6-Jan-26

Body Systems

S2 Biology

Today's Learning Intention is

To find out about the skeletal system.

By the end of this lesson I will be able to…

- ✓ Describe the function of the skeleton.
- ✓ Give the names of some bones in humans.

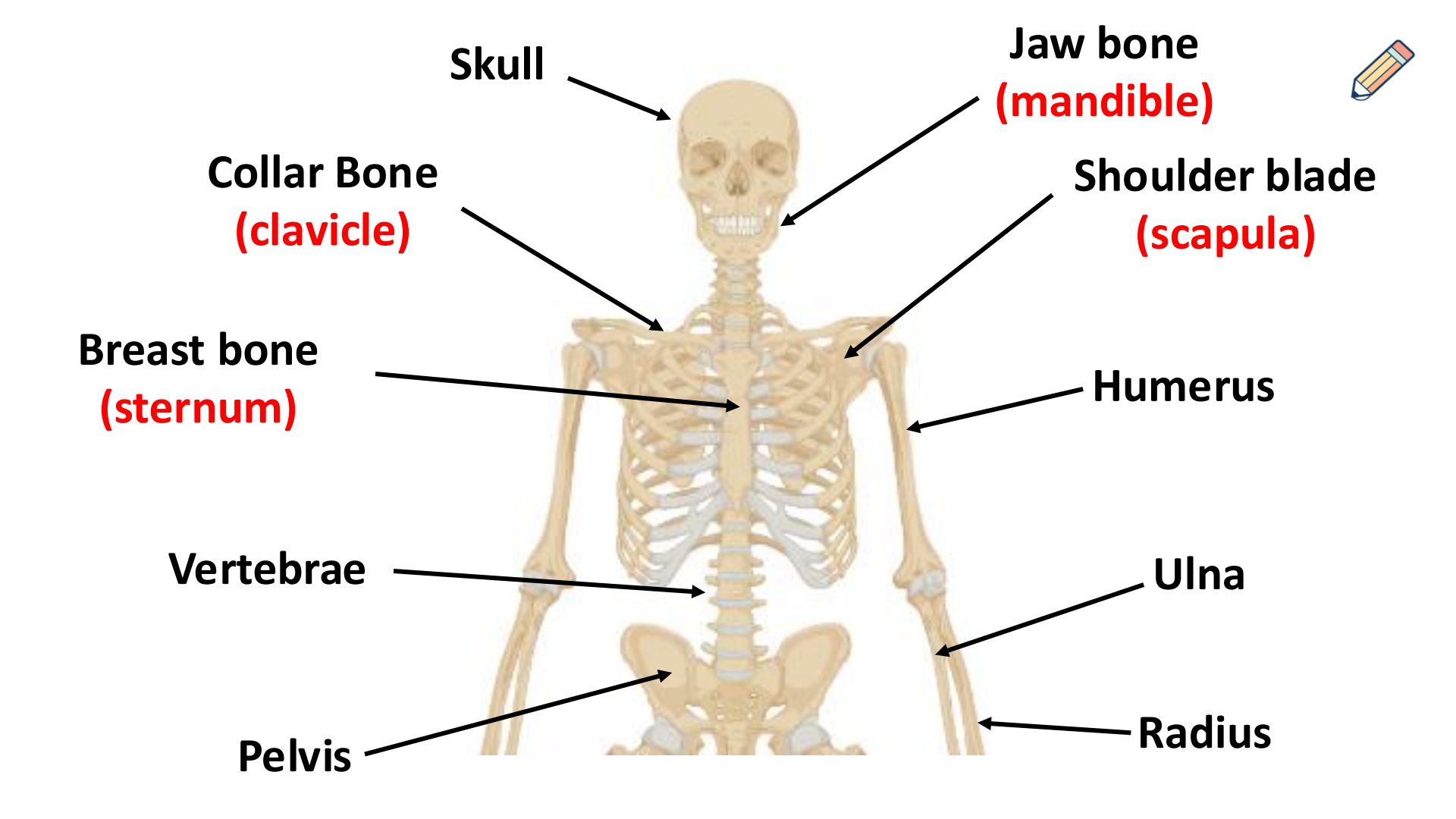
6-Jan-26

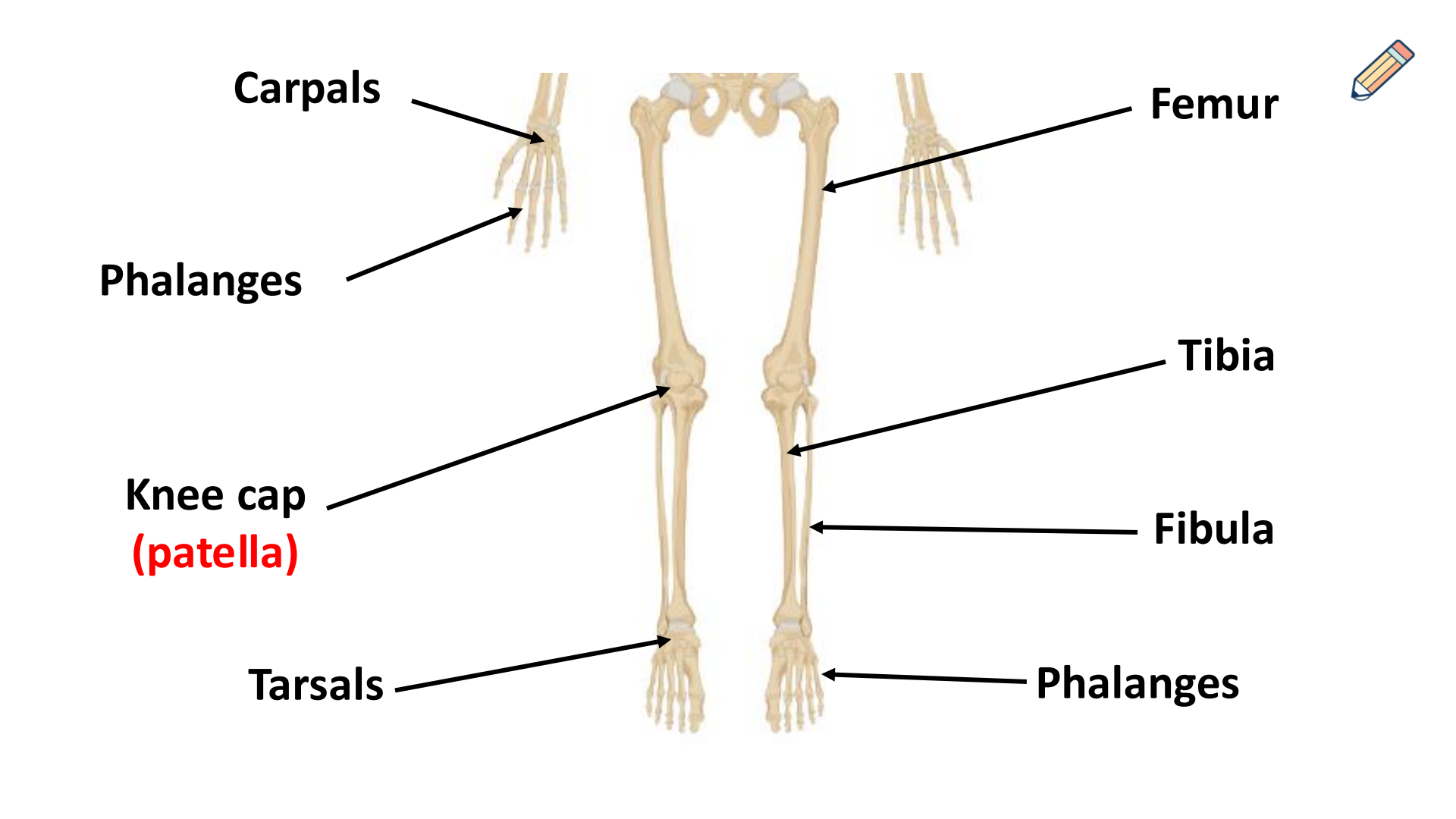
Skeleton

Skeletal System

Functions:

- **Support**
- **Protection**
- **Movement**
- **Shape**
- **Production of blood cells.**


Skull
Jaw bone
(mandible)
Collar Bone
(clavicle)
Shoulder blade
(scapula)
Breast bone
(sternum)
Humerus
Vertebrae
Ulna
Pelvis
Radius


Carpals
Femur
Phalanges
Tibia
Knee cap
(patella)
Fibula
Tarsals
Phalanges

I can now…

- ✓ Describe the function of the skeleton.
- ✓ Give the names of some bones in humans.

Today's Learning Intention is

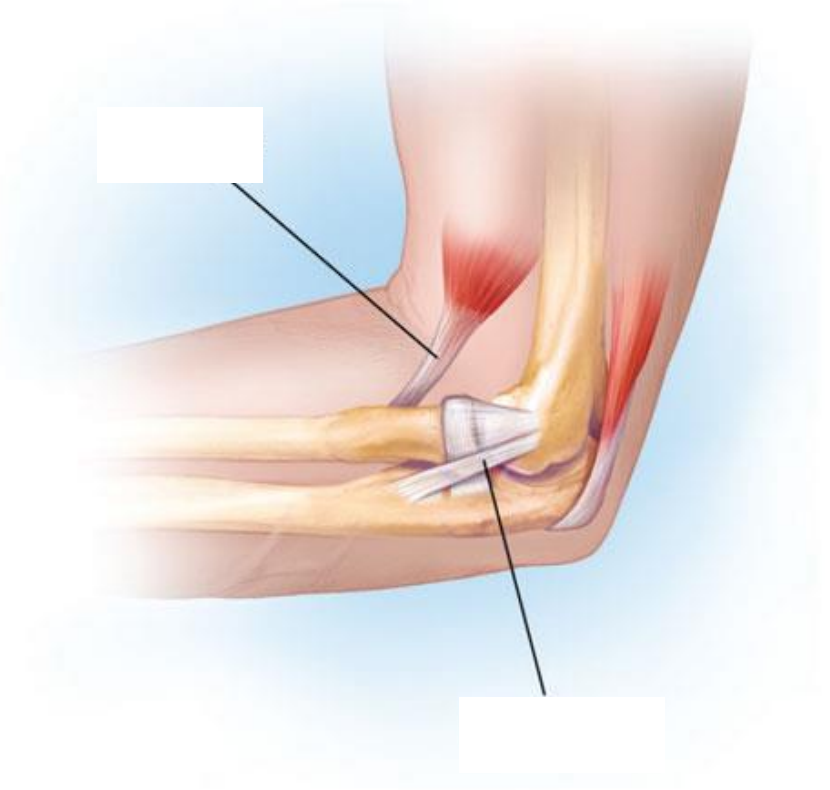
To find out about tendons and ligaments.

By the end of this lesson I will be able to…

- ✓ State what is meant by a tendon.
- ✓ State what is meant by a ligament.

Skeletal System

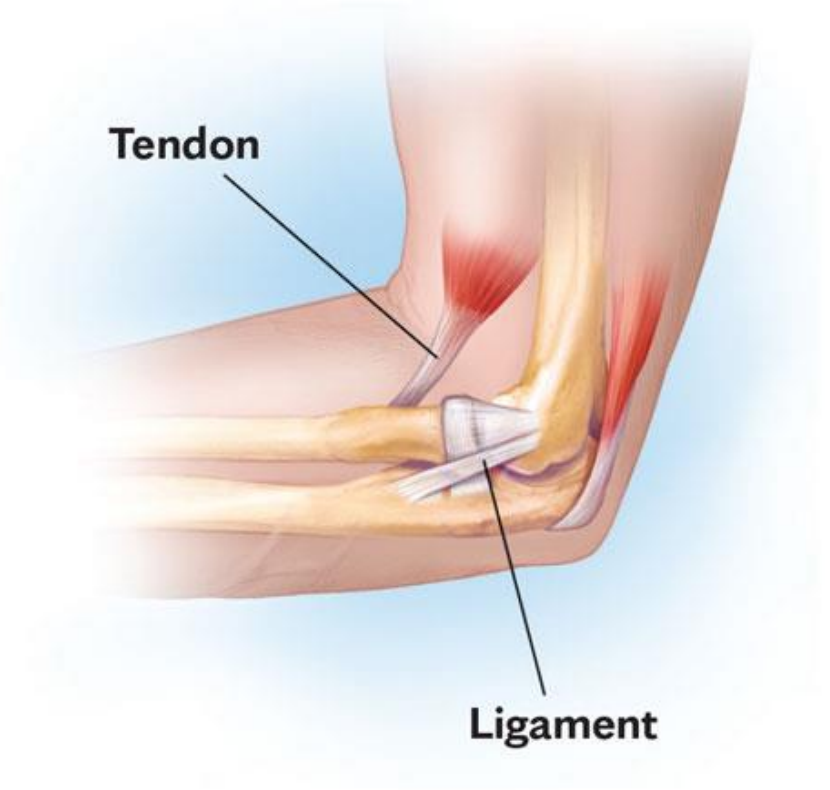
A **joint** is an area of the body where bones meet.



Skeletal System

Tendons connect bone to muscle.

Ligaments connect bone to bone.



I can now…

- ✓ State what is meant by a tendon.
- ✓ State what is meant by a ligament.

Today's Learning Intention is

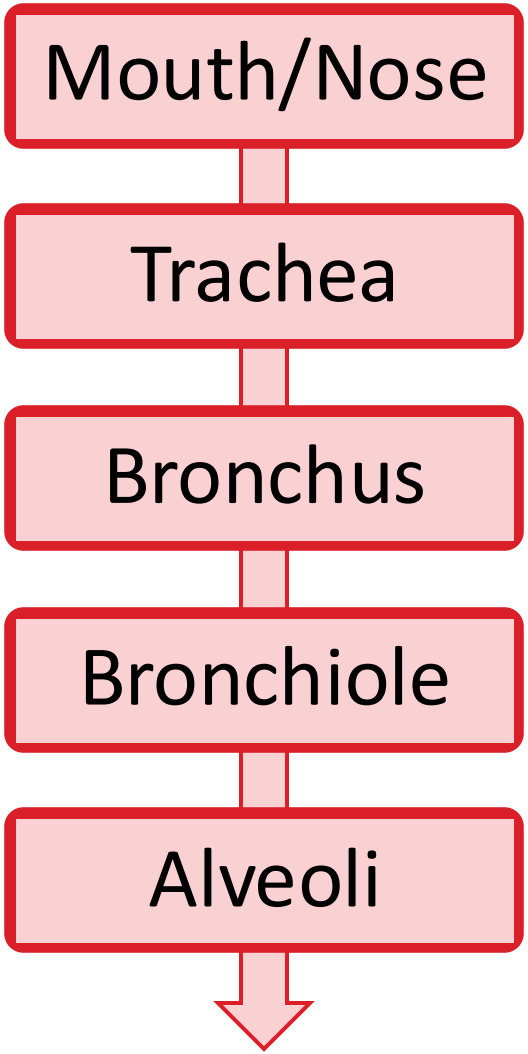
To find out about the respiratory system.

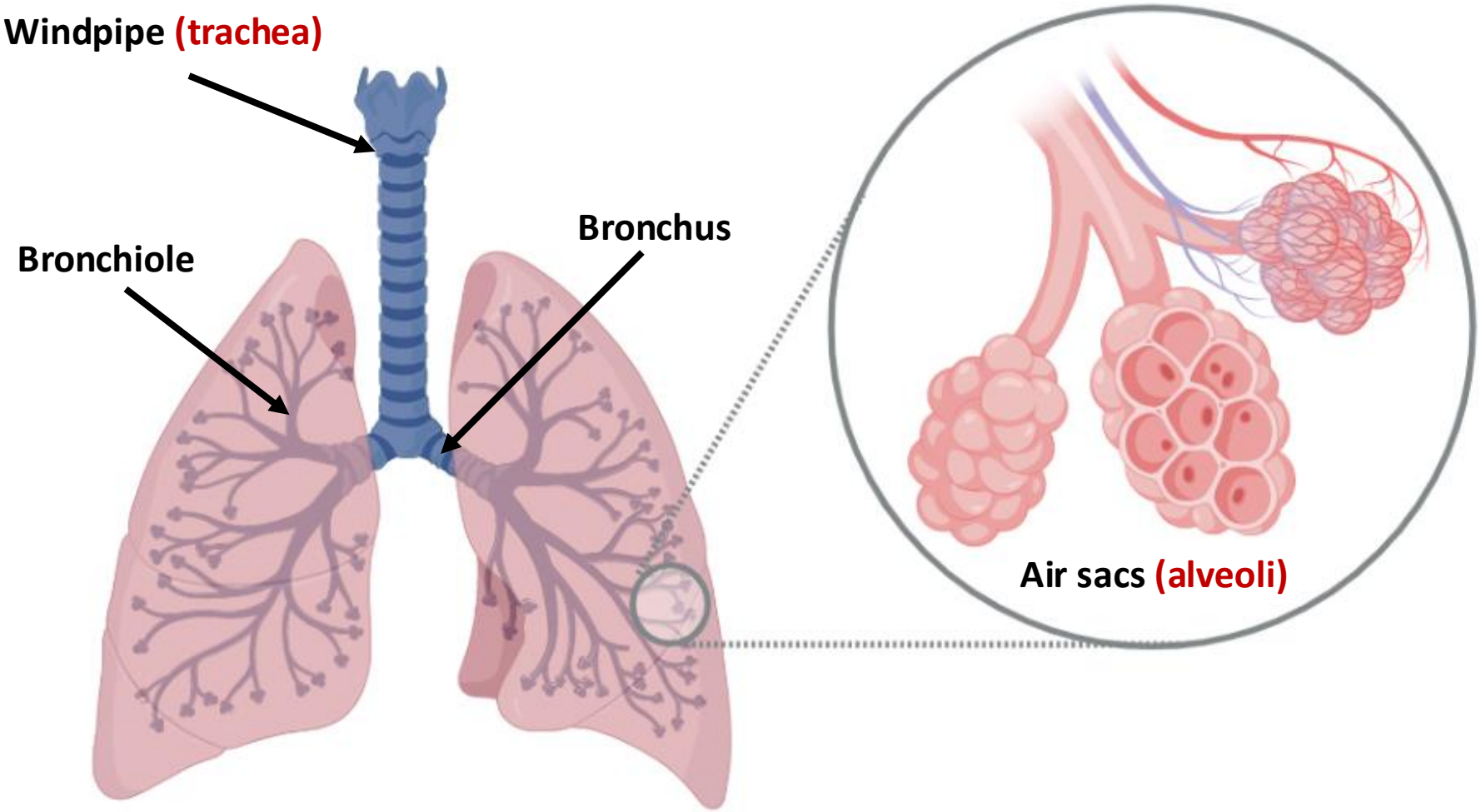
By the end of this lesson I will be able to…

- ✓ State the organs involved in the respiratory system.
- ✓ Describe the journey of air in the respiratory system.
- ✓ Explain how muscles assists gas entering and exiting the lungs.

6-Jan-26

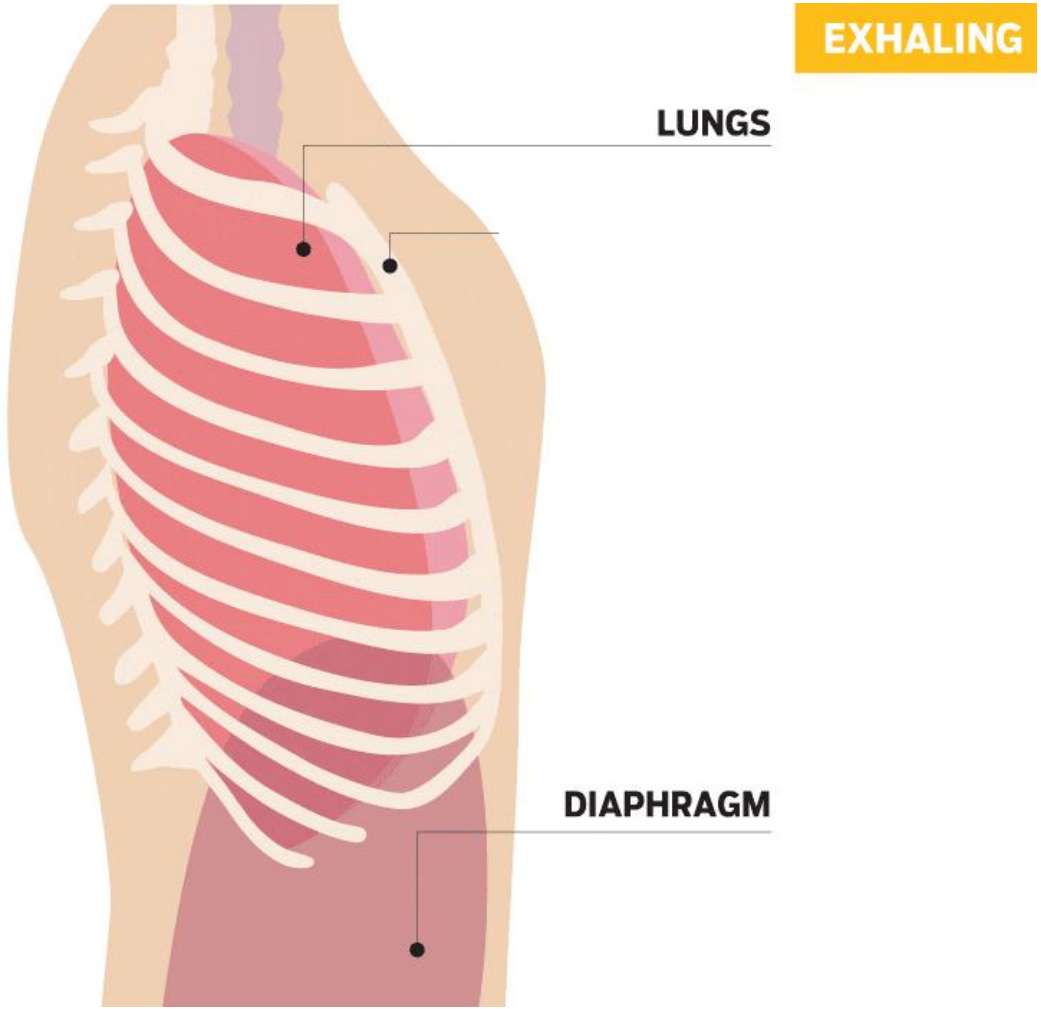
Lungs

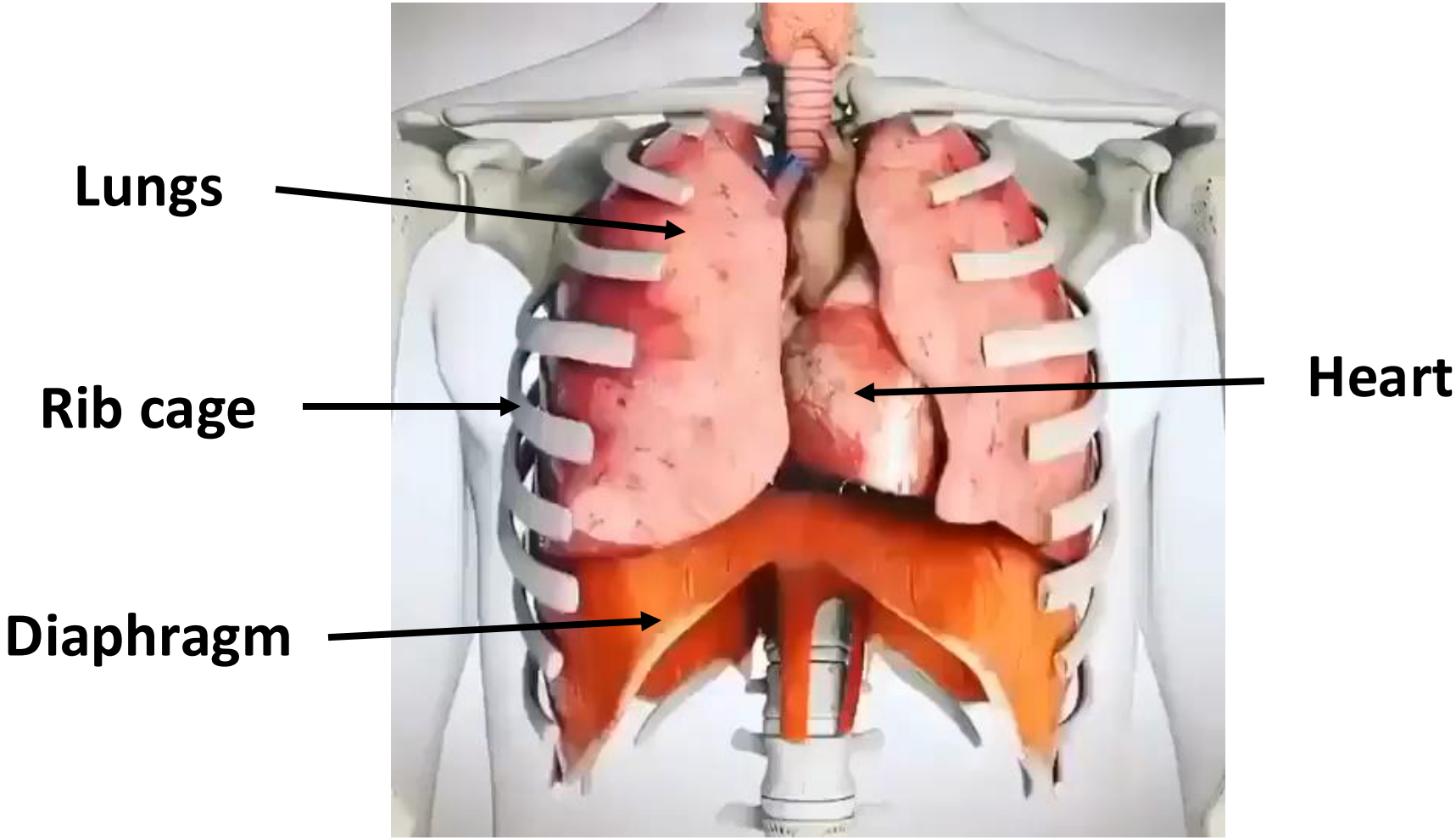

Mouth/Nose
Trachea
Bronchus
Bronchiole
Alveoli


Windpipe (trachea)
Bronchiole
Bronchus
Air sacs (alveoli)

Inhale = chest goes **out** and diaphragm goes **down** as it contracts.

Exhale = chest goes **in** and diaphragm goes **up** as it relaxes, pushing air out.




Lungs
Rib cage
Diaphragm
Heart

I can now…

- ✓ State the organs involved in the respiratory system.
- ✓ Describe the journey of air in the respiratory system.
- ✓ Explain how muscles assists gas entering and exiting the lungs.

Today's Learning Intention is

To find out about gas exchange at the lungs.

By the end of this lesson I will be able to…

- ✓ Describe the structure and function of the air sacs.
- ✓ Describe what gases enter and exit the air sacs during gas exchange.
- ✓ State the test for carbon dioxide gas.

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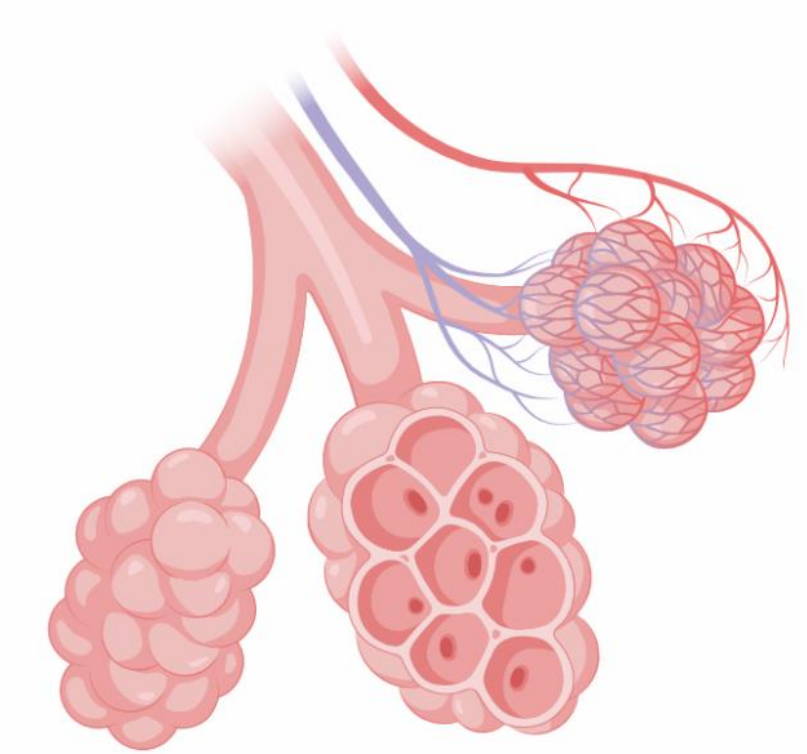
Gas Exchange

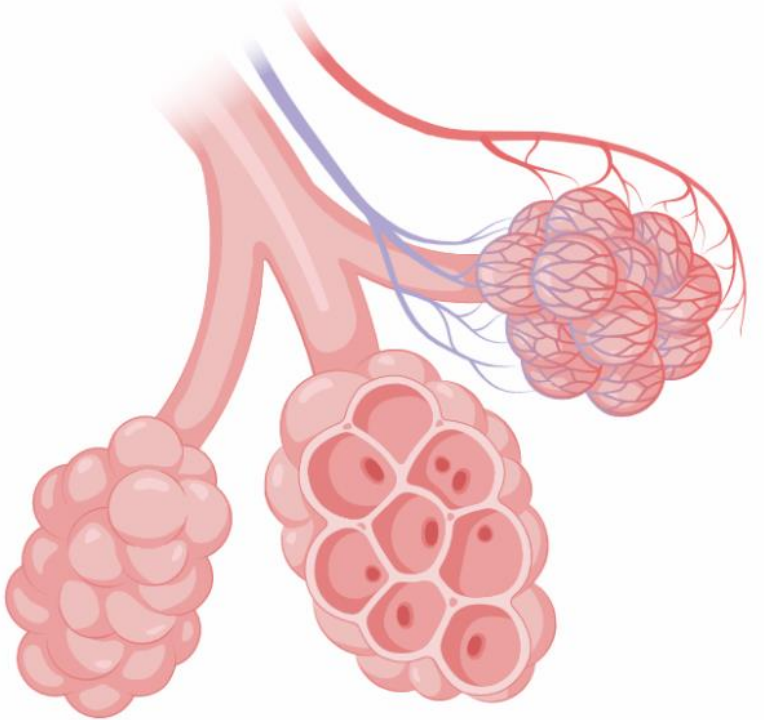
Gas Exchange



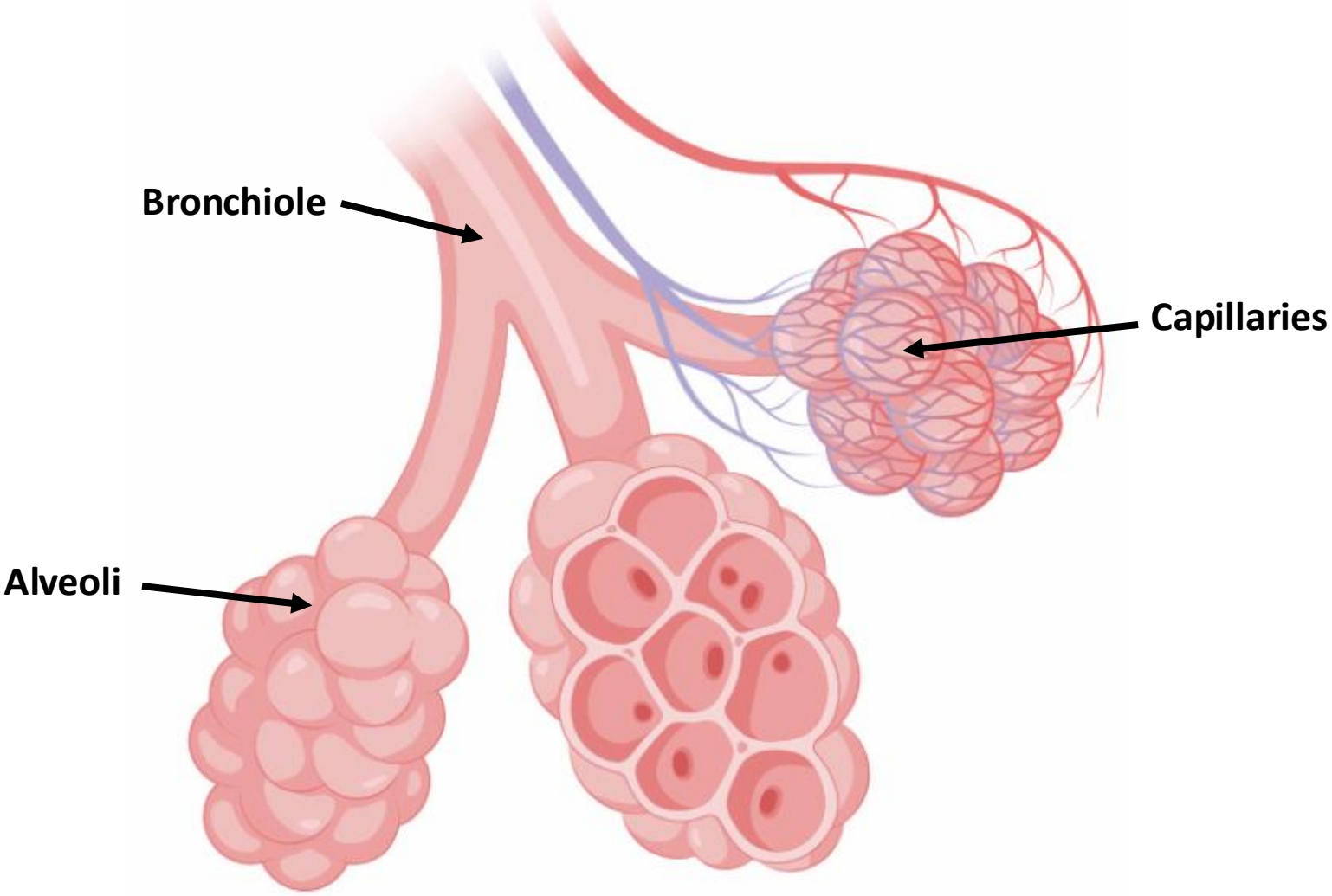
Gas exchange takes place at the **air sacs** (alveoli) of the lungs.

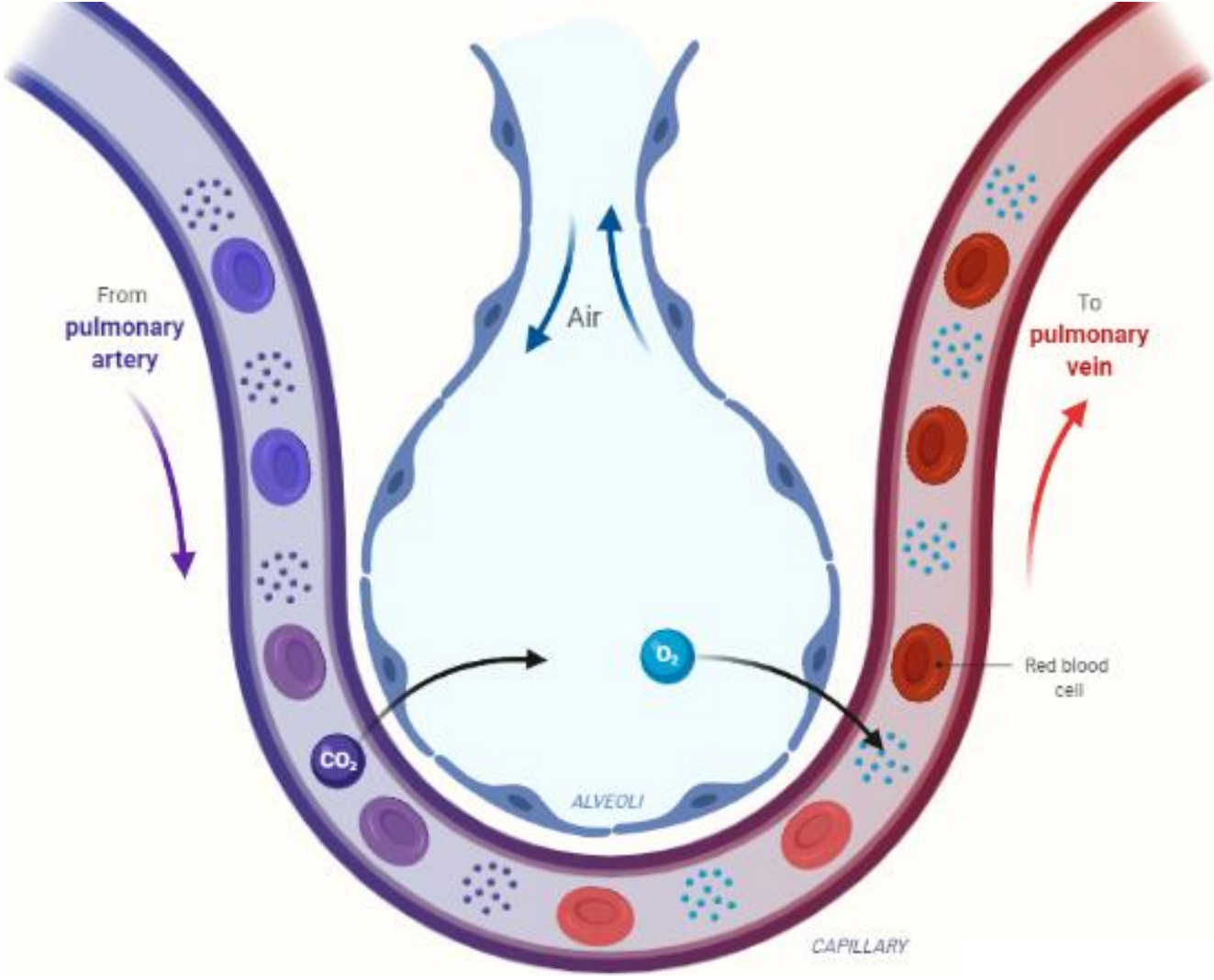
Air sacs are surrounded by blood vessels called **capillaries.**

Gas Exchange



Air sacs have **thin, moist walls**, which allow for **quick** movement of gases to and from the capillaries.


Bronchiole
Capillaries
Alveoli


From
pulmonary
artery
Air
To
pulmonary
vein
O_2
Red blood
cell
CO_2
ALVEOLI
CAPILLARY

Gas Exchange

Gas	Breathed	Goes from	In to
Oxygen (O_2)	In	Air sacs (lungs)	Capillaries
Carbon Dioxide (CO_2)	Out	Capillaries	Air sacs (lungs)

Gas Exchange

Aim:

To find out what the test for carbon dioxide gas is.

Gas Exchange

Method:

1. Pour **1ml of limewater** into a **test tube**.
2. Place a **straw** into the limewater.
3. **Lightly blow** through the straw keeping your fingers at the top of the test tube to stop splashing.
4. Observe the change in appearance.

Gas Exchange

Test for carbon dioxide gas:

If **carbon dioxide** gas is present, then limewater will turn **cloudy**.

I can now…

- ✓ Describe the structure and function of the alveoli.
- ✓ Describe what gases enter and exit the alveoli during gas exchange.
- ✓ State the test for carbon dioxide gas.

Today's Learning Intention:

To find out about the structure of the human heart

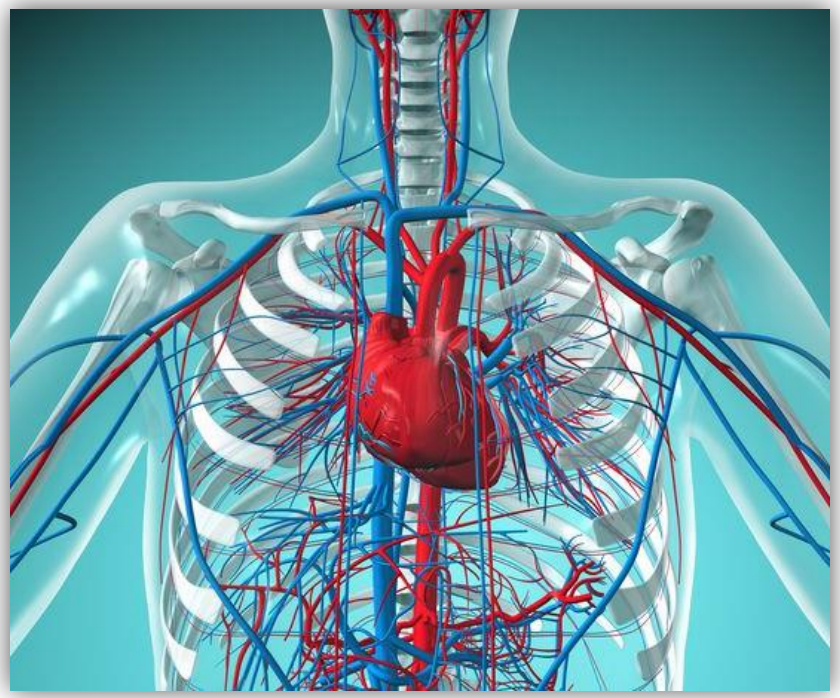
By the end of this lesson I will be able to

- ✓ State the function of the heart.
- ✓ State the name of the chambers found in the heart.
- ✓ Describe the structure of the heart chambers and blood vessels.

Cardiovascular System

This system includes:

- Heart
- Blood vessels
- Blood

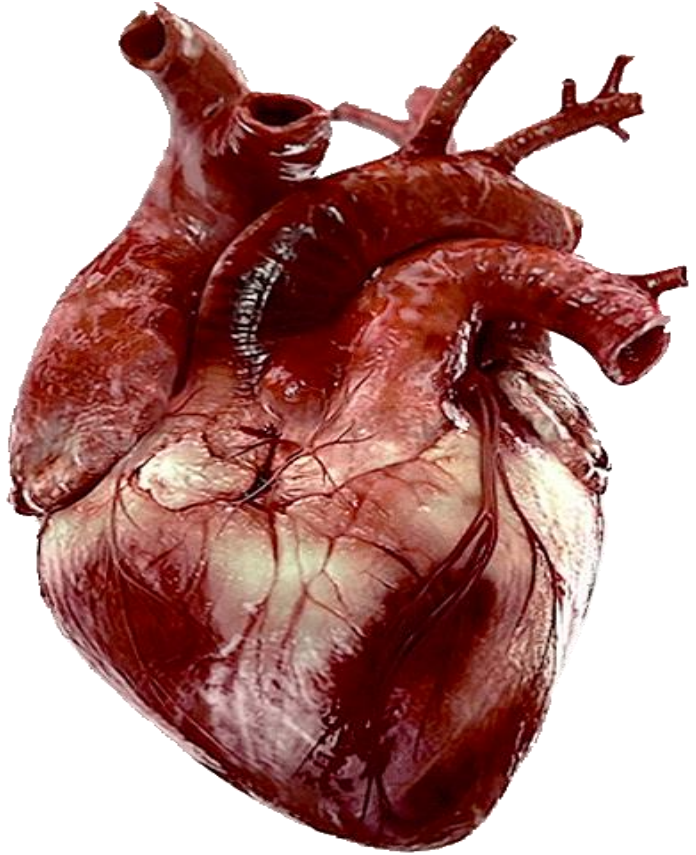


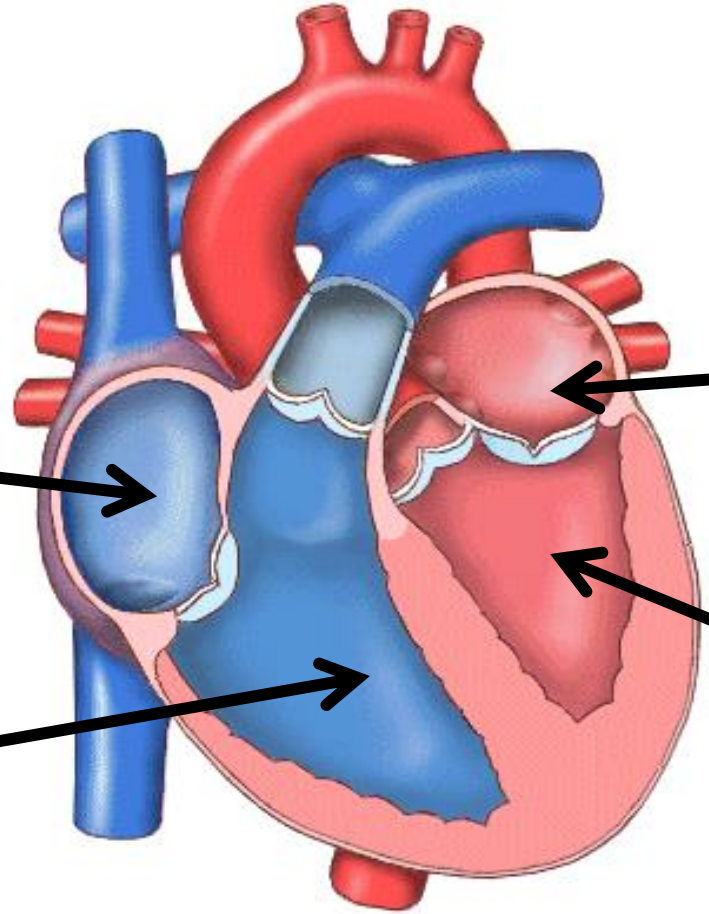
6-Jan-26

The Heart

Heart

The function of the heart is to **pump blood** to the lungs and the rest of the body.





Chamber 1

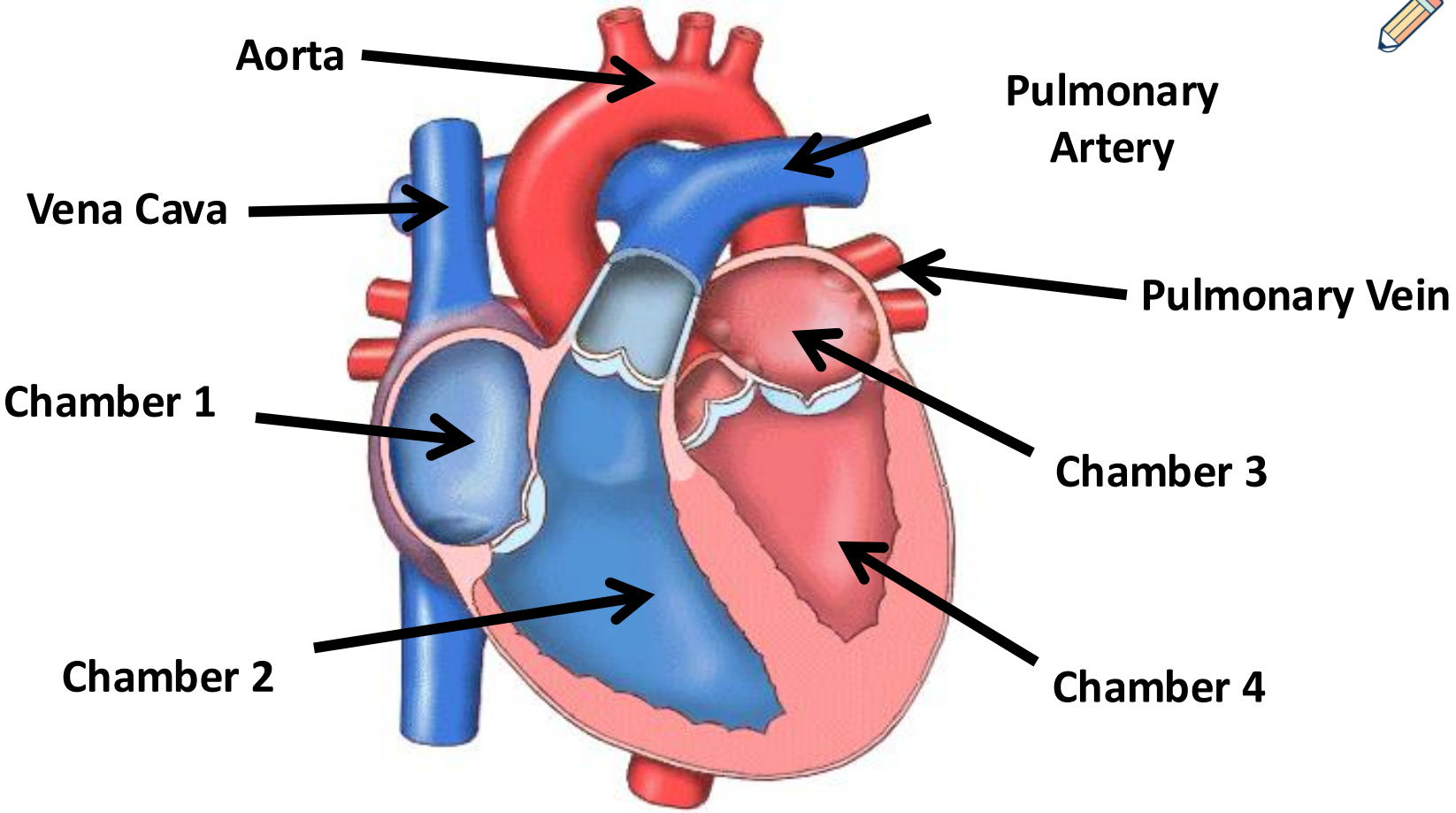
Chamber 2

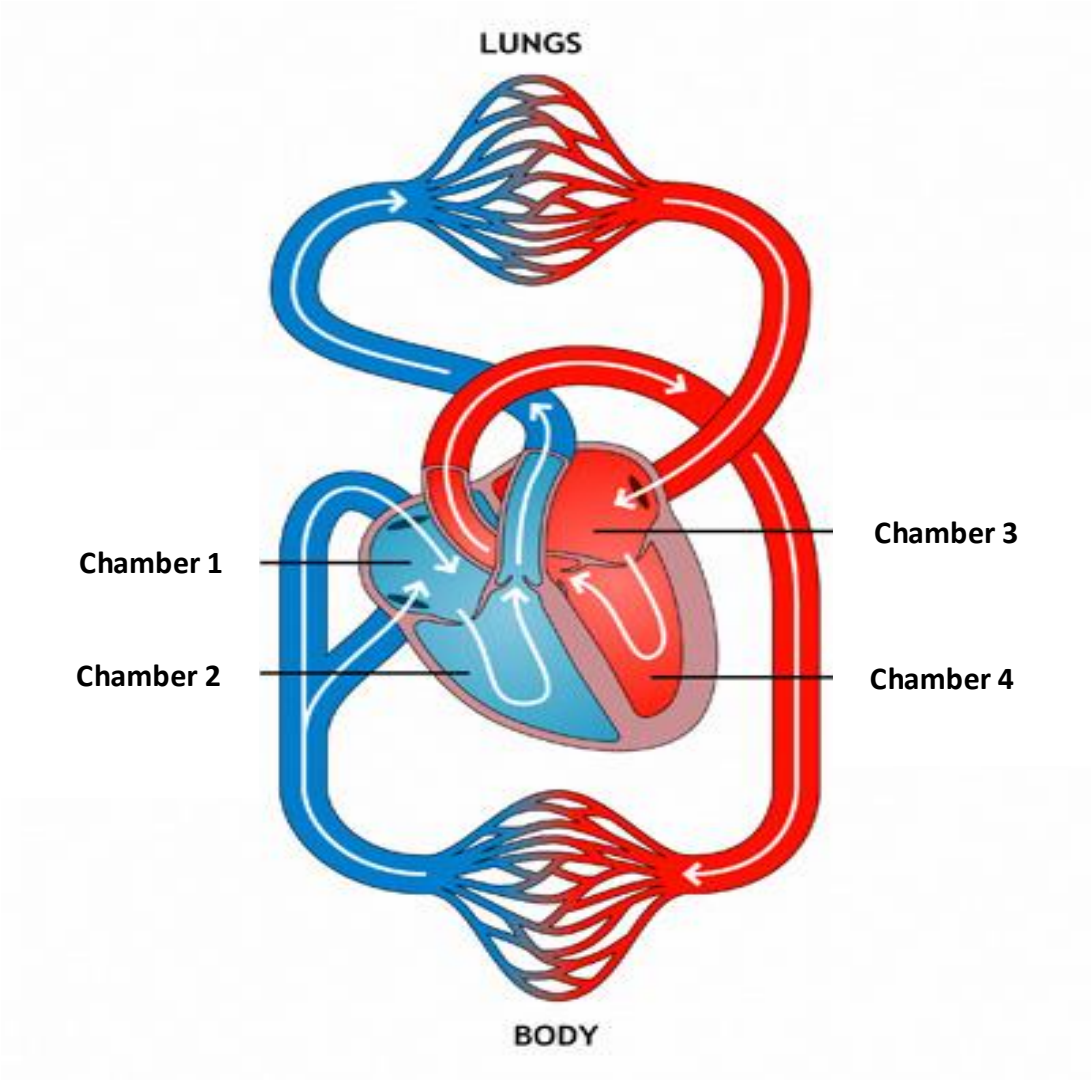
Chamber 3

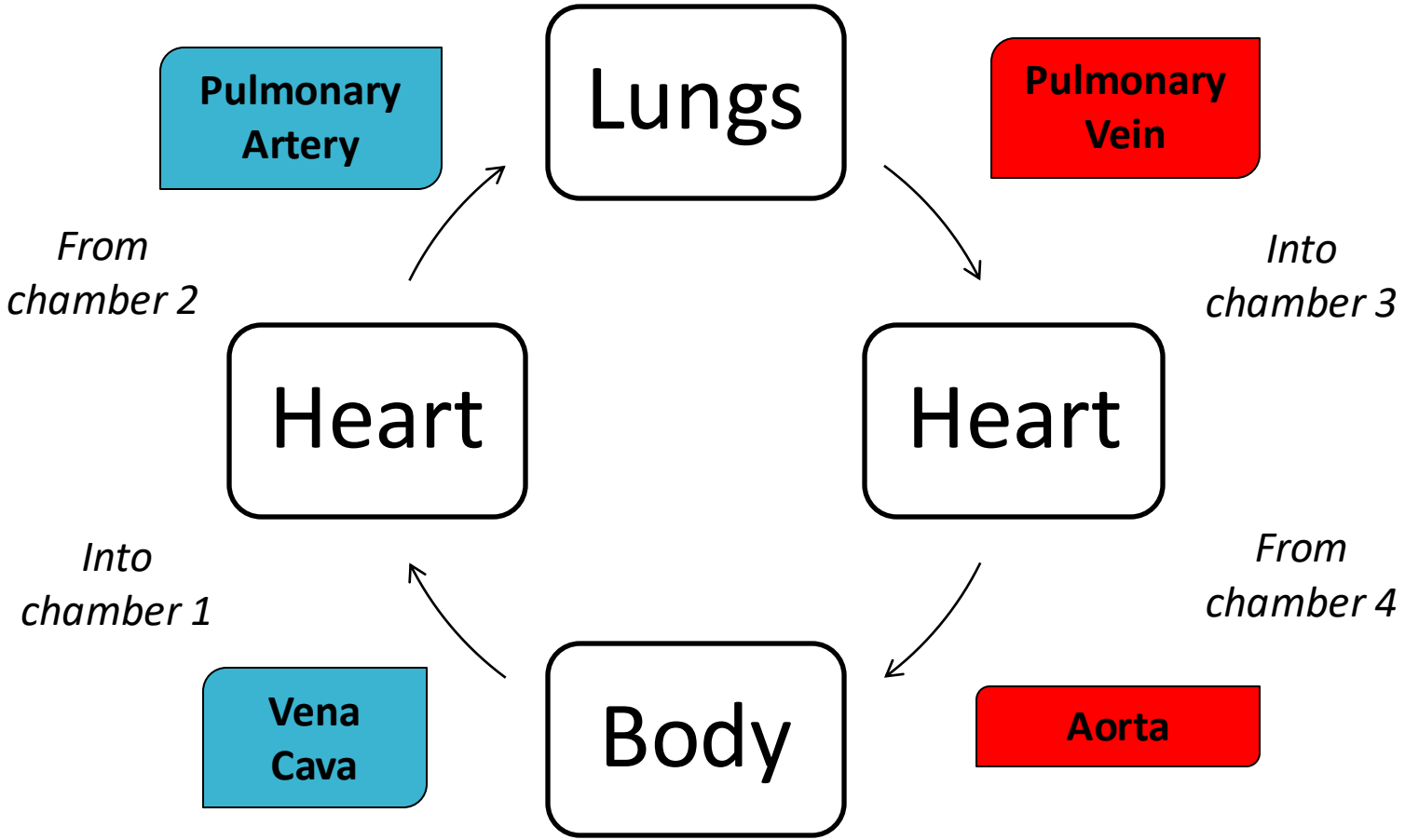
Chamber 4

IT IS A MYTH THAT BLOOD IS BLUE!

The **right s** **ft side** of the
the heart co rt contains
no oxyg **oxygen**


Aorta
Pulmonary Artery
Vena Cava
Pulmonary Vein
Chamber 1
Chamber 3
Chamber 2
Chamber 4


LUNGS
Chamber 1
Chamber 2
Chamber 3
Chamber 4
BODY


Lungs
Pulmonary Vein
Into chamber 3
Heart
From chamber 4
Aorta
Body
Vena Cava
Into chamber 1
Heart
From chamber 2
Pulmonary Artery

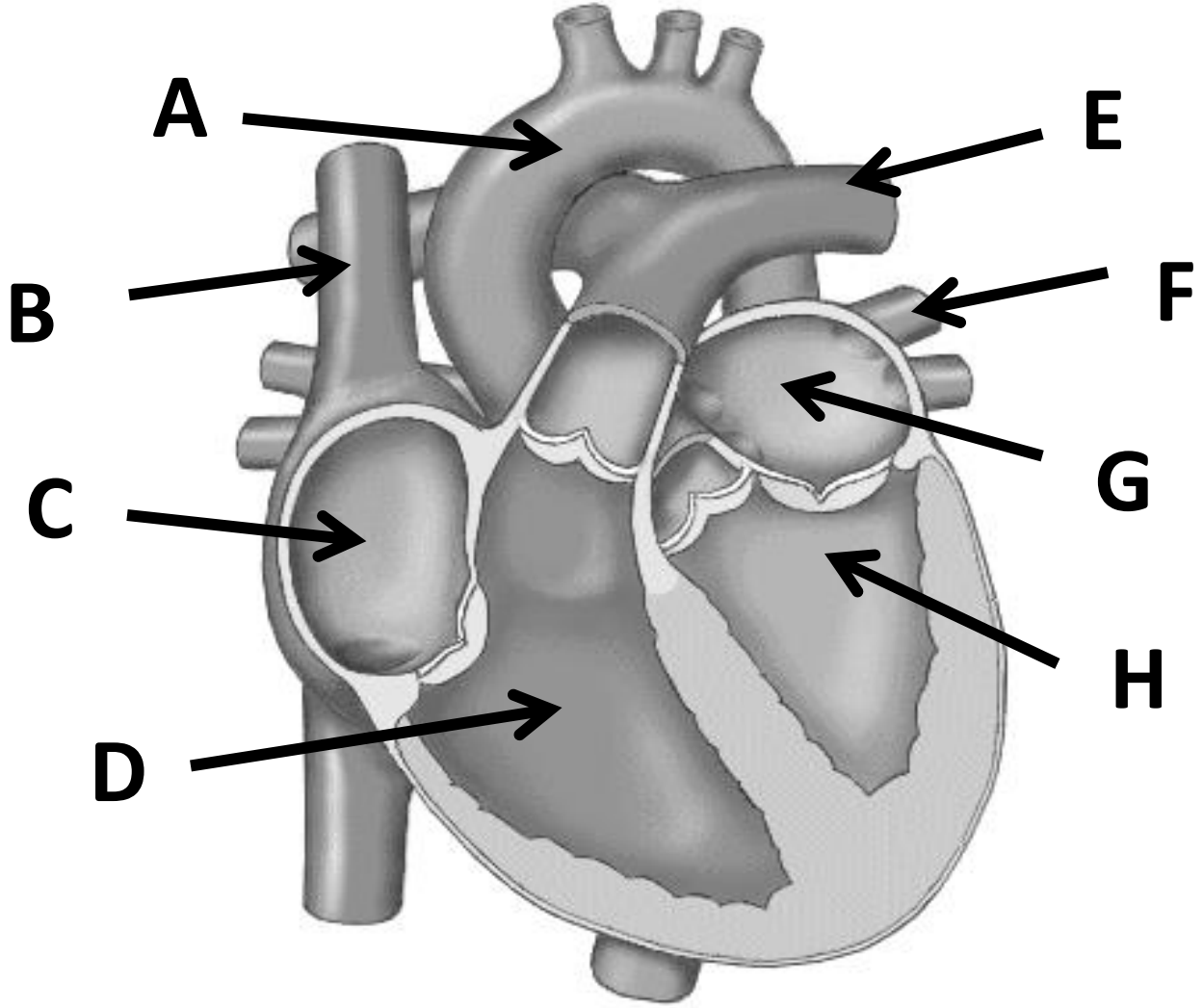
Valves

There are **valves** in the heart to stop the blood flowing

backwards.

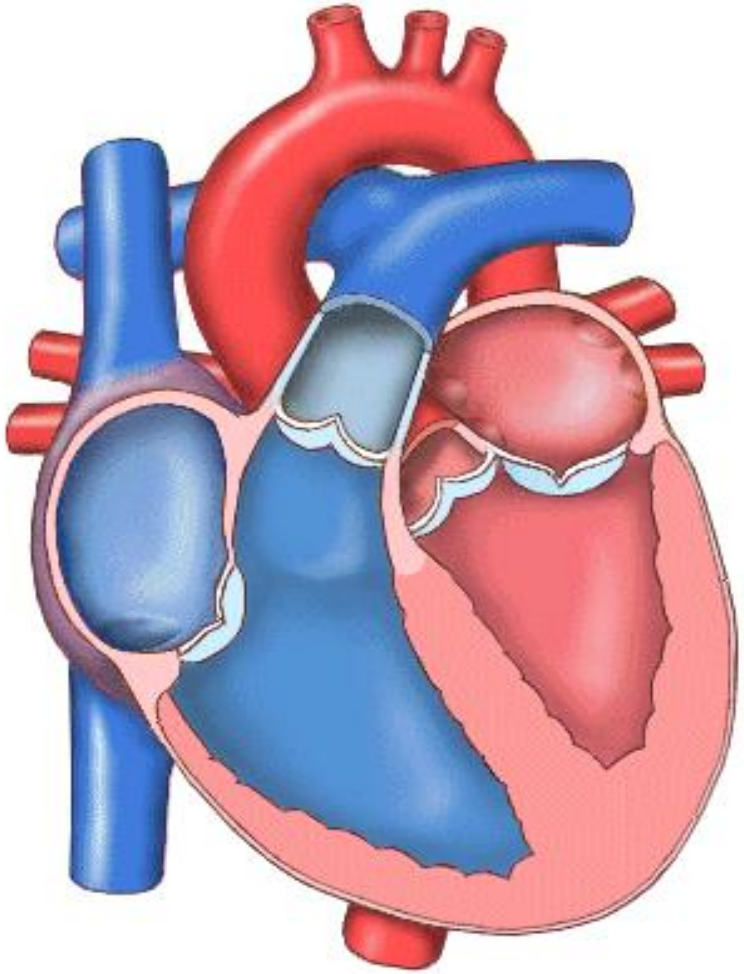
I can now

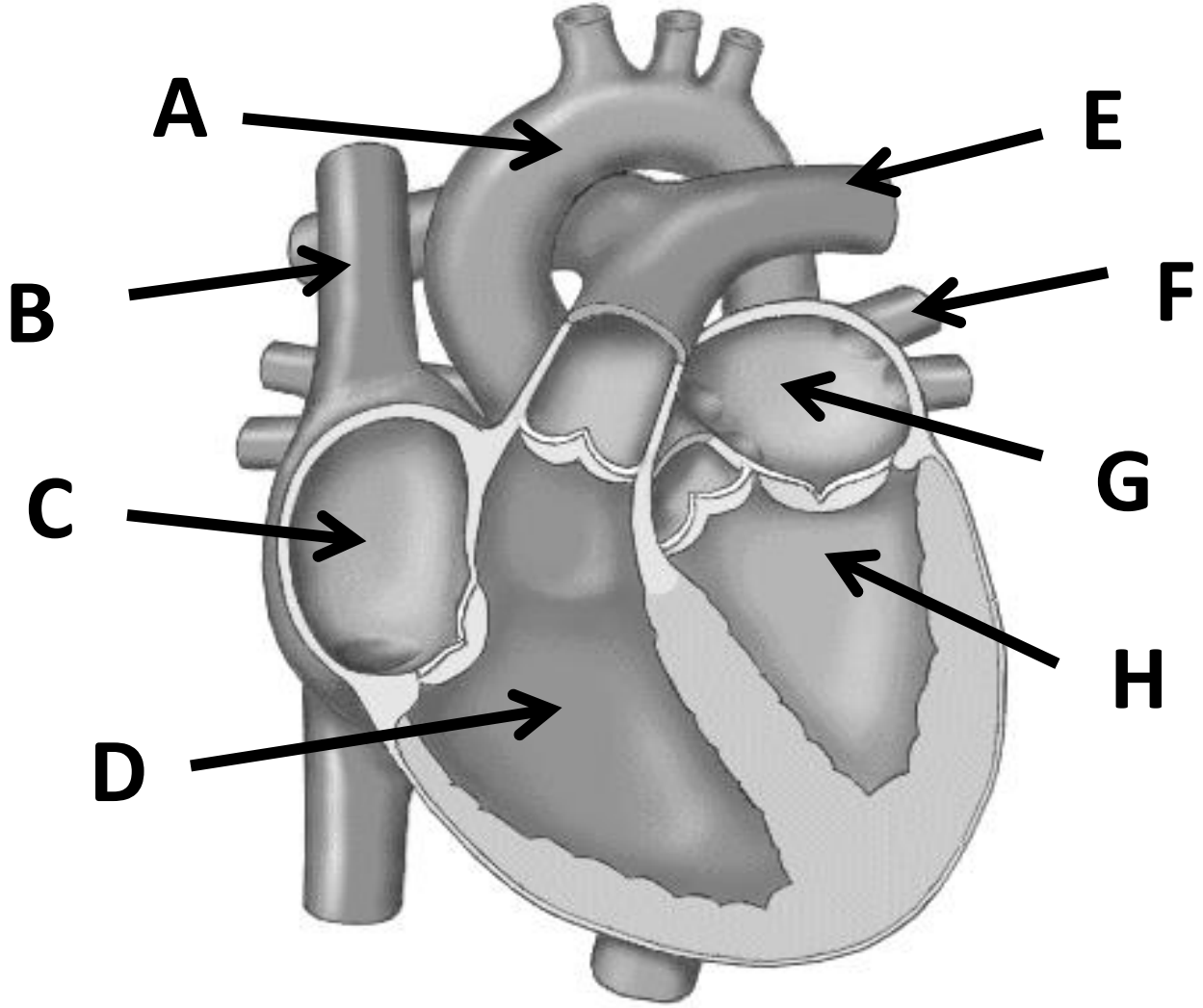
- ✓ State the function of the heart.
- ✓ State the name of the chambers found in the heart.
- ✓ Describe the structure of the heart chambers and blood vessels.


A
B
C
D
E
F
G
H

Prior Knowledge – True or False:

1. The lungs are 2 hollow lobes that contains the air that you breathe (like balloons).
2. Because the lungs contain lots of gas this means that they would be able to float in water.




A
B
C
D
E
F
G
H

Today's Learning Intention:

To find out about blood vessels.

By the end of this lesson I will be able to

- ✓ State the function of the heart.
- ✓ State the name of the chambers found in the heart.
- ✓ Describe the structure of the heart chambers and blood vessels.

6-Jan-26

Blood Vessels

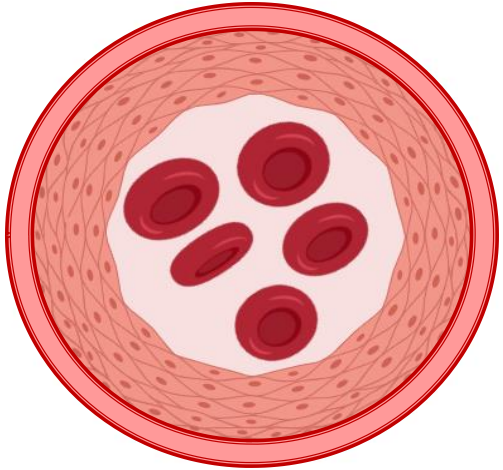
Today's Learning Intention is

To find out about the blood vessels in the human body.

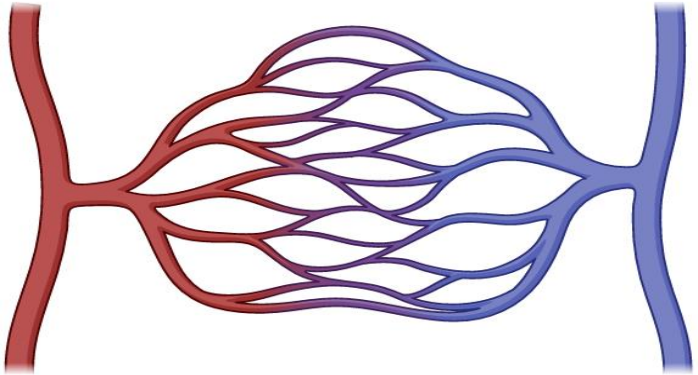
By the end of this lesson you will be able to…

- ✓ State what the three main categories of blood vessels are in the body.
- ✓ Describe the structure and function of the blood vessels and compare similarities and differences between them.

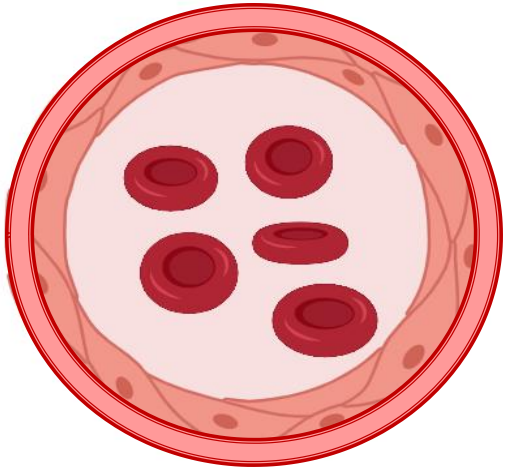
Blood Vessels



Arteries

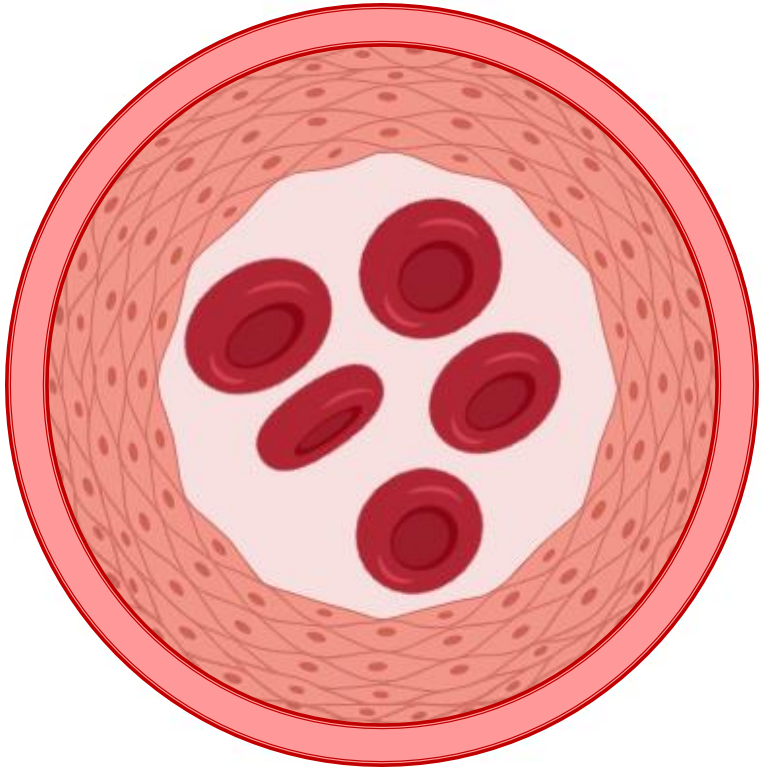


Capillaries



Veins

Arteries



Arteries carry blood **away** from the heart towards the lungs and the rest of the body.

A rtery **A** way

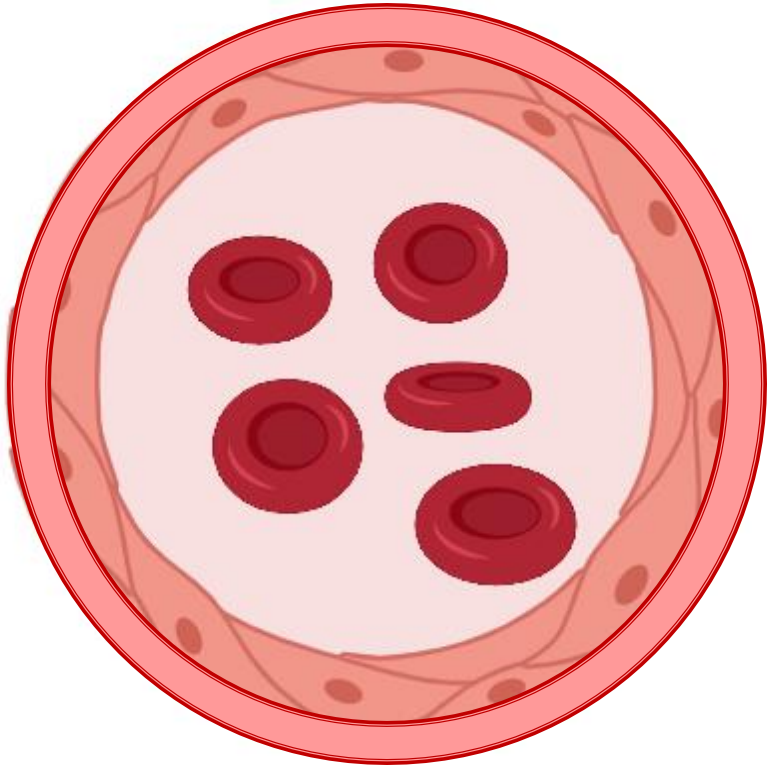
Arteries have thick walls to sustain the pressure from the heart. Arteries have narrow channels for blood to pass through.

Veins

<u>Veins</u> carry blood **back towards** (back into) the heart from the lungs and the body.

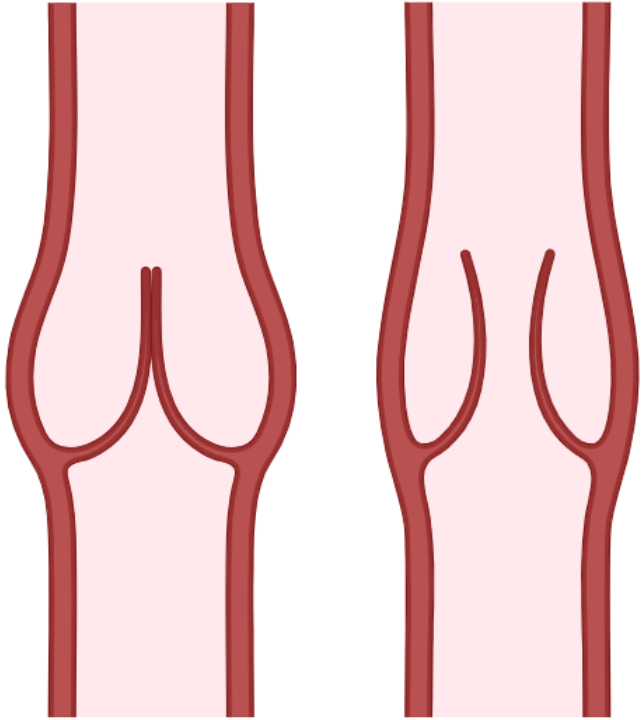
Vein in

They also have wider channels for blood to travel through, which are surrounded by thinner walls.



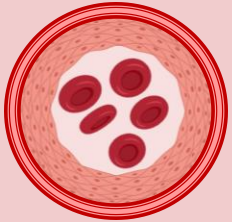
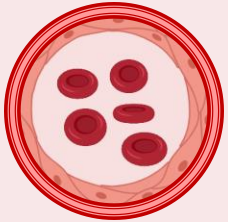
Valves

Veins also have **v**alves, which makes sure blood always goes in one direction.

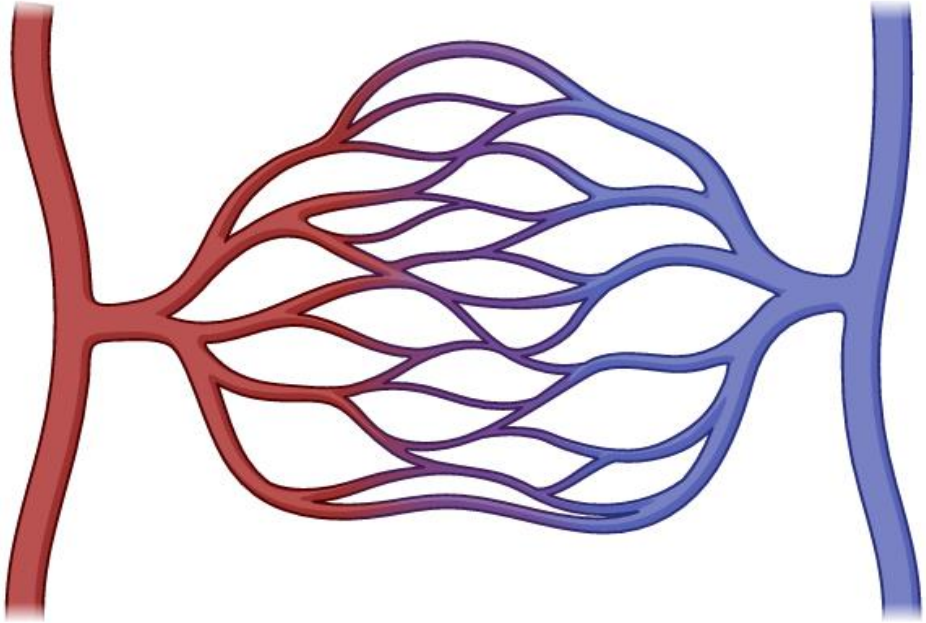


Closed **Open**

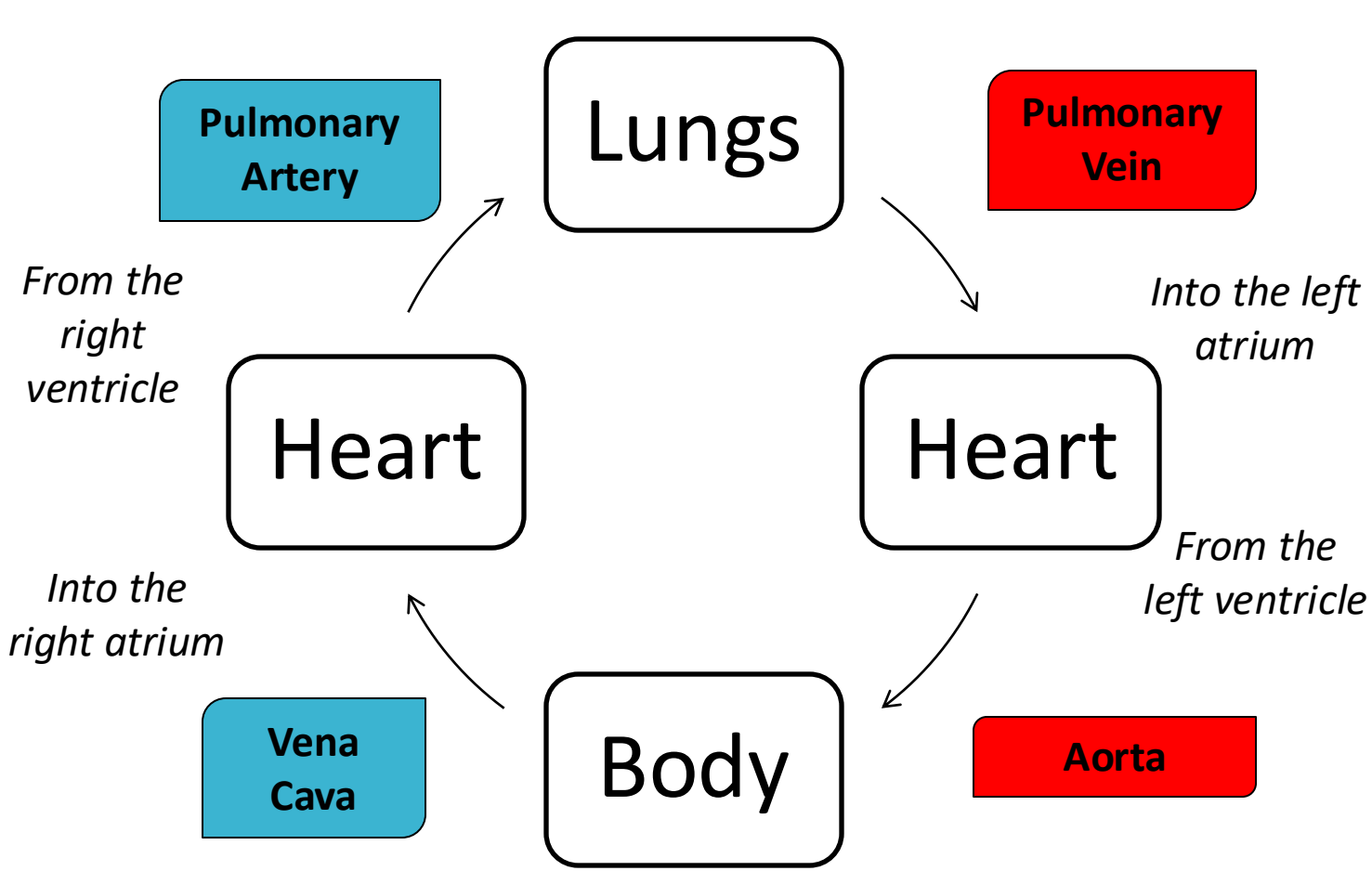
Arteries vs Veins

Blood Vessel	Direction of Blood Flow	Valves	Channel where Blood Flows Through	Muscular Walls	Diagram
Arteries	**A**way from the heart	No	Narrow	Thick	
Ve**in**s	**In**to the heart	Yes	Wide	Thin	

Capillaries



Capillaries are where arteries and veins connect and where **gas exchange** between oxygen and carbon dioxide takes place.


Lungs
Pulmonary Vein
Into the left atrium
Heart
From the left ventricle
Aorta
Body
Vena Cava
Into the right atrium
Heart
From the right ventricle
Pulmonary Artery

I can now

- ✓ State what the three main categories of blood vessels are in the body.
- ✓ Describe the structure and function of the blood vessels and compare similarities and differences between them.

Today's Learning Intention is

To find out about the digestive system.

By the end of this lesson I will be able to…

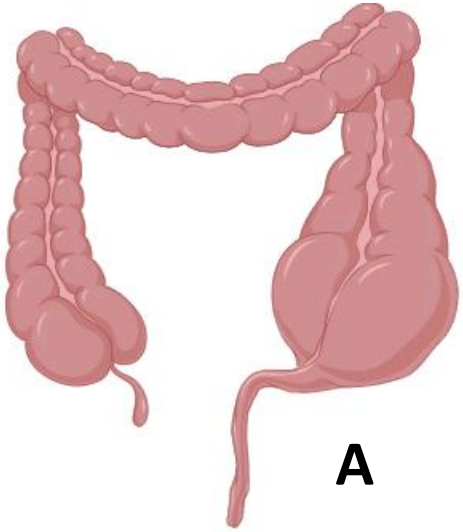
- ✓ Explain the purpose of digestion.
- ✓ State the main organs involved in the digestive system.

6-Jan-26

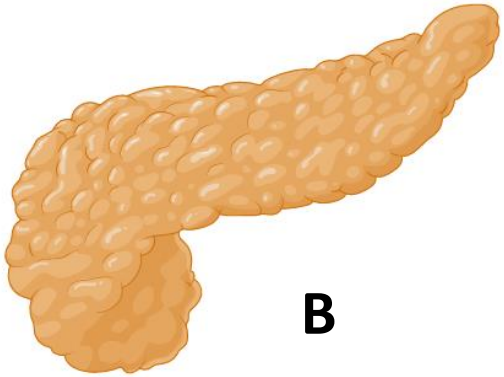
Digestive System

Digestion

Digestion is where food molecules are broken down from **large insoluble** molecules into **smaller soluble** molecules to provide us with **energy** and for **growth**.



A



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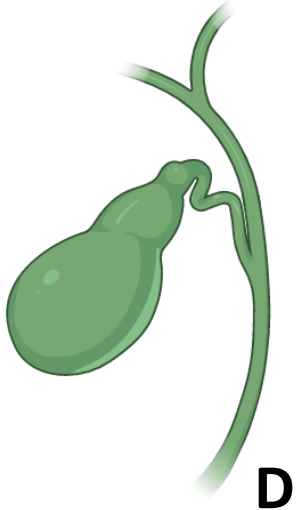
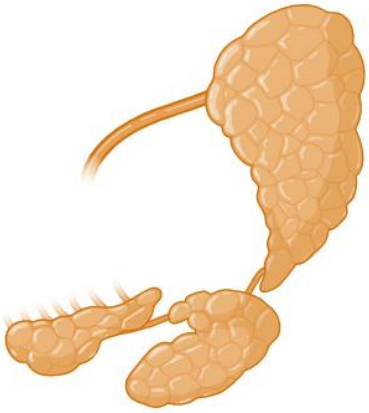


D



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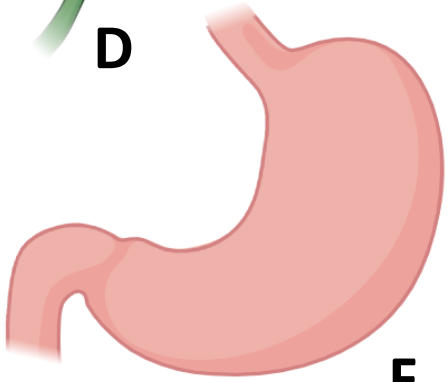
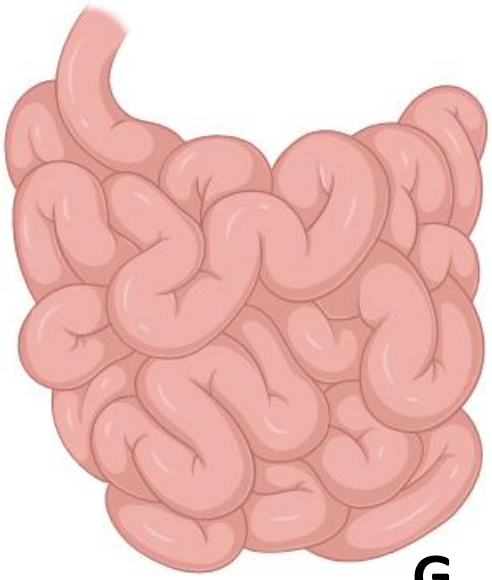
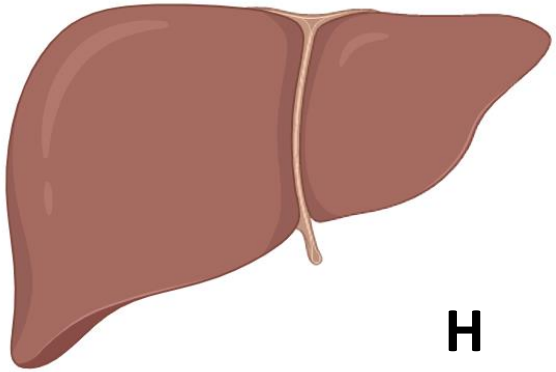


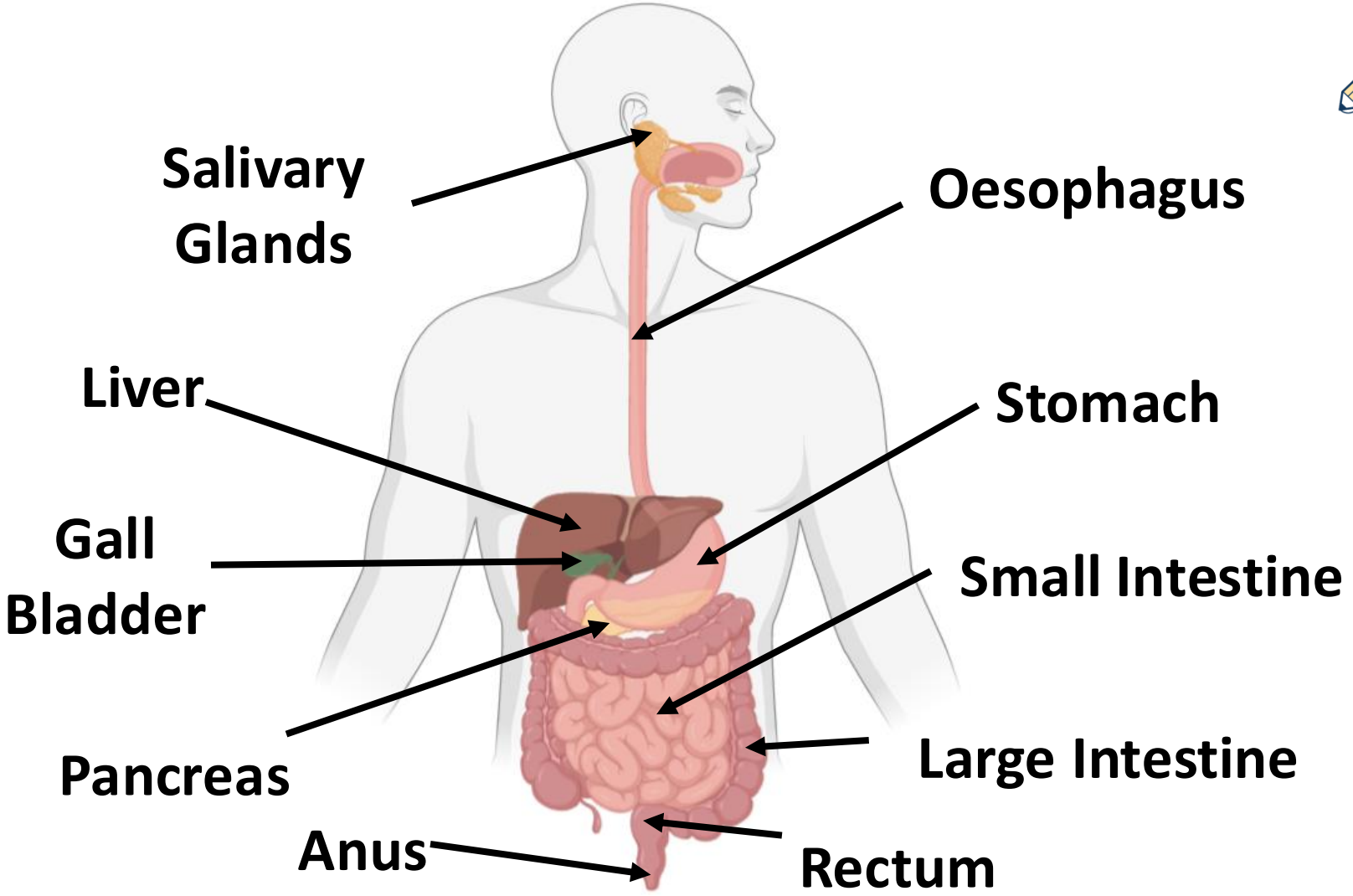
F

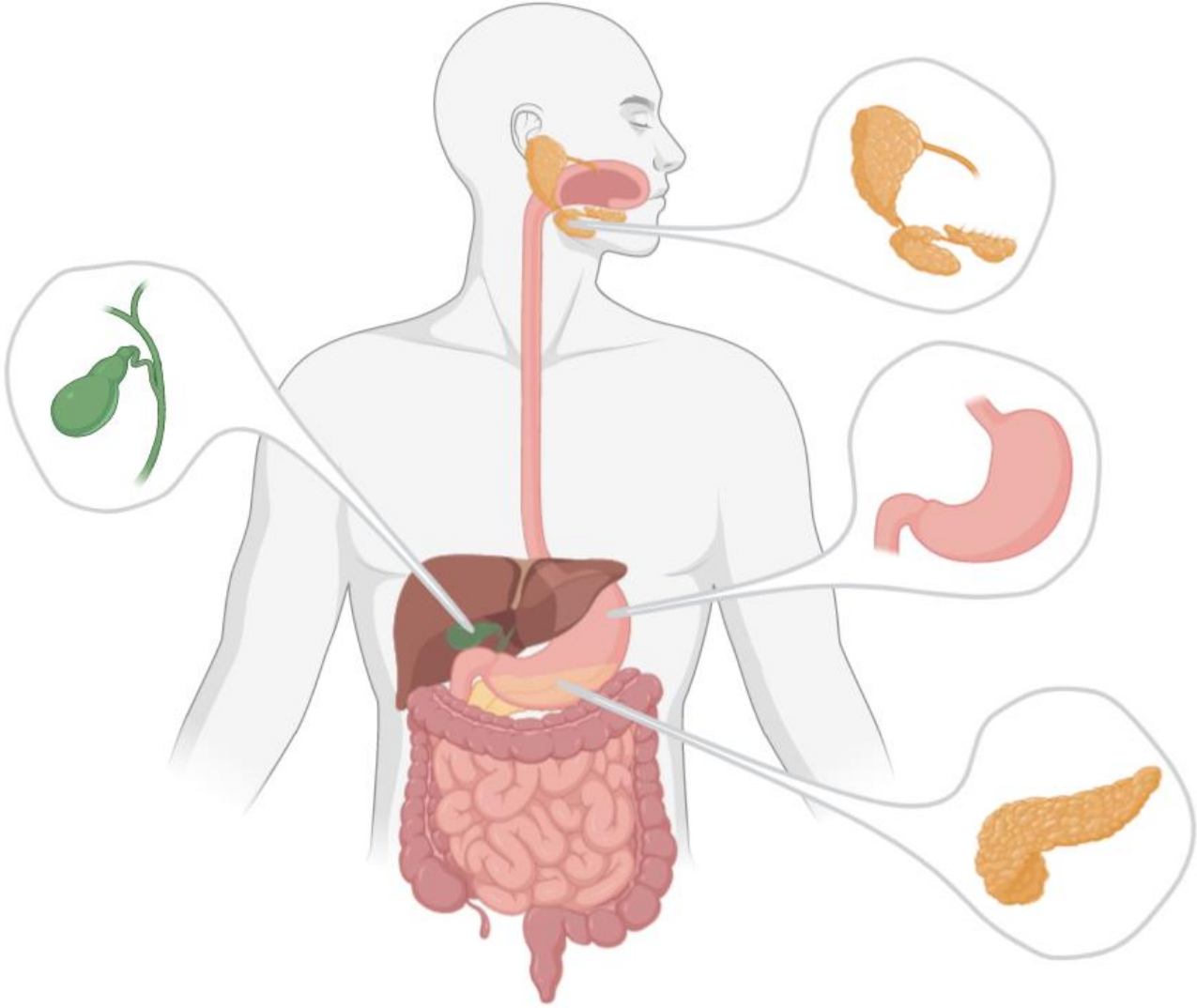


G



H


Salivary Glands
Oesophagus
Liver
Stomach
Gall Bladder
Small Intestine
Pancreas
Large Intestine
Anus
Rectum

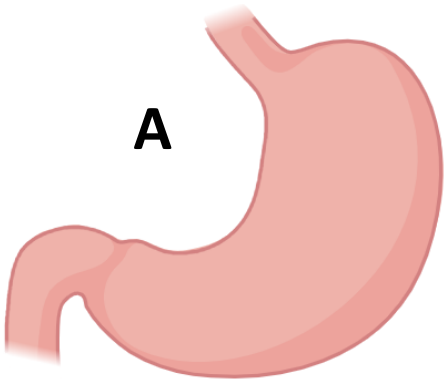


Organ	Function
Salivary Glands	Releases saliva and enzymes to aid the breakdown of food.
Oesophagus	Tube connecting the mouth to the stomach. Muscle contractions push food down.
Stomach	Muscular bag filled with acid and enzymes to churn the food down more.
Pancreas	Releases more enzymes to aid with the breakdown of some food molecules.
Liver	Makes bile, which is used to breakdown fat molecules.

Organ	Function
Gall Bladder	Stores bile made by the liver and releases it when it is required.
Small Intestine	Absorbs essential nutrients from the food molecules.
Large Intestine	Absorbs all excess water from the food molecules.
Rectum	Stores faeces until it is ready to be expelled from the body.
Anus	The opening where the faeces is expelled from the body.

I can now…

- ✓ State the main organs involved in the digestive system.
- ✓ Explain the purpose of digestion.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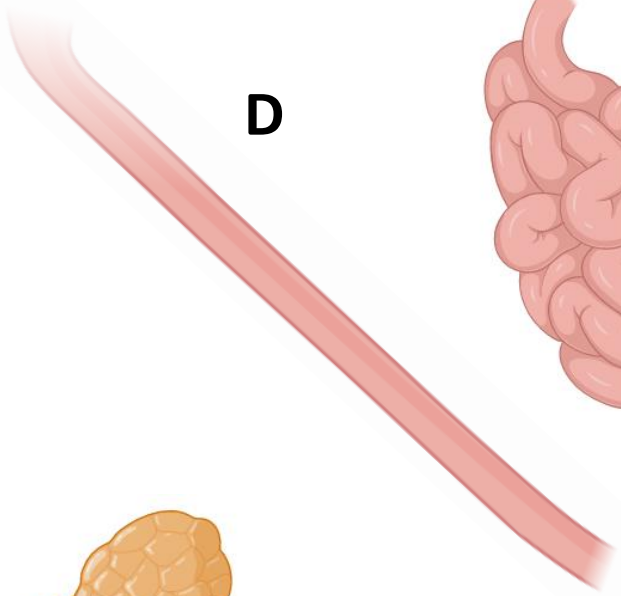
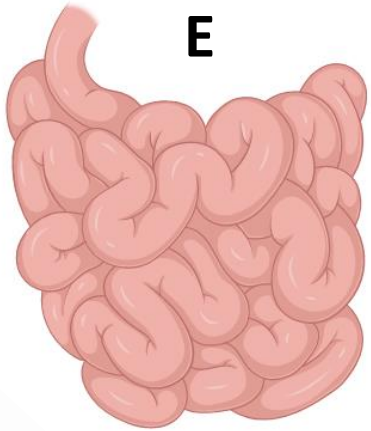
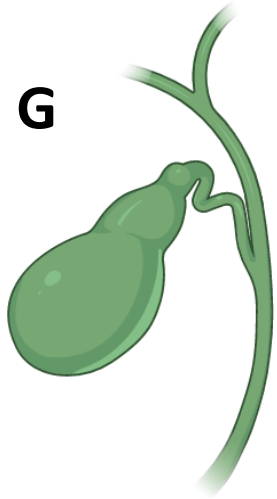
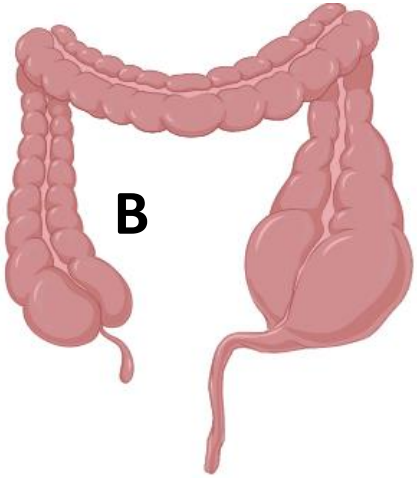

D


E


G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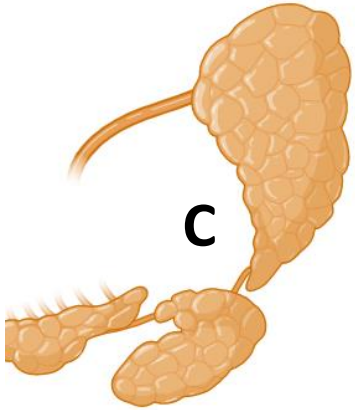
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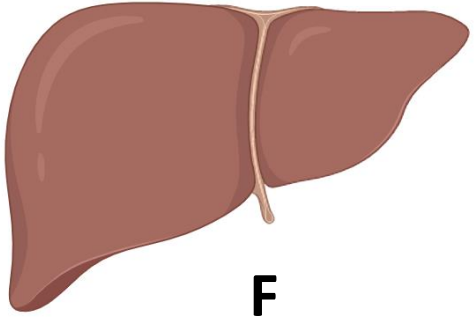
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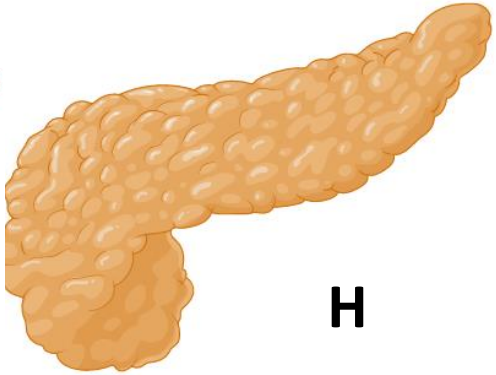
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Today's Learning Intention is

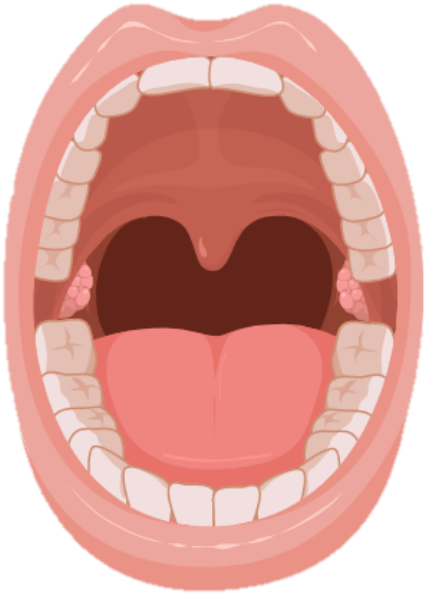
To understand the process of digestion.

By the end of this lesson I will be able to…

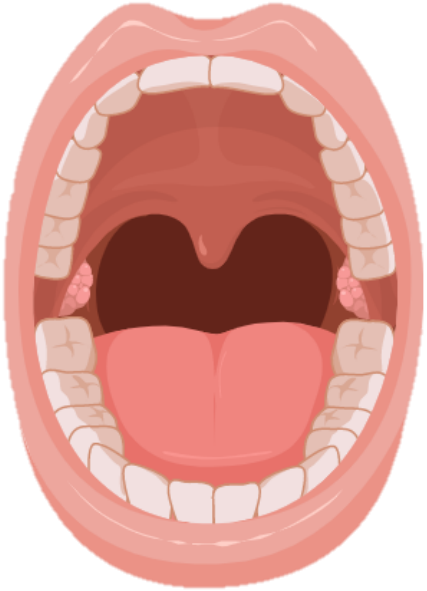
- ✓ Describe the process of digestion.
- ✓ Describe what is meant by an enzyme.
- ✓ State where in digestion enzymes are released.

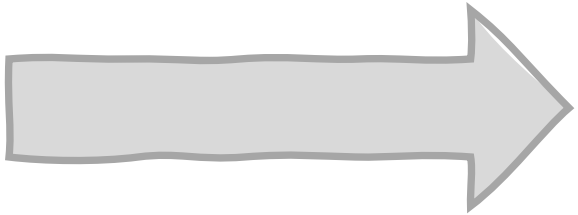
Enzymes

Enzymes are chemicals released throughout digestion and are there to **speed up** the breakdown of food molecules.

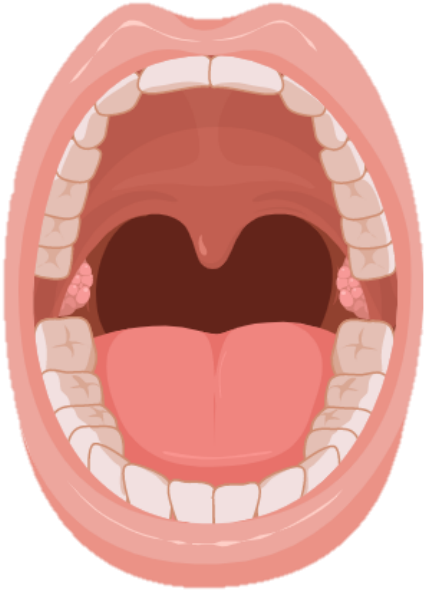


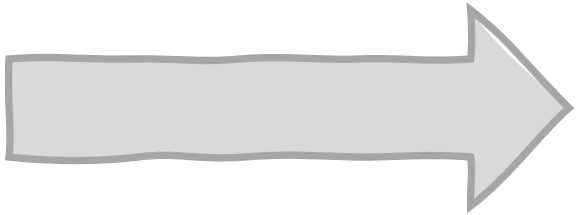
Chewing in the **mouth** along with **salivary glands** releasing **saliva** and **enzymes** helps to break the food down to swallow.



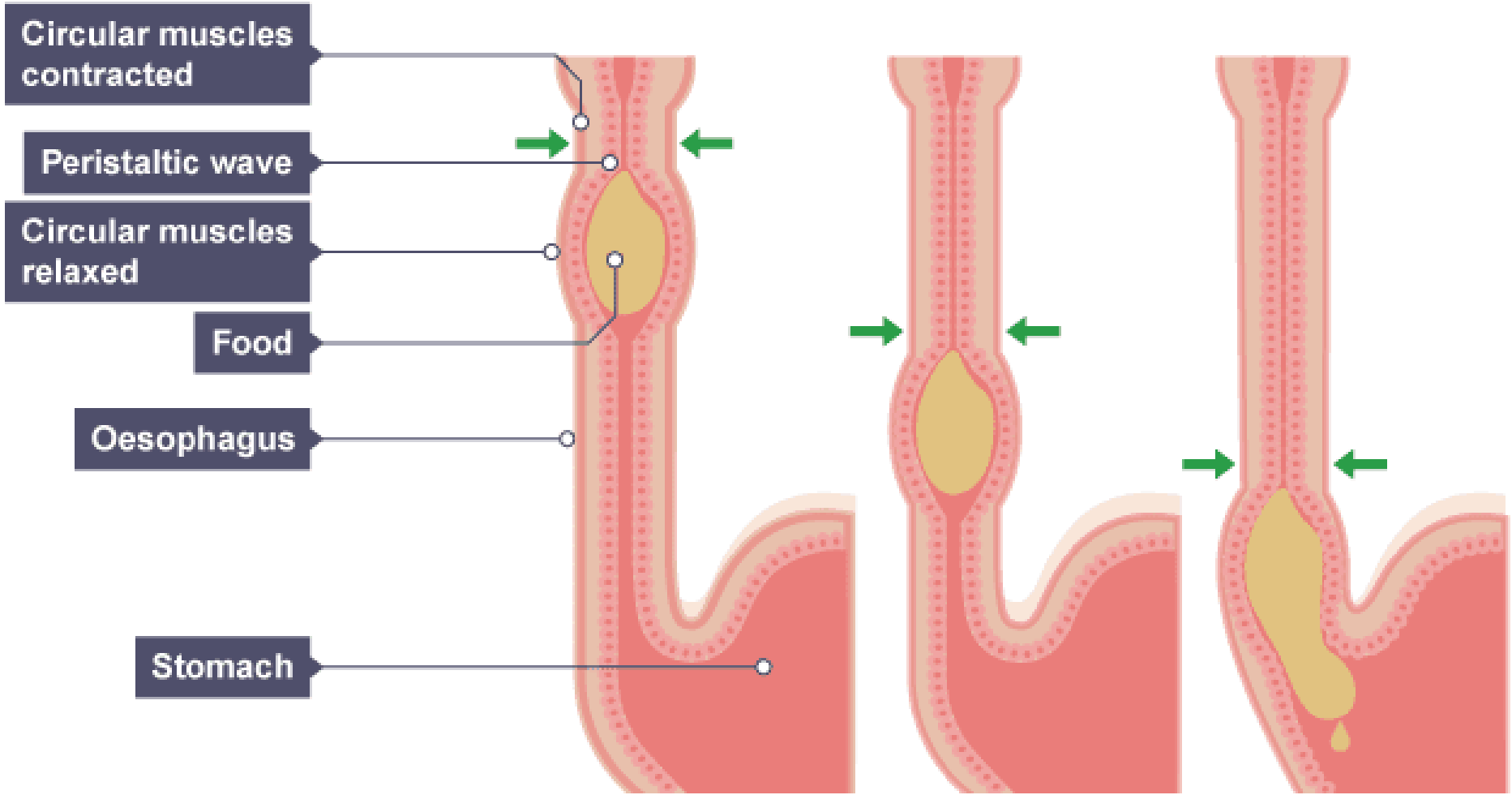


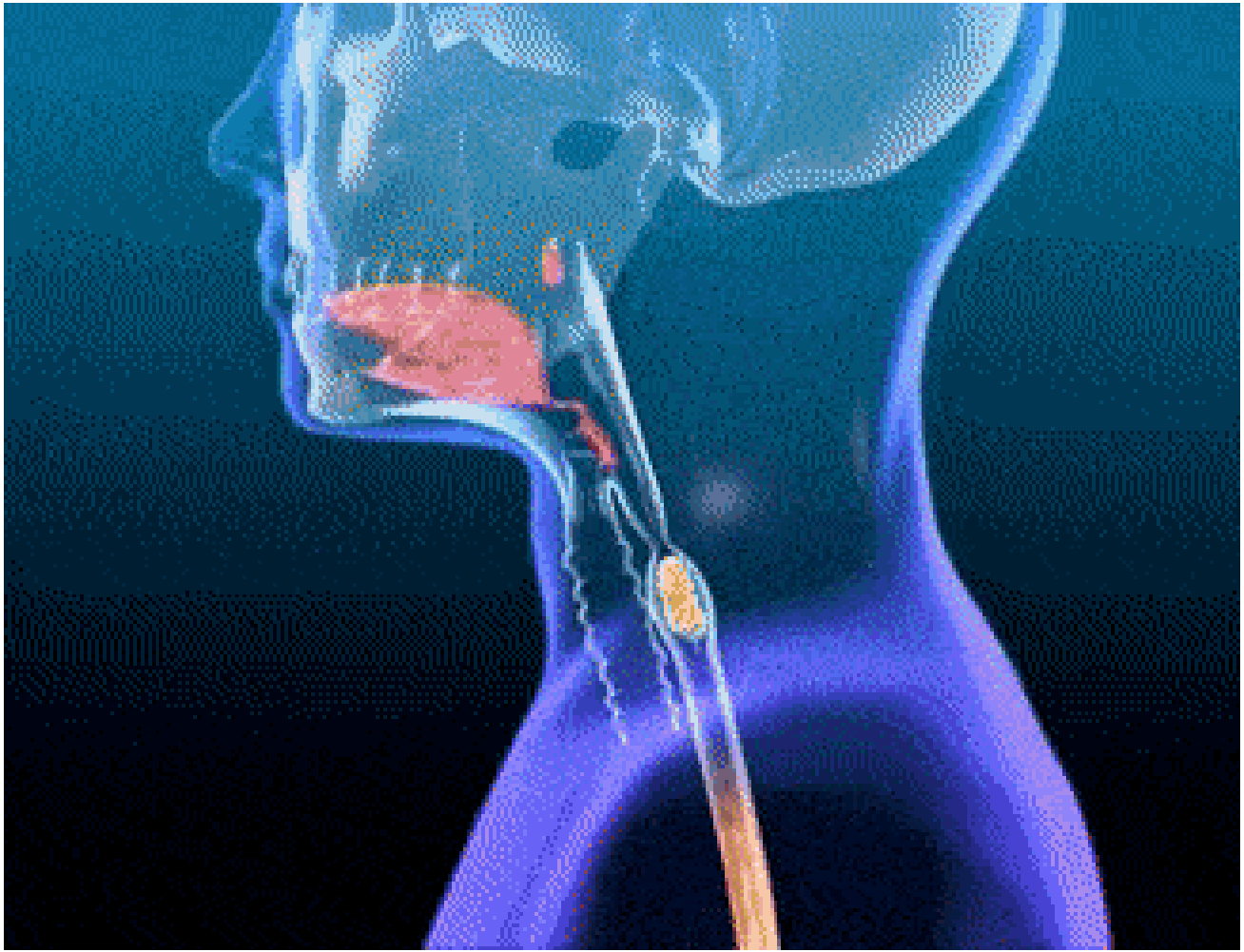
Once it is easy to swallow, the **tongue** pushes food to the back of the throat and down into the **oesophagus**.

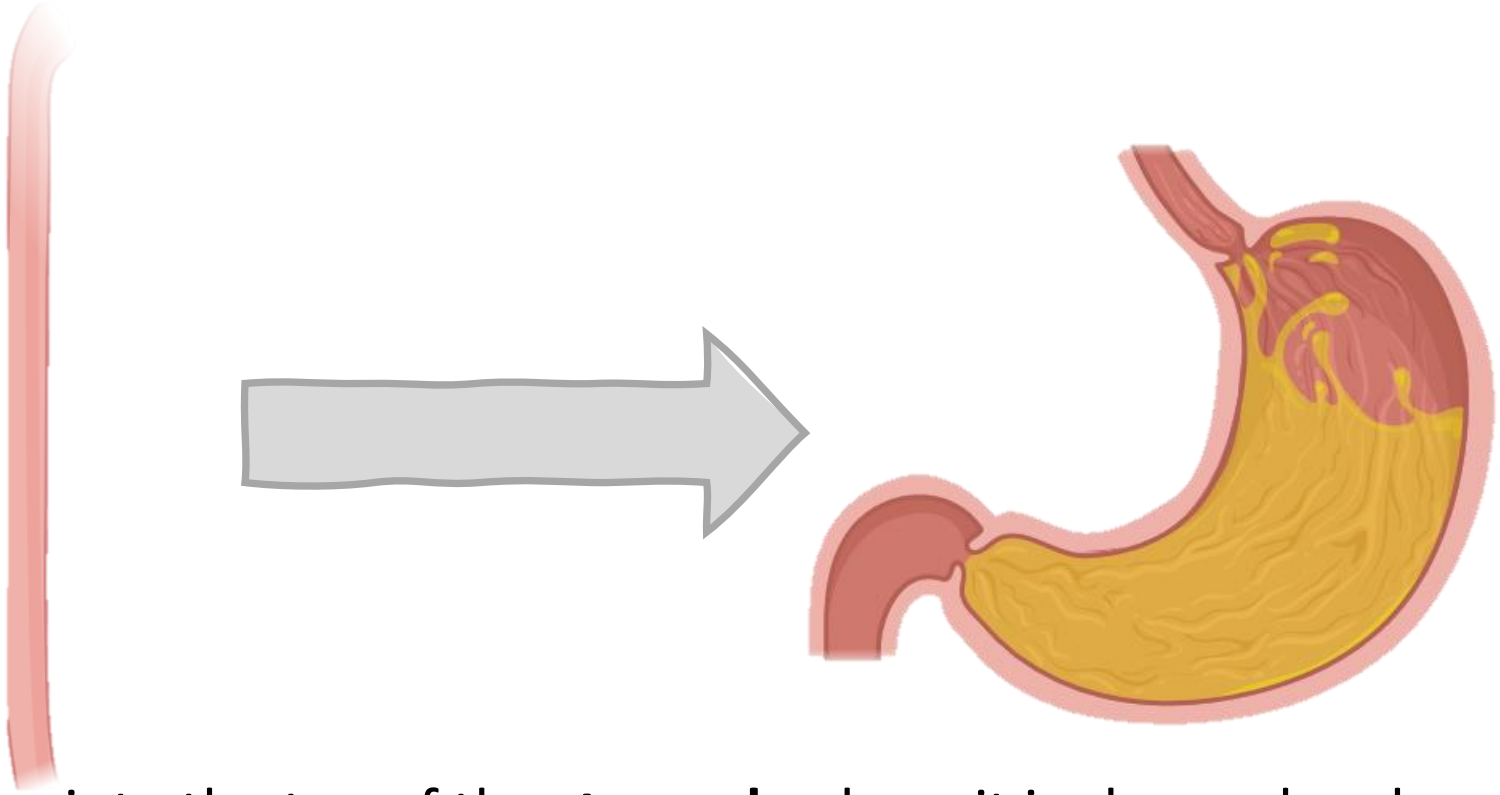




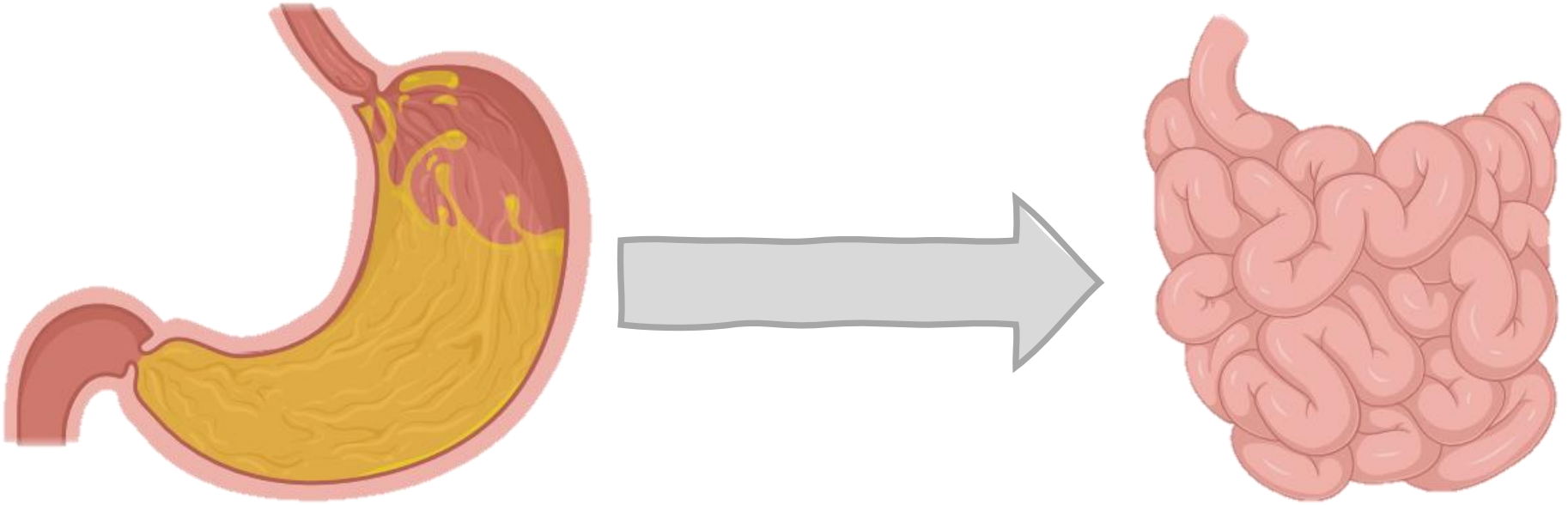
The oesophagus undergoes muscle contractions called **peristalsis** pushing the food downwards.


Circular muscles contracted
Peristaltic wave
Circular muscles relaxed
Food
Oesophagus
Stomach

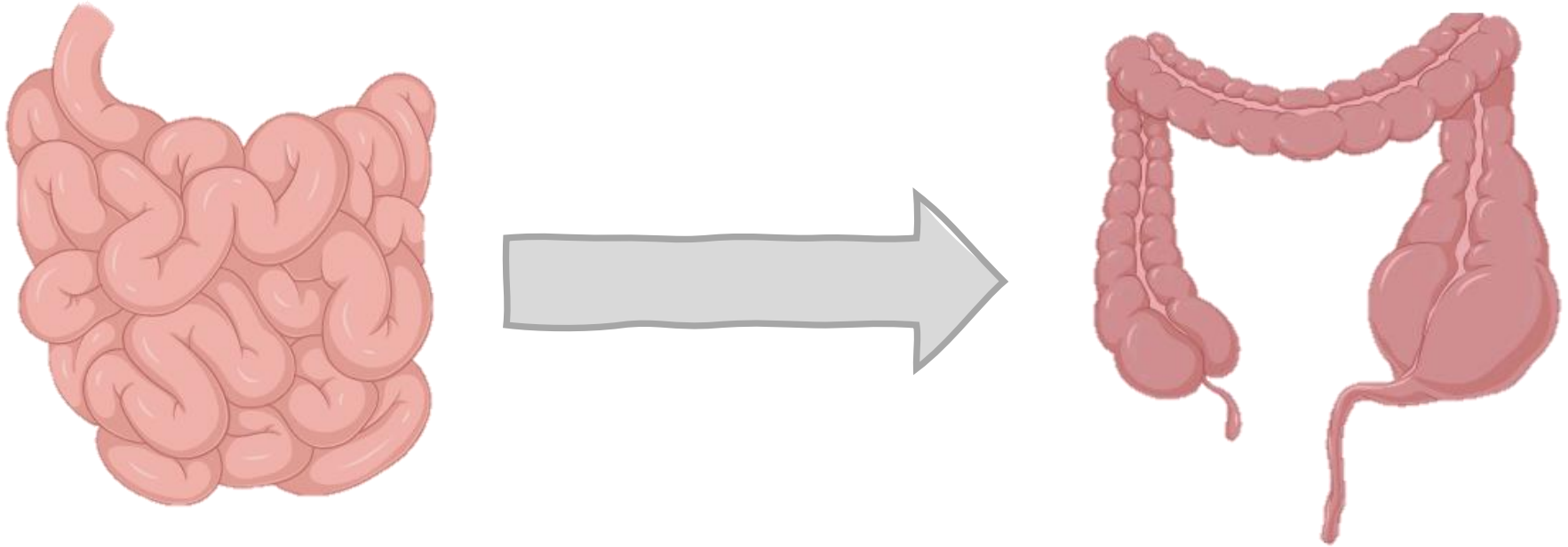




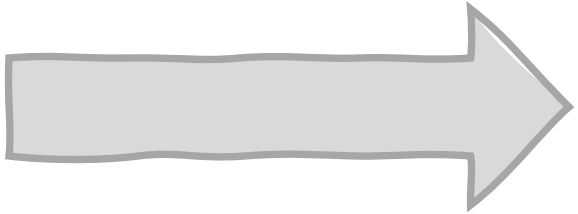
Food enters into the top of the **stomach** where it is churned and mixed with **stomach acid** and **enzymes**. This further breaks down the food molecules.



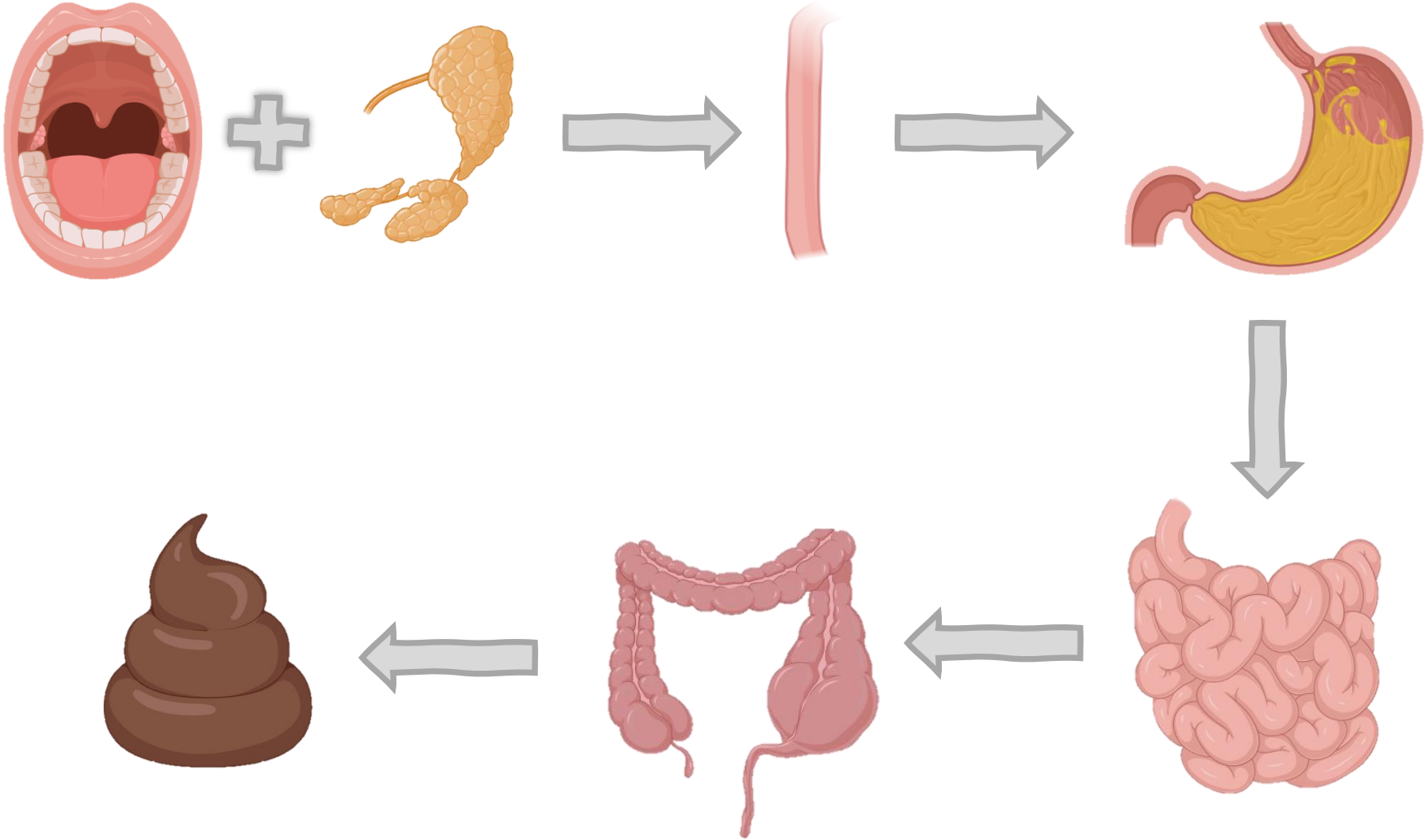
Once broken down, the food enters into the first portion of the **small intestine**. The food travels through this long organ where the essential **nutrients** are absorbed into the bloodstream.



The remaining food material is then passed into the **large intestine**. In the large intestine **water** is absorbed out, leaving behind non-essential waste products behind.



Once the waste material has passed through the large intestine, it finishes the journey by passing through the **rectum** and finally the **anus** where it leaves the body as **faeces**.



I can now…

- ✓ Describe the process of digestion.
- ✓ Describe what is meant by an enzyme.
- ✓ State where in digestion enzymes are released.

Today's Learning Intention is

To find out about the senses of the human body

By the end of this lesson I will be able to…

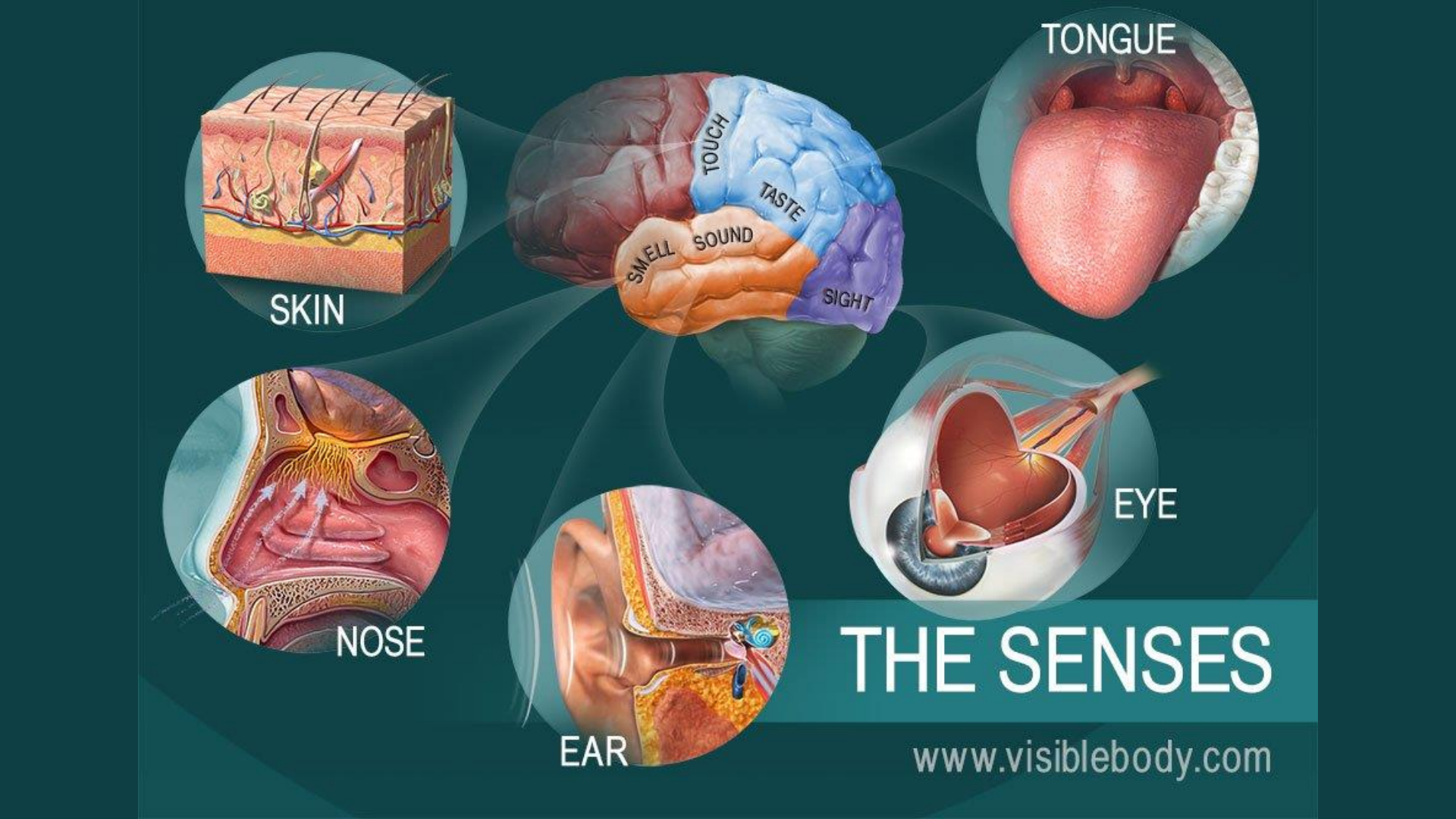
- ✓ State what the different senses of the human body are.
- ✓ State what organs detect these senses.

6-Jan-26

Senses

Senses

The 5 senses of the body are:


TONGUE
SKIN
TOUCH
TASTE
SMELL
SOUND
SIGHT
EYE
NOSE
EAR
THE SENSES
www.visiblebody.com

Senses

Senses	Sensory Organ
Sight	Eyes
Hearing	Ears
Touch	Skin
Smell	Nose
Taste	Tongue

Touch

Touch

The sense of touch is detected by receptors in the skin.

These receptors are all over the body.

Do we feel things the same all over the body?

Touch

Aim:

To find out if the sense of touch is the same all over the body

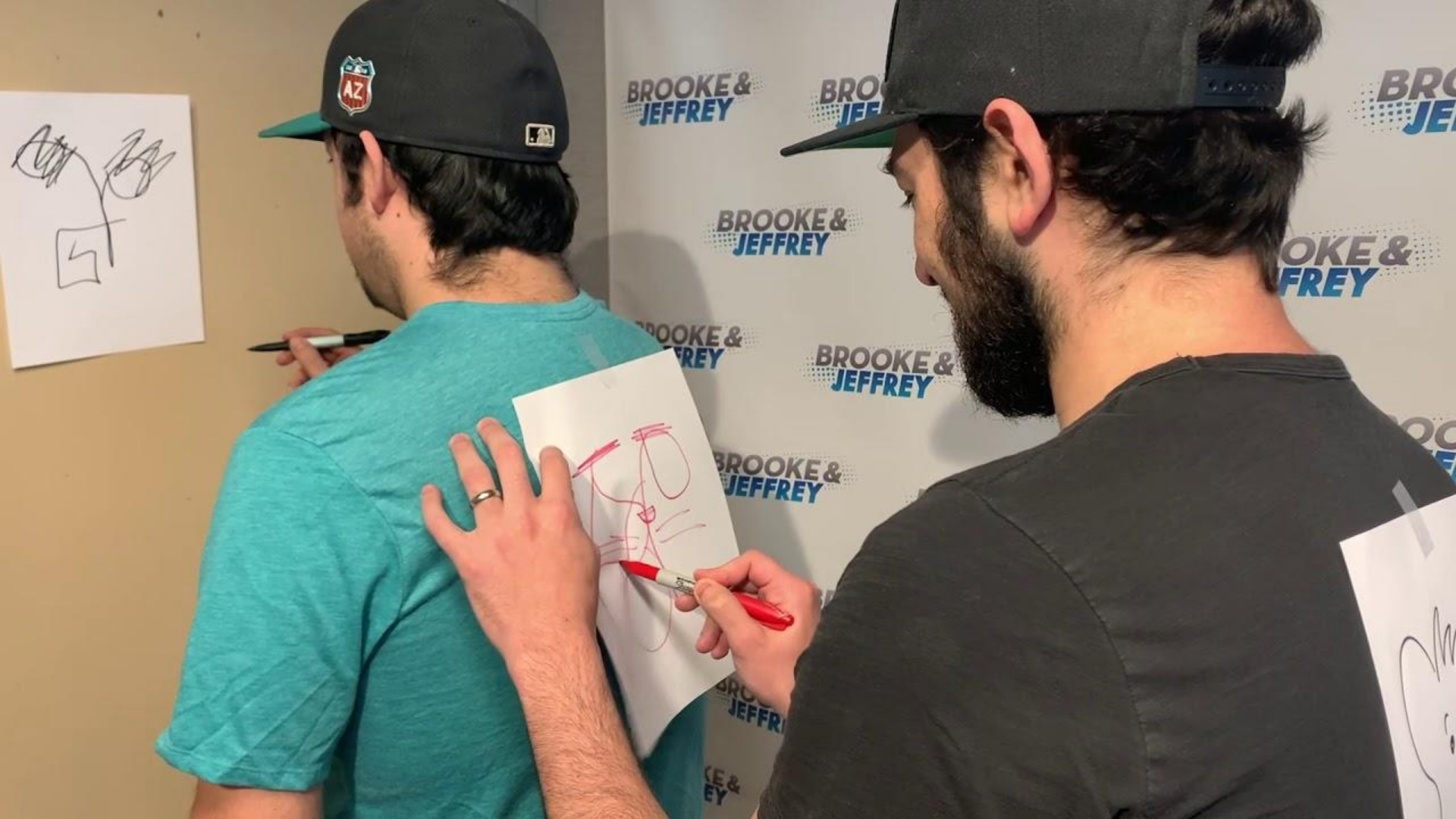
Touch

Location	Distance between the two points (mm)
Cheek	
Forehead	
Palm of hand	
Fingers	
Upper Arm	
Tip of nose	
Calf	
Back of hand	

Touch

Method:

1. Bend a paperclip out straight and press the 2 ends of the clip onto your skin at the first place on your body.
2. Gradually widen the gap between the points until you can feel 2 points instead of just 1.
3. Using a ruler record the distance between the points.


BROOKE & JEFFREY
AZ

I can now…

- ✓ State what the different senses of the human body are.
- ✓ State what organs detect these senses.

Today's Learning Intention is

To find out how information can be processed differently through sight.

By the end of this lesson I will be able to…

- ✓ Explain what is meant by an optical illusion.
- ✓ Explain what is meant by colour blindness.

6-Jan-26

Sight

Can you remember?

1

What part of the eye light enters?

2

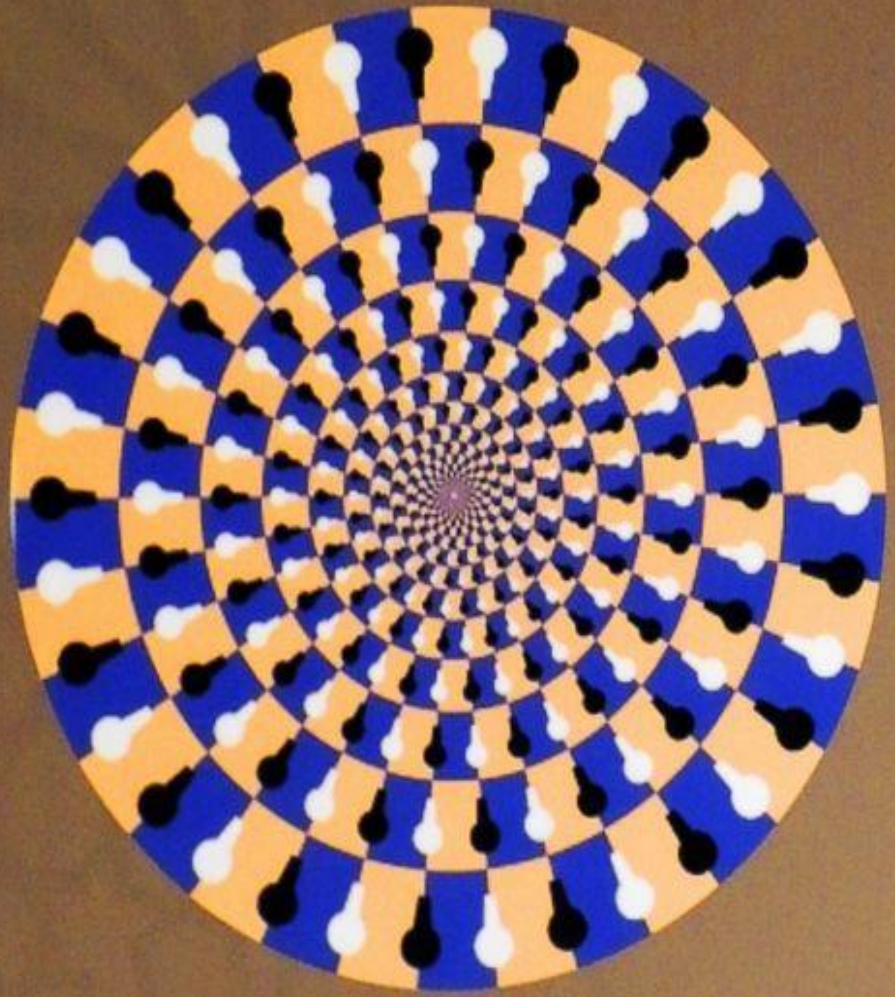
What part of the eye detects light?

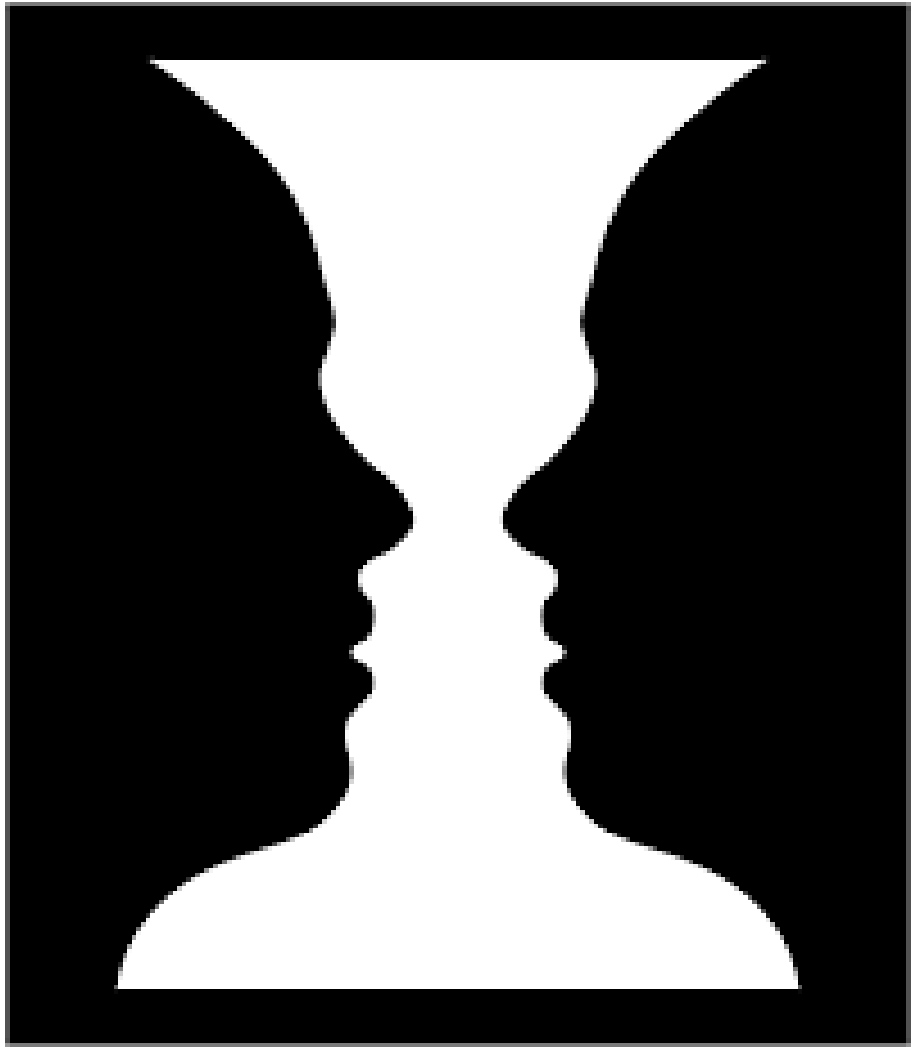
3

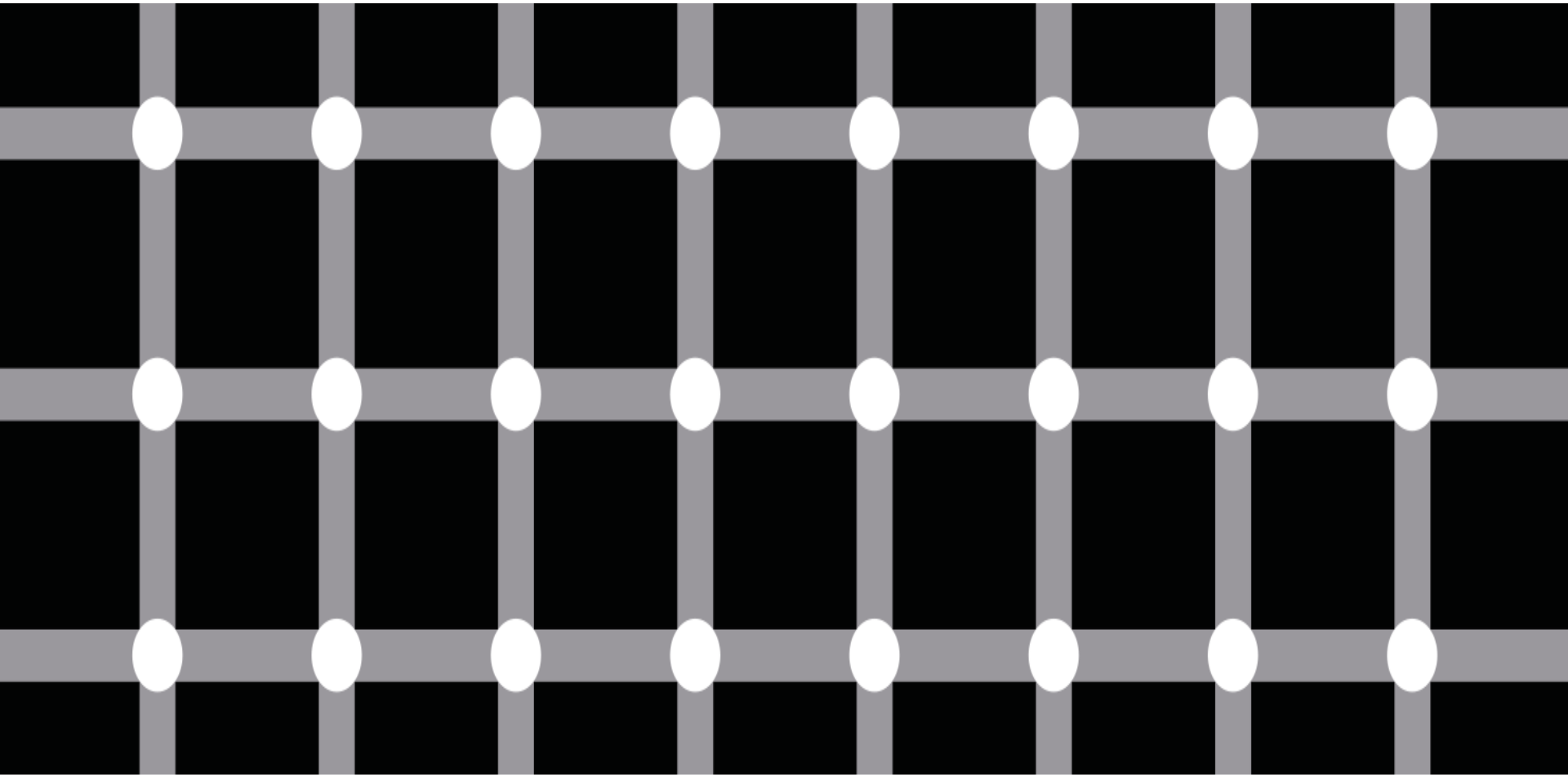
What part of the eye transfers this information from the eye to the brain?

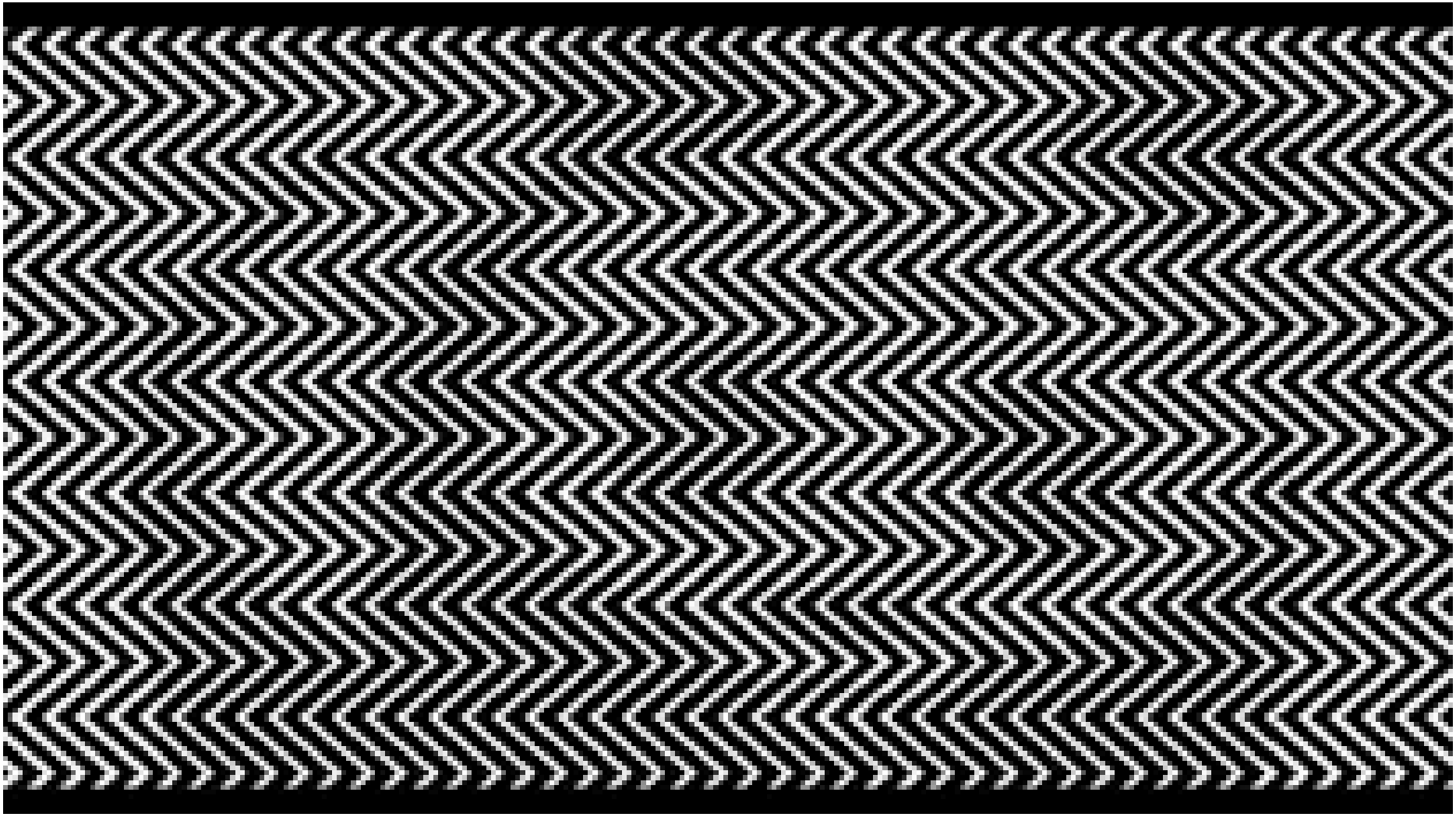
Optical Illusion

An **optical illusion** is when you see something, which **does not exist** or is **different** to how it appears.



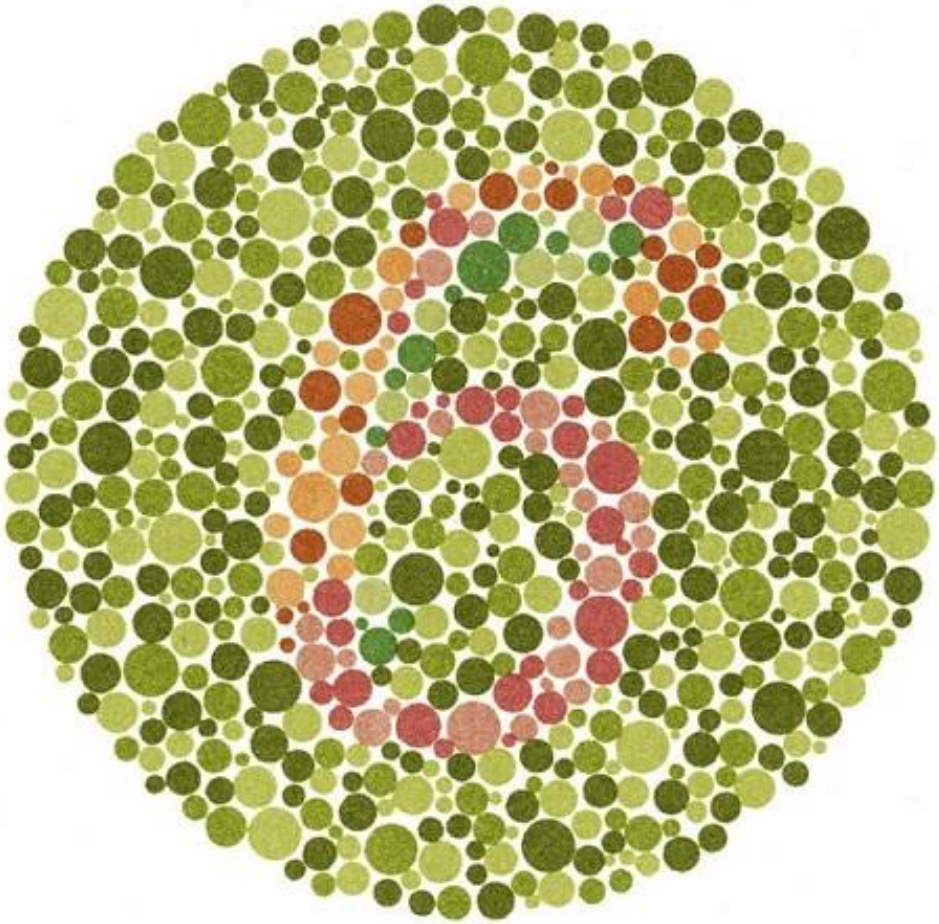


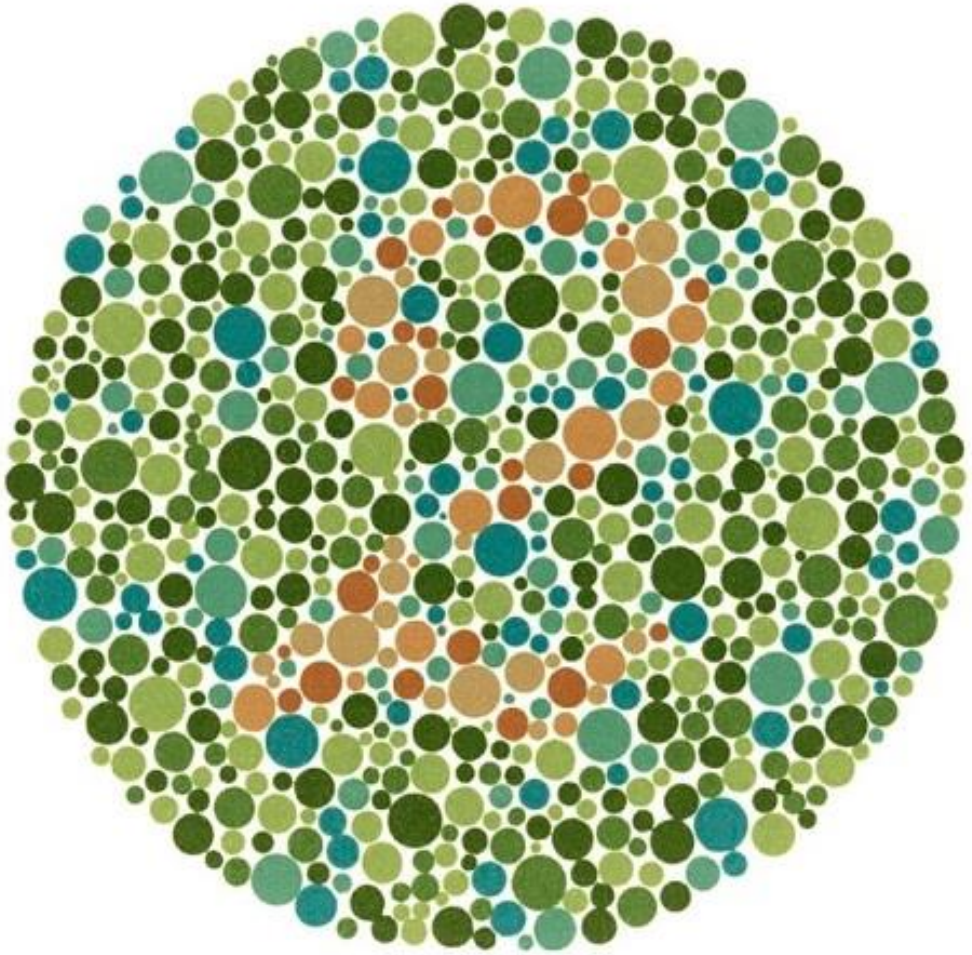


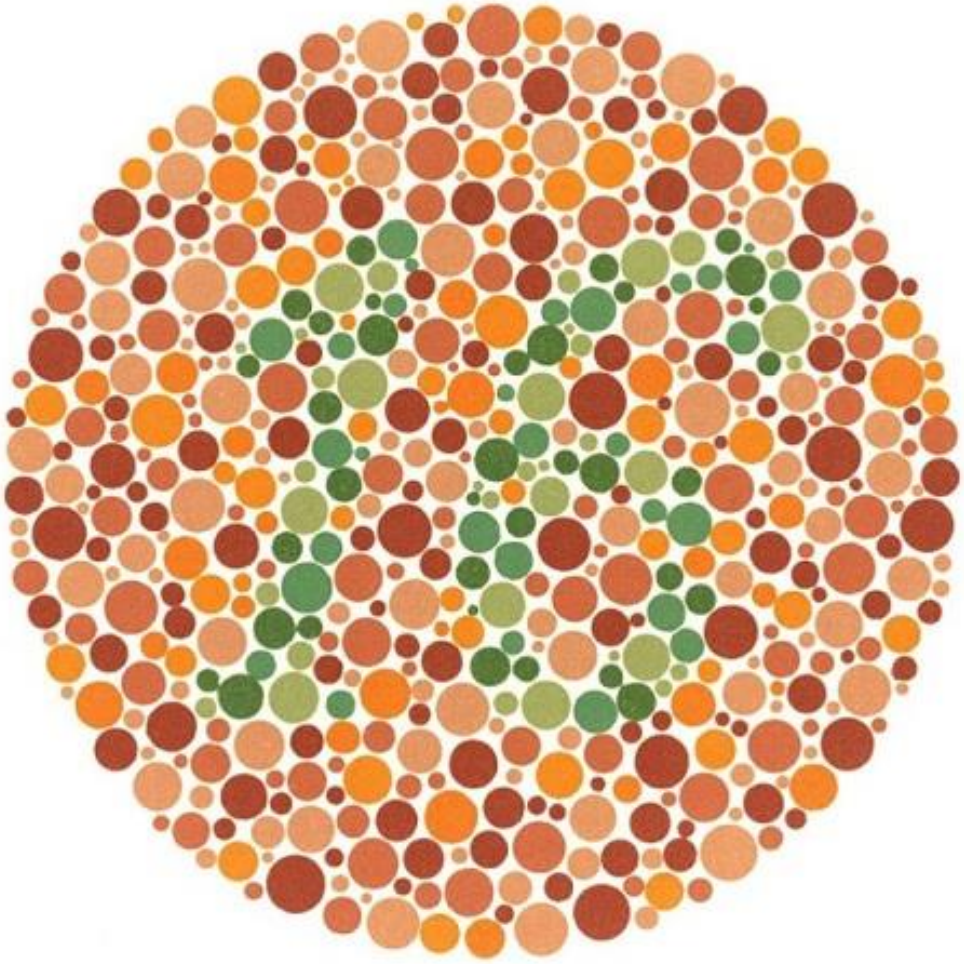


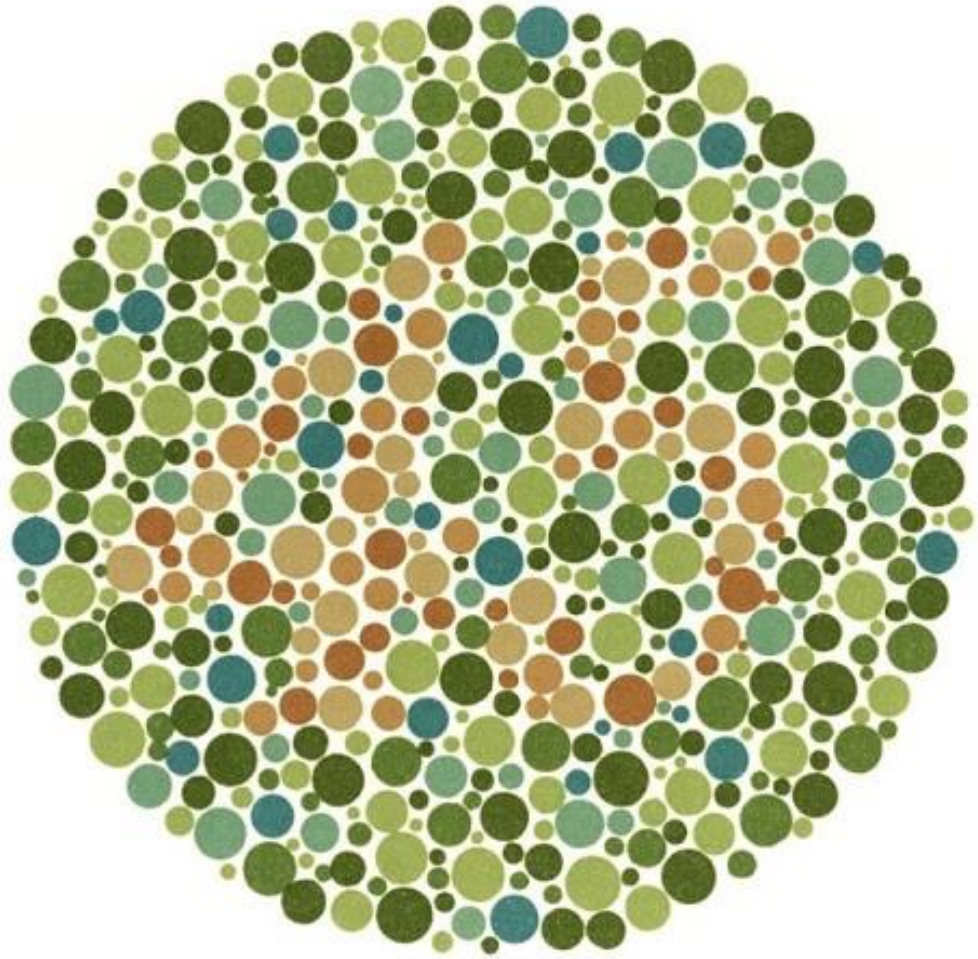
Colour Blindness

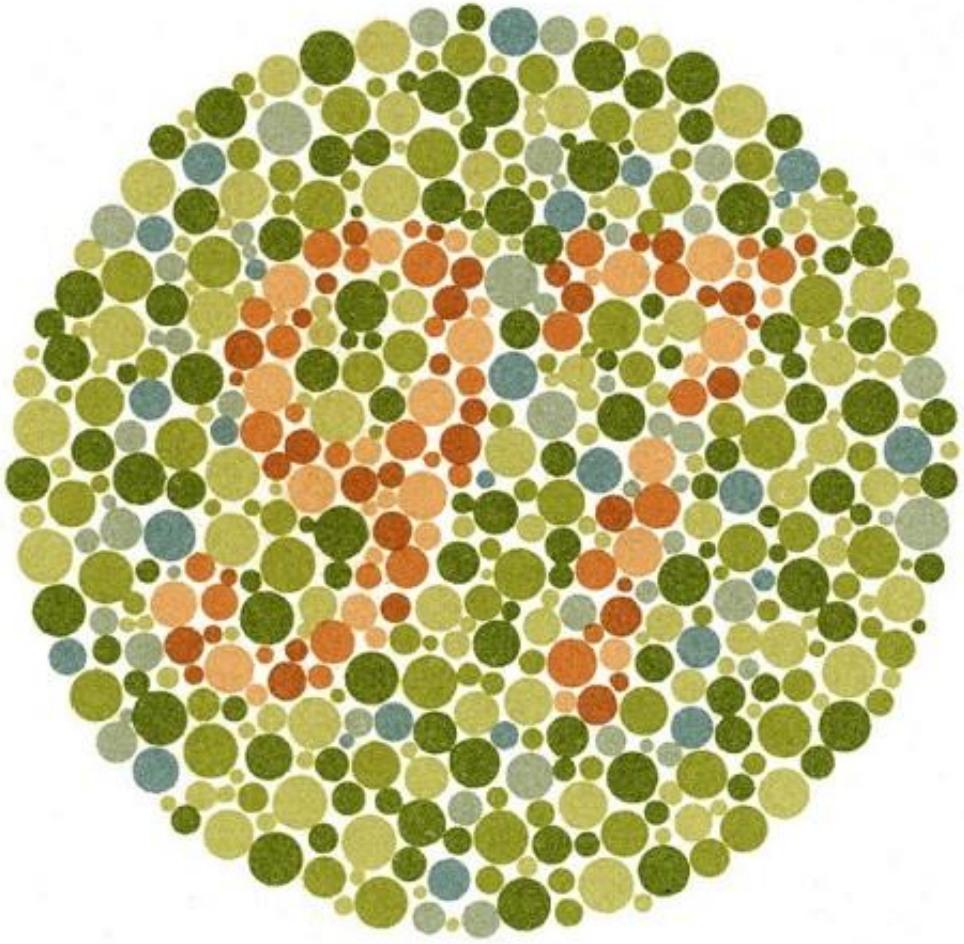
Colour blindness is where people see a colour in a **different way** or might find it **difficult to identify** different colours.

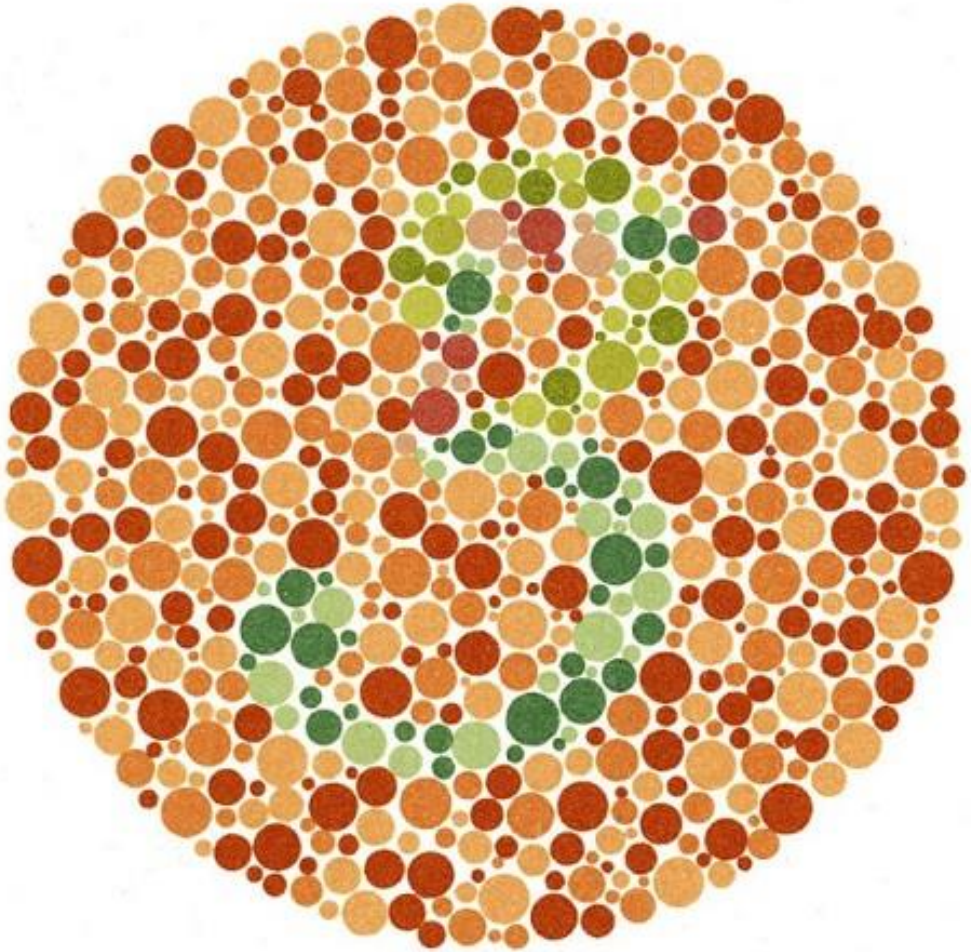












What colour is this dress?

What are the 2 colours you can see?

ORIGINAL

(Blue and Gold)
+0% brightness, +0% contrast

BRIGHTER

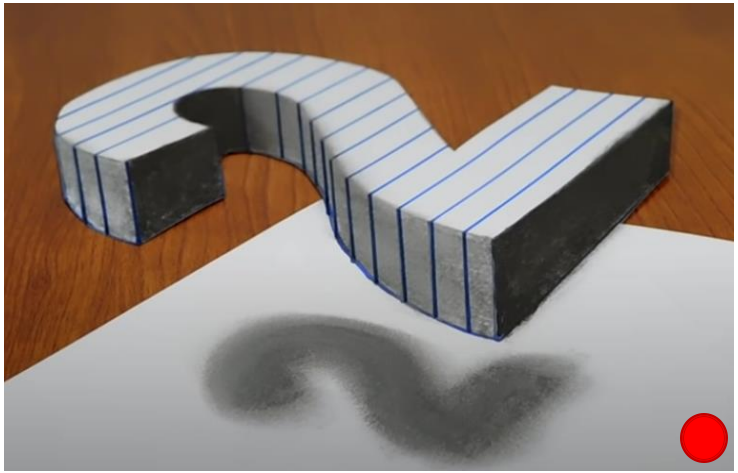
(White and Gold)
+40% brightness, +40% contrast

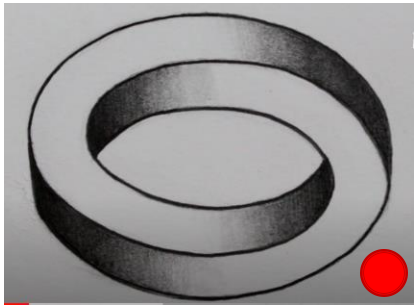
DARKER

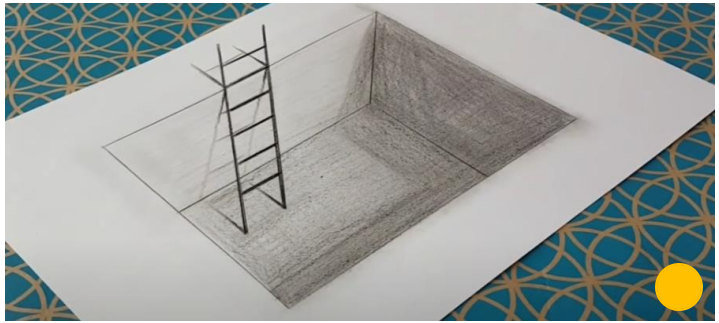
(Blue and Black)
-30% brightness, +40% contrast

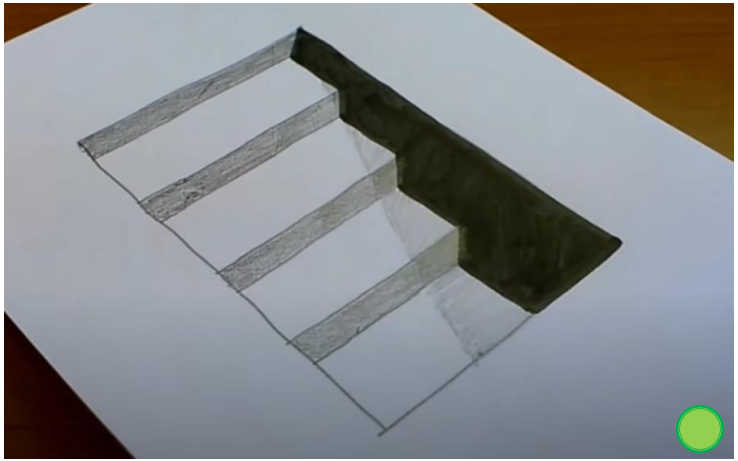
I can now…

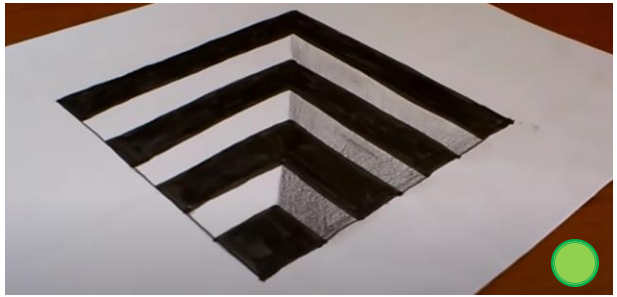
- ✓ Explain what is meant by an optical illusion.
- ✓ Explain what is meant by colour blindness.

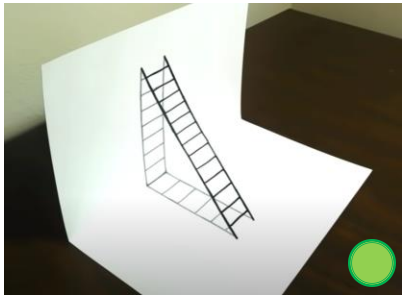


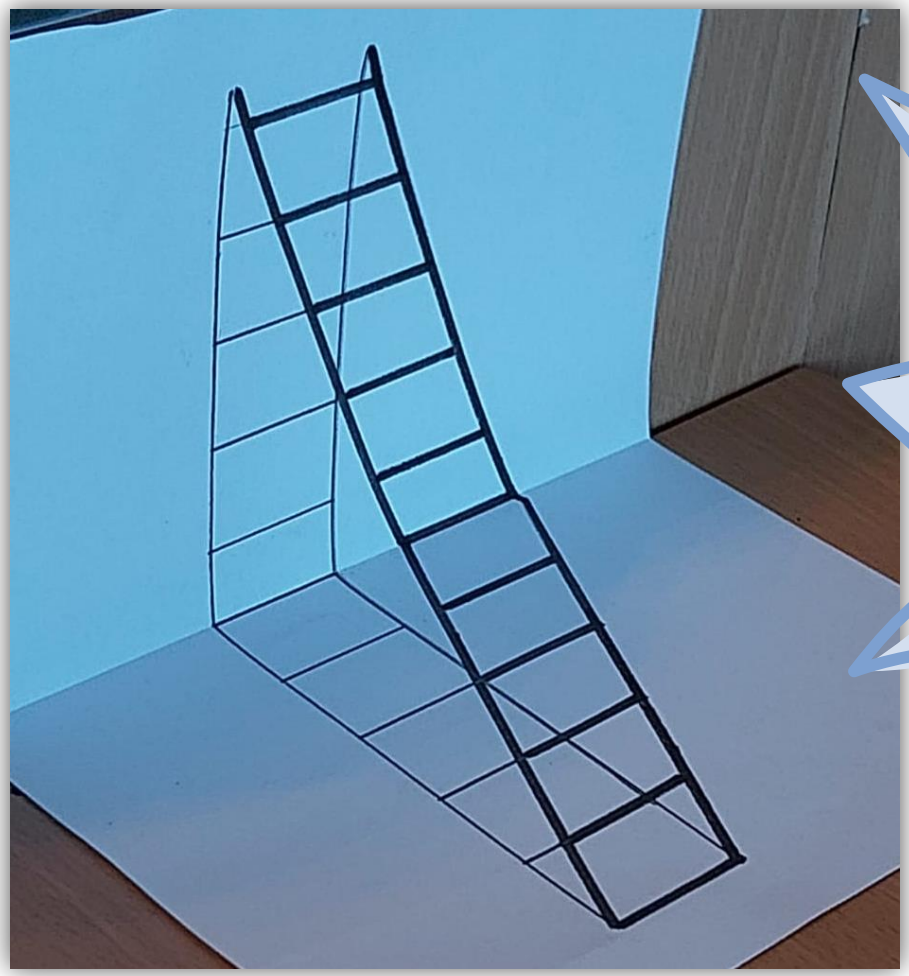












Ta Da!

Here is one I done earlier.

Today's Learning Intention is

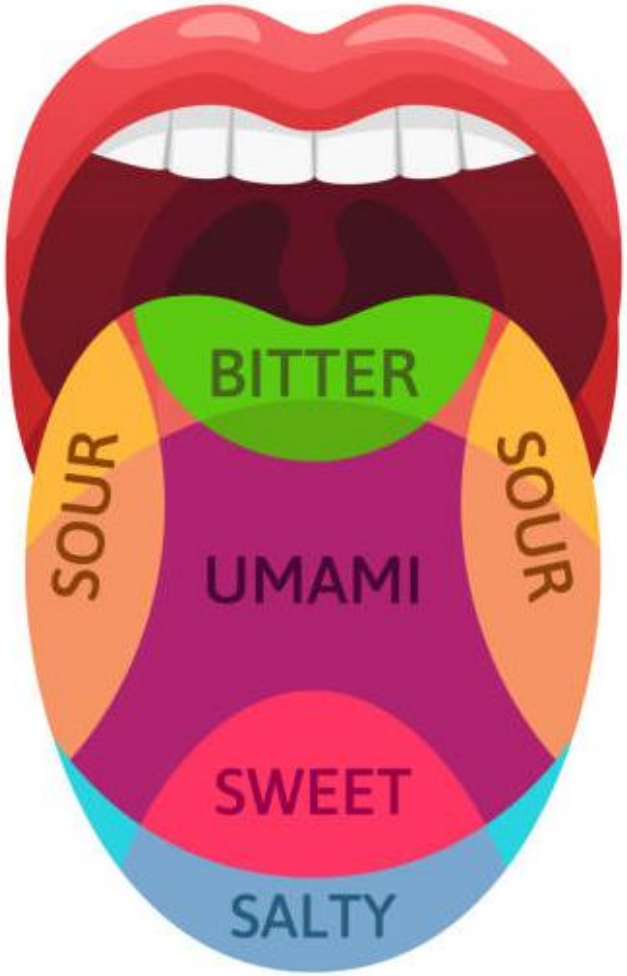
To find out about the sense of taste.

By the end of this lesson I will be able to…

- ✓ State what the different human tastebuds are.
- ✓ State what types of foods the tastebuds detect.

6-Jan-26

Taste


BITTER
SOUR
SOUR
UMAMI
SWEET
SALTY

Taste

Tastebud	Examples of Foods Detected
Salty	Soy sauce and table salt
Sweet	Syrup and milk chocolate
Sour	Vinegar and lemon juice
Bitter	Dark chocolate and coffee
Umami	Meat broth and aged cheese

Taste

Method:

Blindfolded and holding your nose, try and identify the flavours of three different crisps correctly.

No peaking!

I can now…

- ✓ State what the different human tastebuds are.
- ✓ State what types of foods the tastebuds detect.