Medium Term Plan: Animals including humans Cycle Y5/6

Enquiry Type:	Working Scientifically Concepts:	Previous Scientific vocabulary	New Scientific vocabulary
• Pattern seeking • Research using secondary sources • Identifying, classifying and grouping • Observing over time.	• Asking questions • Making observations and measuring them • Engaging in practical enquiry • Recording and presenting evidence • Answering questions and concluding • Evaluating and predicting • Communicating findings.	Previously studied seasons so should know the seasons and reference to day and night.	• Earth • Planet • Star • Mercury • Venus • Earth • Mars • Jupiter • Saturn • Uranus • Neptune • Orbit • Axis • Shadow • Rotate • Gravity • Spherical

Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically concepts:	End Point Assessment Statements:
		Earth and Space 1. I can identify the different parts of the solar system. 2. I can describe the movement of the Earth and other planets relative to the sun in the solar system 3. I can describe the movement of the moon in relation to the Earth 4. I can describe the sun, Earth and moon as approximately spherical bodies 5. I can use the idea of the Earth's rotation to explain day and night. 4. I can use the idea of the Earth's rotation and movement in relation to the sun to explain the 'apparent' movement of the sun across the sky.

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Learning Question	How do we know that the Earth and other planets are spherical	How can we demonstrate that the Earth and planets orbit the sun?	Can you identify a pattern in how long it takes a planet to orbit the sun?	How can observing and measuring shadows demonstrates the spinning of the Earth?	How do changes in the apparent shape of the moon support the idea that it moves around the Earth?
Enquiry Type	Research using secondary sources	Identifying, classifying and grouping. Pattern seeking	Identifying, classifying and grouping. Pattern seeking	Observing over time	Research using secondary sources
Conceptual Knowledge	I can describe the sun, Earth and moon as approximately spherical bodies	I can describe the movement of the Earth and other planets relative to the sun in the solar system . I can identify the different parts of the solar system.	I can describe the movement of the Earth and other planets relative to the sun in the solar system . I can identify the different parts of the solar system.	I can use the idea of the Earth's rotation to explain day and night. I can use the idea of the Earth's rotation and movement in relation to the sun to explain the 'apparent' movement of the sun across the sky.	I can describe the movement of the moon in relation to the Earth
Working Scientifically	I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer. I can talk about how scientific ideas change due to new evidence being gathered.	I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources.	In my conclusions, I can: identify causal relationships and patterns in the natural world from my evidence; identify results that do not fit the overall pattern; and explain my findings using my subject knowledge. In my conclusions, I can: identify causal relationships and patterns in the natural world from my evidence; identify results that do not fit the overall pattern; and explain my findings using my subject knowledge.
Concept flashback (previous phases or earlier in the year)	Animals including humans Y3/4 (digestion) 1. https://wordwall.net/resource/31950440/science/digestive-system 2. Define digestion	Plants Y3/4 : 1. https://wordwall.net/resource/2493510/science/year-3-plants-key-knowledge-parts-of-a-plant 2. Define transpiration (show image for stimulation)	Electricity Y3/4 1. https://wordwall.net/resource/2901311/science/electric-circuit-labelling-year-4 2. Define conductor	Living things and their habitats Y3/4 1. https://wordwall.net/resource/31925212/food-chain 2. Define herbivore, carnivore and omnivore	State of matter Y3/4 1. https://wordwall.net/resource/2372616/science/year-4-states-of-matter-key-knowledge-water-cycle 2. Define evaporation
Review/ Revisit	Initial starter: Starter: Put Gustav Holst's The Planets op#32: Mars, Bringer of War on as the lesson starts - do the children know this music? Explain how the world has been fascinated by the planets for years, hence the creation of the music. Ask: What do you already know?	1.Prevouis lesson on spherical shaped planets 2. Knowledge mat **black out words**	1.Prevouis lesson on spherical shaped planets and orbit 2. Knowledge mat **black out words**	1.Prevouis lesson on spherical shaped planets and orbit 2. Knowledge mat **black out words**	What is going on? Recap from previous lesson https://explorify.wellcome.ac.uk/en/activities/whats-going-on/earth

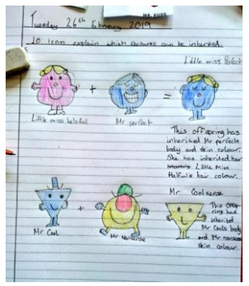
Read	Throughout and secondary resources	Throughout and on flip for explanations Quiz Police style comments	Throughout Quiz Definitions of others	Throughout Results tables Concept cartoon	Throughout Results tables Concept cartoon
Teach	Introduce the children to the letter from Galileo's letter explaining his problem from 1633. Follow up by watch the BBC Clip on Copernicus and Galileo. Pose the question… what makes Galileo a 'good scientist'? Is proof important in science to support your ideas? Present the children with the picture below. What are these photos of? What shape are they? Prompt the children's thinking by asking - how do we know that the Earth and other planets/sun are spherical? Have they visited the planets themselves?  Discuss how scientists have used a range of equipment from powerful telescopes to probes, to make observations of our solar system and that much of the info we know is from 'secondary sources'. Explain that some 'space' phenomena can be investigated here on Earth, but that other knowledge comes from what others have seen and analysed - for over 25 years the Hubble Space Telescope (a reflecting telescope based on Alhazen's work in the 10/11C) has been collecting data and images about our solar system and the universe for scientists to analyse.	Explorify Odd one out https://explorify.wellcome.ac.uk/en/activities/odd-one-out/maps-of-the-solar-system Introduce the key term planets as an anagram – can you unscramble the word? What does it mean – explain to your partner in less than 10 words. Link back to Gallileo – what did he suggest about the planets? Introduce the planets – ask children to come in posing as a planet and reading a description of that planet like a police line up! Children to listen to the key information as they are introduced to it as they will be quizzed afterwards! Quiz – four corners!	Starter: Explorify Zoom in and zoom out – The great red spot https://explorify.wellcome.ac.uk/en/activities/zoom-in-zoom-out/the-great-red-spot Explore planetary movement links noting that they don't all sit in a long line (as in your scale solar system). Discuss orbits and how long they think each planet might take in Earth years to orbit the sun. Watch BBC video and explore the sky map – children to watch images, highlighting differences across the months and how they change. What does this show us? Do we notice a pattern?	**https://explorify.wellcome.ac.uk/en/activities/what-if/there-was-no-night** Have http://www.ictgames.com/dayNight/index.html on the IWB and ask the children to discuss in pairs what they are observing. Feed back ideas and establish that this is how day and night are created through the spinning of the Earth. Watch the first 2 BBC clips to clarify understanding and explain that we are going to design and implement a shadow investigation to demonstrate that the Earth spins, creating day & night. Ask the children why such an investigation helps to demonstrate that the Earth spins (rather than the sun moving across the sky). Model explaining using scientific vocabulary – children to mimic and repeat terminology. Look at the question: how can shadows show that the Earth is rotating?' Give the children (in groups) an equipment list, to plan their investigation using the sticky-note approach. Discuss variables, measurement units and intervals of time to be used.	Introduce images of something that Galileo first described in great detail after looking through his telescope. Children to look at the moon images and decide in pairs what it is and what it is showing. What do we know about the moon? Introductory question to gain prior-knowledge. Show them the Vimeo simulation and ask them to describe what they can see and to identify the spheres (Earth, moon and sun). Ensure that the children understand that the moon is a satellite (not a planet) and that many scientists think that it may have originally been part of the Earth. .
Practice	Provide children with a series of statements for them to sort – do they support a flat Earth or a spherical Earth? Monitor discussion in pairs to assess children's understanding. Is there more evidence to support one particular idea? What do you think?	Quiz – four corners!	During input, highlighting the differences across the months and how they change. What do they show us? Do you notice a pattern?	Go outside to an open area that is in sunlight for most of the school day. Each group to set up a rounder's post and draw around the shadow (including the base, in case it moves). Measure the shadow length and note how defined it is – children to record this in a table (of their own design)	Present the question to the children to prompt discussion – Why doesn't the moon fly away? Challenge: can you use the words gravity, mass and weight in your explanation? (This requires prior understanding from forces unit of work – assessment opportunity)

Apply	Give children books and key websites. In groups, children are to create a spider diagram which explains how we know the Earth and other planets are spherical. Mindmaps/word web	Using the 1st BBC clip and nrich resource for reference, show how the planets move around the sun in what we call an orbit. (New term to be introduced) Go outside and with fruit/loo roll, measure out a solar system (see nrich data). Work out a scale (distance represented by one section of loo roll). Image evidence.	Children to create an image to showcase the orbit of the planets in our solar system. They then need to explain what their image shows, supporting their explanation with scientific evidence. Model expectation with the children – Use sentence stems to support explanations. Sentence building strings or jumbled sentences HA/LA	Once the experiment is set up, children tp predict what they think will happen over time across the day. Give them a torch, a globe (or ball) and a Lego person to explain their predictions – record for evidence. Vocabulary cards to be given as prompts. Re-draw the shadow every hour, labelling/recording the time it was drawn and the length and definition of it. Children to record results in a graph at the end of the day to showcase the trend over time. At the end of the day, review the results. What happened to the shadows they have drawn outside and why? Share measurements they took and draw the arc of the changing shadows, noting patterns. Children to the explain what they have found out and how this proves the theory – link back directly to the lesson enquiry question. Use group explanation technique for form group explanation.	Children to use the following for reference to answer the question by demonstrating how the moon orbits the Earth: • 3rd bbc clip • lunar phases images/diagram • equipment (ball, torch, string) • books • ipad information (pre-printed for reference plus 2/3 available for specific questioning) Link back to the question – how does this information help Galileo prove his theory about the moon? Explore how the changing appearance of the moon tells us about its orbit around the Earth. Link back to previous idea about gravity – this helps Galileo by allowing the logical argument that the greater the mass the greater the gravitational pull, so the sun must gravitationally be at the 'centre' of the solar system as the Earth is the centre of the moon's orbit. Children to present ideas using the showme app – scan QR codes for evidence in books.
Reflect	Share ideas and 'Magpie' any information from other groups which they might not have.	What did we notice? What does orbit mean? Explain to your partner and then switch partners.	Share your diagram with a partner. What have you included? Could you add anything? Under your diagram, explain what your image shows.		Show each other's show me apps – what did we like? what was useful information to answering the LQ?
End of Block Assessment	Give me 5 Was Galileo right? Pose the question to the children – they are the refute or support this question and present their findings in a way they choose (poster, fact file, for and against tbale) Explain to children that at the end of the unit, it is now time to determine whether Galileo was right? Recap his letter and as a class identify and revisit the arguments he proposed and we have been exploring and recap the evidence that we have gathered to support each scientific statement/question. Children to then create a mind map as a plan for their argument and answer to the enquiry question – linking to the evidence from previous lessons. Children to then write an explanation to answer the question, with pictures to support them in doing so and to showcase they learning. **<u>End of unit reflection:</u>** Challenge: what if a contemporary and well-respected scientist said, for example, that they had spotted alien life in another solar system… how would people react? To a degree Galileo's suggestions seemed as absurd in his time. Note that eminent scientist Stephen Hawking has suggested that evidence suggests to him that other life forms are likely to exist somewhere in the universe…				

Medium Term Plan: Evolution and Inheritance Cycle Y5/6

Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
• Pattern seeking • Research using secondary sources • Identifying, classifying and grouping	• Asking questions • Making observations and measuring them • Engaging in practical enquiry • Recording and presenting evidence • Answering questions and concluding • Evaluating and predicting • Communicating findings.	• characteristics • environment • differences • habitat • fossil	• characteristics • inheritance • variation • offspring • adaptation • habitat • environment • evolution • natural selection • fossil • inherited traits • adaptive traits • influence • selective breeding
Previous Learning End Point Assessment in this concept:	**Previous Learning End Point Assessment in working scientifically concepts:**	**End Point Assessment Statements:**	
	Within other concepts, children will have previously learnt: I can draw on prior knowledge to help answer a question. I can make systematic and careful observations. I can interpret the data to generate simple comparative statements based on my evidence. I can begin to identify naturally occurring patterns and causal relationships.	Evolution and Inheritance: 1. I can recognise that living things have changed over time (e.g. peppered moth) 2. I can understand that fossils provide information about living things from millions of years ago 3. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (inheritance and environmental influences). 4. I can suggest how specific examples of animals and plant have adapted to suit their environment. 5. I can identify how animals and plants are adapted to suit their environment in different ways and that this may lead to evolution. 6. I can explain how and why animals and plants have adapted to suit their environment.	

	Revisit of knowledge short AfI lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Learning Question	Can I recall the definition of some key words?	How can we tell if we are related to somebody?	What is the most common eye colour in our class?	How are the Galapagos islands linked to Charles Darwin?	Is there a pattern between the size and shape of a bird's beak and the food it will eat?	Is the theory of evolution valid?
Enquiry Type		Pattern seeking	Pattern seeking	Research using secondary sources	Pattern Seeking	Identifying, classifying and grouping.
Conceptual Knowledge	Prior units key vocabulary	I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (inheritance and environmental influences).	I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (inheritance and environmental influences).	I can suggest how specific examples of animals and plant have adapted to suit their environment. I can identify how animals and plants are adapted to suit their environment in different ways and that this may lead to evolution. I can explain how and why animals and plants have adapted to suit their environment. I can understand that fossils provide information about living things from millions of years ago	I can suggest how specific examples of animals and plant have adapted to suit their environment. I can identify how animals and plants are adapted to suit their environment in different ways and that this may lead to evolution. I can explain how and why animals and plants have adapted to suit their environment.	I can understand that fossils provide information about living things from millions of years ago. I can recognise that living things have changed over time (e.g. peppered moth)
Working Scientifically		I can communicate my findings to an audience using relevant scientific language and illustrations.	I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs.	I can record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. I can talk about how scientific ideas change due to new evidence being gathered.	I can look for patterns and relationships using a suitable sample.	
Concept flashback (previous phases or earlier in the year)		Plants Y3/4 : 1. https://wordwall.net/resource/2493510/science/year-3-plants-key-knowledge-parts-of-a-plant 2. Define adaptation and explain how plants have adapted	Electricity Y3/4 1. https://wordwall.net/resource/2901311/science/electric-circuit-labelling-year-4 2. Define insulator	Earth and Space Y5/6: https://wordwall.net/resource/32713075/earth-in-space 2. Define orbit	Animals including humans Y3/4 (skeleton): 1. https://wordwall.net/resource/9200653/pe/skeleton 2. What are the three purposes of the human skeleton	Sound Y3/4: 1. https://wordwall.net/resource/2901856/science/ear-diagram-year-4 2. Define pitch (use picture aid if needed)
Review/ Revisit	Creating definitions and then matching them for relevant vocabulary that has been used in previous units: - fossil	1. Gaps in prior vocabulary Etymology & Morphology for all new vocabulary	1. Gaps in prior vocabulary 2. New vocabulary 3. Inherited vs environmental traits	1. Gaps in knowledge from revisit lesson to address any gaps 2. Previous lessons - Inherited vs environmental traits	1. Gaps in knowledge from revisit lesson to address any gaps 2. Previous lessons - Inherited vs environmental traits and Darwin	1. Gaps in knowledge from revisit lesson to address any gaps 2. Previous lessons - Inherited vs environmental traits and Darwin 3. Reasons for variation

Read	- environment - characteristic - habitat - differences Children could create a concept map of what they know from these terms so far. Enlarge image for example. Keep these and redo at the end of the unit.	Throughout and secondary resources and reading Mr Men scenarios.	Throughout and on flip for explanations and conclusions.	Throughout Quiz Definitions of others		Throughout Results and findings Information on taking heart rate and calculating it.
Teach		https://explorify.uk/en/activities/odd-one-out/brilliant-brain-case Once children have had a go at the guessing the parents of the offspring, introduce children to the idea of inherited traits and environmental traits. Talk about different factors and what these key terms mean. Children to do apply one. Then once they have finished, talk about selective breeding and what this means.	https://explorify.uk/en/activities/what-if/all-humans-looked-the-same What does inherited mean? How do we inherit eye colour? Look at how eye colour is inherited and what this means.	What are the Galapagos islands? Who is Charles Darwin? Discuss what Charles Darwin discovered. Ask chn what a theory is and ascertain that it is a logical idea based on the interpretation of scientific investigations, observations and evidence.	https://explorify.uk/en/activities/odd-one-out/perfect-pinchers Adaptation and we creatures have changed over time – what is the purpose. Survival of the fittest – happening everyday	What fossils are and what they tell us. Peppered moth example – how it has changed and why.
Practice		Saying who they think the Mr Men parents are based off the new offspring. Why did they pick those? What made them choose this? Venn diagram about inherited and environmental traits and which could be classified as both.	Explorify discussions to build on current knowledge but explore new parameters.	Natural selection. Sort statements on what Darwin found. Anticipation guide – before and after practice	Scenarios and group discussions. Each group could feedback their animals adaptation and why they think this to other groups (one stray) Building a case	Organise statements into arguments for and against the theory of evolution. Assumptions and evidence
Apply		1. Mr Men and Little Misses: Choose one character from the Mr Men and one from the Little Misses. Observe each characters' traits and characteristics. Look closely at their facial features, skin colour, hair colour and body shape. Draw some possible offspring – each child will inherit some of their mother's characteristics and some of their father's. The children may be similar to both their mother and father but they will not look identical to either.  2.organise statements into positives and negatives of selective breeding.	Task: Children to collate the class information about the most popular eye colour in the class. Turn the 'tally' chart into a bar model. Children to write what they observed from their findings. Children to write why everybody does not have the same eye colour.	Key question: how do anatomical observations help support the idea of natural selection? Look carefully at Darwin's finches (http://www.arkive.org/myarkive/scrapbooks/view/4a327879- 3688-418c-bb73-7f610a0103cfandhttps://www.pbs.org/wgbh/evolution/library/01/6/image_pop/l_016_02.html) and note: - How the finches are similar and different. - The individual shape and specific function of beaks in terms of the good they are most suited to eating The impact of the environment on the survival of finches with specific beak characteristics	Using different shaped tweezers, children will practice picking up different types of food (gummy worms, seeds, larger objects). Apply: Is there a pattern between the size and shape of a bird's beak and the food it will eat? Children to use the images to describe how the beak correlates to certain food https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/25880-Battleofthebeaks-student.pdf	Debate – split the class in half and debate the question. Balanced argument – what supports the theory of evolution. - cross curricula link to English writing and publish into science books as a double page spread.
Reflect		Share Mr Men and Little Miss new generations. Discuss why this explains how siblings are different.	What else could we test for and find patterns for?	Share findings.	What did you notice?	Debating – whose points were more convincing and why? Think – what do you think about evolution?
End of block assessment: Using the photos, can you put together the family tree for a human and animal and explain why you have chosen these people/animals. Why have some adaptations occurred in the animals (natural selection).						

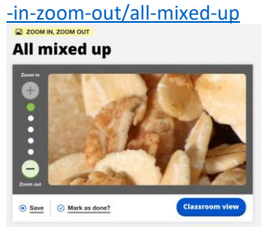
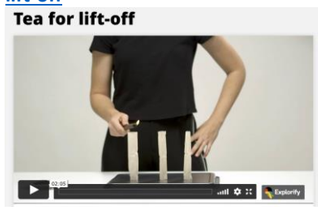
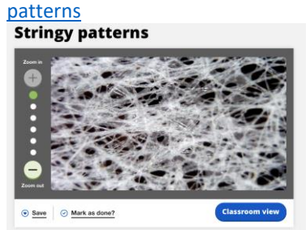
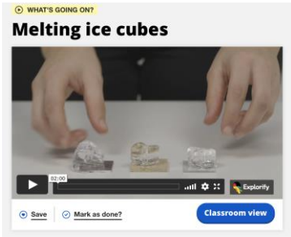
Medium Term Plan: Materials Y5/6

Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
• Comparative and fair testing • Pattern seeking • Research using secondary sources • Identifying, classifying and grouping • Observing over time.	• Asking questions • Making observations and measuring them • Engaging in practical enquiry • Recording and presenting evidence • Answering questions and concluding • Evaluating and predicting • Communicating findings.	• Solid • Liquid • Gas • State • Melting • Boiling • Evaporation • Condensation • Degrees Celsius	• Soluble • Insoluble • Solution • Conduct • Insulate • Distillation • Chromatography • Particles

Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically concepts:	End Point Assessment Statements:
State of Matter: 1. I can identify and group materials together, according to whether they are solids, liquids or gases. 2. I can compare and group materials together, according to whether they are solids, liquids or gases 3. I can compare and group materials together, according to whether they are solids, liquids or gases, giving scientific reasons for my choices. 4. I can 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) 5. I can identify the role of evaporation and condensation in the water cycle 6. I can find a relationship between the rate of evaporation and temperature. 7. I can find a relationship between the rate of evaporation and temperature and suggest how the rate could be altered.	I can draw on prior knowledge to help answer a question. I can make systematic and careful observations. I can use a range of equipment for measuring length, time, temperature and capacity. I can record my measurements e.g. using tables, tally charts and bar charts (given templates when needed). I can interpret the data to generate simple comparative statements based on my evidence. I can begin to identify naturally occurring patterns and causal relationships.	**Materials** 1. I can compare and group together everyday materials on the basis of their properties (e.g. hardness, solubility, transparency, conductivity) 2. I can suggest possible ways of testing using existing scientific knowledge the properties of everyday materials so that results are quantifiable and comparable 3. I can define the following terms: solute, soluble, insoluble and solution. 4. I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. 5. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 6. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. 7. I can demonstrate that dissolving, mixing and changes of state are reversible changes 8. 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 with burning and the action of acid on bicarbonate of soda.

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
Learning Question		How are materials different	What can affect solubility if you change it?	Can we always separate materials?	How could you stop a snowman from melting?	How does a flask keep a hot chocolate warm?	Once a material has been changed, can we get it back?
Enquiry Type		Identifying, classifying and grouping	Fair and comparative test	Pattern seeking	Fair and comparative test Observing over time	Research using secondary sources	Fair and comparative test
Conceptual Knowledge	Prior end of blocks assessment	I can compare and group together everyday materials on the basis of their properties (e.g. hardness, solubility, transparency, conductivity)	I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	I can define the following terms: solute, soluble, insoluble and solution. I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating I can demonstrate that dissolving, mixing and changes of state are reversible changes	I can suggest possible ways of testing using existing scientific knowledge the properties of everyday materials so that results are quantifiable and comparable	I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can compare and group together everyday materials on the basis of their properties (e.g. hardness, solubility, transparency, conductivity)	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 with burning and the action of acid on bicarbonate of soda. I can demonstrate that dissolving, mixing and changes of state are reversible changes

Working Scientifically		I can look for patterns and relationships using a suitable sample.	I can decide what observations or measurements to make over time and for how long. I can use the scientific knowledge gained from enquiry work to make predictions I can investigate using comparative and fair tests.	I can record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs.	I can select from a range of practical resources to gather evidence to answer their questions. I can select a suitable measuring method and therefore equipment to give the most precise results (e.g. ruler, tape measure or force meter).	I can decide how to record and present evidence. I can present the same data in different ways in order to help with answering the question.	In my conclusions, I can: identify causal relationships and patterns in the natural world from my evidence; identify results that do not fit the overall pattern; and explain my findings using my subject knowledge.
Concept Flashback (previous phases or earlier in the year)		Earth and Space Y5/6: 1. https://wordwall.net/resource/7726120/science/solar-system 2. Define solar system	Light Y3/4: 1. https://wordwall.net/resource/2898124/science/light-sources-year-3 2. Define man-made and natural light source	Evolution and Inheritance Y5/6: 1. https://wordwall.net/resource/31074480/science/evolution-natural-selection-and-inheritance-quiz 2. Define natural selection	Animals including humans Y3/4 (Teeth) 1. Label the different teeth: https://wordwall.net/resource/7220357/science/y3-teeth 2. Define decay	Rocks and soils Y3/4: 1. https://wordwall.net/resource/2039805/science/rocks-fossils 2. Define fossil	Earth and Space Y5/6 1. https://wordwall.net/resource/32713075/earth-in-space 2. Define planets
Review/ Revisit	Range of short activities: - match definitions to key words Group materials based on	1. Knowledge from previous end point assessment	1. Knowledge from previous end point assessment 2. How could I group these materials? One sentence summaries	1. Knowledge from previous end point assessment 2. Previous lesson focus One sentence summaries	1. Knowledge from previous end point assessment 2. Previous lesson focus One sentence summaries	1. Knowledge from previous end point assessment 2. Previous lesson focus One sentence summaries	1. Knowledge from previous end point assessment 2. Previous lesson focus One sentence summaries
Read		Definitions Page 52 – KS2 science Highlight the facts/evidence	Disappearing act Definitions Page 56 – KS2 science Highlight the facts/evidence	Scenarios Page 58,59 and 60 – KS2 science book Highlight the facts/evidence	Concept cartoon Page 53 – Ks2 science book Highlight the facts/evidence	Read through information and one another's posters Page 53 – Ks2 science book Highlight the facts/evidence	Read information grids Page 57 – KS2 science Page 61-64 Highlight the facts/evidence

Teach	solid, liquid and gas: discussion of WHY they did this. - What happens if scenarios for evaporation and condensation understanding	https://explorify.uk/en/activities/zoom-in-zoom-out/bright-spark Pose the question, what is a material? Ask children to verbalise a definition and compare to the example on the Knowledge Organiser/Whiteboard. Have an example of a man-made and natural material. What is the difference? Can you explain what the terms mean? Introduce the term 'property'. Using the definition from the Knowledge organiser, label an example object with the material and the property. So why is the property important? Establish the link between the property and the purpose (link back to KS1) After the practice: Model on the board identifying the object, material and property and using this to link objects under these categories due to similarities. Showcase a connection tree as a method for classifying and linking.	https://www.youtube.com/watch?v=EcWuHXYGbKw  What is happening? Assessment opportunity – Present concept cartoon to the children. Who do they agree with and why? Share ideas with a partner. Add/combine answers.  Show video of diffusions https://www.youtube.com/watch/ZmWYG7qh0QA Discuss diffusion and what is happening – can the children write a definition using the video to help them?	https://explorify.uk/en/activities/zoom-in-zoom-out/all-mixed-up  What does the word 'separate' mean? Act out in the class – can the children show their understanding using a diagram on their whiteboards or moving apart etc? Pose the scenario of a supermarket disaster where the items and produce have been mixed and need separating. For each mixture, identify the mixture/solution combining knowledge from the previous lesson. 	**https://explorify.uk/en/activities/whats-going-on/tea-for-lift-off**  Use concept cartoon as an assessment opportunity to showcase progression and learning. Children to answer in books.  Introduce the question of ow to stop a snowman from melting as the solution of 'putting on a jacket'. Do the children think it will work or not? Why? Let's prove it!	https://explorify.uk/en/activities/zoom-in-zoom-out/stringy-patterns  Ask the children – how does a thermos work? Introduce the question via the video and stop at 1.15. https://www.youtube.com/watch?v=0i1bvpu0xW0 After practice: Then show the children the rest of the video and they can then rearrange the statements after watching the video with the new information they have learnt. Are there any statements we are still unsure about? How could we find this out? Research information via given links and information to determine if the other statements are true/false.	https://explorify.uk/en/activities/whats-going-on/melting-ice-cubes  Reversible change – what do you think this means? What word is it similar to we already know? Showcase information to explain further. Based off the prior definition, what do you think irreversible means? Share ideas and then read information to give more detail. Use video to consolidate new information. https://www.bbc.co.uk/bitesize/topics/zjty4wx/articles/zk9mt39 Introduce food reactions as common place to seen reversible and irreversible reactions. Show video of an egg cooking. https://www.bbc.co.uk/bitesize/clips/z9wkjxs What happened in the video? Explain with given vocabulary on the board. Children to do so verbally before sharing a written example on the IWB. Discuss what causes the change, if a new products is made and what the reactants and products are.

Practice		Match the definition of the property to the term. Can you give examples of an object/material that shows this property?	Define the different terms explored. Children to use range of solutes to predict first and then check if they are soluble or insoluble. In groups, they will then think of an independent variable that they can test to see if it affects solubility. Introduce activity with the lesson enquiry as the question that is posed. What will you need? What will need to be kept the same? How will you carry out your investigation? Children to complete investigation and record results in a table.	Talk through each separating method by first asking the children how they think they can do it? Children to record the process using a labelled diagram and explaining what method they are going to use. Tell me... (adapt titles)	Children to use ice cubes to compare over time, how an ice cube melts by measuring its size. One example with a jacket and one without. Children to then map the change in time as a line graph to showcase trend over time.	Provide statements for reason why and children to sort into True and False based on their prior knowledge (but no knowledge taught in the lesson) Redo the practice..	Record this in the table as shown.  Complete alternate reactions including • Vinegar and warm milk • Chocolate • Bicarbonate of soda and vinegar Use the bicarbonate of soda reaction for the children to then predict what they think will happen in the 3,2,1 video below. https://explorify.uk/en/activities/whats-going-on/3-2-1-lift-off
Apply		Children to create their own using a collection of items given to each small group. Verbal explanation as to why they chose that property/object/criteria to link them. Were some criteria's easier/harder to use or more prevalent in the objects that we have in the selection. Are there any properties we weren't as confident with? (This could lead to insulator/conductor being identified which will be addressed later in unit of work)	What is happening? Teacher to work with each group to discuss why they think has happened has done so before they write an explanation of their results structures	Children to then complete the method and explain if it worked and why it worked. Key vocabulary to be given on the whiteboard to support. Guided answer for the first example so expectation is set. Presentations	What do you notice? Why might this be the case? Share the theory with the children to explain the terms insulator and conductor. Answer the key question – whose results didn't show a difference? How did you determine this? What could have gone wrong and how could you improve next time? Verbal discussion. E.g. weight rather than size	Children to then draw a thermos flask using their knowledge and label it with the information they have found out (children can be encouraged to use the T/F statements and additional research). Children to explain in their labels how it works.	Assessment – True or false. Children to answer in books to showcase understanding. Encourage reasons why to support their answers. Anticipation guide 
Reflect		Share groups connection trees and why they were drawn in this way.	Peer check from a different working group – are the findings clearly articulated and presented?	Pose exit question as the lesson enquiry: Encourage examples to be used when answering the question.	Share answers and compare findings. Discuss potential differences.	Do thermal insulators and conductors work the same whether it is cold/warm? – combination assessment of two lessons.	Odd one out: 
End of Unit Assessment: A group of materials have been mixed up in a laboratory – you need to organise and group these materials into suitable categories to give the laboratory order again.							

Medium Term Plan: Living things Cycle B Y5/6

Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
• Pattern seeking • Research using secondary sources • Identifying, classifying and grouping • Observing over time.	• Asking questions • Making observations and measuring them • Engaging in practical enquiry • Recording and presenting evidence • Answering questions and concluding • Evaluating and predicting • Communicating findings.	• Classification • Environment • Danger • Adaptation • Defences	• Differences • Lifecycle • Mammal • Amphibian • Insect • Bird • Processes • Reproduction • Classification • Micro-organisms • Fungi • Bacteria • Virus

Previous Learning End Point Assessment in this concept:	End Point Assessment Statements:
Classification: 1. I can recognise that living things can be grouped in a variety of ways 2. I can use classification keys to help group, identify and name a variety of living things in my local and wider environment (particularly tress and invertebrates) 3.I can recognise that environments can change and that this can sometimes pose dangers to living things (i.e. cutting down trees)	**Life cycles:** 1. I can identify the different stages of life cycles in plants and animals (plant, mammal, amphibian, insect and bird) 2. I can describe the differences (looking at similarities and differences) in the life cycles of a mammal, an amphibian, an insect and a bird. 3. I can evaluate the differences between animal life cycles and give justified reasons for these differences. 4. I can describe the life process of reproduction in some plants (asexual and sexual). 5. I can describe the life process of reproduction in some animals (humans, mammals and amphibians). **Classification:** 1. I can compare difference living things and classify them into groups using given similarities and characteristics. 2. I can describe how living things are classified into broad groups according to observable characteristics (microorganisms, plants and animals). 3. I can describe how living things are classified into broad groups according their similarities and differences (microorganisms, plants and animals). 4. I can give reasons for classifying plants and animals based on specific characteristics.

	Revisit of knowledge	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
Learning Question	What can I remember about classifying living things?	How do plants reproduce?	How do all mammals have the same lifecycle?	Are there any similarities between the life cycles of amphibians and insects?	Do all living things start and end the same way?	How can you classify different living things?	How are living things classified using the Linnaean system?	How are living things, including microorganisms , classified?
Enquiry Type		Observing over time.	Pattern seeking	Pattern seeking *Observing over time – get some caterpillars and watch them grow over the weeks: what do we notice?*	Research using secondary sources	Identify, classifying and grouping	Identify, classifying and grouping Research using secondary sources	Identify, classifying and grouping
Conceptual Knowledge	Prior units end point assessment	I can describe the life process of reproduction in some plants (asexual and sexual). I can identify the different stages of life cycles in plants.	I can describe the life process of reproduction in some animals (humans, mammals and amphibians). I can identify the different stages to life cycles in plants and animals (mammals)	I can identify the different stages to life cycles in plants and animals (plant, mammal, amphibian, insect and bird)	I can describe the differences (looking at similarities and differences) in the life cycles of a mammal, an amphibian, an insect and a bird. I can evaluate the differences between animal life cycles and give justified reasons for these differences.	I can compare difference living things and classify them into groups using given similarities and characteristics.	I can describe how living things are classified into broad groups according to observable characteristics (microorganisms, plants and animals). I can give reasons for classifying plants and animals based on specific characteristics.	I can describe how living things are classified into broad groups according to observable characteristics (microorganisms, plants and animals).
Working Scientifically		I can communicate my findings to an audience using relevant scientific language and illustrations.	I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work.	I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	

Concept flashback (previous phase or earlier in the year)		Evolution and Inheritance Y5/6: 1. https://wordwall.net/resource/31074480/science/evolution-natural-selection-and-inheritance-quiz 2. Define inheritance and adaptation	Sound Y3/4 1. https://wordwall.net/resource/2902066/science/sound-quiz-year-4 2. Define vibration	Earth and Space Y5/6 3. https://wordwall.net/resource/7726120/science/solar-system 4. Define orbit and rotation	Plants Y3/4: 1. https://wordwall.net/resource/726716/y3-plants-knowledge 2. Define pollination	Materials Y5/6: 1. https://wordwall.net/resource/1575330/science/reversible-or-irreversible-changes 2. Define soluble	Electricity Y3/4: 1. https://wordwall.net/resource/2901532/science/mains-or-cell-electricity-year-4 2. Define insulator and conductor	Animals including humans (digestion) Y3/4: 1. https://wordwall.net/resource/9674435/digestive-system 2. Define predator, prey and producer
Review/ Revisit	Observed activities and discussion - Give children different living things and ask them to group them - Introduce a classification grid and then ask children to group the living things based on this - Show them some scenarios and ask WHY the environment has changed and the potential impact this has. Note any misconceptions and gaps in knowledge and add to flips for review.	Misconceptions or gaps in knowledge from pre-assessment. Features of a plant: structure.	Check the cuttings we made and if they have grown: What would expect at this stage? Asexual and sexual reproduction	Check the cuttings we made and if they have grown: What would expect at this stage?	Check the cuttings we made and if they have grown: What would expect at this stage? Check the caterpillars	Check the cuttings we made and if they have grown: What would expect at this stage? Check the caterpillars	Check the cuttings we made and if they have grown: What would expect at this stage? Check the caterpillars	Check the cuttings we made and if they have grown: What would expect at this stage? Check the caterpillars
Read		Life cycle of a plant	Different mammals' lifecycles Others findings and information	Metamorphism Life cycle's when organising and sorting		Different animals	Information about Carl Linnaeus. Their classification grids.	Information on microorganisms
Teach		https://explorify.uk/en/activities/whats-going-on/sturdy-pads Life cycle of a plant. Term reproduction and how this subdivides into asexual and sexual. Why some plants are pollinated by insects and not wind	What mammals are – what do you need to be classified as a mammal? Look at the basic stages: embryo, baby, child, adult. Look at sexual reproduction and the process. http://www.bbc.co.uk/education/clips/zpmqxnb Look at different mammals lifecyles together.	Metamorphism and what this means. What animals do you know that undergo metamorphosis? Amphibians and insects are examples of animals that undergo metamorphosis. Their life cycles show the stages of their transformations. Introduce the caterpillars and class observation diary and who will observe the changes each day	Explain that the children are going to research a range of life cycles, in pairs, from around the world (they can pick a suggested one - see list in resource), or can identify their own animals and plants). Suggested list to research: Mammals: dolphin and polar bear Birds: penguin or kiwi Amphibians: salamander or caecilians Insects: mosquito or dung beetle Plants: lotus or coco de Mer Model a dolphin and how to search – what to type and how to record findings in a scientific illustration or note formation.	Introduce the word taxonomist and look at what classification means. Once children have organised the snacks, discuss why they have picked this method. What has worked well? Children discuss how they classified the animals with the members of their group. Groups discuss whether and why taxonomists may use a single, standard method of classification	Look at who Carl Linnaeus is. Look at how living things are classified using the Linnaean system	What are microorganisms? The difference between eukaryotic microorganisms and prokaryotic microorganisms? The main difference between the two types of organisms is the structure of their cells.
Practice		Sort images into whether they are pollinated by insects or the wind. Organise statements into the advantages and disadvantages of asexual reproduction.	Organise the cards to describe the process of reproduction. Discuss different mammalian life cycles.	What animals do you know that undergo metamorphosis? Organise the lifecycle of an amphibian and insect based off prior learning and understanding.	Researching lifecycles and drawing illustrations to support their findings in groups.	Children discuss how to sort and group the snacks shown on the Lesson Presentation. Guide the children through splitting the snacks into smaller and smaller groups.	Naming animals: The genus and species are always written in italics. The names of the genus and species are used to give the scientific name (recognised Latin name) of each living thing. So the scientific name for a dog is Canis lupus.	Organise microorganisms into those that are harmful and those that are not.

Apply		Take a cutting of a plant to grow asexually. In books: describe how taking a cutting will allow a plant to grow. Further challenge: how else can a plant grow? What is pivotal for a plant to start growing?	Choose two lifecycles and compare these two lifecycles: how are they similar and how do they differ? In pairs complete a grid to compare two mammals.	Pick an amphibian and an insect and draw out their lifecycle. Once complete draw a Venn diagram to denote the similarities and differences between these lifecycles.	How do lifecycles differ. Draw upon comparisons. Ask the children: Why do they think life cycles differ around the world and in contrasting environments and habitats? Ask chn why they think scientists use the most common 'patterns' noticed to set out scientific theory. Do the exceptions make the generalisations invalid? Thinking about observations from the growth of birds over time in the classroom, what do they notice about the changes? How is this similar or different to other animals? Showcase and model a linking diagram with similarities between the different animals.	Using the zoo animals, how would the children group these. Treat it as a classification key and do it on tables in groups. Put the title and draw on tables as to how they would classify, group and organise their animals.	Choose a living thing from the list given to the children and follow the levels of the classification system to classify it. Use the genus and the species to give the scientific name of the species. Research task.	Classify different living things including microorganisms and give reasons for these groupings and classifications.
Reflect		Can humans reproduce asexually and sexually? Link to prior learning on lifecycle of a human.	Share with the class their findings	Compare these to a bird https://www.bbc.co.uk/programmes/p00m2q9n	Share ideas. Why are generalisations not always a valid scientific approach?	Do you think taxonomists use different classification methods like you may have done? Is it important to use the same method of classification?	Partner feedback – can you guess the animal? Rotate rolls – 30 second challenge etc	Share ideas and findings
End of Unit Assessment: A local zoo wants to create a poster to educate young people about the different lifecycles of some of their animals and an interactive tool that teaches young children how to classify different living things. Can you create something which will allow the zoo to educate young people in a clear, fun and engaging way?								