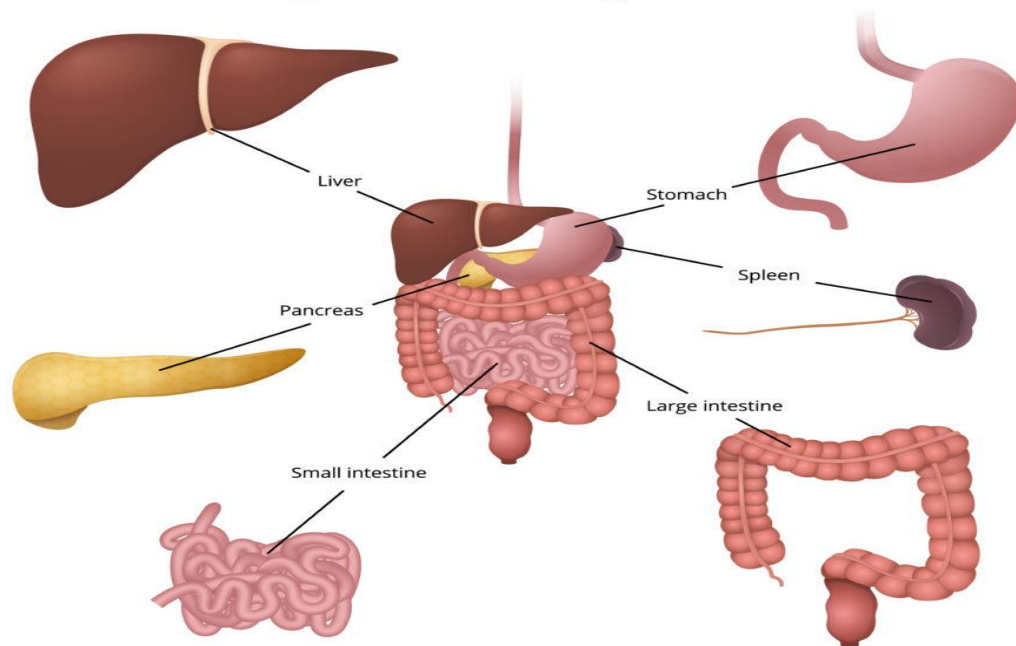


DIGESTIVE SYSTEM MODEL

The **digestive system** is made up of several organs working together, to make an organ system (Digestive system). This activity shows how to make an easy **digestion system model** using food and tights!

Human digestive system



WHAT IS DIGESTION?

Digestion is the process by which large insoluble molecules of food are broken down into smaller soluble molecules which can be used by the body.

Digestion starts in the **mouth** where food is broken into smaller pieces as people chew. Food is mixed with saliva which contains an enzyme called amylase. **Amylase** starts to break down carbohydrates in the food.

Food then passes down the **oesophagus** and into the **stomach**.

The **stomach** contains **stomach acid** and more enzymes which break up the food further. Stomach acid is actually hydrochloric acid which kills most harmful bacteria and provides the optimum pH for enzymes to get to work.

As food is slowly released from the **stomach** into the **small intestine** the **liver** adds alkaline **bile** to the mixture. This neutralises the **stomach acid** so as not to harm the **small intestine** and helps to break up fats.

The **pancreas** makes three **digestive enzymes** which are also added into the food mixture. These are:

Protease for digesting proteins.

Carbohydrase for digesting carbohydrates

Lipase for digesting lipids.

The **small intestine** produces even more enzymes to continue digesting proteins, carbohydrates and fats. Nutrients are absorbed through the walls of the **small intestine** and transported to cells in the body by blood.

In the **large intestine** water is absorbed from food, and undigested food is passed to the rectum as faeces.

The final part of the journey is when the faeces pass out of the **anus** hopefully into a toilet!

Nutrients from the food we eat are absorbed by the **small intestine** and then the **large intestine** absorbs water and any nutrients not absorbed by the **small intestine**.

Undigested food becomes faeces or poo which are excreted from the body via the rectum and anus!

EASY DIGESTIVE SYSTEM MODEL WITH TIGHTS

You can make a very simple digestion model using one leg of a pair of tights as the **small intestine**.

WHAT YOU NEED TO MAKE A DIGESTIVE SYSTEM MODEL

- Potato masher – or something else to crush the food with.
- Bowl
- Funnel
- 1 small banana or piece of bread
- 1 plain biscuit
- Yoghurt- optional
- Jar or bowl
- 30ml water
- 30ml orange juice
- Green and red food colouring – optional
- Medium size ziploc bag or food bag– stomach
- Scissors
- 1 leg from a pair of tights – small intestine
- Tray or plate



DIGESTION MODEL INSTRUCTIONS

Place the biscuit and banana into a bowl and gently crush with a potato masher. This represents the food being chewed.

Pour the crushed food into an empty ziploc bag and add the water. The water represents saliva.

Pour the orange juice into the bag (this represents stomach acid) Make sure there is no air in the bag and seal it.



Squeeze the bag for about a minute crushing up the biscuits and banana further. This represents the food breaking down further inside the stomach.

Once the stomach contents feel like a thick liquid, cut a small hole in the one corner and carefully squeeze into the open leg of the tights (**small intestine**).



At this point you can add a little red and green food colouring, but this is not necessary. The red food colouring represents dead red blood cells that are being disposed of and the green represents **bile** which is released by the **liver**.

Hold the tights over the tray or a bowl and gently squeeze the liquid out. The liquid on the tray represents the nutrients the body absorbs and uses. Keep squeezing until no more liquid comes out. If you used food colouring it might be a good idea to wear gloves for this part.



Digestion Model – squeeze through tights

The food left behind in the tights represents waste products that cannot be absorbed. Cut a hole in the bottom of the tights and squeeze the contents into the jar. This is the pool!



Digestion Model – end result poo

DIGESTIVE SYSTEM MODEL CHALLENGE

Change the food you “digest” and investigate to see if you can make a different colour poo!

Did you know the stomach walls are made of muscle and mix the food helping break it down?

The small intestine contains lots of thin structures called villi. These give a very large surface area to absorb food molecules.

DIGESTION IN A NUTSHELL

Food is initially broken down in the *mouth* as you chew helped by amylase (an enzyme found in saliva)

It then passes down the **oesophagus** into the **stomach** where it mixes with **stomach acid** and **enzymes**.

The **liver** makes bile to help break up fats and neutralise the acidic mixture heading to the **small intestine** from the **stomach**.

The **pancreas** adds more **enzymes** to the mix.

Food is broken down further in the small intestine where small usable molecules are absorbed through the **small intestine** walls into the blood.

Water is absorbed by the **large intestine**.

Waste products are expelled via the **anus!**