

Science Vision Statement

At Loughton School, our science curriculum provides the foundations for our children to confidently explore and foster an appreciation for the world around them and to excite them to want to know more about the world they live in. In order to achieve this, we want our pupils, as developing scientists, to be taught the essential aspects of knowledge, attitudes, skills and experiences relating to science that they learn whilst in and outside of school.



As a school and in line with the National Curriculum's expectations, we aim to ensure that all children:

- Develop scientific knowledge and conceptual understanding, through specific disciplines of biology, chemistry and physics.
- Develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Science curriculum road map

In science, our curriculum is mapped out so that the key knowledge and skills that our children need, progress in a logical and sequenced way, from year to year, enabling our children to revisit previously taught content and to build on it. The curriculum ensures a wide breadth of content and skills, to ensure they have the knowledge to apply these at a deeper level.

In year 3, they learn the basic structure of plants and revisit in year 5 with how plants reproduce. In year 4, children learn about circuits and this is revisited more in depth in year 6 again.

Strong links with other subjects within our immersive curriculum are made. In year 4, electricity circuits are taught and the children's learning of a circuit is incorporated into the making of a Diwali lamp for their Hinduism/India topic.



Curriculum webs

Where possible, the science curriculum is linked to termly themes to enable a cross-curricular approach to learning.

A Year 5 Curriculum Web



As scientists, we become immersed in the world— and indeed the universe -around us. We begin by looking at materials and their properties. Our investigative skills are tested by separating solid and liquid materials and we also demonstrate reversible and irreversible changes. Later, we take a journey into space as we study the planets and our moon. Our visiting planetarium helps bring this closer to us and gives us a full understanding of our place in space. Finally, we conduct experiments to investigate different forces.



Following on from our topic of forces, we will become rocket designers! In DT this term, our brief will be to launch our rocket as high and as far as possible. Knowledge of air and water resistance and fair testing will be crucial to our design and we will also have the chance to practise our measuring of capacity and length.



Year 5 Autumn term The World Around Us



As geographers, we look at how human behaviour is affecting the world around us. Through the study of rainforests and climate change, we consider environmental challenges faces by both plants and animals. Our map skills are further developed by locating the equator, tropic and the world's rainforests.



We learn how to pace ourselves whilst running a long distance during cross-country where we are improving our stamina and fitness. We also learn how to control the ball with a tennis bat, using forearm and backhand and play small matches 1v1. In an environment of competitive game situations and teamwork, we will learn how to play handball. Handball is a great game for movement, throwing and catching, accuracy, teamwork and resilience. We will learn ways to throw the ball, attacking and defending and shooting. We will also use yoga as a way to improve our core, strength, flexibility and overall fitness.

This theme has been designed to engage the children in current affairs. By the end of the unit, they will understand how they can make a difference to the world around them as they are the future! To enhance the children's learning, we have a visiting planetarium in our school hall. This will allow the children to further develop their knowledge about space. They will also visit the MK Recycling centre (or have them visit us in a school workshop) to experience first-hand how the process of recycling takes place and learn about the alarming amount of plastics in our oceans. This then provides us a great stimulus to complete some persuasive writing in our English lessons.

Once we have been reminded how to stay safe online, as digital learners we use technology (including online encyclopaedias) to research Jane Goodall—a famous environmentalist. We learn how to use search engines effectively and look for reliable sources of information.



As artists, we will be using sketchbooks to try a number of ideas before finding a design we want to take to completion. We will be learning to draw shaded and shiny objects by adding tone to our work using different techniques. We will be inspired by the work of Vincent van Gogh and use his work as a starting point for our own compositions. We will increase our oil pastel skills using blending and layering techniques. We will also explore perspective and the role of the background, foreground and middle ground of our pieces of work.



As musicians, we learn to explore, select, combine and exploit a range of different sounds, specifically clusters to compose a space soundscape. These are shared with the class and we learn to listen closely and evaluate the compositions.

In preparation for Christmas, as singers and performers, we learn to confidently participate in a whole year group carol concert. We focus on honing our existing skills of correct breathing technique, maintaining pitch and tempo, enunciation and projection.



As linguists, we can now explain which foods we have for certain meals in French or German. We also are able to write a few short sentences to express our preferences. Our grammar knowledge now extends to being about to use a preposition. We can now also use a dictionary more effectively to make our work more our own. We are also given the opportunity to access books and classic stories from French or German speaking countries.



As responsible citizens, we explore what equality means for everyone in our school and in the wider world. We celebrate differences and can explain and describe customs and traditions that are celebrated in our own families as well as those celebrated in the wider community. We continue to learn how to keep ourselves safe online by being able to explain how peer pressure can influence our behaviour both in real life and online.



In RE, we explore what peace means to us. We explain what makes us feel peaceful and explore different symbols of peace. The story of the Christmas truce in WWII inspires us.



Planning

Quality planning of lessons is key to successful learning.

Therefore when walking into a Science lesson at Loughton, you may see practical, investigative activities, either outdoors or within the classroom. For the digestive system, they might be outside using tights for intestines and mushed up Weetabix to act as food travelling down the intestines and be observing how the intestines absorb the necessary nutrients. Groups of children may be acting out the structure of the particles in solids, liquids and gases. Other times, children may be researching, for example: a key scientist like Darwin or watching videos or science clips to understand the movement of the moon. They may be scientifically carrying out their own devised experiments, taking into account certain variables to fair test the dissolving of solids. The follow up work of writing up findings, analysing results and observations and coming up with conclusions to their experiments will be evident. All the time, they will building on previous knowledge.



The Digestive System

Year 4 Planning



Science



What is a fair test?

Name the parts that are needed to make an electrical circuit?

Why do living things have a habitat?

Do you know how scientists classify/group living things?

What is a conductor?

How can a habitat change throughout the year?

What is an insulator?

Can you group animals or plants?

What are the scientific symbols for the parts of a circuit?

What impact do humans have on habitats?



Year 4 Objectives

I can describe what happens to food and drink inside my body

I can explain how the early stages of the digestive system works

I can identify the different parts of the digestive system (including: mouth, oesophagus, stomach and intestines)

I can describe the simple function of the basic parts of the digestive system (including: mouth, oesophagus, stomach and intestines)



KS1

Year 1

Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Year 2

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Year 3

Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.

Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Year 4

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.



Lesson 1 – Introduction and assessment

I can describe what happens to food inside my body.

I can describe what happens to drinks inside my body.

What do I already know?

- We are going to have a class snack.
- While you are having your snack, think about what happens to the biscuit and drink inside your body.
- Draw a diagram, explaining what you think happens to the drink and biscuit.



Lesson 3



I can recap the functions of human teeth.

Teeth



- Can you name the different teeth we have in our mouth?
- Can you remember the function of the different teeth?
- What part do you think teeth play in the function of the digestive system?



- What is a tooth covered in?



Lesson 7



I can explain the function of the intestines.

INVESTIGATION



- You need to get the soggy Weetabix along the whole length of the tube and out at the other end.
- You are not allowed to use gravity to help you.
- How can you make the soggy Weetabix move along the 'intestines'?



Outdoor learning

We try to take as many opportunities to take our learning outdoors.



Digestive system



Butterfly release



Measuring heart rate activity

Assessment

Throughout a unit of work, the continual assessment of the children's learning will be observed and made. Any misconceptions will be addressed within the lessons. This may be done by presenting the learning in a different way (eg: watching a video), making it more practical (eg: acting out the flow of blood around the body to the heart and lungs) or supporting and guiding the children with the completion of experiments by posing questions to make them think for themselves. To reinforce this learning, weekly 'Thinking Time' questions are posed for the children to revisit and secure their knowledge and the understanding of previous science work, both in their current year's topics and in previous years. To see the children's progress at Loughton within each topic, children are asked to complete a double page spread activity. In their first lesson they are asked to write down 'What I Know' about the topic. In the last lesson, they are asked to add to this double page spread again, using a purple pen, with 'What I Know Now'.

The children are also asked to complete a more formal assessment before and after the topic. This allows teachers to see what they have learnt and retained. Through this evidence and teacher's observations, INSIGHT is completed, whereby the National Curriculum objectives are colour coded to show attainment. This then provides us with our science data for the children.

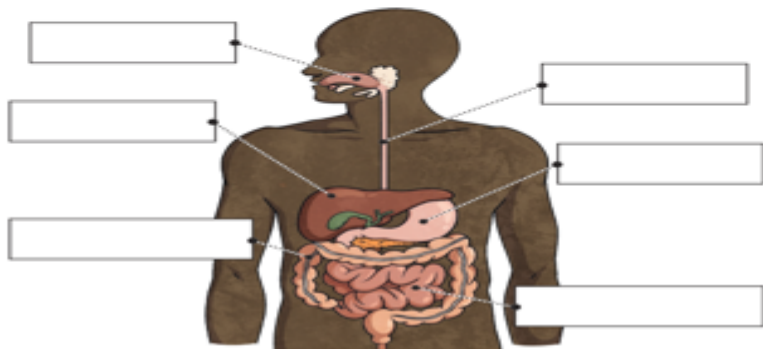
The next couple of slides show an example of the year 4 Digestive System Assessment.

Name _____ Date _____



Digestive System Review Sheet.

1. Label these parts of the digestive system.

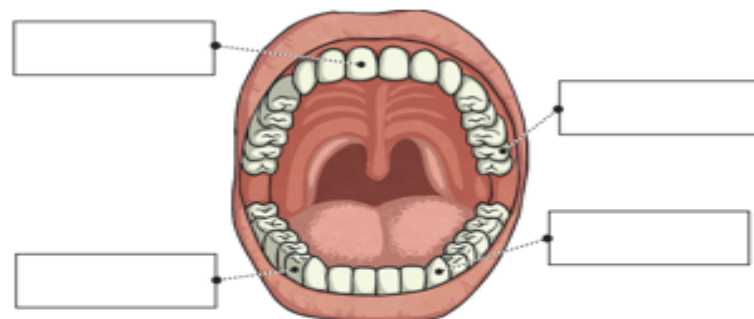


2. What is digestion?

3. Number these stages from 1-4 to show the order in which they work in the digestive system.

Stage of Digestion	Order (1-4)
Any remaining water is absorbed from food in the large intestine.	
Food is transported down the oesophagus using peristalsis muscle movement.	
The tongue helps move food around the mouth as a person chews.	
The pancreas releases digestive enzymes into the small intestine.	

4. Label the types of teeth in the human mouth.



5. Draw a line to match up the type of tooth with its function.

molar
canine
premolar
incisor

bites, cuts and chops food
chews and grinds food
holds and crushes food
tears and rips food



How many incisors does a human have? _____

Resources

Each area of science teaching/learning has the relevant resources provided for in school.



How Can Parents Help

- Website – curriculum webs – be aware of what your child is learning each term
- Padlet – communication – this is up to date information on related homework/activities parents should be aware of
- Support homework projects
- Back ground reading at home
- Extra learning – own experiments/visit museums

