

## **Upper key stage 2 – Years 5 and 6**

- The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- ‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read, spell and pronounce scientific vocabulary correctly.



## **Upper Key Stage 2 National Curriculum Working Scientifically**

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- 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
- identifying scientific evidence that has been used to support or refute ideas or arguments

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; 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. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.

They should 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. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

They should 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.

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.

# Year 5 Studying Living Things



**Know about the life and work of Sir David Attenborough**



**Know about the life and work of Dame Jane Goodall**



**Learn about sexual reproduction**



**Describe the life cycles of a mammal, bird and reptile**

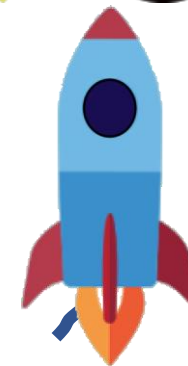


**Describe the life cycle of an insect and amphibian**



**Learn about asexual reproduction**

Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Report and present findings from enquiries, in oral and written forms	David Attenborough, natural sciences, documentary, naturalist, lecture	Create a quiz about Sir David Attenborough h!	The Life of Sir David Attenborough Handout Sir David Attenborough Quiz Handout	They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.	In which year was Sir David Attenborough born? When he was growing up he made collections of which natural objects? Sir David Attenborough is the oldest person to have visited the North Pole. What animals might he have seen on the way there? Put your answers in the right bucket. True or false: Sir David Attenborough became the Controller of BBC2 before going on to become its Director of Programming. Place the following events in Sir David Attenborough's life in the correct order.
Report and present findings from enquiries, in oral and written forms	Jane Goodall, chimpanzee, primatologist, primate, endangered	Research the life and work of Dame Jane Goodall.	<i>A Timeline - Jane Goodall</i> Lining Paper Colouring Pens Paints ICT - research Magazines/internet for pictures and maps Handout	They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.	A person who studies monkeys and apes is called a primatologist. Complete the statement: Jane Goodall is one of the world's leading {{primatologists}}. Her love of these animals began when she was child when she owned a toy chimp called {{jubilee}}. She went on to travel to Tanzania in {{Africa}} to study wild {{chimpanzees}}. Place these animals into the correct bucket. Arrange the following primates in size order, smallest to largest. What do gorillas eat?
Write a report and present your findings	fertilisation, genes, sexual reproduction, pollination, pollen	Produce a storyboard of reproduction in a flowering plant.	<i>Flowering Plant Storyboard</i> Handout Images from internet Pens / pencils / colouring pencils	Describe the life process of reproduction in some plants and animals	Place these animals into the correct buckets. Arrange the following stages of the oak tree into the correct order. Complete the statement: Most plants start off life as {{seeds}}. Under the right conditions the seeds {{germinate}} and grow into {{seedlings}}. They then grow and eventually get big enough to produce their own seeds and this life {{cycle}} continues. Which animal gives birth to the world's biggest baby? Which of the following is not a stage in an animal's life cycle?
Report and present findings from enquiries, in oral and written forms	unborn, egg, hatch, fledgling, mammary gland	Create a lifecycle poster and factfile on an animal of your choice.	<i>Life Cycle Challenge</i> Computers/Books Handout Pens Paper	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Place the animals into the correct bucket. Arrange these stages of the butterfly life cycle into the correct order. Do all birds lay eggs? Which of these animals produce milk to feed their offspring? Which animal has the world's biggest egg?
Comparing the life cycle of a butterfly with two other egg-laying animals.	metamorphosis, larva, pupa, tadpole, butterfly	Comparing the life cycle of a butterfly with two other egg-laying animals.	<i>Life Cycle Comparison</i> Handout	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 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.	What does metamorphosis mean? Where do female butterflies lay their eggs? (Tick all that apply) True or false: Once an insect has gone through metamorphosis, it is called larvae. Order these stages of a butterfly's life cycle. What does a caterpillar wrap itself in to change into a butterfly?
Plan different types of scientific enquiries to answer questions, including controlling variables where necessary	asexual, plantlet, bulb, tuber, bacteria	Clone your own plant cutting and explore how the outcome can be varied.	<i>Method 1</i> Plant (such as strawberries, tomato, basil or chilli), scissors, water, small flowerpot of moist soil, moist rooting powder <i>Method 2</i> Plant (such as strawberries, tomato, basil or chilli), scissors, glass of water, small flowerpot of moist soil	Describe the life process of reproduction in some plants and animals	Place the animals and plants into the correct buckets. True or false: All bacteria reproduce asexually. Sort these organisms that reproduce asexually into size order from the smallest to the largest. Complete the statement: Hydra is a tiny freshwater creature related to the sea {{anemone}}. They are usually brown or green in colour and catch tiny {{organisms}} using the stinging harpoons along their tentacles. They reproduce {{asexually}} by budding, a small lump appears on the side of the body that grows and develops {{tentacles}} before dropping off and living independently. Which of the following reproduce sexually?



# Year 5 Changes of Materials



**Understand that some changes to materials are not reversible**



**Know the difference between physical and chemical change**



**Be able to explain the words dissolve and solution**



**Understand the actions of filtering, sieving, and evaporating**

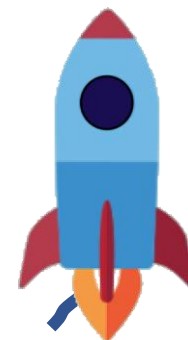


**Understand that a chemical change alters a molecule permanently**



**Know the difference between elements, compounds and mixtures**

Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Report and present findings from enquiries, share your conclusions	bicarbonate of soda, irreversible, permanent, burning, activate	Have a go at today's fun experiment to see if a chemical reaction occurs.	<i>Chemical Reaction or Not?</i> Test Tube, Test Tube Rack Balloons, Vinegar, Water, Bicarbonate of Soda, Handout, <i>Cup Cake Challenge</i> , 110g butter, softened, 110g caster sugar, 110g plain flour, 2 tsp baking powder, ¼ tsp salt, 2 medium eggs, 1 tsp vanilla extract	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	Place the images in the correct buckets, which activities are reversible or irreversible? Complete the statement: Mixing materials together may form a new {{substance}} but not a {{mixture}}, as with {{Plaster of Paris}} and water. A {{chemical}} reaction has taken place in which case a completely new substance has been formed. True or false: Mixing concrete is an irreversible process. What do we call the remains after we have burnt wood? Which of these ingredients would you use to create a cake?
Use existing knowledge to identify physical and chemical processes	physical change, chemical change, rust, iron oxide, properties	Identify chemical and physical changes	Handout Mission Assignment Film Scientific apparatus and equipment (as seen on film) - optional	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	Which of these happens when you saw a piece of wood in half? Which of these would happen if you burnt a piece of wood? True or False - Rust can be produced when iron is mixed with water. Complete the statement: We create {{chemical}} changes in our body when we eat. Inside our stomach and other organs are {{acids}} which convert our food into {{energy}}. This chemical energy allows us to breathe, pump blood around our body and to {{exercise}}. Which of these shows a chemical change and which shows a physical change?
Take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings	solution, dissolve, solute, saturated, solvent	The Dissolving Sugar Challenge!	The Dissolving Sugar Challenge! 2 beakers of water sugar measuring spoon thermometer (optional)	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Demonstrate that dissolving, mixing and changes of state are reversible changes	Place these liquids in the correct buckets. True or false: If a material is saturated it means it can't absorb any more water and when a liquid is saturated it means that no more substance can be dissolved in it. Complete the statement: If you put clay in clear {{water}} and mix it up thoroughly, the liquid will turn {{cloudy}}. If you leave it to stand for a while the {{particles}} will slowly sink to the base of the container. This is an example of a {{suspension}}. What do you call a liquid in which solids can dissolve? Which of these substances can be dissolved in water and then be retrieved by evaporation?
Describing laboratory processes	separate, method, filter, sieve, evaporate	Explain how to separate mixtures	Separating a mixture Handout	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Place the images into the correct bucket. Those that involve filtration and those that don't. Sort the following objects into size order from the smallest to the largest, think about how you would separate them if they were all mixed up. True or false: If you completely dissolve a spoonful of sugar in warm water, then leave it for a long time to evaporate, you will end up with the same amount of sugar left in the cup. Where might you find filtration being used? What do we call a combination of substances that do not react chemically when they are mixed?
Identifying chemical changes	bond, molecule, product, reaction, atom	Identifying the chemical change.	<i>Handout</i>	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	Which of these statements best describes a chemical reaction? True or false: Fireworks are an example of a chemical change. How is a molecule made? How many atoms are there in an oxygen molecule? Put these in order, from when tea leaves are picked to when a cup of tea is consumed.
Identify scientific evidence that has been used to support or refute ideas or arguments	compound, element, mixture, helium, methane	Identifying atoms, elements and compounds by making models to represent them.	<i>Modelling Elements, Compounds and Mixtures</i> Different coloured balls (can use modelling clay) Cocktail Sticks Scissors	Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	True or False: Humans breathe in carbon dioxide and release oxygen. Which of these is a compound and what is an element? Once you've answered, can you work out the difference between an element and a compound? Which of these describes carbon dioxide? (choose all that apply) Which of these is the best description of a compound? Which of these combinations makes up water?





# Year 5 Properties of Materials



**Describe the properties of different materials**



**Compare the properties & uses of different materials**



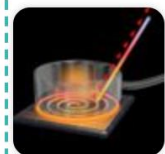
**Make the perfect sandcastle**



**Explore extracting useful substances from natural resources**

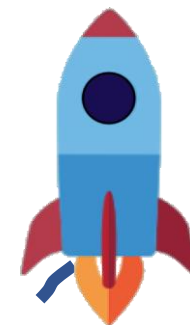


**Explore materials which can be derived from crude oil; explain the importance of carbon compounds in our lives**



**Explore the thermal conductivity of materials to improve energy efficiency in buildings or other systems**

Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Testing properties of materials	hardness, transparency, conductive, magnetic, solubility	Compare the properties of different materials.	Testing Properties Iron nails, wooden batons or doweling, jelly*, wires, bulb, battery, torch, hot water in foil tray, magnet, beaker of warm water, *make several "jelly sticks" in a ice stick tray. Or cut up jelly packs. jelly, don't dilute it.	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	Which of these is the word to test a material's solidity and resistance to pressure and scratching? Which of these would test well when testing how waterproof a material is? (choose all that apply) Which of these needs to be elasticated to function properly? (choose all that apply) True or false: Paper is more absorbent than rubber. Which of these is rigid and which is flexible?
Use test results to make predictions to set up further comparative and fair tests	elastic, durable, absorbency, waterproof, flexibility	Absorbency Investigation.	<i>Kitchen Towel Absorbency Investigation</i> Various brands of kitchen towel , Trays, Pipettes , Water , Measuring jug, <i>Designing a Ball Test</i> , Sponge Balls , Rubber Balls, Plastic Balls , Leather Balls Wooden Balls , Measuring Sticks , Stopwatches , Paper, Pens	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	Which of these could you test various types of balls for, if you wanted to find the perfect tennis ball? Which of these words can be used to describe sponge as a material? (choose all that apply) Which of these is rubber used in because it is resistant and waterproof? True or false: True or False: There are three main types of wood. Which of these is testing for the strength of the item?
Plan a scientific enquiry to answer today's challenge, recognise the controlling variables	bridge, tamp, imagination, damp, unmould	Build the perfect sandcastle!	<i>Build the perfect sandcastle!</i> Tray of dry sand, Jugs of water Small containers for making sandcastles , A range of equipment for measuring volume e.g. beakers, measuring cylinders , Other equipment such as a camera, timers / stopwatches and masses may also be requested by the pupils. <i>Handout</i>	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	What do you need to make the perfect sandcastle? What tool do professional sand sculptors find most useful? Place the images of sandcastles into the correct buckets. Arrange the following list of locations from the most suitable to the least suitable places to build sandcastles. Complete the statement: To make the perfect {{sandcastle}} you need clean, fine {{sand}} and water to hold it together. Once the sand is {{damp}} you shovel it into a bucket and {{tamp}} it down well before tipping the bucket upside-down to {{unmould}} the sandcastle. Hopefully, it will hold together perfectly.
Use test results to make predictions to set up further comparative and fair tests	resource, non-renewable, sustainable, overexploited, renewable	Pigment Painting Challenge!	<i>Pigment Painting Competition</i> Range of natural resources, such as: leaves, soil, bark, stones, vegetables etc. Water-based paint , Paper/card , Scissors Other craft materials, <i>Synthetic Materials Research Task</i> Library to access books and the internet, <i>Handout</i>	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Place the examples of renewable raw materials into the correct buckets. Complete the statement: {{Fossil}} fuels are considered to be a non-renewable {{resource}} because they are formed over {{millions}} of years from dead and decayed organic matter such as trees, other plants and animals. Examples include {{coal}}, oil and natural gas. Which of these forms of power utilise energy from the Sun? Which of the following use the power of water in some way? True or false: Hydroelectric power stations harness the energy of fast-flowing rivers and waterfalls and are usually found in hilly or mountainous regions.
Report and present findings from enquiries, by creating a display	crude oil, bitumen, zooplankton, fraction, hydrocarbon	Create Crude Oil Display.	<i>Crude Oil Collage</i> Magazines Newspapers Catalogues Scissors Glue Paper Pens <i>Crude or Not?</i> Handout	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	True or false: Crude oil is formed underground by the heating and compression of organic materials over millions and millions of years. How many uses for oil are there? Place the items into the correct buckets. Which of these countries are major oil producers? Complete the statement: Crude oil contains {{substances}} called hydrocarbons which are made up of {{hydrogen}} and {{carbon}} atoms. Most crude oil informed from the remains of tiny prehistoric marine {{organisms}} such as zooplankton.
Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings	conduction, thermal conductivity, kelvin, insulation, residential	Thermal Conductivity Investigation	Beakers Water Aluminium foil Thermometers Cardboard 'lids' Stopwatches <i>Handout</i>	Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials	If you leave a metal spoon in a hot saucepan and then try and pick it up, why is it so hot? What is the measurement of thermal conductivity called? Put these objects in order of thermal conductivity - which would get hottest the quickest down to the slowest? Complete the statement: Lots of {{energy}} can heat a cold house in the Winter. Most heat is lost through the {{roof}} so it is important that people {{insulate}} their houses and attics. Another place heat is lost is through glass windows. Nowadays, many people have {{double glazed}} windows to help prevent heat escaping. Which of these materials is useful for insulating a house to prevent heat loss?



## Year 5 Forces



Describe the life and work of Sir Isaac Newton



Understand water resistance and friction



Explore gravity and air resistance



Predict if an object will float or sink

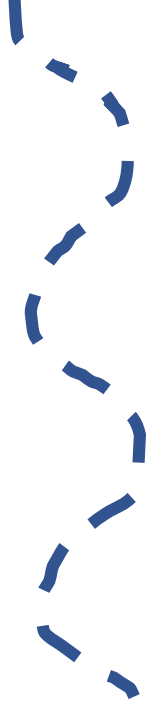
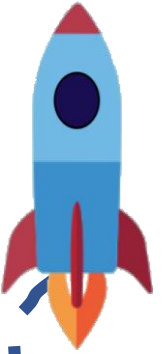


Investigate mechanisms – gears




Investigate mechanisms – levers and pulleys


Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Report and present findings using other presentations	Sir Isaac Newton, prism, gravity, theory, curved mirror	Newton Challenges.	Paper Pens <i>Handout - Mission to Write! Newton Mini-Saga</i>	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	Sort the following by size from the largest to the smallest. Place these items into the correct category. Sort the following planets in order of distance from the Sun, from the nearest to the furthest away. True or false: A prism is a clear triangular object that can separate white light into a variety of colours as it passes through. Complete the statement: {{Telescopes}} are used to study the planets and the stars. They vary enormously in terms of strength; some can reveal the {{craters}} on the Moon, while larger ones can show distant {{galaxies}}. Some telescopes are housed in {{observatories}} on mountain tops above the clouds where the air is clear.
Use test results to make predictions to set up further comparative and fair tests	brake, water resistance, streamlined, paddle, friction	Water drag investigation.	Friction Ramps Metre stick, A short ramp, Different materials; foil, felt, film, sandpaper, bubble wrap, a weight <i>Handout</i>	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Place the items in the correct bucket. Which of these items will help you swim underwater? True or false: Friction is the resistance of motion when objects rub together. List these items in order of the ease with which they would break through the water's surface when dropped into it. Easiest first. Complete this statement: Turtles are well suited for {{swimming}} underwater because they have {{smooth}} shells and large front {{flippers}} that power them through the water and up onto the {{beach}} when they lay their eggs.
Use test results to make predictions to set up further comparative and fair tests	parachute, paragliding, sky diving, gravity, drag	Paper drop investigation	Paper Drop, Metre stick, Stopwatch, Paper, Scissors, Paperclip Make a Parachute String, Plastic carrier, bags, Sticky tape Tangerines (or similar), <i>Handout</i>	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Place these items in the correct buckets. On the Moon a rock and a feather will fall to the ground at the same speed. What are the best materials to make parachutes from? What is the name of the activity where a person is towed behind a boat or vehicle attached to a parachute? Complete the statement: For many years, before {{Galileo}}, people thought that {{heavier}} objects fell faster than light objects. But Galileo demonstrated that {{gravity}} accelerates all objects at the same rate, regardless of their {{mass}}.
Take measurements, use a range of scientific equipment, take repeat accurate readings	mass, volume, buoyant, floating, sinking	Sink or Swim?	Container filled with water tennis ball, golf balls, marbles, ping-pong balls base 10 cube, Calculator mass balance/ scales <i>Handout</i>	They might explore resistance in water by making and testing boats of different shapes. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Place the items into the correct buckets, one for those things that float and one for those that sink. True or false: The mass of an object is measured in kilograms and grams (sometimes pounds and ounces). Complete the statement: When an object {{floats}}, it is because the upwards-acting force provided by the liquid ({{buoyancy}}) is greater than the downwards acting force provided by the weight of the object ({{gravity}}). Sort the following items in order of their density from the greatest to the least. If you fell overboard from a boat which of the following items would you hold on to keep you afloat?
Report and present findings using other presentations	gear, worm gear, rack and pinion, bevel gear, mesh	Create a set of 3 gears which interact with each other.	<i>Create a Set of Gears</i> Cardboard Straws Masking Tape Pencil	Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	True or false: When two gears grind together they rotate in opposite directions. Which of the following are types of gear mechanisms? When gears are connected by a drive belt or chain in which direction do they turn? Place the following gears into the correct bin. In which of these every day objects would you expect to find gears.
Record data using scientific diagrams and labels	load, effort, lever, pivot, fulcrum	Explore how to use a pulley - Why is it better to use a pulley? What are the advantages of using a pulley?	<i>Making a Pulley System</i> , pulley wheels, wooden rod, string rope, scissors, <i>Handout</i>	Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	Complete the statement: {{Pulleys}} are used like {{levers}} to lift heavy loads with less effort over a greater distance. They {{reduce}} the amount of {{effort}} needed to lift a load. Place the correct items into their buckets. Sort these pulley systems into the right order of the amount of effort needed to use them to lift the same weight. From the least effort to the greatest effort. Give examples of levers. True or false: The fulcrum is the place where a lever pivots.




# Year 5 Earth and Space




**Describe Nicolaus Copernicus' ideas about planetary motion**




**Describe the movement of the Earth in space**




**Learn about gravitational force**



**Describe the characteristics of the planets in our solar system**

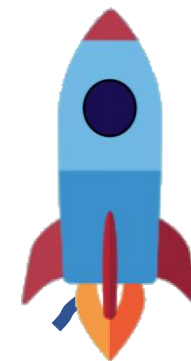


**Describe the Big Bang theory**




**Explore what causes the different phases of the Moon**

Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Use existing knowledge to create a model of the solar system.	heliocentric, geocentric, Nicolaus Copernicus, orbit, Ptolemy	Create your own Solar System.	Planet Mobile 1. <i>Papier Mâché model</i> , 9 balloon, Newspaper, PVA glue, Bowl, Water, Rings to stand balloons on while they are drying, Paint, Paintbrushes, String , 2. <i>Ball Model</i> , 8 polystyrene balls of different sizes, Paint, Paintbrushes, String , <i>Handout - Mission to Write! Copernicus' Theory</i>	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.	Complete the statement: For thousands of years people believed that the Sun, stars and other {{planets}} circled the Earth. Then, in the early 1500s, an {{astronomer}} in Poland called Nicolaus Copernicus, suggested a theory that said the {{Sun}} was at the centre of our {{solar system}} and the Earth and all the other planets rotated around it. The asteroid belt lies between the orbits of which two planets in our Solar System? True or false: It takes about eight seconds for the light from the Sun to reach Earth. Sort these planets in order of the number of 'moons' they have. Place these planets into the correct place.
Record data using scientific diagrams and labels	axis, season, poles, eclipse, hemisphere	Create a diagram / drawing which shows the movement of Earth around the sun, indicating how day and night occur where you live.	Pencils Paper Colouring Pencils	Describe the movement of the moon relative to the Earth Describe the sun, Earth and moon as approximately spherical bodies	Arrange these planets in order of distance from the Sun from the nearest to the furthest. How far is the Earth from the Sun? Place the photographs of these heavenly bodies in the correct boxes, either within our solar system or beyond. Which of these planets are bigger than the Earth? The Earth rotates fully once every 24 hours.
Using test results to make predictions to set up further comparative and fair tests	ocean tides, gravitational force, black hole, mass, celestial	Does weight affect how fast the balls will fall?	<i>Handout</i> Modelling clay Weighing scales Metre stick Stopwatch (optional) Camera (optional)	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Place the images in the correct bucket. Those that show tidal situation and those that show a non-tidal situation. True or false: The gravitational pull on the Moon is about a sixth that on Earth. That means that if you weighed yourself on the Moon you would weigh a sixth of your normal weight, but you would also be wearing a very heavy space suit. Complete the statement: The {{Moon}} has less gravity than Earth, but its gravity still affects us. The gravity of the Moon {{pulls}} on the waters of the {{oceans}} here on Earth. This gravitational pull causes the {{tides}} which are the regular patterns by which the ocean's water rises and falls. What is at the centre of every galaxy? Which of the following become more accessible at low tides?
Apply knowledge and understanding	rocky planets, gas planets, dwarf planet, moon, solar system	Heather and Jon show how to play a game of Space using today's Handout.	<i>Handout</i> Scissors Backing card Coin (or something to decide who will play first)	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).	Place these planets in size order from the smallest to the largest. Place the photographs of the surface of planets into the correct bucket. NASA's Messenger spacecraft was launched in 2011 to orbit and investigate Mercury, the closest planet to the sun. Complete the statement: {{Mercury}} gets very hot and cold. When facing the {{Sun}} it is over 400 degrees Celsius but minus 160 degrees Celsius when facing away from the Sun. Mercury is named after the swift and speedy messenger of the {{Roman}} gods. The name fits because it is the {{fastest}} moving planet. Which of these planets is known as the Blue Planet?
Reporting and presenting findings from enquiries, including conclusions, casual relationships of and degree of trust in results, in oral and written forms, such as displays and other presentations	astronomy, universe, Milky Way, expand, Big Bang theory	Making a model of the Universe.	<i>The Expanding Universe</i> Balloon Marker pen Measuring tape Handout	Pupils should find out about the way that ideas about the solar system have developed	Arrange the following into size order, starting with the smallest. What is a scientist who studies the stars called? True or false: Is the Universe is constantly contracting? Complete the statement: Many scientists believe that about 14 billion years ago, all the matter in the {{Universe}} was held together in a super-dense {{ball}}. No one knows why but something caused this huge, dense ball the {{explode}} with an enormous explosion. This Big Bang caused matter to be {{hurled}} into Outer Space and these eventually formed the stars, planets and everything else. Which of the following are names of galaxies?
To explain a natural process	phase, orbit, illuminate, waxing, waning	Create a leaflet which shows the different phases of the Moon.	Paper Scissors Pens Pencils Pictures of the Moon (optional) Glue	Describe the sun, Earth and moon as approximately spherical bodies	Starting from a new Moon, place the phases of the Moon in the right order. The Moon emits its own light. The different phases of the Moon are caused by the Moons Select... around the Earth. This is because the changing Select... of the Moon means that a viewer from Earth would see different portions of the Moon being Select... by the Sun. <i>Drag the images into the correct area.</i> Imagine two observers are looking at the Moon. One observer is in France, the other is in Nigeria. On the same night, at the same time, will the two observers see the Moon in the same phase?

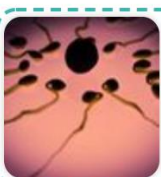





Year 5 Animals Including Humans - The Human Life Cycle




Know about life cycles




Know about the human reproductive organs




Exploring gestation periods



Describe the changes which happen in childhood



Understand changes which happen in adolescence



Describe the changes as humans develop to old age

Scientific Enquiry Covered	Rocket Words Covered	Name of Task / Tasks	Resources Needed	National Curriculum Reference	Summative Quiz Questions
Present information in a series of drawings	reproduce, adult, foetus, embryo, puberty	Make a flip book animation showing the life cycle of a human.	Life Cycle Flipbook Pens/pencils Sticky Notes	Pupils should draw a timeline to indicate stages in the growth and development of humans.	Sort the following list in order of those animals that normally have the lowest number of offspring at a time to those that have the highest number of offspring. Place the animals into the correct buckets. True or false: The echidna, from Australia, is the only mammal to lay eggs. Place the following stages of human development into the correct order. Which of the following animals produce milk to feed their offspring.
Report on findings from enquiries, including oral and written explanations, displays of results	egg, sperm, ovary, testes, fertilisation	Complete the card sort activity to label the parts of the male and female reproductive systems.	Card Sort Activity Handout - Pages 1-4 Laminator (optional) Rubber Bands to hold sets of cards together. Scientific Diagrams Pencils Colouring Pencils Paper	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.	Place the animals in the correct buckets depending on whether they have internal fertilisation while others use external fertilisation. Snails are 'hermaphrodites' in that each animal has both male and female reproductive parts. But they each have to find another snail to mate with as they can't fertilise their own eggs. Sort these animals by the length of their gestation period (the time from fertilisation until birth). List them from the shortest to the longest. How many eggs does a sea turtle lay? Which of the following animals suckle their young with milk?
Report and present findings from enquiries, including conclusions, in oral and written forms	gestation, breeding, elephant, North American Opossum, time period	Conduct research on the gestation periods of different animals and create a bar graph that shows the different periods of gestation.	Report and present findings from enquiries, including conclusions, in oral and written forms	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.	The period between conception and birth of an animal is called ({{gestation}}). This is the period of time that the baby's ({{growth}}) happens. All animals have different gestation periods. Normally, a ({{smaller}}) animal will have a shorter gestation period, whereas a large animal, such as an ({{elephant}}) will have a longer gestation period. True or false, a human's gestation period is always exactly 9 months. How many times more heavy (on average) is a baby elephant than a baby human? Put these animals in order - from shortest to longest average gestation period. Which of these animals, during gestation, grow inside their parent and which grow outside?
Report and present findings from enquiries, including conclusions, in oral and written forms	growth spurt, childhood, motor skills, milk teeth, labour	Write down a list of instructions and ideas of how to look after a newborn baby.	Handout	Pupils should draw a timeline to indicate stages in the growth and development of humans.	Place these stages in human development in the correct order. After reaching the uterus, the sperm swim towards the fallopian tubes, where one sperm cell breaks through the egg's outer covering and then fuses with the egg and fertilises it. What essentials should a mum-to-be take into hospital for the birth of her baby? Sometimes a baby has to be delivered through a cut in the mother's abdomen, what is this operation called?
Report and present findings from enquiries, including conclusions, in oral and written forms	adolescence, bloodstream, hormone, growth, appetite	Create a quiz about adolescence.	Adolescence Quiz Books/Internet Paper Pens	Pupils should draw a timeline to indicate stages in the growth and development of humans.	What is the name of the powerful chemicals which are released from glands during adolescence? Which of these body changes may happen during adolescence? (choose all that apply) Boys and girls reach adolescence at the same age. Complete the statement: Adolescence usually happens during the ({{teenage}}) years. People's bodies go through many changes, both physical and ({{emotional}}). Girls and boys have some different changes. For example, girls' ({{breasts}}) will grow and they will begin their ({{periods}}). Which of these changes happen to boys and which happen to girls during puberty? When you've finished, can you think of changes which both boys and girls go through?
Report and present findings from enquiries, including conclusions, in oral and written forms	cataract, cardiovascular, plasticity, memory, neurodegenerative	Create your own activity for residents to participate in at their local care home.	A Guide to Keeping Active Paper Pens Books / Internet for research Pictures / images	Describe the changes as humans develop to old age	True or false: Men tend to live longer than women. Which of these is likely to decline when someone is elderly? (choose all that apply) Which of these is a disease elderly people can get due to decreased brain function? Which of these noticeable physical changes happen during elderly years? Put these stages of life in order.

