



Wirksworth Junior School. Science skills progression. Year 5. 2020-2021.

Year Group	Properties of materials and changes of state (Autumn Term 1)	Earth and Space (Autumn Term 2)	Living things and their habitats – lifecycles and reproduction (Summer Term 1)	Growth & Development Transition unit (Summer Term 2)	Forces (Summer 2 Term – Transition unit)
Year 5/6 Year A	<p>Galileo Galilei</p> <p>I can 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.</p> <p>I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>I can demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated</p>	<p>Zhang Heng</p> <p>Mae C. Jemison</p> <p>I can describe the movement of the Earth and other planets relative to the sun in the solar system.</p> <p>I can describe the movement of the moon relative to the Earth.</p> <p>I can describe the sun, Earth and moon as approximately spherical bodies.</p> <p>I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<p>Carl Linnaeus</p> <p>I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>I can describe the life process of reproduction in some plants and animals.</p>	<p>Fedichev</p> <p>I can describe the changes as humans develop to old age.</p>	<p>Isaac Newton</p> <p>I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>I can identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>

	with burning and the action of acid on bicarbonate of soda.				
--	---	--	--	--	--

Science	I plan a fair test, recognising the most	I recognise when		I recognise when	I recognise when identifying and	I recognise when	
----------------	--	------------------	--	------------------	----------------------------------	------------------	--

skills

suitable variables to measure, change and keep the same and what equipment to use to make my measurements as accurate as possible.

I select scientific equipment and use it with increasing accuracy, I take repeat readings when appropriate.

I record data and results of increasing complexity.

I present data in line, bar and scatter graphs.

I draw valid conclusions based on the data.

I report and explain causal relationships using scientific ideas,

I evaluate the effectiveness of my fair testing, recognising variables that were difficult to control and where my results were trustworthy.

I use my results to predict and set up further comparative or fair tests.

I identify scientific evidence that supports or refutes ideas or arguments.

variables cannot be controlled and pattern seeking will be the best way to answer my question.

I decide how detailed my needs to be and what equipment to use, to make my measurements/observations as accurate as possible.

I select scientific equipment and use it with increasing accuracy.

I take repeat readings when appropriate.

I record data and results of increasing complexity.

I present data in scatter and frequency charts.

I recognise patterns in results.

I recognise the effect of size on reliability.

I draw valid conclusions from data about patterns and their limitations.

best

terms

observing changes over time will be the best way to answer my question.

I decide how detailed my observations need to be and what equipment to use to make my measurements/measurements as accurate as possible.

I select scientific equipment and use it with increasing accuracy. I take repeat readings when appropriate.

I record data and results of increasing complexity.

I present data in line and scatter graphs.

I recognise the effect of changing the temperature and number of observations.

classifying will be the best way to answer my question. I decide what equipment, tests and secondary sources of information to use to identify and classify things.

I use a series of tests to sort and classify materials.

I use secondary sources to identify and classify things.

I make my own classification using key and branching databases with four or more items.

I use more than one piece of scientific evidence to identify and classify things.

I draw valid conclusions when sorting and classifying.

I report and explain what I have done using scientific ideas.

I evaluate how well my key/branching database worked.

variables need to be controlled and a fair test is the best way to answer my question.

I plan a fair test recognising the need for suitable variables to measure, change and keep the same and what equipment to use to make my measurements as accurate as possible.

I select scientific equipment and use it with increasing accuracy, I take repeat readings when appropriate.

I record data and results of increasing complexity.

I present data in line and scatter graphs.

I draw valid conclusions based on the data.

I report and explain causal relationships using scientific ideas,

I evaluate the effectiveness of my fair testing, recognising variables that were difficult to control and where my results were trustworthy.

		<p>I report and explain terms</p> <p>cause and effect pat using scientific ideas.</p> <p>I evaluate how well looked for patterns.</p> <p>I use my results to predict and set up further sing. pattern see</p>	<p>I draw valid conclusion data about</p> <p>I interpret changes. the data.</p> <p>changes in</p> <p>I report an changes using scientific id explain</p> <p>I evaluate h eas.</p> <p>observed o</p> <p>ow well I</p> <p>I use my re predict and further obs set up</p> <p>ervations.</p>		<p>variables that were</p> <p>difficult to control where my res were trustworthy.</p> <p>I use my resu predict and set up comparative or fair</p> <p>I identify sc evidence that supp refute ideas arguments.</p>
<p>Investigation type focus</p>	<p>Comparative and fair testing</p> <p>How does the temperature of tea affect how long it takes for a sugar cube to dissolve?</p>	<p>Pattern seeking</p> <p>Is there a pattern between the size planet and the ti takes to travel ar the sun?</p> <p>of a ie it ound</p>	<p>Observing over time</p> <p>How does a bean change as i ; germinates?</p>	<p>Identifying, classifying and grouping</p> <p>Can you identify all the stages in the human life cycle?</p>	<p>Comparative and fair testing</p> <p>How does the angle of launch affect how far a paper rocket will go?</p>

Notes and guidance (non-statutory)

The table below contains notes and guidance for each science topic for your year group. These have come from the National Curriculum and might help when planning lessons. This should also help with the progression of learning throughout the school and stop year groups from teaching the same thing twice.

Living things and their habitats

-Pupils should study and raise questions about their local environment throughout the year. They should 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. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.

-Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.

-Pupils might work scientifically by: observing and comparing 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), asking pertinent questions and suggesting reasons for similarities and differences. They

might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.

Animals including humans

-Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.

-Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.

Properties and changes of materials

-Pupils should build a more systematic understanding of materials by exploring and comparing 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. They should explore reversible changes, including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.

-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. Safety guidelines should be followed when burning materials.

-Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. 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.

Earth and space

-Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 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.

-Pupils should find out 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.

-Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.

Forces

-Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should 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. Pupils should explore the effects of levers, pulleys and simple machines on movement.

-Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

-Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.