

# Foundation Subject Medium Term Planning

<b>Subject: Science</b>	<b>Concept/Theme: Ourselves</b>	<b>Year Group: Year 4</b>	<b>Term: Summer 1</b>
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<b>Vocabulary:</b>		<b>End of Unit Milestones:</b> <ul style="list-style-type: none"> <li>• I know I know the main parts of the human digestive system: mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus.</li> <li>• I know what happens at each of the main parts of the human digestive system and how this helps to digest food: mouth, oesophagus, stomach, intestine, rectum, anus.</li> <li>• I know the four different types of teeth found in humans: pre-molar, molar, canine, incisor.</li> <li>• I know that it is important to care for teeth by brushing them with toothpaste.</li> <li>• I know what could happen to teeth if they are not cleaned carefully.</li> <li>• I know which organisms are producers, predators or prey.</li> <li>• I know which organisms are producers, which are predators and which are prey on a food chain.</li> </ul>
<b>digestion</b>	The process by which the stomach and intestines change food into a form that the body can use as energy.	
<b>intestine</b>	Intestines are. organs, or body parts, that are shaped like long tubes. They help break down food so that the body can use it for energy.	
<b>incisor</b>	A tooth for cutting.	
<b>canine</b>	A pointed tooth next to the incisors used for tearing.	
<b>premolar</b>	A double-pointed tooth that comes between the canines and molars.	
<b>molar</b>	A large tooth near the back of the mouth with a broad surface used for grinding.	
<b>food chain</b>	The order in which organisms, or living things, depend on each other for food.	
<b>predator</b>	An animal that lives mostly by killing and eating other animals.	
<b>producer</b>	Plants are called producers because they produce their own food.	
<b>prey</b>	An animal that is hunted or killed by another animal for food.	<b>Working Scientifically</b> <ul style="list-style-type: none"> <li>• I can record the main parts of the human digestive system using clear scientific vocabulary in scientific diagrams with labels.</li> <li>• I can explain what happens to food from the moment it is put into the mouth until it is removed from the body as waste.</li> <li>• I can research tooth types using a text or and iPad.</li> <li>• I can explain my results using scientific vocabulary</li> <li>• I can group a selection of organisms to show which are producers, which are predators and which are prey and I can explain why I have made each selection.</li> <li>• I can record what I have learnt in a clear key using scientific vocabulary.</li> </ul>

<b>Prior Learning:</b>	<b>Future Learning:</b>
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- **Year 3 Spring 1** - Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

- **Year 6 Spring 1** – Animals Including Humans - recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Animals Including Humans - describe the ways in which nutrients and water are transported within animals, including humans.

## Influential Scientists

William Beaumont, Ivan Pavlov, Franciscus Sylvius, Rene de Reaumur,

## Week One

### Objective:

- I am learning to identify the main parts of the human digestive system.

### Working Scientifically

- I am learning to record my observations using clear scientific vocabulary in scientific diagrams with labels
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### Success Criteria:

- I know the main parts of the human digestive system: mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus

### Working Scientifically

- I can record the main parts of the human digestive system using clear scientific vocabulary in scientific diagrams with labels.

## Learning And Teaching

## Outcomes

*(what is in books, any computing/photo/video evidence etc and where it is to be saved)*

### Reading:

I was feeling a bit sick because I hadn't been to the toilet for four days, so I was in the doctors with my Mum. 'So, Liam,' the doctor asked, 'What have you been eating?' Before I could reply, Mum spoke. 'He read that if you only eat meat, you'll become super-strong, so he hasn't had any fruit, vegetables or cereal for nearly a week.' She continued apologetically, 'he's literally only eaten chicken, pork and beef in that time doctor.' The doctor raised an eyebrow. 'That's why you haven't been to the toilet Liam. You see, when you eat protein alone, it can stop the food moving through your digestive system properly. You need lots of fibre in your diet. When food leaves your stomach, it goes into a long tube called your intestine. The first part is the small intestine and then it becomes the large intestine. The food needs to move smoothly through your intestines so you can get all the nutrients your body needs – Digestion is the process where our bodies break down food into the nutrients we need to stay healthy. Anyway, eventually digestion just leaves what your body doesn't need – what you call poo – if you don't regularly get rid of this waste from your body through the anus, it will build up in your rectum and that's why you're feeling a bit sick. You need to make sure you get lots of fibre from what you eat and that means lots of cereal, fruit and vegetables. Okay?' 'Yes doctor.' I replied sheepishly. 'Good,' the doctor nodded, satisfied. 'Another thing. Make sure you chew your food properly as well. You might not know this, but digestion starts in your mouth. If you make your food as small as possible, it will be easier to swallow it. When you do swallow it, it goes down another tube called the oesophagus and that leads to our stomach.' 'You will, won't you Liam?' Mum said in a tone that I knew not to argue with. 'I'll make sure he will doctor,' promised Mum, 'and thank you!'

Use the text to answer the questions:

Labelled diagram of the digestive system.

**Pupils needing extra support:** Fewer labels/less detailed diagram.

**Pupils working at greater depth:** Can the children begin to consider the role of each part of the digestive system? (iPads)

1. What substance makes your food move through your digestive system smoothly?
2. What foods can you eat to get enough this substance?
3. What is the name of the tube that food goes into after it has been in the stomach?
4. What is digestion?
5. Where does digestion start?
6. Where does all the waste leave the body?

Give each individual a copy of the diagram (see Pzaz resources)– although they will work in pairs. See if they can use the text above to label the diagram. They may wish to colour the different parts. If required, pupils can use their learning pads to check their diagrams are correct. Once you have ensured each group has a correctly labelled diagram, they will each need a copy for their books.

Pupils research the following parts to the digestive system and produce a report on their function: Mouth, Oesophagus, Stomach, Liver, Pancreas, Small Intestine, Large Intestine, Rectum, Anus. This can be done as a pre-printed

### Exploring the Intestine

Measure out about 10m of string.

Have a pupil at one end and hold the string at the other end.

Show pupils how this length of intestine fits into our abdomen by folding the string in half metre steps and holding it over your own abdomen.

Ask pupils why they think that the intestine needs to be so long.

### Science Explained

The intestine is long so the maximum number of nutrients and water can be extracted from food moving along it.

There is a huge network of blood vessels connected to the intestines so that the nutrients can be moved from the intestine into the blood.

**This can be added to class Twitter**

## Week Two

**Objective:**

**Success Criteria:**

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<ul style="list-style-type: none"> <li>I am learning to describe the simple functions of the basic parts of the digestive system in humans.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>I am learning to describe the process of digestion using key scientific vocabulary.</li> </ul>	<ul style="list-style-type: none"> <li>I know what happens at each of the main parts of the human digestive system and how this helps to digest food: mouth, oesophagus, stomach, intestine, rectum, anus.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>I can explain what happens to food from the moment it is put into the mouth until it is removed from the body as waste.</li> </ul>	
<b>Learning And Teaching</b>		<b>Outcomes</b> <i>(what is in books, any computing/photo/video evidence etc and where it is to be saved)</i>
<p>KMRM quiz: label a basic diagram of the digestive system – practical</p> <p>Equipment: Cream Crackers, 2 picnic bowls, water, 1% iodine solution.(stored in KH cupboard, complete with H&amp;S paperwork from CLEAPPS)</p> <p>The following should be modelled to the class to demonstrate what happens during digestion at the chewing stage and why the mouth, teeth and tongue are all considered part of the process:</p> <ol style="list-style-type: none"> <li>Break a cracker in half.</li> <li>Physically break one half into a few smaller pieces and place in 1 bowl. Add 2 tablespoons of water and stir.</li> <li>Chew the other half of the cracker for 1 minute but do not swallow it.</li> <li>Spit the chewed cracker into the other bowl and add 2 tablespoons of water.</li> <li>Wait for 1 minute, and then add 1 drop of iodine to each of the bowls. Stir.</li> <li>Observe the similarities and differences between the contents of each bowl.</li> </ol> <p><b>Science Explained</b></p> <ul style="list-style-type: none"> <li>Crackers contain a lot of starch.</li> <li>When iodine is added to starch, it goes blue black.</li> <li>The unchewed cracker will go blue black because nothing has happened to it.</li> <li>Enzymes are chemicals that the body uses to break down food into nutrients.</li> <li>In saliva, there is an enzyme called amylase that breaks down starch (the enzyme changes the starch into glucose).</li> <li>In the chewed cracker, the colour should be much lighter because there is less starch to go blue black.</li> <li>Therefore, your mouth starts the digestive process!</li> </ul> <p><b>Possible Questions</b></p> <ul style="list-style-type: none"> <li>What is the difference between the chewed cracker and unchewed (before the addition of iodine)?</li> </ul>		<p>Children should record the process of digestion describing what happens at each part.</p> <p><b>Pupils needing extra support:</b> Cut out labels and descriptors and the children can match the pairs.</p> <p><b>Pupils working at greater depth:</b></p>

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- Why do you think they react differently to the iodine?
- Why do you think we chew our food?

Practical investigation for children to complete in groups to model how the digestive system works:

Children should complete this task in small groups.

1. Cut one leg of a pair of tights and cut the toe so you have a tube. (This is the intestine).
2. Make a hole about 2cm wide in the bottom of the cup. (The cup is the rectum and the hole is the anus).
3. Attach the toe end of the tights to about half-way down the cup. Sellotape the tights so they are tightly secured to the cup.
4. Empty the food into the bowl. You may need to tear the bread into smaller pieces first.
5. Using the fork, mash all the food together for 1 minute. (This represents chewing).
6. Transfer the food to the bag and seal. (The bag is the stomach).
7. Using your hands, knead the bag gently for 1 minute so the food becomes a pulp.
8. Transfer some of the food into the open end of the tights. Your partner is holding the cup, so it is horizontal to the opposite end of the tights.
9. Put your thumb and first finger together so they are in a loop around the tights.
10. Keeping your thumb and finger together, move the food along the tights until it reaches the cup.
11. Repeat steps 8-10 until all the food has moved through the tights.
12. Now hold the cup over the bowl and squeeze. See what happens.

### Science Explained

1. Digestion is the process where the body extracts the nutrients it needs to remain healthy.
2. Digestion necessitates making food as small as possible to efficiently extract these nutrients.
3. Chewing reduces the size of the food and mixes it with saliva.
4. Saliva contains chemicals called enzymes which are used to digest food i.e. extract nutrients from it.
1. The food is swallowed, moves through the oesophagus to the stomach.
2. The stomach mechanically grinds the food and mixes more enzymes.
3. The food then moves into the intestine, where most of the extraction of the nutrients takes place.
4. The intestine is over 10m long in adults, and the nutrients move from the intestine (which is porous like the tights) to the bloodstream.
5. The blood takes the nutrients to every cell in the body.
6. Fibre is needed to move the food smoothly through the intestine.
7. Once all nutrients are extracted, what is left is waste.
8. The rectum is the area at the end of the intestine that stores the waste (faeces).
9. The anus opens and the faeces leave the body. The science term for this is called egestion.

### Possible Questions

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1. What does the orange-brown liquid coming through the tights represent?
2. Do you think the food moves more easily through the tights with more, or less water?
3. Is this a good model of the digestive system? Why?
4. Is this a poor model of the digestive system? Why?
5. How could you improve the model?

## Week Three

### Objective:

- I am learning to identify the different types of teeth in humans and their simple functions.

### Working Scientifically

- I am learning to use secondary sources to answer questions which I understand cannot be answered through practical investigations.

### Success Criteria:

- I know the four different types of teeth found in humans: pre-molar, molar, canine, incisor.

### Working Scientifically

- I can research tooth types using a text or and iPad.

### Learning And Teaching

### Outcomes

*(what is in books, any computing/photo/video evidence etc and where it is to be saved)*

KMRM – Multiple choice quiz

### Reading:

Izzy was worried she was going to lose her teeth because she thought that one was going black, so she was at the dentist with her Dad. 'I don't eat too many sweets I promise.' She claimed to Dr. Roberts. 'Well Izzie, I have some good news,' the dentist said, 'there is no sign of tooth decay here, which is what would happen if you ate too much sugary food and then not brush your teeth regularly.' Izzy thought for a moment before replying. 'I brush my teeth when I get up every day.' Dr Roberts looked concerned. 'You need to brush before you sleep as well, because that gets rid of all the harmful bacteria on your teeth. The bacteria 'eats' sugar that's left on your teeth and then produces acid that causes the decay and we don't want that. Make sure you spend enough time on all your teeth too,' advised the dentist, 'The ones at the top and bottom in the middle are called the incisors, which cut the food you eat, then next to your incisors are the canines, which tear the food, and then you have wider, flatter teeth called the premolars. The biggest teeth are at the back of your mouth are called molars. Both molars and premolars are good for crushing food as they have the same shape. If you lose any tooth, it'll be more difficult to eat your food.' 'Yes Dr. Roberts' promised Izzy.

1. What happens if you eat too much sugary food and then don't brush your teeth regularly?
2. How many times a day should you brush your teeth?

All children should draw and label molar, premolar, canine, incisor and identify similarities and differences. They should identify key differences between herbivores, carnivores and omnivores teeth and explain why they exist.

**Pupils needing extra support:** If drawing is a barrier provide diagrams for children to annotate with sentences to fill the

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3. What does brushing your teeth do?
4. Which types of tooth crushes food?
5. What is the name of the tooth that is next to the incisors?

### Research and Modelling:

Pupils will use their learning pads to research the types of human teeth, and then label their diagrams correctly. They then need to write the features of each tooth including its shape, size etc. They should also comment on the differences and similarities between the teeth, and how the shape of each tooth informs its function.

If time allows this is an excellent opportunity to use modelling (pink and white plasticine or play dough)

### Work for GD Children

#### Observing Changes Over Time:

Equipment: 5 plastic cups, 5 eggs, water, cold tea, cola, orange juice, cold coffee, learning pad.

1. Place 1 egg in each of the plastic cups and photograph the eggs.
2. Simply pour one of the liquids over the eggs.
3. Examine the eggs every 2 days and photograph the eggs.
4. After a week compare the photographs and make a comment of which liquid will stain teeth the most/least over time.

Although this investigation will be decided on and set up by GD children, its purpose and results must be shared with the rest of the class.

blanks.

**Pupils working at greater depth:** Provide children with the question:

Which drinks stain teeth?  
Provide the children with the equipment to see if they can decide on how to set up the investigation. Children should record what they have set up and the results they recorded to share with the class.

## Week Four

### Objective:

- I am learning to explain the importance on caring for teeth.

### Working Scientifically

- I am learning to demonstrate scientific knowledge by explaining why something has happened using correct scientific vocabulary.

### Success Criteria:

- I know that it is important to care for teeth by brushing them with toothpaste.
- I know what could happen to teeth if they are not cleaned carefully.

### Working Scientifically

- I can explain my results using scientific vocabulary

### Learning And Teaching

### Outcomes

*(what is in books, any computing/photo/video evidence etc and where it is to be saved)*



KMRM Multiple choice quiz

Teach the children the need to brush teeth and the hazards of sugary foods for teeth. Show pictures of what happens when teeth are not carefully brushed each day. This should be a quick input as the emphasis should be on the investigative activities which follow.

**Using disclosure tablets:**

Pupils chew the plaque reveal tablets for 1 minute.

Examine the teeth and then shade in the before picture on the sheet.

Now brush your teeth for 2 minutes.

Repeat steps 1-2.

Write a commentary on the benefits of brushing teeth regularly with reference to 'before and after brushing.'

**Science Explained**

Plaque is the stick film that builds up on and around the teeth.

Plaque contains a lot of bacteria.

Regular brushing helps remove the plaque.

**Questions:**

What was the difference in your teeth after you brushed?

What would happen if you never brushed your teeth?

**This can be recorded on class Twitter.**

**Investigating the most effective toothpaste:**

**Equipment:** Plastic Cups, 3 brands of toothpaste, white vinegar, toothbrush, stopwatch, 4 eggs

1. One egg will be the control so will not be covered in toothpaste.
2. Use a toothbrush to cover 1 egg thoroughly with 1 brand of toothpaste and repeat with the other 2 eggs.
3. Place the eggs in the cups. Label the cups with the brand of toothpaste used to cover the egg.
4. Cover the eggs completely with vinegar and start the stopwatch.
5. Observe each cup carefully, when yolk can be seen in the vinegar, note the time next to the stopwatch.
6. The longer the time it takes to see yolk in the vinegar, the better the toothpaste's protective qualities.

**Pupils needing extra support:**

**Pupils working at greater depth:**

Brand of Toothpaste	Time (min/sec)
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## Science Explained

1. Teeth are made mainly of calcium and phosphorous.
2. The shell is made of calcium.
3. The calcium in the shell reacts with the acidic vinegar thereby weakening it.
4. Eventually the egg white and yolk will spill into the vinegar.
5. The control should theoretically show the first result.

## Possible Questions

Which was the best toothpaste?

What effect do you think acid has on your teeth?

You will need to model to the class how to make a conclusion from the results as this is the skills focus this lesson.

PLENARY: Look at the results from GD children's investigation last week. Which drink stained teeth most?

## Week Five

### Objective:

- I am learning to identify producers, predators and prey.

### Working Scientifically

- I am learning to think of a range of criteria for grouping, sorting and classifying and can explain how my ideas link scientifically.
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### Success Criteria:

- I know which organisms are producers, predators or prey.

### Working Scientifically

- I can group a selection of organisms to show which are producers, which are predators and which are prey and I can explain why I have made each selection.

## Learning And Teaching

KMRM Multiple Choice Quiz

### Reading:

### Outcomes

*(what is in books, any computing/photo/video evidence etc and where it is to be saved)*

Children should record their results in a table to demonstrate that they have grouped organisms

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Lilah was watching a wildlife documentary on the Arctic at home with her family. The presenter had flecks of ice in his beard as he was talking about polar bears. 'In this habitat, the polar bear is the apex predator so it's at the top of the food chain. It mainly hunts ringed seals, which are easy prey as they gather in large numbers on the ice, where they spend so much time. The seals themselves feed on the plentiful cod which spawns in the Arctic waters around the ice sheet. The waters around here are rich in plankton, which the cod eat. The plankton themselves then feed on invisible aquatic plants called algae. Plants are always described as producers. When we come back, we will talk about how this food chain is threatened by the activities of mankind.'

1. How do we describe an animal at the top of the food chain?
2. What animals in the text are prey?
3. How do we always describe plants?

## Grouping and Classifying

1. Simply use the cards to classify each organism. (Pzaz Resources)

Organism	Predator	Prey	Producer

## Science Explained

- Producers are always plants.
- Predators can be prey and vice-versa.

## Possible Questions

1. Which column do plants always appear in?
2. Are animals always just one category?

correctly. They should explain what is the same about producers and predators.

### Pupils needing extra support:

Prepare the table and limit the number of pictures given.

### Pupils working at greater depth:

How could this knowledge support environmental biologists concerned with animal preservation?

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## What eats me?

1. Use the information on the cards to complete the below table. (Pzaz Resources)

Organism	What Eats Me?	What Do I Eat?
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## Possible Questions

1. Are animals ever both predator and prey?
2. What are animals called that are predators but never prey?

## Week Six

### Objective:

- I am learning to construct and interpret a variety of food chains, identifying producers, predators and prey.

### Working Scientifically

- I am learning to record my observations, using clear scientific vocabulary and classification keys.

### Success Criteria:

- I know which organisms are producers, which are predators and which are prey on a food chain.

### Working Scientifically

- I can record what I have learnt in a clear key using scientific vocabulary.

## Learning And Teaching

**Outcomes**  
*(what is in books, any computing/photo/video evidence etc and where it is to be saved)*

KMRM Multiple choice quiz.

Children will explore food chains; the position each organism takes in a food chain and the impact this has on environments.

use the resources from STEM: <https://www.stem.org.uk/resources/elibrary/resource/28091/dinner-reef-food-chains-age-7-11>

Children should record marine food chain in books.

**Pupils needing extra support:**

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login: [k.hogan@stphilipwestbrook.co.uk](mailto:k.hogan@stphilipwestbrook.co.uk) Password: ScienceRocks1!

These focus on marine animals but you may want to also develop the lesson further to explore food chains in different habitats.  
Photographs of the game should be placed on Twitter pages.

Limit number of animals to simplify the chain.  
**Pupils working at greater depth:**