TOPIC 2

Healthy bodies

About this topic

Curriculum link: Year 6, Animals, including humans

SUMMARY:

In this topic children build on learning from Years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system). It considers life processes that are internal to the body, such as the circulatory system. The impact of lifestyle on bodies, particularly of humans, is also considered. Scientists are continually finding out what is good and bad for us, and their ideas do change as more research is carried out.

UNITS:

2.1: Circulatory system
2.2: Exercise
2.3: Diet and lifestyle

ACTIVITY RESOURCES:

2.1 Is your heart in it?
2.2 Race against time
2.3 Out of puff
2.4 Reading the label
2.5 Deaths from smoking
2.6 Dangers of smoking
2.7 Milking it
2.8 Milking it

ONLINE RESOURCES:

Teaching slides (PowerPoint): Healthy bodies
Interactive activity: Healthy bodies
CPD video: Healthy bodies
Pupil video: Healthy bodies
Word mat: Healthy bodies
Editable Planning: Healthy bodies
Topic Test: Healthy bodies

Learning objectives

This topic covers the following learning objectives:

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.

Working scientifically skills

This topic develops the following working scientifically skills:

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

CROSS-CURRICULAR LINKS

This topic offers the following cross-curricular opportunities:

English

- Research parts of the body. Pupils should plan to find out what information they need before using non-fiction text.
- Ask questions to improve their understanding when using non-fiction.
- Use contents pages and indexes to locate information.
- Create a script for a role-play video, e.g. stop smoking advert.
- Research Christiaan Barnard and first heart transplants.
- Participate in for and against arguments for making organ donation compulsory.
- Draft and redraft a story or poem on the journey of blood around the circulatory system.
- The children write a letter as part of their work on changes in opinions about health and lifestyle over the years.

Numeracy and mathematics

- Bar graphs.
- Measuring capacity and time.
- Calculating difference.
- Calculate bpm (beats per minute) – take pulse for 15 seconds multiply by four.

Computing / ICT

- Use the Internet to research information.
- Use digital pulse meters.
- Create an infographic, e.g. statistics about heart disease.
- Create a podcast on the circulatory system, interview a nurse or doctor on keeping the heart healthy.
- Use tablets, digital video cameras or audio recorders to create a healthy living advert.
- Use tablets to create a dangers of smoking video.
- Plan and create an exercise video for the class, or a healthy eating food programme with the children as TV chefs demonstrating a healthy meal.
- Research the effects of smoking and drinking.
- Spreadsheets could be used to analyse smoking data.

Design and technology

- Design and make a model heart.
- Create a circulatory system board game.

Drama

- Role-play the circulatory system.
- Script and present a short play about saying ‘no’ to alcohol and cigarettes.

Art

- Look at microscope pictures of blood cells and platelets and then create collages, patterns and prints from observations.

PSHE

- Discuss the dangers of drugs and alcohol abuse.
- Role-play persuading a friend not to smoke.
- Discuss the wider issues of being healthy, e.g. feeling safe, having friends, not being bullied.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Year 7 science teacher to show children anatomical model of body systems including the heart.
- Year 7 science teacher to work alongside class to collect and graph data.
- A parent or someone from the school community who stopped smoking, to discuss the effect on their health and lifestyle.

Visit

- A local secondary school to dissect a heart.
- A local pharmacist to learn about the safe use of medicines and what is available to help people stop smoking.

HEALTH AND SAFETY

When children carry out exercise in activities ensure children do this safely and do not over exert themselves.

SUBJECT KNOWLEDGE

Circulatory system

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 heart beat! 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 arteries carry blood away from the heart while veins return blood to it, the veins have valves that only allow the blood to travel one-way so that the blood keeps moving in the correct direction.

One misconception the children may have is that the arteries carry only oxygenated blood, when in fact they carry some de-oxygenated blood too. It is more appropriate to talk about how the air we breathe in has oxygen in it, while the air we breathe out has less oxygen and more carbon dioxide.

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

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 and diet

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 more calm.

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.

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. James Lind conducted one of the first ever clinical trials based on the theory that citrus fruits cured scurvy.

Drugs

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.

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.

These chemicals are contained in tiny doses, but accumulate in the body with every cigarette. The trend for using Vapes is not without issues for health, they still give a dose of nicotine and the vapor from e-cigarettes has chemicals in it that can be harmful to children. The liquid in e-smoking devices is also poisonous if drunk or if it comes into contact with the skin. Some children might believe that smoking fewer cigarettes means that they will not develop lung diseases or cancer. Research shows that smoking as little as one cigarette a day is bad for a person's health, making them nine times more likely to die from lung cancer as a non-smoker.

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 send you into depression as you feel panicky.

CHILDREN'S MISCONCEPTIONS

Children may believe…

- That blood only reaches some parts of the body.
- That the structure of the heart is how they imagine, e.g. romantic heart shaped.
- That the word diet means slimming and reduced calorie intake, rather than the idea that a person's diet is what they eat and drink.
- That you can't get addicted to alcohol.
- That just trying one cigarette is OK.
- The heart lies on the left side of the chest.

Children already know…

- That exercise is good for you from general learning and everyday life.
- That the heart pumps blood around the body.
- That smoking is bad for you.

SCIENTIFIC VOCABULARY: HEALTHY BODIES

You can download a Word mat of essential vocabulary for this topic from *My Rising Stars*.

addiction: an uncontrollable urge to do something as it makes you feel good

aorta: a major artery carrying blood from the heart to the rest of the body

artery: a blood vessel carrying blood away from the heart

atrium: chambers of the heart that receive blood from the veins

blood: the liquid that transports oxygen around the body

capillaries: tiny blood vessels between the end of the arteries and the start of the veins

carbon dioxide: gas released when humans and other living things breathe, or when materials are burned

circulatory system: system of organs and tissues, including the heart, arteries and veins, which circulate blood around the body

de-oxygenated: not containing oxygen

exercise: the activity of exerting your muscles in various ways to keep fit

heart: the organ that pumps blood around the body

lungs: the organ that gathers in air as part of breathing

nicotine: the addictive substance in cigarettes

oxygen: the gas in the air that is needed for respiration

oxygenated: enriched with oxygen

pulse: regular throbbing of the arteries, which can be felt at certain parts of the body such as the wrist

respiration: the process of breathing or taking in oxygen

vein: a blood vessel carrying blood back to the heart

ventricles: chambers of the heart from which blood is forced into the arteries