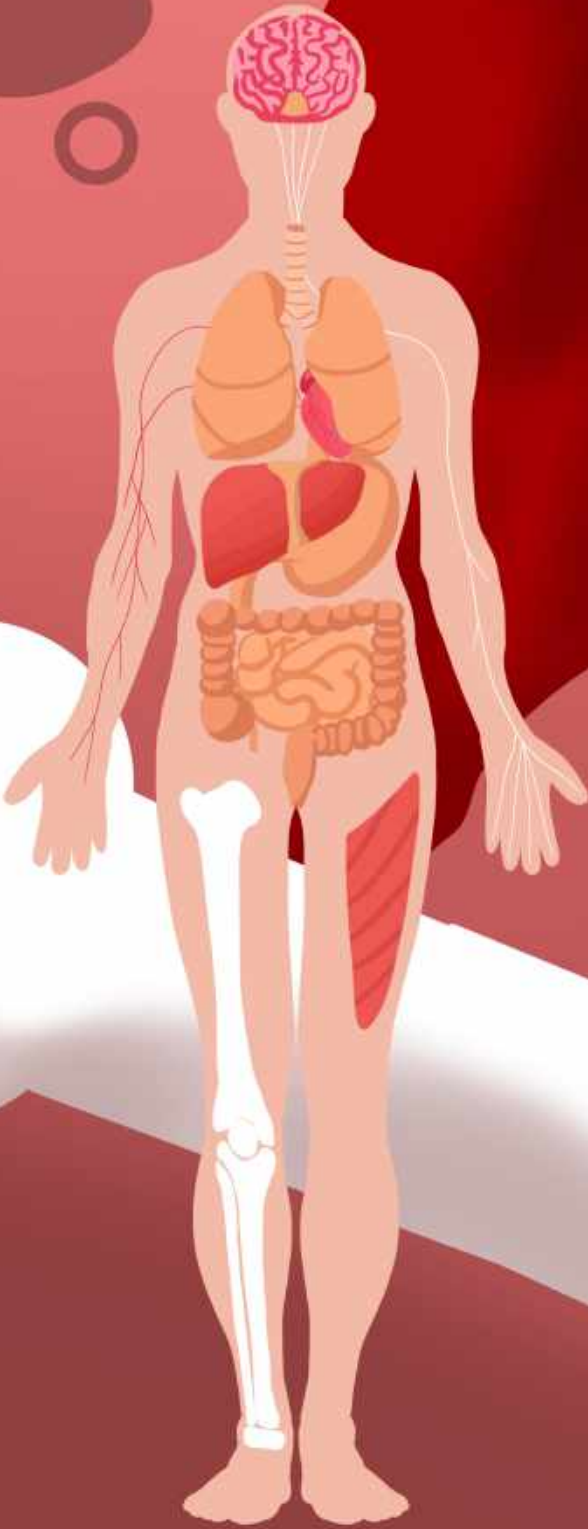
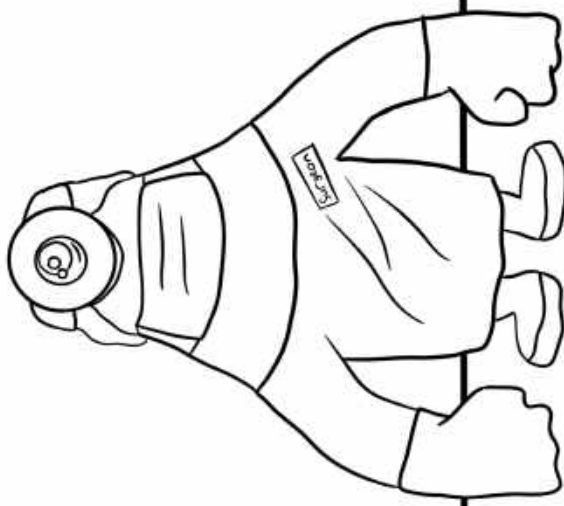
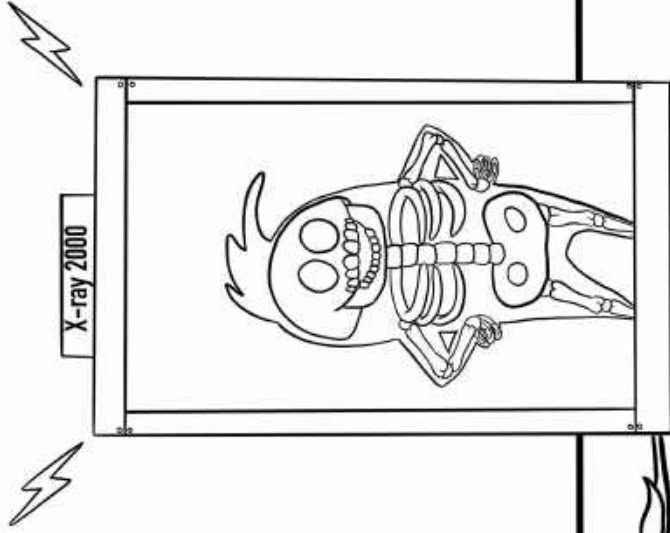
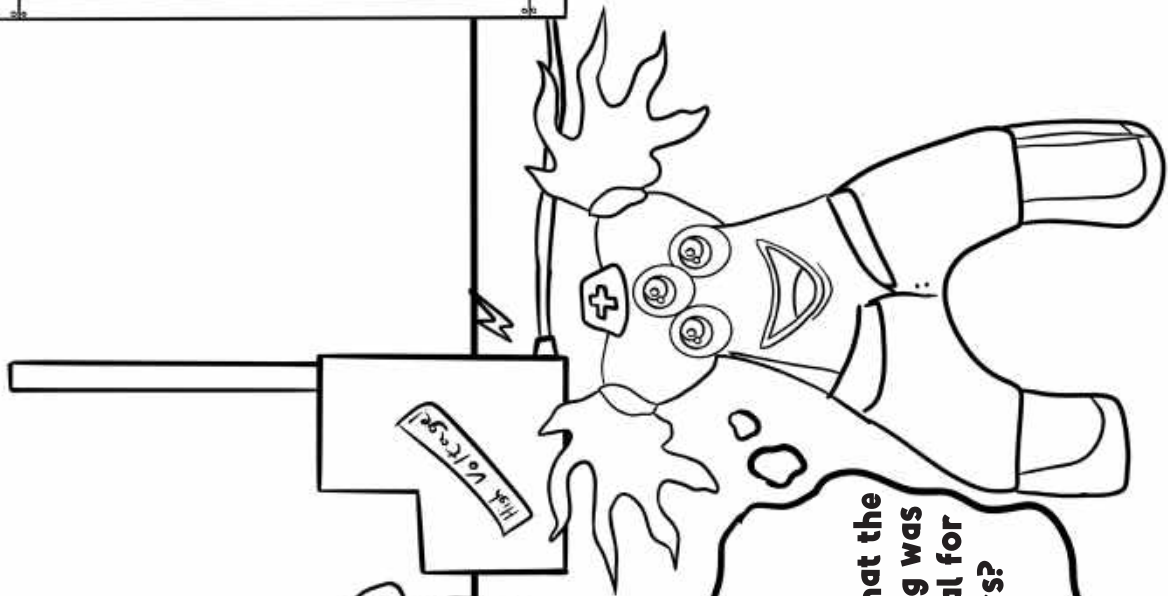


# The Human Body

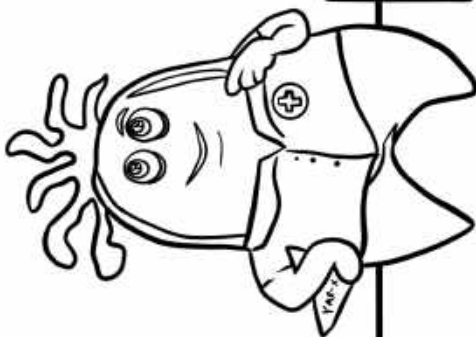




Did you know that the earliest hospital we know of was built over 1000 years ago?



Did you know that the Explora building was once a hospital for war soldiers?



# The Tongue



**The tongue  
has over 2000  
taste buds!**

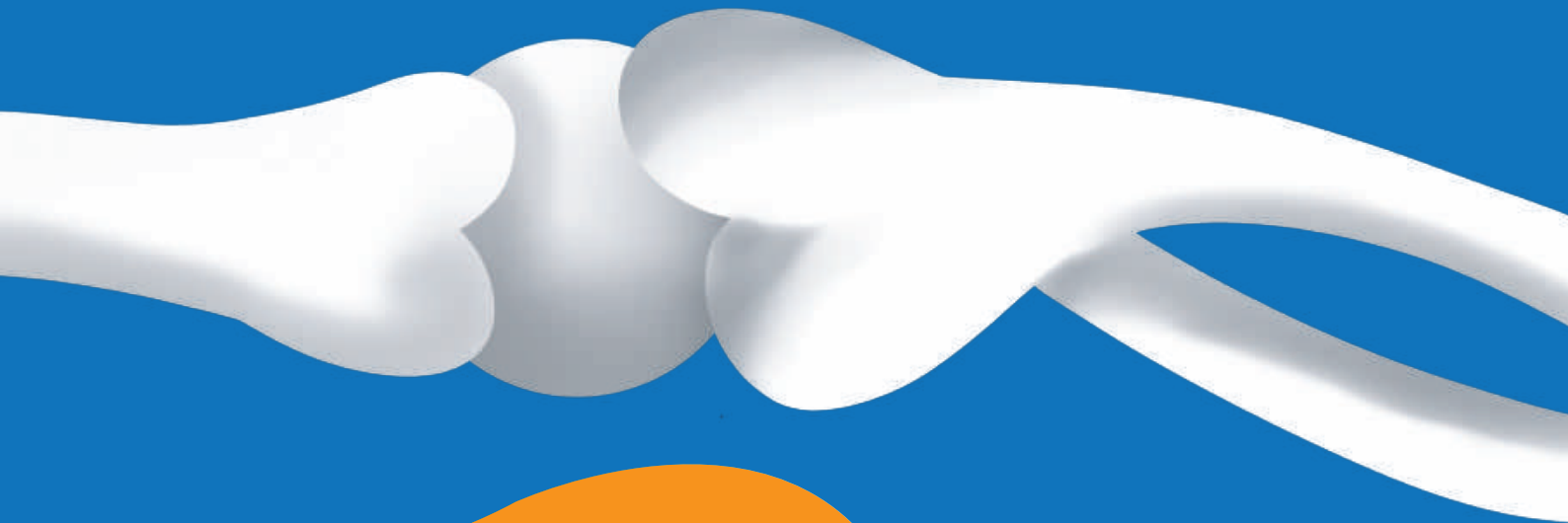
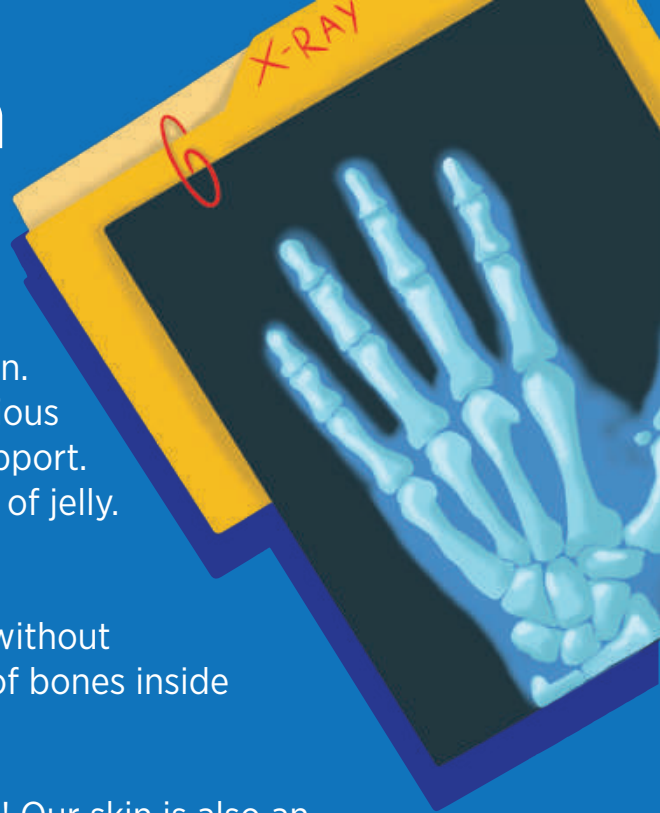
**The tongue  
doesn't just help  
us taste yummy  
food! It also  
helps us  
swallow and  
talk!**

# The human skeleton

Inside our body we have bones - over 200 of them in fact! When connected together, they form our skeleton. What does the skeleton do? It protects all of our precious organs from any damage and also give our bodies support. Without it, our body will look wobbly, just like a piece of jelly. Funny right?

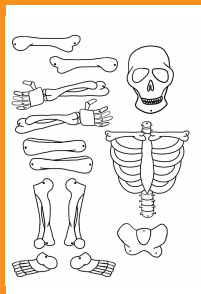
The skeleton also helps us to move. It cannot do this without muscles. With the skeleton alone we would be a pile of bones inside a skin bag.

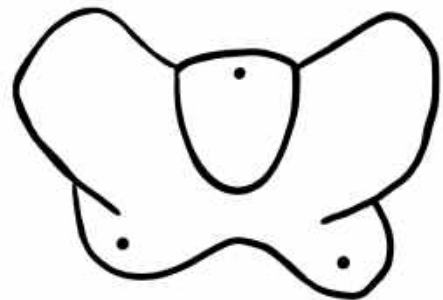
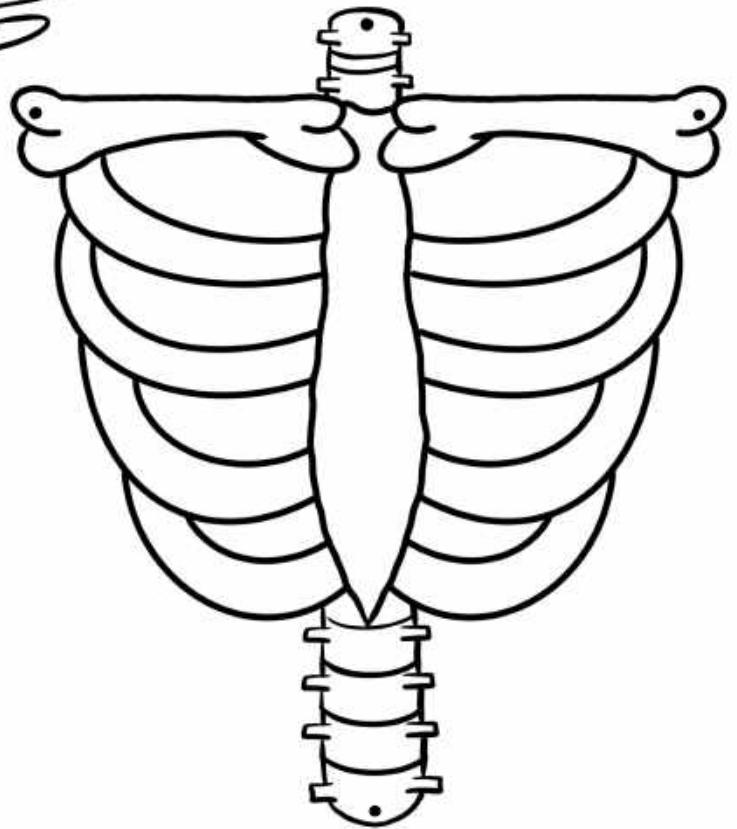
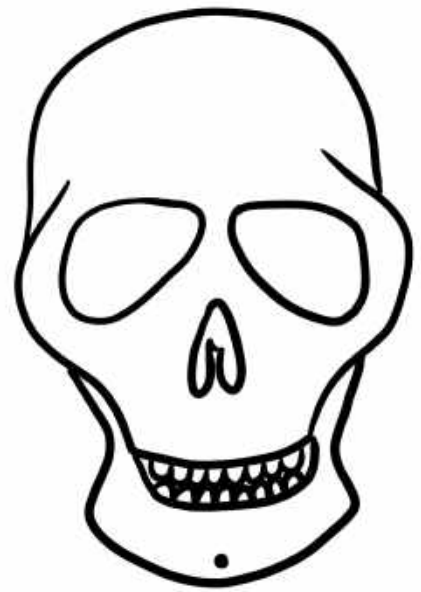
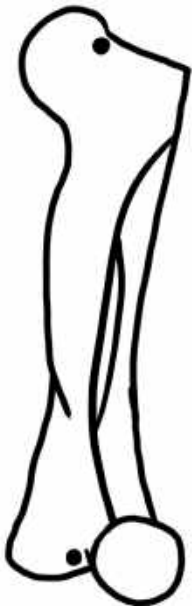
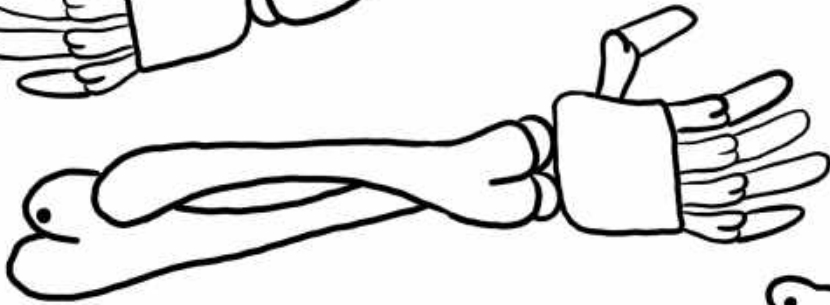
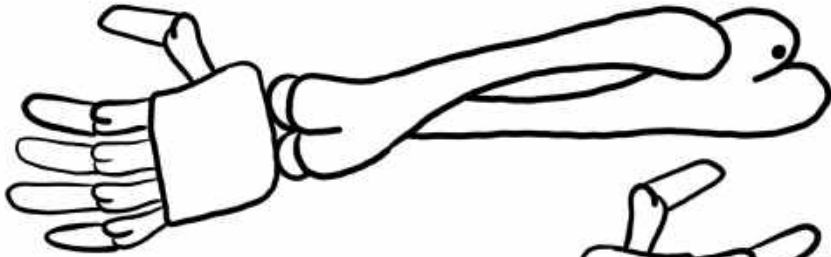
Our skeleton is covered by another organ. That's right! Our skin is also an organ, in fact it is the largest organ of all!



## Skeleton instructions

Cut out skeleton: place the whole sheet on a cardboard and using a sticky-glue, glue both parts together. Cut out all the pieces provided. Using a hole punch to make holes as guided by the dots on each bone and attach the whole skeleton together by using butterfly pins or small pieces of string.





# Can I give you a hand?

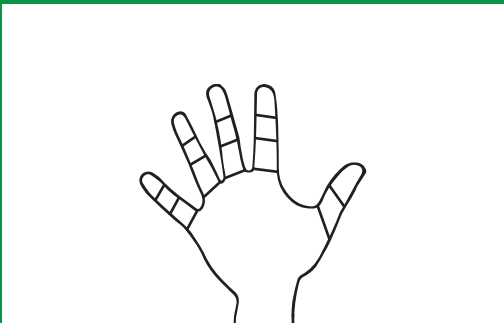
## What we need:

- Cardboard
- Ruler
- Scissors
- Tape
- String/ Ribbon
- Straws

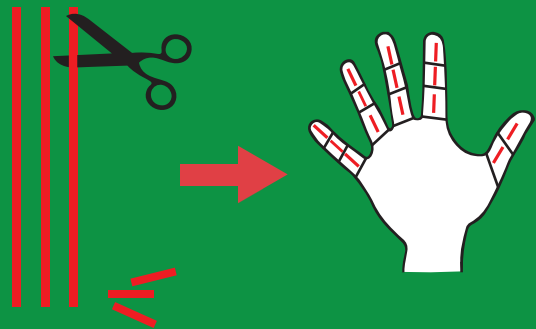


## How to do it:

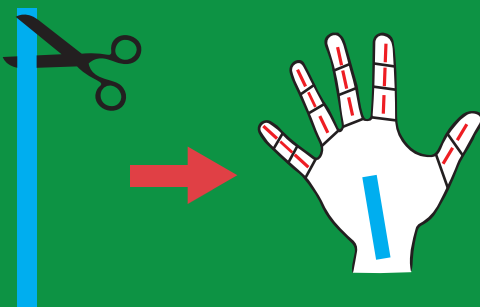
1. Place your hand on a piece of cardboard and trace around it. Cut it out and draw lines on the fingers where your fingers naturally bend.



2. Cut the straws a little shorter than the bends of the finger. Stick the straw pieces with glue or tape.



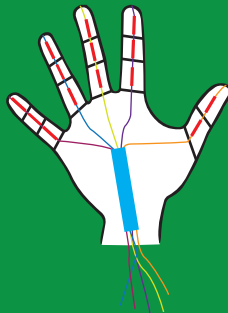
3. Get a thicker straw (smoothie straw) and stick it at the centre of the hand – on the palm.



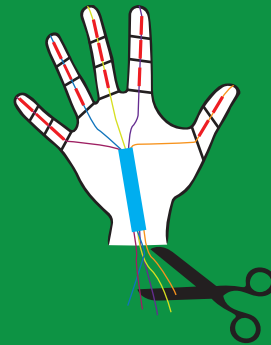
Muscles help the skeleton to move as they produce force and motion. Our brain tells our muscles to contract or extend to control movement.



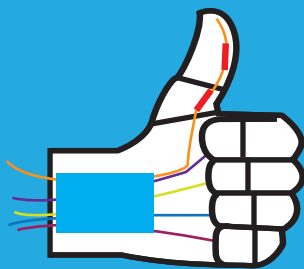
4. Using some string or ribbon stitch each fingers together and run the remaining string through the thicker straw.



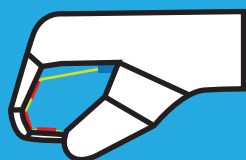
5. Cut the extra pieces.



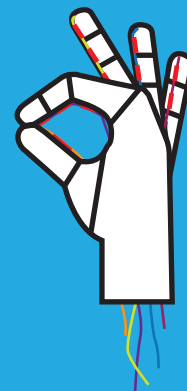
**Can you try some of these signs?**



**THUMBS UP**



**FIST BUMP**



**OK**

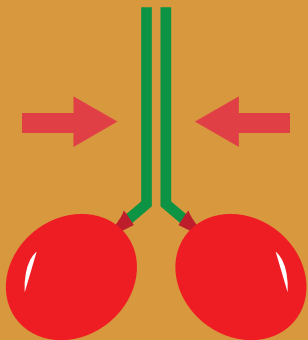
# Take your breath away

## What we need:

- Empty plastic bottle (clear)
- 3 Balloons
- 2 Straws
- Sticky Tac
- Scissors
- Tape

## How to do it:

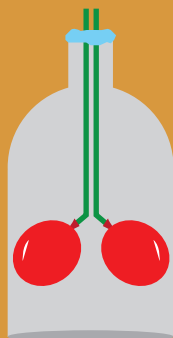
1. Use tape to attach a balloon tightly to each of the two straws. Make sure the seal is airtight. Connect the two straws together with tape. These are our two **lungs!**



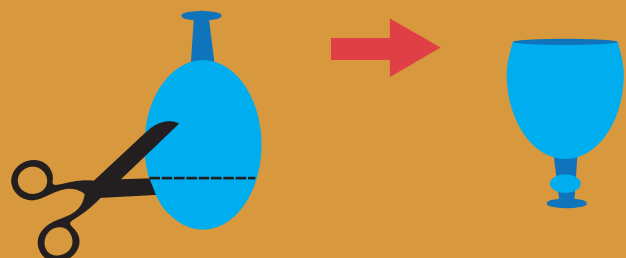
2. Cut the bottom part off of the plastic bottle using scissors (Ask an adult for help!)



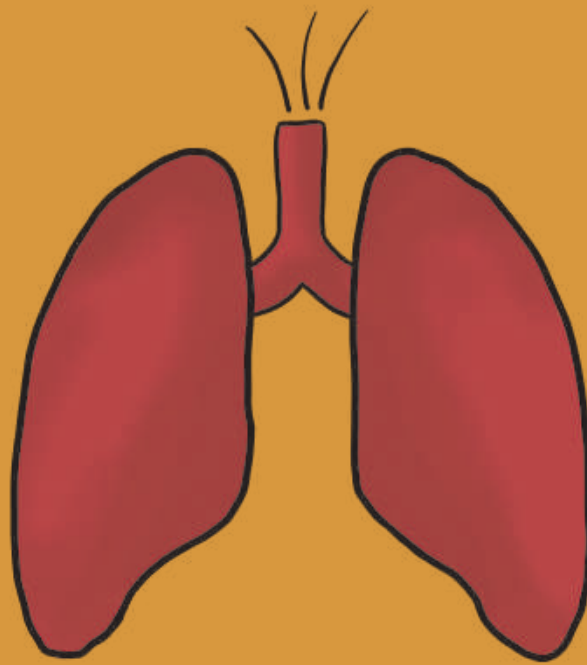
3. Place the straws with the balloons inside the plastic bottle. Use sticky tack to completely seal the top of the bottle. Make sure it's as airtight as possible!



4. Cut the end of another balloon and tie a knot at the neck.

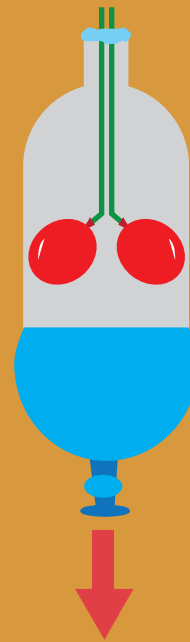
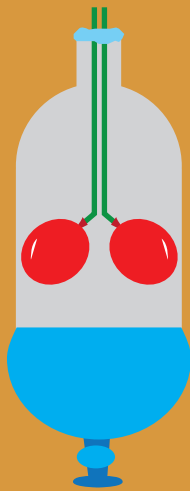






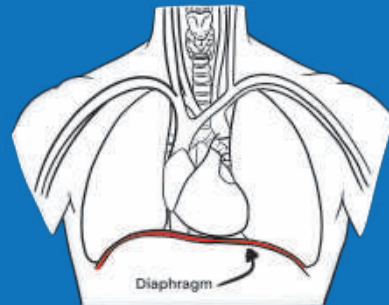
5. Stretch it out over the opening you cut in the bottle. Secure it with tape. This represents our **diaphragm**.

6. Grab the knot of the balloon, push it in as far as you can and then pull. The lungs should fill with air and inflate



## FACT

The diaphragm is a thin dome-shaped muscle found right beneath the lungs. It separates them from your stomach and intestines and most importantly it helps you breathe. When it gets irritated, the diaphragm also causes the hiccups!



Remember that our bodies only have one air pipe called the trachea which then connects to both of the lungs.

# Gut Reactions

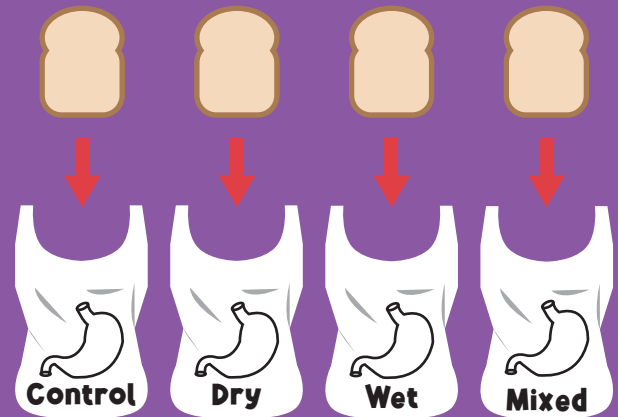
## What we need:

- 4 Resealable Plastic Bags
- 4 Slices of Bread/Crackers
- Water
- Marker

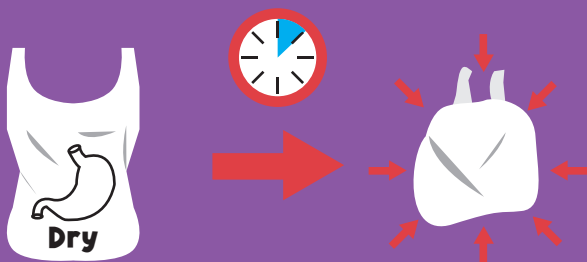
1. Label your 4 bags: Control, Dry, Wet, Mixed. Each of these bags represent a stomach which we will be filling with food! Draw a stomach on each bag using a marker.



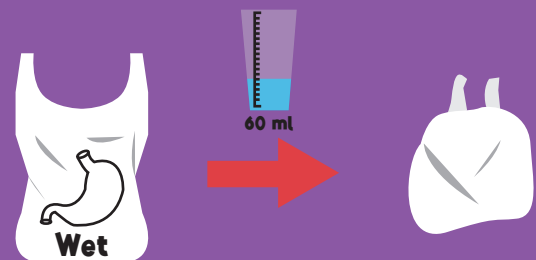
2. Place a slice of bread into each bag.



3. In the dry bag, squash the bread with your hands for a few minutes.

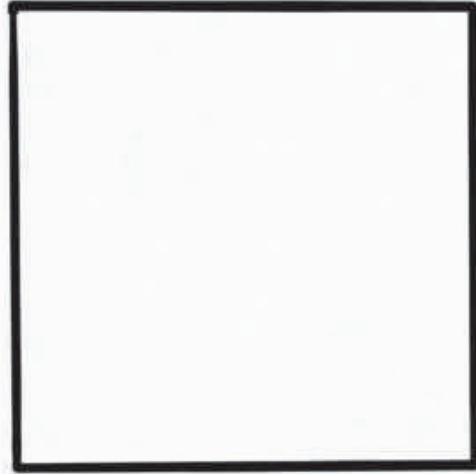
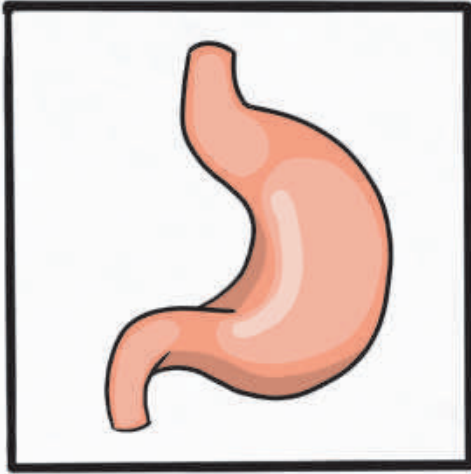


4. In the wet bag, add ¼ cup (60 ml) of water into the bag and move it around. Make sure it's closed well!

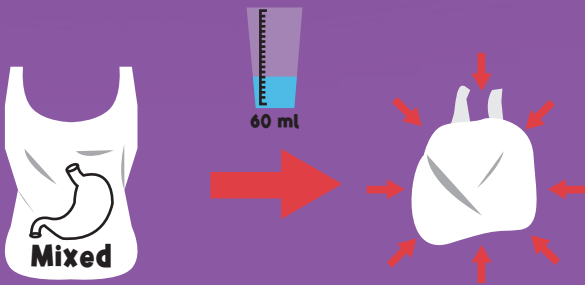


It's most likely that the bread in the mixed bag looks the most broken down. This is what happens in our stomachs! The stomach helps digestion by using muscles as well as stomach acid to squash and squish your food into tiny pieces. Where does your food go next? Have a look at our science show Body Wonders at Esplora to find out!

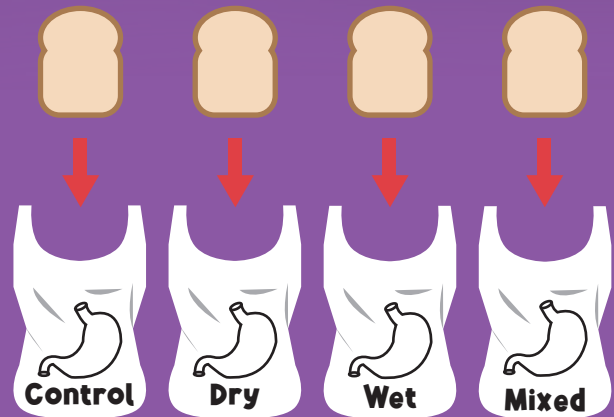
# Draw a stomach



5. In the mixed bag add  $\frac{1}{4}$  cup of water, close the bag and squash up the bread.



6. Which piece of bread looks the most broken down?



## FACT

The stomach also helps your body to defend from pathogens. The acid which is found in the human stomach can kill certain pathogens and neutralize some toxins.



Our bodies work a little differently than this experiment because food would have already been chewed up and broken down by our teeth before arriving in our stomachs. Our stomachs break the food down even further.

# All About Blood

Learn more about what flows through our veins below!

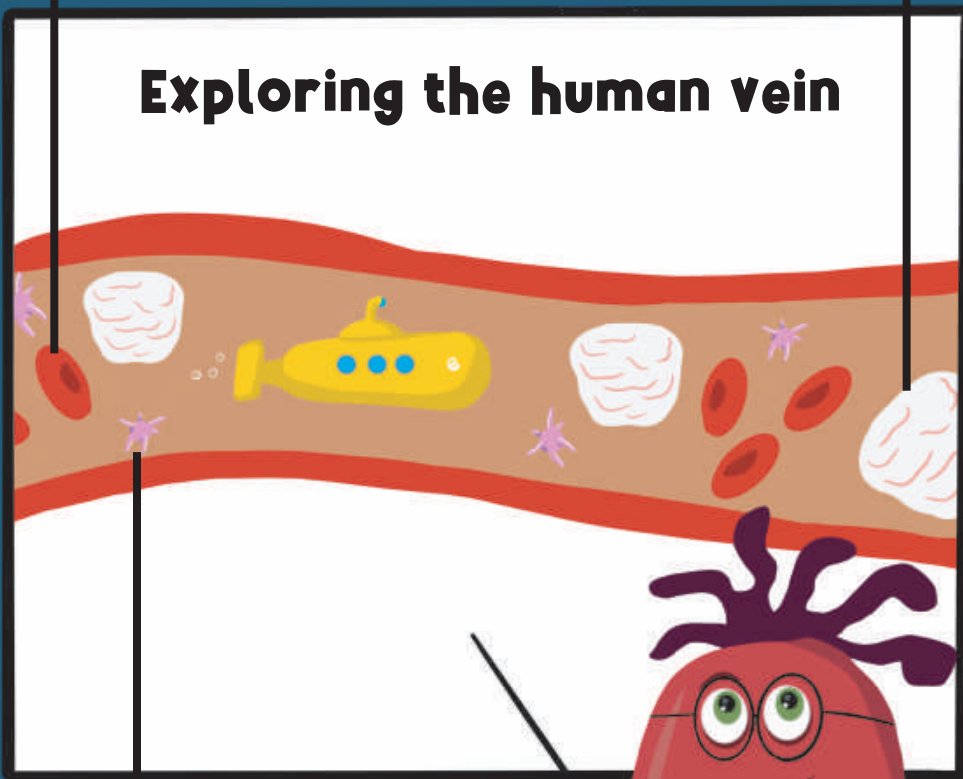
## Red Blood Cells

The red blood cell's job is to pick up oxygen from the lungs and transport it to all parts of your body.

## White Blood Cells

White Blood Cells are part of the germ-fighting army inside your body. They are like little warriors waiting to attack any invaders like viruses and bad bacteria.

### Exploring the human vein



## Platelets

Platelets are there to help your body repair itself. When you get a cut, they join together to help plug the hole and eventually form a scab to help heal the skin underneath.



# Project Maleth

Project Maleth is Malta's first scientific experiment taking place in space! The research carried out is linked to the human body since some human blood and skin cells will be traveling to the International Space Station.

## Why do they need to go to space?

Well, gravity is different in space; especially on the ISS. It's much smaller than the gravity on Earth; in fact it is called **microgravity**. When the human cells are exposed to this kind of gravity and even radiation coming from space, they behave differently than they would here on Earth. This gives scientists a great opportunity to spot the differences that come up and how these can be used to take better care of sick patients.

## How will this happen?

These cells will be sent to space inside of a Biocube onboard the Space X Falcon 9 rocket which will be launching on the 29th of August. When it arrives on the ISS, the team here in Malta will be able to look at the cells all the way from space thanks to cameras. After spending 45 days orbiting Earth, the capsule will be sent back home by splashing down into the ocean close to the USA. It will then make its way back to the labs at the University of Malta where they will be compared to similar cells in the lab.





# Our Bodies Inside Out

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