

YEAR 6 UNIT 2: Staying Alive (Animals including Human)

Enquiry Question: How can we stay healthy?

Related units:

Year 5 Unit 5: How do humans change?

Unit overview

National Curriculum Link Year 6: Animals including humans.

Children will identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. They will recognise the impact of diet, exercise, drugs, lifestyles on the way their bodies function. They will describe the ways in which nutrients and water are transported within animals, including humans. Pupils will build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular, and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Children already know that exercise is good for you from general learning and everyday life; that the heart pumps blood around the body and that blood transports oxygen and carbon dioxide. Children know that smoking is bad for you.

Assessment (Expectations)

1. Explain the function of the circulatory system
2. Explain the effect of drugs on the body
3. Explain why we need to eat a healthy balanced diet
4. Explain the ways in which nutrients and water are transported within animals, including humans

Scientific vocabulary

heart
lungs
blood
oxygen
vein
artery
exercise
addiction
nicotine
circulatory
System
digestive System
endorphins
excretory system
John Boyd Orr
plasma

Working Scientifically

Is your heart in it?

Record using scientific diagrams.

Lub dub

Report findings from enquiries e.g., display and other presentations.

Out of puff

Take measurements, using a range of scientific equipment. Record data and results. Report findings, including conclusions, causal relationships, and explanations.

Race against time

Plan a scientific enquiry to answer question. Identify scientific evidence that has been used to support or refute ideas or arguments.

What is a drug?

Draw conclusions, causal relationships, and explanations.

The importance of diet

To know about the life and work of a scientists – John Boyd Orr.

Milking it

Record data and results as a graph or report conclusions.

Cross-curricular links

English: Report and present findings from enquiries including conclusions, causal relationships.

Maths: Record data and results as a graph and report conclusions.

Teacher knowledge

The circulatory system is made up of the heart, the lungs, blood, and the vessels it travels through. Its function is to transport nutrients, gases and wastes between the cells of the body and the digestive system, respiratory system, and excretory system. It also carries hormones for internal communication and co-ordination, and white blood cells for fighting disease, as well as assisting in maintaining body temperature.

The heart is a huge muscle that never appears to rest. In fact, it does rest – between each heartbeat! It beats rhythmically, contracting two sets of chambers to act as a double pump to move blood around the body. It is about the size of a closed fist and is protected by the ribs.

The right side of the heart pumps deoxygenated ('used') blood through the pulmonary circuit to the lungs, where it picks up oxygen and where carbon dioxide is released. The blood is then returned to the left side of the heart, which is sufficiently muscular and powerful to pump the blood through the systemic circuit to all tissues of the body, including the kidneys for waste removal, and the liver for blood sugar regulation.

Blood is made of a watery yellow fluid called plasma that carries dissolved nutrients, hormones, and proteins. It contains red blood cells, which carry gases around the body and make the blood appear red. It also carries white blood cells, which fight against disease. The blood also contains platelets, which form the scabs we get on a cut as part of the healing process.

Exercise has many effects on the body. During exercise, the heart rate and breathing rate increase to provide more oxygen to the muscles and to remove carbon dioxide quicker. Regular exercise can lead to stronger muscles and bones. The heart will become stronger with a reduced risk of heart disease. There is also an increase in lung capacity. To provide the energy for exercise, the body breaks down fats and sugars stored in the body. Regular exercise, along with a balanced diet, can prevent obesity. Exercise also has effects on mental health and mood. It releases endorphins which makes humans feel happier and calmer.

During recent years there has been more focus on obesity in Britain with people getting bigger and less healthy. This has an effect on the NHS as it impacts on the nation's health. It is important that children are educated about the importance of health and diet to their lives.

Smoking accounts for a quarter of all deaths by cancer in the UK. Cigarette smoke contains around 4000 different chemicals, including 70 that can cause cancer. It contains tar, which can damage the lungs and stain teeth and fingers as well as cause cancer. These can also damage the heart and blood vessels. These chemicals are contained in tiny doses but accumulate in the body with every cigarette. The smoke also contains poisons such as hydrogen cyanide and carbon monoxide. The nicotine in cigarettes is very addictive, and many people find it very hard to give up smoking.

Alcohol is also a drug, but not one that many consider in the same light as smoking. However, it is just as addictive. Alcohol causes damage to organs in the body too, this time the liver. The liver breaks down the alcohol as part of its detoxification process. However, it also produces chemicals that aid digestion, and if the liver is damaged through excess alcohol then these chemicals cannot be made. Drinking too much can also affect your emotional state, as it can make you feel very happy or then send you into depression as you feel panicky.

John Boyd Orr was born in Ayrshire, Scotland in 1880, the middle child of a family of seven. He was a medic in the trenches during World War I and witnessed how the poor diet and conditions led to the poor health of the soldiers he served with. After the war he set up the Rowett Research Institute. He was the first scientist to show that there was a link between poverty, poor diet, and ill health.

Did you know:

- The heart beats around 3 billion times in the average person's lifetime.
- If you put your circulatory system on a straight line, it is actually long enough to orbit the Earth two and a half times!
- The human stomach can stretch large enough to hold almost 1 gallon (4.5 litres) of water. Where does it all go?

Misconceptions: Children might think....

- that blood only reaches some parts of the body. In fact, its function is to transport nutrients, gases and wastes between the cells of the body and the digestive system, respiratory system and excretory system. It also carries hormones for internal communication and coordination and white blood cells for fighting disease as well as assisting in maintaining body temperature.

- that arteries carry blood rich in oxygen and that veins carry blood lacking in oxygen. In fact, they carry some de-oxygenated blood too. Their purpose is based on the direction in which they carry the blood around the body; arteries carry blood away from the heart, and veins to the heart.
- that the structure of the heart is how they imagine it or have seen it drawn.
- that you can't get addicted to alcohol; in fact, alcohol is highly addictive
- that just trying one cigarette is OK; in fact, even having just one cigarette can damage internal organs

Resources

- www.kidshealth.org/kid/htbw/digestive_system.html has information about digestion.
- www.neok12.com/Circulatory-System.html has some support for teachers and short videos to help with the circulatory system and how the heart works.
- Ideas for health and sport-related activities: www.getinthezone.org.uk/ www.neok12.com/Circulatory-System.html has some support for teachers and short videos to help with the circulatory system and how the heart works
- Cancer Research UK: Smoking and cancer: www.cancerresearchuk.org/cancer-info/healthyliving/smokingandtobacco/ www.talktofrank.com/

