Y3 Science Planning

A note about the planning Please read carefully.

This planning has been created and adapted by the science leaders at Sacred Heart RC Primary School. It is primarily based on the ASE planning matrices and the exemplification materials. It includes other high quality resources to support the lessons and assessment, such as Explorify, STEM, BP, YouTube, and TAPs. The planning is set out to provide teachers with a series of approximately 6 lessons (a half term's worth) which include the opportunities for working scientifically, incorporating the 5 enquiry types (a table at the end of the planning shows where these enquiry types have been met).

Each set of plans begins with key learning, possible evidence , vocabulary to be used within the topic (created by the ASE), the statutory national curriculum aims and a suggested LO for that lesson. Where possible, we have included the opportunities to incorporate SMSC into the lessons, the opportunity to develop the children's science capital by providing them with potential job opportunities that this area of science offers and the chance to learn briefly about a scientist who was well-known within that area of study or the specific strand of science. Teachers may wish to expand on this further in reading/writing lessons. As this planning has been created for teachers at Sacred Heart, this document can be edited by class teachers if they have alternative ideas but they must inform the science lead before hand and the editing must be done in a different colour and not replace the original.

A set of exemplification materials with the activities supplements this planning and is where teachers can see how the activities were delivered and the work produced by children. The exemplification materials also include the national curriculum statements for the previous year group and the later year groups. Teachers should look at this before making any changes to the planning.

Where appropriate, there are teacher notes that provide extra information about what teachers may need to be aware of before the topic begins, such as resources that may need to be purchased before the topic or the way that the topic has been split.

Please note that it is down to the teacher's discretion as to how they adapt the activities for SEND /more able pupils, although some suggestions have been made. It is important to remember that currently there is no criteria for GD in science.

The start of each topic should begin with the children completing a concept map with the key vocabulary on to show their understanding prior to the topic. When necessary children should revisit this using a different colour when new learning has taken place and children are secure with their understanding of the vocabulary.

It is important that the children now begin to understand and use the terminology linked to the 5 enquiry types and it is important to start explaining what type of science their topics are linked to, for example plants – biology etc

Y3 Plants

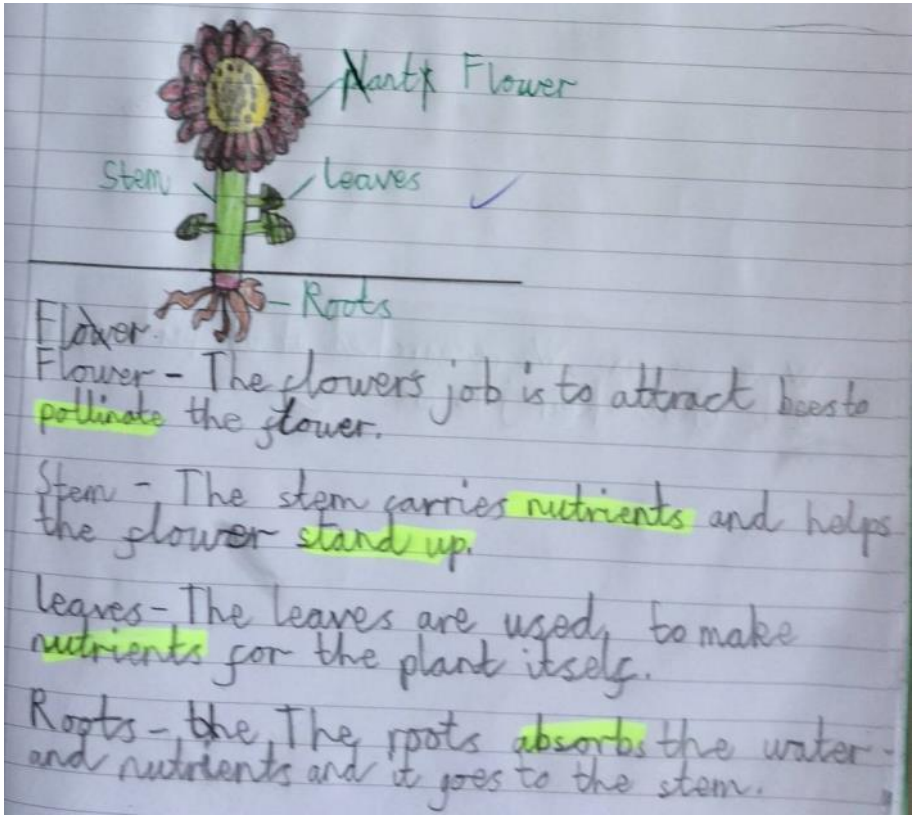
- **identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers**
- **explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant**
- **investigate the way in which water is transported within plants**
- **explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal**

	Assessment guidance	**Key learning**	**Possible Evidence**
SECURE	Shows understanding of a concept using scientific vocabulary correctly	Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth Key vocabulary Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal	Can explain the function of the parts of a flowering plant Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination Can give different methods of pollination and seed dispersal, including examples

	Applying knowledge in familiar related contexts, including a range of enquiries	Observe what happens to plants over time when the leaves or roots are removed Observe the effect of putting cut white carnations or celery in coloured water Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space Spot flowers, seeds, berries and fruits outside throughout the year Observe flowers carefully to identify the pollen Observe flowers being visited by pollinators e.g. bees and butterflies in the summer Observe seeds being blown from the trees e.g. sycamore seeds Research different types of seed dispersal Classify seeds in a range of ways including by how they are dispersed Create a new species of flowering plant	Can explain observations made during investigations Can look at the features of seeds to decide on their method of dispersal Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

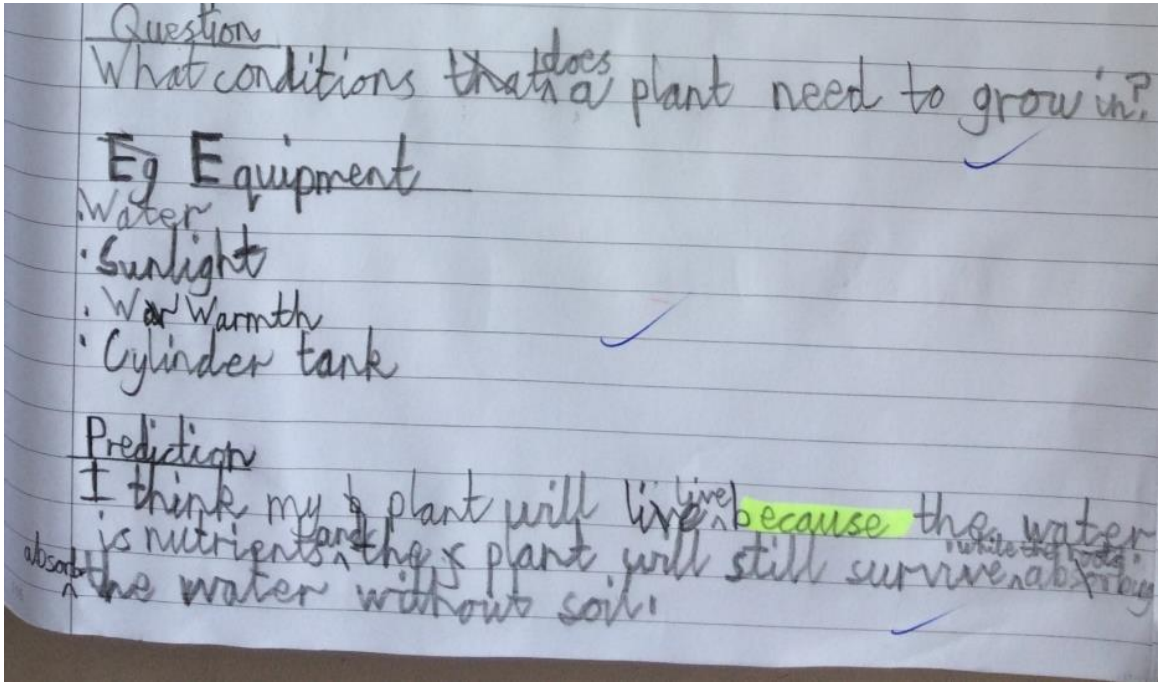
To spark the children's interest and to create a wow moment, a week before you introduce the plants topic, set up a simple experiment in your classroom. You will need a white flower and food colouring to prove that water travels up the stem to the flower. Place the flower in coloured water and over a week or so, the petals should begin to change colour. This can support the children's learning of the functions of different parts of the flower. You will also need to purchase several white carnations before lesson 2 and allow some time each day for the children to record what is happening to each of the carnations. For lesson 3 there are two options: provide children with soil, seeds (that will grow quickly) and pots or a few potted plants/flowers that have already grown.

	LOs	Activities
Planning	Lesson 1 **identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers** LO: To use secondary sources to find out about the functions of different plants Research ipads	Pre assessment activity. Children will have visited this topic twice before now. Please refer to the previous statements for Y2. You could create a quIck quiz linked to the Y1 and Y2 statements. Before introducing the new topic, explain to the children that there are certain scientists called biologists who study and research plants. Biology is the study of living organisms. Show the video clip below to spark the children's interest. Ask them to look closely at what is happening using their observation skills. https://www.youtube.com/watch?v=eKo5F87A8a0 Explain that in order for a plant to survive, all the parts need to work together. Remind the children that they did some planting last year in Y2 – What did they plant? How did they keep their plant alive? Tell the children that they are going to be conducting some research today to find out the functions of each part of a plant. Put the children into pairs and provide them with an ipad. Give each table the name of the part of the plant that they will be researching and give them as much time as you think they will need. Provide the children with scrap paper/jotter to make notes. Once the children have done their research, one pair from each table should feed this back to the group. At this point, the teacher should jot down the feedback on the IWB so all chn can see what their peers have found out. Look out for any misconceptions. Provide the children with A3/A4 paper and ask them to create a poster about the parts of the plant using their research. Posters culd be put on display but should also be photocopied for books. https://www.bbc.co.uk/programmes/articles/Mf5rhbTkHLZ3fbJzScyDvC/primary-science-plants To end the lesson with a bit of fun, show the children this song on Youtube. https://www.youtube.com/watch?v=qI6OL7_qFgU

		You could learn this throughout the topic and perform it at the end of the topic to the other class or film it and upload it to the school facebook page. 

	Lesson 2 **investigate the way in which water is transported within plants** **LO: To conduct a fair test** Fair testing/observation Over time	**This lesson is a TAPs assessment lesson https://pstt.org.uk/resources/curriculum-materials/assessment slightly amended.** Ask the children to think about last week's learning. One of the groups were asked to look at the job of the stem (carrying water to the petals) Remind the children of the experiment you set up at the beginning of the topic which proves that the stem does carry water from the roots to the flower. Present the children with the following question taken from the Ogden Trust website for Y3 plants https://www.ogdentrust.com/assets/general/WS-fair-tests_February-2020.pdf ***How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals?*** And explain that the children will be conducting a fair test to find this out. Explain to the children what a fair test is and ask them what they could do to ensure that their test is a fair one .You could provide the children with the post it planning sheet to help them. To make it fair the children should use same amount of water, the same amount of food colouring and same type of flower) What will they change? (The size of them stem) **Activity 1** Put children into groups and provide them with a carnation. The children can decide what length to cut their stem to. **Activity 2** Ask the children to create a graph of each group's stem size ready to plot times on over the next few days/week. X axis - Groups along the bottom with the size of the stem in cm and y axis –time in days of how long it takes. This could be presented in their books as a bar chart.

	Lesson 3 **explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant** **LO:** To investigate the requirements of plants by changing certain variables **Fair testing** setting up simple practical enquiries, comparative and fair tests	Allow children 5-10 minutes to record their carnation investigation findings by writing a simple conclusion to the question: ***How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals?*** This lesson links to Geography and links back to the children's learning of Africa in y2. Begin the lesson by looking at Rose and Kiilu's story as an example of the problems that can occur with farming in eastern Africa. https://www.farmafrica.org/downloads/2016-ghtb/science-ks2---plant-growth-2017.pdf (scroll down to page 8) Rose grows a variety of crops. Why would growing crops be important for Rose? (Food and money). But Rose's crops didn't grow well, and every day was a struggle to feed her grandchildren. Why might it have been difficult for Rose to grow her crops? Focus on specific challenges such as there being little rainfall. Recap with the children what plants need to grow and survive – they should remember their work in y2.What do they remember about planting seeds in Y2? Ask the children to discuss the functions of each part of the plant and how they all work together to keep the plant alive. **Activity 1** Explain that they are going to set up an investigation to see how plant growth could be affected by amount of light, water and soil. Ask pupils if they have any ideas about how they could do this. Explain that they will be growing beans (similar to beans which are grown in Kenya) under different conditions: If you feel your class are able to, they could pick the different conditions (1) light, water and soil; (2) no water; (3) no light; (4) no soil. Each group will have four plants to pot up, and monitor throughout the week. Ask pupils to think about how we can ensure this is a fair test? Refer to independent variables and dependent variables e.g. same amount of water, same place for light, same type and amount of soil. Why is a fair test important?

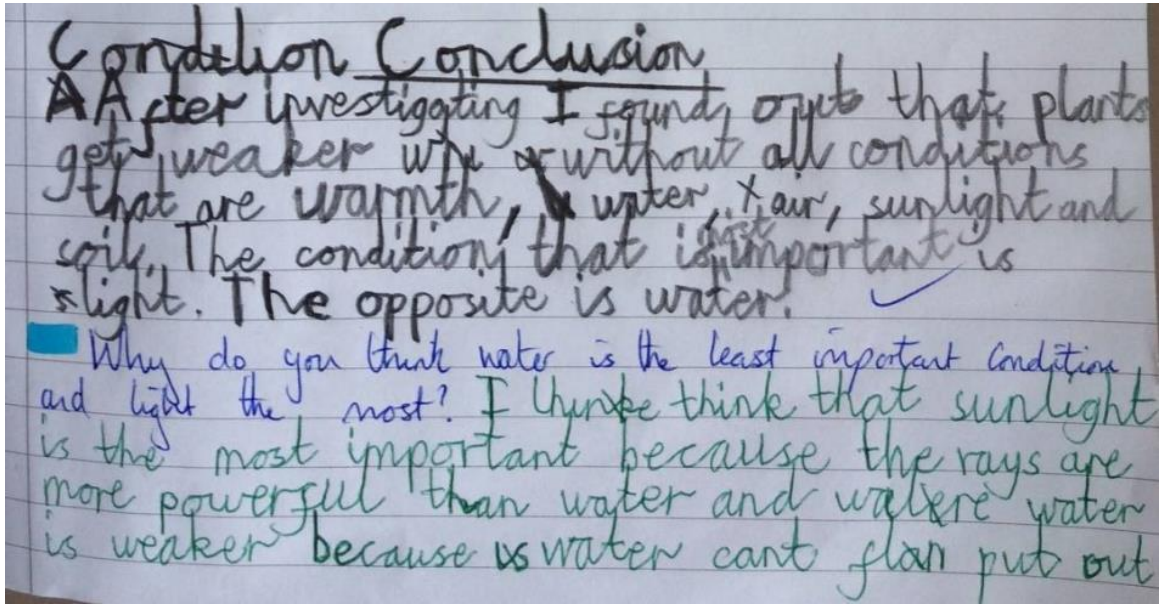


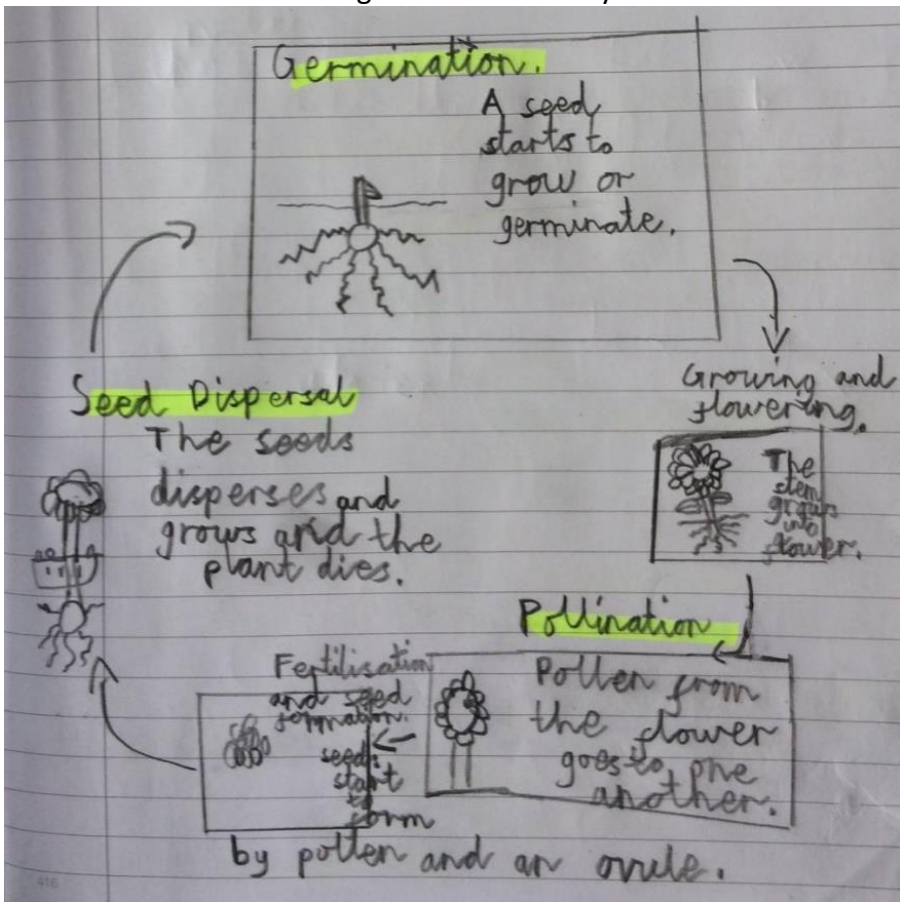
You can create your own recording sheet similar to the one in the pack https://www.farmafrica.org/downloads/2016-ghtb/science-ks2---plant-growth-2017.pdf page 7

Allow children time to plant their seeds in groups. Children to work in mixed ability groups to set up the investigation. Each group will have four plant pots/plastic cups to pot up and label. Each pot will have slightly different conditions, as outlined on the recording sheet. Children to write a prediction about what they think will happen. eg Which plant will grow the best/the worst? Encourage pupils to provide their reasons.. *E.g I think that the plant that will be deprived of soil will not grow at all as the roots will be unable to attach themselves to the soil and therefore will be unable to provide nutrients for the plant*

Alternatively, you could provide each group with a plant that has flowered and explain that you are going to take away one of the requirements such as soil, water, light etc. Then ask the children to predict based what will happen to each plant if it's deprived of soil. E.g I think the plant that is deprived of soil will die first because there is nothing for the roots to attach to and therefore no nutrients can travel up the roots and no water can travel up the stem to the flower. For any SEND children, predictions could be made through drawings.

At the end of the lesson, you could continue to learn the song/rap

		https://www.youtube.com/watch?v=ql6OL7_qFgU
	Lesson 4 **explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal** LO: to research the life cycle of a plant **research** reporting on findings from enquiries, including oral and written explanations, displays or presentations of	Allow children to record their findings of the investigation from the previous lesson. You could provide them with a list of vocabulary to help support them.  Discuss previous learning with the children – what have they learned so far? They should be able to tell you that they have learned about what the functions of each part of a plant, they've explored the requirements of plants by doing investigations etc. Explain to the class, that just like humans and animals, plants have a life cycle too.

	results and conclusions	Place the children into mixed ability pairs and provide the children with an Ipad (one between 2) Ask the children to Research the life cycle of a plant and provide them with note taking materials. On the board have the following words written and explain that the children's research must contain the words **pollination, seed formation and seed dispersal**. Provide the children with the amount of time you think they will need to conduct this research effectively and ask them to draw a diagram of the a life cycle into their books with definitions/explanations  End the lesson by showing the children the following clip https://youtu.be/j-S5ui9Us7U

	Lesson 5: **explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal** LO: to use my knowledge about pollination to write a non-fiction report	Remind the children of this video clip that they watched last week. https://youtu.be/j-S5ui9Us7U **What is pollination and how does it work?** To consolidate learning, children could produce an informative short non-fiction report including diagrams explaining what happens during pollination ensuring that there is a focus on key vocabulary. For more able students, you may ask them to pick one of the three: **pollination, seed formation and seed dispersal** and create a report on seed formation or dispersal instead. You may want to provide those childen with an ipad or books for further information.

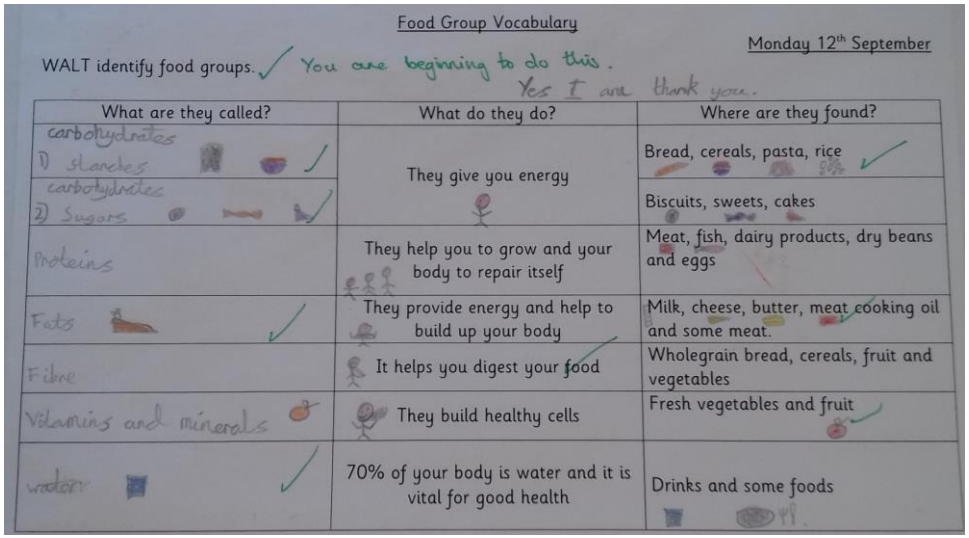
	Lesson 6: **explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal** **LO:** to discover the impact that deforestation has on plants and nature	The following film clip provides an overview of the dangers deforestation poses to plants and animals. It highlights the impact habitat loss has on animals, how it causes their numbers to decrease, even to the point of extinction. The impact it has on humans is also discussed. In particular, how the lack of trees to convert carbon dioxide into oxygen leads to increased air pollution To end the topic, the children will look at the impact that deforestation has on plants. Show the children the video clip https://www.bbc.co.uk/programmes/articles/Mf5rhbTkHLZ3fbJzScyDvC/primary-science-plants and pause at around 50 seconds. Ask the children to reflect on the comments made by the two people in the clip. Encourage some healthy debate around the comments and then continue playing the video clip. Remind children that plants such as tress provide habitats for animals. Ask the children to consider the impact that this could have on animals and the longer -term effects. Show the children a second video clip and discuss the impact that we could have at SH. After the video clip, ask the children to create an informative poster warning people about the dangers of deforestation and how we can help to protect the plants and wildlife in our local area. Remember – this week would be a good opportunity to record the song that you've been learning to post on school facebook and to create a qr code from to stick in books.

Y3 Animals and Humans

- **identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat**
- **identify that humans and some other animals have skeletons and muscles for support, protection and movement**

Learning about the skeleton has been highlighted as an area that needs more time in order to embed learning therefore this topic will stretch over more than 1 half term. The focus for the first half term will be humans and the second will be focussed on animals.

	Assessment guidance	Key learning	Possible Evidence
SECURE	**Shows understanding of a concept using scientific vocabulary correctly**	Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients. Humans and some other animals have skeletons and muscles which help them move and provide protection and support Key vocabulary: Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints	Can name the nutrients found in food Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients Can name some bones that make up their skeleton giving examples that support, help them move or provide protection Can describe how muscles and joints help them to move
	Applying knowledge in familiar related contexts, including a range of enquiries	Classify food in a range of ways Use food labels to explore the nutritional content of a range of food items Use secondary sources to find out they types of food that contain the different nutrients Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet contain a good balance of nutrients Explore the nutrients contained in fast food Use secondary sources to research the parts and functions of the skeleton Investigate pattern seeking questions such as • Can people with longer legs run faster? • Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals	Can classify food into those that are high or low in particular nutrients Can answer their questions about nutrients in food based on their gathered evidence Can talk about the nutrient content of their daily plan Use their data to look for patterns (or lack of) when answering their enquiry question Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons

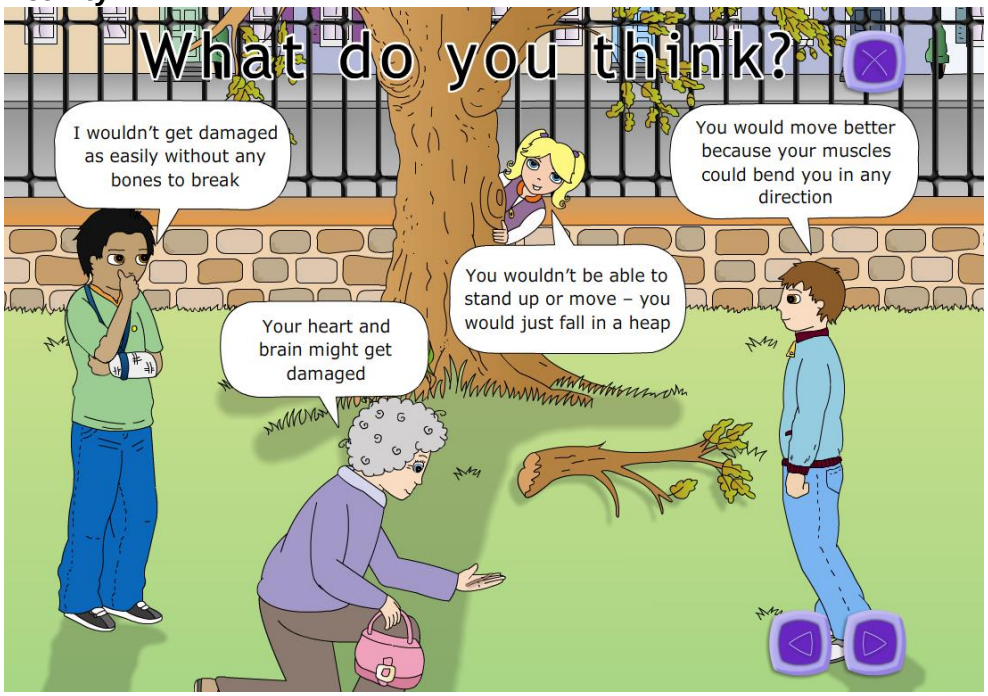
	LOs	Activities
Planning	Lesson 1 **identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat** LO: to research the different types of food Research	Initial assessment activity -Ask the children to talk to their partner about what they learned about animals and humans in year 2. Provide them with a few key words to help them remember – food, water, exercise, survive, health, healthy minds , rest. Take feedback from the children. You could write this down on flipchart paper and have it stuck up on your display board as a reminder to the children about what they already know. Run the odd one out activity .this could be done verbally or you could print screen and print of the images and allow the children 5-10 minutes to explain their thinking . https://explorify.wellcome.ac.uk/en/activities/odd-one-out/fuel-up Remind the children that in Y2, the children had to describe the importance of eating the right amounts of different types of food. Now that they are in Y3, they are going to build on that knowledge and learn about eating the right types of food and right amount of nutrition. Provide each table with the following words: **carbohydrates, proteins, fats, fibre, minerals and vitamins.** One pair from each table will be responsible for that word for the rest of the lesson and share their feedback with the rest of the table. Provide the children with a table similar to the following and ask the children to complete the first column. You could differentiate this for more able pupils by not providing them with 'which foods can they are found in' and asking them to research that further.  Food Group Vocabulary Monday 12th September WALT identify food groups. ✓ You are beginning to do this. Yes I am thank you. What are they called? / What do they do? / Where are they found? carbohydrates 1) starches ✓ — They give you energy — Bread, cereals, pasta, rice ✓ carbohydrates 2) Sugars ✓ — Biscuits, sweets, cakes Proteins — They help you to grow and your body to repair itself — Meat, fish, dairy products, dry beans and eggs Fats ✓ — They provide energy and help to build up your body — Milk, cheese, butter, meat cooking oil and some meat. Fibre — It helps you digest your food ✓ — Wholegrain bread, cereals, fruit and vegetables Vitamins and minerals — They build healthy cells — Fresh vegetables and fruit ✓ water ✓ — 70% of your body is water and it is vital for good health — Drinks and some foods It Is also important to highlight that unlike plants, human's and animal's bodies cannot create food to sustain us. Instead we need to eat food in order to get nutrition.

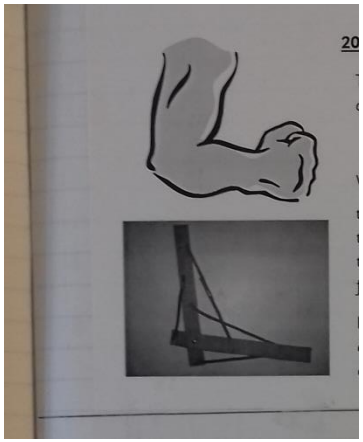
	Lesson 2 **identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat** LO: to identify the nutrition in my favourite meal	Remind the children of the learning they did in y2 based on the Eatwell guide where they were given a pie chart and asked to put the words such as fruits, vegetables, dairy, sugar etc into the right sections on the pie chart to show they understood the importance of eating lots of fruit and veg and not as much sugar. Explain to the children that they are going to build on this knowledge and become more familiar with the terminology they learned last week .This video clip should support their learning: https://www.youtube.com/watch?v=mMHVEFWNLMc Discuss with the children what food types would provide them with which nutrients – they should remember from their first research lesson. Ask the children to draw their favourite meal, including a drink and a dessert, and annotate it to show what nutrients they would gain from their choices. In a different colour, the children should then think about what could be improved on their plate to make it more nutritious. For example, *my main course doesn't include any vegetables ,which I need if I want to make sure I'm getting enough vitamins and minerals.*

	Lesson 3: **identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat** LO: to investigate the amount of sugar in the same foods from different brands Classify and compare gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Investigative lesson using food packaging Provide the children with food packaging of three of the same meals (ready meals may be easier but you may pick beans – Heinz beans, aldi beans, asda's own brand etc or) but from different brands, for example, weightwatchers, Tesco's own brand , Aldi. If unable to provide enough packaging, photos of the meals can be taken or you can recreate the nutritional information on a table for the children – this will need to be done for each child anyway so that they can annotate it and compare. Discuss why companies provide this content on the back of their products and why it is useful. Ask the children to look at the sugar, protein and fat content of each meal. And ask them to create table to write down their findings. The children must now decide which meal is healthier based on the nutritional value and justify their answers using vocabulary. The children will then classify other food packaging but this time the meals will all be different. Pose the question to the children: based on nutritional value, which of these ready meals would be the best to eat? Provide the children with a range of different ready meal packaging e.g spag bol, lasagne, fish pie etc. and ask them to group and classify them. Some may choose to classify them based on high sugar content and low sugar content, some may choose high fat content and low fat content and write this as two columns in their science books. Ask them to discuss with their table which meal they believe would be the best to eat based on it's nutritional value and ask them to write this in their science books.

	Lesson 4: **identify that humans and some other animals have skeletons and muscles for support, protection and movement** LO: to label parts of the human skeleton Research recording findings using simple scientific	Have the skeleton resource (skelly) already in the room to engage the children. Link back to the previous week's learning about nutrition. Explain that this nutrition helps to support our bodies. Our bodies need to be looked after to protect some of our vital organs (inside us). Another part of our body that helps to protect some of our organs is our skeleton. Show children the following video clip https://www.bbc.co.uk/bitesize/clips/zmptsbk (it says ks1 but is certainly not KS1 content as the physical human body is not taught in KS1) Explain to the children that they are going to recreate the human skeleton and label it. To avoid using lots of paper, allow the children to collect materials from the outdoors and provide them with materials such as cotton wool balls, lolllypop sticks etc . As a table, they will help to recreate the skeleton. Provide the children with labels and ask them to place these next to the right bones – for some of the children, this will be the first time learning about the bones so you could create clues to help them. For example, *I am part of the skull and I help to keep your eyes in place – eye sockets.* Take pictures as evidence to stick into books the following lesson.

	language, drawings, labelled diagrams, keys, bar charts, and tables	
	Lesson 5: **identify that humans and some other animals have skeletons and muscles for support, protection and movement** LO: to understand that our muscles support and protect us and	Remind the children on the learning that has already taken place during this topic – we've learned about the nutritional value of food, how this food provides our bodies with nutrients we need and how our bodies have skeletons that help to protect some of the important organs in our bodies. Explain to the children that our skeletons don't just move on their own. In order for our skeletons to move, we also need our muscles. Show the children the following clip https://www.bbc.co.uk/bitesize/clips/zpp6n39 As a demonstration, partially fill some rubber gloves with water and tie them so the water won't leak out. Ask two sensible children to come to the front and shake hands using the rubber gloves. Was it possible? Could they grasp the other person's hand? Explain that this would be what our hands would be like without our skeleton and our muscles. Show the children the following video clip: https://www.bbc.co.uk/teach/class-clips-video/science-ks2-how-do-muscles-and-bones-work/zfgtscw if it's available. Ask the

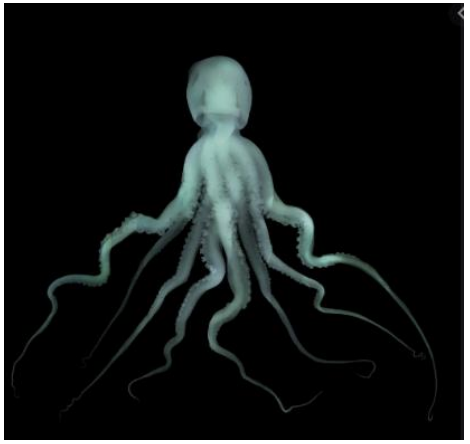
	help our skeleton to move Research	children to recall some of the facts that they have learned while watching the video clips **Activity 1** in their books, ask them to write the heading 'Facts about the human body' and underneath a list of their learning of the skeleton and the muscles, this will support their next activity **Activity 2**  Ask the children to consider whether or not we would be better of without bones . Ask them to annotate the image and write the words agree or disagree next to each person. They will then need to justify why they disagree or agree with the children in the image

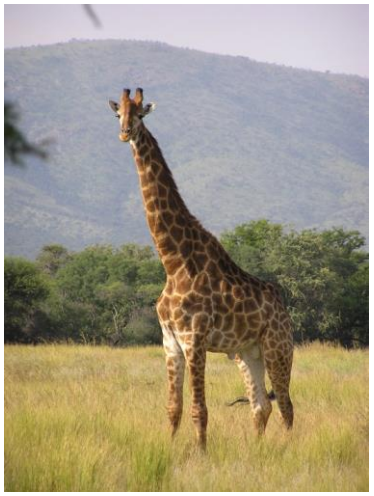
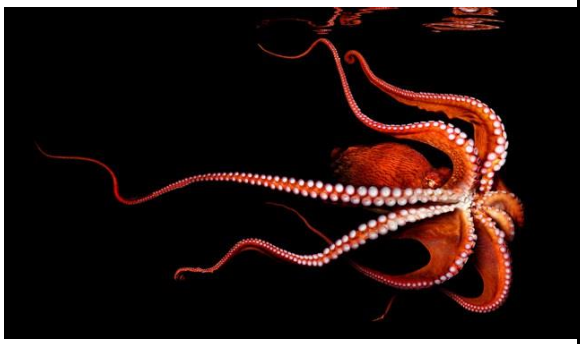
	Lesson 6: **identify that humans and some other animals have skeletons and muscles for support, protection and movement** LO: to understand that our muscles support and protect us and help our skeleton to move	Explain to the children that part of being a good scientist is to help others understand things. Explain to the children that today they are going to create a model of an arm to demonstrate to other children/parents how the muscles in our arms work. https://www.bbc.co.uk/teach/class-clips-video/science-ks2-how-do-muscles-and-bones-work/zfgtscw share this video with the children again. Ask them to consider how our arms move by asking them to imagine they have a weight in their hand and they are flexing their muscles. Put the children into mixed ability pairs and provide them with two pieces of card, two elastic bands and some split pins. Sk them to carefully consider how they could replicate our arm movement using these materials. Which piece of equipment will act as what? The children should choose the cardboard the arm, the split pins for joints and the rubber bands for muscles. Ask the children to create their model . While the children are making their models, use this as an assessment opportunity by visiting each group and asking them to explain their model to you encouraging them to use the facts in their books from last week and to draw on the knowledge they have gained so far. Children could demonstrate this to a younger year group , an adult in school or a few could be selected to be videoed with Miss Platt. 

	Lesson 7 **identify that humans and some other animals have skeletons and muscles for support, protection and movement** LO: to ask an investigative question about the human body Pattern seeking asking relevant questions and using different types of scientific enquiries to answer them	**********AFTER HALF TERM********** Allow children to recap on the learning that took place before half term. Now that the children have learned lots about the human body, explain that over the next few weeks they'll be studying the bodies of different animals Today though, they will become *osteologists.* An osteologist is someone who studies bones. *(*TAPs assessment) Explain that an important part of working scientifically is to ask questions and investigate them. Click on this link and show the children the video clip called '**planning an experiment'** https://bpes.bp.com/planning-an-experiment Explain to the children that today, in groups or pairs, they are going to be creating their own questions based around 'pattern seeking', linking to our learning of humans. Explain to the children that pattern seeking is when you investigate a question multiple times to see if your findings are always the same. Provide the children with post-it-notes so that they can write down their questions after discussion with their group/partner. These post its can be put on display. Give the children an example of a pattern seeking investigation such as *Are adult heads bigger than children's heads? Do taller children have longer arms?* Today's lesson focus will purely be on planning their investigations, next week they can carry these out. Give the children time to write a few question on some post-it-notes. You may wish to helicopter the room to ensure that their questions are able to be investigated and support any group/pair who made be struggling. Once the children are happy with their questions, ask them to choose just one that they will investigate as a group/pair and provide them with the post it planning sheet or if you want to save on paper, the children could just write up their plans in their science books ensuring it is presented neatly and has subheadings such as Equipment

		Method Prediction The conclusion will come after the experiment

	Lesson 8 **identify that humans and some other animals have skeletons and muscles for support, protection and movement** LO: to investigate our questions and draw conclusions from our findings Pattern seeking reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Begin the lesson by asking the children to look at the questions from last week and to also look at their methods (the way in which they will carry the investigation out). Today's lesson will focus on the children carrying out their investigations in a safe manner. This would be a good opportunity to remind children of the safety elements when carrying out any investigation. As we are focusing on people, it is important to remember that we need to maintain good hygiene before touching others and that we should always ask permission first. Show children the animation 'obtaining and presenting evidence' https://bpes.bp.com/obtaining-and-presenting-evidence Before they begin, provide the children with a blank table and explain that they will need to record their data. For example, if they are investigating the question: Do taller children have longer arms? They will need the name, height In cm and length of arms in cm of that child to compare it to a smaller child. Allow the children adequate time to carry out their investigations. Before the children draw conclusions from their evidence, show the children the animation of 'evaluating evidence'. Explain that they have already been fantastic scientists because they've repeated their experiments on different children each time. They might have measured 3 tall children and 3 small children. If they only measured one tall and one small, their evidence might not be as accurate.
	Lesson 9 identify that humans and	Begin the lesson by explaining to the children that they have learned lots about the human body. Over the next few lessons, they will learn about the bodies/skeletons of animals and may be asked to compare these to humans. Ask the children some of the facts that they can remember about the human body. You may wish to encourage them to think about the bones, the job of the skeleton and how the muscles work.

	some other animals have skeletons and muscles for support, protection and movement. Research LO: Compare the skeletons of different animals	Download the ppt from tes https://www.tes.com/teaching-resource/animals-skeleton-and-xray-powerpoint-11413862 which shows a number of animal skeletons through an xray and ask the children to guess what the animals are. Then show them an xray of an an octopus. Ask the children what they notice. After discussion, explain that some animals like this one, don't have skeletons and don't need skeletons to help them to move.  Explain to the children that some animals, like the ones from the ppt have bony skeleteons and have a backbone and we call them vertebrates – please note that it is not essential that the children remember this specific terminology but it is good to provide them with the correct vocabulary. Animals like octopuses, don't have bony skeletons and don't have a backbone and we call these invertebrates. Provide the children with ipads and allow them 10 minutes to research which other animals don't have skeletons and why. They could present this evidence as a simple table in their books as 'animals without skeletons' and 'animals with skeletons'. Under this, ask the children to write up a simple written explanation of the animals that do have backbones and animals that don't. Example: *My research shows that just like humans, many animals need skeletons and muscles to help them move. These animals include dogs, cats, rabbits, etc. They need their skeletons so they can run and move and to protect their organs. Some animals don't have skeletons. These animals include octopuses, snails and jellyfish. They don't have skeletons to allow them to squeeze into any space and change their shape without hurting themselves.*

	Lesson 10 Identify that humans and some other animals have skeletons and muscles for support, protection and movement. LO: To use my knowledge to justify an explanation	Ask the children to draw on their knowledge from last week about animals that have skeletons and animals that don't. Now that the children have some knowledge of animals and skeletons. Encourage discussion by providing the children these 3 images to stick into their books. Ask them which is the **odd one out and why?**   

Y3 Forces

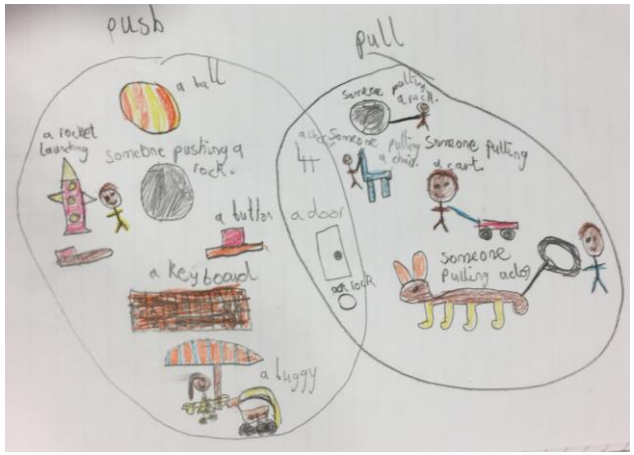
- **compare how things move on different surfaces**
- **notice that some forces need contact between two objects, but magnetic forces can act at a distance**
- **observe how magnets attract or repel each other and attract some materials and not others**
- **compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials**
- **describe magnets as having two poles**
- **predict whether two magnets will attract or repel each other, depending on which poles are facing**

	Assessment guidance	Key learning	Possible Evidence
SECURE	**Shows understanding of a concept using scientific vocabulary correctly**	A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles e.g. a north and south, are brought together they will pull together – attract. For some forces to act there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts. Key vocabulary: Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Can give examples of forces in everyday life Can give examples of objects moving differently on different surfaces Can name a range of types of magnets and show how the poles attract and repel Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets

	Applying knowledge in familiar related contexts, including a range of enquiries	Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet Classify materials according to whether they are magnetic Explore the way that magnets behave in relation to each other Use a marked magnet to find the unmarked poles on other types of magnets Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table Devise an investigation to test the strength of magnets	Can use their results to describe how objects move on different surfaces Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface Can use classification evidence to identify that some metals but not all are magnetic Through their exploration they can show how like poles repel and unlike poles attract and name unmarked poles Can use test data to rank magnets

Please note that lesson 6 is a celebration lesson and will therefore require additional resources, some may need purchasing. Please refer to lesson 5 so resources can be purchased in advance if necessary.

	LOs	Activities
Planning	Lesson 1 **notice that some forces need contact between two objects, but magnetic forces can act at a distance** LO: to identify different forces recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	As this is the children's first time encountering forces, a pre assessment task isn't necessary, however you will be able to gage what they know based on the concept map. Ask the children what they believe a force is. Once you have taken some feedback, show the children the following video clip https://www.bbc.co.uk/bitesize/topics/zvpp34j/articles/zywcrdm or this video https://bpes.bp.com/introducing-forces and discuss with the children, making particular reference to balanced and unbalanced forces and which cause movement. To demonstrate this further, you could get two children to pull on a skipping rope. Show the children the image:  Ask them the following questions: What is moving? Why is it moving? What is in contact to create movement? Discuss. Ask the children to sensibly move around the classroom and find things that they could move by pushing, pulling or both. Once children are back in their places, invite the children to think about their findings. Which needed contact? Ask the children to consider how they might present their findings. It could be as a simple table, labelled objects (push or pull) or a venn diagram.



Lesson 2 compare how things move on different surfaces

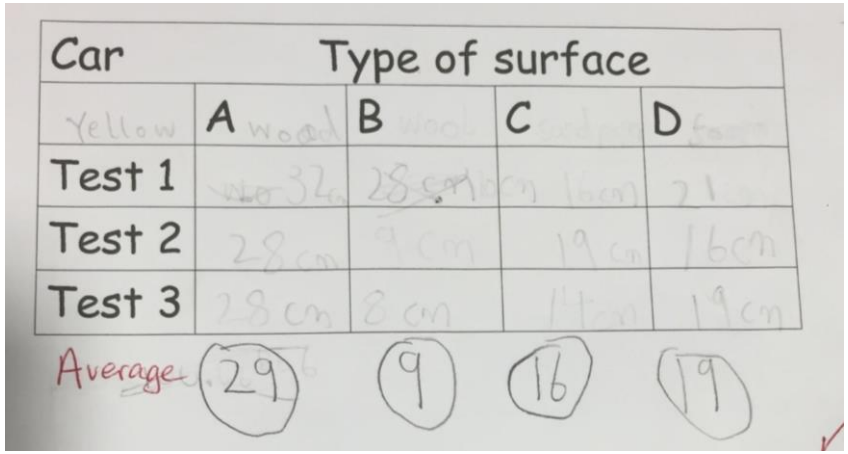
LO: to compare the movement of cars on different surfaces

Comparative testing

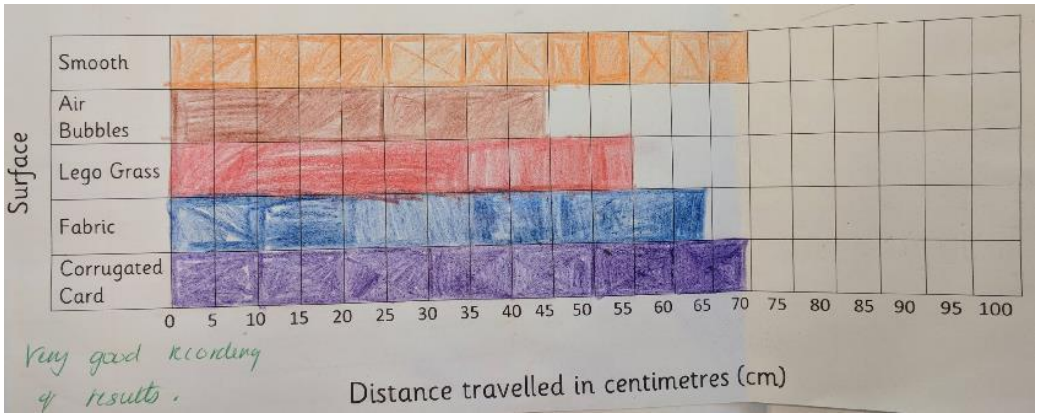
setting up simple practical enquiries,

Remind the children of last week's learning. Explain that today you are going to be doing some comparative testing about how things move on different surfaces using toy cars and a ramp.

Ask the children to create a ramp and provide them three/four surfaces. Provide a range of measuring equipment for them to choose from (rulers, tape measure, metre sticks, cubes). Provide them with a table to record their results, which prompts them to test each surface three times. Ask the children to consider what it is they'll be measuring (distance travelled), and from which point they'll be measuring (end of ramp to where the car stops).



Car	Type of surface			
Yellow	A	B	C	D
Test 1				
Test 2	28cm		19cm	16cm
Test 3	28cm	8cm		19cm
Average	29	9	16	19

	comparative and fair tests	For your SEND/less able pupils, you may wish to consider allowing them to present their findings using cubes and turn this into a block graph. Ask the children to compare each surface as a written explanation under the sub heading 'findings'. e.g '*From my findings, I have noticed that the cars moved differently on each surface. On surface A the car travelled around 24 cm from leaving the ramp but on surface C the car only travelled 10cm from leaving the ramp which shows that a wooden surface helped the car to travel a further distance.'* Although the children do not yet need to know about 'friction', some children may notice that when the car leaves the ramp it is coming into contact with another surface (the carpet) and that this may have an impact on how far the car travels. If this is the case, you can refer to that force as friction however, it does not need to be explicitly taught. 
	Lesson 3: • **describe magnets as having two poles** • **predict whether two magnets will attract or repel each other, depending on which poles**	To spark conversation and to first introduce the children to magnets, show the children the odd one out image https://explorify.wellcome.ac.uk/en/activities/odd-one-out/pull-together and run the activity, but don't read out the background science yet. Ask the children the questions and see their responses. Ask the children were they have seen magnets being used before (fridge magnets etc) Provide the children with a range of magnets and give them some time to explore but do not yet give them anything that is magnetic. Encourage them to explore the N and S markings on the magnets. What do they notice? If you feel it necessary, show the children the video clip https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zpvcrdm which explains magnets a bit more.

	are facing • **compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials** LO: to explore magnets Group and classify recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	**Activity 1** Ask the children to carefully draw two magnets with N and S on. Ask them to first draw two next to each other that show that they attract and then ask them to draw two that shows the magnets repelling. Underneath the images, ask them to write a short explanation about what they notice e.g *1.When the N and S poles on two different magnets are facing, they attract one another and therefore the surfaces touch.* *2. When the North on the first magnet is facing the North on the second magnet, they repel. It feels almost impossible to force them together.* **Activity 2** Provide the children with a range of materials including a silver spoon/fork (this will be used to identify misconceptions later) Ask them what they think it means if we describe something as being magnetic. Explain to the children that they are going to be grouping and classifying materials based on whether or not they are magnetic. Ask the children to have a look at the range of materials and to write a prediction about which resources will be magnetic and which resources won't. They don't have to justify their answers at this point, as they may not be aware that for magnetism to occur, the materials must contain certain elements. Once they have explored the resources, ask the children to think about how they may choose to present their findings through grouping and classifying. Which could be the most appropriate way? Tables, diagrams, drawings, bar charts? Ask them to select their own way of presenting this data. This is providing the children with an opportunity to make independent informed choices and to work scientifically. Once children have presented their findings in their books, ask them to look at the objects that are magnetic. What do they notice? Are some of these objects similar? What is similar about them? Explain to the children that the items that were magnetic are all made of metal. Show the video clip below to support this. https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zw889qt To help the children understand the phrase all magnetic items are metal but not all metals are magnetic, you could bring in a silver fork/ spoon which is a metal but not magnetic. Finally ask the children to write a short simple explanation of what they have found out today under the heading 'Findings' . For

		example, "*After my investigation, I have learned that all the objects that were magnetic were all made from some kind of metal, I predicted that a silver spoon would be magnetic because it looked similar to other objects that I thought would be magnetic but I learned that not all metals are magnetic. Metals that are magnetic are iron, nickel and steel.* "
	Lesson 4 Notice that some forces need contact between two objects, but magnetic objects can act at a distance. LO: Test the strength of different magnets **Pattern seeking** use straightforward scientific evidence to answer questions or to support their	Recap previous learning and what the children remember from last week. TAPs assessment Download the TAPs assessment documents for the magnet activity. Explain to the class that they are going to be *physicists.* **Physics** is the study of the relationship of objects, forces, and energy. **Physics** explains gravity, and the way things move. https://pstt.org.uk/resources/curriculum-materials/assessment Investigative question: Does the size and shape of a magnet affect how strong it is? Provide the children with a collection of magnets and other materials (e.g. card, fabric, tissue, thin wood, aluminium foil, paperclips) to explore. Ask them to find out ways to test whether the magnets are all equally strong *e.g. through paper/card or layers of each, how close magnet needs to be before it attracts a paper clip etc.* Ask the children to report their findings verbally, e.g. explaining how they carried out  their investigation to their peers. As a class, discuss the different ways of testing magnet strength and talk about the advantages and disadvantages of each approach. Discuss why it is a good idea to try different ways of answering a question (to get a more reliable answer). See https://pstt.org.uk/application/files/1714/7015/6579/Y3eg_Forces_Magnet_results_table_WS_Do.pdf for an example of how the work produced by the child completing this TAPs activity

	findings.	
	Lesson 5: LO:	

	Lesson 6: LO:	Celebration of learning – In this lesson, the children will be creating games to showcase their knowledge of magnets. Children could invite their parents in to explore some of the games that the children will be making. The resources for this lesson can be found here https://www.stem.org.uk/resources/elibrary/resource/26717/forces-and-magnets-amazing-magnets and are taken from the 'Magnetic Fun Time' section. There is a ppt to support teaching. Login details if needed: U: kasbiak@sacred-heart.bolton.sch.uk P: Sacredheart1 Explain to the children that we are now great experts on magnetism and today we will begin to work on designing our own exciting magnetic activities for the visitors at the Science Fair. Before we start on this though, let's play a fast-paced game called Chain Magnets to remind us what we learnt last time. Show the *How to play Chain Magnets* PowerPoint and then play the game. Now it's time to get thinking about all the exciting ideas you have for fun activities on magnetism. They could be similar to some of the activities we've done over the past few sessions or they could be ideas of your own. Our activities should be fun and at the same time teach the visitors something about magnetic forces. Use the flip board to write a list of the chn's ideas. Wow! You have some great ideas there. Mr Newton has sent a few ideas on a PowerPoint too just in case anyone is stuck. Some of them are probably similar to your ideas but there may also be a few you haven't thought of. Watch the ideas PowerPoint.

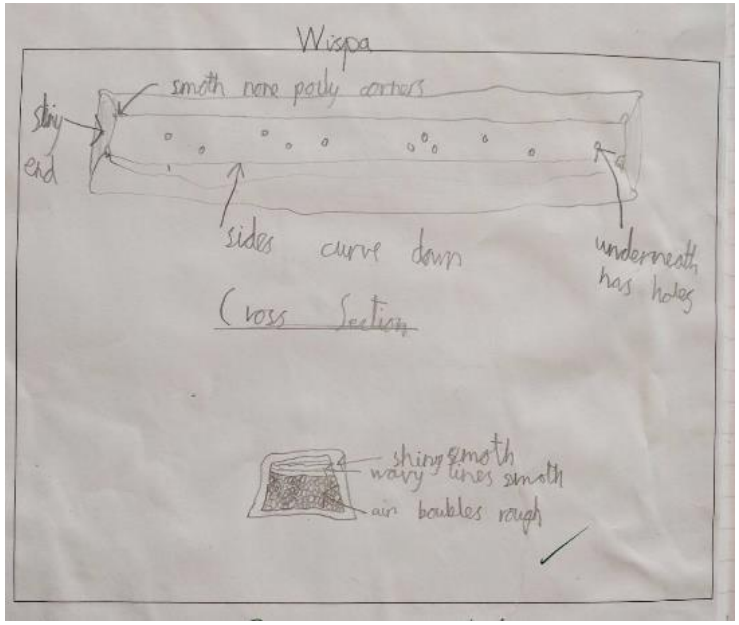
Y3 Rocks and Soils

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter

	Assessment guidance	Key learning	Possible Evidence
SECURE	Shows understanding of a concept using scientific vocabulary correctly	Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock piece and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. Key vocabulary: Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	Can name some types of rock and give physical features of each Can explain how a fossil is formed Can explain that soils are made from rocks and also contain living/dead matter
	Applying knowledge in familiar related contexts, including a range of enquiries	Classify rocks in a range of ways based on their appearance Devise a test to investigate the hardness of a range of rocks Devise a test to investigate how much water different rocks absorb Observe how rocks change over time e.g. gravestones or old building Research using secondary sources how fossils are formed Observe soils closely Classify soils in a range of ways based on their appearance Devise a test to investigate the water retention of soils Observe how soil can be separated through sedimentation Research the work of Mary Anning	Can classify rocks in a range of different ways using appropriate vocabulary Can devise tests to explore the properties of rocks and use data to rank the rocks Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc. Can identify plant/animal matter and rocks in samples of soil Can devise a test to explore the water retention of soils

Please liase with the office about a potential fossils workshop which will replace one of the two lessons on fossils as it should cover some of the objectives. http://www.primaryscienceworkshops.co.uk/fossils/4590059895

	LOs	Activities
Planning	Lesson 1 • **compare and group together different kinds of rocks on the basis of their appearance and simple physical properties** LO: **Comparing chocolate 'rock' to real types of rock** Grouping and Classifying	Introduce the new topic by sparking interest and conversation with this Zoom in and Zoom out explorify activity https://explorify.wellcome.ac.uk/en/activities/zoom-in-zoom-out/kaleidoscope-of-colour Explain that the new science topic will be all about rocks and soils. Provide children with a concept map with vocabulary on and ask them to write down what they think they know about the vocab, remember to allow the children to revisit this throughout the topic. People who study rocks are called geologists. Tell the children that they will be learning about a famous female scientist who studied rocks and fossils called Mary Anning (you could link this to RAMP reading sessions). Explain that geologists have to make careful observations when studying rocks. This is a link to the life of Mary Anning – it is a 12 minute clip so you may want to show this to the children at the end of the lesson or the end of the day. https://www.bbc.co.uk/teach/class-clips-video/true-stories-mary-anning/zn7gd6f Ask the children what they think a rock is? What are the properties of rocks (link back to Y2 materials)? Provide the children with a range of chocolate rocks (malteasers, Aero, Minstrels, twirl, flake) Ask the children to group these chocolate rocks in any way they like. Take lots of pictures of this activity for your display **Activity 1** In groups or pairs, ask the children to choose one of the chocolate bars (rocks)) and ask them to draw the outside of it and label it. Provide them with a knife to cut the bar in half and draw and label a cross section using key vocabulary from y2 (materials) and y3. (plastic knives should work fine). Remind the children about keeping themselves and others safe.



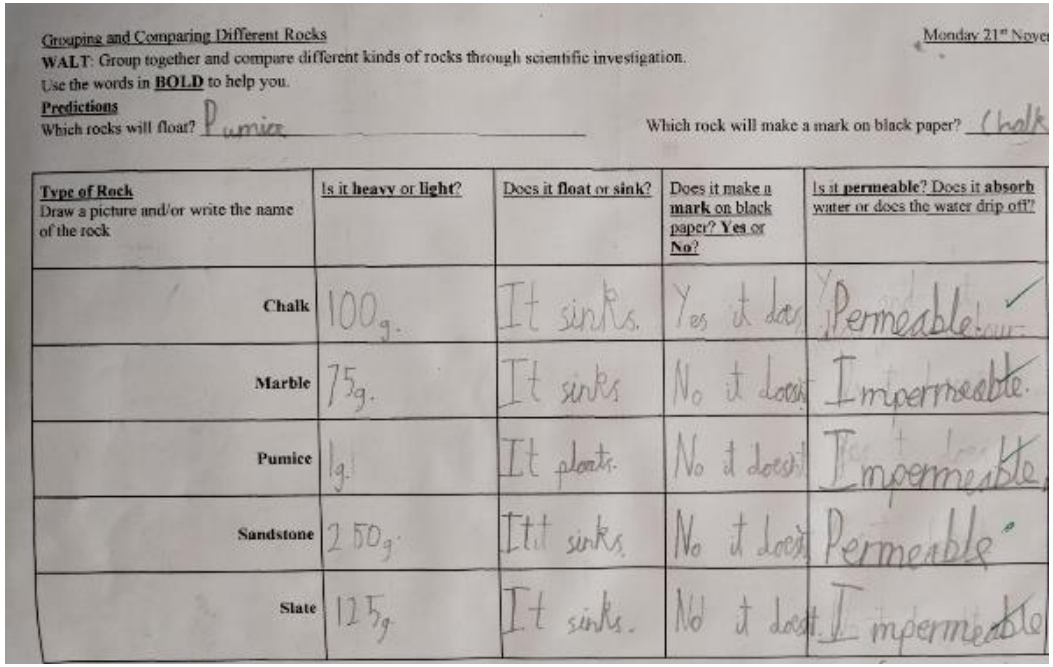
Activity 2

Provide the children with the information from slide 14 from the exemplification ppt to stick into their books. Ask the children to look carefully at the information provided about rocks and to write an explanation about which chocolate rock resembled each.

Explain to the children that although this was a fun lesson, it will help us to prepare for when we study real rocks.

To finish the lesson, you may wish to show the children the following video clip
https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/zsgkdmn

	Lesson 2 • **compare and group together different kinds of rocks on the basis of their appearance and simple physical properties** LO: to investigate different types of rocks **Identifying, classifying and grouping** setting up simple practical enquiries, comparative and fair tests	Begin the lesson by showing the children this video clip again https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/zsgkdmn and scroll down a bit further to read the properties and uses which focuses particularly on **permeable and impermeable rocks.** **Activity 1** Provide the children with images of slate, sandstone,chalk and marble on a ppt and explain that these are all rocks. Ask the children what objects could be made from these types of rocks (the video should help) with this. **Activity 2** Provide the children with a range of rocks(from activity 1) and equipment. You may wish to provide them with some scales so that they can weigh the rocks to see how heavy/light they are and water so they can test whether they are permeable or impermeable/ to see if the rock sinks or floats. Ask the children what they could use the equipment for. You may wish to provide some of the children with a blank table to create their own headings or one like the following which guides the children through their simple testing of these rocks



Grouping and Comparing Different Rocks

Monday 21st Nove

WALT: Group together and compare different kinds of rocks through scientific investigation.

Use the words in **BOLD** to help you.

Predictions

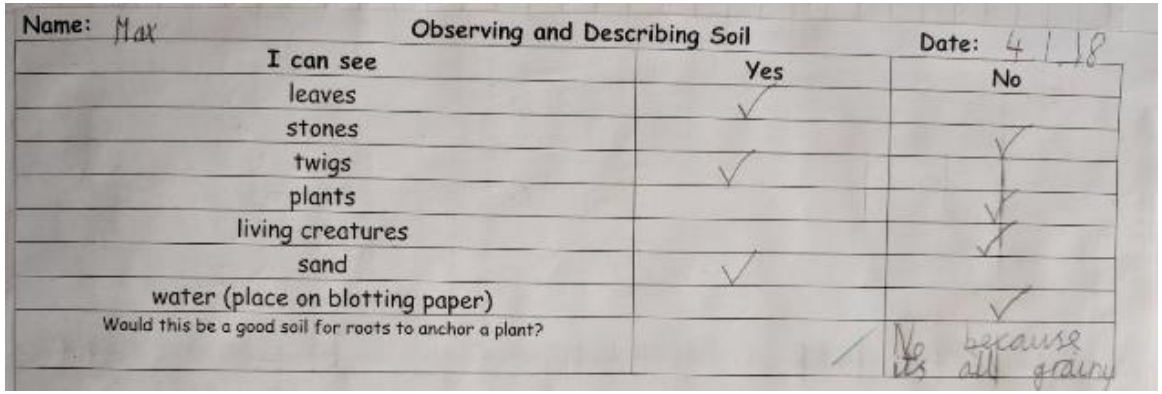
Which rocks will float? Pumice

Which rock will make a mark on black paper? Chalk

Type of Rock Draw a picture and/or write the name of the rock	Is it **heavy** or **light**?	Does it **float** or **sink**?	Does it make a **mark** on black paper? **Yes** or **No**?	Is it **permeable**? Does it **absorb** water or does the water drip off?
Chalk	100g.	It sinks.	Yes it does	Permeable
Marble	75g.	It sinks	No it does	Impermeable.
Pumice	1g.	It floats.	No it does	Impermeable
Sandstone	250g.	It sinks.	No it does	Permeable
Slate	125g	It sinks.	No it does	Impermeable

See exemplification for further clarity.

	Lesson 3 • recognise that soils are made from rocks and organic matter LO: investigating soil to identify what it is made from	Depending on the time of year, take the children out into the Ole area or the Room2Grow area and ask them to look closely and carefully at the soil that is around that area. They should remember that the soil is providing nutrients for the plants (linking this with their plants topic) and this enables those plants to be strong and healthy. Most of them should know that soil has a job to do. Pose the question: what is soil made from? In pairs, ask the children to collect a sample of soil that they will observe closely once they are back in class. You may wish to provide the children with gloves and magnifying glasses. In pairs or groups, ask them to look through the soil by rubbing the soil between their fingers and if they find anything inside the soil, to put it in a separate pot. Ask the children to make a note in their science books of what they find (maybe leave a space after the LO for pictures for evidence). It is important that the children are able to find these things out for themselves however for SEND children you may wish to

	identifying differences, similarities or changes related to simple scientific ideas and processes	provide a similar table to the one below.  Name: Max — Observing and Describing Soil — Date: 4/10 I can see / Yes / No leaves ✓ stones ✓ twigs ✓ plants ✓ living creatures ✓ sand ✓ water (place on blotting paper) ✓ Would this be a good soil for roots to anchor a plant? No because its all grainy Show the children the following video clip but only up to 30 seconds https://www.bbc.co.uk/bitesize/topics/zjty4wx/articles/ztvbk2p Once the children have observed their soil, ask them to write a short report about their findings. In the next lesson, they will be investigating different types of soil and its properties.
	Lesson 4: **recognise that soils are made from rocks and organic matter** LO: to investigate different types of soil recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	**There are two options for this lesson due to potential resourcing issues. If possible, attempts should be made for the children to investigate different types of real soil, however, if this is not possible, this could be a research lesson about the different soils and their properties**. In groups, provide the children with a sample of sandy soil, clay soil and chalky soil but do not let them know which soil is which. Show the children the following video clip again https://www.bbc.co.uk/bitesize/topics/zjty4wx/articles/ztvbk2p You may wish to provide the children with the following information which could simply be on a ppt for all children to see. *Sandy soil is pale coloured and has large particles. These create lots of small air gaps. Water drains through them easily so it usually feels dry.*

		Clay soil is usually sticky and has small particles. They contain very few air gaps and water does not drain through it easily. *Chalky soil is a light brown soil. Water drains through it quickly* Explain to the children that they are going to be investigating the soil to identify which soil is which. They will do this by testing each for the properties described above. For example, children should get a sample of the different soils and should then test the soil to see if water drains through it easily, if they can feel large or small particles etc. They could do this with a bowl, a sieve and a small amount of water. Again, if this is proving to be difficult due to resourcing, it could be done in larger groups, or, as demonstration by the teacher. However the teacher must not give any clues as to which soil it could be. Once the children have investigated the soils, provide them with three images of the different soils to stick into their books. The children should then write which soil they believe it to be. For example, *'I believe this soil is the sandy soil. I think this because it is quite pale to look at and when I felt it, It had lots of large particles. After dropping a few drops of water onto it, I noticed that the water drained through it quickly and that is why I believe this to be the sandy soil.'* **For a cross curricular opportunity, children could write up a mini report in their English books. Please see exemplification for further guidance.**
	Lesson 5: • **describe in simple terms how fossils are formed when things that have lived are trapped within rock** LO: to describe how	Begin by explaining to the children that they are going to be learning about fossils. Ask the children what they think is meant by a fossil. Then explain that some people are **palaeontologists.** A **paleontologist** is a scientist who studies the history of life on Earth through the fossil record. Fossils are the evidence of past life on the planet and can include those formed from animal bodies or their imprints (body fossils). Show the children the video https://vimeo.com/205363042 This video shows how dinosaur fossils are formed https://www.nhm.ac.uk/discover/how-are-fossils-formed.html?gclid=Cj0KCQjwn7j2BRDrARIsAHJkxmybKvJPBmtREiMzqCqJB3JgkdkRRlVj-NDkaHXlwWI7wzpBHPXE0TYaAjiQEALw_wcB

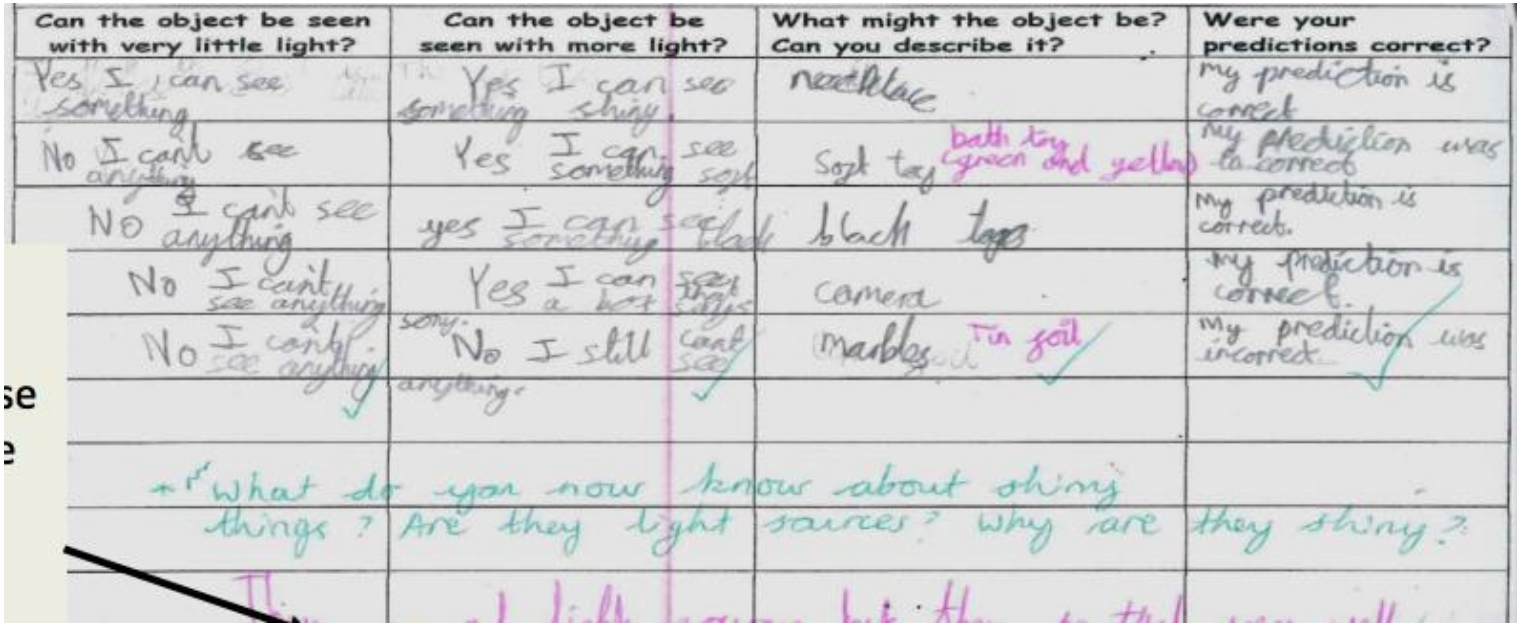
	fossils are formed	In pairs give the children 6 statements, all mixed up, about the process of fossil formation and ask them to sequence them in order: **Millions of years ago, a prehistoric fish was swimming in the ocean.** **Some time later, the fish dies and other fish eat its flesh leaving behind just the skeleton.** **Mud and sand cover the skeleton which help to preserve it.** **The skeleton dissolves into the rock leaving a mould. This is filled with minerals leaving behind a stony substance.** **Over thousands of years the mud is compressed and turns into rock.** **Millions of years later, the fossil comes to the surface and is discovered.** The children should then write the statements in the correct order or for SEND children, statements could be read out and stuck in. The children could draw diagrams next to each statement to support it. Remind the children about Mary Anning and her discoveries.
	Lesson 6: • **describe in simple terms how fossils are formed when things that have lived are trapped within rock**	If there is a problem with getting the education group in to do a fossil workshop, you could end the topic with a hands on and practical lesson where the children can make their own fossils to excavate. Please use the link below https://www.edenproject.com/sites/default/files/documents/The%20Great%20Fossil%20Hunters%20with%20letterhead.pdf There are downloadable lesson plans, instructions and resource lists.

Y3 Light

recognise that they need light in order to see things and that dark is the absence of light
• notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change

	Assessment guidance	Key learning	Possible Evidence
SECURE	**Shows understanding of a concept using scientific vocabulary correctly**	**We see objects because our eyes can sense light. Some objects, for example the sun, light bulbs and candles are sources of light. We can see light sources shining directly into our eyes but to see other objects, light from a source must first shine on the object and then be reflected into our eyes. Some objects are easier to see as they are more reflective or shiny than other objects. Objects are easier to see if there is more light. Dark is the absence of light. We cannot see anything in complete darkness. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. If the light source and object move closer to each other, the shadow will become larger.** **Key vocabulary: Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous**	**Can describe how we see objects in light and can describe dark as the absence of light. Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses. Can define transparent, translucent and opaque. Can describe how shadows are formed by objects blocking light.**
	Applying knowledge in familiar related contexts, including a range of enquiries	**Explain why different objects are more or less visible in different lighting and for different object surfaces e.g. shiny vs matt. Explain how shadows vary as the distance between a light source and an object is changed.**	**Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change. Therefore can clearly explain that objects are not visible in complete darkness. Can describe patterns in how shadows vary due to blocking of light and predict what will happen as light source or object are moved.**

	LOs	Activities
Planning	Lesson 1 recognise that they need light in order to see things and that dark is the absence of light LO: To explore the need for light to see things	Begin your lesson with the odd one out activity https://explorify.wellcome.ac.uk/en/activities/odd-one-out/sources-of-light and once done, ask them what they think their next topic is going to be. Provide the children with the concept map and ask them to write about what they already know about light. As an introduction to the topic, have 3 shoe boxes prepared with 2 holes in either side (one to look through and one to let some light in) and a different object in each one. Have some material draped over the box so that it is covering the hole at the back. Provide the children with a list of what the objects could be e.g marbles, necklace, tin foil, paper, white board, glue stick. Explain to the children that 3 of the objects are in 3 of the boxes and that the boxes will be completely dark except a small part of light which is coming through the hole at the back of the box. Ask the children to make a prediction about which objects they think will be the easiest to identify when there is limited light. The children will look through the boxes three times – once without the material draped over, once with the material draped over and once with their hand covering the hole completely. Provide them with a table similar to the one below and ask them to fill it out after they've looked through the boxes.



Can the object be seen with very little light?	Can the object be seen with more light?	What might the object be? Can you describe it?	Were your predictions correct?
Yes I can see something	Yes I can see something shiny.	necklace	My prediction is correct
No I can't see anything	Yes I can see something soft	Soft toy bath toy Green and yellow	My prediction was correct
No I can't see anything	yes I can see something black	black tags	My prediction is correct.
No I can't see anything	Yes I can see a bit	camera	My prediction is correct.
No I can't see anything	No I still can't see anything.	marbles Fun ball	My prediction was incorrect
What do you now know about shiny things?	Are they light sources?	Why are they shiny?	

Once the children have filled in their table. Ask them to think back to the odd one out activity and explain that in order to see, we need sources of light. Ask them to look around the classroom and identify the sources of light.

Show the children the following video clip https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/z2s4xfr

and ensure that they are aware of the many sources of light. There is also a quiz that the children could take part in underneath the video.

If time permits, you may want the children to write brief explanation of what they have learned so far (see exemplification).

	Lesson 2 notice that light is reflected from surfaces LO:	Recap the last lesson to see what the children have remembered. Explain that the children will be learning about the word 'reflect' or 'reflection'. Ask the children if any of them know what this word means. You may wish to show them this video clip at this point or at the end of the lesson https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/zqdxb82
	Lesson 3 recognise that shadows are formed when the light from a light source is blocked by an opaque object LO:	Write the words 'transparent', 'translucent' and 'opaque' on the board. Ask the children what they mean – they should remember as they were introduced to these words in Y1. Ask the children, in pairs or groups, to gather some objects from around the classroom, ensure each group has a mixture of opaque, translucent and transparent. Provide the children with torches and turn of the lights.
	Lesson 4: LO:	

	Lesson 5: LO:	
	Lesson 6: LO:	

	LOs	Activities

Planning	Lesson 1: LO:	
	Lesson 2 LO:	
	Lesson 3: LO:	

	Lesson 4: LO:	
	Lesson 5 LO:	

	Lesson 6: i LO:	

Enquiry types checklist for planning

Topic	Observation over time	Pattern seeking	Identifying, classifying and grouping	Comparative and fair testing	Research
Plants					
Animals incl. Humans					
Forces					
Rocks and soils					
Light					