



# The Human Heart

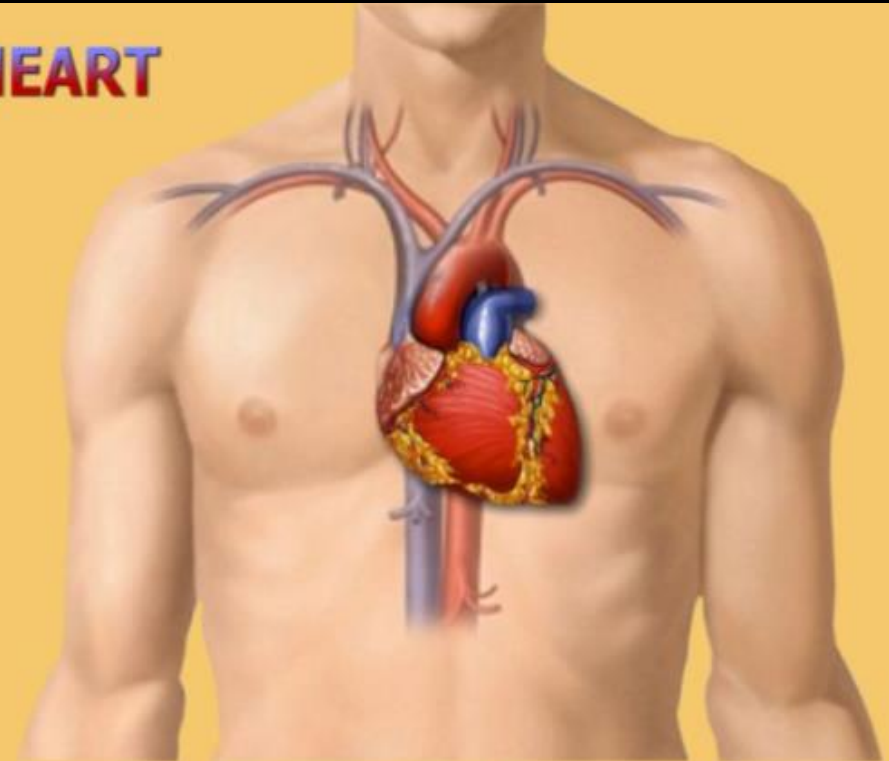
Science Live Lesson Week Beginning 1/3/21



What do we  
already know  
about the  
heart?

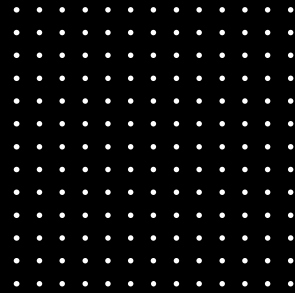
- Where is your heart?  
Your heart is in the middle of your chest and is slightly tilted meaning more of it lies to the left of the breastbone (sternum).

## THE HEART





What do we  
already know  
about the  
heart?



- What is your heart?

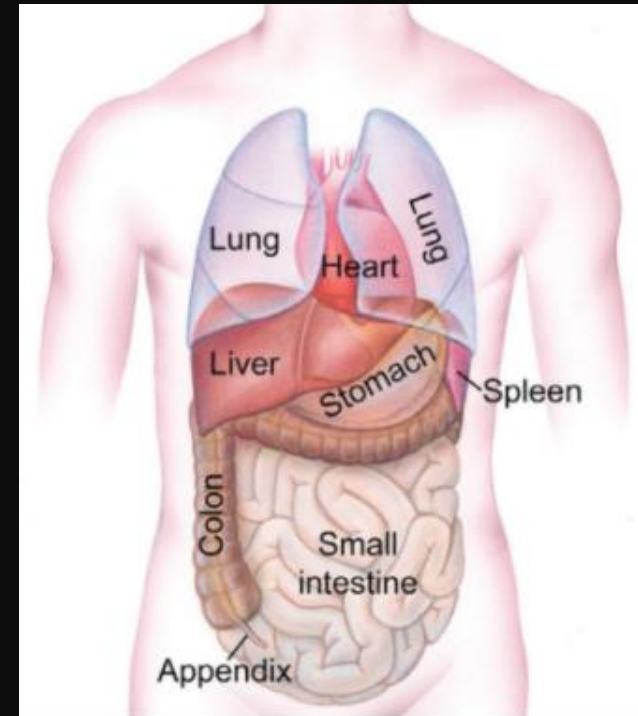
Your heart is a fist-sized organ which continuously pumps blood. With each heartbeat, the **heart** sends blood throughout your body, carrying oxygen to every cell.



# Location of the heart relative to other organs.

The heart sits between and behind the lungs.

It is protected by the ribcage and the sternum.



# What is your heart made of?

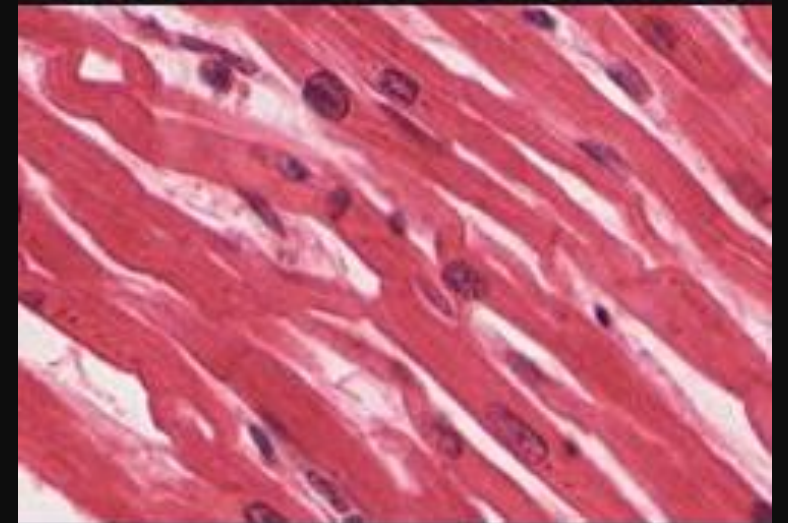
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Your heart is made of a special type of muscle that continuously contracts and relaxes without getting tired.

This is called CARDIAC muscle.

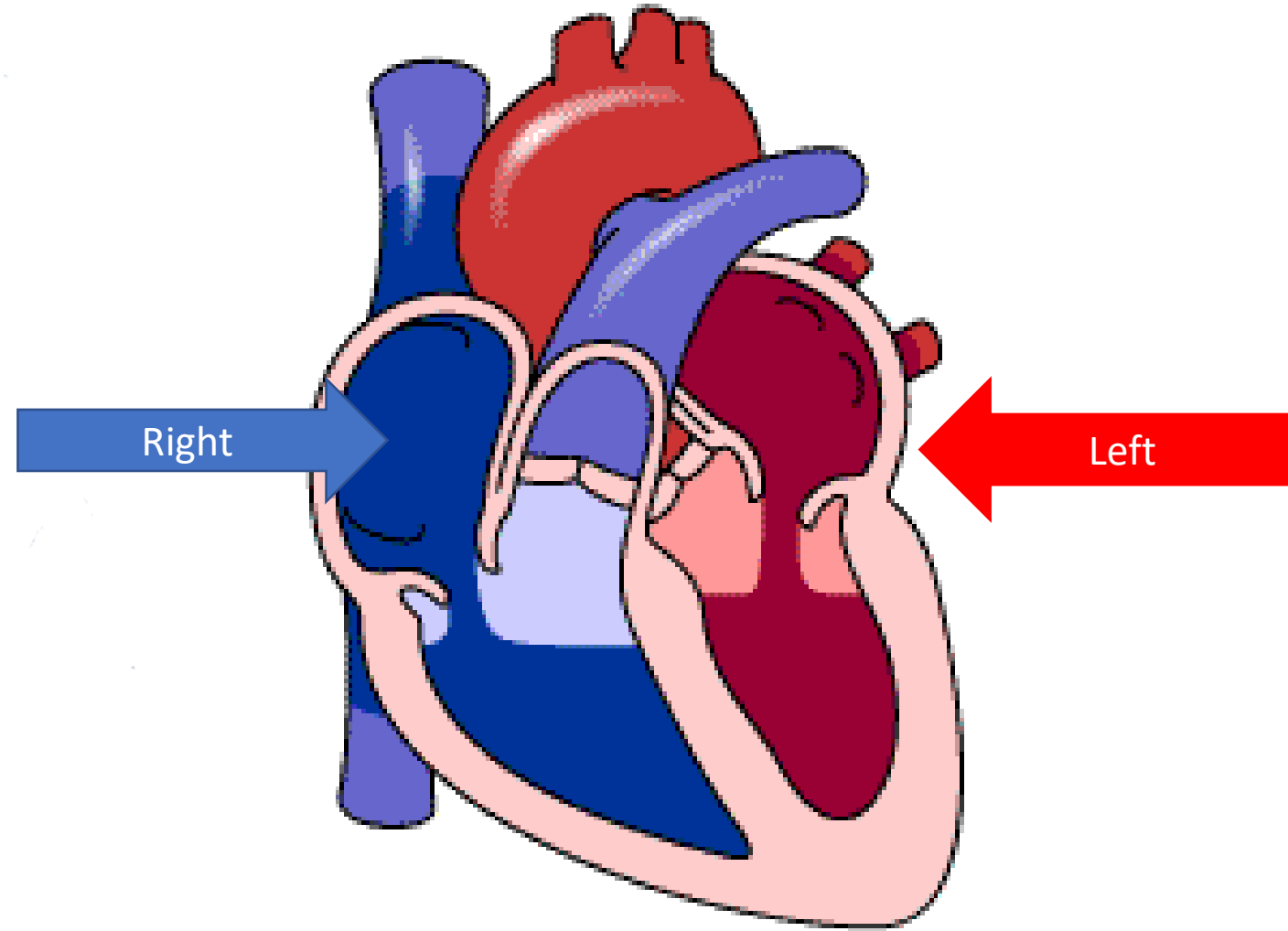
CARDIAC muscle is involuntary muscle meaning that you have no conscious control over it.

This is different to skeletal muscles which are voluntary meaning that you can decide how and when to move them.



The heart is drawn as if it is facing you. The right side of the heart (as it is in your chest) is this side...

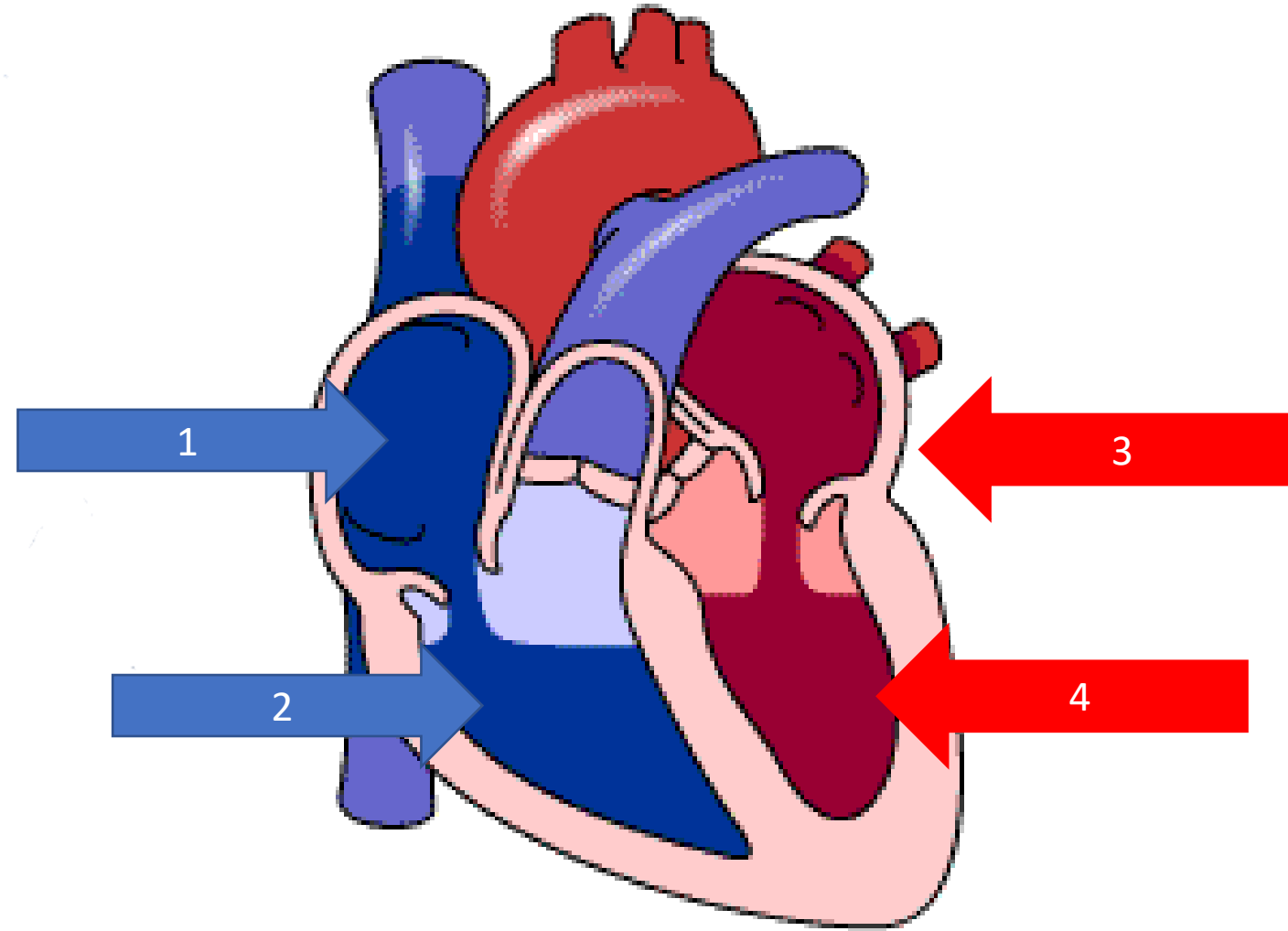
# The structure of the heart



...and the left side of your heart as it is in your chest is this side...

## The heart has FOUR CHAMBERS

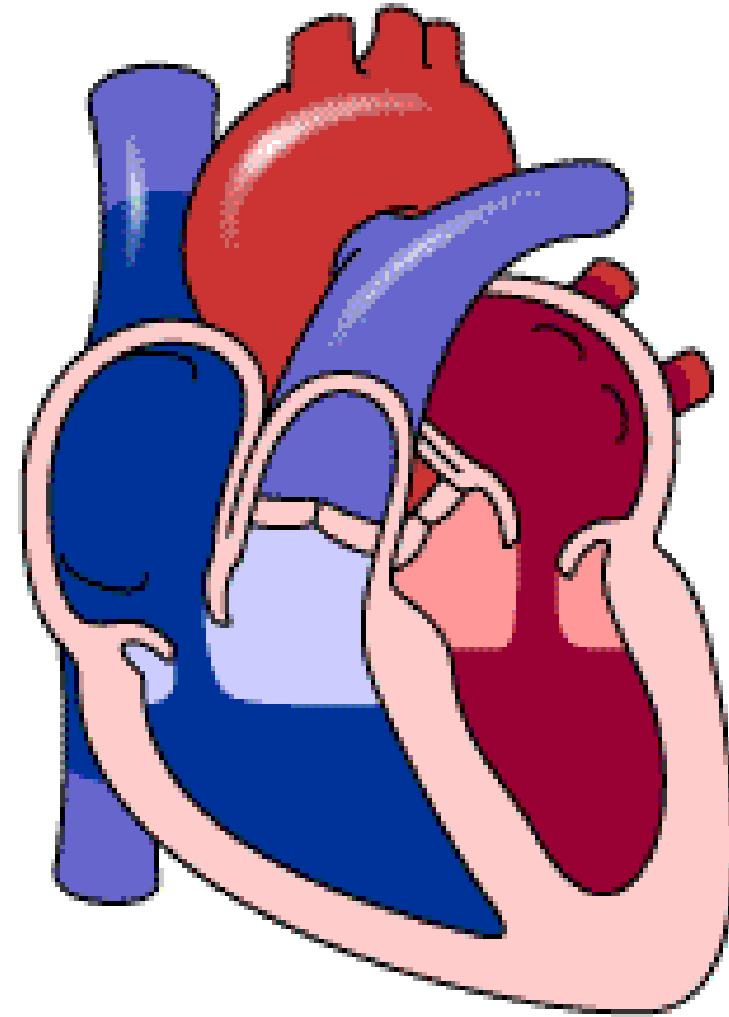
A heartbeat is the time taken for both top and bottom chambers to contract



The top two chambers fill with blood first and contract forcing blood into the bottom two chambers. The bottom chambers then contract pumping blood out of the heart.

A complete  
heartbeat takes  
about one  
second

A heart beat has two parts. First the top chambers contract then the bottom chambers contract.



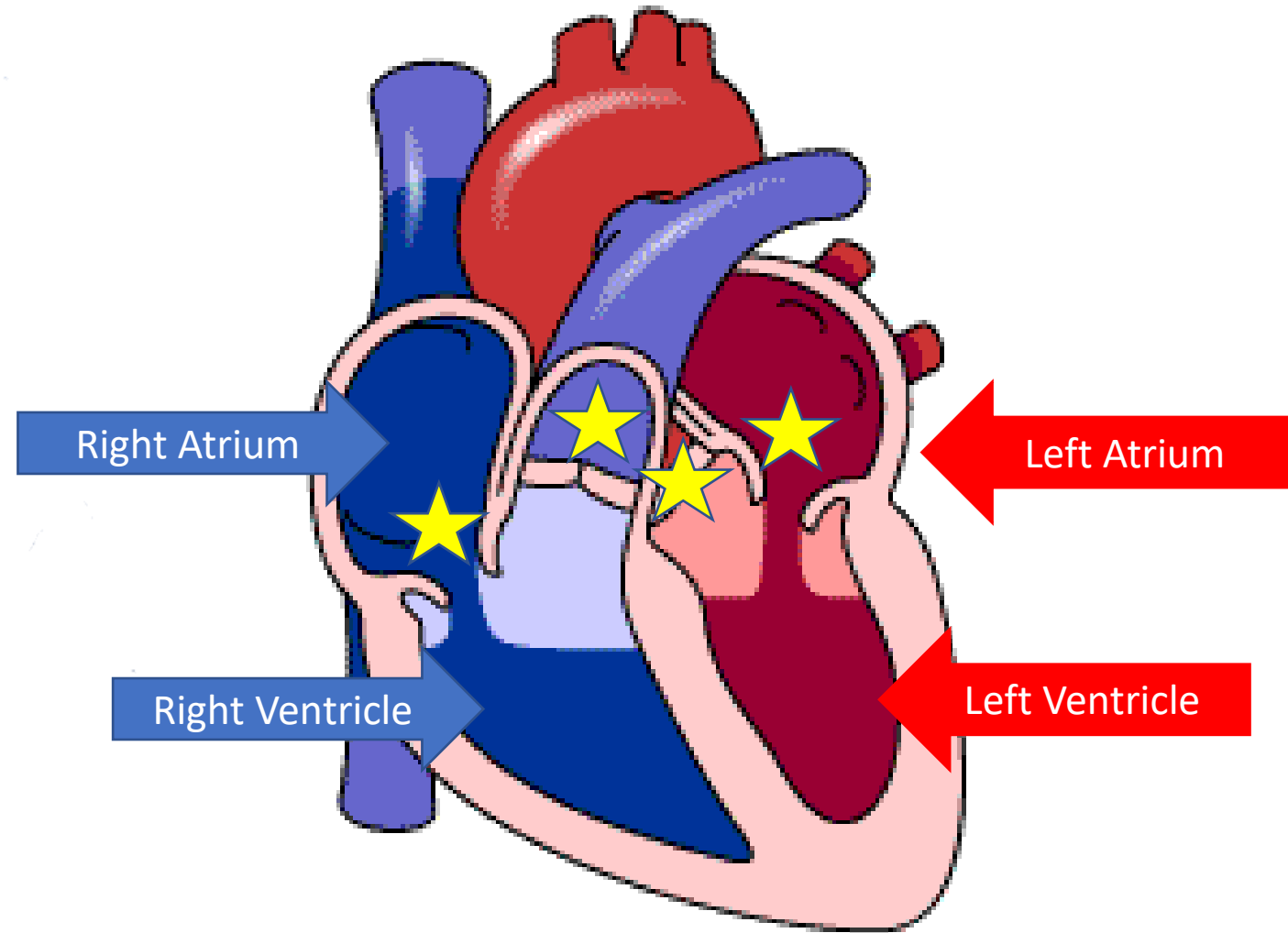
It is these two  
contractions  
that we hear  
and recognise  
as a heartbeat.

A heartbeat is the total time taken for the heart to fill and empty again.



These 4 chambers have names.

# The structure of the heart

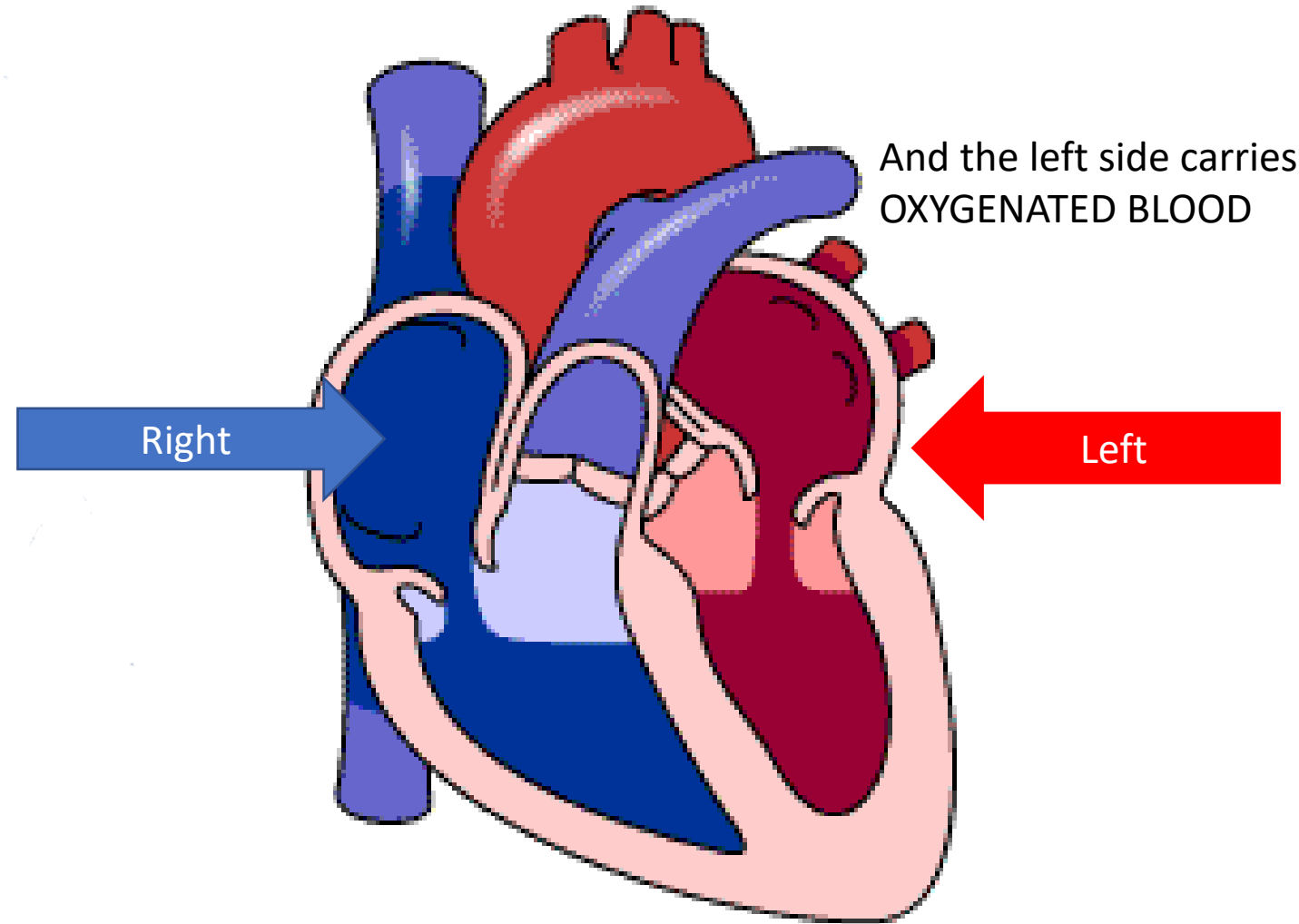


Notice that each chamber has a valve.

These valves ensure blood cannot flow in the wrong direction.

Now we are going to look at the differences between the right and left side

The right side of your heart carries  
DEOXYGENATED BLOOD



And the left side carries  
OXYGENATED BLOOD

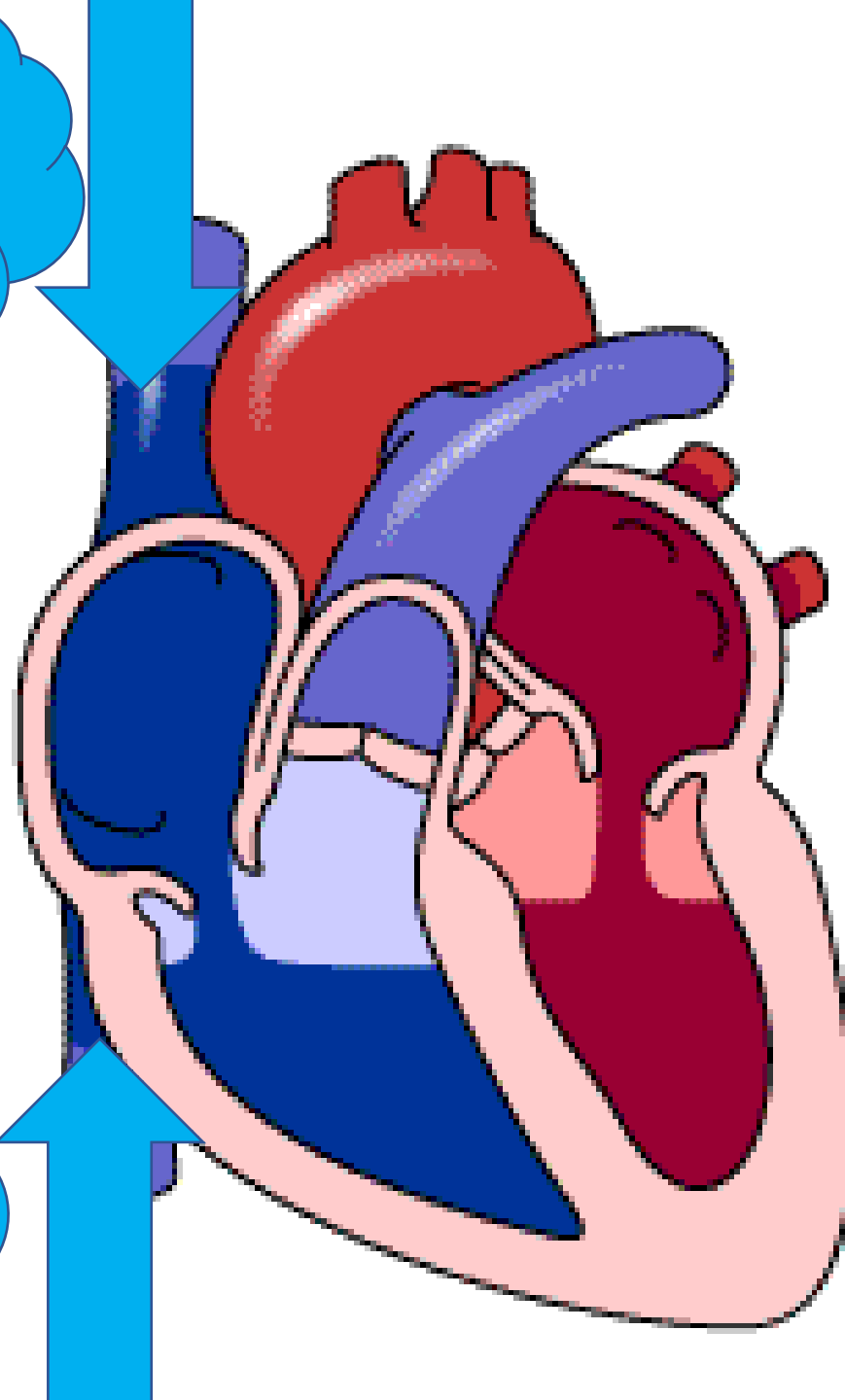
One way to help you remember this is that the word deoxygenated has more letters than oxygenated and right has more letters than left.

Deoxygenated  
blood from the  
upper body  
VEINS

## Two types of blood enter the heart

Blood with no oxygen in  
it is usually drawn in  
blue. It is **NOT** blue. It is  
a dark red colour.

Deoxygenated  
blood from the  
lower body  
VEINS



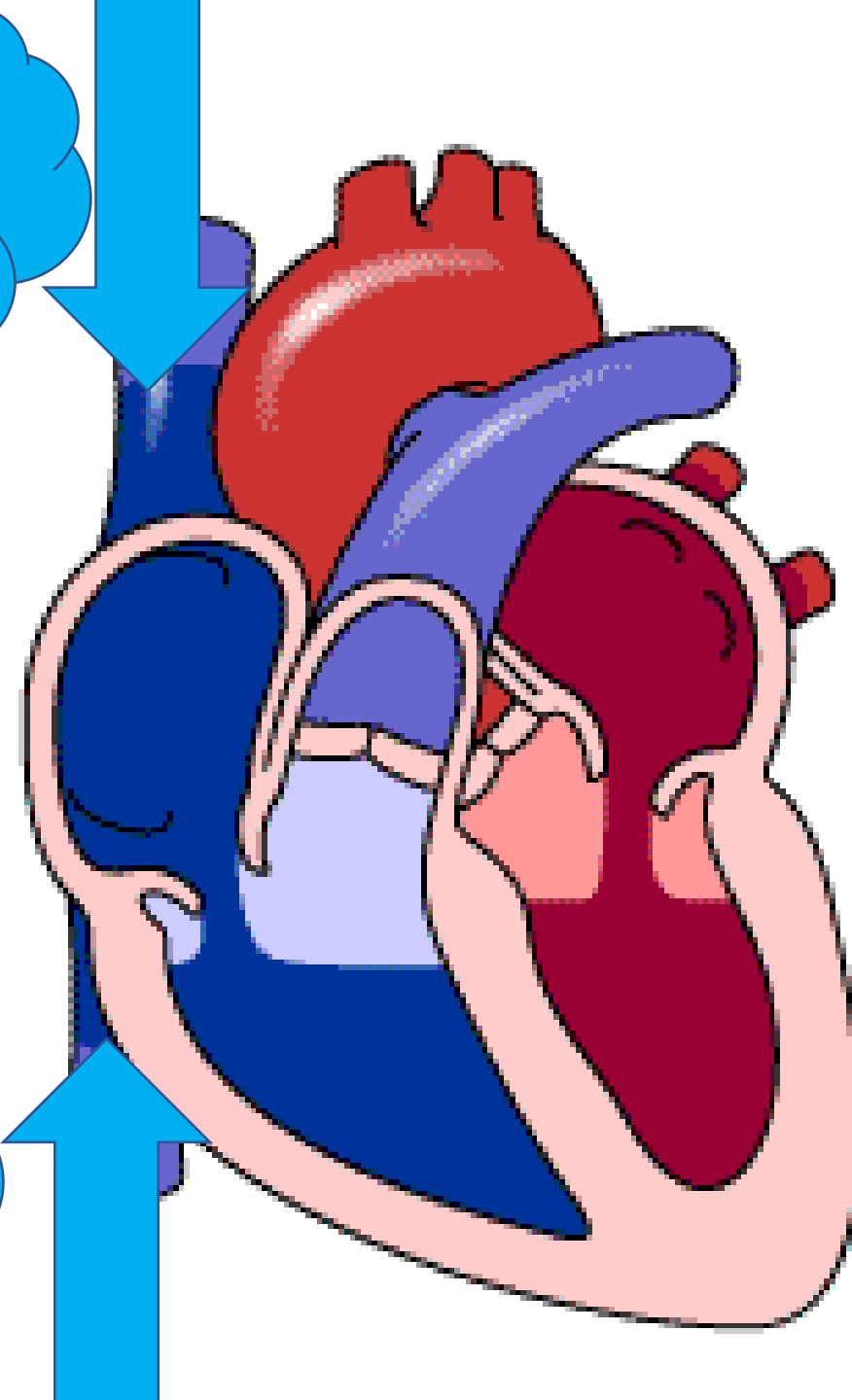
Oxygenated  
blood from the  
lungs

Blood with oxygen in it is  
usually drawn in red.  
Oxygenated blood **IS**  
bright red.

# The Vena Cava

Superior (top)  
Vena Cava

Inferior (bottom)  
Vena Cava



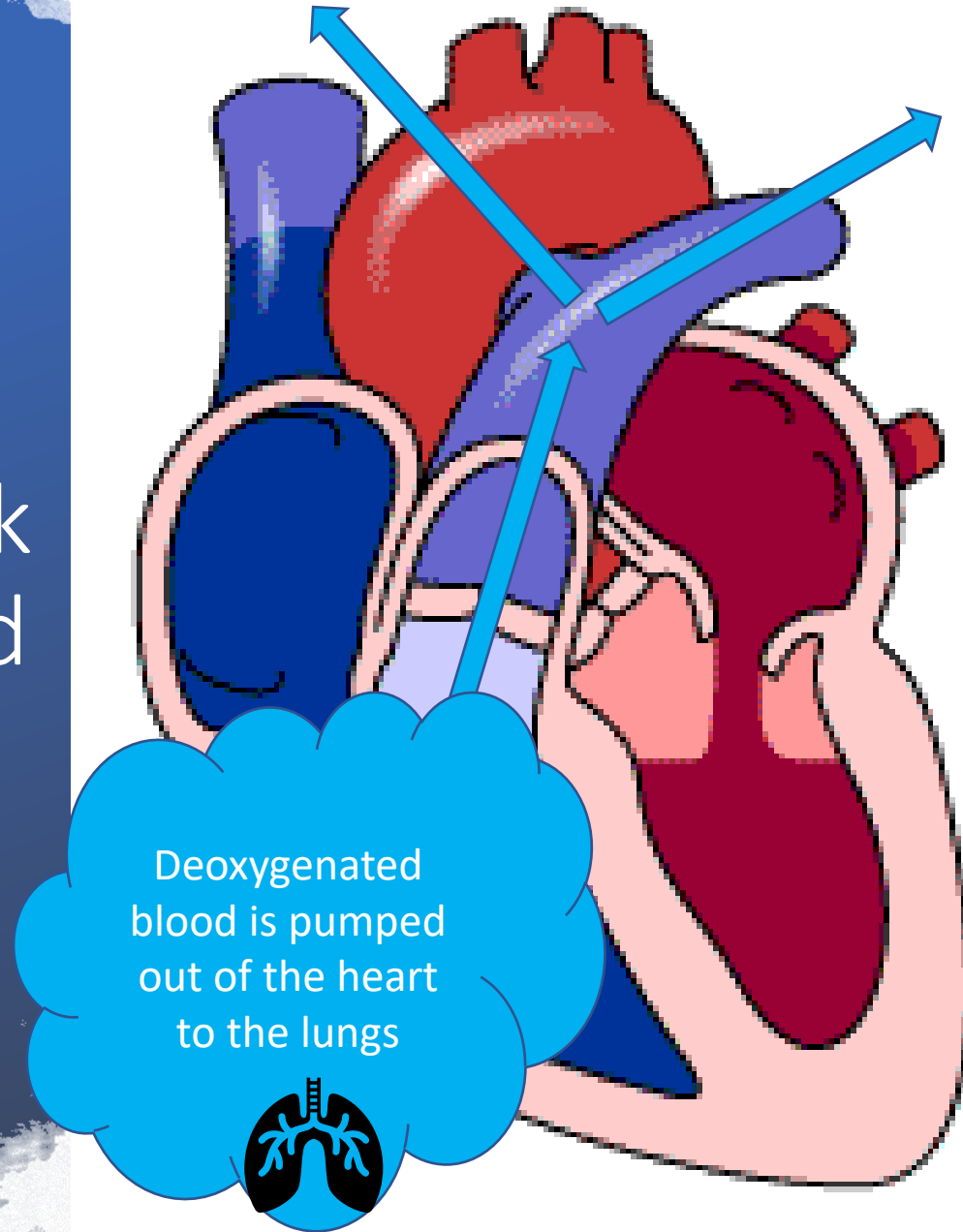
The two largest veins carrying deoxygenated blood back to the heart are called the superior and inferior vena cava.

The name is latin. Vena = vein and Cava = hollow.

Two types of blood leave the heart – let's look at deoxygenated blood first

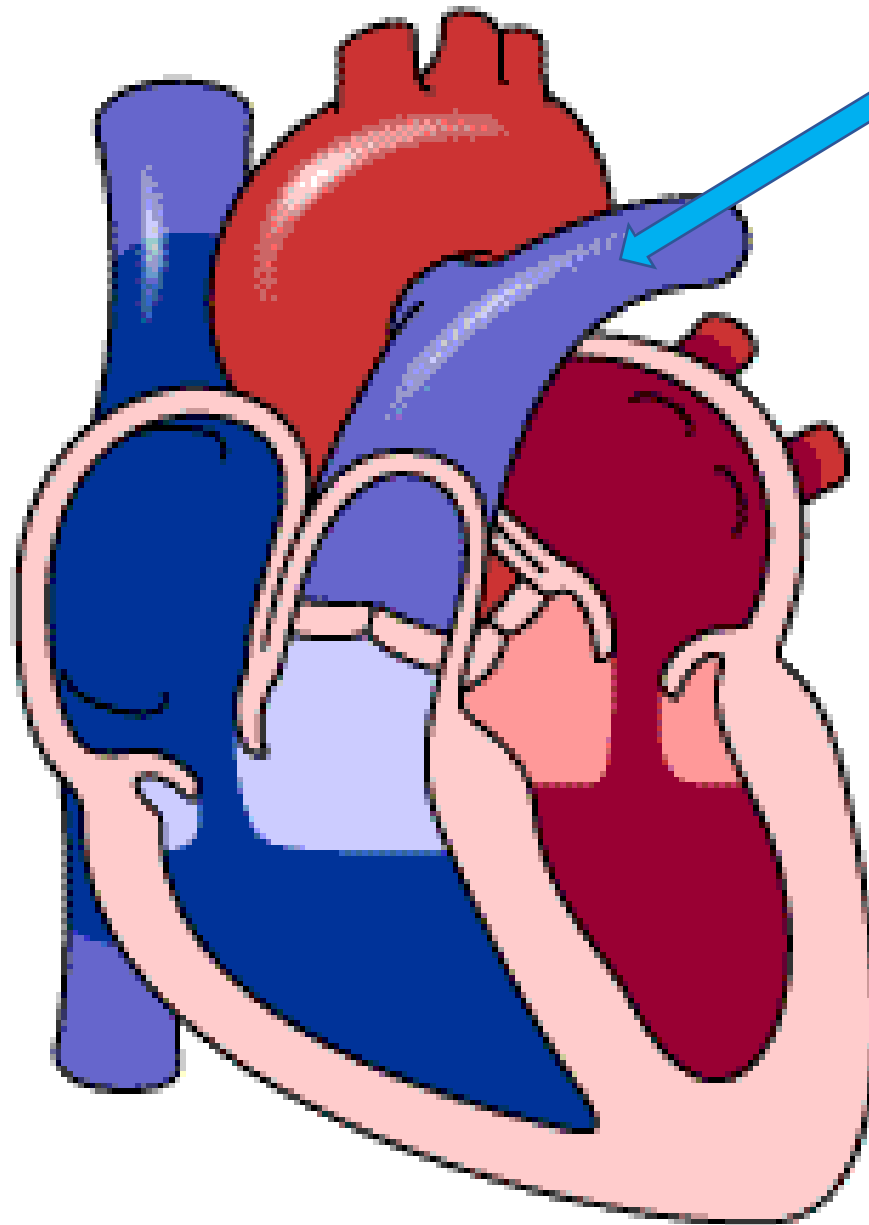
Blood to the right lung

Blood to the left lung



Deoxygenated blood is pumped out of the heart to the lungs

# The pulmonary artery



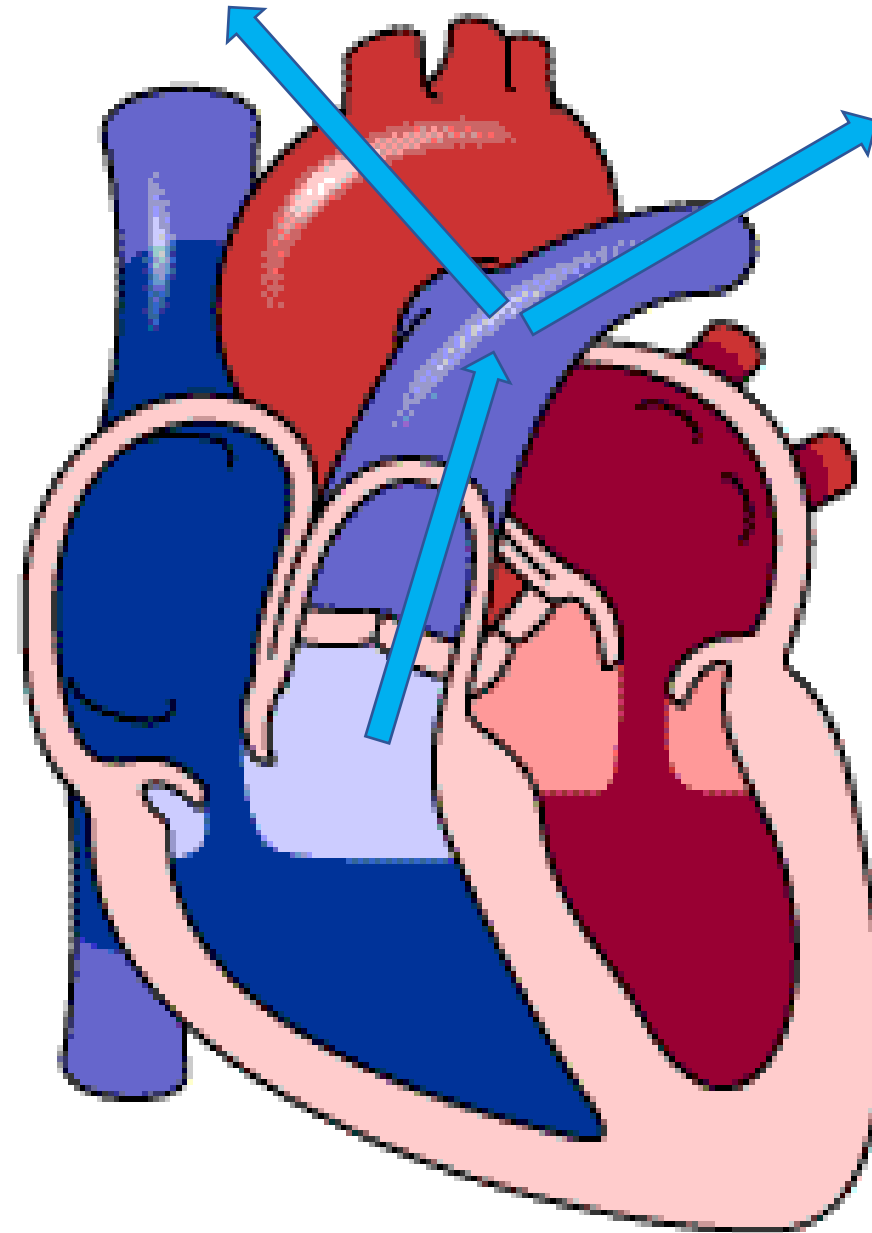
The large blood vessel carrying blood to the lungs is called the PULMONARY ARTERY.

It is an artery because it is carrying blood AWAY from the heart to the lungs.

It is special because it is the **only artery which carries deoxygenated blood.**

After going to the lungs blood returns to the heart

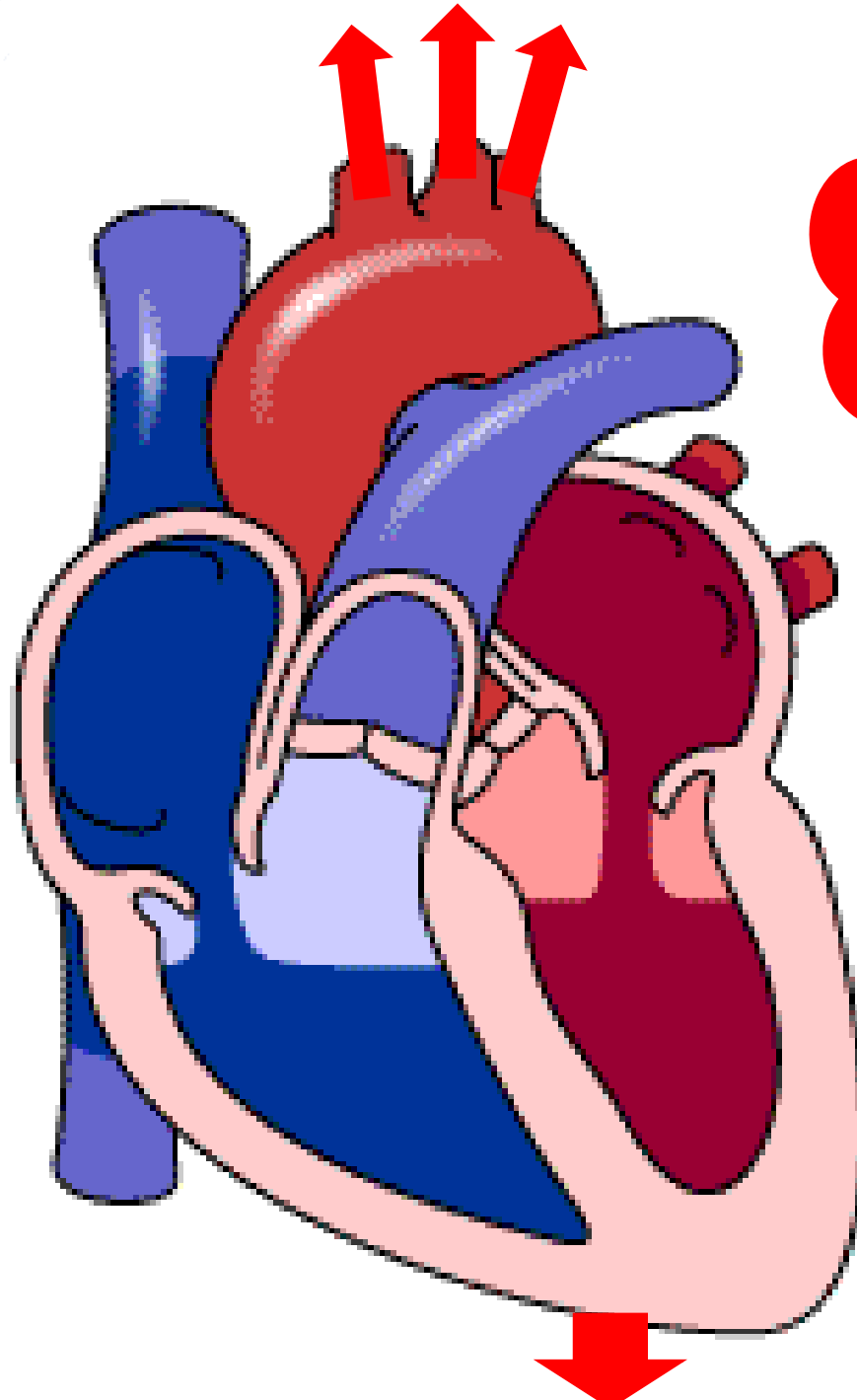
Blood to the right lung



Blood to the left lung

Once the blood has been to the lungs it is freshly oxygenated from the air we breathe and it returns to the heart to be pumped round the body.

Two types of blood leave the heart – now let's look at oxygenated blood



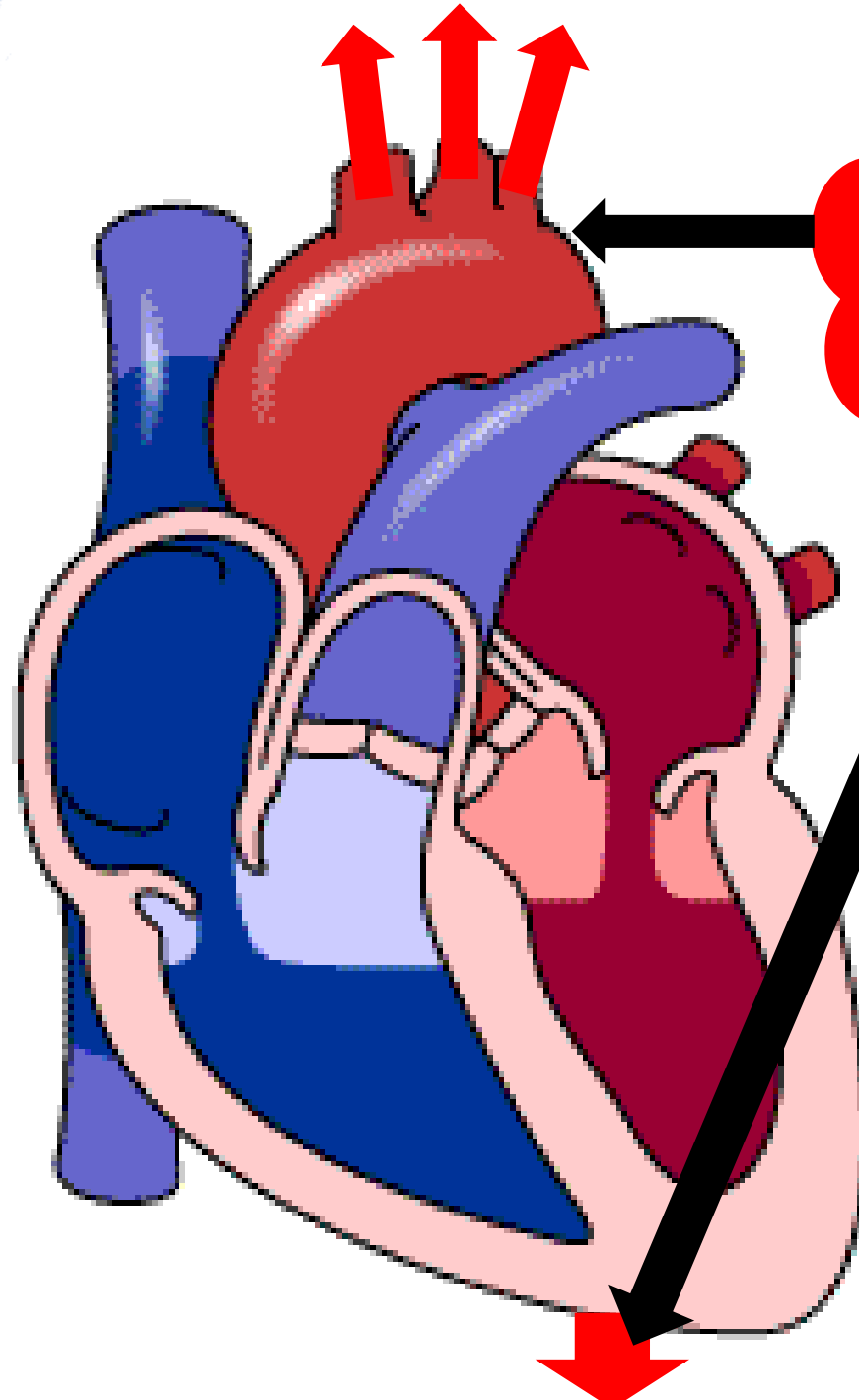
Freshly oxygenated blood is pumped away from the heart to the rest of the body

This oxygenated blood is carried away from the heart in **ARTERIES**

A = arteries  
A = away



# The Aorta



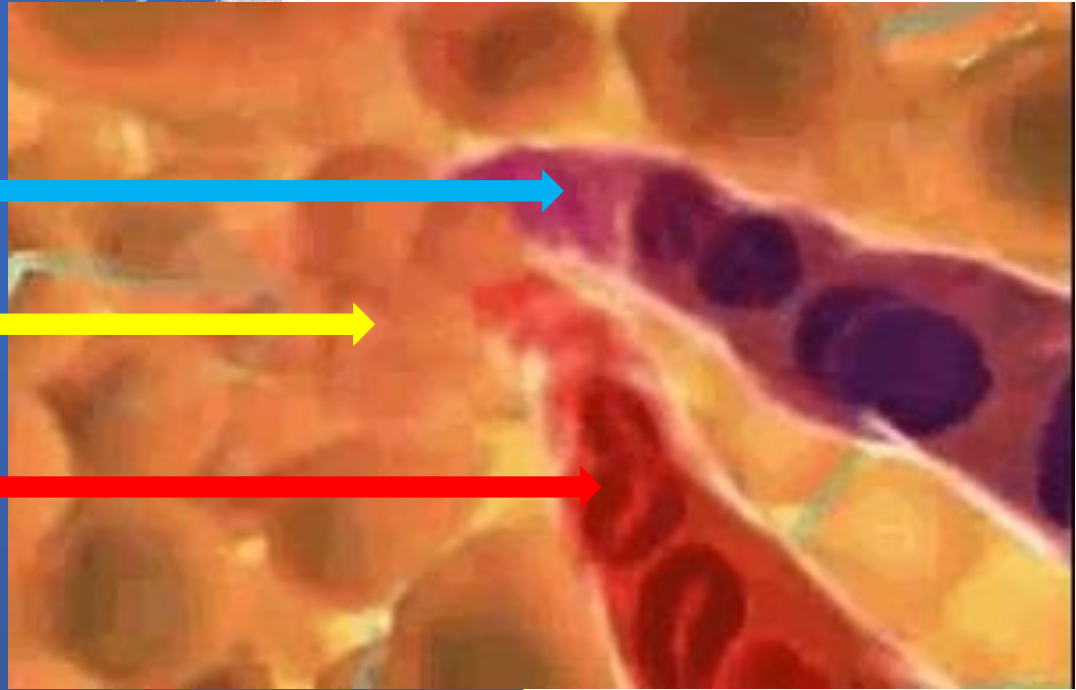
The largest artery in the body taking blood away from the heart is called the AORTA

Amazingly, it only takes about 20 seconds for **one red blood cell** to go round the whole **body**. Red **blood cells** last approximately four months (120 days) before your **body** renews them.

Deoxygenated blood in a capillary returning to a bigger vein

Body cells

Oxygenated blood in a capillary taking oxygen to the cells of the body



# The Capillaries

Amazingly, it only **takes** about 20 seconds for **one red blood cell** to go round the whole **body**.

**Red blood cells** last approximately four months (120 days) before your **body** renews them.

Capillaries are the smallest blood vessels in the body.

Arteries carry oxygen into tiny capillaries which deliver oxygen to the cells of the body.

These capillaries then feed into bigger and bigger veins carrying deoxygenated blood back to the vena cava and then to the heart.

# Video – Operation Touch The Heart

- <https://www.youtube.com/watch?v=DB5HxSPGVp0>

# recap questions

- Where is the heart? In the middle of the chest slightly over to the left, between the lungs and behind the sternum.
- What size is the heart? The size of your clenched fist.
- What kind of muscle is the heart made from? Cardiac muscle.
- How many chambers does the heart have? Four.
- The right side of the heart fills up with deoxygenated blood. True or False? True.
- Veins carry deoxygenated blood. True or False? True.
- What blood vessels carry oxygenated blood AWAY from the heart? Arteries.

- Where does blood go to become oxygenated? **The lungs**
- Where does blood return to straight after becoming oxygenated? **The heart**
- Why does a heartbeat have two parts, boom boom?

**The first boom is the sound of the two top chambers contracting and the second boom is the sound of the two bottom chambers contracting.**

- On average how long does a single heartbeat take? **One second**
- What is present in each of the four chambers of the heart to stop blood flowing backwards? **Valves**
- What are the smallest blood vessels called? **Capillaries**
- How long does it take a single blood cell to travel around the body? **20 seconds**
- How long do blood cells live? **120 days or four months**
- Where are new blood cells made? **Bone marrow**



Register

Health and Technology  
Healthy Heart

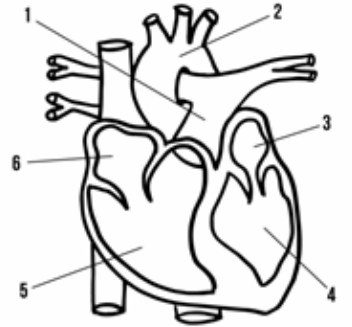
I. Match each of the words in the word bank to its correct description.

Artery	Sternum
Capillary	deoxygenated
Four	Aorta
Heart	Valve
Vena Cava	Vein

	The bone the heart sits behind
	Structure made of flaps that prevents backflow of blood
	The name for blood that has no oxygen
	Blood vessel that carries blood towards the heart
	Number of chambers of the heart
	Muscular organ that pumps blood around the body
	Tiny blood vessels that allow nutrients and oxygen to pass from blood to tissues
	Blood vessel that carries blood away from the heart
	The largest artery carrying blood away from the heart
	The largest vein carrying blood to the heart.

- How long on average does it take for a single blood cell to travel around the body?
- How long do blood cells live?
- Where are new blood cells made?
- Label the diagram of the heart.

PULMONARY ARTERY  
AORTA  
LEFT ATRIUM  
LEFT VENTRICLE  
RIGHT VENTRICLE  
RIGHT ATRIUM



The independent task this week can be found on the WHEC home learning hub and on the Teams page under files and class materials.