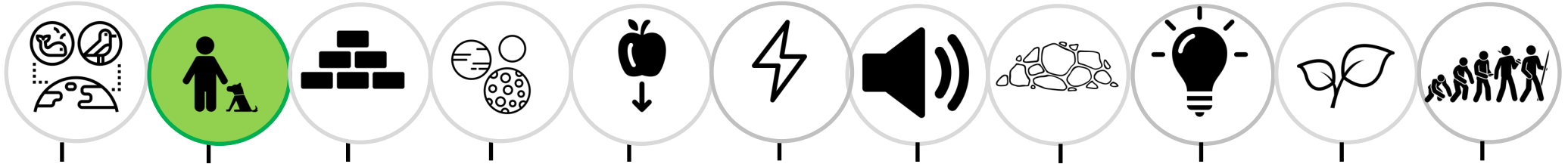
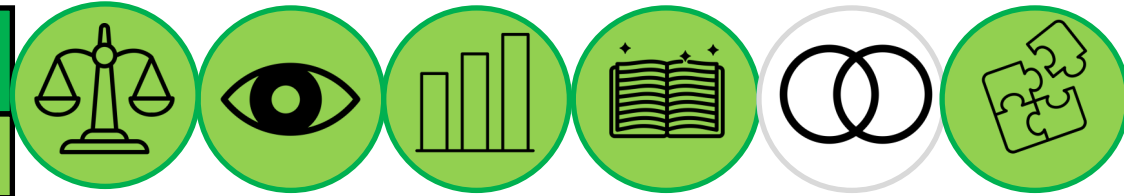


# Year 6: Animals including humans

SCIENTIFIC CONTEXT: Biology



## KEY VOCABULARY:

Circulatory System	A system which includes the heart, veins, arteries and blood transporting substances around the body.
Blood Vessels	The tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels.
Oxygenated blood	Oxygenated blood has more oxygen. It is pumped from the heart to the rest of the body
Deoxygenated blood	Deoxygenated blood is blood where most of the oxygen has already been transferred to the rest of the body
Drug	A substance containing natural or man-made chemicals that has an effect on your body when it enters your system.
Alcohol	A drug produced from grains, fruits or vegetables when they are put through a process called fermentation
Nutrients	Substances that animals need to stay healthy

### Key Questions:

- 1) Can you name the main parts of the human circulatory system?
- 2) Can you describe the function of the heart, blood vessels and blood?
- 3) What is the impact of diet, exercise, drugs and lifestyle on body function?
- 4) Can you describe how nutrients and water are transported around the body?

## As Scientists we will...

Pupils should be taught to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

Pupils should be taught how to recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

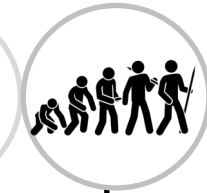
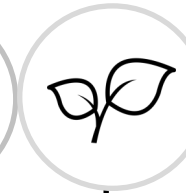
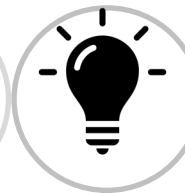
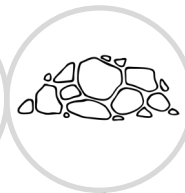
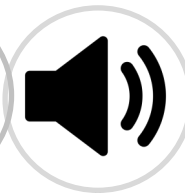
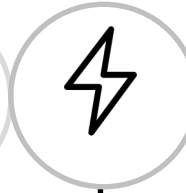
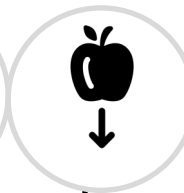
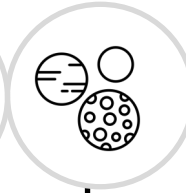
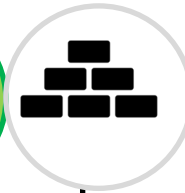
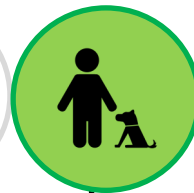
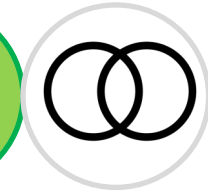
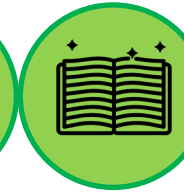
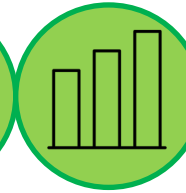
Pupils should be taught how to describe the ways in which nutrients and water are transported within animals, including humans.

**Working Scientifically:** Pupils should be taught how to take measurements using a range of scientific equipment, with increasing accuracy and precision, record data and results using tables, use test result to make predictions to set up further comparative and fair tests and report and present findings from enquiries in oral and written forms such as displays and other presentations.

**Notable Scientist:** Percy Lavon Julian

# Year 6: Animals including humans

SCIENTIFIC CONTEXT: Biology



## What I need to know:

The heart is a very strong muscle that pumps blood to every part of the body via the circulatory system. The waste product of respiration, carbon dioxide, is returned by the heart to the lungs. Blood is carried away from the heart in arteries and back to the heart in veins. These veins divide into smaller tubes called capillaries. This is where respiration takes place in cells and body tissues. Pulse is a measure of heartbeats per minute. The body requires a balanced diet from different food groups to be healthy. These are carbohydrates for energy, proteins for growth, fats for energy and warmth, and vitamins and minerals for healthy body functions. Overeating can lead to excess fat deposits, which can have a negative effect on the body. Under-eating can also lead to health problems. Exercise helps the body to build muscle and strong bones, maintain a healthy heart and lungs, and burn excess fat. It also makes the brain more alert and helps release "feel-good" chemicals in the brain. The term "drug" refers to both prescription and non-prescription substances. Some drugs are legal and others are illegal. Legal drugs are not necessarily "safe". Tar and other chemicals in cigarettes damage the lungs and other organs, causing disease. All drugs affect body function in some way, particularly drugs that target the senses and affect the mind.

## Opportunities for science capital

Invite in doctors/surgeons/nurses to discuss the function of body parts such as the heart.

Invite in personal trainers and/or athletes to discuss the impact of exercise on bodily functions, as well as other lifestyle contributors (e.g. drugs).

Visit We are the Curious in Bristol and attend a science show- How my Body works. This active show explores the lungs, pump blood with a model heart, and how our bodies know when it's time to use the toilet!

Part of science capital includes scientific media consumption- documentaries, reports etc. Here are links that provide daily science news for children. Checking in on these every now and then would be beneficial to help children see science in the wider world.

<https://www.sciencenewsforstudents.org/>

<https://www.sciencejournalforkids.org/>

## Assessment:

By the end of this area of study, children should be able to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

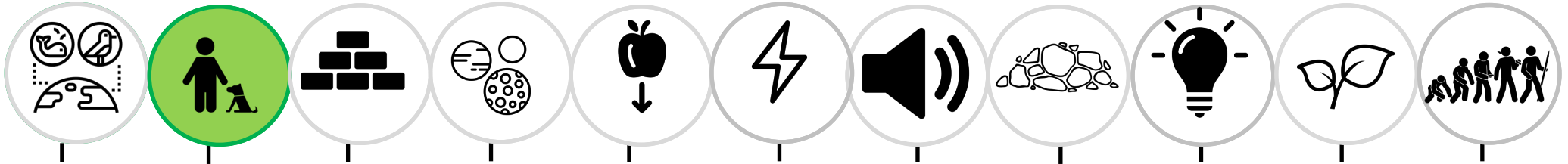
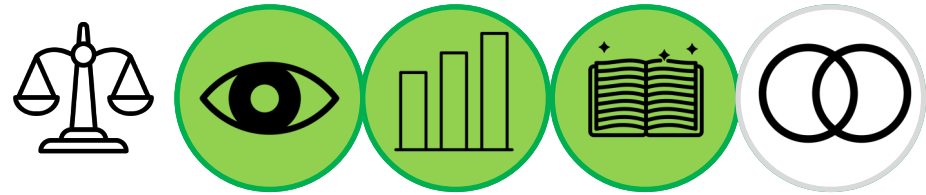
Pupils should be able to describe the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Pupils should be able to describe the ways in which nutrients and water are transported within animals, including humans.

Pupils should be able to take measurements using a range of scientific equipment (with increasing accuracy and precision), record data and results using tables, use test result to make predictions to set up further comparative and fair tests and report and present findings from enquiries in oral and written forms such as displays and other presentations.

# Year 6: Animals including humans

SCIENTIFIC CONTEXT: Biology



## Theme 1: Human circulatory system

### Starter

KWL grid– prompt with questions such as ‘What are the main parts of the human circulatory system?’

### Main

#### **Substantive knowledge**

Introduce key vocabulary using: <https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00335/activities/starter>

Introduce the 4 main parts of the circulatory system: the lungs, the heart, arteries and veins.

These activities focus on the heart and how it pumps blood around the body: <https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00335/activities/main>

Pumping heart model available in school.

**NOTE: questioning includes NC objective of describing how water and nutrients are carried around the body, make a point of highlighting this to children.**

#### **Disciplinary knowledge**

Observation over time

**Working scientifically objectives: taking measurements using a range of scientific equipment, with increasing accuracy and precision, recording data and results using tables.**

Explain to children that the circulatory system has to work harder when exercising so our muscles get more oxygen. How can we prove this? Get children to measure and record their resting heart rate. As a class, chose an exercise and length of time to perform exercise (e.g. jumping jacks for 5 minutes) and create a class list of controlled variables. Get children to complete the exercise and then measure how long it takes for pulse to return to resting. For reliable results, children could perform same test three times and find the average length of time it took for heart rate to return to resting.

How could we investigate this further? List possible further enquiries.

### Plenary / assessment

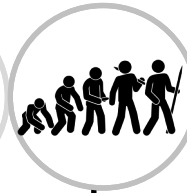
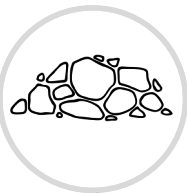
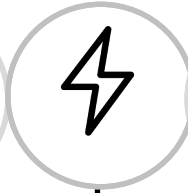
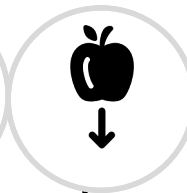
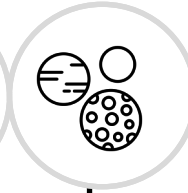
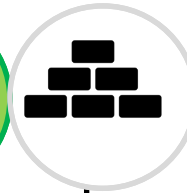
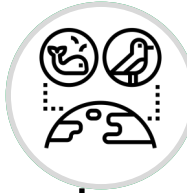
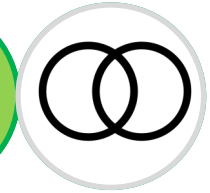
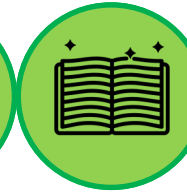
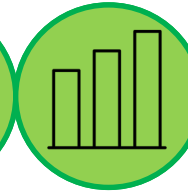
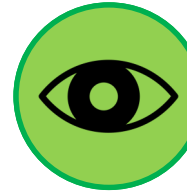
Labelling diagram of circulatory system including its main parts

Odd One Out:

<https://www.tigtagworld.co.uk/film/the-circulatory-system-odd-one-out-PRM00415/>

# Year 6: Animals including humans

SCIENTIFIC CONTEXT: Biology



## Theme 2: Impact of exercise on bodies.

### Starter

Recap:

- 1) Can you name the major parts of the circulatory system?
- 2) What transports blood around our bodies?
- 3) Challenge– draw it!

### Main

#### **Substantive knowledge**

Watch video: <https://www.youtube.com/watch?v=wWGullAa000>

Question: what impact does exercise have on the body? What were the benefits?

Recap learning around the heart: exercise increases heart rate because blood carries oxygen around the body, the muscles need more oxygen during exercise, so your heart works harder to supply more oxygen.

### Plenary / assessment

#### **Disciplinary knowledge**

Comparative/fair test

Working scientifically objective: Use test result to make predictions to set up further comparative and fair tests.

*Today we are going to be cardiovascular scientists.*

**Previous lesson:** measuring pulse rate at rest and after exercise (measuring and recording focus).

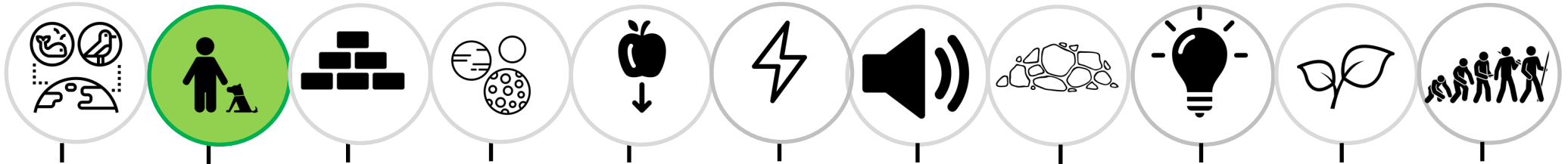
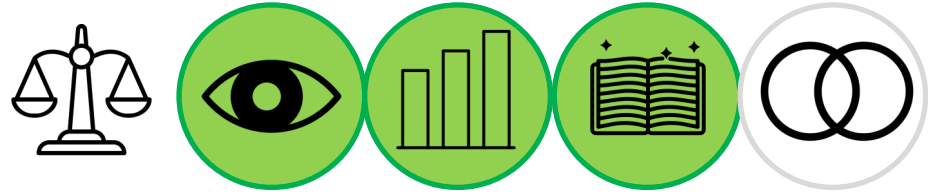
**This lesson:** Discuss previous findings about pulse rate: can be hard to measure, but generally found that pulse rate increases after exercise.

Pose the Big Question: But what if your body is still e.g. headstand, raised arms, balance, yoga pose, plank? Get children to use their results from previous lesson to make a prediction in response to this question. From their predictions and response to big question, children set up comparative/fair tests in groups using planning grid.

See TAPS plan for full plan: [Heart rate pose](#)

# Year 6: Animals including humans

SCIENTIFIC CONTEXT: Biology



## Theme 3: Impact of diet, exercise, drugs and lifestyle on the way their bodies function.

### Starter

Recap:

Give me 5!

You have 5 minutes to list 5 ways exercise impacts the human body.

### Main

#### **Substantive knowledge**

Use link: [https://www.stem.org.uk/system/files/elibrary-resources/2019/10/UKS2\\_Sci\\_Y5\\_6\\_A\\_Spr\\_1\\_%20Human\\_Species\\_S4\\_resources.pdf](https://www.stem.org.uk/system/files/elibrary-resources/2019/10/UKS2_Sci_Y5_6_A_Spr_1_%20Human_Species_S4_resources.pdf)

Set up the starter challenges on each table and get chn to complete all three in pairs or small groups. Come back together and share chn's suggestions and go through each one (see guidance pp. 2-17).

#### **Disciplinary knowledge:**

Research

Now get chn into 'jigsaw gps' to become experts on either diet, exercise & lifestyle, or drugs & alcohol, explaining that they will become a specialist in one and then share their findings in re-grouped 'jigsaw' gps to share this information – see guidance and research information pp.18-26. Oversee the work the gps are doing and guide chn where there may be misconceptions. When chn come together in their new gps (try and ensure these are their 'working gps') to share info, ensure that they are including the key points and again address any misconceptions. **Yr6 expectations are to focus on key messages as well as why these are important for health etc.**

In gps, chn to create a series of adverts/public information posters (see guidance) exploring healthy and unhealthy lifestyles, offering 'expert' advice for others on eating habits, healthy habits and levels and types of exercise that they should be incorporating into their lifestyle on a weekly basis as well as the dangers and importance of drugs (& alcohol). Highlight the importance of understanding the impact of these things on the way that the human body works.

### Plenary / assessment

#### **Disciplinary knowledge**

Working scientifically objective: reporting and presenting findings from enquiries in oral and written forms such as displays and other presentations

Share posters and discuss why it is important to have healthy lifestyles from a young age.