DESIGN OF A POSTER ABOUT MICROBES AND THE HUMAN BODY

Follow this order:

1. You are currently eating your favorite food. This is chewed, crushed by your teeth, and then transported down your esophagus as a paste of food.
   Take the document “Protocol: How to Grow Mold at Home”, read the beginning and start with the first section: “Propose a hypothesis with your parents”.

2. The food pulp now arrives in the stomach. Digestion in the stomach takes about 3 to 7 hours. It is done with the help of digestive enzymes, which work like small scissors, which cut the food into very small pieces.
   Continue in the protocol up to the section "Explanation". Don't forget to fill out your journal each day, and when you are done with the experiment, read the “Explanation” section.

3. Digestion continues in the small intestine. It is on average 6 meters long! It mainly absorbs nutrients and continues to break down food.
   Watch the video about the bacteria in the digestive tract (https://www.youtube.com/watch?v=I_9QuH302dI).

4. The sugars and amino acids are sent along the small intestine towards the liver. This creates sugar reserves, produces bile, which is needed for the digestion of fats, and produces proteins from the amino acids. Proteins are the basic building blocks that you need to make everything your body needs, like bricks for a house. The liver also stores vitamins.
   Take the document "Poster about microbes" and edit the section: "Production of a base".

5. The pancreas has two functions: to secrete digestive juices for digestion and to produce insulin, which is used to regulate blood sugar levels.
   Take the “Poster About Microbes” document and work on Section 2: “Crafting Pretty Microbes”.

6. Everything that is left of the food ends up in the large intestine, also called the colon. It is about 2 meters long and its job is to absorb the remaining water and some vitamins and to remove the waste.
   Take the document "Poster about microbes" and work on section 3: "Placing the microbes on the poster", then work on section 4: "Solution".

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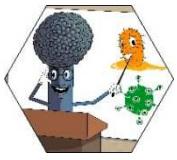

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Poster about Microbes

Thanks to this poster, which you will design with your parents, you will become aware of the multitude of microbes that live with you and you will see where they are in and on your body.

Microbes are microscopic organisms (not visible to the naked eye). You can see how they act everywhere: when the bread dough rises, when milk becomes yoghurt or when you get a fever. There are billions of them, but contrary to what many think, the majority of them are harmless.

The production of this poster is divided into 4 main parts:

1. Production of a base
2. Crafting the microbes that will be attached to it
3. Placing the microbes on the poster
4. Looking at the solution and sticking the microbes on the right place.

Part 1: Production of a base

Take a box, approximately A3 (29.7cm x 42cm), for example from a muesli box or a parcel.

Cut out the body using the template that we have attached for you in Annex 1 and glue it to your cardboard box. You can attach the microbes that you will be crafting to this later.

You may have already noticed the boxes with the magnifying glass on the worksheets for carrying out your handicraft work. This is where you can find the knowledge we want to teach you about microbes. Ask your parents to read these to you. When that's done, you can cut them out (have them cut out) and stick them on your collage.

Part 2: Crafting pretty microbes

To craft your friends the microbes, you can choose from two options. You can either make small pom poms or cut your microbes out of cardboard and decorate them with what you have at home. Either way, your parents can help you. You can also use both options and thus show the variety of microbes that are living in and on your body.

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Crafting the Pompon-Microbes:

Equipment:

- Carton or solid paper
- Scissors
- Wool in the colour of your choice
- Paint
- Tube of glue

Draw two circles about 6cm in diameter on a piece of cardboard, using a glass as a template. In the middle of each circle draw a second one 2cm in diameter. Ask your parents for help to cut out both circles.

Cut 6 to 7 threads of wool about 1.5m long. Tie the threads to the circles you lay on top of each other, then wrap them around the two circles.

Ask your parents to cut the threads with the scissors by running the scissors between the two circles of cardboard.

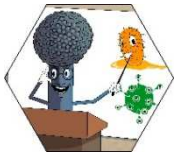
Then pull a double thread between the two cardboard circles. Tie a knot and pull tight.

Gently tear or pull apart the circles to free your pompom. To give your microbe a nicer shape, cut off the excess threads and cut the rest of the way you like it: round or oblong and, if possible, a bit smaller.

Then ask your parents to cut out two small cardboard ovals that will later become the eyes.

Color them, then use the glue to glue them to the pompoms.

And there they are, your finished microbe pom-poms!



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Crafting the Cardboard-Microbes:

Equipment:

- Carton oder solid paper
- Paint, coloured pencils or wax crayons
- Glue
- Thread or wool
- Scissors

Ask your parents for help and use one or both of the templates from Appendix 2; or design your own shape inspired by the photos in Appendix 3; or think of a new shape yourself and draw it on the cardboard / paper. Cut out the shape and paint it in to make it really beautiful.

You can also glue on small pieces of thread or wool to represent the flagella that some bacteria have.

In total, you need at least 5 microbes in the shape you like, whether it's cardboard, pompoms, or both.

There are 3 types of microbes:

- *Bacteria: They are everywhere on earth (at least almost), they multiply by dividing.*
- *Viruses: They are the origin of many diseases such as the flu or Covid-19, they have to penetrate a cell in order to multiply.*
- *Fungi: In general, they cause little disease, but their microscopic spores are all over the air.*

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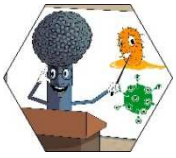

Part 3: Placing your Microbes on the Poster

Now that you have the base and your pretty microbes, you're ready to use them. There are numerous microbes in your body that work for you to stay healthy, but do you know where they are hiding?
Put your crafted microbes on the human body, in the places where it can take in a **microbiot**. After that, take a photo so you can remember where you put them.
Our bodies have several microbiota, now you should find them!

> A microbiot is the set of microorganisms, bacteria, fungi ...
> that animate a specific environment.

Part 4: Solution

Attention, you are only allowed to read this part after you have completed part 3, it is more fun if you compare your own answers with ours.

Our body has 5 main microbiota:

1. On the skin, the cutaneous microbiome
2. In the mouth, the bucco-dental microbiome
3. In the lungs, the pulmonary microbiome
4. In the genital organs, the vaginal microbiome
5. In the digestive tract, the gut microbiome

Now you can put the microbes in the right places if they aren't there already. Then you can glue them on to finish your poster.

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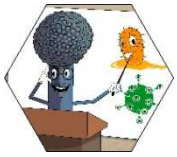

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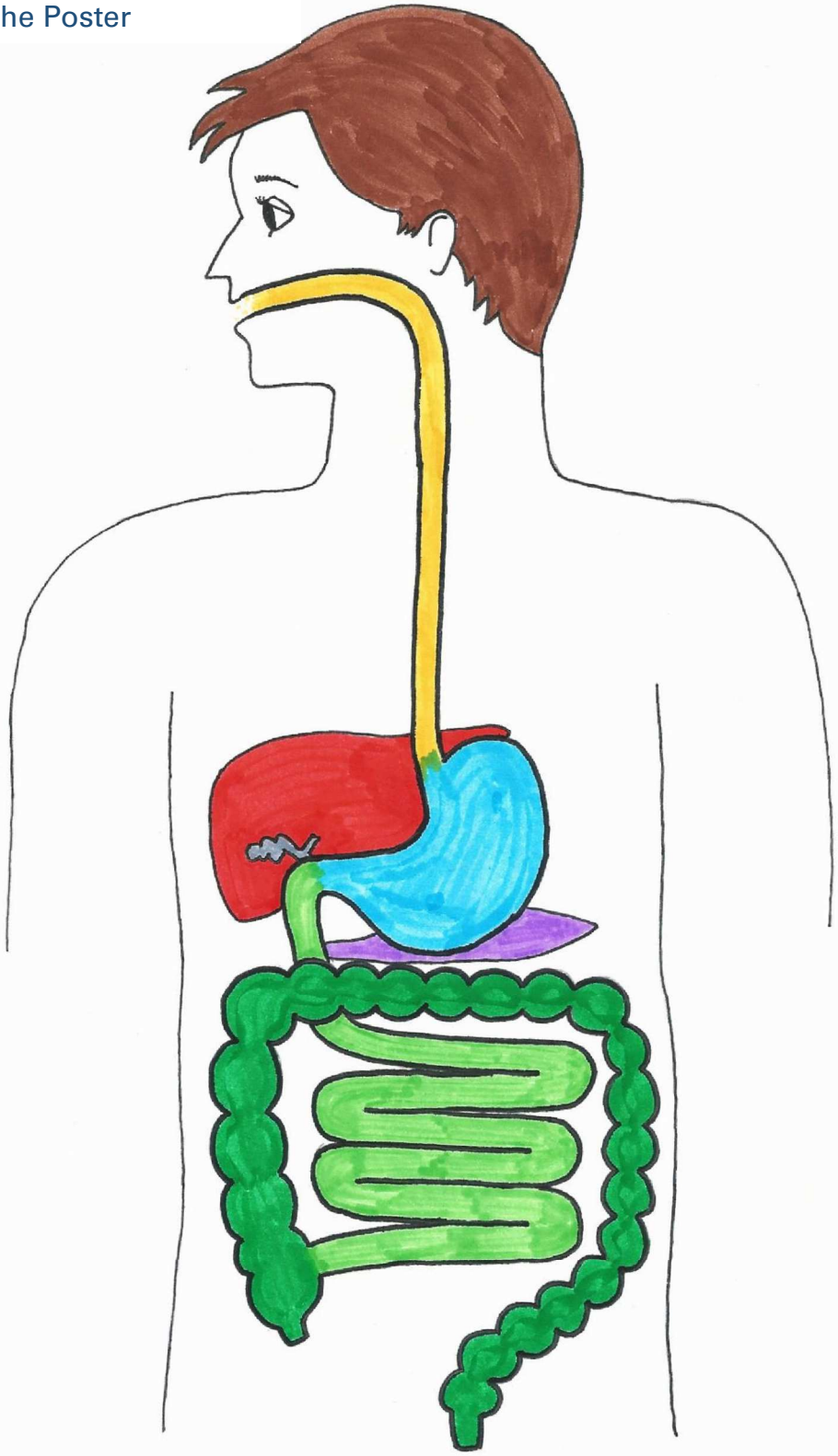
The different microbiota:

- Skin: This microbiome is very useful to us and protects us against pathogens that want to invade the body. It functions like the wall of a fortress. If there is an imbalance, skin diseases can occur.
- Mouth: it houses almost 700 types of bacteria that live there in equilibrium and play a protective role. Tooth decay, for example, is due to an imbalance among the bacteria, which attacks the tooth enamel.
- Lungs: For a long time it was thought that it was sterile, but microbes also live in the lungs. They are few in number and not much is known about their effects.
- Sexual organs: The vaginal flora is the first barrier against bacterial sexually transmitted infections. This flora is constantly changing throughout a woman's life.
- Digestive tract: This is where the concentration of bacteria is greatest. They take part in many digestive processes. For more information on this, you can watch the short video again about the bacteria in your digestive system (link on page 2).

Annex 1

Body for the Poster



Annex 2
Photos for your inspiration

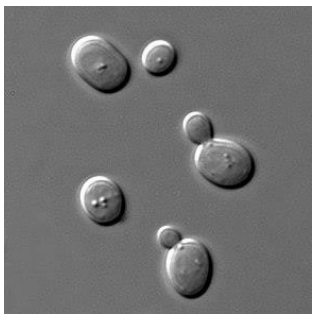


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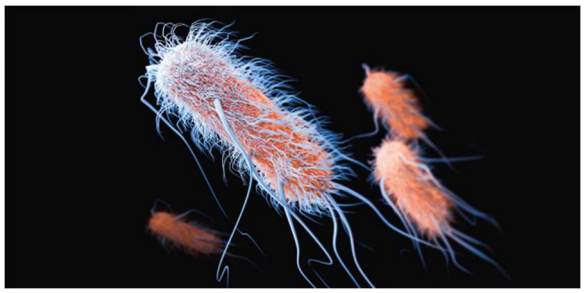
Photo of yeast (a microscopic fungus)



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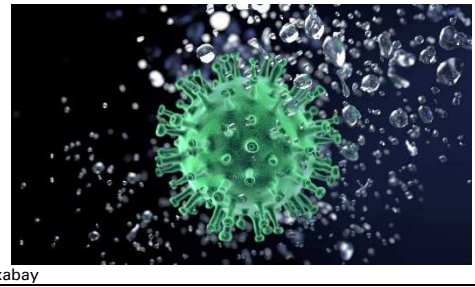
One form that bacteria can take



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One of the many forms of viruses

Another form of virus

Annex 3
Cardboard-Microbes templates