# Year 2
# Science Curriculum

# Whole-school definition of science

**Science** is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.

# Year 2 Overview

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|---|---|
| **Block 1** | Chemistry: Uses of Everyday Materials |
| **Block 2** | |
| **Block 3** | Biology: Living Things and Life Cycles |
| **Block 4** | |
| **Block 5** | Biology: Plants and Animals Including Humans |
| **Block 6** | |

# Year 2 Working Scientifically

(Continuing from year 1)

**New vocab: properties,** observe, test, magnifying glass, object, record, equipment

- **Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science**
- **Know that we can use magnifying glasses to observe objects closely**
- **Know that we can test our questions to see if they are true**
- **Know that objects can be identified or sorted into groups based on their observable properties**
- **Know that we can write down numbers and words or draw pictures to record what we find**

- Sc1/1.1 asking simple questions and recognising that they can be answered in different ways
- Sc1/1.2 observing closely, using simple equipment
- Sc1/1.3 performing simple tests
- Sc1/1.4 identifying and classifying
- Sc1/1.5 using their observations and ideas to suggest answers to questions
- Sc1/1.6 gathering and recording data to help in answering questions

# THE BIG IDEAS OF SCIENCE

Physics
P1: The universe follows unbreakable rules that are all about forces, matter and energy.
P2: Forces are different kinds of pushes and pulls that act on all the matter that is in the universe. Matter is all the stuff, or mass, in the universe.
P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.

Chemistry
C1: All matter (stuff) in the universe is made up of tiny building blocks.
C2: The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter (e.g. hot/cold, soft/hard, light/heavy, etc).
C3: Matter can change if the arrangement of these building blocks changes.

Biology
B1: Living things are special collections of matter that make copies of themselves, use energy and grow.
B2: Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago.
B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.

Earth science
E1: The Earth is one of eight planets that orbit the sun.
E2: The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate.
E3: The Earth is made up of several layers, including a relatively thin rocky surface which is divided into tectonic plates, and the movement of these plates leads to many geologic events (such as earthquakes and volcanoes) and geographical features (such as mountains.)

# Block 1
# Chemistry
# Uses of Everyday Materials

<table>
<tr><td rowspan="2">Year 2 Block 1<br>Uses of Everyday Materials<br>Big Idea(s): C1, C2</td><td>Retrieval vocab: absorption, matter, property<br><br>New vocab: conductor, brick, paper, cardboard, friction, movement, suitability, surface, stretch, twist, waterproof, deformation, flexible, rigid</td></tr>
<tr><td>Composites: I can compare the suitability of a variety of everyday materials, I can describe how solid objects can change shape. Stewardship – Gods creation and not spoiling it. Option for the poor – recycling our toys rights and responsibilities – God gives us all we need to be happy</td></tr>
<tr><td>Week 1 (retrieval)</td><td rowspan="2"><ul><li>Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments</li><li>Know that objects are made from materials such as wood, plastic, glass, metal, water, rock</li><li>Know that materials have properties such as being hard, soft, strong, weak, absorbent, heavy, light, solid, runny, smooth and rough; these descriptions denote the properties of a material</li><li>Know that matter (stuff) is made from tiny building blocks</li></ul></td></tr>
<tr><td>Week 2 (retrieval)</td></tr>
<tr><td>Week 3</td><td rowspan="4"><ul><li>Know that materials can have useful properties for a given job (including being waterproof, strong, hard, soft, flexible, rigid, light or heavy)</li></ul></td></tr>
<tr><td>Week 4</td></tr>
<tr><td>Week 5</td></tr>
<tr><td>Week 6</td></tr>
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Block 2

Chemistry

# Uses of Everyday Materials

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|---|---|
| **Year 2 Block 2**<br>Uses of Everyday Materials<br>Big Idea(s): C1, C2 | **Retrieval vocab:** absorption, matter, property<br><br>**New vocab:** conductor, brick, paper, cardboard, friction, movement, suitability, surface, stretch, twist, waterproof, deformation, flexible, rigid<br><br>I can compare the suitability of a variety of everyday materials, I can describe how solid objects can change shape.<br>**Stewardship – Gods creation and not spoiling it. Option for the poor – recycling our toys rights and responsibilities – God gives us all we need to be happy** |
| **Week 1**<br><br>**Week 2** | • **Know that many types of plastic are waterproof, that steel (a type of metal) is strong, that rock is hard, that cotton wool is soft, that rubber is flexible, that rock is rigid, that polystyrene (a type of plastic) is light and that iron (a type of metal) is heavy** |
| **Week 3**<br><br>**Week 4** | • **Know that when objects move across a surface there is friction when they rub against each other and that sometimes this friction is larger or smaller** |
| **Week 5** | • **Know that applying forces to objects can change their shape, by squeezing, stretching, bending and twisting** |
| **Week 6** | • Know that Isambard Kingdom Brunel was a famous scientist who used materials to build impressive and important things; know that he was an engineer<br>• Know that Brunel lived in the Victorian era and that he designed steamships, railways, bridges, tunnels and dockyards |

# Block 3
# Biology
# Living Things and Life Cycles

<table>
<tr><td rowspan="2">Year 2 Block 3<br>Living Things and Their Life Cycles<br>Big Idea(s): B1, B3</td><td>Retrieval vocab: habitat, growth, absorption, deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, herbivore, carnivore, omnivore<br><br>New vocab: birth, decay, energy, reproduction, microhabitat, dead, life cycle, food chain, source, nutrients, consumption, environment</td></tr>
<tr><td>Composites : I can explain the difference between living, dead and things that have never been alive. I can talk about God's wonderful creation and recognise the beauty in it.</td></tr>
<tr><td>Week 1 (retrieval)<br><br>Week 2 (retrieval)</td><td>• Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments<br>• Know that dandelions, rose bushes, grass, ash trees, birch trees and conifers trees are examples of plants.<br>• Know that trees can be deciduous or evergreen.<br>• Know that a trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal<br>• Know that herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants</td></tr>
<tr><td>Week 3<br><br>Week 4<br><br>Week 5</td><td>• Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.</td></tr>
<tr><td>Week 6</td><td>• Know that there are many kinds of jobs as a scientist including communicator scientist, teacher scientist, technician scientist and explorer scientist<br>• Know that technician scientists are scientists that help other scientists to do their job<br>• Know that explorer scientists try to find out new things that no one has ever learned before; many of the most famous scientists in history were explorer scientists</td></tr>
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# Block 4
# Biology
# Living Things and Life Cycles

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|---|---|
| **Year 2 Block 4**<br>Living Things and Their Life Cycles<br>Big Idea(s): B1, B3 | **Retrieval vocab:** habitat, growth, absorption, deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, herbivore, carnivore, omnivore<br><br>**New vocab:** birth, decay, energy, reproduction, microhabitat, dead, life cycle, food chain, source, nutrients, consumption, environment<br><br>**I can describe how an animal adapts to a habitat. I can talk about God's wonderful creation and recognise the beauty in it.** |
| **Week 1**<br><br>**Week 2** | • **Know that light is a form of energy**<br>• **Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals** |
| **Week 3** | • **Know that the arrows on a food chain show the direction that the energy travels** |
| **Week 4** | • **Know that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice**<br>• Know that sharks are another example – smooth skin and streamlined shape for quick swimming; and gills for breathing underwater |
| **Week 5** | • **Know that cacti are an example of a plant adapted to its environment – thick skin keeps a store of water safe; sharp spikes keep animals from stealing the water**<br>• Know that pine trees are adapted to their environment in that they have thick bark and pine cones to protect against cold winters |
| **Week 6** | • Know that woodlice live under logs – an example of a microhabitat - as they need somewhere dark and damp so that they do not dry out<br>• Know that frogs can live in ponds – an example of a microhabitat - as they water in which to lay their eggs (frogspawn) |

# Block 5
# Biology
# Plants and Animals Including Humans

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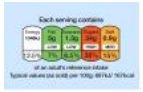
|---|---|
| **Year 2 Block 5**<br>Plants and Animals Including Humans<br>Big Idea(s): B1 | **Retrieval vocab:** growth, habitat, reproduction, nutrients, consumption<br><br>**New vocab:** offspring, adult, bulb, seed, survival, temperature, hygiene, exercise |
| | **I can describe how seeds and bulbs grow into mature plants. I can describe what a plant needs to grow and stay healthy. I can show how to care of the earth. I can talk about how farmers should get a fair wage** |
| **Week 1 (retrieval)** | • **Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments**<br>• **Know that living things move, grow, consume nutrients and reproduce; that dead things use to do these things, but no longer do; and that things that never lived have never done these things** |
| **Week 2 (retrieval)** | |
| **Week 3** | • **Know that seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth)** |
| **Week 4** | • **Know that plants that are deprived of light, food or air will not grow and will die.** |
| **Week 5** | • **Know that plants and animals produce offspring that grow into adults.** |
| **Week 6** | • Know that George Washington Carver was a practical scientist and inventor<br>• Know that he helped farmers in America to grow more crops by showing them the benefits of growing different things at different times and of using fields for different crops |

# Block 6
# Biology
# Plants and Animals Including Humans

| **Year 2 Block 6**<br>Plants and Animals Including Humans<br>Big Idea(s): B1 | **Retrieval vocab:** growth, habitat, reproduction, nutrients, consumption<br><br>**New vocab:** offspring, adult, bulb, seed, survival, temperature, hygiene, exercise |
|---|---|
| | **I can describe how animals, including humans, have offspring which grow into adults, We eare all different and all amazing We look after each other and care for each other** |
| **Week 1** | • **Know that animals, including humans, need food, water and air to survive**<br>• **Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods** |
| **Week 2** | |
| **Week 3** | • **Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)**<br>• **Know that more than half of our diet should be made up of carbohydrates, fruit and vegetables (see diagram below)** |
| **Week 4** | • **Know that fats and sugary foods should be eaten rarely and in small amounts** |
| **Week 5** | • **Know that people need to exercise often to help their body stay strong and fit** |
| **Week 6** | • **Know that keeping clean, including washing and brushing teeth, is an important part of staying healthy** |


Each serving contains
of an adult's reference intake


6-8
a day


Raisins
Chopped tomatoes
Frozen peas
Potatoes
Whole grain cereal
Cous Cous
Porridge
Whole wheat pasta
Bagels
Rice
Spaghetti
Lentils
Beans (cans and sugar)
Tuna
Plain nuts
Chick peas
Soya drink
Milk


Lower fat spread


Sauce
Crisps

# Working Scientifically: Enquiries

| Topic | Small Question | Enquiry | Big Idea | Enquiry Type | Working Scientifically Skill |
|---|---|---|---|---|---|
| **Use of Everyday materials** | What materials could be used to make a good raincoat? | Chn test whether different materials are waterproof, flexible and light. | **C1 and C2:** All matter (stuff) in the universe is made up of tiny building blocks. The arrangement of these building blocks determines the properties of materials. | grouping and classifying<br><br>simple comparative test | Sc2/1.1, Sc2/1.3, **Sc2/1.5 (enquiry write up),** Sc2/1.6 |
| **Uses of Everyday materials** | What materials could be used to make a good bike shed | Chn test whether different materials are strong, hard and waterproof | **C1 and C2:** All matter (stuff) in the universe is made up of tiny building blocks. The arrangement of these building blocks determines the properties of materials. | grouping and classifying<br><br>simple comparative test | Sc2/1.1, Sc2/1.3, **Sc2/1.5 (enquiry write up,** Sc2/1.6 |
| **Living Things and Life Cycles** | Is everything on Earth alive? | Chn sort pictures and specimens into *alive, dead,* and *never alive.* (Include misconceptions like the sun and the sea.) | **B1:** Living things are special collections of matter that make copies of themselves, use energy and grow. | grouping and classifying | Sc2/1.4, Sc2/1.5 |
| **Living Things and Life Cycles** | Do plants grow the same amount every day? | Chn measure the height of a growing plant over a period of days and weeks | **B1:** Living things are special collections of matter that grow. | observing over time | Sc2/1.2, Sc2/1.6 |
| **Plants and Animals Including Humans** | Is all food good for us? | Chn look at a variety of food labels (looking at the traffic light nutrition), comparing which are healthy and why. | **B1:** Living things are special collections of matter that use energy and grow. | finding out using secondary sources | Sc2/1.4, Sc2/1.6 |
| **Plants and Animals Including Humans** | Do all animals start off small? | Chn pair up pictures of a variety of animals with their very young and juvenile forms. | **B1:** Living things are special collections of matter that use energy and grow. | noticing patterns | Sc2/1.4 |