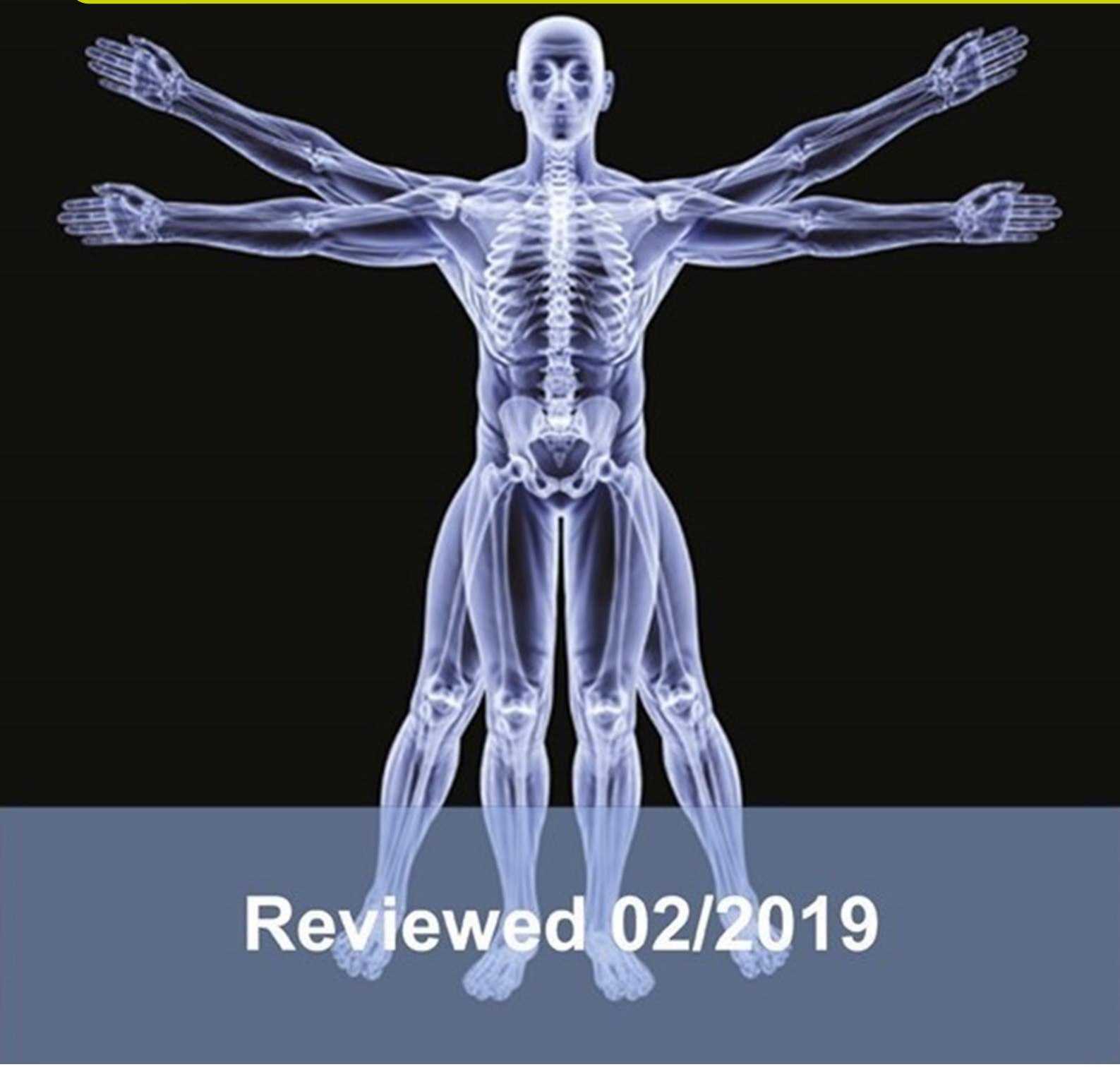
Being Human

Humans and other animals



Fieldwork Education
Improving Learning

fieldworkeducation.com/curriculums/primary-years/ipc

Contents

Basic Information

This section details the time allocation for this unit of work, links to other subjects and Assessment for Learning opportunities.

Timings

This unit of work is intended to last about 3 ¼ weeks.

The following suggested timings are approximate guides and are dependent on each school's individual context.

	No of Hours	No of Weeks
Entry Point, Knowledge Harvest, Explain the Theme	4	½
Science	10	1 ¼
Technology	4	½
International	4	½
Exit Point	4	½

Links to other IPC subjects

ICT & Computing learning goals are included in the subject learning.

Mathematics links

Suggestions of how to include links to Mathematics are provided where appropriate at the end tasks.

Learning Goals

International Learning Goals

Children will:

3.03 Know about ways in which the lives of people in the countries they have studied affect each other

3.04 Know about similarities and differences between the lives of people in different countries

3.05 Be able to explain how the lives of people in one country or group are affected by the activities of other countries or groups

3.06 Be able to identify ways in which people work together for mutual benefit

Science Learning Goals

Children will:

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.02a Be able to conduct scientific investigations posing scientific questions

3.02b Be able to choose an appropriate way to investigate a scientific issue

3.02c Be able to make systematic and accurate measurements from their observations

3.02d Be able to explain and justify their predictions, investigations, findings and conclusions

3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

3.03 Be able to gather evidence from a variety of sources

3.04 Be able to discriminate between evidence and opinion

3.05 Understand the importance of using evidence to test scientific ideas

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.17 Know about similarities and differences between humans and other creatures

3.18 Know about the effect of exercise on the human pulse rate

3.19 Know about the effect of drug misuse on the human body

3.20 Know about the ways in which humans and other animals reproduce

3.21 Know that some characteristics of humans and other animals are inherited from their parents

3.22 Know that some characteristics of humans are influenced by their environment

3.23 Understand the importance of an appropriate diet for the health of humans and other animals

Technology Learning Goals

Children will:

3.05 Be able to gather and use information to suggest solutions to problems

3.06 Be able to devise and use step-by-step plans

3.07 Be able to consider the needs of users when designing and making

3.09 Be able to work with a variety of tools and materials with some accuracy

ICT & Computing Opportunities

The table below shows you where you can cover the following ICT & Computing Learning Goals.

Task	Goals
International Task	3.7, 3.8, 3.13
Science Extension Task	3.6, 3.7, 3.8, 3.13
Science Task 1	3.6, 3.7
Science Task 2	3.7, 3.8
Science Task 3	3.6, 3.7, 3.8, 3.11
Science Task 4	3.6, 3.7, 3.8, 3.11
Science Task 6	3.6, 3.7, 3.8
Technology Task	3.7

Assessment for Learning

Are your children busy, or are they busy learning? This is the question that we need to be able to answer throughout each IPC unit – what improvements are being made to children's learning as a result of studying this theme?

There are ***three areas of learning*** to reflect on, and ***three types of learning*** to assess.

The Three Areas of Learning: Academic, Personal and International

The three *areas* include **academic, personal and international learning**. To reflect on these, you will need access to the IPC Learning Goals for each subject (including International) and the IPC Personal Goals – a list of these can be found in Appendix A of the IPC Implementation File. You can also find a full list of IPC Learning Goals in the Assess section of the Members' Lounge.

The Three Types of Learning: Knowledge, Skills and Understanding

The three *types* of learning include **knowledge, skills and understanding.** We believe that differentiating between knowledge, skills and understanding is crucial to the development of children's learning. We also believe that knowledge, skills and understanding have their own distinct characteristics that impact on how each is planned for, learned, taught, assessed and reported on. The implications of these differences are therefore far-reaching and deserve proper consideration.

Knowledge refers to factual information. Knowledge is relatively straightforward to teach and assess (through quizzes, tests, multiple choice, etc.), even if it is not always that easy to recall. You can ask your children to research the knowledge they have to learn but you could also tell them the knowledge they need to know. Knowledge is continually changing and expanding – this is a challenge for schools that have to choose what knowledge children should know and learn in a restricted period of time.

The IPC does not provide examples of knowledge assessment (tests or exams) as the knowledge content of the curriculum can be adapted to any national curricula requirements.

Skills refer to things children are able to do. Skills have to be learned practically and need time to be practiced. The good news about skills is the more your practice, the better you get at them! Skills are also transferable and tend to be more stable than knowledge – this is true for almost all school subjects.

The IPC supports skills tracking and assessment through the IPC Assessment for Learning Programme. This programme includes Teachers' Rubrics, Children's Rubrics and Learning Advice.

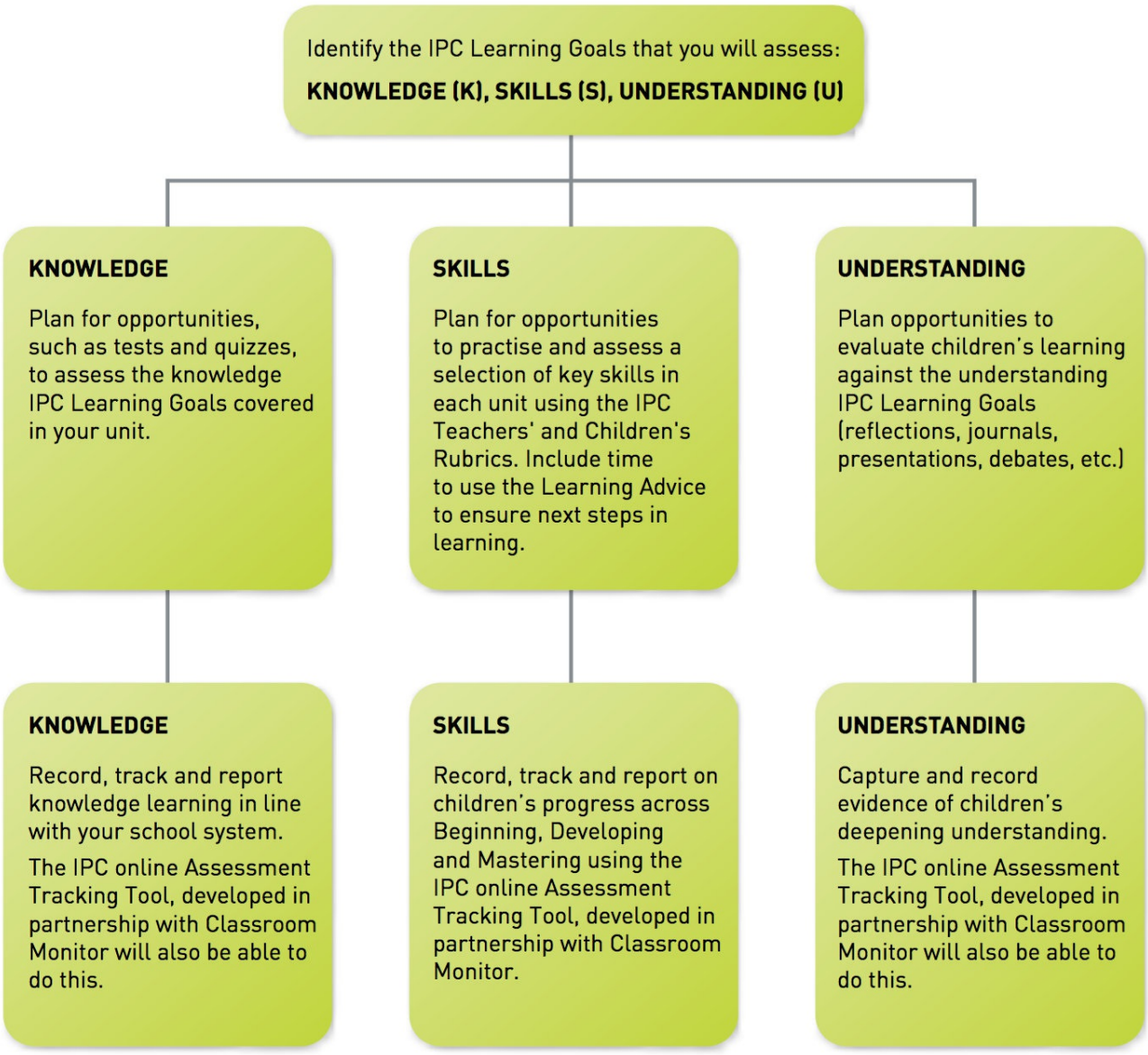
Understanding refers to the development or 'grasping' of conceptual ideas, the 'lightbulb' moment that we all strive for. Understanding is always developing.

The IPC units can't assess understanding for you, but they do allow you to provide a whole range of different experiences through which children's understandings can deepen.

*(**Please note:** as well as the IPC Assessment for Learning Programme, we also offer an online Assessment Tracking Tool, developed in partnership with Classroom Monitor. Please email members@fieldworkeducation.com for more information on how to sign up to this tool.)*

Planning for Assessment

Once you have planned for the different IPC Learning Goals for each subject it is important to plan for assessment opportunities within each unit of work. Assessment needs to be balanced but rigorous to ensure that the children have learned what we planned for them to learn. The diagram below illustrates the processes you may want to use to ensure this happens.



Helping Children Reflect on Their Own Learning

In addition to teacher assessment, it is also vital to include children in reflecting on their learning and setting next steps for improvement. Ask the children to carry out self-assessments throughout each unit (using the Children's Rubrics to assess skills, and other methods chosen by the school for knowledge and understanding).

They could use the following headings to list/make notes on their newly acquired knowledge, skills and

understanding – 'new things I now **know',** 'new things that I can **do**' and 'new things I am beginning to **understand**'.

Ask the children to evaluate different aspects of their learning – what did they do well, what could improve next time and how, what did they find the most/least interesting? How did they prefer to learn – as an individual/in pairs/small groups/large groups/as a whole class? What was their preferred method of researching and recording - writing/talking/making, etc.? This evaluation aspect will also support the development of the IPC Personal Goals.

Further Information

For more information on assessment, and knowledge, skills and understanding, please refer to:

- The IPC Implementation File
- The Assessment for Learning Implementation File
- The IPC Self-Review Process

Or contact the Membership Support team at members@fieldworkeducation.com

The Entry Point

The theme for this unit is the human body – there can be no other more fascinating but more complex topic for primary-age children.

Let's start with a fun introduction into how our bodies work with a Human Body MOT.

Just like a car needs regular servicing by a mechanic, our body needs regular check-ups too. Ask the children: which people in our community help us to look after our body? The children might say: doctors, nurses, dentists, opticians, fitness instructors, etc. Some of these professionals may also be parents who are willing to talk to the children about how we can keep our body in good working order. You could invite them in to school for the entry point where they could give the children a Body MOT consisting of several fun games or challenges, for example:

- Playing games that will test the children's knowledge of external and internal body parts, e.g. singing 'The knee bone's connected to the thigh bone' or playing 'Heads, shoulders, knees and toes'
- Checking their pulse and heart rate, and allowing them to check each other's – perhaps listening to their own heart through a stethoscope
- Testing their body's senses, e.g. with optical illusions and identify-the-sound games (Milepost 1)
- Choosing healthy foods from a selection, e.g. put a variety of foods in a shopping basket and ask the children to find the healthier options
- Trying different ways to exercise – this activity could be led by a fitness instructor
- Demonstrating good oral and body hygiene, e.g. tooth brushing and hand-washing techniques
- Watching videos about the harmful effects of tobacco and alcohol (Milepost 2 and 3)
- Demonstrating First Aid techniques and what to do in an emergency*

etc.

You should keep in mind what your learning goals are and devise activities that will help you to introduce these topics in an exciting way. You could organise this as a whole-school entry point with the various activities set up in different classrooms. The children could visit each professional in turn to complete their 'Body checklist' and, when they have done all of the activities, they could be awarded a Human Body MOT Certificate. The children could create the certificate themselves using appropriate design software.

Note: we recommend that teachers read through all of the tasks in this unit in advance to see if there is any preparation work that can be done or information they can gather whilst they have the professionals in school, e.g. the children could have questions they would like to ask them.

The ideas, concepts and knowledge the children will gain from this entry point activity, should form a solid foundation for the knowledge harvest and all further learning in this unit.

* You could try to arrange a First Aid session for the children with a healthcare professional or specialist organisation that offers First Aid courses in your area. First Aid is a life skill that even young children can learn. It is easier than most people think and is not just for adults, children can and do save lives.

See link below:

- **redcross.org.uk/What-we-do/Teaching-resources/Teachingpackages/Microsite/Life-Live-it-first-aid-education-for-children/Whatis-first-aid/How-to-videos** – the Red Cross website has six 'How to' videos that show the simple steps children can take to help in different First Aid situations.

Knowledge Harvest

This unit is designed to be a whole-school study of the human body. The research carried out by the different mileposts could be shared with other age groups across the school in the form of science presentations and reports. There are links to the Milepost 3 units, *Fit for Life*! and *Drugs Education*.

Note: you should allow approximately three weeks to cover the tasks but there is potential to turn this topic into a much bigger project because the human body is complex and fascinating and there is so much you can explore, depending on the interests and abilities of the children in your class. For this reason, you will find this unit to be more knowledge- based than other science topics, which is mainly due to the subject matter, but it serves also to give teachers the knowledge and support they need in order to deliver the complex themes we cover.

Recall the entry point Body MOT and ask the children: what can we do to keep our body safe and healthy? Discuss with the children how they might:

- Act responsibly – taking care and looking after each other
- Eat a healthy diet
- Exercise regularly
- Avoid pressures to drink alcohol or smoke

Now ask the children:

- What's going on inside your body right now? (Heart beating, blood pulsing, nerves sensing, stomach rumbling)
- If we could peel away the skin what would we see? (Internal organs, blood vessels, nerves, etc)
- Do we all look the same under the skin? (Yes, but there may be differences depending on our health and age)

What changes happen to our body as we age? Consider not only external changes (such as wrinkling skin, greying/loss of hair) but internal changes too (declining bone mass, weakening of the heart muscle). The children will discover more about ageing in tasks throughout the unit. Recall any prior learning about the human body (e.g. from the Milepost 2 units, H*ow Humans Work, Shaping up!* and *The Generation Game*). Can the children name any major organs? Make a list of these on the board and then map them out on a child-size outline of the human body. Don't worry at this stage about the positioning of the organs because the children will have an opportunity to check and correct this later on.

As well as our major organs (brain, heart, lungs, liver, stomach, intestines, etc) what else do we have in our body? The children may say: blood, nerves, cells, and so on. Again, ask the children to map these out on the outline drawing. If they draw onto transparent paper or acetate they can build up a picture of the human body in overlapping layers. Later, they can then correct or replace layers as their learning progresses through the unit. They should try to add as many organs and other body parts as they can at this stage so they will have something with which to compare their learning afterwards.

Now think about how we are the same or different from other animals. Into which biological group do

humans belong? (If you have completed the Milepost 2 science unit, *The Nature of Life* then you could ask the children to recall what they learned about the classification of living things.) Humans belong to the group called mammals. How are we the same and how are we different from other mammals? (For example, we give birth to live young and are warm-blooded, and we have a more complex language system.) Do other mammals have hearts, lungs and livers? Are we the only mammals that walk on two feet? Ask the children what they know and record this knowledge in mind maps or pictures so that you can refer back to it later.

Are there any other questions the children would like to explore about the human body? Make a note of these so that you can investigate them during the course of the unit.

The Big Idea

Your body is designed to help you to breathe, move, eat, respond, reproduce and live. But how do the different parts of your body function and how are humans different from other animals? Let's find out.

Explaining The Theme

In Science, we'll be finding out:

- How humans are different from other animals
- About the brain and the nervous system
- About the bones and muscles in the body
- How the human heart works
- How we breathe and what the lungs do
- What we inherit from our parents
- How our environment affects us
- How the body uses food and water
- About the latest medical research

In Technology, we'll be finding out:

- How to plan and prepare a healthy meal

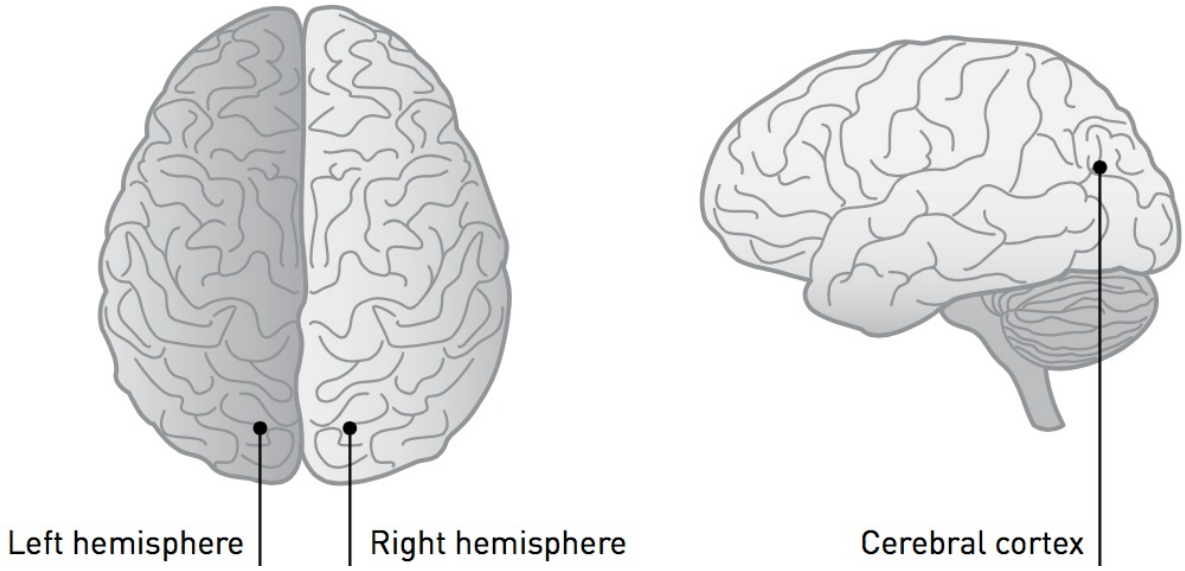
In International, we'll be finding out:

- About a major global health problem
- If we can improve the health of the world's children

The Big Picture

The human brain

The human brain controls all of the body's functions. As well as controlling everything the body does, the brain also provides mental and cognitive ability. It has a complex anatomy with two hemispheres, the right and the left, linked by nerves. Qualities we usually associate with being human stem from the cerebral cortex – the brain's outer layer or 'grey matter', comprising deep curving folds within which are billions of neurons. Signals from the cortex control our thoughts, understanding, language and behaviour. The cortex also contains the motor and sensory areas to process information from the muscles. Our brain is energy hungry – it consumes about 20% of our energy to control everything that happens in our body, though our brain is only 2.5% of our body weight.



Nervous system

The brain and the spinal cord form the central nervous system – the body's communication highway. This system is made up of neurons and nerve cells. It processes and transmits data, makes decisions and issues orders.

Information travels from the brain via neurons through the spinal cord and then out to the muscles. The human brain alone may contain up to a trillion neurons. Neurons are like a network of tunnels that pass electrical signals through the body at lightning speed. There are two main types of neurons: sensory and motor neurons. Sensory neurons input data from the nervous system associated with the body's senses and with heat and pain; while motor neurons output data from the brain associated with the body's movement.

Skeletal system

The 206 bones in our skeletal system form a supporting structure; similar to the walls in a building, they keep us upright, allow movement and protect our internal organs and soft tissues. The bones are different sizes and shapes according to their function. The thigh (femur) bones have to support the body's weight so these are large compared to the smaller bones found in the hands (phalanges) that are designed to

make precise movements or the tiny bones (anvil, hammer and stirrup) found in the middle ear that amplify sound. The bones in the skull are flat and curved to protect the brain like a helmet. Although thin, the curved shape of these bones makes them strong.

To enable the skeleton to move, there must be connections between the bones. These connections are made at the joints by ligaments, cartilage and connective tissue. Of all the joints, the shoulder has the greatest range of movement while the knee is the most complicated. There are different kinds of connections between bones: ball and socket joints such as the hips and shoulders, and hinge joints such as the elbow and knee. Ball and socket joints give more freedom of movement, whereas hinge joints support loads.

Skeletal muscles, attached to the bones via the tendons, help the body to move. They all have Latin descriptive names: 'maximus' meaning largest. We can control skeletal muscles but we cannot control cardiac muscle (the heart) or the smooth muscle of the internal organs. Skeletal muscles always exert a 'pull' force – they work in pairs or groups and act on the bones like pulleys. When signalled to move from the nervous system, they will move our legs to walk and run, or lift our mouth to smile.

Circulatory system

Blood

Human blood contains 45% cells and, therefore, is not a true liquid. Blood is viscous – a little bit thick. There is a liquid component which we call plasma.

Blood is sometimes called the 'river of life'. It carries oxygen and nutrients from the food we consume to every single one of the trillions of cells in our body. The blood then carries carbon dioxide and waste away from the cells and drops it off at the lungs. Then it picks up fresh oxygen from the lungs and delivers it back to the cells.

Cells

There are over 200 different types of cells in the human body, most are specialised for a particular function, e.g. fighting disease or storing nutrients.

Heart

The heart is like a double pump, the size of our fist. It has two halves, right and left and two valves. It sends blood to the lungs and other tissues – the blood travels under pressure in a network of branching vessels then it is transported back to the heart where the journey starts again. The heart has its own built-in pacemaker – over the course of a day the heart will beat 100,000 times. People who have irregular heart beats sometimes have an electronic pacemaker fitted. Each heartbeat is a sequence of contraction then relaxation. The average child's pulse rate (at rest – not running or playing) is around 90 beats per minute, ranging from 70-110 beats.

It takes one red blood cell less than one minute to do a circuit around the body. How hard the heart works depends on what our muscles are doing, e.g. muscles need oxygen and more exertion needs more oxygen, so a faster blood flow needs a faster heart rate, and so on. When we exercise our heart needs to work harder.

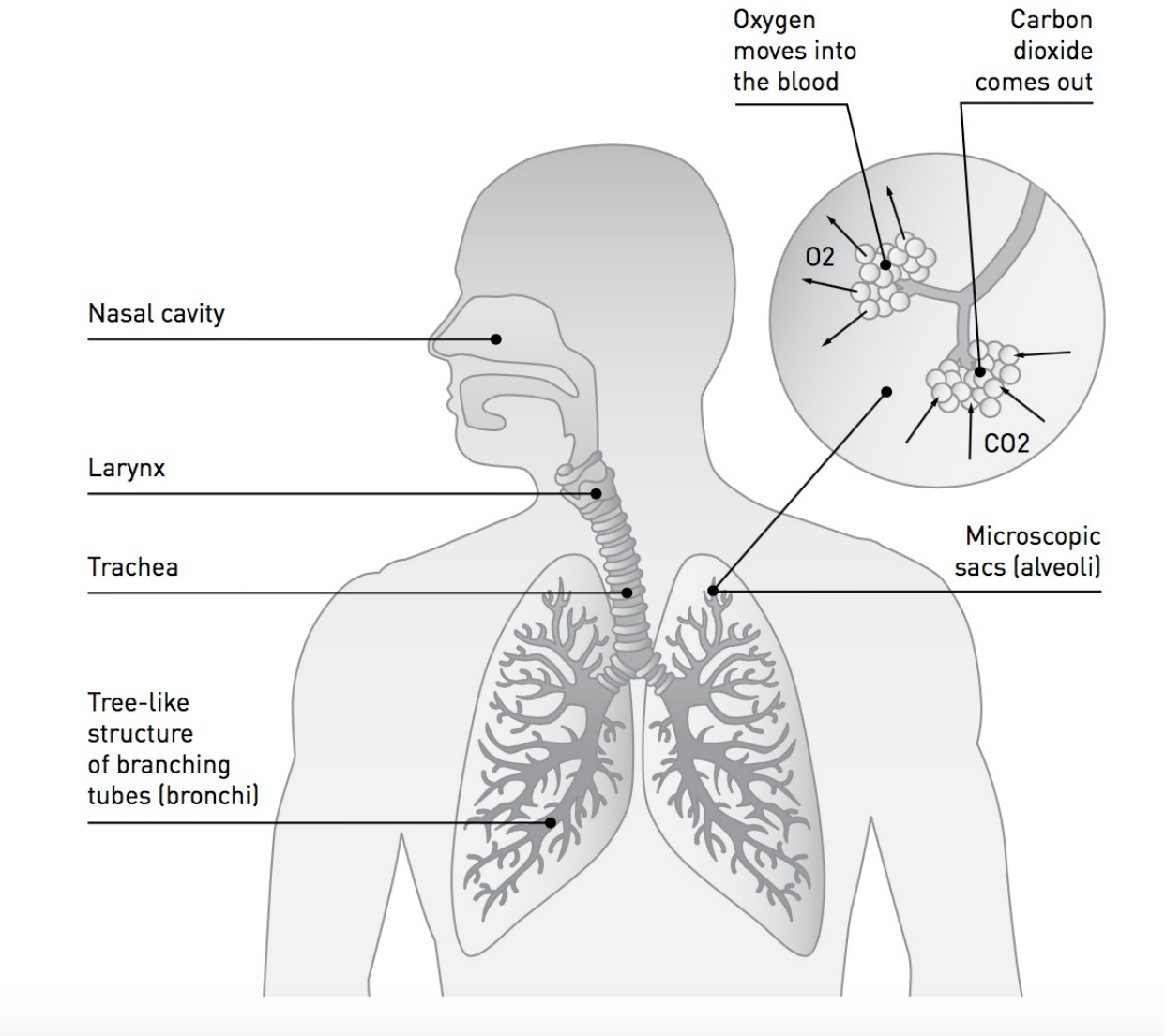
Nutrients and oxygen are carried by the blood through a network of branching tubes called blood vessels, arteries and veins – this is the circulatory system. It is powered by the heart. Blood needs to travel under

pressure to go from the heart to the head, overcoming gravity.

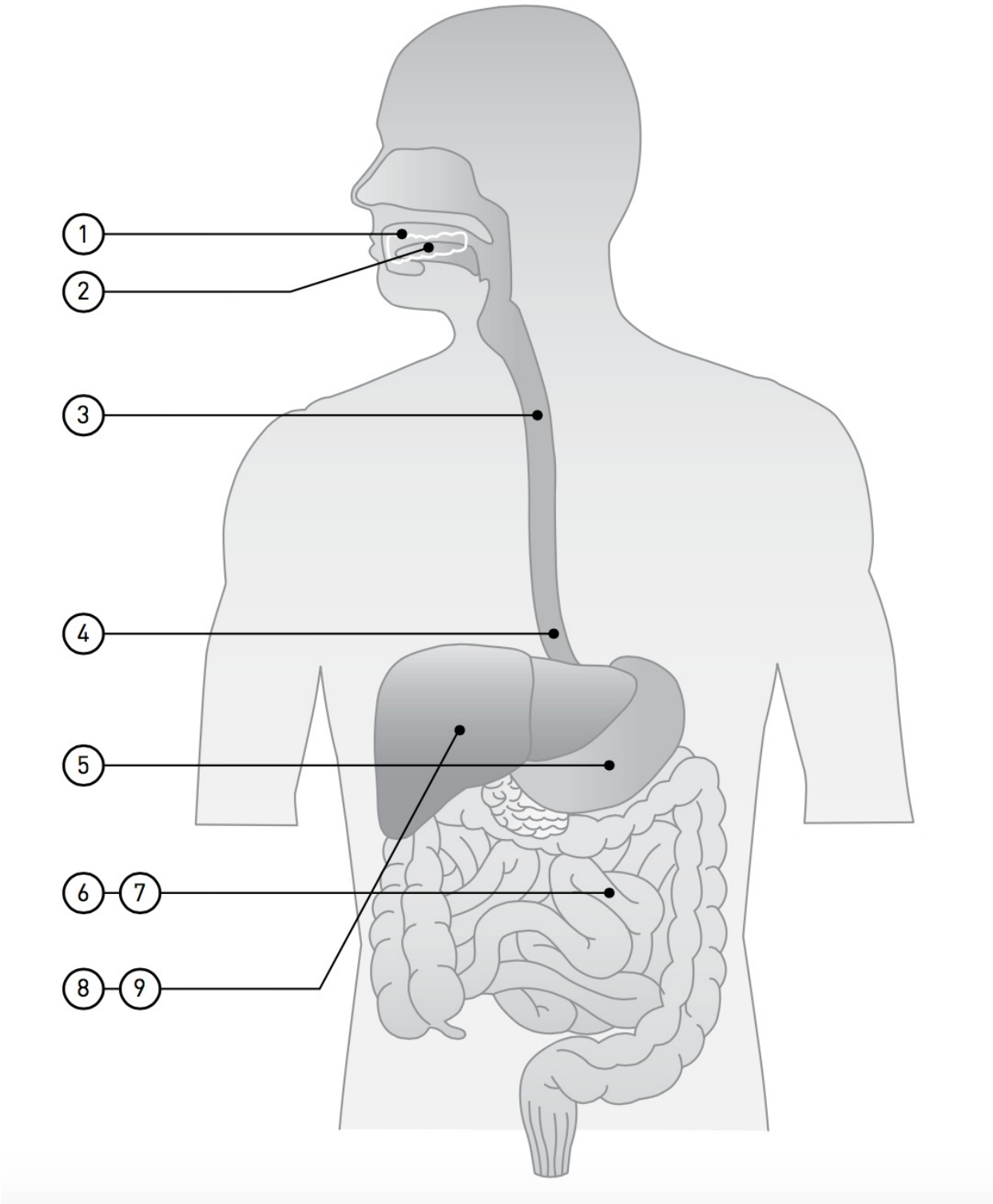
Respiratory system

The respiratory system functions to fill our lungs with air, move oxygen into our bloodstream and expel carbon dioxide. This exchange of gases is critical to life. Meanwhile, the human respiratory system is faced with environmental attack from dust particles, pesticides, smoke, toxic substances, and emissions from factories and cars. In response, our cells produce mucus which can then be swallowed or expelled through the mouth. Toxins that cannot be removed in this way enter the lungs and cause disease.

The upper part of the system (nasal cavity, larynx, trachea) are a route to the lungs. Our lungs are composed of a spongy tissue, inside of which is a tree-like structure of branching tubes (bronchi) with each branch ending in a tiny air sac. In these microscopic sacs (alveoli), oxygen moves into the blood and carbon dioxide comes out.



Digestive system



The digestive system breaks food down into nutrients that can be used by the body's cells for growth and repair.

1. The teeth tear, crush and chew the food we eat.
2. The tongue moves the food around in the mouth and saliva washes the food away.

3. The food falls into the oesophagus, which is like a long tube.
4. The walls of the oesophagus squeeze the food down towards the stomach.
5. The stomach, shaped like a bag, squeezes and churns the food for a few hours.
6. The stomach secretes acid onto the food to turn it into a juice so that it can pass into the small intestines.
7. The food is absorbed into the blood as sugars, fats, vitamins and minerals.
8. The blood takes the food to the liver for further processing.
9. Finally, the blood carries the food, vitamins and minerals to the body tissues.

Senses

Our senses help us to understand and remember the world around us. The human body has general senses (e.g. touch, pain, temperature) and special senses (e.g. sight, smell, taste, hearing and balance). Each sense organ has a different structure, designed to perform a specialised function and to link to the nervous system and the brain.

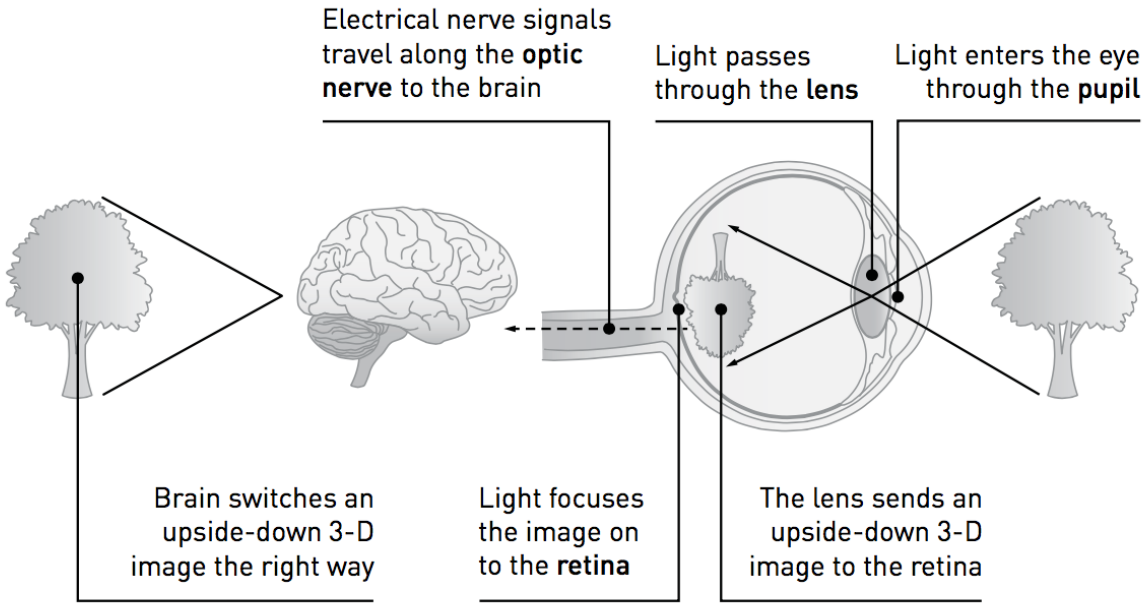
Sight

Sight is the most developed of the human senses.

Inside the human eye

The eye is a complex and sensitive body part. Light enters the eye through a hole called the pupil – this looks like a black dot to us. The light then passes through the lens (this is shaped like a small pea) which then focuses the image on to the retina at the back of the eye. The retina converts the light into electrical nerve signals that travel along the optic nerve to the brain.

The lens sends an upside-down 3-D image to the retina but the brain switches it the right way.

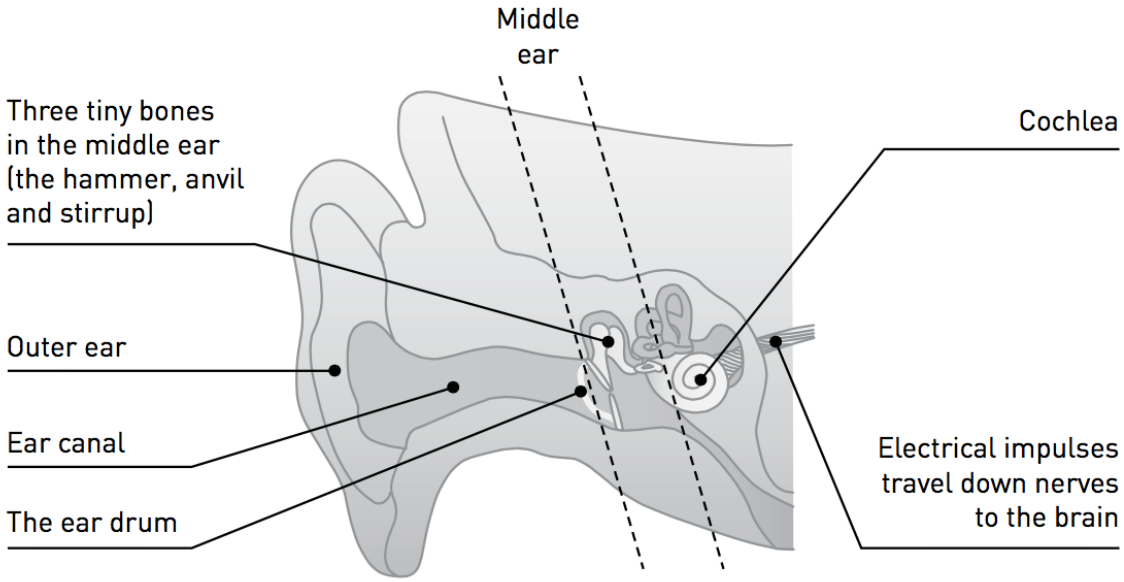


Hearing

Ears have evolved in many shapes and sizes in animals. External ears act like acoustic receivers, directing the sound to the inner ear.

Inside the human ear

Sound travels from the outer ear, down the ear canal to the ear drum. The ear drum vibrates and three tiny bones in the middle ear (the hammer, anvil and stirrup) amplify the sound and send it to the inner ear where it passes through a fluid to the cochlea. Here it is transformed into electrical impulses that travel down nerves to the brain.



Hearing evolved to aid communication between animals – singing, howling, hooting, neighing, barking, quacking, grunting, etc. Some animals use special alarm sounds to alert others of danger.

Rabbits, deer and other prey species have excellent hearing that acts as an early warning system. Some animals such as bats, owls, whales, dolphins have hearing that is well in advance of human hearing. Echolocation is like animal sonar. It works by reflecting back sound (echoes) from the environment and helps animals to detect obstacles or prey in the dark where vision is impossible. This system allows bats and dolphins to detect much higher frequencies than humans.

Taste

It used to be thought that different areas of the tongue detected different flavours – this is now thought to be inaccurate because we now know there are taste receptors not only on the tongue but on the sides and on the roof of the mouth as well. At the base of each taste receptor there is a nerve that sends sensations to the brain. Our taste receptors are able to detect salty, sweet, sour and bitter flavours. Some scientists also recognise a fifth flavour called 'umami' (savoury).

Taste and smell are interconnected – their pathways converge in the brain. When we taste our food we are smelling it at the same time.

Where are taste receptors in invertebrates? On the heads of worms, on legs of insects, or on antennae.

Smell

The inside of the nose has membranes that have smell receptors connected to a nerve. The smells we recognise are vapours of various substances. The smell receptors interact with the molecules of these vapours to transmit sensations to the brain. When we put food into our mouth, vapours from the food pass through our nose so that the flavour we experience is the result of smell and taste together. That's why our sense of taste can be temporarily lost when we have a blocked nose.

Why don't we all like the same smells and tastes? Animals, including humans, experience smell and taste differently so that the food that repels one animal may attract another. This means we are not all competing for the same foods.

WHO Recommended levels of physical activity

The World Health Organisation (WHO) defines fitness as "the ability to perform muscular work satisfactorily".

The recommended level of physical activity for children aged 5-17 years is 60 minutes per day of "accumulated activity of moderate to vigorous intensity, including play, games, sports, chores, recreation and physical education in the context of family, school and community". To improve cardio respiratory, vascular, metabolic, bone health and muscular fitness, most of the activity should be aerobic and "vigorous intensity activities should be incorporated including those that strengthen muscle and bone at least three times a week" - World Health Organisation

Refer to the following websites for further information:

- **who.int/dietphysicalactivity/physical-activity-recommendations-5-17years.pdf** – the World Health Organisation website has this PDF of the recommendations for levels of physical activity for 5-17 year olds.

- **who.int/dietphysicalactivity/pa/en/index.html** – the World Health Organisation website has a Global Strategy on Diet, Physical Activity and Health.

WHO Global Strategy

The World Health Assembly adopted the WHO Global Strategy on Diet, Physical Activity and Health in May 2004, recognising the opportunity for reducing deaths and diseases worldwide by improving diets and increasing levels of physical activity.

Factors that increase the risks of non-communicable disease include "elevated consumption of energy-dense, nutrient poor foods that are high in fat, sugar and salt; reduced levels of physical activity at home, at school, at work and for recreation and transport; and use of tobacco … Of particular concern are unhealthy diets, inadequate physical activity and energy imbalances in children and adolescents." - WHO Global Strategy

Specific recommendations for diet include the need to:

- Limit the energy intake from fats and move fat consumption away from saturated fats to unsaturated fats and eliminate trans fats

- Increase consumption of fruits and vegetables, whole grains and nuts

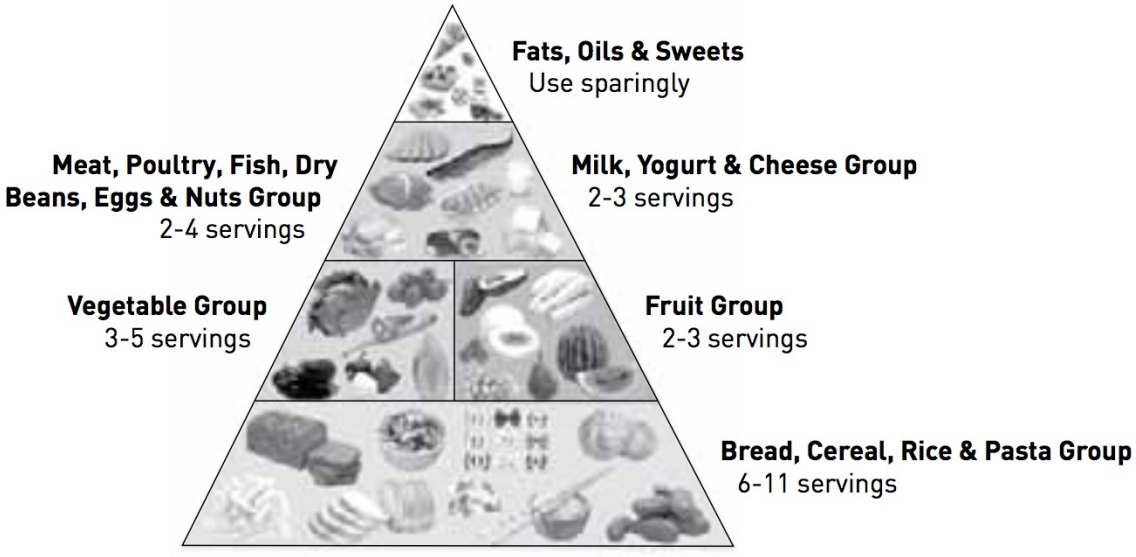
- Limit the intake of sugars
- Limit sodium from all sources

A balanced diet

A healthy diet includes a variety of foods that contain proteins, fats, carbohydrates, vitamins, minerals and fibre to provide energy for the body and building materials for growth and repair.

- **Proteins:** found in milk, meat, fish, cheese, eggs, pulses and nuts; we need proteins to grow
- **Carbohydrates:** our main energy source; found in foods such as potatoes, pasta, rice, noodles, bread and cereals
- **Fats** (e.g. meat, oil, butter, cheese) **and sugars** (e.g. fruit, refined sugar) give us energy
- **Vitamins and minerals:** found in fruit and vegetables; we need to eat at least five portions a day to aid our nervous system
- **Milk and dairy foods:** (e.g. butter, cheese, eggs) provide calcium to strengthen our bones
- **Water:** we need about 8 glasses a day to keep us hydrated and our bodies working properly

All the above are needed for health, but our bodies can adjust to different levels of each nutrient. The proportion of nutrients in the diet varies widely across the world.



Human Body Vocabulary

Bladder – receives and stores urine from the kidneys

Bone – a hardened living tissue that forms the skeleton

Bone marrow – tissue inside the bones that produces blood cells

Brain – the communication centre of the body and the controlling organ in the nervous system

Cartilage – flexible connective tissue that joins soft tissues, e.g. found in the nose, ears, trachea

Heart – acts like a double pump, it sends blood around the body

Ligament – tissue that stabilises the bones at the joints

Lung – respiratory organ through which oxygen enters the body and carbon dioxide is expelled

Muscle – attached to the skeleton by tendons, muscles help move the body

Nerve – signals travel to and from the brain along nerves (also called neurons)

Skin – the largest organ in the body, it helps to regulate the body's temperature

Stomach – helps process food by churning and then turning it into a juice

Scientific Investigation

Scientific enquiry

Scientific enquiry is the process of questioning, investigating, interpreting results, drawing conclusions, communicating findings and reflecting on what we have discovered. It is the way we discover how the world works. Scientific enquiry is 'doing' science.

Children should be actively involved in decision-making. In a science context this means having opportunities to decide aspects of what they investigate and how to investigate.

Ways to investigate in Science

There are many different types of scientific enquiry. Children need opportunities to explore and familiarise themselves with this full range. Listed below are some common approaches to scientific enquiry. Although not all of the methods are investigated during this unit, we have listed them here so that you can get a big picture of the range of possible ways to 'do' enquiry science. The list is not exhaustive.

1. Modelling

A model can be used to help children understand how a process works, or to explain ideas or a concept. Some manufactured models can be useful, for example, skeletons and human body anatomy models. Children can use the model to observe the different parts of the body. In this unit, we will also be looking at examples of animated videos to study different body parts.

2. Pattern seeking

This method involves observing and recording natural events, or carrying out experiments where the variables can't easily be controlled. In pattern seeking, it is still important to note and record variables. The investigator needs to try to identify patterns that result from these variables. This method is well suited to the study of humans and other animals. For example, the teacher could ask the children: have scientists found a pattern between smoking and ill health or between lack of exercise and ill health?

3. Research

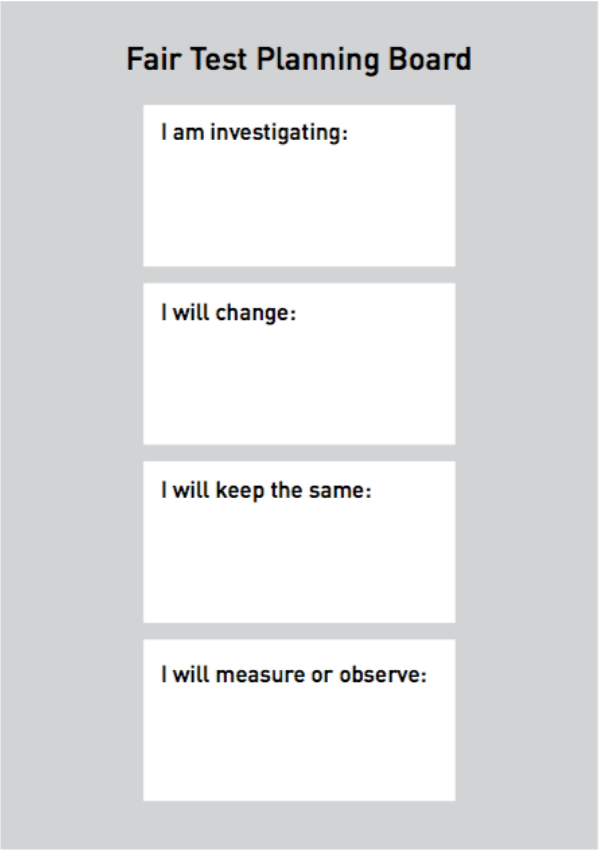
Researching in the scientific sense, involves gathering and analysing other people's opinions or scientific findings in order to answer a question or to provide background information to help explain observed events. In the primary school, this might mean searching in non-fiction books, using the internet and utilising experts in the community, for example, you could ask a local doctor, dentist, first-aider or fitness instructor to come in to school to talk to the children about health and the human body.

4. Challenges

These sorts of investigations involve some kind of design task and/or a problem to solve. Challenges are most often suited to the study of materials and physical processes. In such situations children apply their scientific knowledge, skills and understanding to make (or design) something. Challenges can also be used as effective assessment tasks. In this unit, the children will be faced with the challenge of designing and making a healthy meal.

5. Fair testing

Fair testing finds relationships between factors (variables). A single variable is changed – this is the variable you are testing. All other variables are kept the same, which is why it is said to be fair. Any differences are said to be the result of the changed variable. So, if you wanted to test how much your heart rate increases with exercise, then the variable you should change is the amount of exercise you do. However, the way you carry out the test must be kept the same. Fair testing is particularly well suited to investigations that record measurements. The fair test planning board (see below) will be useful for this task.



6. Identifying and classifying

Identifying and classifying involves sorting objects or events into groups or categories, for example, sorting foods into different groups: proteins, carbohydrates, dairy, fruit and vegetables. We will be teaching identification and classification in this unit by exploring how we can identify and classify foods that are good for us.

7. Observations

We can learn a great deal about the world around us from direct observation. In this unit, the children will be observing what it is that makes us human, and how they are the same and/or different to other animals.

Science Learning Goals

Children will:

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

- **3.02a Be able to conduct scientific investigations posing scientific questions**
- **3.02b Be able to choose an appropriate way to investigate a scientific issue**
- **3.02c Be able to make systematic and accurate measurements from their observations**
- **3.02d Be able to explain and justify their predictions, investigations, findings and conclusions**
- **3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions**

3.03 Be able to gather evidence from a variety of sources

3.04 Be able to discriminate between evidence and opinion

3.05 Understand the importance of using evidence to test scientific ideas

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.17 Know about similarities and differences between humans and other creatures

3.18 Know about the effect of exercise on the human pulse rate

3.19 Know about the effect of drug misuse on the human body

3.20 Know about the ways in which humans and other animals reproduce

3.21 Know that some characteristics of humans and other animals are inherited from their parents

3.22 Know that some characteristics of humans are influenced by their environment

3.23 Understand the importance of an appropriate diet for the health of humans and other animals

Science Task 1

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.02a Be able to conduct scientific investigations posing scientific questions

3.02b Be able to choose an appropriate way to investigate a scientific issue

3.02c Be able to make systematic and accurate measurements from their observations

3.02d Be able to explain and justify their predictions, investigations, findings and conclusions

3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

3.03 Be able to gather evidence from a variety of sources

3.05 Understand the importance of using evidence to test scientific ideas

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.17 Know about similarities and differences between humans and other creatures

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Identifying and Classifying
- Observations

Research activity

Refer back to the knowledge harvest when you discussed the differences between humans and other mammals. Ask the children: what can we do that other animals can't do? Invite suggestions from the class. For example, they might say we can talk, ride a bike, play a musical instrument, play chess, read books, fly to the moon, and so on. Collect pictures of people doing a variety of different activities. Are animals capable of these same activities?

Invite the children to put forward their own ideas and hypotheses. They could then sort these pictures into two groups: those that are purely 'human activities' and those activities that animals can do also. We will come back to this later to check if their hypotheses were right and to emphasise the importance of using evidence to test scientific ideas.

If any of the children have pets, you could encourage the children to talk about what their pets can do. Have any of the children ever taught a pet dog or cat to perform a trick? How did they teach the trick? Did they use a reward? Invite the children to share their experiences. For example, dogs can be taught to sit, lie or give a paw on command.

Some animals can be taught to perform complex repeated actions, e.g. dressage ponies are taught to perform sequences of precise movements but can we teach an animal to remember facts or to write a story, e.g. if you told your pet that two plus two equals four, could they remember this fact? Refer back to your two groups above and add any new hypotheses or ideas.

Ask the children, can a pet communicate with its owner and other animals? For example, a dog can communicate with humans and other animals by growling, barking, crying, wagging its tail, etc. Does this mean that dogs have their own language? Is dog language as complicated as human language? Humans have developed a highly complex communication system using a language of spoken and written words. Does our complex human language set us apart from our closest animal relatives? Ask the children to share their views. Add any new ideas to the groupings above.

How can we account for the differences between humans and other animals? Is it something to do with the memory and/or the brain?

Do animals have memories like ours? We know that many mammals have autobiographical memories, i.e. they can remember things that happen to them but do they have factual memories, i.e. can they remember facts? Ask for the children's suggestions – they should make a note of these and then investigate to see if their hypotheses are correct. Human memory can be divided into short-term memory (when you remember something for a few minutes) and long-term memory (when you remember something for years). Can the children provide any examples of different types of memory? Remembering a string of ten digits for a few seconds is an example of short-term memory. (Try this with the children.) Remembering a multiplication table, a dance step or how to play a tune on a musical instrument are long-term memories. Where are these memories stored in our body? We know that memories are stored in many different parts in the brain. Some people develop memory loss as they age because of chemical changes in the brain. Scientists are working to try to find out how they can treat or cure this problem.

As a research task, ask the children to find out about the functions of the human brain. You could provide information books and/or internet sources.

The following website is a useful starting point for research:

- **http://whoami.sciencemuseum.org.uk/whoami/findoutmore** – the Science Museum website has information about how the brain works and how the body ages.

If the brain is an important organ in the human body then we need to find out how we can keep our brain healthy. As a home-learning task, ask the children for their ideas. They might

say:

- Drink water to provide hydration and oxygen for the brain's cells
- Eat a balanced diet to provide energy – our brains consume a lot of energy
- Sleep so that the brain can rest and recover
- Avoid drugs – link to the IPC unit *Drugs Education* and learning target 3.19 about the effects of drug misuse on the brain, i.e. the adverse affects on motor skills and coordination

Recording activity

The children could create a display (or an ICT presentation, if you prefer) called Being Human. The display could include pictures illustrating people doing exclusively human activities. For example, playing a complex tune on a musical instrument is a human activity but running is not confined to humans and therefore should not be included.

The children could draw a diagram of the brain (a 'brain map') and label the parts associated with different functions (see the big picture): speech, vision, sensory, motor skills, language and maths, etc.*

* No specific part of the brain manages memory. Many different parts of the brain are associated with processing memories.

The children could then add some examples of their own personal short-term and long-term memories – these could be in the form of cartoon pictures added to the brain map.

Include your brain map in the *Being Human* display or ICT presentation. This display/ presentation could incorporate the children's discoveries about what the human brain does and their ideas about how we can keep the brain healthy.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Thoughtfulness

Science Task 2

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.03 Be able to gather evidence from a variety of sources

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

This task uses the following scientific enquiry methods:

- Modelling
- Pattern seeking
- Research
- Challenges
- Identifying and Classifying
- Observations

Research activity

Pose the question: how is the brain connected to the rest of the human body? The children may say that the brain is connected to the body by the neck – but what is at the back of the neck? (The spinal cord – it runs down the length of the back and is protected by the spine.) The spinal cord is like an information super highway carrying data to and from the brain.

Show the children a diagram of the nervous system to show how the brain is connected to it. Can the children locate the spinal cord on the diagram? The brain is connected through neurons (nerve cells) to the spinal cord and from here to a network of nerves called the nervous system. These nerves look like a road map or an underground map of tunnels, leading to muscles in every part of the body including the heart, lungs, abdominal organs, arms, legs, fingers, toes, etc.

But what does a neuron look like? Show the children a picture of a neuron. (You can find images using a search engine on a computer.) It has arounded centre with pathways coming off – some pathways carry outgoing information while other pathways receive incoming information. Ask the children to find out about the two main types of neuron: sensory and

motor neurons. Use reference books and internet sources for research.

More of the big picture:

The brain controls all of the body's activities. Information travels from the brain via neurons through the spinal cord and then out to the muscles. The human brain alone may contain up to a trillion neurons. Neurons are like a network of tunnels that pass electrical signals through the body at lightning speed. There are two main types of neurons: sensory and motor neurons.

Sensory neurons input data from the nervous system associated with the body's senses and with heat and pain; while motor neurons output data from the brain associated with the body's movement.

Now play a 'neurons' game. Give the children a variety of statements (see list below) and ask them to sort out 'Who would say what…' the sensory neurons or the motor neurons?

- That's hot
- That's cold
- That feels nice
- That smells bad
- Ouch! That hurts
- That's loud
- This tastes good
- I feel dizzy
- Help! Let's run!
- Jump!
- Stop!
- Hide!
- Let's read
- Let's sing

Ask the children to sort the statements into two groups (sensory neurons or motor neurons) and give reasons for their groupings.

In the human body, sensory and motor neurons are connected to each other and they communicate together. You could role play how this works by asking the children to hold hands and talk to each other as sensory and motor neurons would do. What might they say to each other? The noisy classroom chatter serves as an example of what is going on inside your body when the neurons are all talking at the same time!

Neurons talk to each other and they also talk to the brain. But sometimes neurons act on their own without involving the brain. They do this to save time when they think the body is in immediate danger. This is called a reflexaction. Ask the children if they know what a

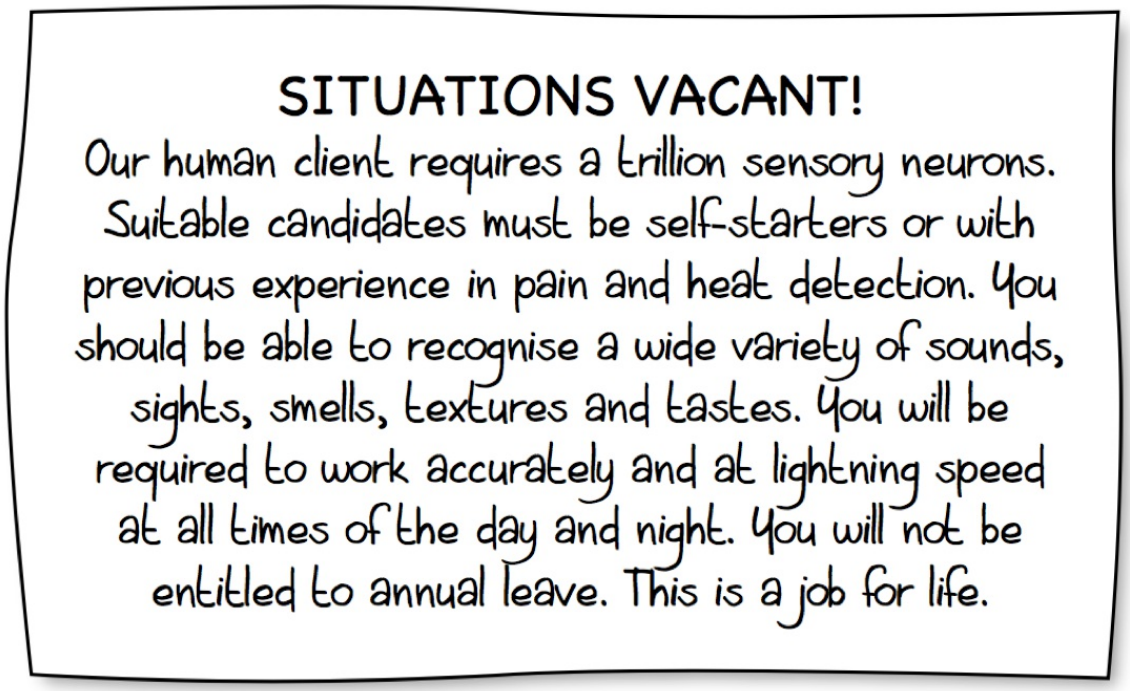
reflex action is. Can they think of any examples? They might say it's when we touch something hot then immediately pull our hand away. Reflex actions are automatic responses often associated with pain.

Invite the children to investigate 'knee-jerk' reflex actions on each other. One child, in the role of the patient, could sit on a chair with their legs crossed and the other child, the doctor, could try striking the knee with the side of their hand. Can the children concentrate and not react to this – if not, why not?

Recording activity

The children should add what they have discovered about the spinal cord and the nervous system to their knowledge harvest display. They could draw their own road map of the nervous system on an outline shape of the human body (at child size). If they do this on a layer of fine tracing paper or transparent acetate then they can build up layers of information as they progress through the tasks.

Ask the children to write about the job of sensory neurons and motor neurons, and include some examples of these in your human body display. With older children in the age group it might be fun to write this (or typeset it on the computer) in the form of a job advertisement, for example:



Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Thoughtfulness

Science Task 3

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.02a Be able to conduct scientific investigations posing scientific questions

3.02b Be able to choose an appropriate way to investigate a scientific issue

3.02c Be able to make systematic and accurate measurements from their observations

3.02d Be able to explain and justify their predictions, investigations, findings and conclusions

3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

3.03 Be able to gather evidence from a variety of sources

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.17 Know about similarities and differences between humans and other creatures

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Identifying and Classifying
- Observations

Research activity

In the last two tasks, the children have been researching the brain and the spinal cord. What protects these two soft parts of the body from damage? The children will probably know already that the skull protects the brain and the spine protects the spinal cord. But do they know the names of any other bones in the body? (Pelvis, femur, tibia, fibula, humerus, radius, ulna.) Refer back to your Body MOT and knowledge harvest display.

The children could research the names of the other main bones in the human body from

books and the internet.

The following website and videos are useful starting point:

- **childrensuniversity.manchester.ac.uk/interactives/science/bodyandmedicine/theskeleton/** – Children's University Manchester website has interactive activities about the human skeleton.
- **kidshealth.org/kid/closet/movies/SSmovie.html** – KidsHealth website has this video about how the body's bones work.

Note: if Milepost 2 children are working on this set of units at the same time they could tell your class what they have discovered about the skeleton.

Why are thigh bones big and finger bones small? Why are bones different shapes? Ask the children to hypothesise. If you have a skeleton model this might provide a stimulus for ideas. The children should discover from their research that bones have different functions within the body. What are these functions? (Support, protection and movement.) Ask the children to colour in the bones in the human skeleton, using three different colours – one colour if the bone is designed for support (e.g. the spine), a second colour if the bone is designed for protection (e.g. the skull) and a third colour if the bone is designed for movement (e.g. the legs). You may decide to use two overlapping colours where a bone serves two functions (e.g. the thigh is designed for both support and movement). Ask the children to explain the reasoning behind their choice of colours for the bones. Does the shape of a particular bone give us a clue as to its function? For instance, thigh bones have to support the body's full weight so are large compared to the finger bones that have to make small and precise movements or the tiny bones in our ear that vibrate so that we can hear sounds.

Ask the children: are bones alive? Bones are living and growing. We know this because when we fracture or break a bone, it can repair itself providing the break is not too serious. Relate to the children's own experiences – have they or someone they know ever broken a bone? Did it heal by itself? Consider the affects of ageing on our bones. What happens to our bones as we age? Older people have reduced bone mass, i.e. their bones are thinner, more brittle and more liable to break in the event of a fall.

How are the bones in the human body joined? (By muscles that are attached to the skeleton.) Can the children locate any of the main muscles on their own body and on an outline shape of the human body? Don't forget we have muscles in our face too!

Challenge the children to investigate the different joints in their body and how these move. Do all the joints work like levers? (Link to any prior learning in Technology about levers or hinges.) Which joints have the greatest amount of movement? Examine elbows, knees, ankles, shoulders, hips. The children could take turns to adopt the doctor and patient roles for this exercise. They could examine what their different body joints can do against a checklist (e.g. can this joint move forwards, sideways, backwards, in circles?) and add this to their Body MOT notes from the entry point. They could measure or draw the angle of the movement (links to Mathematics below). Some people have loose joints, e.g. contortionists! Why do people get stiffer joints in old age? The children may be able to discuss this question with their grandparents or other older relatives. Many people over the age of

50 have some degree of osteoarthritis - this condition narrows the space between adjoining bones so that movement is more restricted.

Ask the children to find out how the muscles work in pairs and what we can do to keep our bones and muscles healthy. The following website is useful for research:

- **childrensuniversity.manchester.ac.uk/interactives/science/exercise/muscles/** – Children's University Manchester website has interactive activities about how the muscles work.

From this research task, the children should discover that healthy bones and muscles need regular exercise. Weight-bearing and lifting exercises are good for building bone and muscle strength. This is important for maintaining mobility. The children should also discover that muscles often work in pairs so that as one muscle stretches its partner muscle contracts – you can liken this movement to that of an elastic band stretching and relaxing. The children can actually feel this stretching and relaxing of their muscles when they bend an arm or leg. The muscles are acting like pulleys on levers – they pull the bones where we want them to go.

Discuss what happens when we overwork muscles. Relate to the children's own experiences, e.g. have the children ever had stiff and aching muscles after strenuous exercise? This is usually temporary and the muscles soon recover. However, when we feel muscle pain this is a warning signal of an over-stretched muscle that could lead to injury.

Extension activity

Do all animals have skeletons? Link back to prior learning in the Milepost 3 living things-themed science unit. Not all animals have skeletons, e.g. worms and insect larvae. Humans, mammals, birds, fish and reptiles belong to a group known as 'vertebrates' – this means they have a back bone. Can the children remember what 'invertebrates' are? They have a skeleton on the outside – an exoskeleton. What are the advantages/disadvantages of having an exoskeleton?

Recording activity

Draw a child-size skeleton and muscle map and label some of the main bones and muscles. If the children draw onto transparent paper or acetate, then they can add this new layer to the body outline from the previous task. When complete, the display will work like a human body flip-chart.

Draw diagrams, with directional arrows, to illustrate the way in which the body's different joints move. Using software, you could turn these diagrams into computer animations.

The children could create a keep-fit video that other classes can use as a warm up in PE lessons, explaining their learning and demonstrating how our muscles and skeleton moves. You could then use this in exit point with the parents!

Mathematics link: challenge the children to describe the angles of movement in their joints. Relate to any learning on angles in your mathematics lessons. The greatest amount of movement is found in the ball and socket joints (e.g. the top of the leg at the hip and the top of the arm at the shoulder) which allow movement in many directions.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Thoughtfulness

Science Task 4

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.02a Be able to conduct scientific investigations posing scientific questions

3.02b Be able to choose an appropriate way to investigate a scientific issue

3.02c Be able to make systematic and accurate measurements from their observations

3.02d Be able to explain and justify their predictions, investigations, findings and conclusions

3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

3.03 Be able to gather evidence from a variety of sources

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.18 Know about the effect of exercise on the human pulse rate

3.19 Know about the effect of drug misuse on the human body

3.23 Understand the importance of an appropriate diet for the health of humans and other animals

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Identifying and Classifying
- Observations

Research activity

There is one muscle in the human body that is more important than all the other muscles... which muscle is this? The heart.

Ask the children if they know how the heart works. Link back to any prior learning in the

Milepost 2 units, *How Humans Work* and *Shaping up!* The heart works differently to the other muscles in the body – it works like a double pump. It has two halves, the right side and the left side and two valves. Our brain can control our skeletal muscles but it cannot control our heart.

How does a pump work? The children could find out by using a hand pump and siphon tubing to fill a small fish tank with water. This will demonstrate how a pump uses air pressure to move a liquid. Now tell the children to imagine that the pump is the heart, the water is the blood and the tubingrepresents the blood vessels. Through this model the children can visualise how the blood in the human body travels under pressure through the blood vessels.

Note: your class could demonstrate how the heart works as a pump to the Milepost 2 children, if they are working on the human body unit at the same time.

But where does blood go? Ask for suggestions from the children. First, it goes to the lungs where it picks up oxygen and off-loads waste carbon dioxide. Then it travels around the body to every single living cell, delivering nutrients (nutrients come from the food we eat and are needed for energy, cell growth and repair) and oxygen and taking away waste carbon dioxide before going back to the heart. Arteries carry blood from the heart and veins carry blood back to the heart. This is known as the circulatory system.

You could create a big circulatory system role-play to consolidate this learning, with the children playing the various roles of the heart, blood, lungs, oxygen, carbon dioxide, cells and nutrients. You will need a large space (e.g. the hall or playground) so that you can involve as many children as possible. Children who represent 'blood' will run to the lungs where they tag children who are 'oxygen' and drop-off children who are 'carbon dioxide'. Then they run around the body (draw an outline on the floor) to all the body's cells delivering nutrients (from the liver*) and oxygen, and taking away waste carbon dioxide back to the heart. Try to illustrate the continual movement of the blood circulating within the body by having a number of children playing the role of blood, oxygen, carbon dioxide and nutrients so that the flow is uninterrupted by children waiting for the blood to get back to the heart.

* Links to Task 7 later.

Tell the children to close their ears with their fingers. What can they hear? (You can hear your blood pumping through your body.) How fast does your heart beat (pump)? How can you find out? Show the children how to measure their pulse by pressing their fingertips against the wrist. They should count how many times it beats in 60 seconds. This is called the heart rate. Can they work out how many times their heart will beat in one hour or in one day? (Over the course of a day, the heart will beat about 100,000 times.) Together with the children, collect some interesting facts about the blood and its journey around the body.

The following websites are useful for research:

- **childrensuniversity.manchester.ac.uk/interactives/science/exercise/heart/** – Children's University Manchester website has interactive activities about the heart and the pulse.
- **childrensuniversity.manchester.ac.uk/interactives/science/exercise/benefits/** – Children's University Manchester website has interactive activities about the benefits of

exercise.

- **learn.fi.edu/learn/brain/exercise.html** – the Franklin Institute website has resources for children and teachers to learn about the importance of exercise for the brain.

More of the big picture:

The average adult has about 5.6 litres of blood in their body. It takes the blood less than one minute (about 45 seconds) to travel all the way around the body. In one day, the blood travels almost 20,000 kilometres. The normal heart rate is between 70 to 80 beats per minute for adults. The average child's pulse rate (at rest – not running or playing) is around 90 beats per minute, ranging from 70-110 beats. Some athletes have lower heart rates. Stress and drugs such as caffeine and nicotine can increase the heart rate above 100. Chaotic heart rates (arrhythmia) can lead to heart attacks.

Ask the children how they should keep their heart and body healthy. Invite their suggestions. Consider the impact of diet, drugs (smoking), exercise and lifestyle. To maintain a healthy body, what foods do we need to eat more of and what foods do we need to eat less of? Why? The children could make two lists. For each item on their lists, the children should be able to give reasons why. For example, consuming processed foods that are high in fat and sugar will, over many years, block the arteries. That's why older people have more heart problems than younger people. The children should recall that the heart is a muscle and like all muscles it becomes weaker as we age. Are there any types of food that are good for our blood? (Iron-rich foods such as nuts, beans, pulses, whole grains, dark green vegetables, red meat.)

Why is exercise good for the heart? Exercise is good for all the body's muscles, including the heart, because it increases the supply of oxygen to the cells. The children may say that exercise makes the heart beat faster. Ask them how they could test out this hypothesis. Encourage the children to devise their own tests to show the effect of exercise on the pulse rate. You could link to Physical Education here.

It is well known that smoking is bad for our health in many ways (especially for our lungs) but how does cigarette smoke affect our heart? Smoking causes heart disease by decreasing oxygen going to the heart, damagingblood vessels, increasing clotting and increasing heart rate (link to learning in the Milepost 3 unit, *Drugs Education*.

Recording activity

The children should draw a diagram of the heart on an outline of the body then draw the arteries leading to the lungs and the network of blood vessels leading to all other parts of the body. Finally, they should draw the veins leading back to the heart. As before, if the children draw on to transparent paper or acetate then this can be overlaid on top of the previous diagrams.

The children could perform their role play showing the function of the blood for the parents at the exit point, or they might create a cartoon or animation with imagined characters playing the various roles.

As a home-learning task, ask the children if any of their parents are blood donors. Discuss what this means and how this generous act can save lives. (Links to the International task later.)

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Respect
- Thoughtfulness

Science Task 5

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.19 Know about the effect of drug misuse on the human body

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Identifying and Classifying
- Observations

Research activity

In the previous task, the children focused on the function of the heart and the circulatory system. In the blood circulatory role play, the children saw that the lungs supplied the blood with oxygen. In this next task, the children are going to look in more detail at the lungs and the respiratory system.

Which parts of the body help us to breathe? If the children mention any of the following body parts: the nose, mouth, windpipe (trachea), lungs, bronchus and diaphragm, then they would be right. It is likely that they won't be able to identify all of these body parts straightaway but by the end of the task they should have located and named all of these parts and be able to say what each part does. For example:

- Nose – inhaled air enters the body through the nose or nasal cavity
- Mouth – air can be inhaled through the mouth during exertive activities or when the nose is blocked
- Trachea – the tube that carries air to and from the bronchus
- Bronchi – these tubes branch out like 'trees' to carry air into the lungs

- Lungs – they take in air and supply fresh oxygen to the red blood cells
- Diaphragm – this muscle contracts and relaxes as we breathe in and out

What things are vital for life? Encourage the children to recall what they have learned about the life processes in previous IPC units, particularly the plants and living things-themed units. Oxygen is vital for life (air is about 20% oxygen at sea level). Carbon dioxide is produced when the body uses up oxygen. What happens when we breathe out? We expel (get rid of) carbon dioxide. Refer back to learning from the circulatory system role play in the previous task.

Is breathing automatic? Or do we have to remember to breathe? Ask the children for their ideas. Think about the role of the brain (recall Science Task 1). Our brain automatically controls our breathing.

Why can we only hold our breath for about one or two minutes at the most? Think about the brain again. When the brain detects increasing levels of carbon dioxide in the blood, our neurons command us to inhale – this command is irresistible. Link to the circulatory role play once again and how you dropped off waste carbon dioxide in the lungs and heart.

The following website is also useful for research:

- **sciencekids.co.nz/experiments/lungvolume.html** – Science Kids website has an experiment to test the capacity of your lungs.

Consider the factors (see suggested videos below) that can have an effect on the respiratory system and stop it from working properly, for example:

- Air pollution from industry and vehicles
- Particles from pesticides and dust
- Smoking
- The common cold and bronchitis
- Asthma*

* Be mindful of children in the class who suffer from asthma and handle this with care and sensitivity.

The following videos are useful for further research and discussion:

- **youtube.com/watch?v=rlt-JNZ8-ml** – YouTube has this series of animated 'lessons' for children about environmental pollution.
- **youtube.com/watch?v=ylURbmJZxlg** – YouTube has this video that explains about the effects of smoking on the body.
- **https://www.youtube.com/watch?v=Y18Vz51Nkos** – YouTube has this anti-smoking educational video.

*(To watch a YouTube video in **safe mode**, scroll to the bottom of the page and click on the '**safety**' tab which brings up the*

*'**Safety mode**' information. Under this section, select the '**on**' option, then click '**save**')*

Relate this learning to the children's own experiences, e.g. a heavy cold can sometimes last for seven days or longer and can cause breathing difficulties – have the children ever experienced this?

What can we do to protect our respiratory system from infection? Discuss how older people in the community are vulnerable to flu and cold viruses.

As we get older, our respiratory muscles (lungs and diaphragm) become weaker; this reduces airflow into the body and causes breathing problems. Consider how germs are spread by coughing and sneezing, and how germs can enter the body through our mouth and nose. When we have a cold, what can we do to prevent this spreading to our fellow classmates? For example, by keeping our hands clean, throwing used tissues in the bin, covering our mouths when we cough and sneeze, etc.

Note: you could link to the entry point and First Aid here and ask the children: when a person stops breathing what should we do?

Recording activity

On an outline of the human body, ask the children to draw the nose, mouth, trachea, bronchi, lungs and diaphragm. They should label the parts and be able to write or talk about the function of these parts in the respiratory system. Draw this out on tracing paper or acetate and add to the human body flip-chart. Alternatively, you could create a model using scrap materials and display this at the exit point where it will help younger Milepost 2 children appreciate the harmful effects of smoking.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Respect
- Thoughtfulness

Science Task 6

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.02a Be able to conduct scientific investigations posing scientific questions

3.02b Be able to choose an appropriate way to investigate a scientific issue

3.02d Be able to explain and justify their predictions, investigations, findings and conclusions

3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

3.03 Be able to gather evidence from a variety of sources

3.04 Be able to discriminate between evidence and opinion

3.05 Understand the importance of using evidence to test scientific ideas

3.06 Understand some of the effects of what they learn on people's lives

3.16 Know the functions of the major internal and external parts of the human body

3.21 Know that some characteristics of humans and other animals are inherited from their parents

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Challenges
- Fair testing
- Identifying and classifying
- Observations

Research activity

In this next task, the children will look at inherited physical characteristics and issues around interventionist medicine.

Start the task by asking the children to draw a picture of themselves and to label the parts they can identify as being inherited from their parents. For example, they might label the colour of their hair, skin and eyes as inherited characteristics. Can we investigate any of our inherited characteristics? For example, as a home-learning task the children could find out the eye/hair colours of their parents and grandparents, and match these to their eye/hair colour. Then they could compare the results for all the children in the class to see if there is a pattern in the results.

Ask the children if they think we can inherit a musical talent or a talent for football or for mathematics? Can we inherit a skill/aptitude or is this something we have to learn and practice? Invite their views.

Is this the same for animals, e.g. what do dogs inherit from their parents? Ask the children in the class who have pet dogs for their ideas. Discuss examples of crossbreeds, e.g. the cockerpoo or the labradoodle. Why are some dogs crossbred? Breeders hope to get the best characteristics from each breed, e.g. the curly coat from the poodle that doesn't shed hair and the larger body size of the labrador.

Think back to humans again, if we can inherit strengths can we also inherit weaknesses? Medical research is trying to find out which diseases are inherited so that we can work out the most effective way to treat them.

But what happens when our bodies break down or go wrong? Can we replace parts of our body with new parts? Apart from the brain, we can transplant or replace most other body parts: heart, lungs, kidneys, liver, skin, hair, blood, etc. We can replace legs and arms with prosthetic limbs. Even face transplants have been successfully carried out.

Are the children aware of any issues associated with interventionist medical treatment such as genetic research, cloning, organ replacement or cosmetic surgery? For example, is it a step too far to have replacement ears grown on mice, cloned body parts or genetically-modified limbs? These may be sensitive issues for your school and, if so, you can choose to avoid this part of the task, if you prefer.

The children might be able to find a current news-story related to a topic that you think is appropriate for your class to explore. Debate the issues with the class. Try to look at all sides of an argument – the science, the patient's need and the ethics of the issue. What are the children's views?

Recording activity

Did the children find any patterns in their inherited characteristics, e.g. eye or hair colour? They could write about their findings or present their results in charts and tables. This activity should help to demonstrate the importance of testing scientific ideas.

Ask the children to communicate their views and findings about the medical issue they researched above. They could do this in the form of a written report, a TV-style documentary, a knowledge-awareness campaign, or a look into the future of medical science.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Morality
- Respect
- Thoughtfulness

Science Task 7

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.03 Be able to gather evidence from a variety of sources

3.04 Be able to discriminate between evidence and opinion

3.06 Understand some of the effects of what they learn on people's lives

3.15 Know about the structure of the human body

3.16 Know the functions of the major internal and external parts of the human body

3.20 Know about the ways in which humans and other animals reproduce

3.21 Know that some characteristics of humans and other animals are inherited from their parents

3.22 Know that some characteristics of humans are influenced by their environment

3.23 Understand the importance of an appropriate diet for the health of humans and other animals

This task uses the following scientific enquiry methods:

- Pattern seeking
- Research
- Identifying and classifying
- Observations

Research activity

In this task, the children are going to examine genetic and environmental factors affecting growth and development. Introduce the task by discussing the following scenarios with the class:

What if two plants, both genetically the same, were planted in the same field would you expect them to reach the same height? Yes, you probably would, because the same genetic and environmental factors are affecting both of the plants. What if two plants, both genetically the same, were planted in different fields would you expect them to reach the same height? If not, why not? Here you could take the opportunity to recap on how plants reproduce. Link to the plants-themed unit, *Roots, Shoots and Fruits*.

Discuss what environmental factors could affect the height of the second plant, e.g. the amount of water, food, light and warmth. Link to prior learning, for example, in the science plants-themed units the children will have learned about factors affecting the growth of plants.

Humans, like plants, also have the potential to reach a certain size and height. For example, if your parents are tall you will have the potential to be tall like them because we inherit genes from our parents that determine our body features - from the colour of our hair to the size of our feet. (Recall how humans and other animals reproduce). However, environmental factors also play a part. What environmental factors affect human development and growth? Ask for the children's ideas to then discuss and research. For example, they might suggest the following:

- Food/diet – what is a balanced diet and why is it important for growth? Research the main food groups, the types of foods we should eat more of (vegetables and fruit) and the types we should eat less of (fat, sugar, salt). Why do we need to avoid certain foods? Eating lots of fat and sugar will, over the years, block our blood vessels.

- Water – how much water should we drink each day and why? 75% of our body is water; we need water to provide hydration for the body's cells. We lose water when we sweat, cry and go to the toilet. Dependent on size and body weight, we should drink about 6 glasses of water each day.

- Light/warmth – is sunlight harmful or is it good for us? Ask for ideas from the children. Sunlight provides our body with vitamin D, it boosts our immune system and improves our mood. We need sunlight but we should avoid getting sunburn because this can cause skin cancer.

- Oxygen – what happens to our body when we regularly breathe in polluted air or cigarette smoke? With each breath we take, we breathe in on average two cups of air to provide our body (particularly our muscles) with the oxygen it needs. Polluted or smoke-filled air is harmful because it is 'sticky' and it clogs up our blood vessels andlungs, making it more difficult for us to breathe.

How does the food and water we consume get absorbed by our body? How is it converted into nutrients that the body can use? Ask the children to find out about the journey of food and drink through the body – the digestive system. This is the last of the systems we will be looking at in this unit.

Note: if Milepost 2 and 3 are working on these units at the same time, the children could work together on this activity. Refer to the Milepost 2 unit, *How Humans Work*, Science Task 2.

They should find out the role of each of the following body parts associated with the digestive system: mouth, teeth, throat, oesophagus, stomach, liver, small and large intestines, bladder, bowel.

The following websites are a useful starting point for research:

- **kidshealth.org/kid/htbw/digestive_system.html** – KidsHealth website explains how the digestive system works.

- **http://www.childrensuniversity.manchester.ac.uk/.../digestive-system/**– Children's University Manchester website has interactive activities about the digestive system.
- **kidshealth.org/kid/stay_healthy/food/pyramid.html** – KidsHealth website has information for children about diet and health.
- **learn.fi.edu/learn/brain/pyramid.html** – the Franklin Institute website has resources for children and teachers to learn about how to nourish your brain.
- **nhs.uk/Change4Life/Pages/healthy-eating.aspx** – the NHS website has a wealth of information for teachers about healthy eating.

You could say that the solid food we eat is transformed on the digestive 'journey' from being a solid to a liquid. The stomach plays a big part in this process – it acts like a food processor; it churns the food for hours, breaking it down into tiny pieces and mixing it with acids (gastric juices) supplied by the pancreas, liver and gall bladder. The small intestines (they should probably be called the 'long' intestines because they are about 6 metres long!) complete the job – they work like a tubular liquidiser, turning the food into nutrients that can be absorbed into the bloodstream. Then in the large intestine, water from the food is either soaked up or passed to the bladder, and waste matter (faeces) is prepared before it travels to the bowel.

Recording activity

The children should know about the main food groups and know which foods we need to avoid in order to stay healthy into our old age. In other IPC units, they might have produced food pyramids or plates of healthy food using food pictures cut out from magazines so you could extend the learning here to match groups of food to the particular parts of the body that need these foods. The children should draw a diagram of the digestive system on another outline layer of the body to locate and name the main digestive organs. They should know how these organs work together to break down and digest the food we eat and drink, and absorb nutrients into the bloodstream. Milepost 2 and 3 could work together on this digestive system display, if both mileposts are working on the unit at the same time.

Look at the body flip-charts you have created so far: the nervous system, skeletal system, circulatory system, respiratory system, digestive system and for each one ask the children to identify the foods that will help those systems to function properly. For example:

- Skeletal system – needs calcium-rich dairy foods such as milk, cheese and yogurt
- Nervous system – needs vitamin-rich foods such as fruit and vegetables
- Circulatory system – needs iron-rich foods such as proteins and dark green vegetables to provide hemoglobin to make red blood cells
- Respiratory system – needs oxygen
- Digestive system – needs water and fibre-rich foods such as wholegrain cereals and fruit and vegetables

Ask the children to add the different food groups to the Human Body outline in the appropriate places and to explain their reasoning.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Thoughtfulness

Science Extension Task

Learning Goals

3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them

3.03 Be able to gather evidence from a variety of sources

3.04 Be able to discriminate between evidence and opinion

3.06 Understand some of the effects of what they learn on people's lives

3.16 Know the functions of the major internal and external parts of the human body

3.19 Know about the effect of drug misuse on the human body

3.22 Know that some characteristics of humans are influenced by their environment

3.23 Understand the importance of an appropriate diet for the health of humans and other animals

Extension activity

In this task, the children take a look at some of the latest scientific research exploring the relationship between diet, exercise, drugs, lifestyle and health.

What are scientists saying about our health? Are we getting healthier? Are we going to live longer than our parents? Are we exercising enough and eating the right foods?

Ask the children to look through the health sections in the daily newspapers. Prior to the lesson, as a home-learning task, you could ask the children to collect some recent health news stories.

Here are some avenues for discussion and further research:

- A sedentary lifestyle is killing us
- Children who drink sugary juice weigh more
- Children who drink fizzy drinks are more violent
- Cigarette smoking is the greatest single cause of illness in the world
- Obesity kills more people than we thought
- Alcohol is linked to a high proportion of deaths from falls, fires, burns and drowning
- Super foods reduce cancer risk
- There should be a choking warning label on some foods
- Drinking more coffee leads to an earlier death
- Men are more likely to die from skin cancer than women

The children could create their own health magazine containing news on the latest scientific discoveries about diet, exercise, health and well-being. Alternatively, they could produce a video for a TV news channel, focusing on health issues. You could link to Literacy and Society here and discuss the issue of bias, e.g. although the scientific findings may be true, the reporting of those findings can be biased in order to create a better 'story' and sell more newspapers or attract more TV viewers.

In pairs or small groups, the children could take on the role of journalists, editors and producers, looking for the latest health scoop. They could go on to publish or broadcast their findings for the parents at the exit point.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Morality
- Respect
- Thoughtfulness

Technology Learning Goals

Children will:

- **3.05 Be able to gather and use information to suggest solutions to problems**
- **3.06 Be able to devise and use step-by-step plans**
- 3.07 Be able to consider the needs of users when designing and making
- **3.09 Be able to work with a variety of tools and materials with some accuracy**

Technology Task

Learning Goals

- **3.05 Be able to gather and use information to suggest solutions to problems**
- **3.06 Be able to devise and use step-by-step plans**
- **3.09 Be able to work with a variety of tools and materials with some accuracy**

Research activity

Recall Science Task 7 and the children's findings about what makes a healthy diet. Challenge the children, in small groups, to design, plan and help prepare a healthy meal for a child of their own age. The children could design a breakfast, lunch or dinner meal/menu.

Note: if three mileposts in your school are working on the units at the same time, then Milepost 1 could design breakfast, Milepost 2 lunch and Milepost 3 dinner.

You could turn this into a competition, with one winning meal/menu selected by the school kitchen staff or a local chef. Whether or not the children are able to prepare (i.e. cook) the meal will depend on the kitchen facilities available at your school. If your school has the facilities to prepare meals, the children should explore and experiment with a range of cooking techniques relevant to the dishes they have designed. Alternatively, you could ask a chef from a local café or restaurant to select one of the children's menus and prepare it for the children to eat.

Their menu should be:

- Balanced – includes major food groups
- Healthy – uses fresh ingredients
- Creative and well-presented on the plate
- Not too expensive or difficult to source

If time allows, explore how the ingredients they will be preparing can be sourced locally. What fruit and vegetables are in season at the moment? Why would it be better to use ingredients that could be sourced locally?

If they are using meat in any of their dishes, where does this come from? You could contact local food suppliers to come and talk to the children about the different between locally grown and reared produce and that which is imported. You could adapt the criteria above to match the ability of the children in your class, e.g. you could set the children a budget, or ask them to use only specific food groups, or to use 'super foods' that have a high vitamin content such as broccoli (refer back to Science Task 7 and the Science Extension Task).

If you prefer, you could set this challenge as a home-learning task, and the winning menu could be a healthy snack that the children can prepare and serve to the parents at the exit point. Whatever you decide, you can tailor the task to suit your school's circumstances.

Recording activity

The children could write out their menu or type it up on a computer using design software. Does their menu match the challenge you set them? Is it healthy, creative, not too expensive, easy to prepare, etc – meeting all the criteria you set out above?

Invite the children to comment on each other's menus. They could score them out of 3 (Yes, Almost, No) for each criteria. Is there room for improvement or do any minor adjustments need to be made?

If you are going to ask a chef to choose the winning menu, you could ask for their feedback with the results. Link back to your learning about how the food groups provide nutrients for different parts of the body. Encourage the children to demonstrate this learning to the chef or taster.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Resilience
- Thoughtfulness

International Learning Goals

Children will:

3.03 Know about ways in which the lives of people in the countries they have studied affect each other

3.04 Know about similarities and differences between the lives of people in different countries

3.05 Be able to explain how the lives of people in one country or group are affected by the activities of other countries or groups

3.06 Be able to identify ways in which people work together for mutual benefit

International Task

Learning Goals

3.03 Know about ways in which the lives of people in the countries they have studied affect each other

3.04 Know about similarities and differences between the lives of people in different countries

3.05 Be able to explain how the lives of people in one country or group are affected by the activities of other countries or groups

3.06 Be able to identify ways in which people work together for mutual benefit

Research activity

Ask the children to recall the latest scientific news stories (see Science Extension Task). Of all these findings, which do the children think are of major concern in the world today, and why? The children should be able to draw on the evidence from their previous research from the Extension Task.

For example, scientists believe obesity to be a major global health crisis. Obesity has links to chronic diseases such as diabetes, heart disease and some cancers and its incidence is rising throughout the world, particularly in cities.

Our calorie intake and calorie output can be seen as an equation. If you eat more than you burn off you will have a surplus of calories and put weight on but if you eat less than you burn off you will have a deficit of calories and lose weight.

Calorie intake > Calorie output = Weight gain

Calorie intake < Calorie output = Weight loss

What's the solution to the obesity epidemic? If we eat less and do more, will that solve the problem? Yes – so what's stopping us? Ask the class to discuss factors such as sedentary lifestyles, work and social pressures, convenience of fast foods, food branding and advertising, addictions to sugar, junk food and alcohol that are linked to weight gain. You could link here to your Society learning goals.

There are two sides to this issue. While some people in the world eat more food than their body needs and become overweight, other people don't get as much food as their body needs and suffer from malnutrition. In which countries is malnutrition a health issue? Sometimes a country will use its best land to produce food for export but is then not able to grow enough food for its own people. Can countries work together to find a solution to this problem? Could countries that are able to grow more food than they require redistribute food to those countries where there are food shortages?

Is obesity or malnutrition a health issue in the children's home or host countries? If not, then what other health issues are the children concerned about for people living in the home/ host countries? Encourage the children to put forward the reasons for their concerns and to think of any appropriate solutions.

Recording activity

The children could prepare a special International Health report on a global issue they have researched – it could be about obesity or malnutrition or any other health concern that they are passionate about and believe to be a world crisis.

Encourage them to propose inventive solutions that will reach people wherever they may be, e.g. a health mobile phone app that reminds us to exercise – could this fun approach help fight childhood obesity? Invite the children to share their thoughts and ideas with other IPC schools that are working on these units at the same time – especially if they are in a different country so that you can appreciate this other country's perspective.

The children should present their International Health reports and inventive solutions to the parents at the exit point. (Link to the Science Extension Task.)

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Morality
- Resilience
- Respect
- Thoughtfulness

International Extension Task

Learning Goals

- **3.05 Be able to explain how the lives of people in one country or group are affected by the activities of other countries or groups**
- **3.06 Be able to identify ways in which people work together for mutual benefit**

Extension activity

What does 'being healthy' mean? Recall the previous tasks and ask the children for their ideas. Encourage the children, in small groups, to share their comments and thoughts with others in the class.

Focus on:

- Nutrition – making healthy choices and eating a balanced diet
- Personal hygiene – keeping our body clean
- Disease – preventing the spread of infection

Think about children beyond your classroom in other parts of the world where there is poverty and hardship. Are these children in a position where they are able to make the right choices about their diet and personal hygiene? Are they able to stop the spread of illness within their family? Violence, war, famine, poverty, natural disaster and lack of resources, etc., will all have a negative affect on children's health and wellbeing. Discuss the reasons for this and encourage the children to empathise with others whose lives are in sharp contrast to their own.

Now pose the following big question: how can we help improve the health of the world's children? Here you could link back to the previous task or work with other mileposts in your school or with other IPC schools (refer to the IPC website) in researching the answer to this question. Each milepost or school could focus on a different problem or issue, relevant to their age and ability, and make a plan of action. Remind the children that even a small action can have big results.

Consider the following:

- Providing clean, fresh drinking water for all children
- Sanitation and educating children to wash their hands after using the toilet
- Vaccination programmes for babies and young children
- Other prevention measures

The following websites are a useful starting point for teacher research:

- **wateraid.org/uk/get-involved/campaigns** – WaterAid has many ideas for simple actions and campaigns that can help improve the lives of others.
- **tap.unicefusa.org** – UNICEF Tap Project is a campaign to help supply fresh drinking water to children around the world.
- **savethechildren.net/what-we-do/health-and-nutrition** – Save the Children website explains how you can help to save children's lives.
- **oxfam.org/en/action** – Oxfam International website has ideas for actions you can take to make your voice heard.

Milepost 3 children could look at how large multinational companies can make a difference to health of the world's children (links to Society and Citizenship):

- **unilever.com/sustainable-living-2014** – the Unilever website has details of its Sustainable Living Plan.

Raise awareness of these important global health issues within the wider school community at the exit point. Explain the findings of your research and how you plan to make a positive difference to the health of children around the world.

Personal Goals

- Adaptability
- Communication
- Cooperation
- Enquiry
- Morality
- Respect
- Thoughtfulness

The Exit Point

Now is the time to think about everything you have learned from this unit (have you answered all the questions the children had?) and to get together with the other mileposts to share your exciting discoveries about the human body.

You might also want to share your findings with the wider school community of parents and friends in a special event to showcase what you have learned over the last three weeks. One way of doing this, would be to hold a 'Super Humans' open day.

Milepost 1 children could provide a 4-D senses experience with their display of sights, sounds (some could be pre-recorded), smells, textures and tastes. They could take the parents on a journey of discovery through the human body to find out how our eyes, ears, nose, mouth and fingertips make sense of the world around us. There could be opportunities for the parents to try out some of the tasks the children researched in this unit, e.g. identifying an object by touch alone, or from looking at a partial/close-up view, or identifying a taste with their nose plugged!

Milepost 2 children could check their parents' hearing, measure their parents' pulse rate and tell them what their major bones and muscles are called and how they work. They could advise their parents about healthy food choices and warn them about the harmful effects of alcohol and tobacco. They could present their top ten tips on how to stay healthy and explain how they would persuade young people not to take up smoking and drinking. Focusing on the need for everyone to 'Sit less and Move more' they could highlight the variety of physical activities and hobbies that are available in the local area.

Milepost 3 children could explain what 'being human' means – how we are different from other animals, e.g. because we have a complex memory and highly-developed language system. Through their class role play, they could demonstrate how the heart and circulatory system works and, together with Milepost 2, map out the journey of what we eat and drink. They could then explain what the lungs do, what we inherit from our parents and how the environment affects us. They could present the latest medical research and talk about a global health issue that concerns them.

You could end the event by giving your guests a special Body MOT (see entry point) before finally providing a healthy meal or snack planned, made and served by the children.

The IPC community would love to see examples of your learning, in any subject, at any stage of the learning process. If you have any pictures or stories you would like to share please visit our Facebook page at **facebook.com/InternationalPrimaryCurriculum**, tweet **@The_IPC** or email **stories@greatlearning.com**.

Resources

For this unit, you will need some, but not necessarily all, of the following:

Equipment

- Pictures of animal skeletons
- Pictures of the human skeleton and muscles
- Pictures of the human life cycle
- Toy skeletons
- Anatomical models of the human body
- Timer or stop watch
- Video camera
- Digital camera

Software:

- Presentation software, e.g. Microsoft PowerPoint
- Mind-mapping software such as Inspiration 9 (**inspiration.com/global**)

Links

http://www.childrensuniversity.manchester.ac.uk/learning-activities/science/exercise/the-muscles/
Children's University Manchester website has interactive activities about how the muscles work.

http://www.childrensuniversity.manchester.ac.uk/learning-activities/science/exercise/benefits-of-exercise/
Children's University Manchester website has interactive activities about the benefits of exercise.

http://www.childrensuniversity.manchester.ac.uk/interactives/science/brainandsenses/brain/
Children's University Manchester website has interactive activities about the brain and a brain map.

http://www.childrensuniversity.manchester.ac.uk/learning-activities/science/the-body-and-medicines/digestive-system/
Children's University Manchester website has interactive activities about the digestive

system.

http://www.childrensuniversity.manchester.ac.uk/learning-activities/science/exercise/the-heart/
Children's University Manchester website has interactive activities about the heart and the pulse.

http://www.childrensuniversity.manchester.ac.uk/learning-activities/science/the-body-and-medicines/the-skeleton/
Children's University Manchester website has interactive activities about the human skeleton.

https://kidshealth.org/en/kids/digestive-system.html
KidsHealth website explains how the digestive system works.

https://kidshealth.org/en/parents/habits.html
KidsHealth website has information for children about diet and health.

http://kidshealth.org/kid/closet/movies/SSmovie.html
KidsHealth website has this video about how the body's bones work.

http://www.sciencekids.co.nz/experiments/lungvolume.html
Science Kids website has an experiment to test the capacity of your lungs.

http://learn.fi.edu/learn/brain/pyramid.html
The Franklin Institute website has resources for children and teachers to learn about how to nourish your brain.

http://learn.fi.edu/learn/brain/exercise.html
The Franklin Institute website has resources for children and teachers to learn about the importance of exercise for the brain.

http://www.nhs.uk/Change4Life/Pages/healthy-eating.aspx
The NHS website has a wealth of information for teachers about healthy eating.

https://lifeliveit.redcross.org.uk/What-is-first-aid/How-to-videos
The Red Cross website has six 'How to' videos that show the simple steps children can take to help in different First Aid situations.

http://www.who.int/dietphysicalactivity/pa/en/index.html
The World Health Organisation website has a Global Strategy on Diet, Physical Activity and Health.

http://www.who.int/campaigns/world-blood-donor-day/2013/en/index.html
The World Health Organisation website has information about how to raise awareness of the need for safe blood and to thank donors for the gift of blood.

https://apps.who.int/iris/bitstream/handle/10665/44399/9789241599979_eng.pdf;jsessionid=907 sequence=1
The World Health Organisation website has this PDF of the recommendations for levels of physical activity for 5-17 year olds.

http://www.youtube.com/watch?v=r-m27SZUFj0
YouTube has this anti-smoking educational video.

http://www.youtube.com/watch?v=rIt-JNZ8-ml

YouTube has this series of animated 'lessons' for children about environmental pollution.

https://www.youtube.com/watch?v=Y18Vz51Nkos
YouTube has this video that explains about the effects of smoking on the body.

Books

Body Science, by James Cracknell, Dorling Kindersley Ltd, 2009

Dr Frankenstein's Human Body Book, by Richard Walker, Dorling Kindersley Ltd, 2008

The Kingfisher Book of the Human Body, by Dr Patricia Macnair, Kingfisher Publications, 2005

National Geographic Animal Encyclopedia, by Lucy Spelman, National Geographic, 2012

Animal, Dorling Kindersley, 2011

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