

Subject: Science
Year: 6
Term: 2
Duration: 4
Unit Title: Heart, Lungs and Circulation

Y6 Heart, Lungs and Circulation – Lesson 1

Main focus	Initial teaching	Pupil activity
Describe the heart as an organ that pumps blood as part of the circulatory system.	Begin by giving the children a few minutes to discuss what they know about the heart, lungs and circulation. Collect some of these ideas together by writing them on the board. Make a note of any incorrect ideas that the children have; you can address these in the relevant lesson. Explain that over the next few weeks, they will be learning about what our heart, lungs and blood do in our bodies. Invite them to ask questions; you can note these down and revisit them over the next few weeks.	Show the video <i>How the heart works</i> . (Alternative: Use a picture or draw a diagram of the heart on the board that shows the four <i>chambers</i> and <i>arteries</i> .) Talk about how the <i>blood is pumped</i> through the <i>heart</i> , and <i>travels</i> to the other <i>organs</i> in the body. Explain that the blood doesn't leave our body, but keeps going around this way, through the <i>heart</i> and to the other <i>organs</i> and back again.
Key Vocabulary	Begin by explaining that the <i>heart</i> is responsible for <i>pumping blood</i> around our bodies, and that the <i>heart</i> is actually a <i>muscle</i> , like the ones in the rest of our body.	Have the children draw a diagram of the heart in their books (if using the video, you could pause at around 25 seconds so the children can base their diagram on this). Ask them to label it, then write a few sentences about what the heart does.
heart, organ, blood, circulatory system, circulation, travel, pump, muscle, chamber, arteries, carry, body, heartbeat		
Additional activity: Look at <i>Our beating heart</i> . (Alternative: Use information from a book or fact sheet about the human heart.) Discuss the information in it - is there anything the children did not know? Focus on the information about the pulse; ask children to find their pulse on their neck or wrist. Talk about what they can feel and what it means.		
PLSC Objectives: <ul style="list-style-type: none"> • Understand that the heart is one of the vital organs of the human body. • Explain the role of the heart in moving blood around the body. • Identify their own pulse on the wrist or neck and explain how it relates to their heartbeat. Suggested Resources: Year 6, Our Bodies, Our Bodies 1, Our beating heart Year 6, Our Bodies, Our Bodies 2, How the heart works		

Y6 Heart, Lungs and Circulation – Lesson 2

Main focus	Initial teaching	Pupil activity
Describe the circulatory system as comprising the heart and blood vessels containing blood.	Ask the children to recall what they learned about in last week's science lesson. Call on a few children and check their understanding. Remind them that they learned about how the blood keeps moving through the heart and around the body. Introduce the scientific term for this: <i>circulation</i> . Bring attention to how the first part of this word is like the word <i>circle</i> to help them remember it. Ask the children to repeat the word <i>circulation</i> a few times. Explain that because of this word, there is a special name for the parts of our body that help blood move, and that it is called the <i>circulatory system</i> . Ask them to repeat this phrase, too.	Tell the children that the <i>circulatory system</i> is made up of the <i>heart</i> , <i>arteries</i> and <i>veins</i> , and that <i>arteries</i> and <i>veins</i> together are sometimes called <i>blood vessels</i> . Encourage them to look at their wrists, hands and arms; they may be able to see their veins! Show the video <i>Circulation map</i> . (Alternative: draw a diagram with the heart in the middle, and arteries travelling around the head, lungs and digestive system.) Explain again that the <i>blood</i> travels around the <i>body</i> , back to the <i>heart</i> , through the lungs, and around the <i>body</i> again. Ask the children to draw a 'map' in their books and label it, to show how the blood moves around the body.
Key Vocabulary		
circulatory system, circulation, heart, veins, arteries, blood vessels, muscles, pump, body, heartbeat, organ		
Additional activity: Show the poster <i>Circulating Blood</i> . Discuss why we have three types of blood vessel (<i>artery</i> , <i>vein</i> , <i>capillary</i>) that are different sizes (i.e. that different organs and parts of the body need different amounts of blood to do their jobs).		
PLSC Objectives: <ul style="list-style-type: none"> • Describe the heart as part of the wider circulatory system. • Explain what blood vessels are. • Understand that blood vessels and veins exist throughout the human body. Suggested Resources: Year 6, Our Bodies, Our Bodies 2, Circulation map Year 6, Our Bodies, Our Bodies 2, Circulating blood		

Y6 Heart, Lungs and Circulation – Lesson 3

Main focus	Initial teaching	Pupil activity
Understand that water and nutrients are transported around our bodies in blood. Investigate how pulse rate changes with exercise and explain the reason for the change in terms of transporting oxygen and nutrients to muscles.	Discuss with the children what they remember about the <i>circulatory system</i> – what it is made up of, what job it does, etc. Recall that last time, the children learned about how blood was transported throughout the body. This lesson will focus on what job our blood does. Show the video <i>Blood</i> . (Alternative: show an image/drawing of red and white blood cells moving through an artery.) Explain that these blood cells are <i>microscopic</i> – just like all other cells, we cannot see each one with our eyes. Ask the children to identify what the blood cells are moving through (an <i>artery</i>). Explain that the ones we can see the most of are called red <i>blood cells</i> , and that their job is to transport <i>oxygen</i> around the body. Remind the children that humans and animals need <i>oxygen</i> to survive – that we breathe it into our lungs, and it is transported around our bodies, where organs use it. As well as this, <i>blood</i> picks up <i>nutrients</i> and <i>water</i> , which it also moves to our organs.	Start by asking the children to feel their <i>pulse</i> ; note how fast it is, and to notice their breathing. Ask them to count how many beats they feel over one minute, and write it down in their books. Then, ask all children who are able to stand up and run on the spot for one minute. (If a child is unable, ask them to do another activity that will cause their pulse to rise, if it is safe for them to do so.) When they stop, ask them to notice their breathing; it should be <i>faster</i> and shallower. Ask them to feel their pulse; it should also be <i>faster</i> than before. Have them count for another minute, then write the new number next to the first one. How much has it changed? Ask them to write down in their books what is happening to their heart when they <i>exercise</i> . Then, have them think about and write down why our breathing becomes faster – do we take in more or less <i>oxygen</i> when we do this? Why?
Key Vocabulary		
blood, blood cells, water, nutrients, transport, body, pump, beat, pulse, faster, slower, exercise, harder, muscles, transport, microscopic		
Additional activity: Watch <i>Blood's journey</i> . Ask the children to talk to their partner and summarise the facts that it talks about. Ask the children to create a poster using this information.		
PLSC Objectives: <ul style="list-style-type: none"> • Describe the blood as carrying water and nutrients to different parts of the body. • Identify how pulse changes with physical activity and suggest reasons for this. • Consider how the body's need for nutrients changes with exercise. 		

Suggested Resources: Year 6, Our Bodies, Our Bodies 2, Blood
Year 6, Our Bodies, Our Bodies 2, Blood's journey

Y6 Heart, Lungs and Circulation – Lesson 4

Main focus	Initial teaching	Pupil activity
<p>Describe the lungs as being located in the thorax and as the organs used for breathing. Distinguish between and correctly use the terms breathing (ventilation of the lungs) and respiration (how oxygen is used by the body once it reaches organs).</p>	<p>Briefly recap what has been learned so far with the children, asking the children to recall information wherever possible. Ask whether the children can remember which <i>organs</i> we use in <i>breathing</i>. Explain that the <i>lungs</i> are the part of the body which we use to breathe, and they are located in what is called the <i>thorax</i> – the space around our <i>ribs</i>. Remind them that they have learned that one of the jobs of our bones is to <i>protect organs</i>, and that the <i>ribs</i> are very important as they protect both our <i>heart</i> and <i>lungs</i>.</p>	<p>Demonstrate how the lungs expand and contract by blowing into a plastic bag or balloon. The children could also do this as an activity in groups. Explain that the hole in the top of the bag/balloon does the job of our <i>mouth</i> and <i>nose</i> by allowing the air into the <i>lungs</i>. Blow <i>air</i> into the bag/balloon, and explain that as our <i>lungs</i> fill with <i>air</i>, they expand. Allow some of the <i>air</i> to leave, and demonstrate that our lungs do the same – they do not lose all of the space inside, but are no longer stretched. Explain that we know this process as <i>breathing</i>. When the body uses the oxygen in its different organs, this is called <i>respiration</i>.</p> <p>Have the children draw a diagram of the body in their books, labelling the <i>mouth</i>, <i>nose</i> and <i>lungs</i>. Ask them to write a few sentences that define the words <i>breathing</i> and <i>respiration</i>.</p>
<p>Key Vocabulary</p>		
<p>organs, lungs, breathing, thorax, muscles, ribs, protect, oxygen, air, mouth, nose, respiration</p>		
<p>Additional activity: Ask the children to create a new diagram in their books that is as large as possible. It should show the <i>mouth</i>, <i>nose</i>, <i>lungs</i>, <i>heart</i> and some <i>arteries</i>. The location of the arteries does not need to be very accurate, but it should show the idea that <i>blood vessels</i> are present throughout the body.</p>		
<p>PLSC Objectives:</p>		

- Identify the lungs and where they are located in the human body.
- Understand breathing as the process of our lungs filling and emptying with air.
- Understand respiration as the process of our bodies using oxygen.

Digital Resources: N/A

Y6 Heart, Lungs and Circulation – Lesson 5

Main focus	Initial teaching	Pupil activity
<p>Understand that air is a mixture of gases, including oxygen. Understand that blood picks up oxygen from the lungs and transports it through blood vessels to organs of the body.</p>	<p>Explain that for the children’s final lesson, they will be looking at how <i>oxygen</i> moves around the body. First, discuss how <i>air</i> contains <i>oxygen</i>, but also a <i>mixture</i> of other <i>gases</i>. The air we breathe also contains pollution from the environment, dust and pollen from plants. Germs can also be transported through the air. When we <i>breathe</i>, we take <i>oxygen</i>, along with all of the other things in <i>air</i>, into our <i>lungs</i>. The oxygen then travels to tiny sacs in the lungs called alveoli. From there, it is pumped around the <i>body</i>.</p>	<p>Revisit the video <i>Circulation map</i>, or the drawing or picture you used in Lesson 2. Explain that this showed us some of the organs that <i>blood</i> travels to, but that, actually, all of our <i>organs</i> need <i>oxygen</i> to work properly. Have the children act out the circulatory system as a class; do this outside if you need additional space. Nominate 4 children to be the heart (one for each chamber), two for the lungs, and one each for the head and digestive system. The rest will act as blood. The children could write their job on a piece of paper and hold it, or stick it to themselves. You will need two sets of objects – these could be balls, beanbags or books, for example; these will be your <i>oxygen</i> and <i>carbon dioxide</i>. Have the children acting as organs stand in relevant places. One at a time, have the children acting as blood go to the heart, where they will be ‘passed’ around the four children. They then walk to the lungs, where they are given</p>
<p>Key Vocabulary</p>		
<p>air, gas, mixture, oxygen, transport, body, blood vessels, lungs, heart, organs, breathing</p>		

		<p>the object representing oxygen. They then go to an organ, where they swap the 'oxygen' for 'carbon dioxide'. They then return to the children acting as the heart, back to the lungs and swap the 'carbon dioxide' for more oxygen, and repeat the process.</p> <p>This will help children to visualise how blood moves around the body and what it transports.</p>
<p>Additional activity: Ask the children to write a short paragraph based on what they have done in class, explaining how and why blood is moved around the body.</p>		
<p>PLSC Objectives:</p> <ul style="list-style-type: none"> • Describe air as not only comprising of oxygen. • Understand that blood takes oxygen from the lungs. • Describe the journey of oxygen throughout the human body. <p>Digital Resources: Year 6, Our Bodies, Our Bodies 2, Circulation map</p>		