

Y4 – Science	Autumn 1 <i>States of Matter: In a State</i>
Learning Intention 1	To compare and describe the different properties of materials
Targets	<ul style="list-style-type: none"> - Compare materials using their properties - Describe the properties of solids and liquids - Use a materials properties to decide whether it is a solid or a liquids
Activity	Children to create a table and identify and list known ‘solids’ and ‘liquids’. Extension- Name some examples of these solids and liquids.
Learning Intention 2	Use observations to plan a fair test
Targets	<ul style="list-style-type: none"> - Make careful observations of melting ice - Make predictions based on my observations of melting ice - Plan a fair test to answer a question
Activity	At the beginning of the day, teacher to introduce an ‘ice hand’. Ask questions: What material is this? How is it made? What will happen if we leave this hand in the classroom? Why do you think this will happen? After observing the ice hand throughout the day as a class and recording observations, use these observations to plan own fair test in groups to take place the following week.
Learning Intention 3	Observe what makes a difference to how ice melts
Targets	<ul style="list-style-type: none"> - Carry out a fair test - Make and record accurate measurements of melting ice - Present results on a correctly labelled bar chart - Describe a pattern in the data and use the data to answer a question
Activity	Carry out our planned tests from last week. Observe and record results. Create a bar chart to present results. Extension- what happens to solids when they melt? What do we call this? Explain.
Learning Intention 4	To understand what melting and freezing is
Targets	<ul style="list-style-type: none"> - Describe what happens when a solid melts - Describe what happens when a liquid freezes - Identify and explain how to melt or freeze materials
Activity	Spot the mistakes in the definitions of melting and freezing / children to explain in their own words using the word bank what melting and freezing is.

Learning Intention 5	Investigate gases and explain their properties
Targets	Identify solids, liquids and gases. Explain some uses of gases. Investigate the weight of a gas.
Activity	Whole class experiment – observe weight in gas using fizzy drinks.
Learning Intention 6	Identify and describe the differences between solids, liquids and gases
Targets	<ul style="list-style-type: none"> - Use properties properties to sort materials into solids, liquids and gases - Describe the properties of solids, liquids and gases
Activity	Children decide whether a material is a solid, liquid or gas and complete a table/ Venn diagram to show understanding.
Learning Intention 7	To understand what evaporation and condensation are
Targets	<ul style="list-style-type: none"> - I can carry an investigation to find out what evaporation is - I know what evaporation is - I know what condensation is - Identify if something is condensation or evaporation
Activity	Distribute hand sanitizing gel, everyone to rub in gel into hands/ forearm. – What happens to the liquid? What do you feel? How is it different from washing with water? Investigate the rate of evaporation using water and sponges.

Y4 – Science	Autumn 2 <i>Good vibrations – How is sound made?</i>
Learning Intention 1	To explore the question: what is sound?
Targets	<ul style="list-style-type: none"> - Identify and describe sound sources around school - Explain how sources of sound vibrate, creating sound
Activity	Introductory lesson: Children will first complete a KWL grid to explain what they already know about sound and what they want to know. Children will pair up and complete a St John’s School sound survey. Children will walk around school in pairs carefully listening to different sounds in different areas, thinking about what could be making that sound, what is vibrating?
Learning Intention 2	To investigate how sound is made
Targets	<ul style="list-style-type: none"> - Make sounds in a range of different ways - Say how some sounds are made - Explain how sounds are associated with vibrations
Activity	Children will be introduced to the statement ‘Something has to move for a sound to be made’. Ask if they agree or disagree with the statement, children to then write their name on a sticky note and to stick it on either a piece of paper headed agree, or one headed disagree, next to the statement. Then explore:
Learning Intention 3	To explore how sound travels
Targets	<ul style="list-style-type: none"> - Describe how vibrations make sounds - Explain how vibrations change when a sound gets louder - Explain how loud and quiet sounds travel to our ears
Activity	Children to create an educational programme for children to explain how different sounds travel to our ears. Children to plan episode with their group, they could include pictures or diagrams to support explanations.
Learning Intention 4	To explore how we can make sounds louder and quieter
Targets	<ul style="list-style-type: none"> - Predict which instruments will be louder - Explain what effects the volume of the sound produced - Explain my results and match them to my prediction
Activity	Children to make shakers, predict which will be the loudest, test and record the results. Children to make four shakers by putting different ingredients into a cup and sticking another cup on top with sticky tape.
Learning Intention 5	To explore how sounds change over distance

Targets	<ul style="list-style-type: none"> - Identify how sounds change over distance - Identify sounds at a distance - Create a string telephone and explain how sound travels through it
Activity	String telephone experiment- children to create string telephone using plastic cup and string then explore how the sound travels over the distance of the string. After the investigation, write up our findings.
Learning Intention 6	To investigate ways to absorb sound
Targets	<ul style="list-style-type: none"> - Explain that sound needs something to travel through - Investigate the best material for absorbing sound - Explain why some materials absorb sounds
Activity	Tell the children a band have asked them to find out what the best material is for soundproofing their studio. Investigate as a class how different materials absorb sound – put a sound in a box and surround the box with a chosen material to absorb the sound. After the activity, children to write to the band explaining which material is best for their music studio and why.
Learning Intention 7	To make a musical instrument to play different sounds
Targets	<ul style="list-style-type: none"> - Use my knowledge of sound to answer questions - Create a musical instrument that will play sounds of different pitch and loudness - Explain how my musical instrument makes different sounds
Activity	Children to design a musical instrument, then use the junk materials and other equipment to make it. Will the children think about how their musical instrument might create different sounds? Then test and evaluate instruments.

Y4 – Science	Spring 1 <i>Electricity: Switched On</i>
Learning Intention 1	To sort electrical products according to their power source
Targets	<ul style="list-style-type: none"> - Recognise items that are powered by electricity - Identify the power source for an electrical device - Organise and present findings from sorting activity - Recognise actions that are caused by electricity
Activity	<p>Do not show LI at beginning of lesson. Show the children images of electrical devices on slideshow 1 to the children. Ask: What do all these things have in common? What makes them work? Explain that our unit of work this term will be about electricity. Partner talk what they know about electricity. Then all children to complete KWL grid – what do we know about electricity and what do we want to know? We will complete the ‘learnt’ part at the end of the unit of work. Show the same images again, what are the differences between them? What criteria could we use to sort them? Do they all need to be plugged in to be working? How are battery power and mains power different? Sort items with the children to decide if they use electricity or not. Children to then independently choose challenge 1, 2 or 3 - sort devices according to whether they are electric or not/ use mains or battery/ use mains electricity, battery or rechargeable (resource sheet 1/2/3).</p>
Learning Intention 2	To construct a simple series electrical circuit and explain how it works
Targets	<ul style="list-style-type: none"> - Find different ways to light a bulb - Describe what is happening in the circuit - Use annotated drawings to explain how a circuit works
Activity	<p>Do not show LI at beginning of lesson. Provide each pair of children with a bulb in a bulb holder, a cell and two wires. Challenge the children to light the bulb. Afterwards, share solutions and ensure that everyone has a correctly connected circuit. Questions to answer and discuss together: Do you know the names of any components you have been using? Establish the correct names. Draw attention to the two different ends (terminals) of the cell and the + and – labels. Explain that when everything is joint together to make the bulb light up, you have made a circuit.</p> <p>Challenge 1: Find different ways to make a bulb work then use annotated drawings to explain it</p> <p>Challenge 2: Make a buzzer work then use annotated drawings to explain it</p> <p>Challenge 3: Make a motor work then use annotated drawings to explain it</p> <p>Working in pairs.</p>
Learning Intention 3	To identify and correct problems with circuits
Targets	<ul style="list-style-type: none"> - Recognise circuits which are not complete - Identify what is causing a circuit not to work

	<ul style="list-style-type: none"> - Describe, using labelled drawings what to do to make a circuit work
Activity	<p>Challenge 1: Children identify an incomplete circuit and make a labelled drawing.</p> <p>Challenge 2: Children decide what is wrong with a circuit and make labelled drawings</p> <p>Challenge 3: Children explain why a circuit does not work and remedy it using annotated drawings</p>
Learning Intention 4	To describe what a switch does and how it works
Targets	<ul style="list-style-type: none"> - Make circuits which include switches - Record my circuits using labelled drawings - Explore and explain how simple switches work - Make a simple switch
Activity	Children will make a folding press (push to make) switch and create an annotated drawing. Children will make a switch following instructions on resource sheet 2 and use it in a circuit to switch a bulb on and off.
Learning Intention 5	I can identify and sort materials into electrical conductors or insulators
Targets	<ul style="list-style-type: none"> - I can explain why some materials conduct electrical currents and why others don't. - I can test materials to check if they are conductors or insulators.
Activity	In pairs, children match Parts of a Circuit Cards of the different parts of a circuit that they have used so far. In small groups to be given a small range of items and to label the material it is made from. Children present their items to the whole class. Explain the difference in how electrons move in materials that are conductors and insulators. Children construct a simple circuit as shown on the Lesson Presentation before testing a range of materials. <i>(Avoid testing items made up of multiple materials – e.g. pencil sharpener – as children need to be clear about the link between the material and whether it conducts or insulates electrical currents.)</i> Children record findings on the Insulators and Conductors using activity sheet.
Learning Intention 6	To investigate the link between a material's properties (conductor or insulator) and its use
Targets	<ul style="list-style-type: none"> - Name materials which are good electrical conductors and insulators - Identify where and why they have been used - Explain how this keeps us safe - Choose appropriate materials to make different parts of switches
Activity	All children to make a contained tilt switch using instructions to guide (resource sheet 1).

Y4 – Science: Teeth and digestion	Spring 2 <i>Where does all that food go?</i>
Learning Intention 1	To share what we know about food and nutrition
Targets	<ul style="list-style-type: none"> - Name the main food groups and give examples of foods that belong to each group - Explain why each food group is important - Explain the term ‘balanced diet’
Activity	<p>Complete KWL – What I know, what I want to know and ‘what I have learnt’ will be completed at the end of this science unit. First work through information on PP recapping previous food knowledge from Year 3. Ask the children to suggest key words and list them on the flipchart. Challenge 1: answer questions and draw a diagram to show what happens to food once it has been eaten (resource sheet 1). Challenge 2: sort food into groups, draw and label a diagram to show what happens to food once it has been eaten (resource sheet 2).</p>
Learning Intention 2	To investigate where our food goes after it has been eaten
Targets	<ul style="list-style-type: none"> - Name the basic parts of the digestive system - Sequence the parts of the digestive system
Activity	<p>Recap what our new topic is – what did we learn last week? As a class, can we try and label these parts of the digestive system? Miss Brady to then use equipment to demonstrate how the digestive system works (plastic bags, food, liquid, tights). Afterwards, children to be organised into groups of between four and six children- can they now draw and label these parts of the digestive system on the life size outline? Provide a large piece of paper for each group (large flipchart pieces of paper together). One child in each group to lie on their back on the paper so that another member of the group can draw around their outline. Then explain that once it has been eaten, food goes through the body in the digestive system. Children label a diagram of the digestive system.</p>
Learning Intention 3	To identify the different types of teeth in humans have
Targets	<ul style="list-style-type: none"> - Name the types of teeth - Explain the functions of different types of teeth - Identify differences between the teeth of a child and an adult
Activity	<p>Children to first feel with their finger and then use the mirror to work out what teeth they themselves have and to record this on small paper. Do we have the same number of teeth in the top and bottom jaw? What types of teeth do you have? Children to then explain the function of the types of teeth. Challenge 1 – names given, explain function (key words given). Challenge 2- name and explain function (key words given). Challenge 3- name and explain function. Extension – children to draw adult teeth and children’s teeth. What differences can we explain/identify?</p>

Learning Intention 4	To recognise how to look after our teeth and explain its importance
Targets	<ul style="list-style-type: none"> - Describe different ways to look after our teeth - Explain why it is important to look after our teeth - Recognise some consequences of not looking after our teeth - Make a prediction for an experiment
Activity	Recap last week's learning about teeth, including Dr Raj video. Children to prepare leaflets/posters that could be shared with younger children to teach them how to look after their teeth. At end of lesson/plenary we will set up a class experiment using eggs and different types of drinks to observe how sugary drinks can affect our teeth enamel. Make our own predictions about what we think will happen. Check the eggs in 2 days to observe which we can see the most damage/difference to. Why might this have happened?
Learning Intention 5	To construct food chains and webs for a particular habitat
Targets	<ul style="list-style-type: none"> - State whether a living thing is a consumer or producer - Create food chains/webs from information given - Identify if animals are predators, prey, or both
Activity	Challenge 1: Classify animals into predators and prey and make a food chain. Challenge 2: Children complete a table and food web.
Learning Intention 6	To describe how food is broken down in the digestive system
Targets	<ul style="list-style-type: none"> - Identify the organs in which food is broken down - Describe the difference between a chemical and mechanical process for breaking down food - Use sources to research the digestive system - Present my findings about digestion
Activity	Children research which parts of the digestion system break down food and how. Provide resource sheet 1, together with given information and internet access to help them carry out research about which parts of the digestive system break down food by either chemical or mechanical processes.

Y4 – Science: Human impact	Summer 1 <i>What impacts do humans have on Planet Earth?</i>
Learning Intention 1	To find out what the environment is like at school and what factors affect it
Targets	<ul style="list-style-type: none"> - To explain some negative ways that humans change their environment - Collect data about noise levels around school - Compare noise levels in different areas
Activity	Investigating how much noise there is around the school at different times of the day. In pairs, post children to stand in different areas of the school at different times of the day, filling in the tally chart and questions.
Learning Intention 2	To be able to present geographical findings appropriately
Targets	<ul style="list-style-type: none"> - Present data on a graph using technology - Use data to answer questions and make suggestions
Activity	Children work in pairs/individually to use the data given or the data they collected in Lesson 1 to complete their graph using ICT. Create a chosen chart to present the data.
Learning Intention 3	To plan and complete a litter survey for school
Targets	<ul style="list-style-type: none"> - Group items of litter into categories - Label a tally chart for data collection and collect data - Use the data to answer questions and make suggestions
Activity	Children think about how to group items of waste and collect litter around school in small groups, where they will collect data via a tally chart.
Learning Intention 4	To research and present information about the impact of litter on animals
Targets	<ul style="list-style-type: none"> - Explain how different types of litter can be dangerous to animals - Name local animals that might be affected by litter types - Describe ways to reduce the dangers of litter to animals
Activity	Challenge 1 - Children make a persuasive poster or leaflet for a campaign to not drop litter. Challenge 2- Create a persuasive poster or leaflet for a campaign to clean up a water habitat (River Mimram).

Y4 – Science	<p style="text-align: center;">Summer 2 <i>Living things and their habitats: Who lives here?</i></p>
Learning Intention 1	To recognise that living things can be grouped in a variety of ways
Targets	<ul style="list-style-type: none"> - Sort living things into groups. - Generate criteria to sort living things. - Sort living things into a Venn diagram/ Carroll diagram.
Activity	Children complete a Carroll diagram using their given criteria and a Venn diagram using their own criteria.
Learning Intention 2	To Explore and use classification keys to help group, Identify and name a variety of living things
Targets	<ul style="list-style-type: none"> - Generate questions about animals. - Use questions to sort animals in a key. - Identify similarities and differences between vertebrates.
Activity	<p>Read the information on the PowerPoint to introduce children to the concept of classification, using the questions to prompt children to share any prior knowledge. Introduce the classifications of vertebrate and invertebrate, asking children to give examples of each. Explain that vertebrates can be further split into five groups: amphibians, birds, fish, mammals and reptiles. Explain the broad characteristics of each, asking children to note their similarities and differences. Children complete key Questions Activity Sheet, Children generate three questions to sort vertebrates. Twenty Questions: Split the class into two teams and choose a volunteer from one team to come to the front of the class. The volunteer chooses an animal. The other team can ask the volunteer up to twenty questions about the animal but the volunteer can only answer with a 'yes or no'. If the other team are able to guess the animal within 20 questions, they win a point. If they cannot, the team of the volunteer win a point. The team with the most points after three rounds wins.</p>
Learning Intention 3	To use evidence to identify an invertebrate
Targets	<ul style="list-style-type: none"> - Answer the questions in a key by looking closely at invertebrates - Use a key to name the invertebrates I have found - Identify invertebrates by looking at their characteristics - Explain how I have used evidence to do this
Activity	<p>Children work in pairs in the local environment to find, identify and name invertebrates using the invertebrates classification key. Each child records the invertebrates they have found. Support each pair to carefully capture an invertebrate specimen to take back to class for further study. After carefully examining their invertebrate, children individually complete the invertebrate identification activity by drawing a labelled diagram, writing the invertebrate's name, and describing the characteristics that they have used in identification. Children may use the invertebrates classification Word Mat for support if required.</p>

Learning Intention 4	To show the characteristics of living things in a table and a key
Targets	<ul style="list-style-type: none"> - Identify the characteristics of living things - Use the characteristics of living things to sort them using a classification key - Show the characteristics of living things in a table - Create a classification key
Activity	Each child should fill in the habitat classification activity by filling in ticks and crosses to show which living thing from their cards has each characteristic. Working in small groups, children use the living things cards from the Classification Activity Packs to construct classification keys. Children generate appropriate questions, write them on sticky notes and organise their cards and questions into position to construct a working key. Still working in their groups, children test and evaluate the classification key produced by another group, checking that the pathway for each living thing works correctly, and that appropriate questions have been used.
Learning Intention 5	To recognise positive and negative changes to the local environment.
Targets	<ul style="list-style-type: none"> - Identify dangers to wildlife in the local environment - Suggest how to have a positive effect on the local environment - Record my observations on a map - Record my observations in a table
Activity <u>(2 hours needed for this lesson- could be completed across 2 lessons)</u>	Go on an outdoor visit to a suitable local habitat e.g. a local park or an area of the school grounds that will show signs of man-made changes. In pairs, children survey the local habitat (River Mimram/Park and tennis courts in Digswell) and make detailed observations. Children each draw a sketch map of the habitat, drawing and labelling any environmental dangers that they see there. Children complete the Environmental Dangers Record Activity Sheet by filling in the table to record the dangerous changes that they noted in the local habitat, what danger they pose, and a suggestion for helping the local wildlife. Back in class, children work in pairs to discuss how they can have a positive effect on the local habitat.