SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 3 & Year 4	Term: Autumn 1 (Cycle B)	Topic: Animals including humans (teeth and digestion)

National Curriculum Links

Pupils in Key Stage Two should be taught to:

- describe the simple functions of the basic parts of the digestive system in humans
- identify the different types of teeth in humans and their simple functions

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• oral hygiene (EYFS) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including 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. (Y3 - Animals, including humans)	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans) • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) • Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)

Common Misconceptions

Some children may think:

- your stomach is where your belly button is
- food is digested only in the stomach
- when you have a meal, your food goes down one tube and your drink down another
- the food you eat **becomes "poo" and the drink becomes "wee".**

Sustainable Development Goals & Catholic Social Teaching

These Sustainable Development Global Goals would be perfect to fit with this unit of learning:

- Lesson 6 will focus on Zero Hunger and especially on malnutrition.

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:
These will all be focused on throughout the unit but especially in lesson 6.

- The option for the poor
- Common good
- The dignity of work and participation
- Solidary
- Creation and environment

Applied Write Opportunities

- Explanation text about the digestive system

Enrichment Opportunities

- A visit from a dentist, health visitor or a paediatrician.
- Visit a dentist surgery.

Assessment Opportunities

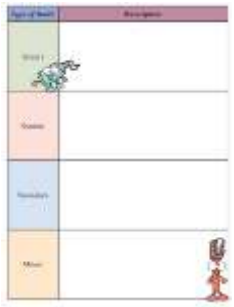
- Can sequence the main parts of the digestive system
- Can draw the main parts of the digestive system onto a human outline
- Can describe what happens in each part of the digestive system
- Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for

Key Vocabulary

Tier Two:

mouth, tongue, teeth, gums, tummy, stomach, bowels, poo, waste, energy, saliva, chew, bite, tear, hygiene, holes, rotten, dentist, dental, sugar, jaw, carnivore, herbivore, omnivore, decay, liver,

Tier Three:
incisors, molars, canines, pre-molars, wisdom teeth, enamel, plague, bacteria, fluoride, cavities, oesophagus, small and large intestine, anus, excrete, rectum,

Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I can name my teeth and I know what they do. Working Scientifically	**Prior Assessment Task:** Use the following Explorify task to get the children talkin all about teeth. https://explorify.uk/en/activities/have-you-ever/been-to-t -dentist-and-had-your-teeth-checked Use the questions online to support the discussion.  Starter Question Ask the question: *Why do we need teeth?* Discuss with Talking Partners before discussing as a whole class. We need them to: • eat • talk • smile **Without eating, we would not be able to survive, grow, move or heal our bodies.** **Introduction** **Explain to the children that they are going to be learning about their teeth and what is amazing about them.** Ask children to feel their teeth with their tongue. Ask the questions: *What do your teeth feel like?* *Do all your teeth feel the same?*	SEND: Children to match the name of the tooth, to its picture and what it does. Main Activity In pairs or small groups, children to read statements about the four types of teeth. (This resource is from CGP Plus Online.) Sort the statements into four groups.   Challenge:

Resources

- Apples
- Biscuits
- Jelly dummies
- Mirrors
- Teeth models/images
- Statements to sort and recording sheet
- Teeth types, functions and locations matching activity (SEND)
- Reading text (challenge)

Children to discuss with their Talking Partners before discussing as a whole class.

<u>Activity 1</u>
Give children a mirror to look at their teeth, observing differences between the teeth, the size of the tooth, the location and the number.
Take photographs for journals.
Discuss their observations with their Talking Partner.

Invite children to talk about their observations.

Discuss the differences between the teeth, introdusing names of the teeth and their physical appearance and quantity. Use an image of the mouth and indovidual teeth to support the discussion.

Explain;
The teeth at the front (incisors) are sharp and blade like. We have 8 of these (4 on the top and 4 on the bottom)
The teeth next to front ones (canines) are pointy. We have 4 of these (2 on the top and 2 on the bottom)
The teeth at the back (molars) large and flat. We have 8 of these (4 on the top and 4 on the bottom)
Some children might have their premolars. These are between the canines and molars. They are just like molars but are smaller than in size. We will have 8 of these as adults (4 on the top and 4 on the bottom)

<u>Activity 2:</u>
Give children a mirror, and invite them to look carefully at their teeth again. Can they identify the different types of teeth? Are any of their teeth missing?

<u>Activity 3:</u>
Give children a piece of fruit e.g. an apple. Invite them to eat it. When doing so, children to think about the teeth they are using and what the teeth are doing.

Children to talk about their observations.

Discuss the different types of teeth and their functions, use images or large models of the teeth as you discuss each one.

Research more about teeth using this text from CGP Plus.

Write facts about teeth on a tooth outline.

Plenary

Use BBC Bitesize video, quiz and activities to consolidate learning **from today's lesson**
https://www.bbc.co.uk/bitesize/topics/z7x78xs/articles/zsp76yc

	Incisors – used for biting and cutting **Canines – used for stabbing and riping** **Premolars – used for holding and crushing** **Molars – used for grinding before swallowing** **Give children a biscuit to eat, and repeat the process.** **Give children a jelly dummy to eat, and repeat the process.**	

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Two I can name my teeth and I know what they do. Working Scientifically	**Prior Assessment Task:** Display a set of teeth on the IWB along with the following questions. • *Why do we have teeth?* • *What are the names of our teeth?* • *What do the different teeth in our mouth do?* • *What do our teeth look like?* • *Where are the different teeth in our mouth?* **Using the 'Quick Write' technique, children to respond to the questions using a** wipe-board. SEND: this can be done verbally or they could work with a partner, and their partner can scribe for them. Take feedback from children. **Photocopy examples of children's boards or take a photograph of their boards as** evidence/for display/for books. Starter Question Ask the question: *Are my teeth (adult) the same as your teeth (child)?* Discuss with Talking Partners before discussing as a whole class.	SEND:  Make a playdough model of the teeth using a plastic model to support. Children to attach premade labels to the teeth. Take a photograph for their book. Can the child talk about each tooth? Main Activity: Children to make a model of teeth in groups. Children to create labels for their model. Then, children to create a video of themselves talking about teeth. Can they answer the following questions: Why do we have teeth? What do our teeth look like? What are the names of our teeth? Where are they in our mouth?

Resources

- White and red/pink playdough or clay
- Premade labels (SEND)
- Labels and arrow cards
- Ipads
- Timeline of teeth sheet (challenge)

Introduction:

Explain that humans get two sets of teeth in their life time.
When humans are born, they are born toothless. Humans do not need teeth as they drink milk from their mother or from a bottle.
As humans grow, their first set of teeth appears (known as temporary, primary or baby teeth). By the age of 3, a child should have all its first teeth.
As human continue to grow, their mouth gets bigger and their diet changes further, they need larger and more teeth. Therefore from approximately 6 years of age, teeth start to fall out. By the age of 13, humans should have most of their second set of teeth excluding the wisdom teeth (known as permanent, secondary or adult teeth)

Activity 1:

Explain that they are going to find out about why teeth fall out.
Watch the following video all about teeth –watch just the first 4 minutes.
https://www.youtube.com/watch?v=Q3ZwCLM0b4U
Discuss what they have learnt through watching the video, especially:

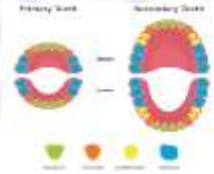
- **As a child we eat softer foods**
- **As a child, the mouth / jaw is smaller**
- **The permanent teeth push the temporary teeth out**
- **The roots secure the tooth in place**
- **As an adult we eat more solid, tougher foods**
- **As an adult, we need more solid teeth to grind food**
- **We have most of our adult teeth by the age of 14 years old**

Activity 2:

Look at models and/or images of baby and adult teeth, and discuss the similarities and differences, e.g. the number of teeth.

Use the key to help identify the teeth type and location.
Talk about:

- Children have 20 teeth
- Adults have up to 32 teeth
- Children do not have premolars



Activity 3:

What job do they do?

Challenge

Children to create a timeline of teeth by matching the age to the teeth developmental stage.

Plenary

Stage a quiz, children responding to questions on a wipe-board.
Asking questions, such as:
Which of our teeth grind food?

a) Incisors
b) Molars
c) Canines

	Explain to the children that in groups of 4, they are going to make clay or playdough **models of the teeth. Two children will create a model of a child's jaw showing baby** teeth, and the other two children will create a **model of an adult's jaw showing adult** teeth. Following the making of the teeth, children to make labels to accompany their model. <u>Activity 4:</u> Explain to the children that they are going to talk about teeth using their model to support them. This will be recorded by their friends. Model how to use the ipads to record a video, and how to create a little presentation. Provide children with key questions to support them. Why do we have teeth? What does the model show? (adult/baby teeth) What are the names of the teeth and what do we use each tooth for? Where are the teeth located in the jaw? What happens to our teeth? **What is the difference between children's teeth and adults' teeth?**	

Knowledge and Skills Objectives	Activity	Differentiation
<u>Lesson Three:</u> I understand the importance of good oral hygiene. I can plan and set up a comparative test. Working Scientifically	**<u>Prior Assessment Task:</u>** Display an x-**ray of a young child's teeth with the adult teeth siting in the gum.** Ask the question: *What does this image show us?* *What does it tell us about our teeth?* Discuss with Talking Partners before discussing as a whole class.	<u>SEND:</u> Chi**ldren to work with a 'buddy'** during all activities. Children to write and draw a prediction with adult support. Children to create a montage of the method using an ipad – print for book.

Starter Question

Explain to the children that it is important to look after our teeth, whether they are our baby teeth or our adult teeth – this is knowledge from EYFS.

Ask the questions:

How can I look after my baby teeth?

How can I look after my adult teeth?

Discuss with Talking Partners before discussing as a whole class. Record children's' thinking on display.

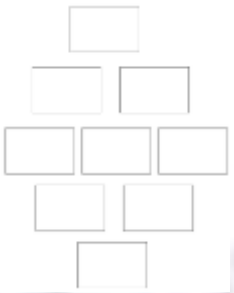
Introduction

Explain to the children that they are going to be given 9 statements in how to look after their teeth. In groups, children need to read the statements and decide where to place the 9 statements in 'Diamond 9' template. The top box has the most important statement in, and the bottom box as the least important statement in.

Listen carefully to the discussion to assess children's knowledge and understanding, and to listen for any misconceptions.

These are the statements:

- **Brush your teeth twice a day**
- **Eat 5 piece of fruit and vegetables a day,**
- **Brush your tonue**
- **investigate why it is important to look after their teeth.**
- **Avoid sugary foods and drinks**
- **Visit your dentist every 6 months**
- **Floss your teeth once a day**
- **Use a floride toothpaste**
- **Use mouthwash every day**



Discuss children's reasonsing for their choices. Take photographs.

Activity 1:

Discuss that some foods contain sugar, and the bacteria in our mouth love sugar.

Ask the question:

So what does sugar do to our teeth?

Watch the video https://www.youtube.com/watch?v=hDZXSMU2lAk

Consolidate the new learning and the scientific terms; plague, bacteria, fluoride, cavities.

Main Activity

Children to write and draw a prediction.

Children to create a montage of the method using an ipad – print for book.

Challenge:

Children to create a poster on tooth decay using images and words.

Resources

- Diamond 9 template and sorting cards

Plenary

• Models of teeth including **children's models from** previous session. • Slime • Yellow playdough • Black playdough • Toothbrushes and paste • Ipads • Raw eggs (at least 6) • Different liquids (tea/coffee, cola, fruits juice, water, vinegar) • Containers • Post-it notes • Comparative Test Planning Template	Use the teeth models, model the process of tooth decay; Explain that when we eat, food gets stuck into our mouths (place some playdough food on it). The bacteria in our mouths starts to eat the food and in doing so produce **a slimy product called plague (put slime on it) If we don't clean the food** away or the plague of our teeth, overtime, the plague (acids) attack the enamel creating a build-up or plaque (add yellowish playdough) and eventually cavities will form (black playdough). Explain how these cavities grow and move into the dentine and possibly into the centre of the tooth where the nerves are. This is when we get tooth ache. When we clean our teeth (get a toothbrush), we have to brush thoroughly to get the food out of our mouths and wash the plaque away. Children to use their models created last week, to tell the story of plaque to their friends and vice versa. Take photographs or videos. <u>Activity 2:</u> Ask the question: *What does good brushing look like?* Children to discuss this with their Talking Partner before discussing as a whole class. Children to watch the following video; https://www.youtube.com/watch?v=hDZXSMU2lAk Talk about what good brushing is: • 2 minutes • Use fluoride toothpaste • Use a pea size amount of paste • Use a rotation motion • Start at one side of the upper jaw and brush along the front. Then go behind the upper teeth and then finally across the top of the teeth. Repeat with the other set of teeth. • Use floss when you get your adult teeth (3-5 days a week) • No rinse Children to practise brushing their teeth (toothbrushes to be resourced from Colgate Smile project or from science budget) Take photographs of children doing this.	**Display the 'What If' question from** Explorify. Use teaching guidance online to support the activity. https://explorify.uk/en/activities/what-if/we-had-no-teeth 

	Activity 3: Explain to the children that we are going to explore what bacteria actual does to the enamel of our teeth if teeth are not brushed well, frequently or cared for. The children are going to plan and carry out the **'Egg Investigation' –** this is a comparative test. Egg Investigation 1) Show the children an egg and explain the egg represents our teeth. Explain that the shell of an egg is made of a hard substance or mineral (calcium carbonate) which is similar to what our teeth are made off (calcium phosphate). 2) Next, show the children 5 liquids; tea/coffee, cola (full sugar), vinegar, fruit juice e.g. fruit shoot, water. Explain that we want to find out what happens **to 'our teeth'** following the consuming of these liquids and poor oral hygiene. 3) **Explain that this experiment is a 'comparative test'; one of the scientific** enquiry types (a way in which scientists work). 4) Use the Comparative Test Planning Template; model the writing of the experiments main aim. 5) Next, introduce **the children to the term 'variables'. Explain in tests there are** variables that we can change or keep the same. When conducting a test, we keep all but one variable the same (fair). If the test is not fair, then the results will not be accurate and this will reduce the effectiveness of the test by making the results incorrect. 6) Model how to complete the variables using post-it notes. Year 4 can do this independently in groups. Take photographs of this stage. 7) **Next, introduce the children to the term 'prediction'.** Explain what a prediction is (a guess as a result of observations) and why predictions are important. 8) Model how to write and draw a prediction. Children to write a prediction in their journal. 9) Finally, go through the method. Discuss what they will need to do first, second etc. to ensure their test is successful. Record this on the Comparative Test Planning Template. Children do not need to write this. 	

	10) Set up the experiment – Year 4 could do this in groups, whereas, Year 3 will need support. Children could use ipads and take images of each step in the method. These can be used to create a montage of their learning. Leave the eggs for 2 days, returning to the investigation to complete what they have found out.	

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Four I can describe the simple functions of the basic parts of the digestive system in humans Working Scientifically	NB: This lesson can be completed as a whole lesson or in two halves: the first part of the lesson can be completed 2 days after the investigation (lesson 3), and the second half can be completed in the designated science lesson for the week. Starter Question: Ask the questions: *How do I know if I have good oral hygiene?* *Why is it important to have good oral hygiene?* Discuss with Talking Partners before discussing as a whole class. Introduction: Explain to the children that they are now going to have a look at the egg investigation from 2 days ago. Consolidate their predictions – what did they think was going to happen? Activity 1: Invite children to remove the eggs out of the liquids, and with a toothbrush carefully give the eggs a clean. Ask the question: ***What has happened to the 'enamel'?*** Discuss observations and explain to the children the following; • Tea and coffee are rich in tannins that stain the teeth if not brushes properly. • Cola and fizzy drinks are acidic and can contain staining products too. • Vinegar is highly acidic and dissolves the enamel and washes it away	SEND: **Children to work with a 'buddy'** during all activities. Children to write and draw a conclusion with adult support. Children to make a playdough digestive system. Have simple function cards to match. Main Activity Children to write and draw a conclusion. Children to make a playdough digestive system. Match detailed function cards to the different parts. Challenge: Children to read the comic strip on the digestive system or other class texts to find out more about the digestive system.

Discuss what they learnt through doing this experiment, and the important of a healthy diet and good oral hygiene.

Model how to write and draw a conclusion.
Children to write and draw a conclusion in their journal.

Activity 2:
Present to the children the idea of repeating this investigation but this time, covering half of the egg with toothpaste. Will this prevent the enamel from changing?

Explain to the children that there are many different types of toothpaste in the shops **so how would I know which toothpaste is best. Introduce the children to 'fluoride'.** Explain that fluoride is a natural mineral that can slow or stop cavities from forming. It protects teeth from damage and helps rebuild the enamel. As well as adding it to toothpaste, many communities have added fluoride to the tap water to help fight cavities and therefore we should drink plenty of water and brush with toothpaste that has fluoride in it.

Invite the children to predict what they think will happen to the egg shells with toothpaste on it.
Collect children's predictions on a large piece of paper.

Set up the investigation, and check it in 2 days.

Activity 3:
Ask the question:
Why do we need to eat?
Discuss with Talking Partners before discussing as a whole class.
Watch the following video and discuss key vocabulary e.g. energy, nutrients, functions.
https://www.youtube.com/watch?v=EswXW9vxR9E

Explain to the children that when we eat, our teeth do an amazing job of preparing the food for an incredible journey in our body. Our molars grind the food up into smaller mushy pieces and our tongue helps us to swallow the mushed up food.

Ask the question:

https://www.storyboardthat.com/storyboards/69dca7b0/digestive-system-comic-strip

Resources

- Egg results from previous lesson
- Eggs
- Liquids
- Toothpaste
- Playdough for digestive system
- Human body outline

Plenary

respond on wipe-boards or play in teams.

There are a couple of tricky questions although the answers can be easily worked out.

https://wordwall.net/resource/11288156/science/digestive-system-quiz

or play this anagram game or similar https://wordwall.net/resource/34368844/digestive-system

or learn this song (TES £5 Fee)

	Where does our food go once it's been swallowed? Discuss with Talking Partners before asking the children to draw either on paper or wipe-boards, what they think happens. Use this as a pre-assessment opportunity. Using a model of the digestive system, explain simply the stages in which food travels and what happens in each part; Mouth – the teeth prepare the food by mushing it up Tongue – is a muscular organ with thousands of taste buds on. The salivary gland – this is where the secretion saliva is made Oesophagus – is a tube that connects the mouth to the stomach. It has muscles in it that work in waves to help to swallow and move your food along. Stomach – is a sack where food is broken down by acid and enzymes. Small intestines – is a stretchy tube. Food is broken down even more so the body can absorb vitamins, minerals, carbohydrates, proteins and fats. Large intestines – this is where all unwanted food is passed through and any last water or minerals are absorbed by the body. What is left gets harder and harder as it moves, creating a solid poo. Rectum – this is the last stop on the digestive tract. The solid poo waits here until you are ready to go to the toilet. Anus – the poo is pushed through this. The following video can aid the understanding of this if needed. https://www.bbc.co.uk/bitesize/topics/zv9qhyc/articles/z74rqp3 <u>Activity 4:</u> Children to work in pairs. Give children an outline of the human body and different coloured playdough. Children to make the digestive system and label it. As the children are making it, ask them questions about what happens in different parts. <u>Activity 5:</u>	https://www.tes.com/teaching-resource/the-digestive-system-a-lower-ks2-song-12439458

	Give out digestive system function cards, and in pairs, children to read the cards and match them to the correct part. Take photographs of this learning for journals. 	
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson Four: I can describe the simple functions of the basic parts of the digestive system in humans Working Scientifically	Explain to the children that they are now going to have a look at the egg investigation from 2 days ago. Consolidate their predictions – what did they think was going to happen? Invite children to remove the eggs out of the liquids, and with a toothbrush carefully give the eggs a clean. Ask the question: ***What has happened to the 'enamel'?*** Discuss observations and explain to the children the following; Discuss what they learnt through doing this experiment, and the important of a healthy diet and good oral hygiene. **Prior Assessment Task:** Give children word cards with the parts of the digestive system on. Children to order the word cards. Then with Talking Partner, discuss the function of each part. Discuss as a whole class. Starter Question: Ask the questions: *How long is the gut?* Discuss with Talking Partners before discussing as a whole class. • Where does the gut start and end? 	SEND: **Children to work with a 'buddy'** during all activities. Children to work with a HA writer for presenting their learning on the ipad. Main Activity Children to take images of the stages of digestion using ipads. Children to write about the different stages of digestion using ipads using scientific language. Challenge: Why do we pass wind? Children to use ipads and Kiddle to find out the answer. This web link is useful. https://www.funkidslive.com/learn/hallux/happy-health-helpdesk/what-exactly-is-a-fart-and-why-do-they-smell/

- What organs is it made up of?
- Will it be the same length in everyone?

https://explorify.uk/en/activities/the-big-question/how-long-is-the-gut

Give pairs or small groups some string. Children to cut the string based on how long they think the gut is.
Pairs or groups to give feedback and reasons for their thinking.

Show the children the actual length of the digestive tract, from the mouth to the anus (5-6m in children and approximately 9m in adults).

Introduction:
Explain to the children that they are going to learn more about the digestive system. Watch the following video, stopping at various points to discuss in more detail.
https://www.youtube.com/watch?v=VwrsL-ICZYo&t=179s

Activity 1:
Explain to the children that they are going to make their own digestive system. There are numerous videos online that can support the teaching and learning of this. Here are two examples
https://www.youtube.com/watch?v=7av19YhNkhE
https://www.bbc.co.uk/bitesize/topics/zf339j6/articles/zrm48mn

In groups, children to make a digestion system and using the ipad, take images of eat step.

Step 1: Cut up bread using scissors, add some water, add some 'saliva' and then mash it.
Step 2: Get a tube and pour the mixture into a plastic bag.
Step 3: Add some 'enzymes' and 'acid' to the plastic bag and start mushing it up further.
Step 4: Put the mixture into a pair of tights and squeeze it lightly then tightly allowing most of the nutrients to come out.
Step 5: Put into a paper cup and press it through the base of the cup – the end result **is 'poo'!**

Resources

- Equipment from egg experiment
- String
- Sandwiches
- Milk
- Water
- Slime
- **'gastric juices'**
- Bowl x 2
- Masher
- Scissors
- Plastic tube
- Plastic food bag
- Tights
- Plate
- Paper cup
- Ipads
- Word bank for tables
- Word cards for game

Plenary

Consolidate the learning on the digestive system. Perhaps play a **'Corners' style of game. Place the** names of parts of the digestive system around the classroom. Give information about it. The children who are standing at that body part collect a point.

After that, explain to the children that everyone passes wind, whether that be through their mouth (burp) or their bottom (trump/fart). Otherwise known as passing gas.

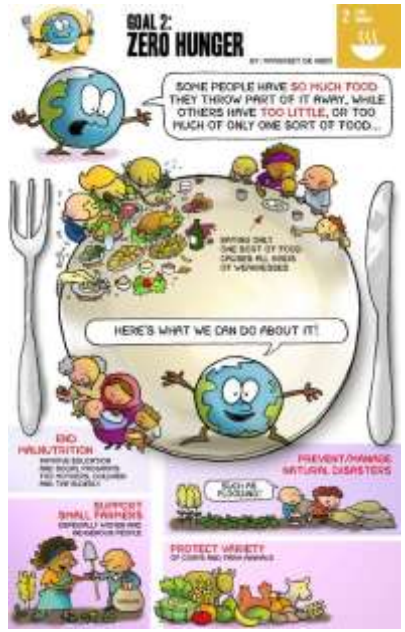
Some people might produce more than others, however, we all do it!

Watch this video to support the teaching and learning of why we pass

	Encourage the use of correct terminology when completing it step by step. Ask children to recreate the digestive system. Do they children use the correct vocabulary when talking about each stage? Take photographs of children doing this Activity 2: Model how to use the ipads to create a strip of images illustrating the steps of digestion. **Consolidate time connectives e.g. first, next, then…** Model how to add text to the images. Children to add text to their images, explaining the process of digestion in some detail. Provide a word bank to support. Print and add to their journals.	gas. Stop at various points to discuss in more detail. https://www.bbc.co.uk/teach/class-clips-video/science-ks2-what-causes-us-to-burp-and-break-wind/zvrhf4j

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Six I can name and explain the parts of the human digestive system. Working scientifically	**Prior Assessment Task:** Consolidate the different types of teeth. Show an image of a tooth and discuss name and function. Consolidate the parts of the digestive system. Show an image of the part and discuss name and function. Ensure there are no misconceptions. Starter question: Explain to the children that food gives us energy so that we can do the everyday things, such as, listen, play football, to write, to walk etc. Ask the question: *Which foods give me the best energy? - this knowledge was taught in KS1.*	Add your activity and the differentiation once you have agreed on your action

	Children to discuss with their Talking Partners before discussing as a class. <u>Introduction:</u> Explain to the children that we are going to learn more about keeping ourselves **heathy, and especially helping our 'gut' to be healthy too.** Watch the following video, stopping at 7minutes and 6 seconds. https://www.youtube.com/watch?v=IMQvBeeObEU Stop at various points to discuss further e.g. - **What's your favourite food?** - What are the 5 main food groups? - Which food group is good for our teeth and why? - What would you eat to have a balanced diet? <u>Activity 1:</u> Give the children the five food groups, images of food and a description of how the food group helps us e.g. proteins help us to grow and to heal. Ensure you discuss how calcium is good for our bones and teeth. <u>Activity 2:</u> Explain that some people struggle to have a balanced diet for a number of reasons. Ask the question: *Why might some people not have access to the food they need to be healthy?* Discuss with Talking Partner before discussing as a whole class. The children might mention poor diet choices (lack of or over consumption, poor water sanitation, poor harvest, no money (poverty) or not near a food source. Explain that some people around **the world are going hungry as they don't have** access to food or money to buy food. This has been a problem for some time and especially in the underdeveloped countries in the world. For this lesson, use the Unicef Teacher Notes as a guide. https://www.unicef.org.uk/wp-content/uploads/2017/02/KS2-DayForChange-Nutrition-Lesson-Teacher-Notes.pdf	
Resources Word cards – food groups Images of food from the 5 food groups Fact cards about each food group IWB NB – other resources will depend on the chosen activity or activities		**Plenary** Consolidate what they have learnt about malnutrition and how they can **help us all to; 'Grow, Nourish, Sustain. Together'.** Consolidate the Sustainable Development Goal Number 2.

	Use these slides from Unicef to present the activity to the children. https://www.unicef.org.uk/wp-content/uploads/2017/02/KS1-DayForChange-Nutrition-Lesson-Presentation.pdf <u>Activity 4:</u> It is World Food Day in the 16th of October (every year) Every year there will be a specific focus so the content of the lesson from this point on should reflect that focus. This is the link to the website for World Food Day. However, there will be numerous other websites to support the teaching and learning of this specific day. https://www.fao.org/world-food-day/en Read information about what World Food Day is from the following web address or from Twinkl https://www.teachingenglish.org.uk/sites/teacheng/files/teaching-kids-world-food-day-worksheet.pdf https://www.twinkl.co.uk/resource/au-t-10000378-world-food-day-fact-file Discuss with Talking Partner before discussing as a whole class. Ask children questions (from the bottom of the text) <u>Activity 5:</u> Here are a couple of suggested activities: • Be a superhero https://www.un.org/sustainabledevelopment/climate-action-superheroes-info/ or https://www.youtube.com/watch?v=toTCMMy5O18 • Make it meaningful by providing context - food security and food poverty are significant issues in the country they live in and likely in their local community, too. Talk about food banks, free school meals and the importance of nourishing food for health, happiness and even for effective learning. Help a local food bank. • Design a poster and enter the annual competition (see website for additional details) • Complete an Activity Book (see website https://www.fao.org/world-food-day/youth/en) • **Speak to the school chef and learn about how they resource the school's food** (sustainability) and how they can support the children in making a difference, especially regarding food wastage) • Listen to Food Hero song (see website https://www.fao.org/world-food-day/youth/en) and create own song.	Look at the following poster and reflect on how together we can make a difference. 

	• Read Stone Soup https://documents.wfp.org/stellent/groups/public/documents/webcontent/wfp202398.pdf or https://www.youtube.com/watch?v=BZf60cb3Th8 • Children to record how much food they waste at home through photographs and charts • Children create a cafeteria recycling centre • Use books and the internet to collect fascinating facts about where food is grown, how far it travels 'from farm to fork', and how much we consume. Present the information as a class display or present in assembly. • Food Technology – cook with the children. Teach 'around' the recipe, for example, try to find out about the food journey of one or more of the ingredients or think seasonally. • Look at some ways in which food is produced and preserved, such as baking bread, pickling vegetables or making butter. • Explore food packaging and food labels – look at ingredients and nutritional values. • Fairtrade • Discover how circular economies work – and how sustainable food systems are a vital part of a circular economy that can protect and sustain the planet. 	

SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 3 & Year 4	Term: Autumn 2 (Cycle B)	Topic: Sound

National Curriculum Links

Pupils in Key Stage Two should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it.
- recognise that sounds get fainter as the distance from the sound source increases

Working Scientifically:

- ask relevant questions and using different types of scientific enquiries to answer them
  setting up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• Explore how things work. (Nursery) • Describe what they see, hear and feel whilst outside. (Reception) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)	• Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3) • Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3) • Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3)

	• Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3) • Auditory range of humans and animals. (KS3) • Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3) • Waves transferring information for conversion to electrical signals by microphone. (KS3)

Common Misconceptions

- pitch and volume are frequently confused, as both can be described as high or low. Some children may think:
- sound is only heard by the listener
- sound only travels in one direction from the source
- **sound can't travel through solids and liquids**
- high sounds are load and low sounds are quiet.

Sustainable Development Goals and Catholic Social Teaching

Sustainable Development Global Goals would be perfect to fit with this unit of learning:

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:

Applied Write Opportunities	Enrichment Opportunities
Non- chronological text about sound	

Assessment Opportunities

- Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear
- Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects
- Can use data to identify patterns in pitch and volume
- Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium

Key Vocabulary

Tier Two:

sound, source, volume, vibrate, vibration, travel, pitch (high/low), faint, quiet, loud, eardrum, inner ear, outer ear, middle ear, ear canal, wave(s), particles, instrument,

Tier Three:

insulation, insulate, insulator, decibel, amp, amplitude, cochlear, hammer, anvil, stirrup

Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I know sounds are made by something vibrating. Working Scientifically:	**Prior Assessment Task:** Starter Question: Introduction: use PPT, ask children to listen to music and identify how sounds are made by different instruments Then Ask, How is sound is created? Then ask, How do we interpret sound? TTYP then take feedback. Tell children that we will look at these questions in more detail over the topic. Activity 1: Children to create sounds by using various classroom objects in a variety of ways (take photographs). *Tell the class that sound is caused when objects vibrate. The vibrations cause waves in the air that enter your ear and you hear them as sound.* Discuss vibrations using the PPT to support. Set up 4 enquires for the children to rotate around with prompt discussion cards (take photographs) 1) rice on a drum	SEND: Scribe their responses or provide sentence openers. Year 3: Year 4: – **Task 1:** Complete investigation sheet to record what they observed in each investigation (provide word bank for LA). **Task 2:** record children's observations on f/c and take a picture of it for a Pic Collage. **Main Learning:** label the ear (differentiated)

2) tuning forks in water
3) elastic bands
4) ruler on a desk

Remind the children that sounds are caused when objects vibrate. The vibrations cause waves in the air that enter your ear and you hear them as sound.

Did they see the vibrations?

Activity 2:

String telephones.

Briefly discuss the history of the telephone.

When? Who? How?

You could use this to support the learning or just use the facts on the PPT

https://www.youtube.com/watch?v=qWUP9EigdjY)

Give out string telephones of different lengths. Can children make their voice travel through them? How far did it travel? What caused the sound?

Explain that the sound we created caused vibrations (take photographs).

Watch to consolidate their learning:

https://www.youtube.com/watch?v=3yqB2KFwJCo

Activity 3:

Learn about how the ear interpreting sounds.

Watch a supporting video clip: https://www.youtube.com/watch?v=-bKy02f1pD4

Show a 3D ear model of an ear or cut-through diagram to reinforce, referring to the parts of the ear: *outer ear, middle ear, inner ear, eardrum, cochlea, anvil, hammer, stirrup and ear canal*

Explain what their functions are.

Challenge:

Can sound travel through all materials?

Resources

variety of musical instruments rice drum
elastic bands
tuning forks
beaker of water
ruler
string telephones
worksheets

Plenary

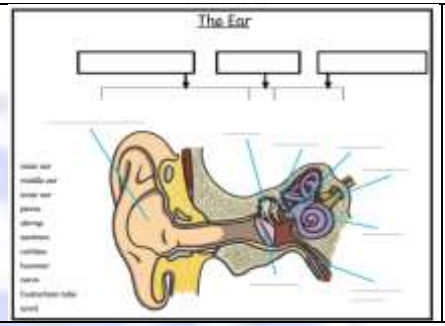
–

Children to summarise their learning.

Watch

https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zstr2nb

https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zx9hcj6

	Label a cut-through diagram of the ear and describe the function of some of the parts. Describe how the ear interprets sound based on video and information given.		

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Two I can find patterns between the volume of a sound and the strength of the vibrations that produced it. Working Scientifically:	**Prior Assessment Task:** Starter Question: Introduction: Ask, how can we create louder / quieter noises? TTYP then give feedback. Show with a glockenspiel - banging harder / softer. Repeat with a triangle. Activity 1: Tell the children we are going to investigate how the strength in which we hit the drum affects the volume.	SEND: write a simple prediction and to complete a simplified table. The graph could be make out of Lego or building blocks. Year 3: **Task 1:** take photographs for a Pic Collage. **Main Learning:** record predictions, complete table and make a graph (differentiated) Year 4: HA could draw all in to books. -

	Record with a sound recorder app: dB Sound meter or a sound decibel meter and show this to the children when the drum is banged with different degrees of strength. Conclude findings. <u>Activity 2:</u> Investigate the above further: drop a coin from different heights (further the distance – stronger the force) every 10cms. Observe and listen what happens (vibrations) repeat 2 more times. Take the mean decibel by using sound decibel app. Can children predict what the next measurement will be form 10cm further away? Repeat this activity for every 10cm. Record results. Represent results in a pre-prepared line graph.	<u>Challenge:</u> What does volume mean? What does pitch mean? **Plenary** Conclude the results as a class. Tell the children that sound waves look different for loud and quiet sounds. Show them the two images on the PPT, and discuss which one is which. Can they children suggest why that might be? Watch https://www.bbc.co.uk/bitesize/topics/zgffr8 2/articles/zqtdpbk
Resources glockenspiel triangle coins worksheets		

Knowledge and Skills Objectives	Activity	Differentiation

Lesson Three

I can find patterns between the pitch of a sound and the strength of the vibrations that produced it.

Working Scientifically:

Prior Assessment Task:

Starter Question:

Introduction:

Play 2 different cords of a guitar (Low/high). Can children identify the different pitches? Play again. Discuss.

Children to identify high /low pitch. Show the children that the cords are different width and some are tighter than others.

Watch: https://www.stem.org.uk/resources/elibrary/resource/315610/what-factors-affect-pitch-and-volume-sound

Tell the children that the term 'pitch' describes how high or low a sound is and 'volume' describes how loud or quiet a sound is.

Activity 1:

Give out different musical instruments to each table (xylophone, glockenspiel, guitar) Children will move around in a carousel and vary the pitch of the instrument. Record how they achieved this. What is the science behind it? (different lengths, sizes, position etc.)

Tell the children that the smaller keys make higher sounds than the lower keys.

Activity 2:

SEND:

draw observations from main learning

Year 3:

Task 1: Take photographs for a Pic Collage.

Year 4: **Task 2**: Children to circle images and then explain why.

Main Learning: Children to draw bottles in order and explain what happened and why.

Challenge:

Do you think the size of the bottle would make any difference to the pitch or the volume of the sound?

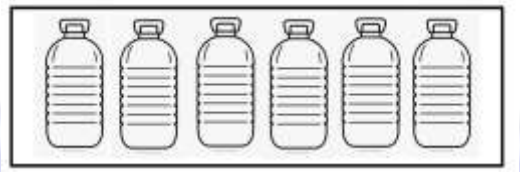
Resources

glockenspiel

Plenary

Review how we achieve different pitches.

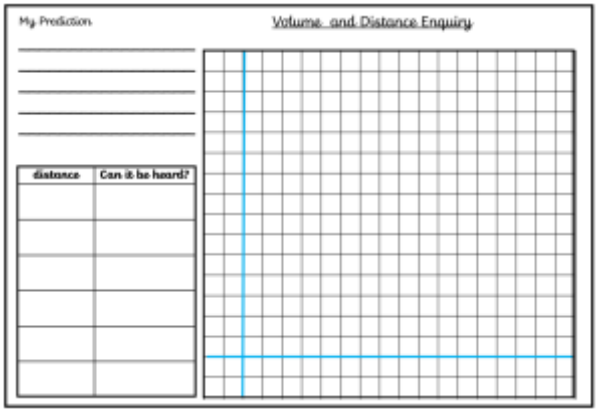
xylophones guitars recorders bottles water images worksheets	Look at the picture of the flute and explain how it works and how the pitch is changed. Do you think the sound produced would be higher or lower if more keys were covered? Why? Give the children a recorder to investigate pitch. Take feedback  <u>Activity 3:</u> Demonstrate how to blow across the top of a bottle to produce a sound. Show children the picture of an empty bottle on the PPT and explain that the air inside the bottle is vibrating. How do you think we could change the pitch of the sound produced? Children to think, pair, share their ideas. Show the next pictures showing bottles with different levels on water in. How do you think the pitch of the sound produced would be different for each of these bottles? Can you order the bottles from the highest sound to the lowest sound?	Ask, why they think that smaller instruments or bottles with less water in or recorders with more holes covered make higher sounds than larger instruments. Encourage children to think about what happens to the sound vibrations that are produced by the source. Watch https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/z3j3jty

	As a class, predict what order they will go in. 	
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson Four I can recognise that sounds get fainter as the distance from the sound source increases Working Scientifically:	**Prior Assessment Task:** Starter Question: Introduction: Ask, How does sound actually travel? TTYP then give feedback. Clear any misconceptions. Show supported diagrams to reinforce. Explain that: *Sound vibrations travel in a wave pattern, and we call these vibrations sound waves. Sound waves move by vibrating objects and these objects vibrate other surrounding objects, carrying the sound along. ... Sound can move through the air, water, or solids, as long as there are particles to bounce off of.* Activity 1: Get a child to stand far away from the classroom and show children how far away they are (perhaps measure the distance). Predict how far away will it be until we hear the clap? Child to make a noise (clap).	SEND: pre-drawn tables and charts. Year 3: Year 4: **Task 1:** Children to write and draw about what happened. **Task 2:** take photographs for a Pic Collage Children to complete table of results **Task 3:** draw and create a bar graph (differentiated) Children to write about what they found out and to suggest reasons for this. HA – draw own tables and charts.

Can children here that noise? Every 30 seconds, get that child to move forward 5 steps or 5 metres. Repeat until children can hear the noise. Record data in a chart. Can children describe what happens to the noise as the child was nearer.

Activity 2:
Tell the children that they are going to investigate how distance affects how well we hear sound.
Equipment: dice, mini-wipeboard
Method: working in groups, a child will roll the dice onto a hard surface. Can the sound be heard? If so tick table of results. Move a set distance away e.g. 5 steps, 2 metres. Repeat. Continue until the sound cannot be heard. What was the total distance?
Repeat with musical instruments.

Activity 3:
Review the results. Get the children to record into a bar chart.



Challenge:
How could we make this a fair test?
Suggest reasons for this.

Resources

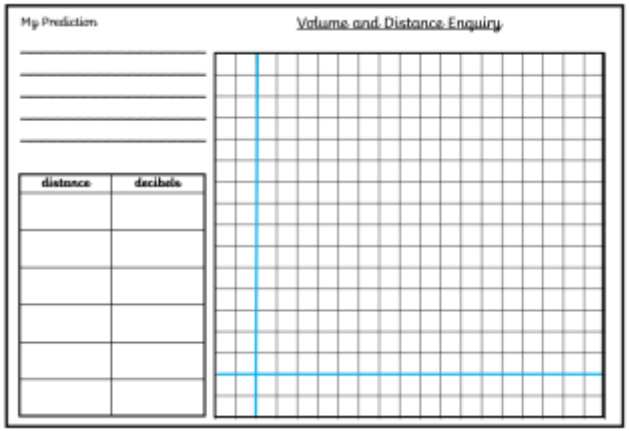
metre sticks
dice
wipe-boards
musical instruments
worksheets

Plenary

show some of the bar charts.
Are any different? If so, why? What are the factors for this?
Explain that we all hear sound differently; wind could have been a factor or someone might have hit the instrument using a different strength.
Was this a fair test then?

		Could certain instrument be heard more than others? Why would this be? Conclude the results.

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Five I can find patterns between the volume of a sound and the strength of the vibrations that produced it I can explore how sounds get fainter as the distance from the sound source increases. Working Scientifically: **Resources** Metre sticks	**Prior Assessment Task:** Starter Question: Introduction: recap on the last lesson where we investigated distance and sound. Tell the children that the speed of sound is very quick: the speed of sound can travel at 343 metres per second and at 761.2 mph. Activity 1: Tell the children that we are going to investigate the relationship between distance and volume. In groups, children will have a football and an iPad (with a sound recording app). Method: get child 1 to stand 5 metres away with iPad. Child 2 to hold a metre stick. Child 3 to drop ball form 10 cm. Child 1 to record the volume (decibels) Predict what the volume will be for another 10cm. Repeat this for another 10cm. Carry on until 100 cm. Activity 2:	SEND: support when interpreting the table into a graph. Year 3 **Task 1:** Take photographs of the children and create a pic-collage. Complete table of results. Year 4 **Task 2:** Children to draw a line graph. HA draw their own. LA create a bar graph from Lego. **Plenary**

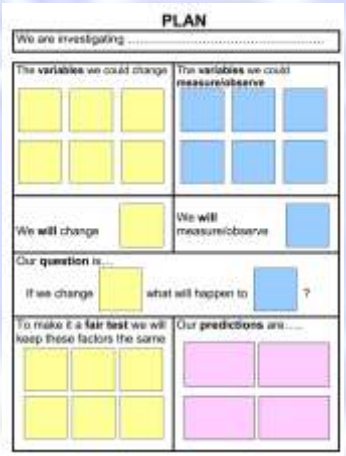
footballs ipads worksheets	Children to record their results into a line graph.  	Conclude together what we found out. Children to write their conclusions in their books.

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Six I can investigate the best material that insulates sound. Working Scientifically:	**Prior Assessment Task:** Starter Question: Introduction:	SEND: Yea **Task 1:** Groups to have their own planning poster to Yea complete. **Task 2:** Take photographs of children completing task -

Context: the next door neighbour plays their music very loud – how can the noise be made quieter in your room? Children to discuss – feedback.

Activity 1:

Use the large investigation poster at the front of the class to demonstrate how to plan. Then, children to complete their individual or group planning sheets.



Activity 2:

Explore the properties of materials that are going to be used

Equipment: a box for a noise device (phone), plaster board, wood, bubble wrap, egg boxes, towel.

Method: Put phone or stopwatch with alarm in a box, cover with material. Either use sound recorder or decide on degrees of loudness.

To change the variable: change material or the amount of layers.

Activity 3: Children to predict. Carry out x 3. Take the mean measurement. Record. Evaluate.

Main Learning: Groups to create a feedback poster on what they have found out.

Challenge:

Why do builders use ear defenders?

Resources

Plenary

Children to feedback – discuss. Conclude.

DEUS PRIMUS

SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 3 & 4	Term: Spring 1 (Cycle B)	Topic: Electricity

National Curriculum Links

Pupils in Key Stage Two should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identify and name its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• Explore how things work. (Nursery - Electricity)	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. (Y6 - Electricity)

	• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. (Y6 - Electricity) • Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity)

Common Misconceptions

Some children may think:

- electricity flows to bulbs, not through them
- electricity flows out of both ends of a battery
- electricity works by simply coming out of one end of a battery into the component.

Sustainable Development Goals & Catholic Social Teaching

Applied Write Opportunities	Enrichment Opportunities

Assessment Opportunities

- Can name the components in a circuit
- Can make electric circuits
- Can control a circuit using a switch
- Can name some metals that are conductors
- Can name materials that are insulators

Key Vocabulary

Knowledge and Skills Objectives	Activity	Differentiation
Week One I can identify electrical appliances and the types of electricity they use.	Firstly, Mind map what is already known about electricity. Encourage children to ask any relevant questions about topic. Intro: Ask children how these items work: light bulb, torch, television etc... Feedback. Ask, where does electricity come from? Show children video clip for how and where electricity comes from. https://www.bbc.co.uk/bitesize/clips/z4spyrd Task 1: Ask children to Identify electrical appliances in the classroom. Ask, is the appliance is using a battery or mains electric? (Write down in books) Task 2: Children to group a range of images for appliances / objects: need main electric, battery or neither. Describe how they need / **don't need power.** Click on image house and walk through interactive house and find the dangers and discuss how we can stay safe around electrical appliances. TASK 3: Draw lines off image to identify the dangers Explain how it is dangerous and how it can be resolved.	LA/SEN – Children sort pictures of appliances into electric, battery or neither MA/HA – Children write down and group appliances of their choice into battery, electric or neither. TASK 2 Chn draw lines off image to identify the dangers and explain how it is dangerous and how it can be resolved. Challenge - Is electricity harmful to the environment? How could we be more eco-friendly. What are alternative sources of power?

Knowledge and Skills Objectives	Activity	Differentiation
Week Two		

-		

	.	
Knowledge and Skills Objectives	Activity	Differentiation
Knowledge and Skills Objectives	Activity	Differentiation

Week Four		**SEN –** **LA** – **MA** – **HA** –
Knowledge and Skills Objectives	Activity	Differentiation
Week Five **Lesson 5**		**MA** – **HA** –
Knowledge and Skills Objectives	Activity	Differentiation

DEUS PRIMUS

SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 4	Term: Spring 2 (Cycle B)	Topic: States of matter (Solids, liquids & gasses)

National Curriculum Links

Pupils in Key Stage Two should be taught to:

- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when heated/cooled, and measure or research the temperature at which this happens in degrees celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials) • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials) • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)

• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)	• Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials) • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. (Y5 - Properties and changes of materials)

Common Misconceptions

Some children may think:

- **'solid' is another word for hard or opaque • solids are hard and cannot break or change shape easily and are often in one pie**ce
- substances made of very small particles like sugar or sand cannot be solids
- particles in liquids are further apart than in solids and they take up more space
- when air is pumped into balloons, they become lighter
- water in different forms – steam, water, ice – are all different substances
- all liquids boil at the same temperature as water (100 degrees)
- melting, as a change of state, is the same as dissolving
- steam is visible water vapour (only the condensing water droplets can be seen)
- clouds are made of water vapour or steam
- the substance on windows etc. is condensation rather than water
- the changing states of water (illustrated by the water cycle) are irreversible
- evaporating or boiling water makes it vanish
- evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.

Sustainable Development Goals and Catholic Social Teaching

This global goal would be perfect to fit with this unit of learning.
The following task focuses on climate change. It explores why the atmosphere is heating up and consequently what is happening to the ice caps.
It also has a scientific study attached.
https://www.twinkl.co.uk/resource/us-sc-341-climate-change-powerpoint

Applied Write Opportunities	Enrichment Opportunities
• Explanation poster about the changing states of matter • Explanation text on the water cycle	

Assessment Opportunities

- Can give reasons to justify why something is a solid liquid or gas
- Can give examples of things that melt/freeze and how their melting points vary
- From their observations, can give the melting points of some materials
- Using their data, can explain what affects how quickly a solid melts
- Can measure temperatures using a thermometer
- Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup
- From their data, can explain how to speed up or slow down evaporation
- Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet

Key Vocabulary

Tier Two:

material, solid, liquid, gas, state change, melting, freezing, melting point, boiling point, heated, cooled, water, ice, steam, the sun, water droplets, temperature, water vapour, energy, particles, volume, water cycle,

Tier Three:

compact, evaporation, condensation, precipitation, substance, thermometer, Celsius, Fahrenheit

Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I can identify if a material is a solid, a liquid or a gas. **Working Scientifically:**	**Prior Assessment Task:** **Starter Question:** **Ask the children;** ***What is a material?*** ***Can all materials be held?*** Discuss with Talking Partners before discussing as a whole class. **Introduction:** Explain to children that all materials can be put into one of three categories or states; solid, liquid or gas. **Give each table a selection of objects and images. Children to discuss which they think are solid, liquid and gas. (Use this as a pre-assessment opportunity)** **Ask the children, what they think the terms, solid, liquid and gas, mean.** • **Solid- the shape of a solid does not change on its own – it is rigid. They also have a fixed volume.** • **Liquid- the shape of a liquid does change, it is not rigid. It fits the shape of the container it is put in. Liquids flow. They also have a fixed volume.** • **Gas-gases do not have a shape; they completely fill any container they are put into. They do not have a fixed volume but the same volume as the container.** **Activity 1:** **Children to sort further objects and images into the different categories including rice and sugar.**	SEND: Children to explore the materials further. • Children to pour liquids from one container to another; observing the liquid taking the shape of the new container. • Children to manipulate solid materials and discover that they **don't change shape on their own.** • Children to breathe air into a bottle and watch it spread out. Year 3: Children to read statements about solids, liquids and gases. Children to sort according to characteristics. Children to stick statements under the 3 headings; solid, liquid, gas. Year 4: Children to read statements about solids, liquids and gases. Children to sort according to characteristics. Children to make mini posters about each state. Challenge: Get three balloons and fill one with a solid (sand), one with a liquid (water) and one with a gas (air). Children to explore how they feel.

Resources Various objects for sorting e.g. a brick, playdough, plastic coin, chocolate, water, honey, oil, sugar, flour, rice etc. Various containers Balloons Sand Water Statements for sorting	**Discuss the groups and any misconceptions e.g. rice takes the shape of a container so must be a liquid.** **(Have some magnifying glasses available for children to use to look at rice and sugar more closely. Through this, children should notice each grain is a solid. It is when the solids are put together they behave like a liquid.)** **Watch the following video to consolidate children's knowledge and understanding of the similarities and differences between solids, liquids and gasses. https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs**	**Plenary** Consolidate the terms; solid, liquid and gas. Play the game, corners; hold up an object and invite children to move to the corner with the correct state displayed in it. Use this as a post-assessment opportunity and to explore any further misconceptions.

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Two **I can explain how particles behave in solids, liquids and gases.** **Working Scientifically:**	**Prior Assessment Task:** **Starter Question:**	SEND: Create the particles image using finger paints or cotton buds placed in paint. Use gloop to explore how a solid can change into a liquid. Year 3:

Resources

Balloons filled with sand, water and air from previous lesson.
Cereal hoops
Containers
Cheese
Water
Air
Paint
Cotton buds
True or false questions
Reference books
Syringes
Sand

Ask the children.
What are the three states of matter (material)?
What are their similarities and their differences?
Discuss with Talking Partners before discussing as a whole class.

Introduction:

Present the children with a solid (cheese), a liquid (coloured water) and a gas (air). Ask the children what would happen if we poured the three states of matter into a beaker. Children to discuss this with the TP before discussing as a whole class. Consolidate that the;

- solid would stay the same shape
- liquid would take the shape of the new container
- gas would spread out in the container and continue spreading into the air.

Explain to the children that the reason solids, liquids and gases behave differently is because the particles of each substance behave differently. Discuss the term, particle. Use the children to help model particles and the behaviour of particles.

Watch this video first (although aimed at KS3, it is quite easy to use)

https://www.bbc.co.uk/programmes/p00xcjtv or
https://www.bbc.co.uk/bitesize/clips/zpbvr82

Activity 1:

Now model the behaviour of the particles in a solid, liquid and gas with the children.

Following the activity, consolidate how;

- **In a solid, the particles are close together in ordered rows. They can't move,** however, they vibrate a little bit on the spot.
- In a liquid, the particles are quite close together, but can move around each other easily. They move quite a bit, moving gently past each other.
- In a gas, the particles can move around very quickly in all directions. There is a lot of space between each particle.

Use cereal hoops to create images of the 3 states of matter.
Children to answer true or false questions about the behaviour of particles in a solid, liquid and gas.

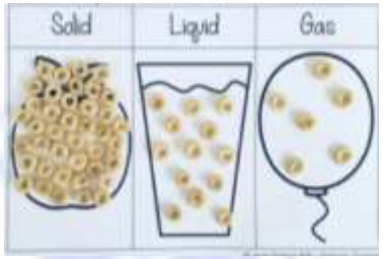
Year 4:
As above.
Then research more about solids, liquids and gases using reference books.

Challenge:
Show pictures of syringes filled with sand, water and air.
Ask the question;
What do you think will happen when each syringe is squashed down?

Plenary

Replay the videos to consolidate **children's understanding of particles in** everyday matter.

Ask the question;
What is matter?
What is a particle?
What is a state?
Use KO to find out the answers. Discuss as a whole class the new vocabulary.

	Activity 2: Use cereal hoops to show what particles look like in a solid, liquid and a gas.  	

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Three I can explain how a solid can change into a liquid. **Working Scientifically:**	**Prior Assessment Task:** Starter Question: Ask the children; *Can I change a solid into a liquid?* *How could I change a solid into a liquid?* Discuss with Talking Partners before discussing as a whole class. Introduction: Give children a candle (one between two). Ask the children if the candle is a solid, liquid or a gas. Explain to the children that I am going to change the state of the candle from a solid to a liquid. Light the candles and let the children observe what happens. Discuss their observations and explain what helped to change the state from a solid to a liquid - heat. Explain that this change is known as, melting. Ask the question; *Can you think of other solids that could change into a liquid when heat is added?* Children to discuss with the TP before discussing as a whole class. Make a list of the materials they suggest could be changed from solid to a liquid depending on the temperature.	SEND: Children to order pre-drawn and labelled images of the substances according to the order in which they melted (or not). Children to give a reason why some substances melted and some substances **didn't melt.** Year 3: Children to draw the substances inside pre-drawn pots in order of which melted first. Children to write a reason why some substances melted and some did not. Year 4: Children to record their learning creatively in their books, giving multiple explanations for their thinking about the melting point of substances. Challenge:

Resources

Candles
Wax
Butter
Chocolate
Ice
Butter
Margarine
Cheese
Pasta
Plasticine
Plastic pots
Kettle
thermometers

Ask the question;
Do all these materials we have thought of melt at the same temperature?

Activity 1:
Explain to the children that they are going to investigate the melting and freezing point of some solids.
Model how to set up a simple practical enquiry.

1. Put small quantities of different substances e.g. chocolate, wax, butter, **margarine, ice cube, cheese, pasta, plasticine into small, plastic 'mousse' pots** or tin-foil pastry cases.
2. Stand them or float them on hot water (talk to the children about safety when using hot water).
3. Children observe the substances melting.
   Do they all melt, if not, why not?
   Discuss which material melted the fastest and why they think this.
4. Now put them in cold water and watch the materials solidify.

Consolidate the states – melting and freezing.

Activity 2:
Explain to the children that water (a liquid) can be a solid (ice), a liquid and a gas (vapour). Ask the children if they know when water turns to ice; what temperature does it need to be? When does water turn to vapour; what temperature does it need to be? This will link to children experiences on seasonal changes and habitats, as well as their Geographical unit on the water cycle.

Introduce the children to a thermometer. Children to look at the scale and discuss what they notice (negative and positive numbers, intervals etc). Discuss degrees Celsius and Fahrenheit. Explain that we use both scales; however, in science we mainly use oC.
Talk about the freezing and melting point of water is 0oC and the boiling point of water is 100oC. Get the children to find these on the scale.

Children to record the freezing/melting point of water and the boiling point of water onto a thermometer.

Order temperatures given.

Plenary

Give out white-boards.
Use the following website; display a temperature on the scale. Children to read scale and record it on their white-boards.
https://www.topmarks.co.uk/Flash.aspx?f= Temperaturev2
Assess children's ability to read scales.
Consolidate by asking which is larger or smaller e.g. which is hotter, -2oC or 2oC?

For Year 4, you could use decimal numbers e.g. 1.5 Oc.

	Explain to the children that they are going to practice reading the degree Celsius scale. This is going to be important for future investigations. Before exploring the temperature of water, explain the safety of using thermometers and hot water, and ensure all children understand the expectations of working safely in science. Give each pair a thermometer and a cup containing water. Children to record the temperature on a post-it note and attach it to the cup. Repeat with more cups of water of differing temperatures. Once all recordings have been done, ask the children to order the temperatures from smallest (coolest) to largest (hottest). Take photographs of this learning for their books.	

Knowledge and Skills Objectives	Activity	Differentiation
Week Four I can explore the melting points of different solids. Working Scientifically:	**Prior Assessment Task:** Starter Questions: Ask the children; *What is temperature?* *What do we measure tempertaure in?* *What do we know about the temperature of water?* Children to discuss with Talking Partners before discussing as a whole class. Introduction: Explain to the children that they are going to investigate at what temperature some solids melt.	SEND: Children to use Lego to build a graph. Children to talk about the results. Year 3: Children to be given pre-drawn chart paper to record their results on. Children to write simple sentences about what they have found out. Year 4: Children to draw their axis and to place their data onto their chart. Challenge: Using additional data, children to use data to answer the following questions;

Resources

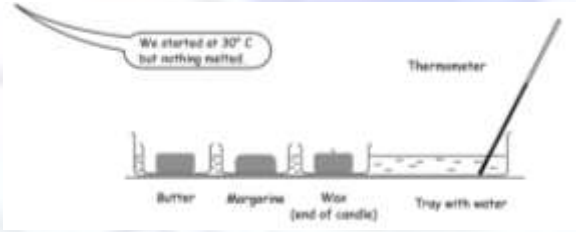
Water
Butter
Margarine
Wax
Chocolate
Tray
Kettle
Lego
Thermometer
Graph paper

For this investigation, limit the children to a few materials that will melt at the temperature of very hot water (80 °C) or below, such as soft and hard fats, chocolate and wax.

Model how to set up another simple practical enquiry.

1. Children to predict at what temperature the materials will melt. Ask the question;
   Will they melt at 0oC like water or would they have a higher or a lower melting point? Children to write prediction in their book.
2. Use small, equal cubes of each substance and place each one into a dish.
3. Place these into a large container of water with a thermometer. Begin the activity with cool water (10oC) and see if any substance begins to melt.
4. Remove the dishes; add warm water to the container (30oC). Replace the dishes to see if any substance begins to melt.
5. Remove the dishes; add hot water to the container (50oC). Replace the dishes to see if any substance begins to melt.
6. Repeat at 70oC and 90oC if needed.
7. As the investigation is taking place, encourage the children to record the water temperatures as different materials melt. A bar graph can be made of the results later.

Take photographs of the enquiry for their book.



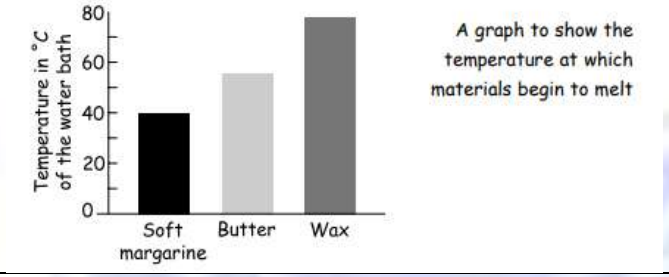
Activity 1:
Children to use their results to create a bar graph. Both the results and graph can be drawn into their books.
Year 4 could use ICT to produce graphs.

Which material has the highest freezing temperature?
Which has lowest freezing point?
Which are solid at room temperature?
Which are liquid at room temperature?
Which material needs to be cooled the most for it to freeze?

Plenary

Discuss how different materials melt at different temperatures. Ask the children questions, such as, which material will melt first, butter or a plastic **whiteboard? A car's metal or a** glass? Through this discussion, the main learning is children understanding that things melt at different temperatures **and that's why a specific material is** chosen for a specific job.

Consolidate what is meant by freezing point. Watch the following video of wax solidifying and water turning to ice. Discuss how liquid is changing into a solid because it has been left to cool to its freezing point.
https://www.youtube.com/watch?v=uW0ETby2DyI
https://www.youtube.com/watch?v=xFRu2mt6SgQ.

	 A graph to show the temperature at which materials begin to melt	This a a beautiful video to watch at the close of the lesson; http://www.youtube.com/watch?v=Wqk_CKSxIyU

Knowledge and Skills Objectives	Activity	Differentiation
Week Five I can explain how a liquid can change into a gas. Working Scientifically:	**Prior Assessment Task:** **Starter Question:** **Ask the question;** ***What is evaporation?*** **When a liquid is heated and the water turns into invisible vapour that rises into the air.** **Children to discuss with their Talking Partners before discussing as a whole class.** **Introduction:** **This session may need to run over a few days, depending on the weather. Alternatively, do the input and the setting-up of the experiment first thing in the morning, and make observations throughout the day.** **Explain to the children that they are going to explore another change of state; this one is called boiling point but we also call it evaporation (the children would have studied evaporation as part of the water cycle).**	SEND: Children to write a simple prediction. Children to stick an image of their puddle measurements into their book and write a simple conclusion. Year 3: Children to write a simple prediction. Children to stick an image of their puddle measurement into their books and write about what they did. Children to write a conclusion. Year 4: Children to complete the same task as a Year 3. However, children should use scientific language and reasoning. Challenge: How can I prevent my pond from drying up challenge from Plan Bee.

Resources Blue material Wellies Sunshine Water Chalk or playdough iPad	**Explain to the children that we are going to explore what happens to a puddle in the playground over time (create one if it has not been raining!).** **Ask the children;** ***What do children think will happen?*** ***How can we measure what is happening? Perimeter? Diameter? Length across widest point?*** ***What could we use to draw around the puddle to show its size at different points in the investigation?*** **chalk, playdough sausage shape** ***How often should we check on the puddle?*** **half hour, hour** **<u>Activity 1:</u>** **Model how to plan an investigation using a planning sheet.** **Children to predict what will happen, and record this in their book with a reason.** **Go outside and find a puddle (or create one). More than one puddles could be investigated e.g. in sunlight, on a shady path. This could promote further discussions on the air temperature or exposer to light.** **Children to draw around the puddle. Repeat throughout the course of the day.** **At the end of the investigation, children to take a photograph of their 'puddle'.** **Display images on the IWB, and discuss what has happened.** **Ask the question;** ***What do they think causes the drying? Wind, sunshine*** ***Can you think of any other everyday examples of when evaporation takes place?*** **Washing drying on a line, water boiling in a saucepan, kettle boiling*.** ***How can we use evaporation?*** **Hair dryers, tumble dryers, rotary clothesline.** **Consolidate evaporation. Ensure the children understand that water hasn't simply 'disappeared' but has become an invisible gas. It is all around us.** ***steam is composed of tiny droplets of water, which can be seen, and then which become invisible water vapour (gas).**	https://planbee.com/products/states-of-matter **Plenary** Go through the challenge with challenge as a whole class. Can they invent a solution to the problem and how could they test their ideas? This task could be sent as home-learning. Consolidate what evaporation is.

Knowledge and Skills Objectives	Activity	Differentiation
Week Six I can explain how a gas can change into a solid. Working Scientifically:	**Prior Assessment Task:** **Starter Questions:** **Ask the children;** ***What is freezing point?*** ***What is melting point?*** ***What is boiling point?*** *What do you think condensation is?* (the children would have met this as part of their learning on the water cycle) Children to discuss with Talking Partners before discussing as a whole class. Introduction: Explain to the children that they are going to investigate how a gas can turn back into a liquid. This is the final stage of the States of Matter cycle. Watch the following video on evaporation and condensation; https://www.bbc.co.uk/bitesize/topics/zkgg87h/ar ticles/zydxmnb Talk to the children about the everyday scenario of taking a hot shower in a closed bathroom. Ask the question; *If you have a mirror, what happens to the mirror when you are having this hot shower?* The mirror is likely to "fog" up. Explain, the "fog" consists of tiny droplets of water that form on the cool surface of the mirror. Some of the hot water from the shower evaporates, so the air in the bathroom contains a lot of water vapour. When the water vapour contacts cooler surfaces, such as the mirror, it cools and loses energy. The cooler water particles no longer have enough energy to overcome the forces of attraction between them. They come together and form droplets of liquid water. Ask the question;	SEND: Take a picture of condensation using an iPad. Using an app, children to insert image and type what makes condensation e.g. when hot air meets a cold surface, the air cools and turns to liquid. Year 3: Children to write their prediction prior to the investigation. Children to draw their observations, and then explain what they saw and why this happened. Year 4: Children to write their predictions prior to the investigation. Children to draw a number of their observations, and then explain what they saw and why this happened. Year 4 should be able to use more scientific vocabulary and reasoning than Year 3. Their explanations should be more in-depth.

Resources

Cold can of pop
Ice box
Mirrors
Ice cubes
Glass jam jars (wide neck)
Plates
Hot tap water
Images for labelling
iPads

At what temperature does water vapour cool to turn into a liquid?
(can they recall from the previous discussion on boiling point)

Activity 1:
Give children a mirror that has been stored in a cool location e.g. in an ice box. Children to breathe onto the mirror and watch what happens. Get the children to **draw onto the 'fog' and notice not only what is happening on the mirror but how** their hands feel too.

Activity 2:
The children are going to make it rain inside the classroom.
Model how to set up the investigation, without actually doing the enquiry with them. Ask the children what they think they might see during the enquiry and make a prediction. Children to record their predictions.

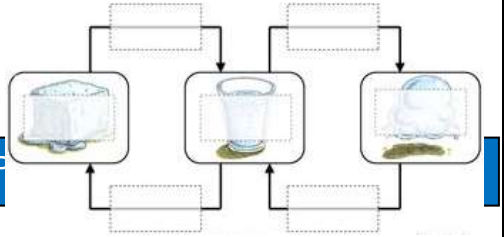
In groups, children to set up the following investigation and throughout make observations. Children could take photographs of these observations to support their journaling of the investigation. (This investigation can also be conducted using a jam jar, plastic cover and elastic band.)

What you need:
- **Ice cubes**
- **Wide glass jam**-jar
- **Plate**
- **Very hot tap water**

Method:
1. Put the ice cubes on the plate.
2. Pour around 3 centimetres of very hot water into the glass jar.
3. Place the plate and ice cubes on top of the jar.
4. Watch what happens!

Can you see droplets forming on the bottom of the plate?
If you tap the plate they will fall down like rain!

Explain to the children that when hot air hits the bottom of the cold plate, water vapour in the air condenses. The water vapour forms water droplets on the bottom of the plate. The water droplets drip down like rain. The same thing happens in the

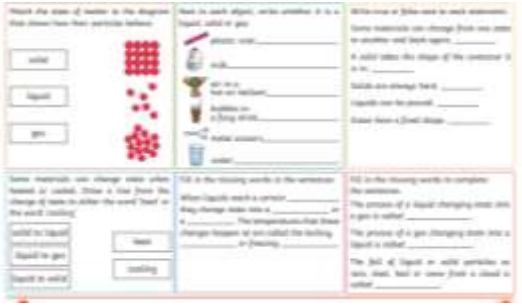


Challenge:
Complete the image

Consolidate all learning on States of Matter.

Using a quizzing app or a template, children to answer questions on States of Matter. Use this as a post-assessment.

Go through questions if misconceptions or misunderstandings are still present.



	atmosphere. Warm, moist air rises. The rising warm air meets colder air high in the atmosphere. The water vapour in the warm air condenses and forms water droplets. The water droplets fall to Earth as rain. Consolidate; condensation occurs when water-vapour molecules in the air lose heat energy (cool), slow down, and join together to form liquid-water droplets when they come near something cold.	

SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 3 & 4	Term: Summer 2 (Cycle B)	Topic: Animals including Humans

National Curriculum Links

Pupils in KS2 should be taught to

- recognise that living things can be grouped in a variety of ways.
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- recognise that environments can change and that this can sometimes pose dangers to living things.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (Y1 – Animals, including humans)	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. (Y6 - Living things and their habitats)

• Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)	• Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Common Misconceptions

Some children may think:

- the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain
- there is always plenty of food for wild animals
- animals are only land-living creatures
- animals and plants can adapt to their habitats, however they change
- all changes to habitats are negative.

Sustainable Development Goals & Catholic Social Teaching

Sustainable Development Global Goals would be perfect to fit with this unit of learning:

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:

Applied Write Opportunites	Enrichment Opportunties
• Write a non-chorological report on deforestation.	

Assessment Opportunties

- Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.)
- Can use classification keys to identify unknown plants and animals
- Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter

Key Vocabulary
Tier Two: environment, habitat, micro-habitat, animals, fish, birds, mammals, weather, Autumn, Summer, Winter, Spring, trees, plants, jungles, forests, rainforests, danger Tier Three: classify, ecosystem, organisms, vertebrate, invertebrate, amphibians, reptiles, conditions, provide, deforestation, pollution, slash and burn, oxygen, carbon footprint, logging, exoskeleton, suited, adapted, predator, prey

Knowledge and Skills Objectives	Activity	Differentiation
Week One I can group animals (according to whether they are fish, amphibians, reptiles, birds or mammals.) Working scientifically	Starter Question: Display images of various types of animals. Ask the question; What am I? I am a fish, amphibian, reptile, bird or mammal? Take feedback. Introduction: Give children information and images about each animal group to read. Discuss the characteristics of each group, and explain any new vocabulary the children uses. Then recap and discuss criteria for fish, amphibians, reptiles, birds, mammal. https://www.youtube.com/watch?v=ITrRMiQB8g4 Task 1: Give children images of animals and ask them to group them according to the characteristics. Can the children explain how they knew the animals belonged to a specific group? *Take photographs of this for their book* Plenary:	Year 3: Children to stick 2 images of each animal group in their book, and write a few **sentences to explain the animal's** characteristics. Year 4: Children to draw 2 images of each animal group in their book (using drawing frame), and write a paragraph to explain the **animal's characteristics using scientific** vocabulary. Challenge: Children to answer the following questions in their book: 1) Which animals were the most difficult to groups? Why?

Resources	Consolidate the five different groups and the differences between them. Share Question 6 from the challenge with the children - Can you think of any animals that do not belong in these groups? What groups do they belong too? Explore this question together.	2) What is the difference between an amphibian and a reptile? 3) What is the difference between a bird and a mammal? 4) What do all of the groups except fish have in common? 5) What do all the groups have in common? 6) Can you think of any animals that do not belong in these groups? What groups do they belong too? Plenary
Knowledge and Skills Objectives	Activity	Differentiation
Week Two I can identify whether an animal is a vertebrate or invertebrate. I can use a classification key to identify a vertebrate. Working Scientifically	Starter Question: What is the difference between a vertebrate or an invertebrate? Introduction: Explain to the children that they are learning the difference between two groups of animals; vertebrate and invertebrate. Give children information to read in their pairs to find out the difference. Take feedback.	Year 3 Write a simple explanation of what a invertebrate is. Year 4 *Write a more detailed explanation using scientific language (e.g. endoskeleton or exoskeleton) and comparison vocabulary (e.g. however)* Challenge:

	Discuss the difference; Vertebrate has a backbone (spine) and an invertebrate does not have a backbone (spine). Consolidate what a **'spine' is and its primary fun**ction. Use BBC Bitesize What is a vertebrate and What is an invertebrate to consolidate understanding. https://www.bbc.co.uk/bitesize/topics/zn22pv4/articles/zp6g7p3 <u>Task 1</u> Give children a set of animal cards. Sort them into two groups. **Discuss children's findings, and explore any misconceptions.** <u>Task 2</u> Consolidate what a classification key is and why they are used; *Scientists use classification keys to group unfamiliar organisms. They can look at the features of the organism and use the key to identify the organism that they have found. This can be useful when different organisms have a similar appearance.* Give children a classification key and children to sort a set of invertebrate according to the questions. Take a photograph of the above tasks for their science book. <u>Plenary:</u> Conclude what the difference is between a vertebrate and invertebrate. Play quiz on BBC Bitesize – children use wipe-boards to assess their understanding and as a post assessment for teacher.	To find out more about endoskeletons and exoskeletons.
Knowledge and Skills Objectives	Activity	Differentiation

Week Three I can explore, identify and name a variety of living things in their local and wider environment. Working Scientifically	Starter Question: What organisms live in our school environment? Introduction: Today, the children will explore their local environment for organisms (animals and plants). Discuss rules for working scientifically with nature including the importance of wearing gloves. Use clipboards, children to make notes of what they find out or take photographs using cameras/ipads. In the outside area, identify some micro-habitats: under a log, in a **bush, base of a tree etc... Predict what organisms (animals and plants)** will live there and why. Task 1: Year 3: Work in small groups. Year 4; Work in pairs or independently. Draw 8 organisms they found in the local environment on a recording sheet. Plenary: Discuss which living organisms (animals and plants) live in the micro-habitats they found. Ask, why do certain organisms live in that particular micro-habitat? Example: the woodlouse lives in moist dark areas under objects (log, rock) as it provides shelter, protection and **moisture that it absorbs (it doesn't drink water).**	Year 3: Children to create the eight images for their classification key. Year 4: Children to create the eight images for their classification key. Challenge: Use Living Things Classification Keys to solve by answering dichotomous questions independently.
Knowledge and Skills Objectives	Activity	Differentiation

Week Four I can create a classification key for organisms in the local environment. Working Scientifically	Starter Question: What is a micro-habitat and which animal would live there and why? Introduction: Consolidate what a classification key is. Discuss why we use classifications? Show two different classification formats. Which do they prefer? Explain why. Demonstrate how to create a classification key using pictures of animals, using post-it notes and large paper. Task 1: Year 3: Work in small groups. Year 4; Work in pairs or independently. Using the 8 organisms drawn in the previous lesson, construct a classification key (Year 3 - give them a leading question to get them started). Plenary: Consolidate which living organisms (animals and plants) live in the micro-habitats they found. Children to watch the following clip to remind them of living things and their habitats. https://www.bbc.co.uk/programmes/p0119dpr	Year 3: Use the 8 images to create a classification key in a pair or as a small group by repeatedly asking dichotomous questions (with exactly two answers) splitting the groups up until each group only has one member. Year 4: Use their 8 images to create a classification key group by repeatedly asking dichotomous questions (with exactly two answers) splitting the groups up until each group only has one member. Challenge: Use Living Things Classification Keys to solve by answering dichotomous questions independently.
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Week Five I can explain the reasons for deforestation and its negative effects. Working Scientifically	Starter Question: Why do we need trees? Introduction:	Year 3 and Year 4: Children to create a non-chronological text about deforestation. Challenge:

	Ask, what would happen if there were no trees in woodland / forest areas? Discuss deforestation around the world and the impact on a larger scale. Watch video clip about deforestation. https://www.twinkl.co.uk/teaching-wiki/deforestation Or https://www.youtube.com/watch?v=Ic-J6hcSKa8 Task 1: Children to read information about deforestation. **Use 'Walk & Talk' activity to get children discussing key information.** Task 2: Consolidate what a non-chronological text is. Create a non-chronological text about deforestation. Plenary: How can we stop deforestation? What is being done to help already?	Children to find out more facts about **deforestation and create 'Did you know…'** facts for the display.
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Week Six I can explain the impact humans are having on ecosystems, both positive and negative. Working Scientifically	Starter Question: How can we look after nature? Introduction: Discuss the positive impact of nature reserves and ecologically planned parks, or garden ponds projects. Why do we have them/need them? Task 1: Watch videos to support understanding: https://www.worldlandtrust.org/get-involved/educational-resources/conservation-videos-for-schools/	Year 3 and Year 4: Children to create a poster on how we can help plants and nature. Challenge: Explore the woodland trust website for kids. What can they find out?

	https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-can-we-protect-plants-and-nature/z4fgxyc Explain what the positive impact of these places is having on an immediate scale and wider scale. Create a mind map of ideas. <u>Task 2:</u> Complete mind map from the first lesson <u>Plenary:</u> Discuss how can we help more, now and the future.	

SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 4	Term: Summer 1 (Cycle B)	Topic: Animals including Humans (classification)

National Curriculum Links:

Pupils in Key Stage Two should be taught to:

- recognise that living things can be grouped in a variety of ways.
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- recognise that environments can change and that this can sometimes pose dangers to living things.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
• Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including 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. (Y3 - Animals, including humans)	• Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) • Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)

Common Misconceptions

Some children may think:

- **arrows in a food chains mean 'eats'**
- the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain
- there is always plenty of food for wild animals
- your stomach is where your belly button is
- food is digested only in the stomach
- when you have a meal, your food goes down one tube and your drink down another

the food you eat becomes "poo" and the drink becomes "wee".

Sustainable Development Goals & Catholic Social Teaching

Sustainable Development Global Goals would be perfect to fit with this unit of learning:

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:

Applied Write Opportunities	Enrichment Opportunities
Write a non-chorological report on deforestation.	

Assessment Opportunities

- Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part
- Can record the teeth in their mouth (make a dental record)
- Can explain the role of the different types of teeth
- Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores
- Can create food chains based on research

Key Vocabulary

Tier Two:

nutrients, herbivore, carnivore, omnivore, producer, predator, prey, food chain, environment, habitat, animals, fish, birds, mammals, weather, trees, plants, jungles, forests, rainforests, danger, conditions, pollution oxygen, carbon footprint, logging, suited, adapted,

Tier Three:

classify, micro-habitat, ecosystem, organisms, vertebrate, invertebrate, amphibians, reptiles, deforestation, , slash and burn, exoskeleton,

Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I can group animals according to whether they are fish, amphibians, reptiles, birds or mammals. Working scientifically:	**Prior Assessment Task:** Starter Question: Display images of various types of animals. Ask the question; *What am I? I am a fish, amphibian, reptile, bird or mammal?* Take feedback. Introduction: Give children information and images about each animal group to read. Discuss the characteristics of each group, and explain any new vocabulary the children uses. Then recap and discuss criteria for fish, amphibians, reptiles, birds, mammal. https://www.youtube.com/watch?v=ITrRMiQB8g4 Activity 1: Give children images of animals and ask them to group them according to the characteristics. Can the children explain how they knew the animals belonged to a specific group? *Take photographs of this for their book*  	SEND: Children to sort a few of each type of animal, and write a few sentences to explain **the animal's characteristics e.g.** a bird has wings and can fly. Year 3: Children to draw 2 images of each animal group in their book (using drawing frame), and write a paragraph **to explain the animal's characteristics** using scientific vocabulary. Year 4: . Challenge: Children to answer the following questions in their book: 1) Which animals were the most difficult to groups? Why? 2) What is the difference between an amphibian and a reptile? 3) What is the difference between a bird and a mammal? 4) What do all of the groups except fish have in common? 5) What do all the groups have in common? 6) Can you think of any animals that do not belong in these

Resources	Children to write about the differences.	groups? What groups do they belong too? **Plenary** Consolidate the five different groups and the differences between them. Share Question 6 from the challenge with the children - Can you think of any animals that do not belong in these groups? What groups do they belong too? Explore this question together.

Knowledge and Skills Objectives	Activity	Differentiation
Lesson 2: I can identify whether an animal is a vertebrate or invertebrate. Working Scientifically:	**Prior Assessment Task:** Starter Question: What is the difference between a vertebrate or an invertebrate? Introduction: Explain to the children that they are learning the difference between two groups of animals; vertebrate and invertebrate. Give children information to read in their pairs to find out the difference. Take feedback. Discuss the difference; Vertebrate has a backbone (spine) and an invertebrate does **not have a backbone (spine). Consolidate what a 'spine' is and its primary function.**	SEND: Year 3 Write a simple explanation of what an invertebrate is. Year 4 *Write a more detailed explanation using scientific language (e.g. endoskeleton or exoskeleton) and comparison vocabulary (e.g. however)* Challenge: To find out more about endoskeletons and exoskeletons.

Resources

Use BBC Bitesize What is a vertebrate and What is an invertebrate to consolidate understanding. https://www.bbc.co.uk/bitesize/topics/zn22pv4/articles/zp6g7p3

Activity 1:
Give children a set of animal cards. Sort them into two groups.
Discuss children's findings, and explore any misconceptions.

Activity 2:
Consolidate what a classification key is and why they are used;
Scientists use classification keys to group unfamiliar organisms. They can look at the features of the organism and use the key to identify the organism that they have found. This can be useful when different organisms have a similar appearance.

Give children a classification key and children to sort a set of invertebrate according to the questions.

Take a photograph of the above tasks for their science book.

Plenary

Conclude what the difference is between a vertebrate and invertebrate.
Play quiz on BBC Bitesize – children use wipe-boards to assess their understanding and as a post assessment for teacher.

Knowledge and Skills Objectives	Activity	Differentiation
Lesson Three I can explore, identify and name a variety of living things in their local and wider environment. Working Scientifically:	**Prior Assessment Task:** Starter Question: What organisms live in our school environment? Introduction: Today, the children will explore their local environment for organisms (animals and plants). Discuss rules for working scientifically with nature including the importance of wearing gloves. Use clipboards, children to make notes of what they find out or take photographs using cameras/ipads. In the outside area, identify some micro-habitats: under a log, in a bush, base of a tree etc... **Predict what organisms (animals** and plants) will live there and why. Activity 1: Year 3: Work in small groups. Year 4; Work in pairs or independently. Draw 8 organisms they found in the local environment on a recording sheet. 	SEND: Year 3: Children to create the eight images for their classification key. Year 4: Children to create the eight images for their classification key. Challenge: Use Living Things Classification Keys to solve by answering dichotomous questions independently.
Resources		Plenary
		Discuss which living organisms (animals and plants) live in the micro-habitats they found. Ask, why do certain organisms live in that particular micro-habitat? Example: the woodlouse lives in moist dark areas under objects (log, rock) as it provides shelter, protection **and moisture that it absorbs (it doesn't** drink water).

Knowledge and Skills Objectives	Activity	Differentiation
Lesson 4 I can create a classification key for organisms in the local environment. Working Scientifically:	**Prior Assessment Task:** Starter Question: What is a micro-habitat and which animal would live there and why? Introduction: Consolidate what a classification key is. Discuss why we use classifications? Show two different classification formats. Which do they prefer? Explain why. Demonstrate how to create a classification key using pictures of animals, using post-it notes and large paper. Activity 1: Year 3: Work in small groups. Year 4; Work in pairs or independently. Using the 8 organisms drawn in the previous lesson, construct a classification key (Year 3 - give them a leading question to get them started).	SEND: Year 3: Use the 8 images to create a classification key in a pair or as a small group by repeatedly asking dichotomous questions (with exactly two answers) splitting the groups up until each group only has one member. Year 4: Use their 8 images to create a classification key group by repeatedly asking dichotomous questions (with exactly two answers) splitting the groups up until each group only has one member. Challenge: Use Living Things Classification Keys to solve by answering dichotomous questions independently.
Resources		Plenary

		Consolidate which living organisms (animals and plants) live in the micro-habitats they found. Children to watch the following clip to remind them of living things and their habitats. https://www.bbc.co.uk/programmes/p0119dpr

Knowledge and Skills Objectives	Activity	Differentiation
Lesson 5 I can explain the reasons for deforestation and its negative effects. Working Scientifically: **Resources**	**Prior Assessment Task:** Starter Question: Why do we need trees? Introduction: Ask, what would happen if there were no trees in woodland / forest areas? Discuss deforestation around the world and the impact on a larger scale. Watch video clip about deforestation. https://www.twinkl.co.uk/teaching-wiki/deforestation Or https://www.youtube.com/watch?v=Ic-J6hcSKa8 Activity 1: Children to read information about deforestation. **Use 'Walk & Talk' activity to get children discussing key informati** 	SEND: Year 3 and Year 4: Children to create a non-chronological text about deforestation. Challenge: Children to find out more facts about **deforestation and create 'Did you know...' facts for the display.** **Plenary** How can we stop deforestation? What is being done to help already

Resources		
	Activity 2: Consolidate what a non-chronological text is. Create a non-chronological text about deforestation. 	

Knowledge and Skills Objectives	Activity	Differentiation
Lesson 6 I can explain the impact humans are having on ecosystems, both positive and negative. Working Scientifically:	**Prior Assessment Task:** Starter Question: How can we look after nature? Introduction: Discuss the positive impact of nature reserves and ecologically planned parks, or garden ponds projects. Why do we have them/need them?	SEND: Year 3 and Year 4: Children to create a poster on how we can help plants and nature. Challenge: Explore the woodland trust website for kids. What can they find out?
Resources	Activity 1: Watch videos to support understanding: https://www.worldlandtrust.org/get-involved/educational-resources/conservation-videos-for-schools/ https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-can-we-protect-plants-and-nature/z4fgxyc	Plenary Discuss how can we help more, now and the future.

	Explain what the positive impact of these places is having on an immediate scale and wider scale. Create a mind map of ideas.  <u>Activity 2:</u> Complete mind map from the first lesson	