

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science



Subject: Science

Key question: How do the systems inside our body work to make a healthy human?

Key Concept/ Theme:

- 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
- Find out about how different parts of the body have special functions

Prior Learning links:

KS1: Children looked at how to group animals including based on their diet. Children studied animals and their offspring and the basic needs that animals need to survive.

Working Scientifically skills:

- Asking questions
- Method and equipment
- Grouping and classifying
- Record results
- So what?

Types of enquiry:



Vocabulary:

nutrition – food or nourishment

skeleton – the framework of bones that supports the body of an animal

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

muscles – a bundle of tissue in the body of an animal that can contract enabling movement

healthy – good for your health


unhealthy – not good for your health

diet – the food that an animal eats

bones – a solid part of the skeleton

vertebrate – an animal with a backbone (spine)

invertebrate - an animal without a backbone (spine)

1.	<p>Prior learning reconnection (year group, cycle & term): Cycle 2, LKS1, Term 1 and 3, Animals including Humans LO: To know that animals cannot make their own food. Working Scientifically Skill: So what? Enquiry skill: Pattern seeking Activity:</p> <p>How do living things get their food? Discuss with the children that one of the things that makes plants and animals living is that they need to take in food. Rocks, windows, pencil, etc do not need food in order to carry on existing. Ask children why they think living things need food (i.e. to grow, to be healthy and to provide energy to move).</p> <p>Recording The children could use drawings to show what the different things that might happen to humans over time if they did not eat (e.g. become hungry, become tired, get grumpy, move around slowly, become ill, etc)</p> <p>Ask the children how they think a plant gets its food. Do they ever see a plant eating? For now, establish that a plant can make its own food by using the gases around it and the water in the soil.</p> <p>Deep thinking time - Plant child. Ask the children to imagine that animals were like plants – i.e. they could make their own food. Get them to think about how animals could take in gases (carbon dioxide), and how they could take in water without drinking. They must then design an imaginary child/superhero that is able to make their food in this way. They could then list the ways in which this would help the being to survive, as well as the threats that it might face to its survival.</p>	
	So what?	T

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

	<p>With support, can I say how this science could be useful or harmful? With guidance, can I say who uses this science?</p>		
	<p>I can say how this science could be useful or harmful. I can say who uses this science to help others.</p>		
	<p>I can suggest a technology that could use or uses this science. I can explain how this technology uses the science. I can say how this science affects our lives.</p>		
	<p>I can describe how technologies using this science could be useful and/or harmful. I can say where this science is used in real-life. I can say where this science is used in jobs.</p>		
	<p>I can explain how different technologies use this science. I can explain how the science I investigated helps particular jobs. I can explain where in the world this science helps or affects different people or places.</p>		
	<p>I can use my results to explain a scientific phenomenon or theory. I can talk about key scientists and suggest reasons for their theories. I can explain how different technologies use this science. I can suggest new experiments based on my understanding of these scientists theories.</p>		
<p>2.</p>	<p>Reconnection: Can you recall why you think that living things need food (i.e. to grow, to be healthy and to provide energy to move). LO: To know that animals, including humans, need the right amounts and types of food. Working Scientifically Skill: Record Results Enquiry skill: Research using secondary sources, pattern seeking Resources: string, paper plates Activity: Research - Why do animals need to eat different foods?</p> <p>It needs to be established with children that the type and amount of nutrition that you require depends on the types of animal you are and the amount of exercise that you have to do.</p> <p>Children need to understand that food is required to: keep animals healthy (e.g. vitamins), help them to grow (e.g. proteins), and provide their body with the energy required to function properly (e.g. sugars and carbohydrates). The following videos will help to explain this:</p> <p>https://www.bbc.co.uk/programmes/p01195z9 https://www.bbc.co.uk/programmes/p0117xs0 https://www.bbc.co.uk/bitesize/topics/z636g2p/articles/zyb9cmn#zqs77yc</p>		

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

Show children a range of foods/pictures of foods and pictures of animals that eat them. Let them discuss which animals they think might eat which of the foods. Encourage them to look for clues in the pictures of the animals and foods – e.g. a head of a fox might show sharp canines for tearing meat, whereas the proboscis of a butterfly shows that the butterfly need to insert this into a flower to extract nectar.

Research other animals - Which food do animals need in order to survive?


Give children an opportunity to find out using books and the internet the types of food and quantity of foods that different animals eat. Try not to focus only on the larger animals that are found outside of Britain. Often it is more challenging and more relevant for children to find out the types of food eaten by animals that they might find around the school grounds such as centipedes (carnivores) and millipedes (herbivores).

Recording

Give each child a paper plate. Attach a piece of string the length of the radius of the plate through the middle of the plate with a split-pin. This will be the child's own pie chart. They could draw a line from the middle to the top of their plates. After researching the types of food of an animal, they could show the quantity of these food that make up the animals' diet. They do this by swinging the string round (for example) quarter of a plate and then hatching in this quarter in particular colour.

Healthy diets for humans - research

Challenge the children to develop a week's food plan for humans with different requirements: a child, an active man, a man who works in an office, a sportsman, etc

 Record results	T
I can record my findings on tables provided by my teacher. I start to design my own tables for recording. I can choose how to classify and group the information and explain how this helps me.	
I can record my findings on tables provided by my teacher.	
I can put results (numbers & words) in the table provided by my teacher.	

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

	<p>I can record results accurately on my table. I can start to recognise when to convert units of measurement and record these accurately.</p>		
	<p>I can record different units of measure accurately, knowing I can convert units of measurement and record these accurately. I can record my findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>		
3	<p>Reconnection: Why can't animals eat the same group of food continuously?</p> <p>LO: To know that humans and some animals have skeletons and muscles for support, protection and movement.</p> <p>Resources: 'Bone's made from Plaster of Paris in plasticene moulds, Trays of sand, Paint brushes</p> <p>Activity:</p> <p>Explore - Functions of skeleton</p> <p>Hook – Mystery bones.</p> <p>Tell the children that they are pretending to be palaeontologists who have found some mysterious bones and want to work out what type of animal it is and why it needs a skeleton. Give each group of children a tray of sand containing 'bones' (Plaster of Paris 'bones' made from plasticene moulds). They must work out which animal they think it might have come from and what functions the skeleton has – i.e. to support, move and protect.</p> <p>Look at pictures of different skeletons. With each one talk about the functions of the different bones.</p> <p>Make a model- the human skeleton</p> <p>Using just paper, the children could make their own skeletons. They could research some of the names.</p> <p>Some websites contain quite detailed instructions as to how to make a very detailed human skeleton - http://www.roylco.com/instructions/eng_ins/60558.pdf</p> <p>The following website will allow you to place virtual bones in a virtual body - http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw_02/index.shtml?skeleton</p> <p>It is also a good idea to ensure that children are aware that there are lots of animals with external skeleton (exoskeletons). The following short video is a quick introduction to this. http://www.bbc.co.uk/learningzone/clips/invertebrate-skeletons/2304.html</p>		

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

4

Reconnection: Why do humans have skeletons?

LO: To know that humans and some animals have skeletons and muscles for support, protection and movement.

Working Scientifically Skill: Record Results

Enquiry skill: comparative and fair test, pattern seeking

Resources: Tape measures, String, Stop watch, Rulers, Card, Tape, Elastic bands, Balls

Activity:

Research – What is the function of muscles?

The following video is a good introduction to the function of muscles: <https://www.bbc.co.uk/bitesize/topics/z636g2p/articles/ztwcbqt#zcvpp4j>

Simple test - Measuring muscles working in pairs

Get children to feel their biceps and triceps as they move their fist towards their shoulder. Explain that as one contract the other relaxes. Children could measure their biceps contracted and relaxed.

Modelling - Make a model of the muscles in the arm



1. Use sellotape to tape a ball to one end of a tube of card.
2. In both cards make 2 holes 5cm from the end of the card and opposite each other. Unfold a paperclip, stick through the hole (do this for both tubes)
3. Pass an elastic band over one of the ends of a paperclip, stretch down both tubes and attaché to another paperclip. Tape over both paperclips' ends. Repeat with the other elastic band and other ends of the paperclips.
4. Tape the top elastic band on to the 'forearm' tube, about 5 cm from the ball. Separate the other elastic band(on the bottom) and tape to the ball


Comparative test - Measure who has the quickest reaction times

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

Children must decide on how they could find out the reaction times of different children. They could, for instance, measure how much of a ruler pass through their hand when it is dropped from just above their open fist.

Recording

Children can record their results in a table.

 Record results	T
I can record my findings on tables provided by my teacher. I start to design my own tables for recording. I can choose how to classify and group the information and explain how this helps me.	
I can record my findings on tables provided by my teacher.	
I can put results (numbers & words) in the table provided by my teacher.	
I can record results accurately on my table. I can start to recognise when to convert units of measurement and record these accurately.	
I can record different units of measure accurately, knowing I can convert units of measurement and record these accurately. I can record my findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	

5

Reconnection: What is the function of our muscles?

LO: To know do people with the longest legs jump the furthest?

Working Scientifically Skill: Method and equipment, Grouping and classifying, Asking questions

Enquiry skill: Pattern seeking, observe and fair test, identifying, classifying and grouping and observing over time.

Activity:

Game – science enquiry run-around

This might be the first time that children have had to categorise different types of scientific enquiry. To help them to decide which enquiry they will need, first play this game. Put up labels of different types of enquiries at the front of the classroom: ‘fair test’, ‘simple test’, ‘investigation over time’, ‘problem-solve’, ‘secondary sources’, ‘identifying and classifying’ and ‘pattern-seeking’. Provide children with an example of each:

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

1. Fair test – Which paper towel soaks up the most water?
2. Simple test – How well do objects float?
3. Investigation over time – What happens to the daisy over the next three weeks?
4. Problem-solve – How can a paper plane stay in the air for 10 seconds?
5. Secondary sources – How can we find out which animals on Earth are the heaviest?
6. Identifying and classifying – Which rocks have we got? How can we group them?
7. Pattern-seeking – Do people with the biggest feet have the biggest hands?

Now, read out a question to the children (e.g. Which surface can toy cars travel the furthest on?). They must then discuss which enquiry/enquiries would be best at helping us to find the answer. When asked to, a member from each group places a post-it on one of the enquiry labels at the front of the classroom. Discuss the children's choices.

Children can decide how they will find out the answer to the question. They will then perform their enquiry, recording their results as soon as they have measured them.


Recording

Ask children to draw the muscles that they think are used when performing the jump.

Children will need to record their results in a table.

Model to the children how to use a scatter graph. Help the children to construct a scatter graph that has appropriate intervals. The children can then plot the length of the child's leg against how far they jumped.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

 Scientific questioning	T
I can begin to shape questions using different question stems.	
I can, with help suggest how to find the answer to simple questions given by my teacher.	
I can, with help, come up with own ideas about what to investigate.	
I can, on my own, put forward sensible ideas about what to investigate.	
I can use scientific language, come up with questions we could investigate.	
I can ask questions thinking about the most appropriate ways to answer these questions	

Quiz/assessment

Science End of Term Quiz LKS2 - Term 4

1. Nadem makes a poster to show how to stay healthy. Only some of the ideas on her poster are good. Tick TWO boxes to show the best ideas on the poster below.


To stay healthy you should:

eat lots of fried food.

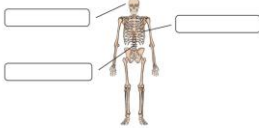
eat different kinds of food.

smoke every day.


exercise often.

 **healthy**

2. Name the parts of the skeleton.



3. Why do living things need food? (circle all that apply)



End points:

- To know what animals and humans need to survive (MRS GREN).
- To know how animals can be grouped depending on their characteristics.
- To know the names of some bones in a human body and describe how they protect parts of the body.
- To compare the skeletons of different animals and know why these are different.
- To know how muscles help movement in the body.
- To know different food groups and how they affect our bodies.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 4
Science

Future learning links:

Year 4 – Children will recap grouping animals in different ways based on their features, nutrition and skeleton. They will also create classification keys based on their study.

Year 5 – Children will explore how humans change over time.

Year 6 – Children will learn about the impact exercise, diet, drugs and lifestyle have on the human body as well as learning about how water and nutrients are transported around the body.

KS3 – Children will study the skeleton and muscles in more depth including biomechanics where they will investigate the interaction between the muscles and bones. They will also study nutrition in more depth looking at the requirements for a healthy diet, calculations for energy requirements and the consequences of imbalances.