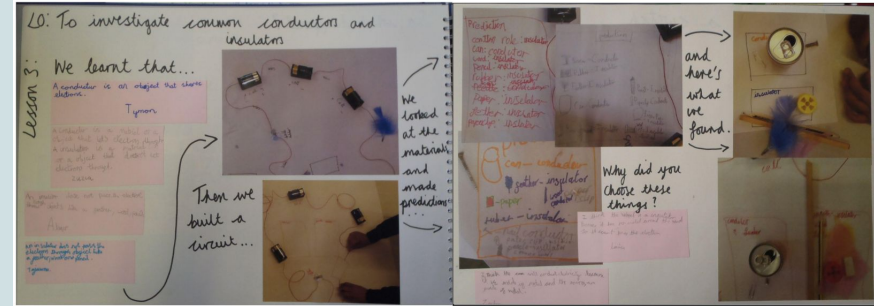
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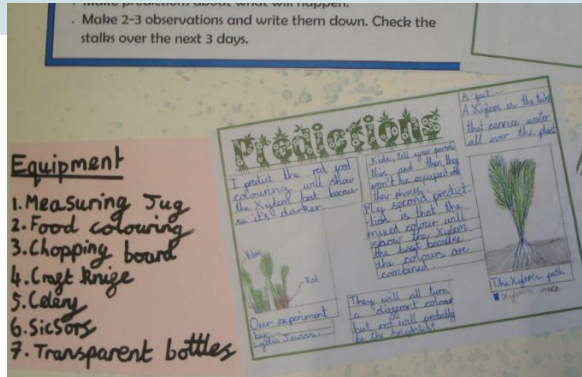
# Implementation

The images on this page and the next show working scientifically requirements:

- Use different types of scientific enquiry
- Setup practical enquiries
- Record and present data in a variety of ways
- Record findings using simple scientific language and tables
- Report findings in displays or presentations



Investigations



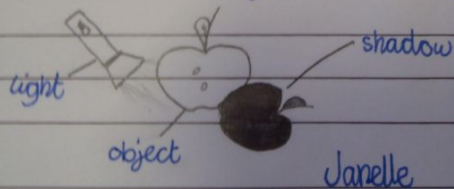
Making predictions



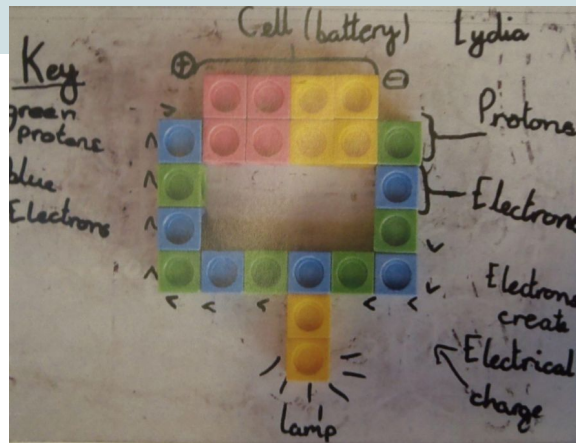
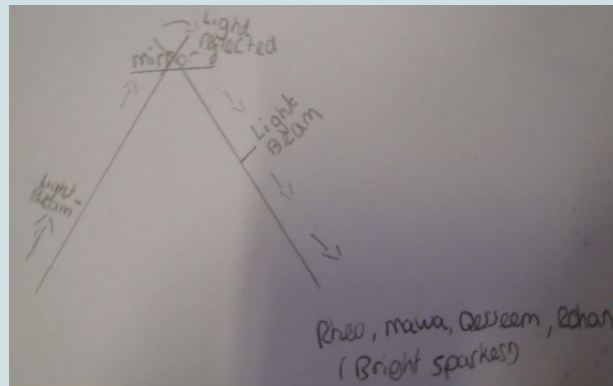
# Implementation

What is a shadow?

A shadow is a dark shape that falls on a surface when something is inbetween the surface and a light.



Recording data and ideas in a variety of ways,  
Reporting findings and presenting enquiries and answering questions  
Using scientific enquiry.



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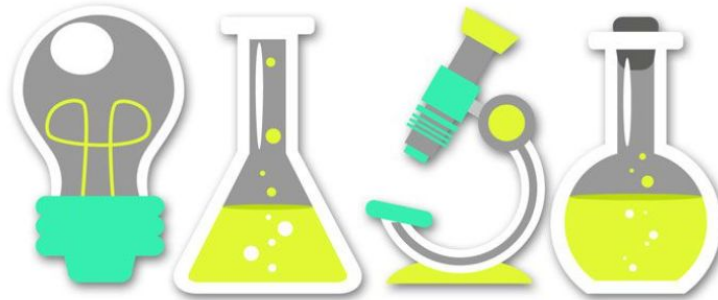


# Inclusive Practice

Lessons are differentiated and scaffolded to ensure all pupils can access content and build skills. Planning allows for individual learning styles and challenge is embedded to develop and build on learning.

Lessons contain a mix of hands on discovery and expression of learning whereby pupils are allowed to present their new knowledge in a way that suits their learning style.

Pupils are encouraged to question concepts and to prove theories and conjectures.



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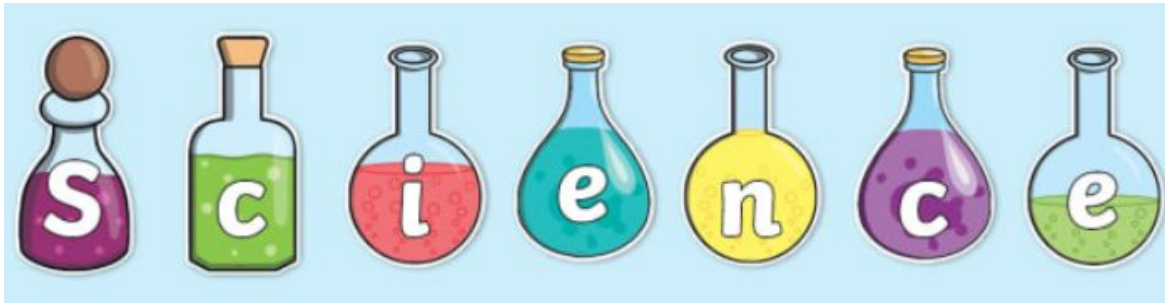


# Impact of the Science curriculum

Children are naturally curious. Science at primary school should nurture this curiosity and allow them to ask questions and develop the skills they need to answer those questions.

Primary science helps pupils to:

- investigate problems
- learn how science works
- discover why science matters in the world.



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# Our Curriculum Coverage

## KS1

	Term 1	Term 2	Term 3 & 4	Term 5 & 6
Year 1	Seasons	Materials	Animals including humans	Plants
Year 2	Materials	Animals including humans	Living things and their habitats	Plants

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# Our Curriculum Coverage

## KS2:

Cycle 1: 2021-2022, 2023-2024

	Term 1	Term 2	Term 3 & 4	Term 5 & 6
Lower Key Stage 2 (Y3-4)	Electricity	Forces	Plants	Animals Including Humans
Upper Key Stage 2 (Y5-6)	Earth and Space	Electricity	Light	Animals Including Humans

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# Our Curriculum Coverage

## Cycle 2: 2020-2021, 2022-2023

	Term 1	Term 2	Term 3 & 4	Term 5 & 6
Lower Key Stage 2 (Y3-4)	Light	Sound	Living things and their habitats	Materials
Upper Key Stage 2 (Y5-6)	Forces	Evolution and inheritance	Materials - changing state	Living things and their habitats

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# Skills Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Areas of study/context	Through year: Seasons Rotation timetable Y1 T1&2 Materials T3&4 Plants T5&6 Animals, including humans	T1&2 Materials T3 Plants T4 Animals, including humans T5&6 Living things and their habitats	2-year rotation: Year 1 Term 1: Forces Year 1 Term 2: Electricity Year 1 Terms 3&4: Plants Year 1 Terms 5&6: Animals, including humans Year 2 Term 1: Light Year 2 Term 2: Sound Year 2 Term 3&4: Living things and their habitats Year 2 Term 5: Rocks Year 2 Term 6: States of matter		2-year rotation: Year 1 Term 1: Electricity Year 1 Term 2: Earth and space Year 1 Terms 3&4: Light Year 1 Terms 5&6: Animals, including humans Year 2 Term 1: Forces Year 2 Term 2: Evolution and inheritance Year 2 Term 3&4: Properties and changing materials Year 2 Term 5&6: Living things and their habitats	
	<p>Working Scientifically:</p> <ul style="list-style-type: none"> <li>asking simple questions and recognising that they can be answered in different ways</li> <li>observing closely, using simple equipment</li> <li>performing simple tests</li> <li>identifying and classifying</li> <li>using their observations and ideas to suggest answers to questions</li> <li>gathering and recording data to help in answering questions</li> </ul> <p>Seasonal Changes:</p> <ul style="list-style-type: none"> <li>observe changes across the 4 seasons</li> <li>observe and describe weather</li> </ul>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> <li>asking simple questions and recognising that they can be answered in different ways</li> <li>observing closely, using simple equipment</li> <li>performing simple tests</li> <li>identifying and classifying</li> <li>using their observations and ideas to suggest answers to questions</li> <li>gathering and recording data to help in answering questions</li> </ul> <p>Materials:</p> <ul style="list-style-type: none"> <li>identify and compare the suitability of a variety of everyday materials,</li> </ul>	<p>Working Scientifically:</p> <ul style="list-style-type: none"> <li>asking relevant questions and using different types of scientific enquiries to answer them</li> <li>setting up simple practical enquiries, comparative and fair tests</li> <li>making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>using straightforward scientific evidence to answer questions or to support their findings</li> </ul>	<p>Working scientifically:</p> <ul style="list-style-type: none"> <li>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>using test results to make predictions to set up further comparative and fair tests</li> <li>reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</li> <li>identifying scientific evidence that has been used to support or refute ideas or arguments</li> </ul> <p>Electricity:</p> <ul style="list-style-type: none"> <li>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>compare and give reasons for variations in</li> </ul>		

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# Skills Progression

<p>associated with the seasons and how day length varies</p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of a variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul> <p><b>Plants:</b></p> <ul style="list-style-type: none"> <li>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul> <p><b>Animals, including humans:</b></p> <ul style="list-style-type: none"> <li>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> </ul>	<p>including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> <p><b>Plants:</b></p> <ul style="list-style-type: none"> <li>observe and describe how seeds and bulbs grow into mature plants</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> </ul> <p><b>Animals, including humans:</b></p> <ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul>	<p><b>Forces and magnets:</b></p> <ul style="list-style-type: none"> <li>compare how things move on different surfaces</li> <li>notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</li> <li>observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>describe magnets as having 2 poles</li> <li>predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><b>Electricity:</b></p> <ul style="list-style-type: none"> <li>identify common appliances that run on electricity</li> <li>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators, and associate metals with being good conductors</li> </ul> <p><b>Plants:</b></p> <ul style="list-style-type: none"> <li>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>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</li> <li>investigate the way in which water is transported within plants</li> <li>explore the part that flowers play in the life cycle of flowering plants, including pollination</li> </ul>	<p>how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> <li>use recognised symbols when representing a simple circuit in a diagram</li> </ul> <p><b>Earth and space:</b></p> <ul style="list-style-type: none"> <li>describe the movement of the Earth and other planets relative to the sun in the solar system</li> <li>describe the movement of the moon relative to the Earth</li> <li>describe the sun, Earth and moon as approximately spherical bodies</li> <li>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul> <p><b>Light:</b></p> <ul style="list-style-type: none"> <li>recognise that light appears to travel in straight lines</li> <li>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</li> <li>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</li> <li>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</li> </ul> <p><b>Animals, including humans:</b></p> <ul style="list-style-type: none"> <li>describe the changes as humans develop to old age</li> <li>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>describe the ways in which nutrients and water are transported within animals, including humans</li> </ul> <p><b>Forces:</b></p> <ul style="list-style-type: none"> <li>explain that unsupported objects fall towards the Earth because of the force of gravity acting</li> </ul>
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# Skills Progression

	<ul style="list-style-type: none"> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul>	<p>Living things and their habitats:</p> <ul style="list-style-type: none"> <li>• explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• 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</li> <li>• identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li>• 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</li> </ul>	<p>seed formation and seed dispersal</p> <p>Animals, including humans:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>• describe the simple functions of the basic parts of the digestive system in humans</li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> <p>Light:</p> <ul style="list-style-type: none"> <li>• recognise that they need light in order to see things and that dark is the absence of light</li> <li>• notice that light is reflected from surfaces</li> <li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>• recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>• find patterns in the way that the size of shadows change</li> </ul> <p>Sound:</p> <ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating</li> <li>• recognise that vibrations from sounds travel through a medium to the ear</li> <li>• find patterns between the pitch of a sound and features of the object that produced it</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• recognise that sounds get fainter as the distance from the sound source increases</li> </ul> <p>Living things and their habitats:</p>	<p>between the Earth and the falling object</p> <ul style="list-style-type: none"> <li>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</li> </ul> <p>Evolution and inheritance:</p> <ul style="list-style-type: none"> <li>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul> <p>Properties of materials:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and <del>gases</del> to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• 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</li> </ul>
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		<ul style="list-style-type: none"> <li>● recognise that living things can be grouped in a variety of ways</li> <li>● explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>● recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul> <p>Rocks:</p> <ul style="list-style-type: none"> <li>● compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>● describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>● recognise that soils are made from rocks and organic matter</li> </ul> <p>States of matter:</p> <ul style="list-style-type: none"> <li>● compare and group materials together, according to whether they are solids, liquids or <u>gases</u></li> <li>● 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)</li> <li>● identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</li> </ul>	<p>Living things and their habitats:</p> <ul style="list-style-type: none"> <li>● describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>● describe the life process of reproduction in some plants and animals</li> <li>● describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including <u>micro-organisms</u>, plants and animals</li> <li>● give reasons for classifying plants and animals based on specific characteristics</li> </ul>
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Click [here](#) to see skills progression in one document.





# Assessment

At the start of each unit, aims and objectives are shared with children.

The unit is reviewed at the end of each term and assessed on its effectiveness and objectives met.

Children are given the opportunity to reflect on their learning and the new skills and knowledge they have gained.

<b>Class Science Review</b>		Class Name: _____
<b>Year 2 - Materials</b>		Teacher: _____
<b>Working Scientifically - practical scientific methods, processes and skills</b>		
asking simple questions and recognising that they can be answered in different ways		
observing closely, using simple equipment, performing simple tests		
identifying and classifying		
using their observations and ideas to suggest answers to questions		
gathering and recording data to help in answering questions.		
<b>Materials Objectives</b>		
I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		
I can identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.		
Using your professional opinion, supported by evidence collected in your Science Big Books, use the above National Curriculum objectives for working scientifically and KS1 materials to identify the children that are working at GDS and WTS. Please provide a brief explanation as to why you have put these children in each category. Use the additional pupil comments box to highlight any children or additional information that you feel is important about the child.		
<b>GDS</b>		I know this because...
<b>WTS</b>		I know this because...
<b>ADDITIONAL PUPIL COMMENTS</b>		