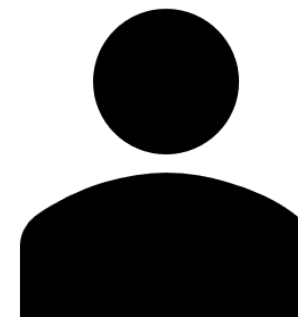




2020.09.30

Do we really
need science?



Without science, you can live a wonderful life



**But if you are willing,
science can let you
see a different world**

Ch.1

**Self
introduction**

Ch.2

**Gene
introduction**

Ch.3

**Hand-made
DNA**

Ch.4

experiment

CONTENTS





Xiang-Yen Wong
Department : Criminology



En-Chi Chang
Department : Psychology

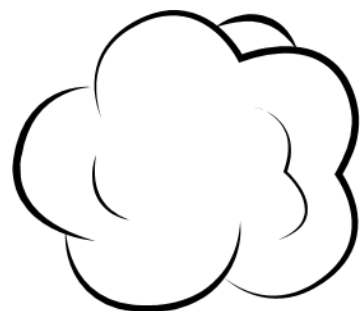


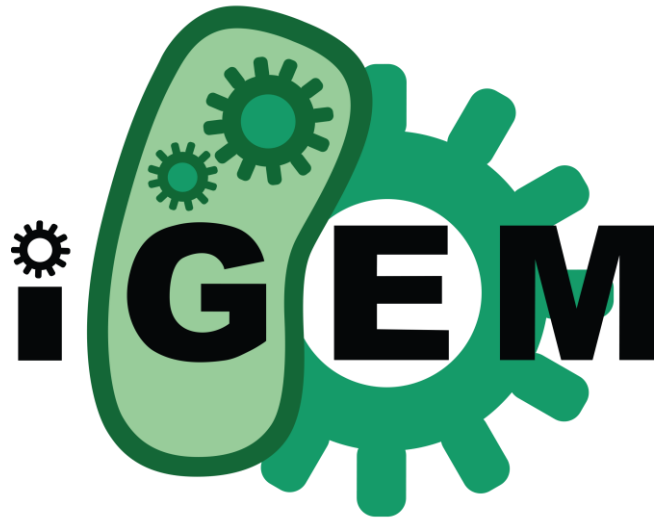
Yuan-Zhi Li
Department : Biomedical Science

Department of Chemistry and Biochemistry
Assistant Professor Eugene Lin



CCU_Taiwan iGEM





**International Genetically
Engineered Machine**



More than 300 universities



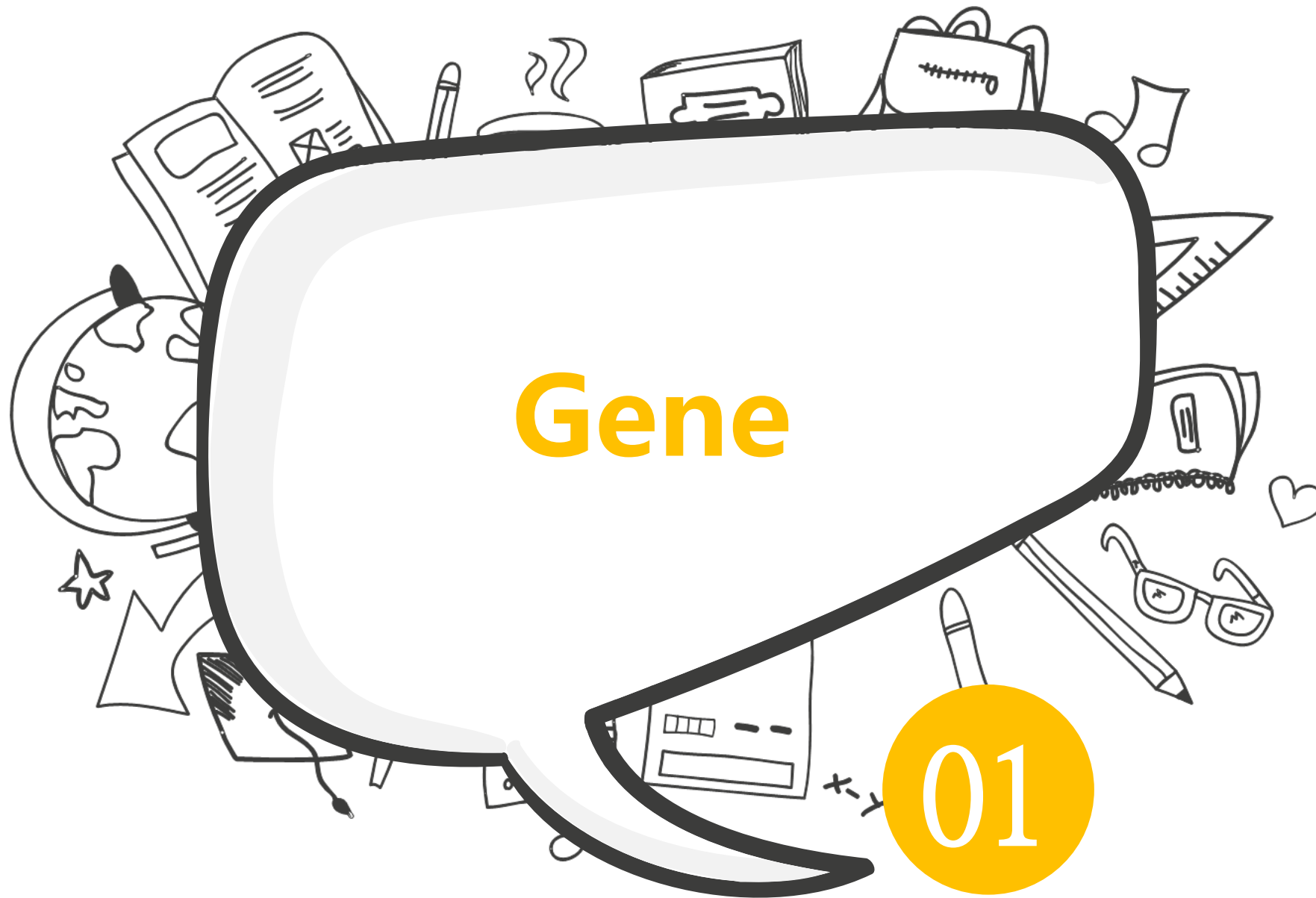
Dengue fever



**Who are mosquitoes
most afraid of?**

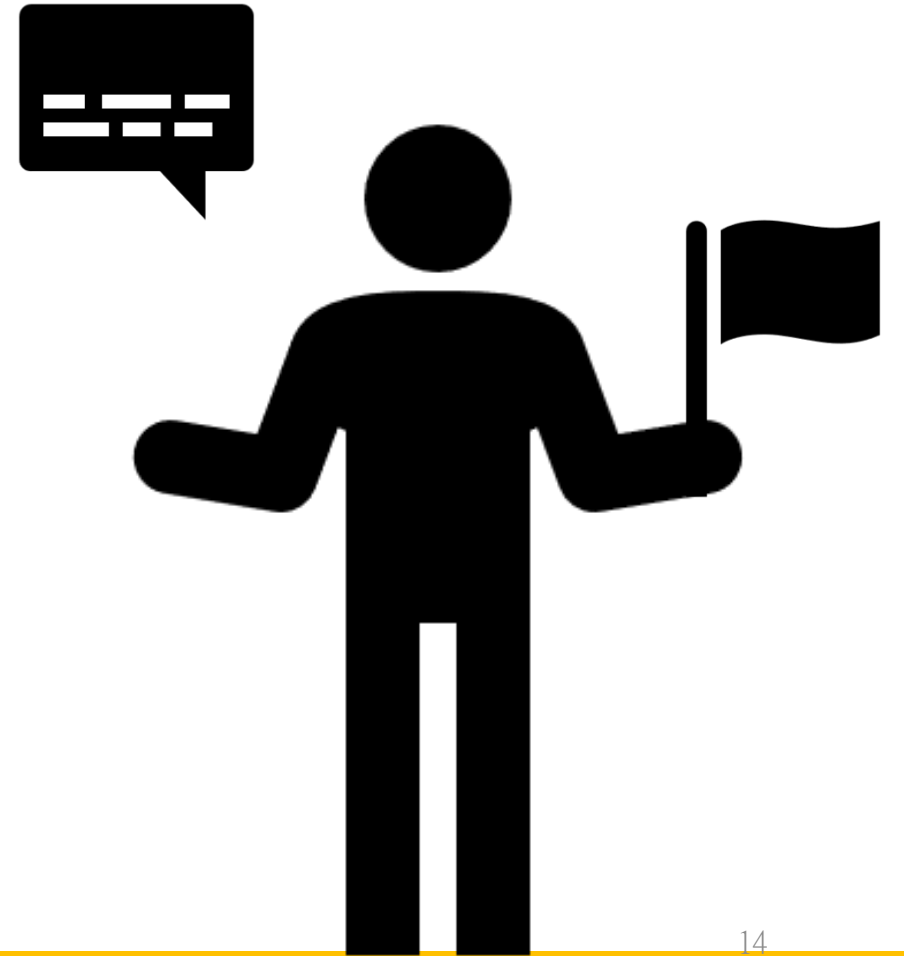
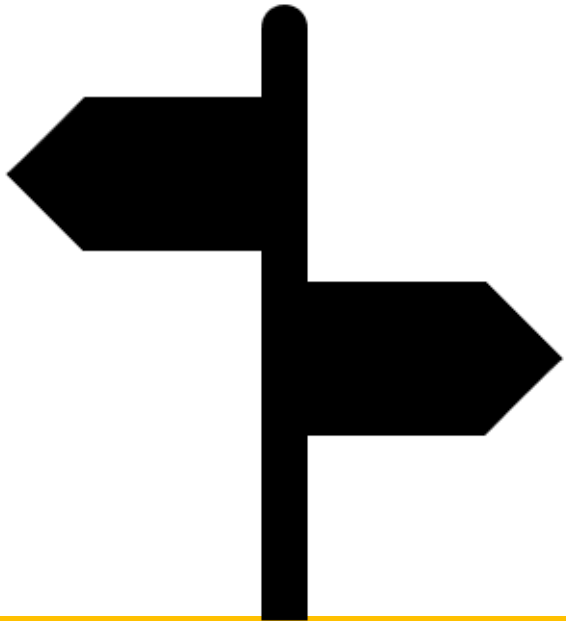
The person who hit it!

Mosquitoes have the ability to recognize smell and can make a connection between "slap" and "smell".





Desert?
Grassland?

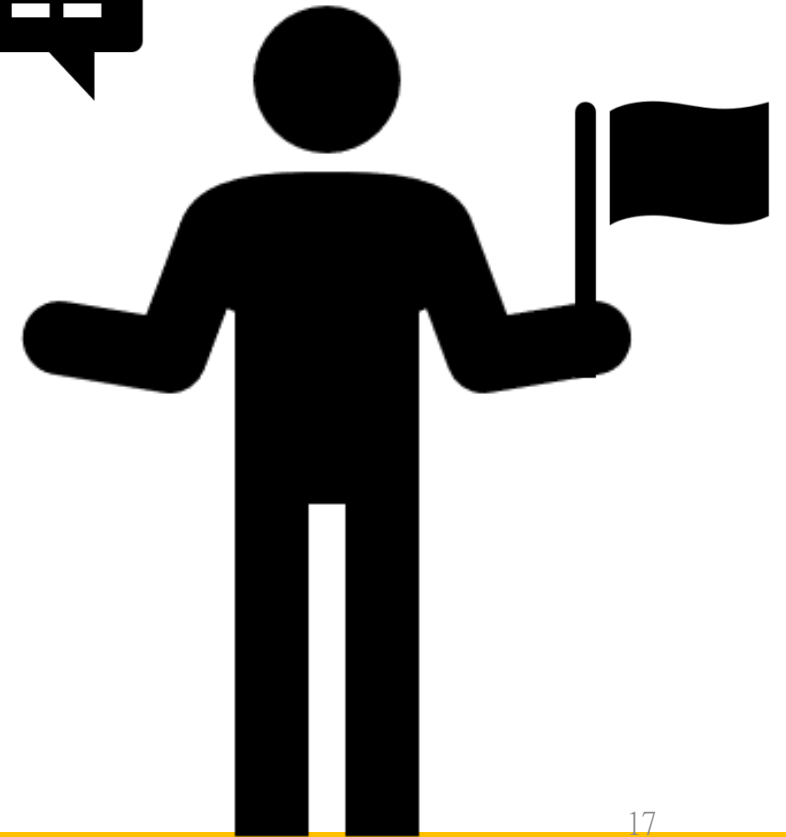
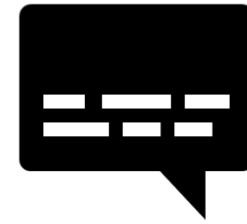
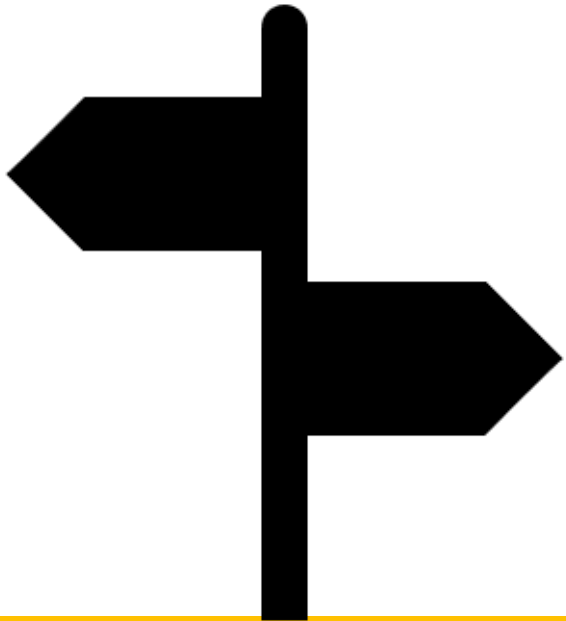






Polar?

Rain forest?

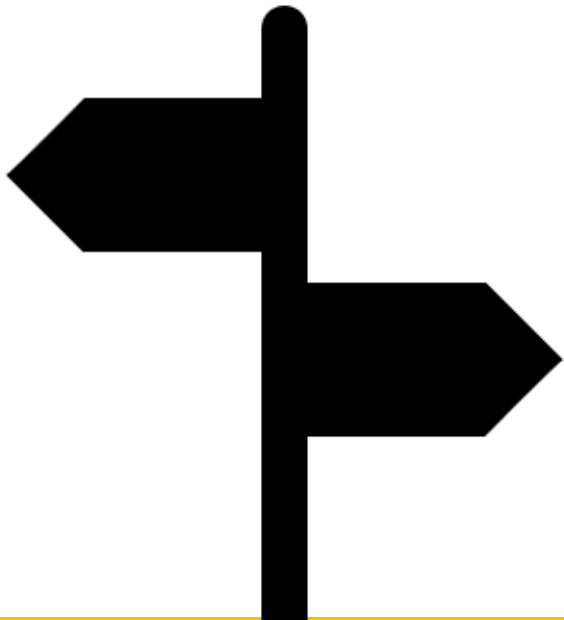
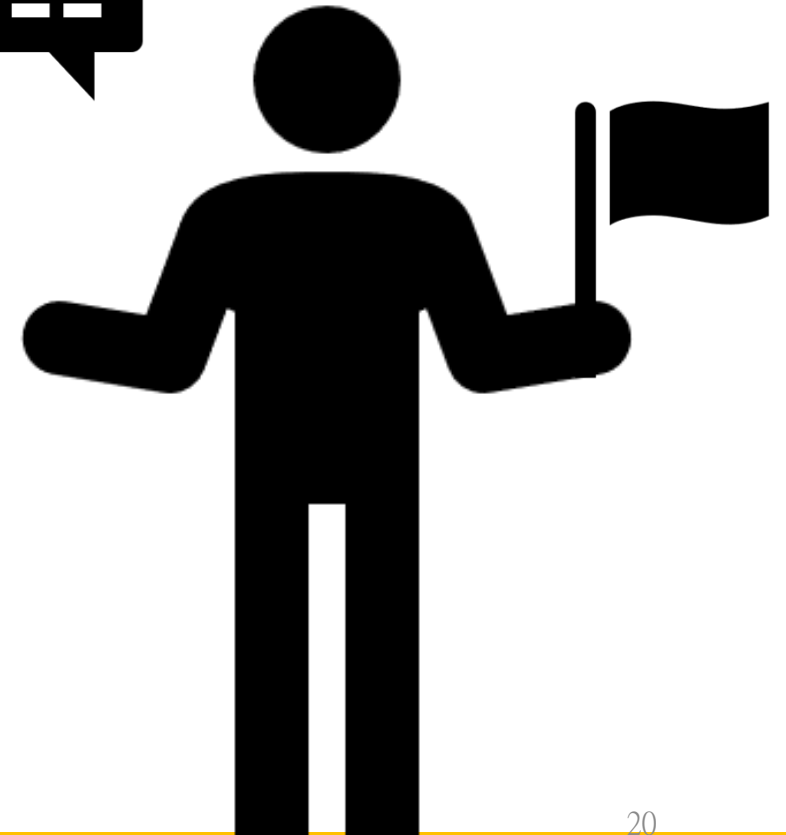
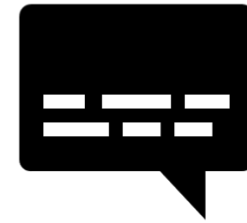






Cute animal area?

Beast area?







environment

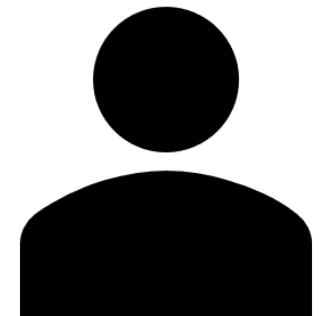
food

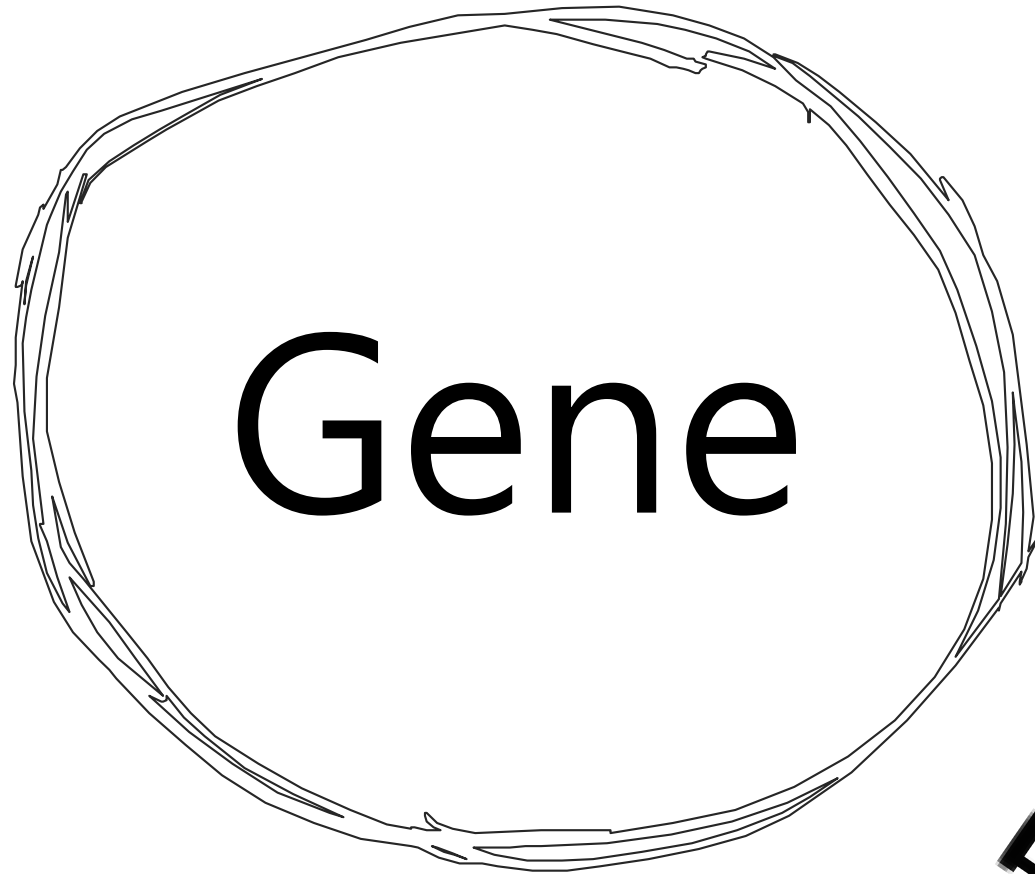


Hair

Limbs

How are they different?
How are we different?

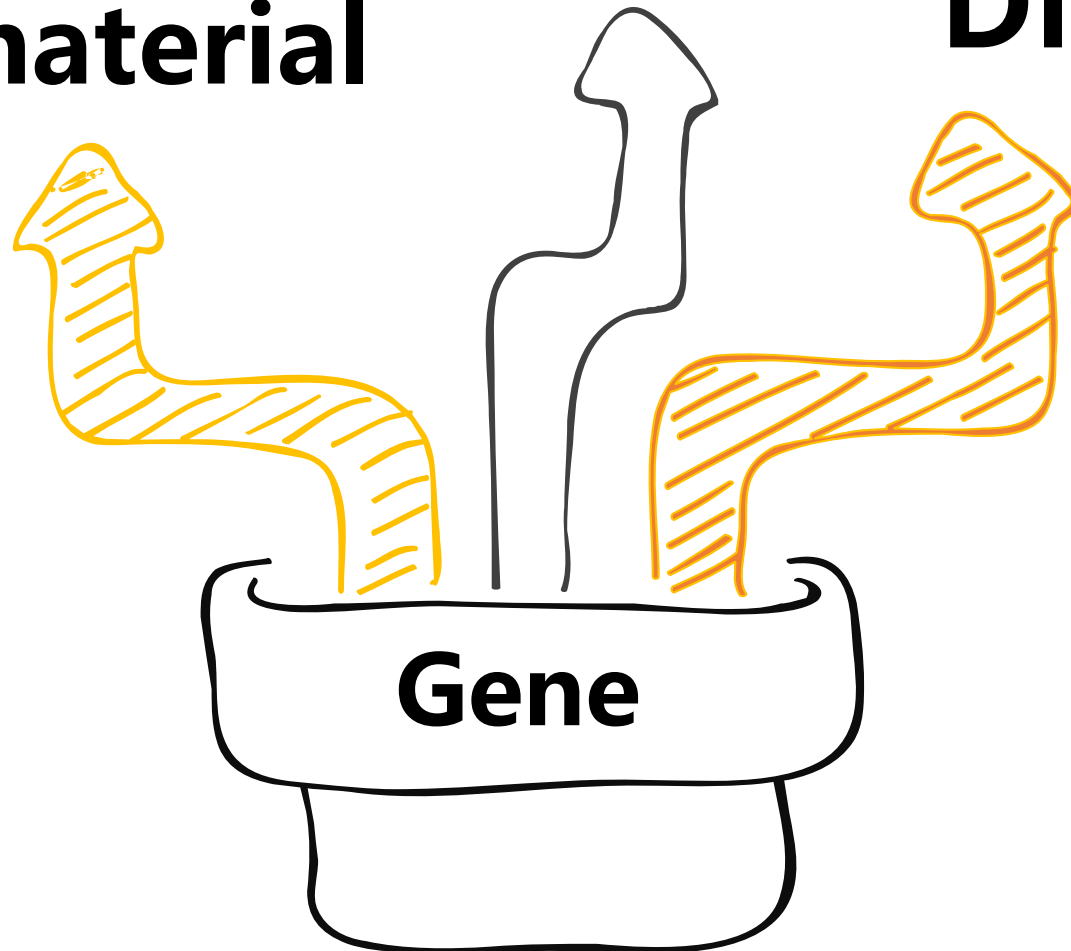




chromosome

Genetic material

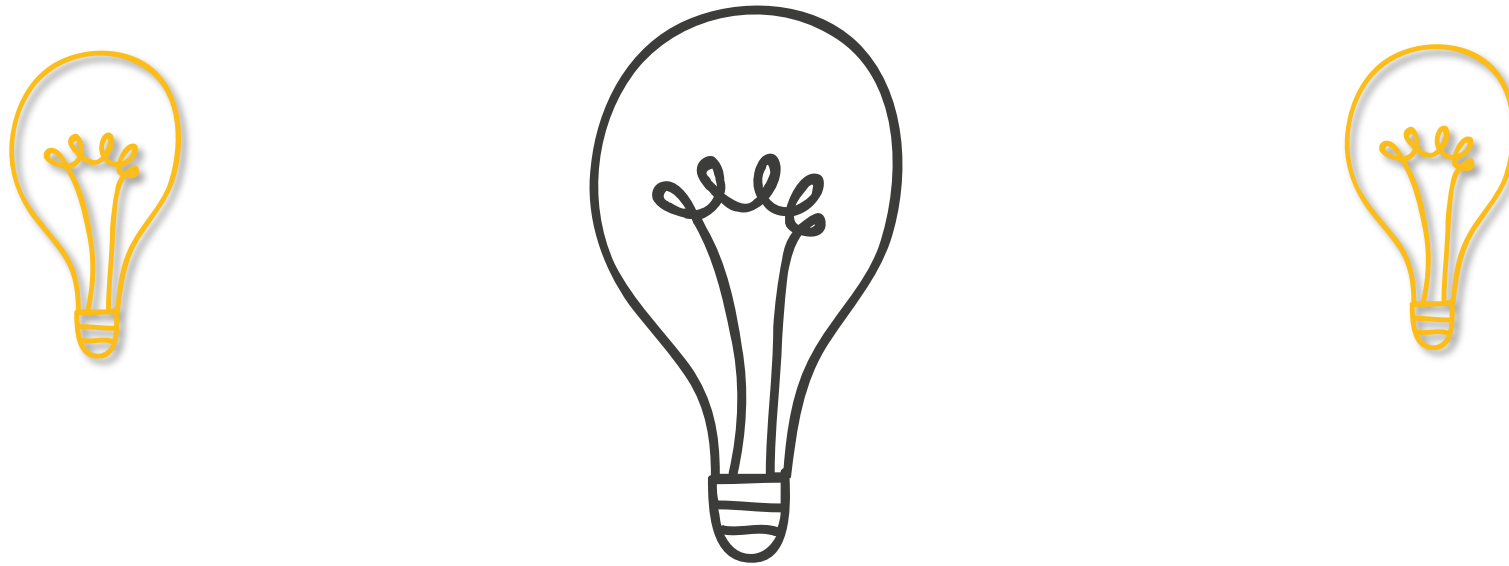
DNA



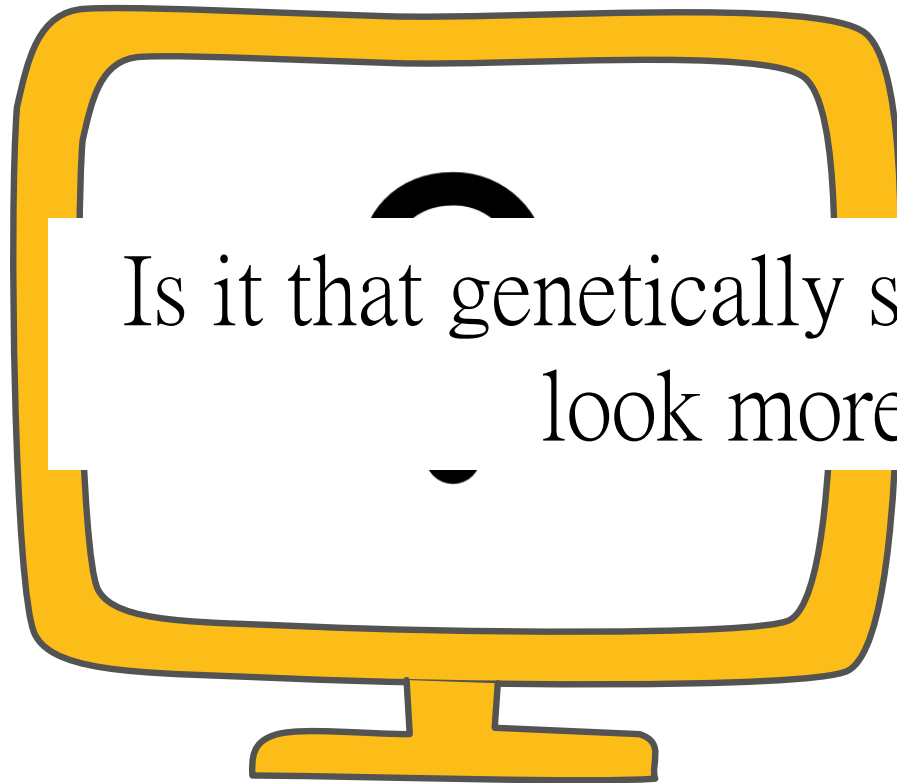


The genetic information
determines the type of organism.





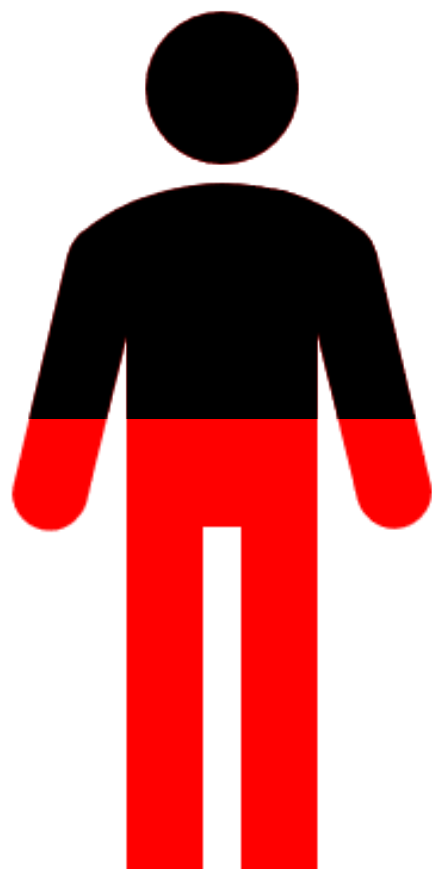
Genes determine our
appearance and habits.



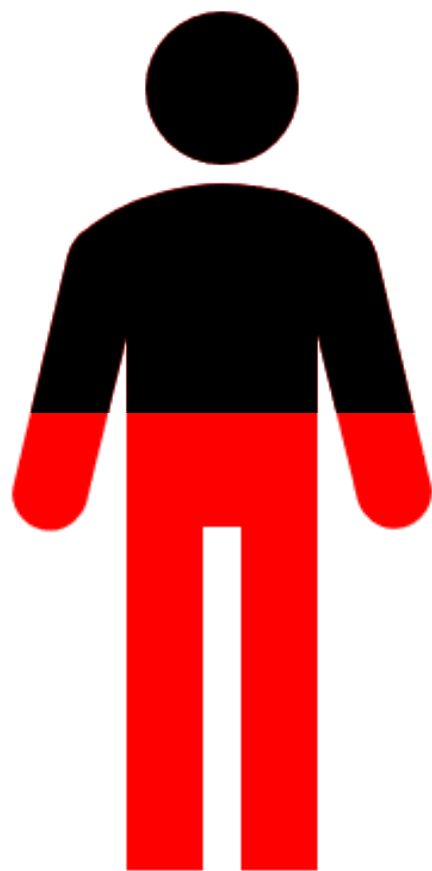
Is it that genetically similar species will
look more alike?



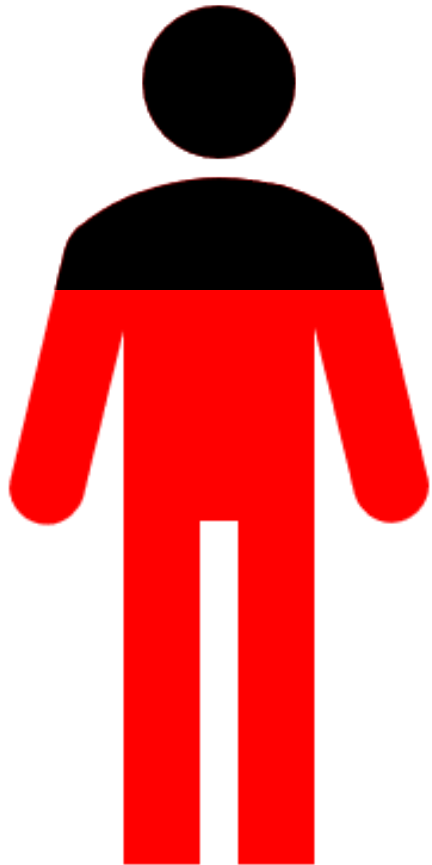
60%



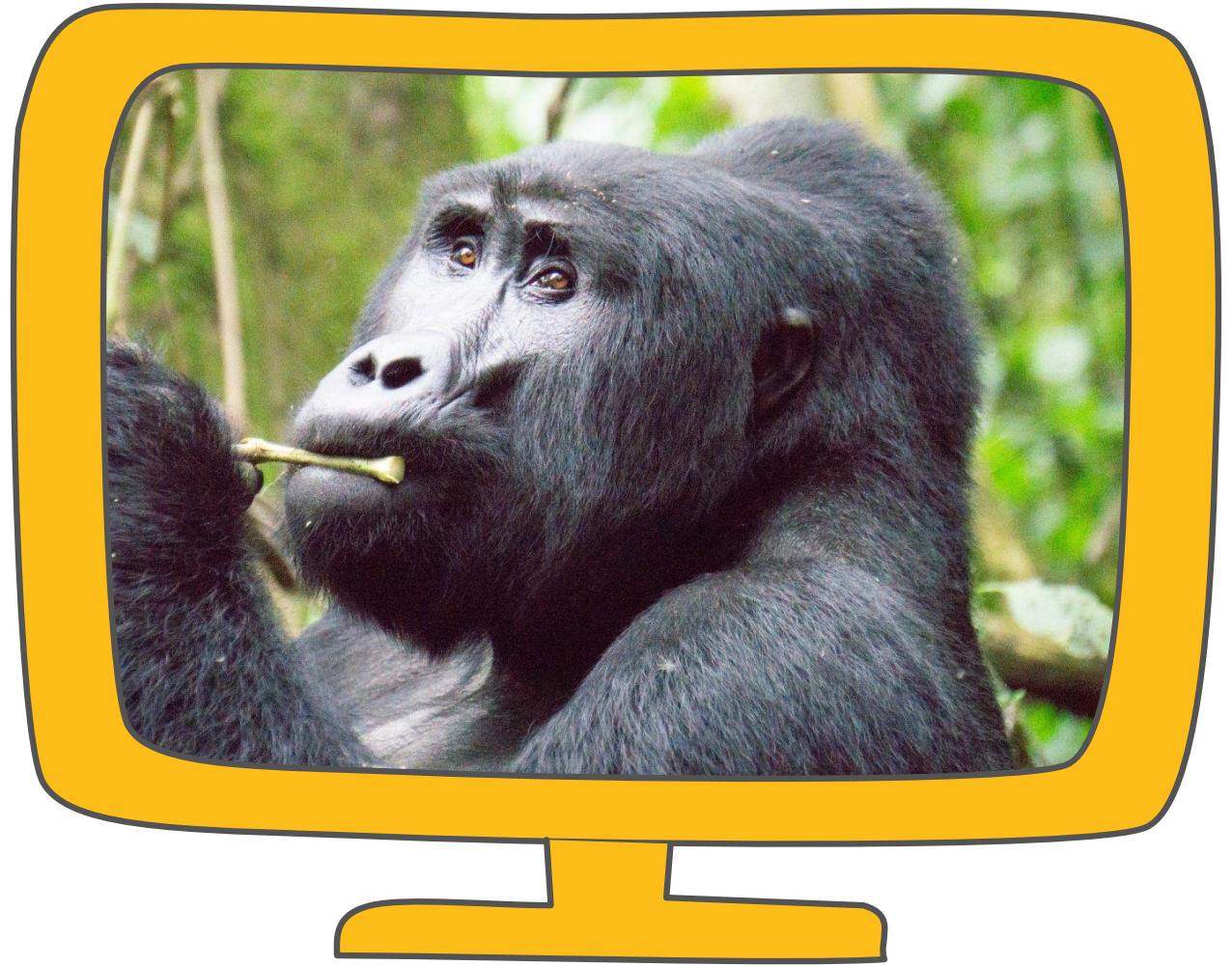
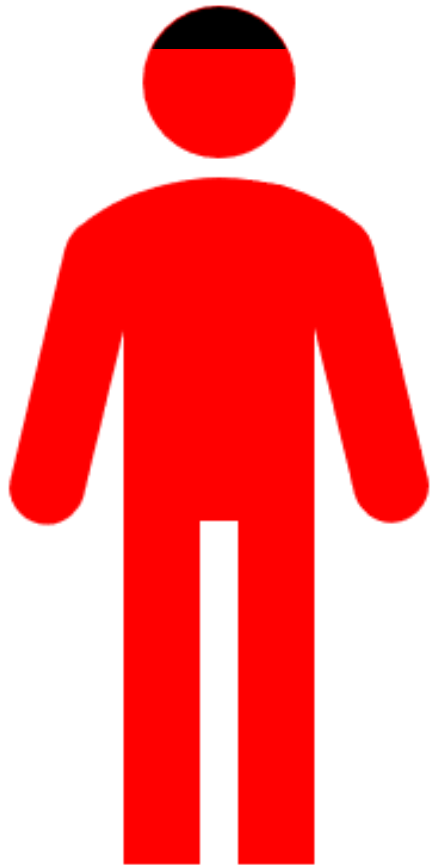
61%



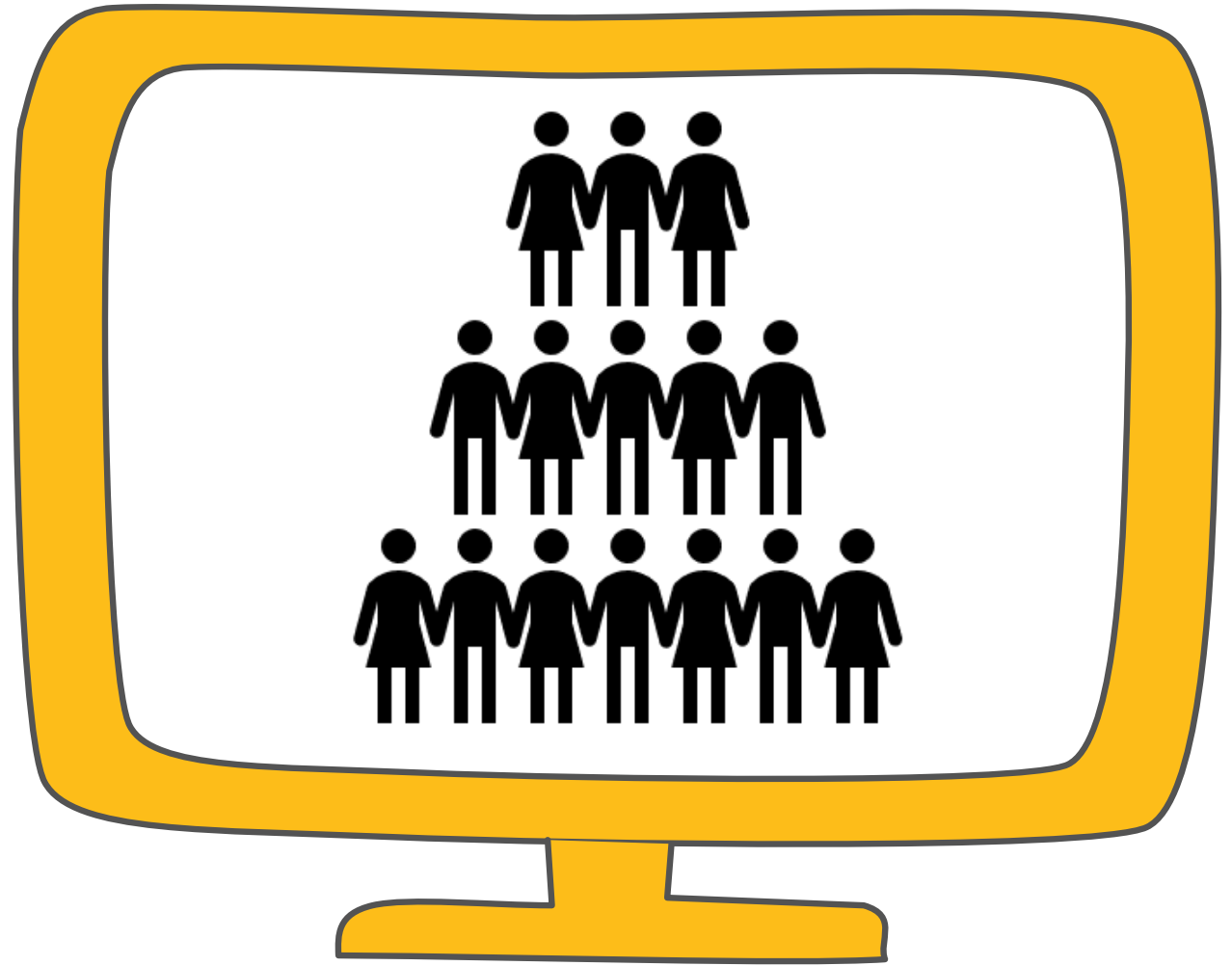
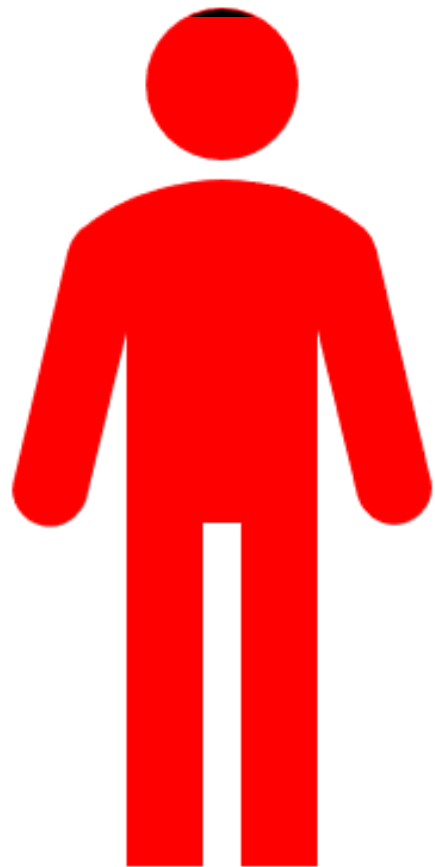
85%



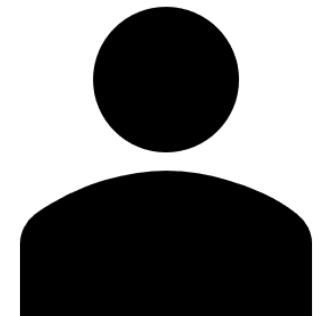
96%



99.9%

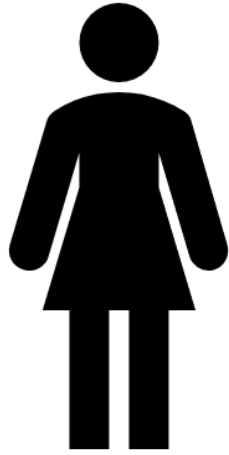
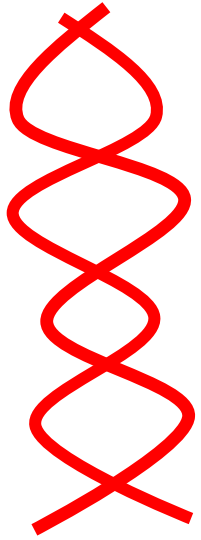


Where do genes
come from?

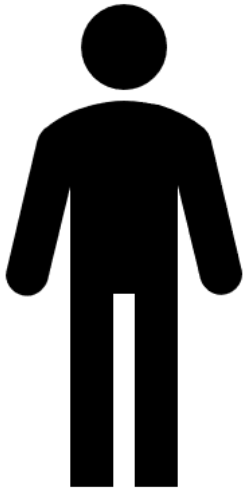
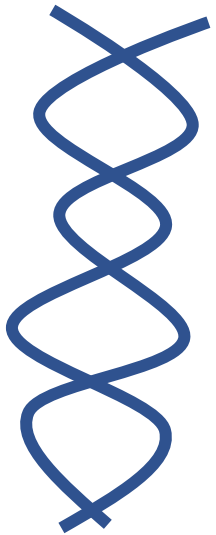




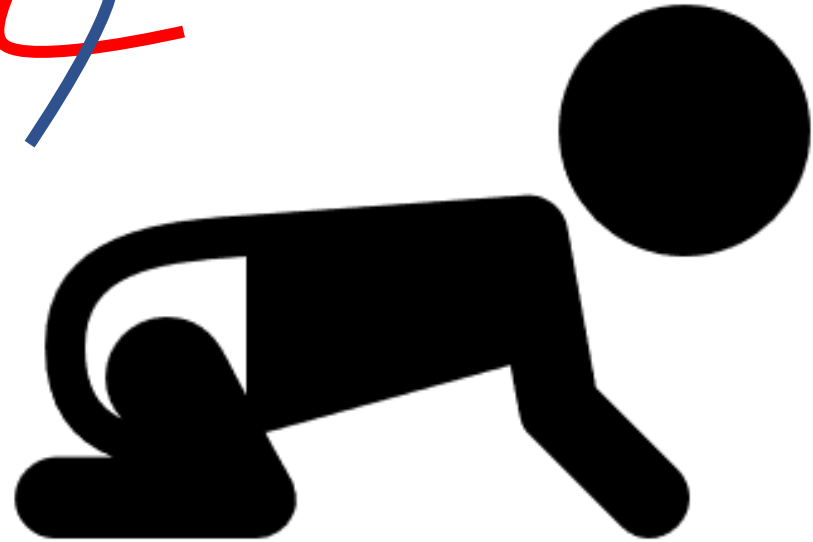
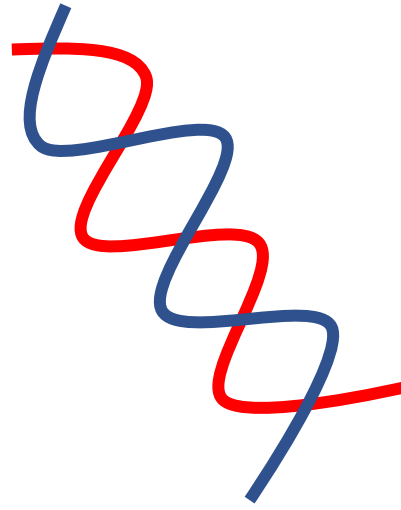




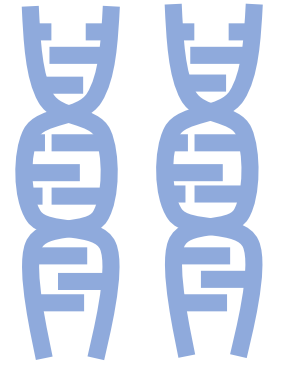
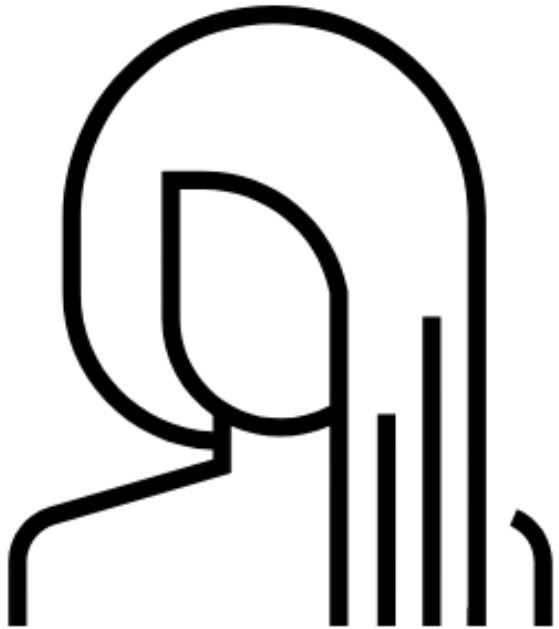
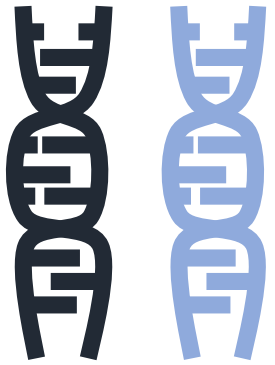
50%



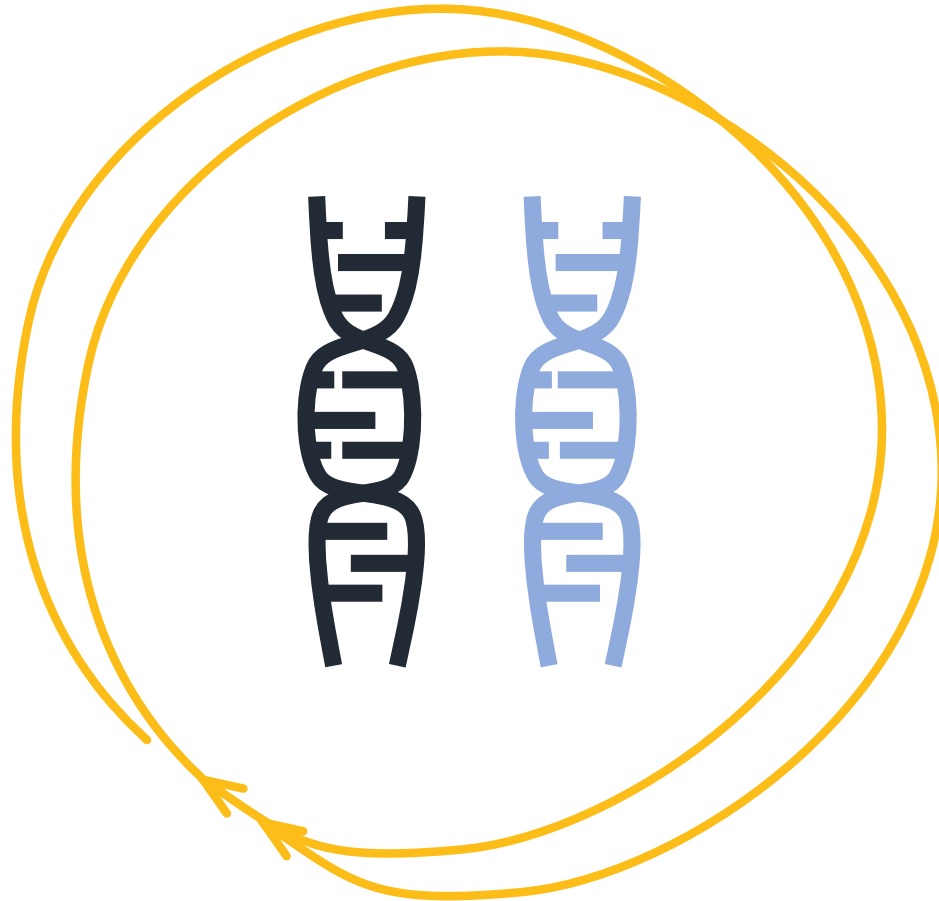
50%

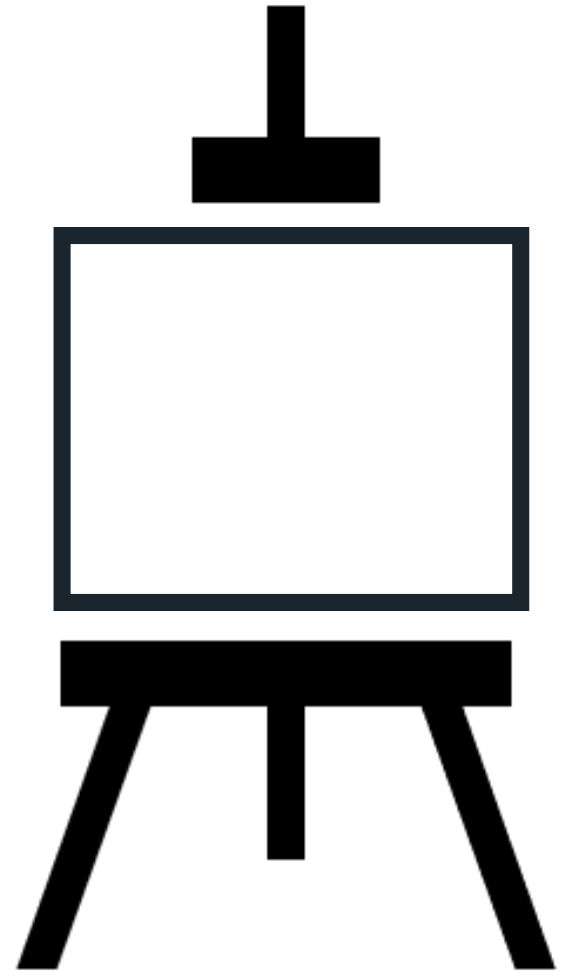
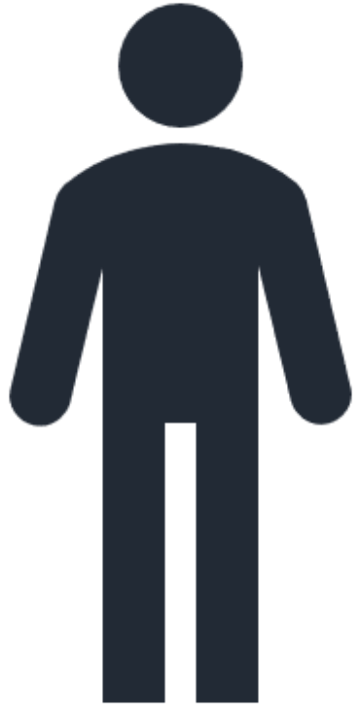


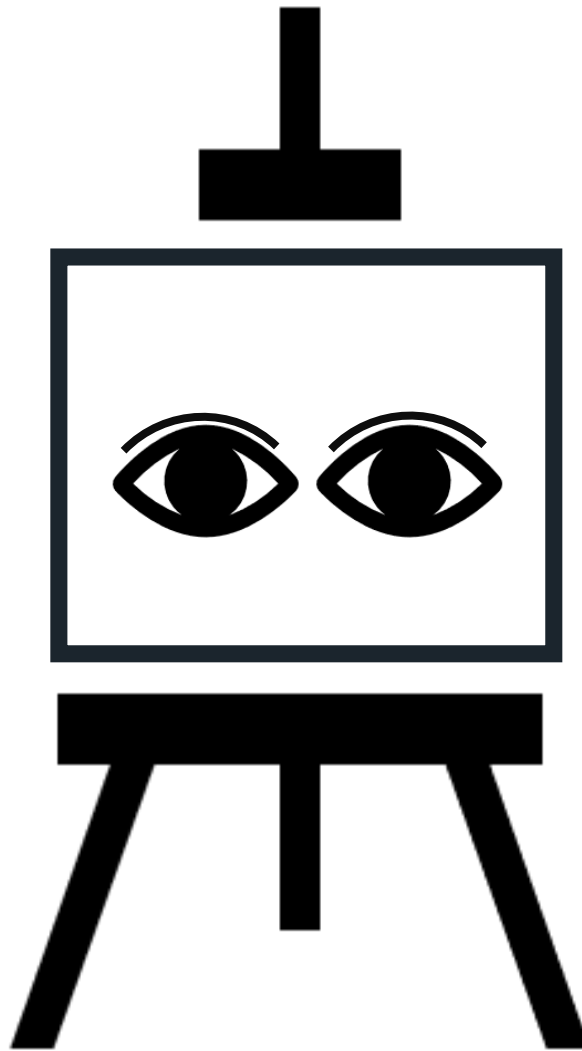
The same part, but a different shape

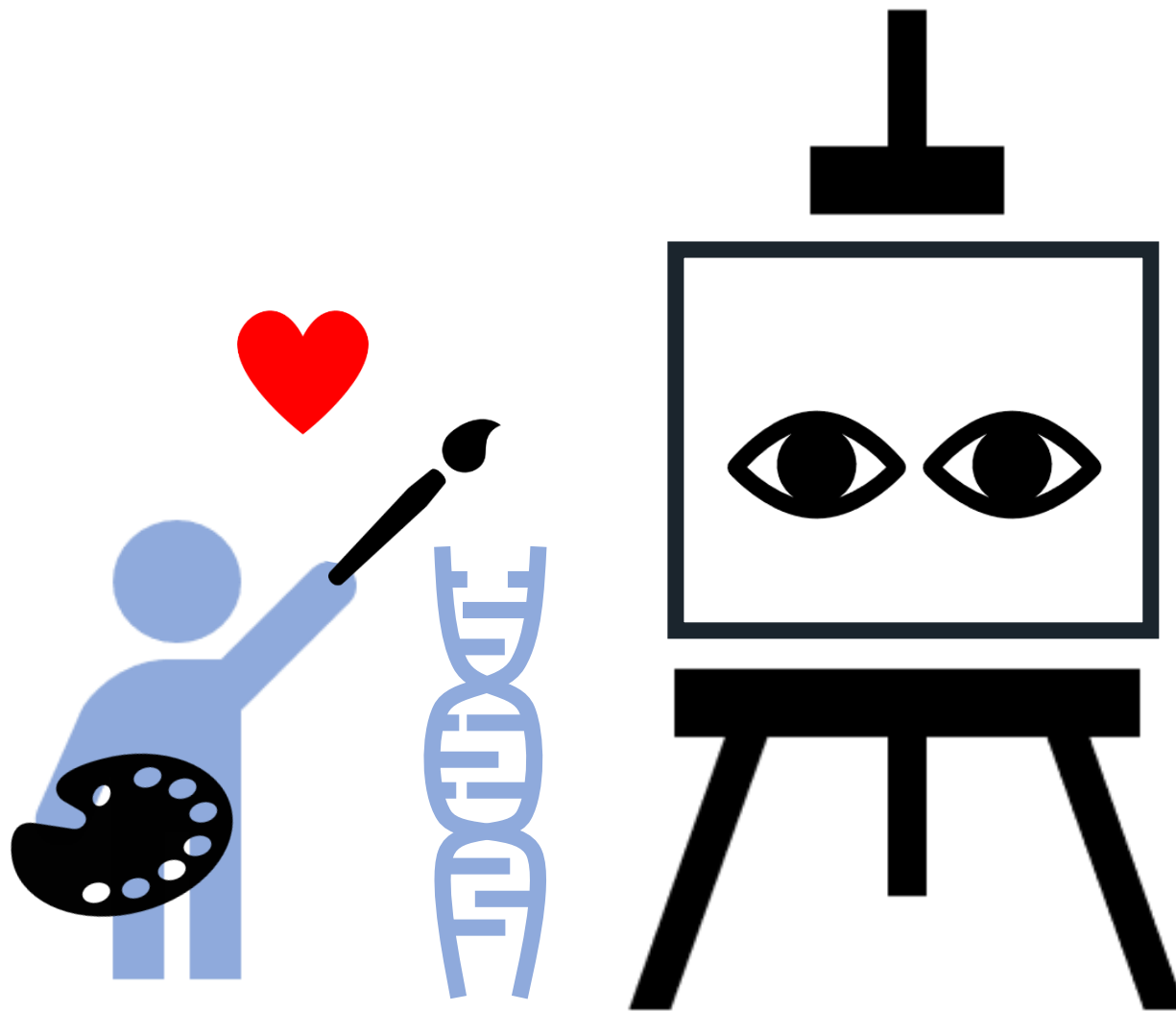


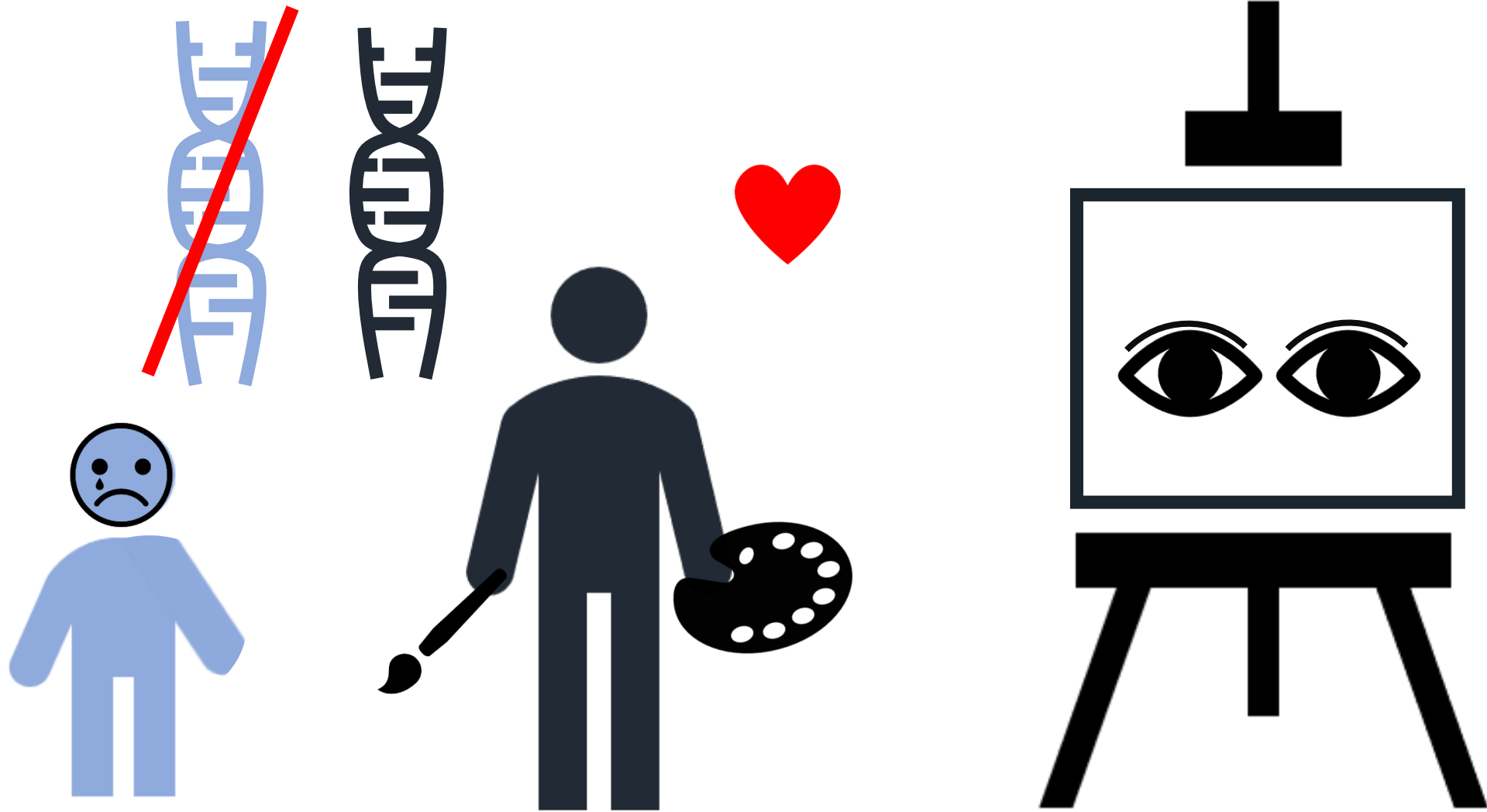
Genes are divided into dominant and recessive

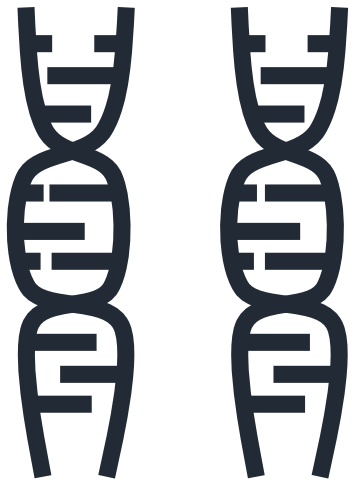




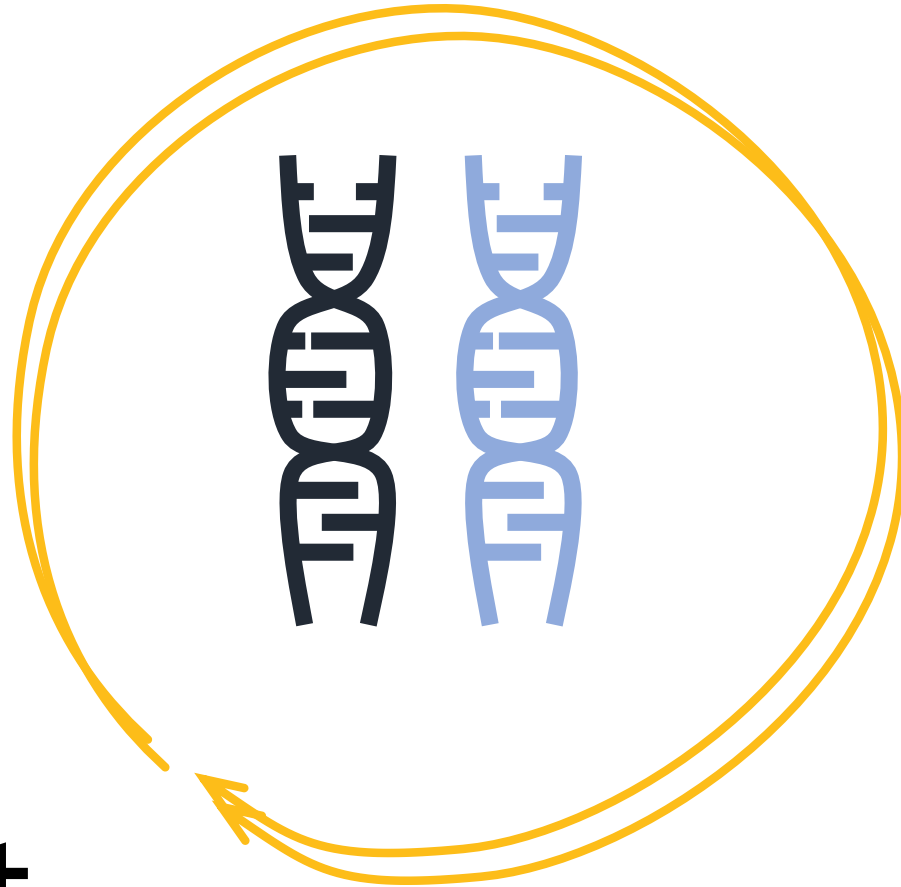




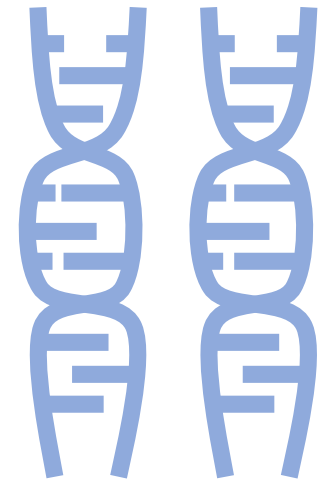




dominant



dominant



recessive



Dominant

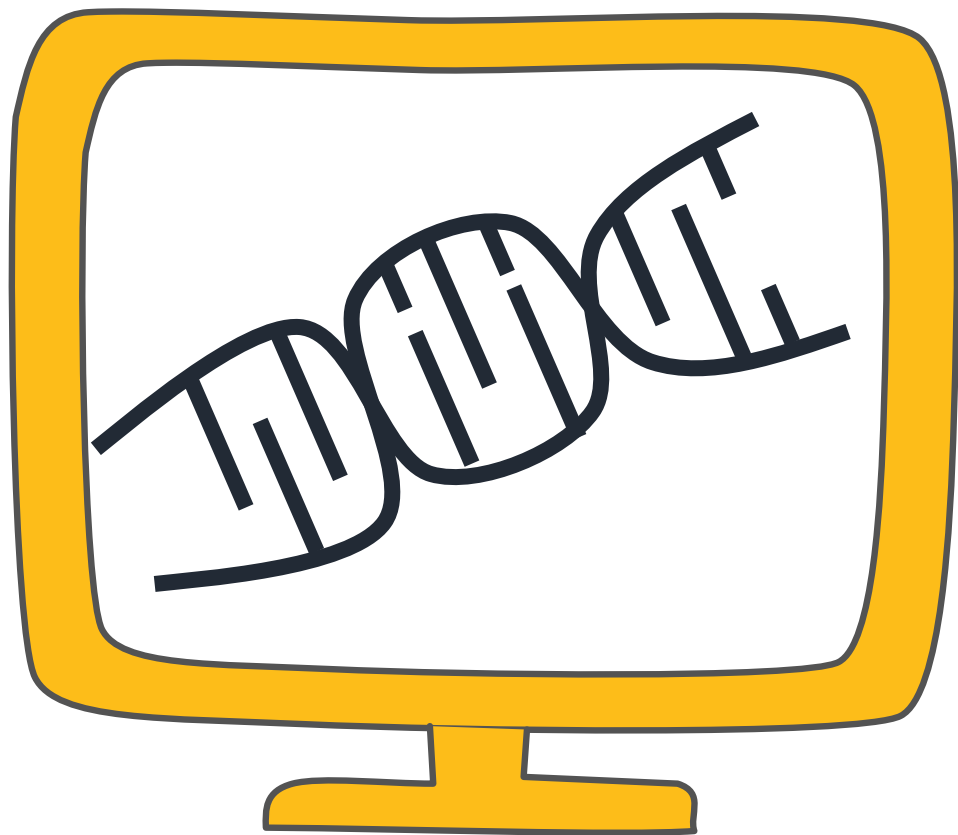
Curly hair, double eyelids,
Separated earlobes,
with beauty tips



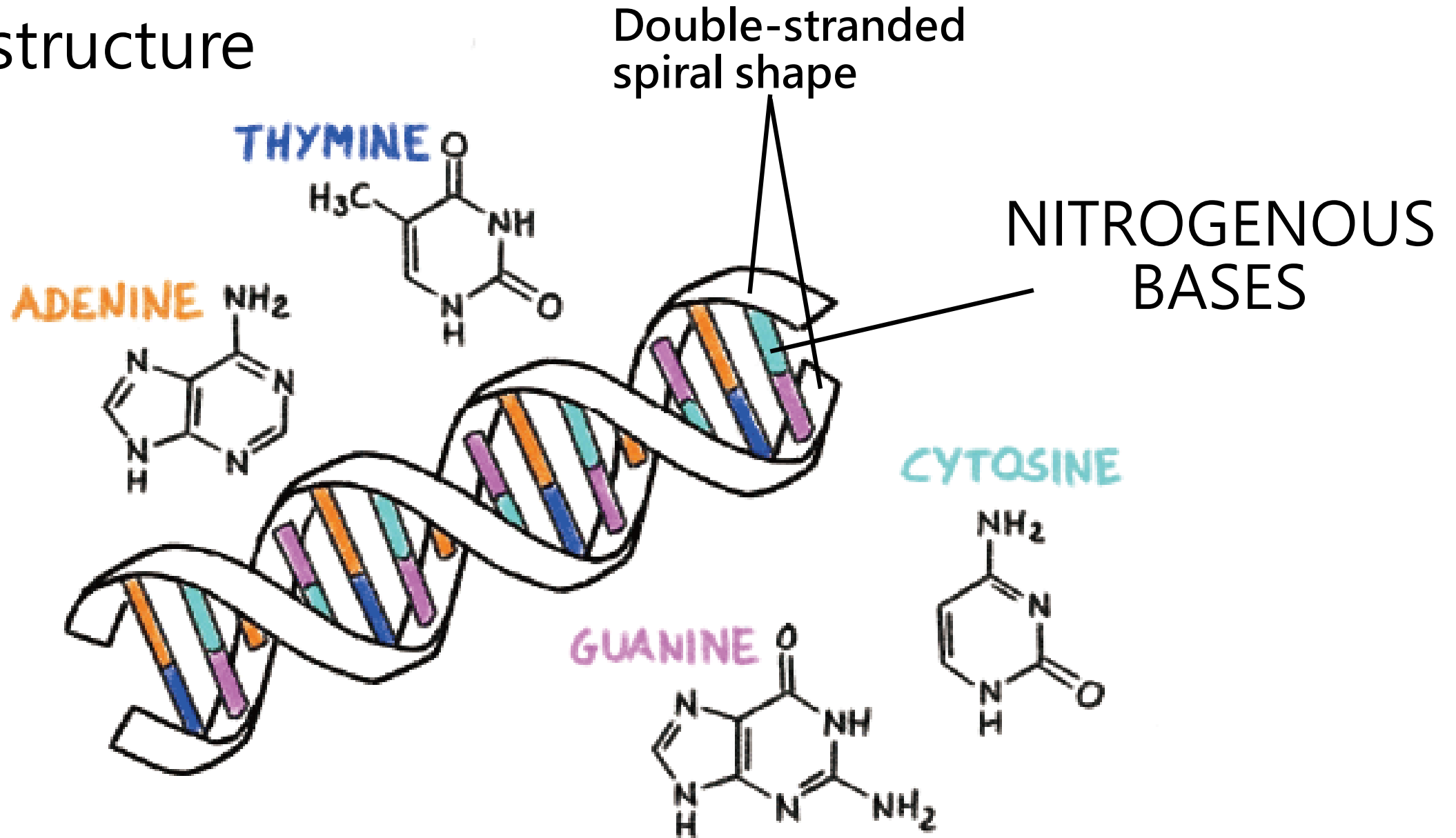
Recessive

Straight hair, single eyelid,
Earlobe tightly,
No beauty tip

DNA



DNA structure



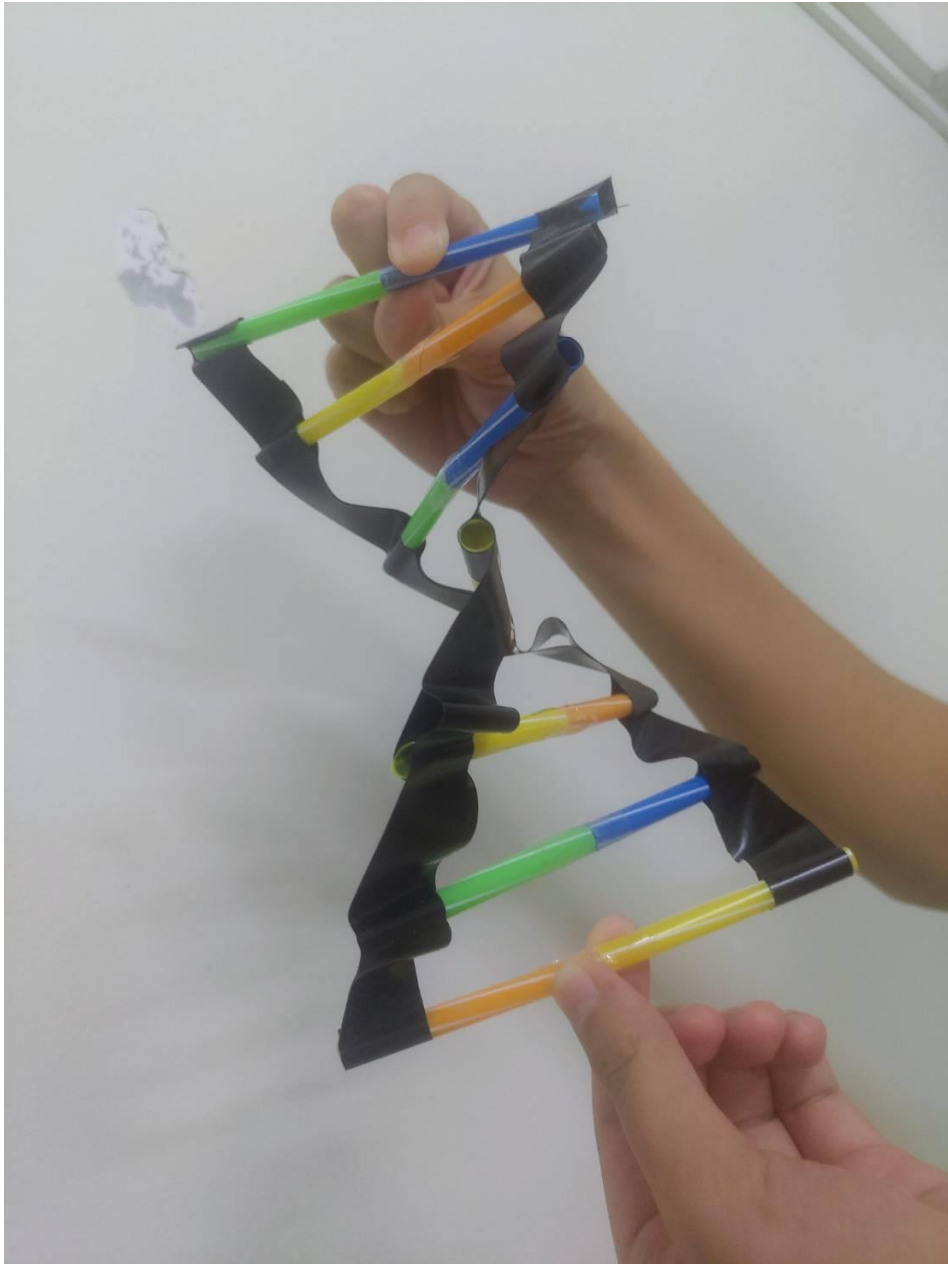
Double strand



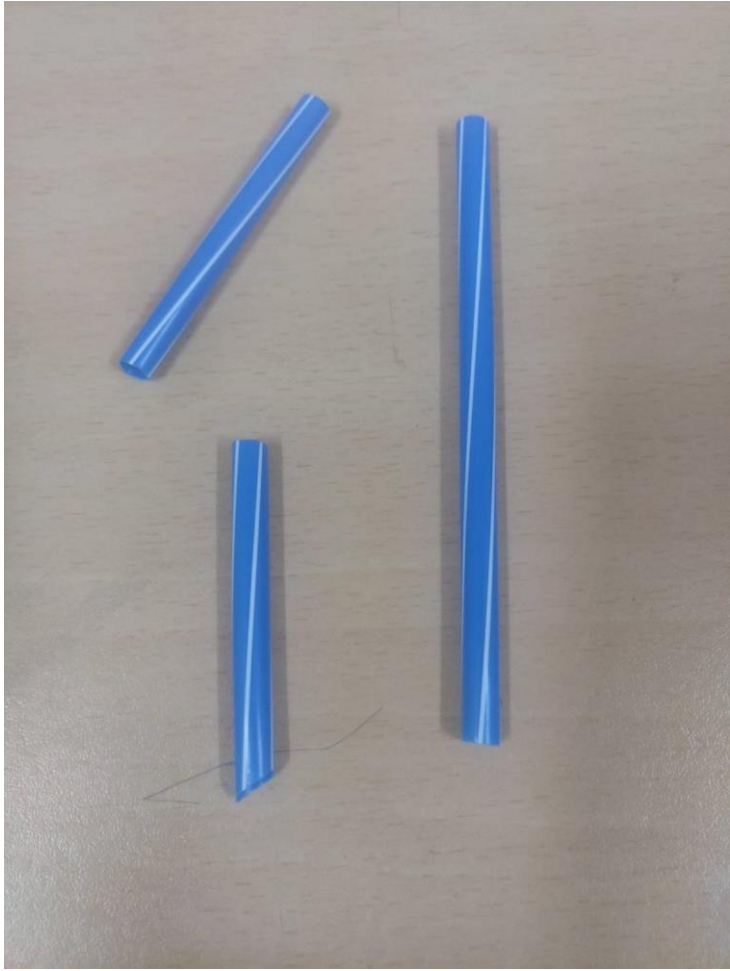


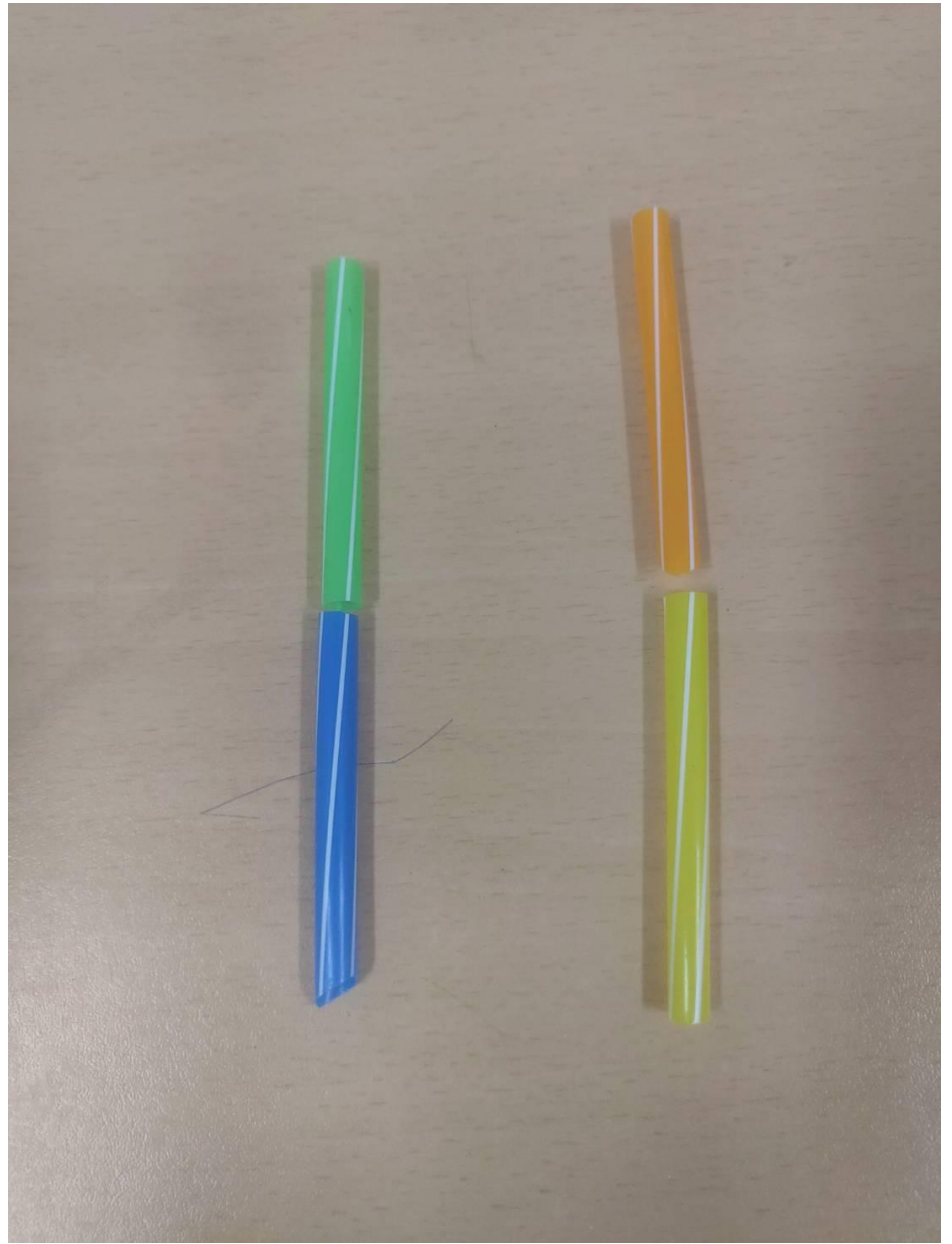
Hands make a DNA
double-strand model

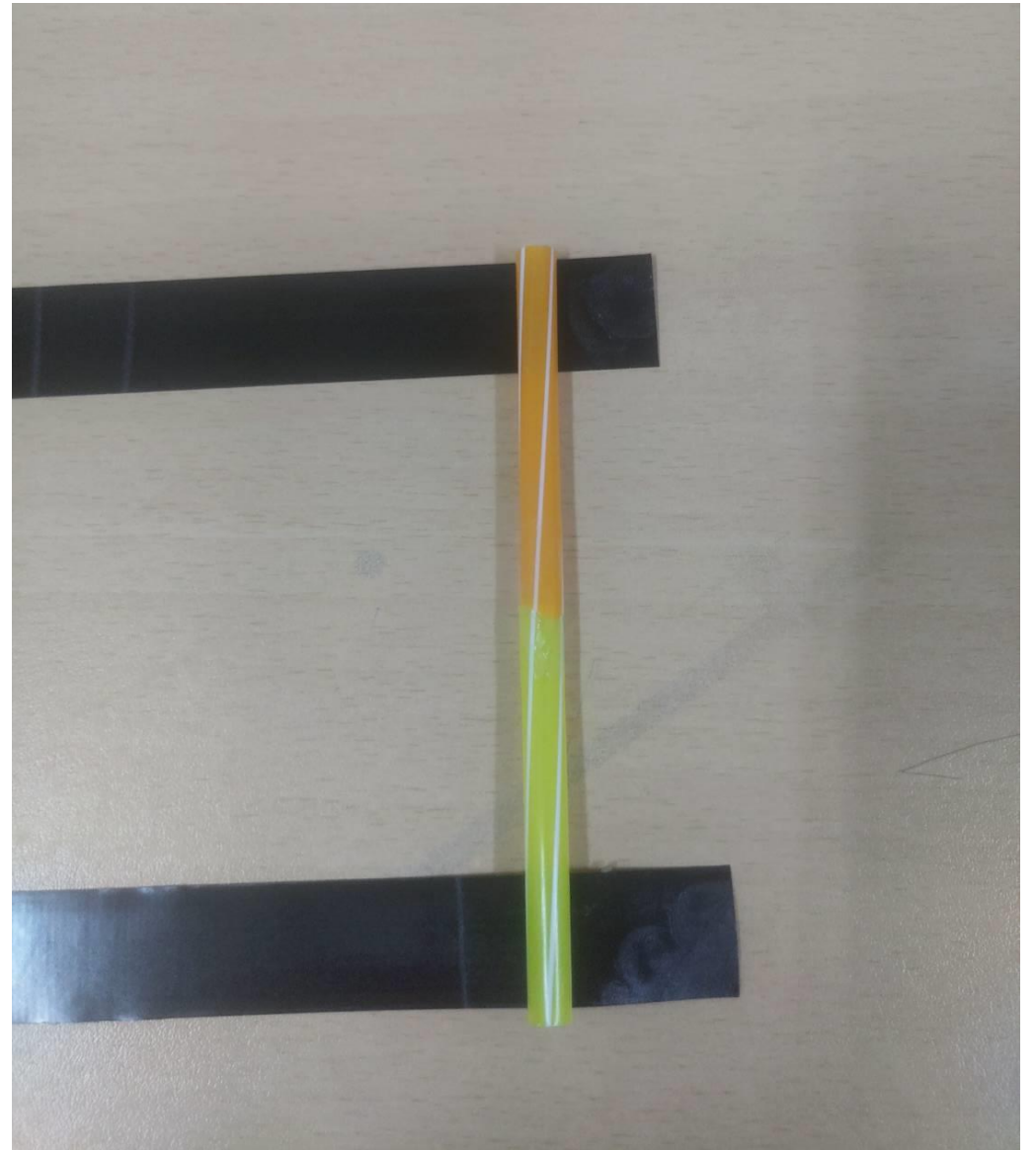
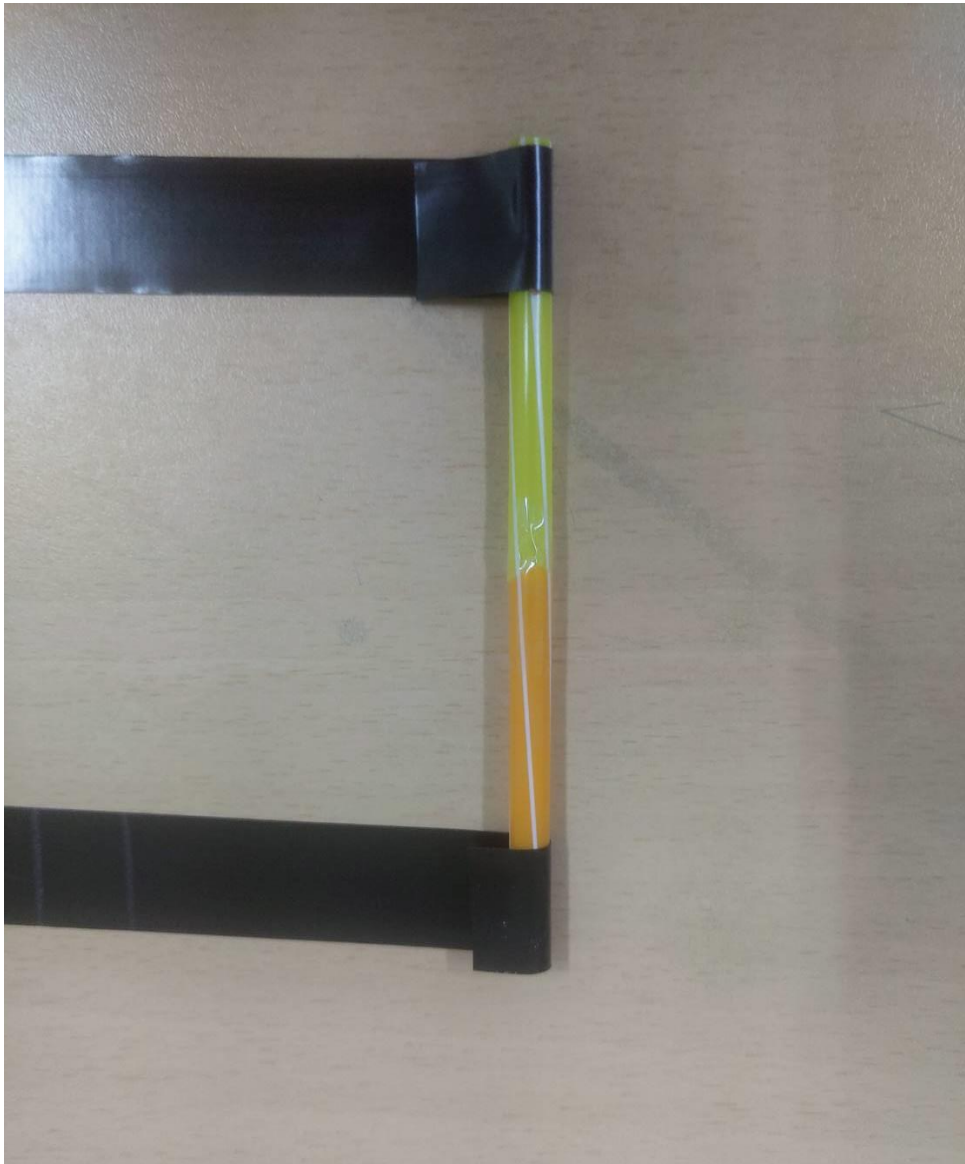
Complementary Principle



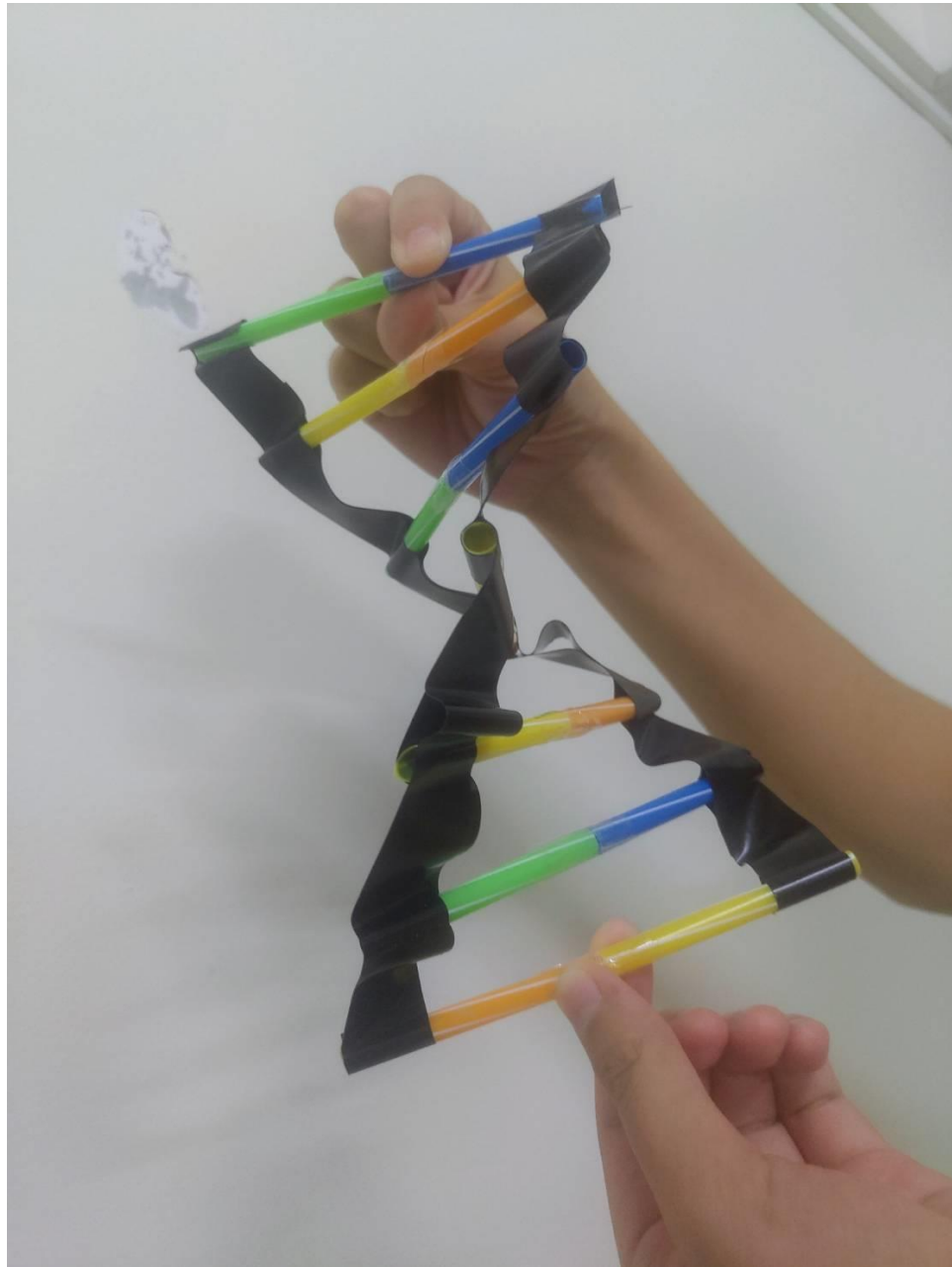












Review



<https://reurl.cc/bRWaKE>



DNA Extraction from Fruit



Purpose

- Understand the basic principles and methods of crude DNA extraction.



Experimental Materials

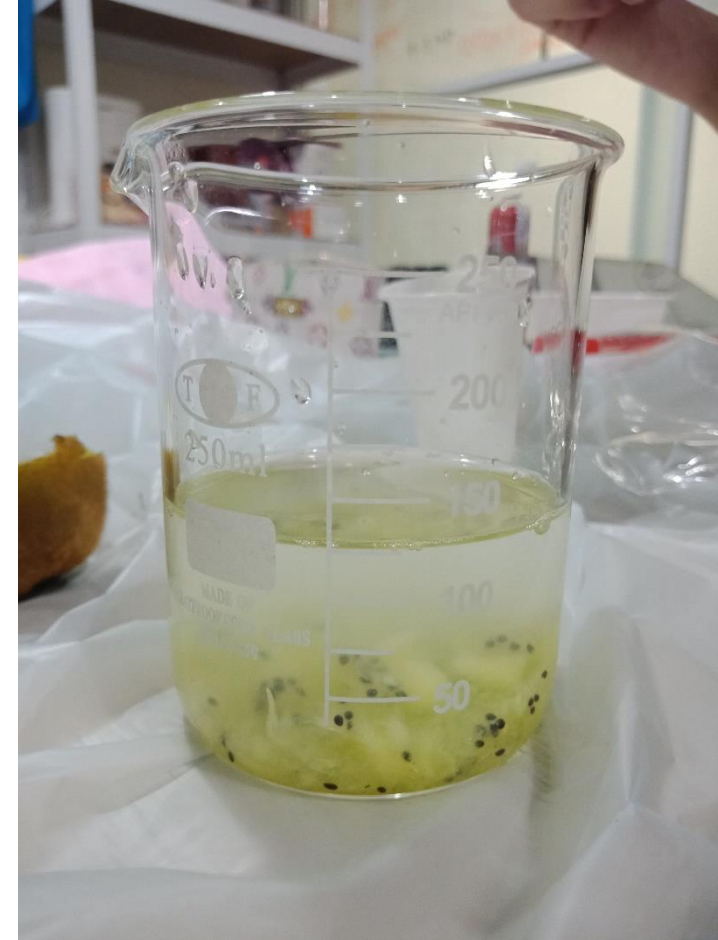
- Kiwi
- pineapple
- Dishwashing liquid
- Salt water
- Distilled water
- 95% ice alcohol
- Beaker*4
- Test tube*2
- Glass rod*2
- Filter paper*2
- Zipper bag*4



Experimental steps

Step 1. Prepare kiwi juice

1. Peel the kiwi fruit and mash it in a zipper bag.
2. Pour the mashed kiwi pulp into a beaker and add 100 ml of distilled water.





Experimental steps

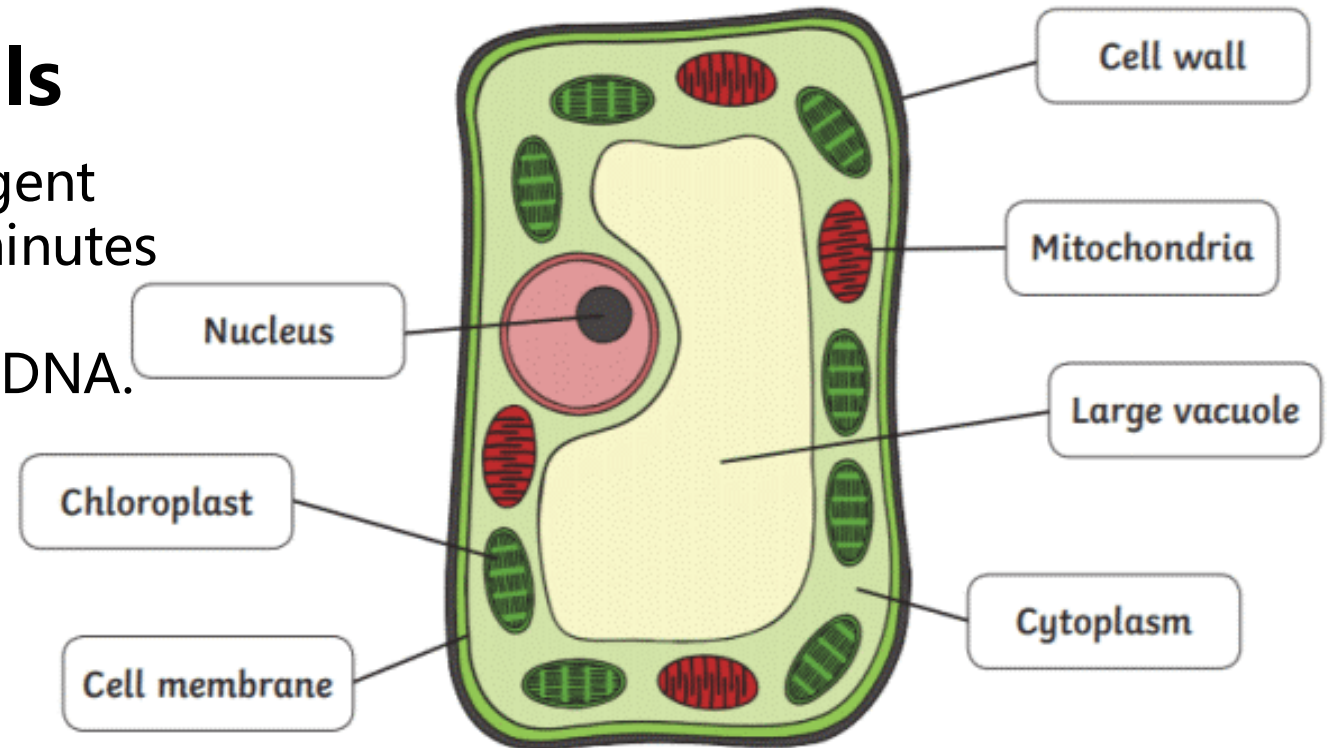
Step2. Destroy pulp cells

- Add 5 ml of dishwashing detergent and stir with a glass rod for 5 minutes to destroy the cell membrane , nuclear membrane and release DNA.

Step3. Dissolve DNA

- Add 5M salt water and use a glass rod to stir for 5 minutes.

Plant Cell Diagram





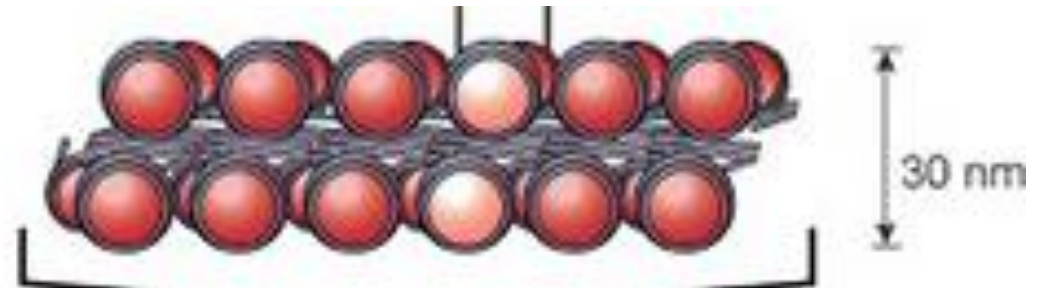
Experimental steps

Step4. Purified DNA to prepare pineapple juice

- Add pineapple pieces and mash them in a zipper bag.

Step5. Purify DNA

- Add 5 ml of pineapple juice and stir for 5 minutes with a glass rod to decompose the protein entangled by DNA and release DNA.





Experimental steps

Step6. Dissolve DNA

- Use filter paper to filter the mixture into a beaker.

Step7. DNA extraction

- Take 15 ml of the filtrate into a test tube, and slowly add 5 ml of 95% ice alcohol along the wall of the tube. White cotton flocs will appear in the solution layering, that is, the DNA condensed out.





End!



Experiment summary

Generally speaking, we cannot see DNA with the naked eye, but through DNA extraction experiments, we can see tiny DNA that could only be seen at a thousand times magnification!



**Thank you for
participating**



2020.10.07

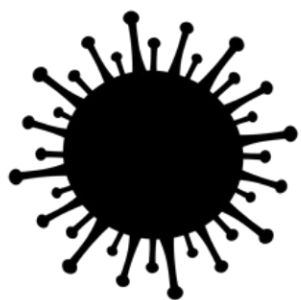


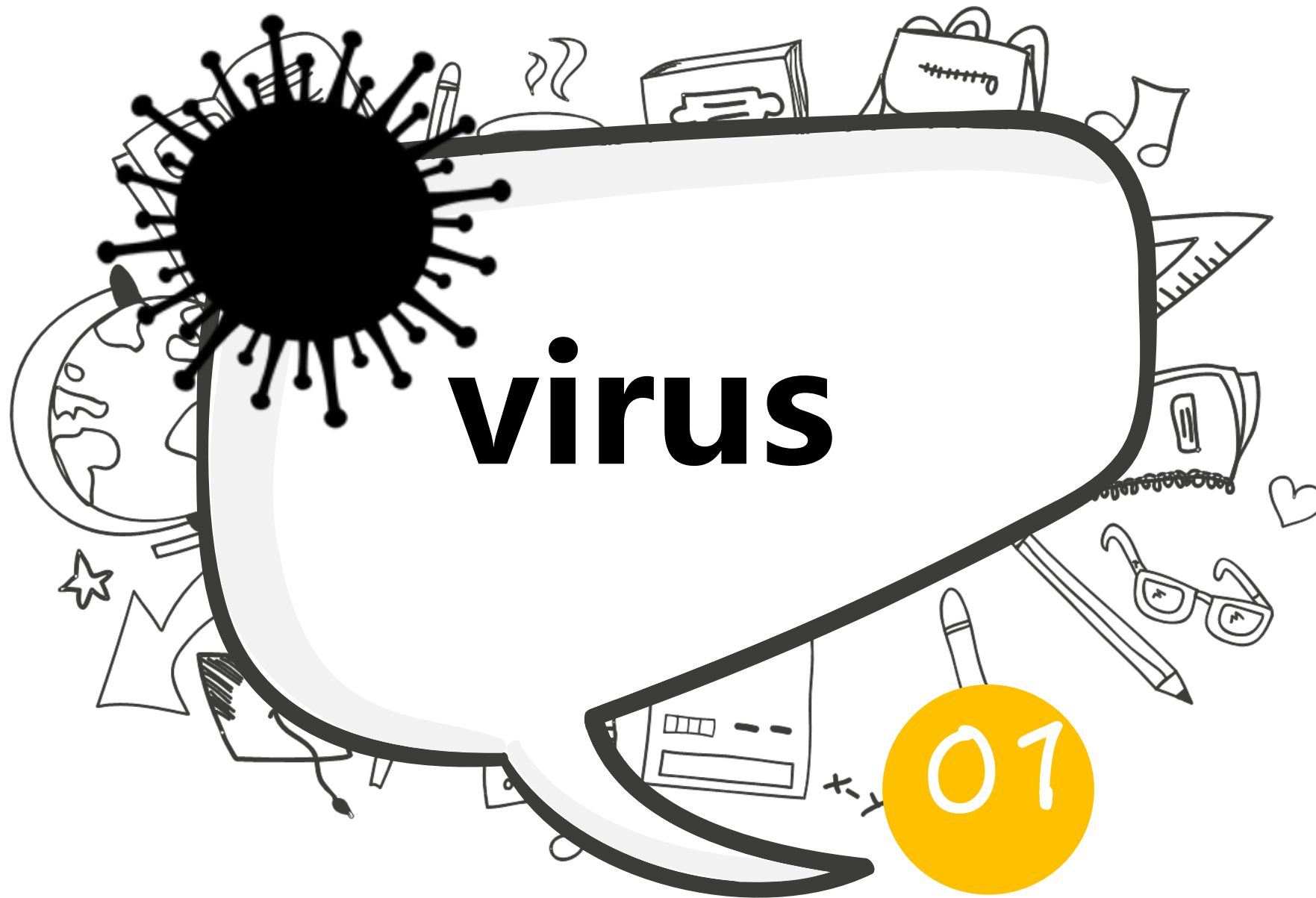
When do we need to wear masks?

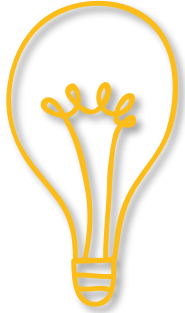


Now, the mask cannot leave the body

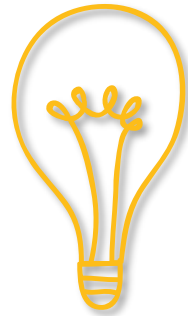
**Why do we need
to wear masks?**



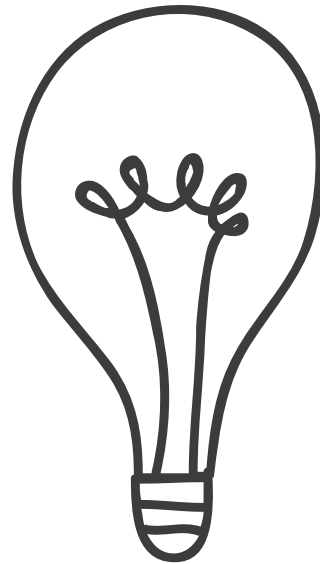




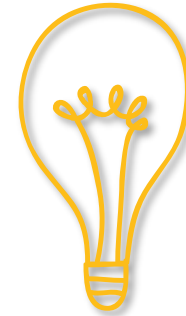
Is it small?



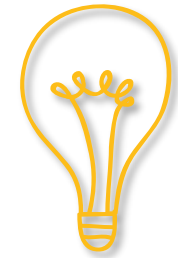
I do not know



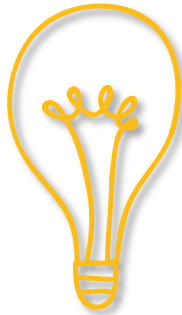
What is a virus?



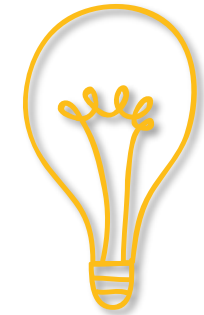
parasitic?



Something that
infects people?



AIDS? Coronavirus?



Between living things
and non living things?

Something that infects people?

The virus will pass through

Mosquito bites

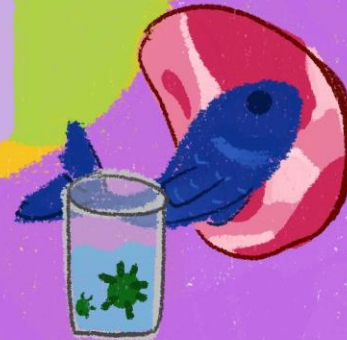


Droplet or air infection

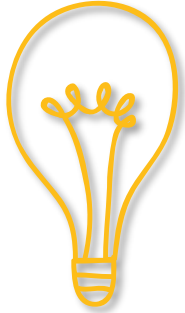
Blood infection



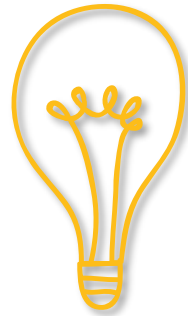
Food or drinking water infection



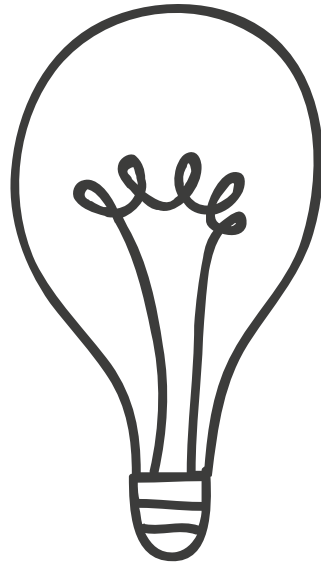
To infect humans



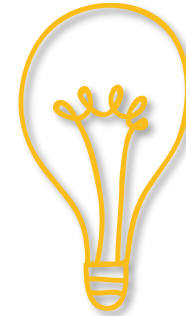
Is it small?



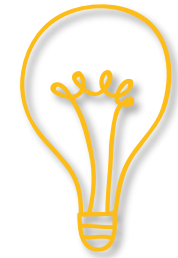
I do not know



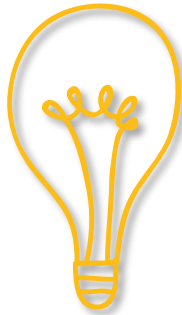
What is a virus?



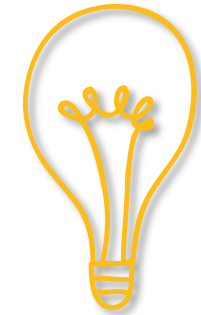
parasitic?



Something that
infects people?



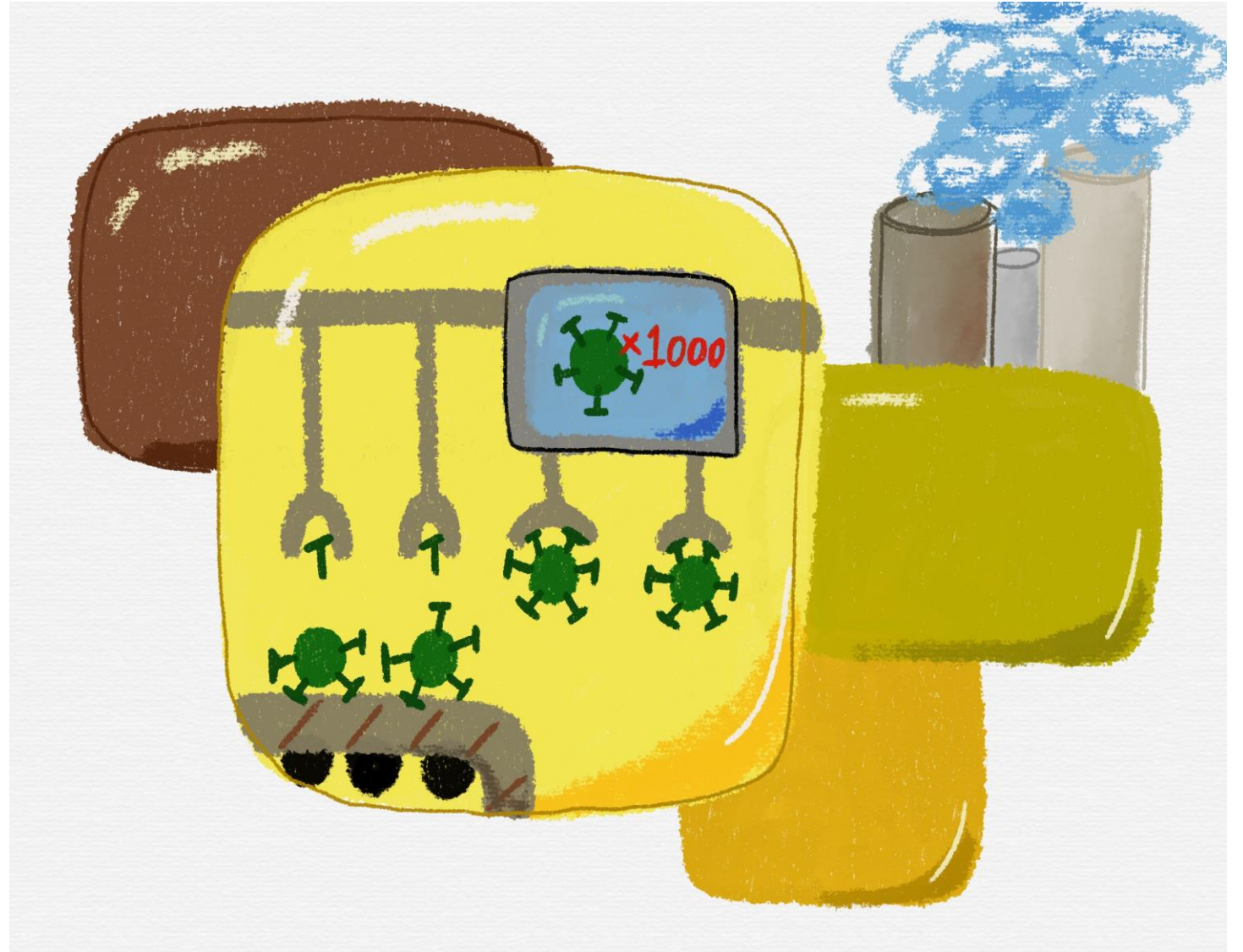
AIDS? Coronavirus?

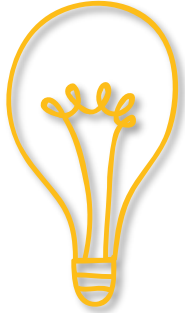


Between living things
and non living things?

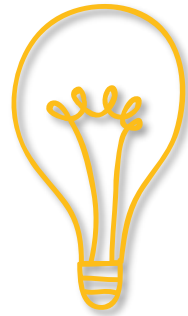
parasitic

After the virus infects a cell, it transforms the cell into a "factory" and uses the cell to replicate the virus to attack the next cell.

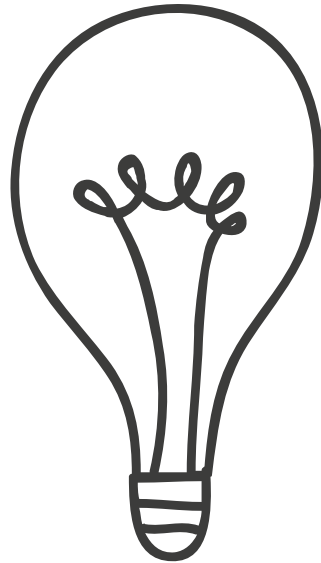




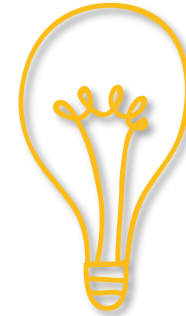
Is it small?



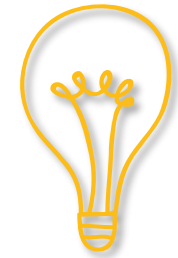
I do not know



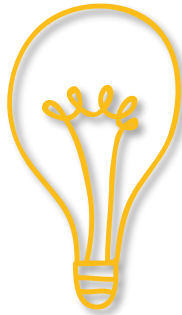
What is a virus?



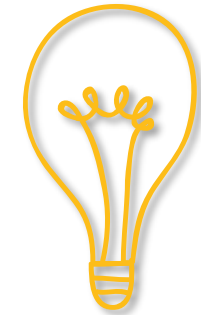
parasitic?



Something that
infects people?



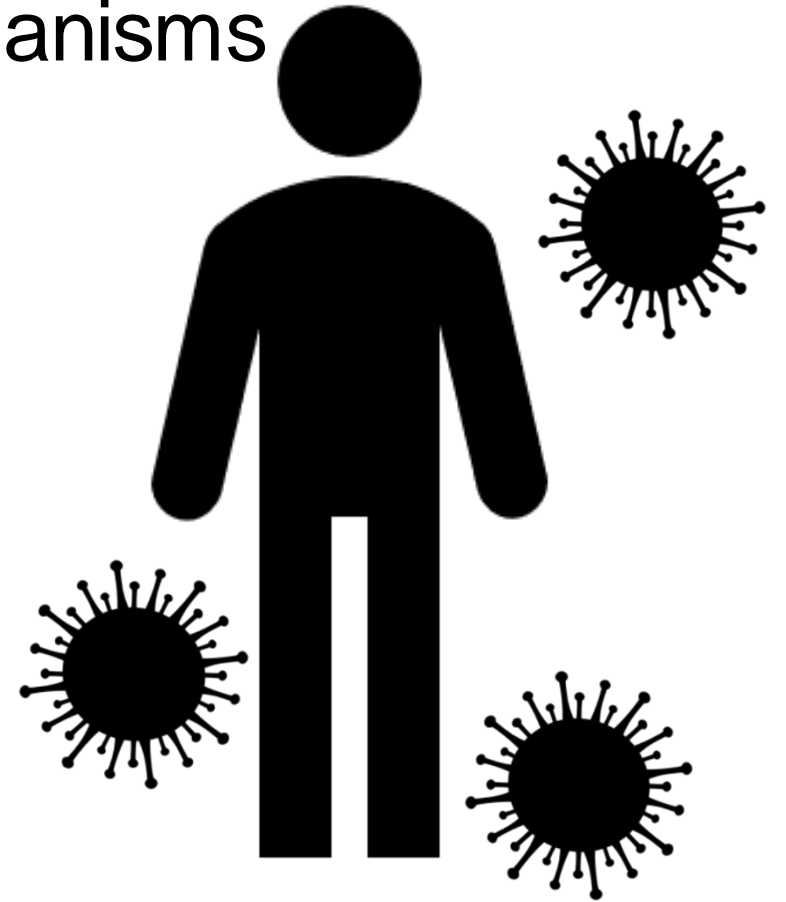
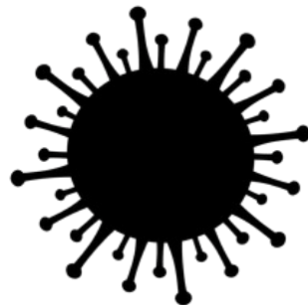
AIDS? Coronavirus?

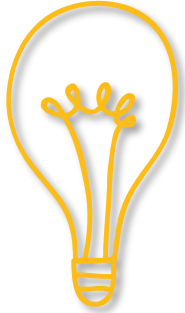


Between living things
and non living things?

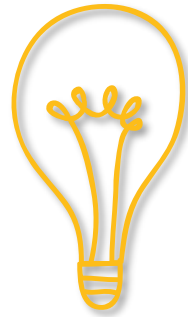
Viruses are not a living thing

Viruses have vital signs only in living organisms
(Growth, metabolism, reproduction)

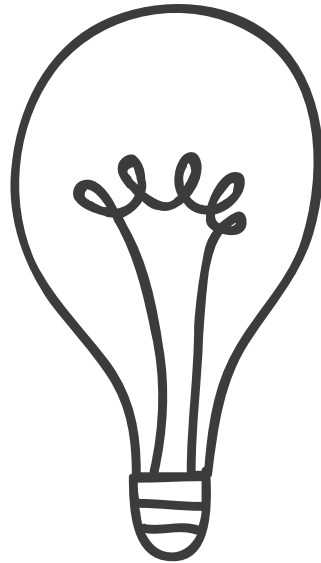




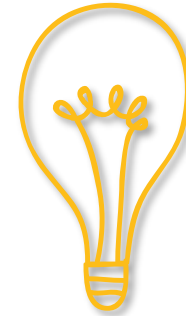
Is it small?



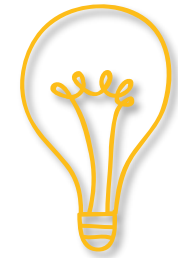
I do not know



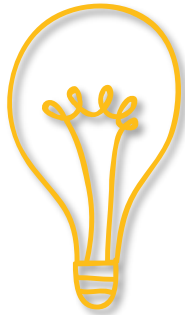
What is a virus?



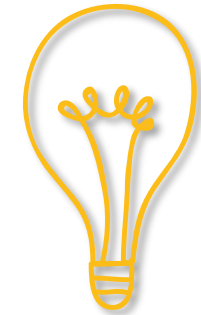
parasitic?



Something that
infects people?



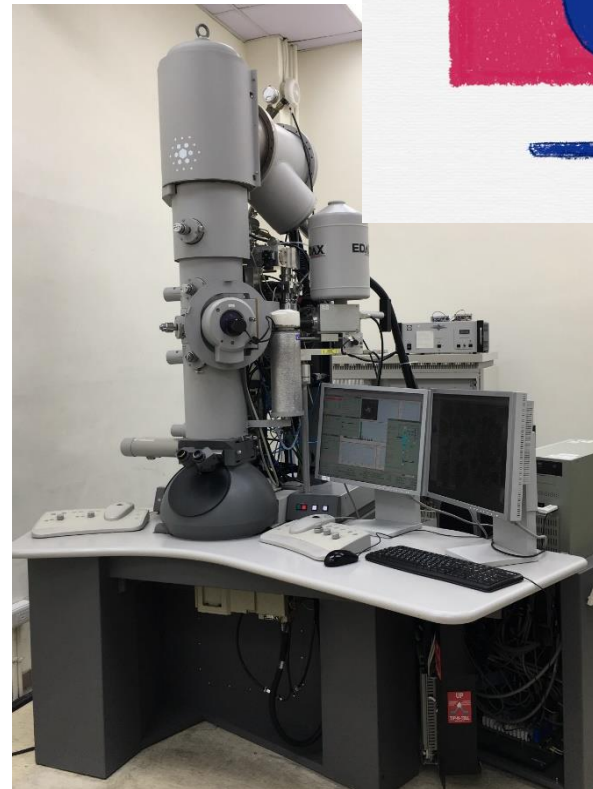
AIDS? Coronavirus?

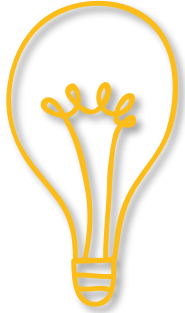


Between living things
and non living things?

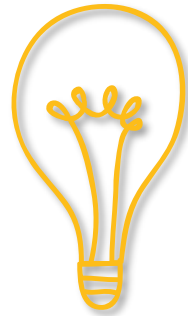
Virus size

The virus cannot be seen with the naked eye, it needs to be observed through an "electron microscope"

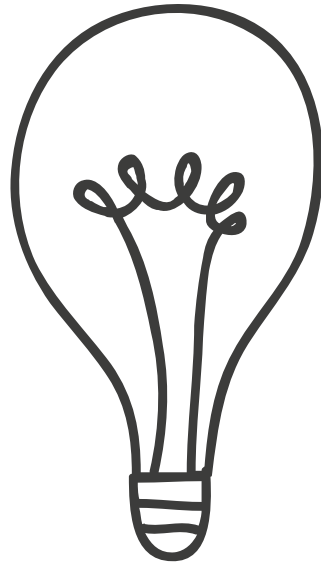




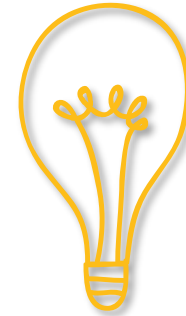
Is it small?



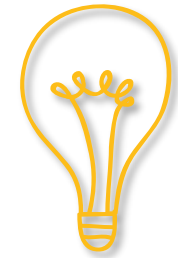
I do not know



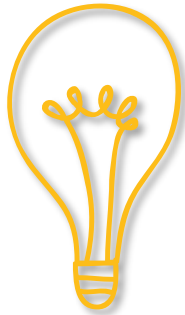
What is a virus?



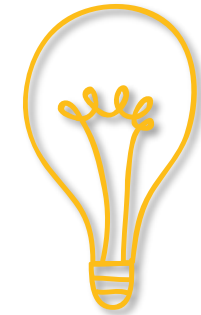
parasitic?



Something that
infects people?

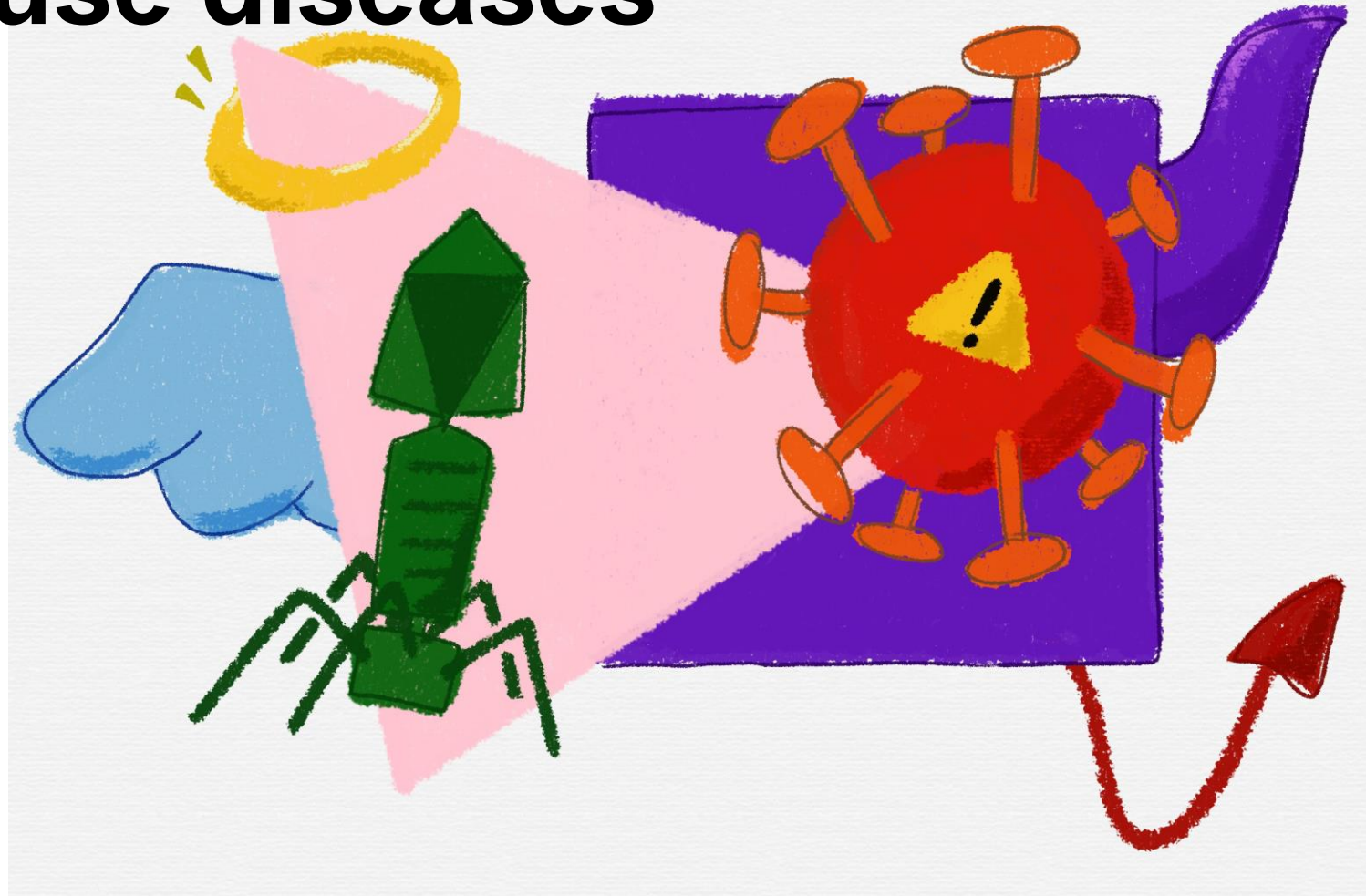


AIDS? Coronavirus?



Between living things
and non living things?

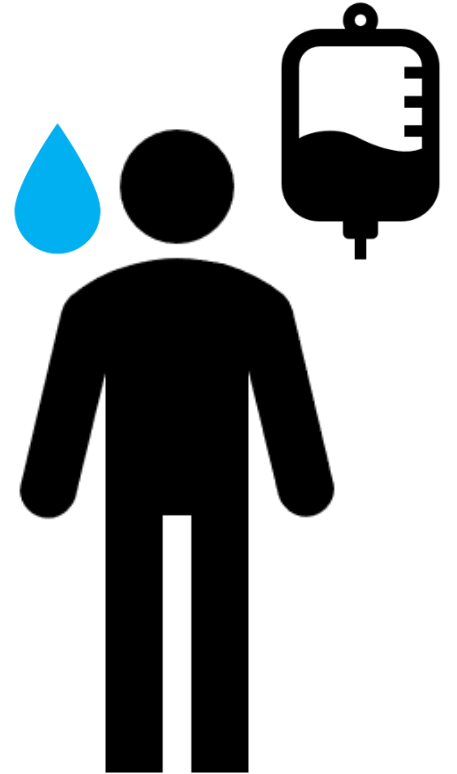
Good viruses help kill bacteria
Bad viruses cause diseases



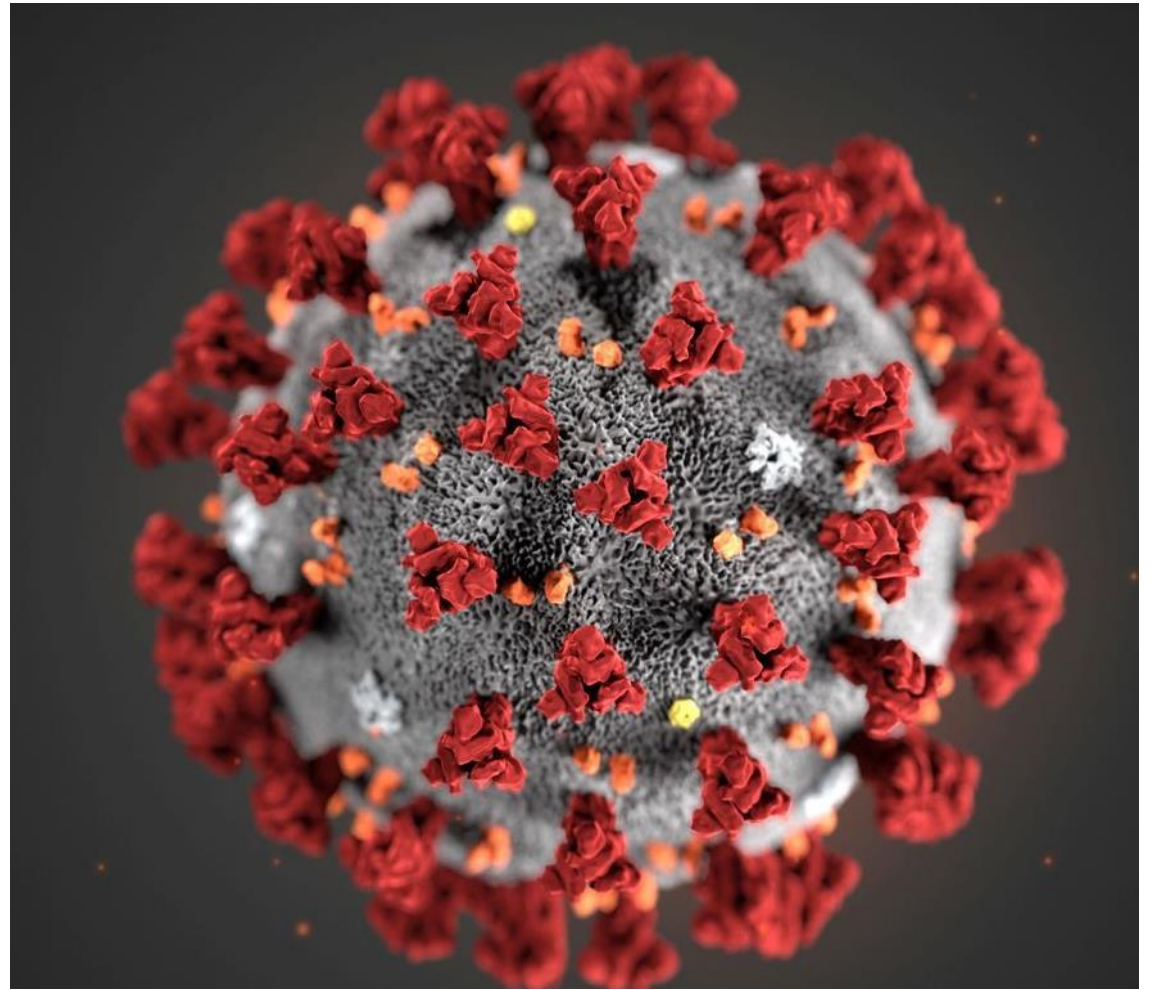
Diseases caused by viruses

AIDS, flu, smallpox, black death

SARS, bird flu, **coronavirus**

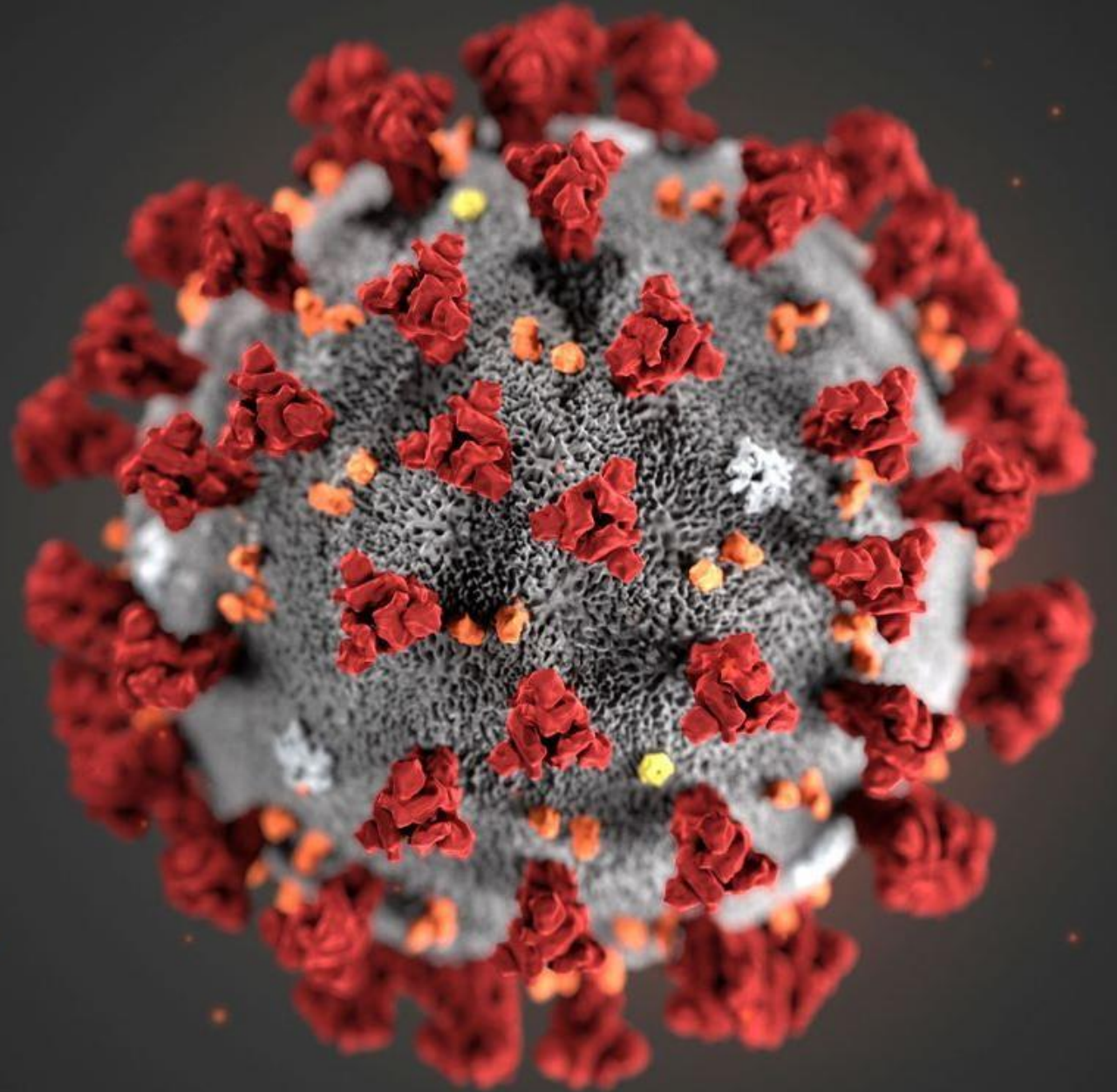


COVID 19



Coronavirus, Cov

When observed under a microscope, the shape showed a **crown-like spike**



Source of Coronavirus

1. Animal : A Civet or a bat?

Coronavirus is a zoonotic disease

2. Laboratory

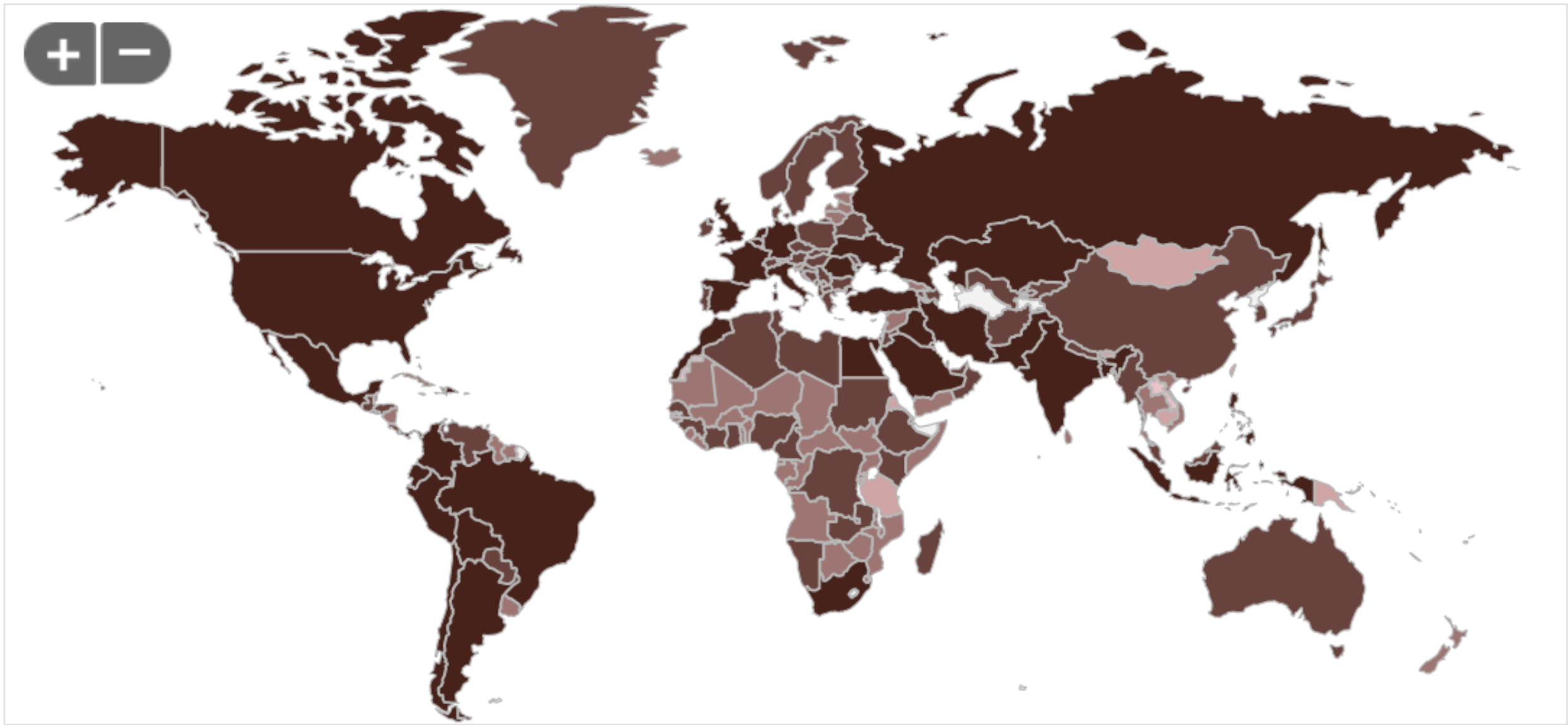
No basis



Severe Acute Respiratory Syndrome, SARS

The infection is characterized by the occurrence of diffuse pneumonia and respiratory failure, which is more serious than atypical pneumonia, so it is named **Severe Acute Respiratory Syndrome**.

**How serious is
COVID-19**



As long as you can breathe, you may be infected

1. Droplet infection

Sneezing, coughing, spitting, etc., as long as close contact, you may inhale these germs.

2. Contagion

Contact with virus-contaminated objects, such as keyboards, door handles, faucets, keys, etc.

3. Fecal-oral infection

Body contact with virus-contaminated objects, such as urine, saliva, feces, etc.

Viruses can invade the body through mucous membranes, including conjunctiva, nasal mucosa, and oral mucosa, so don't touch these places easily when you are not sure whether your hands are clean.

wear mask



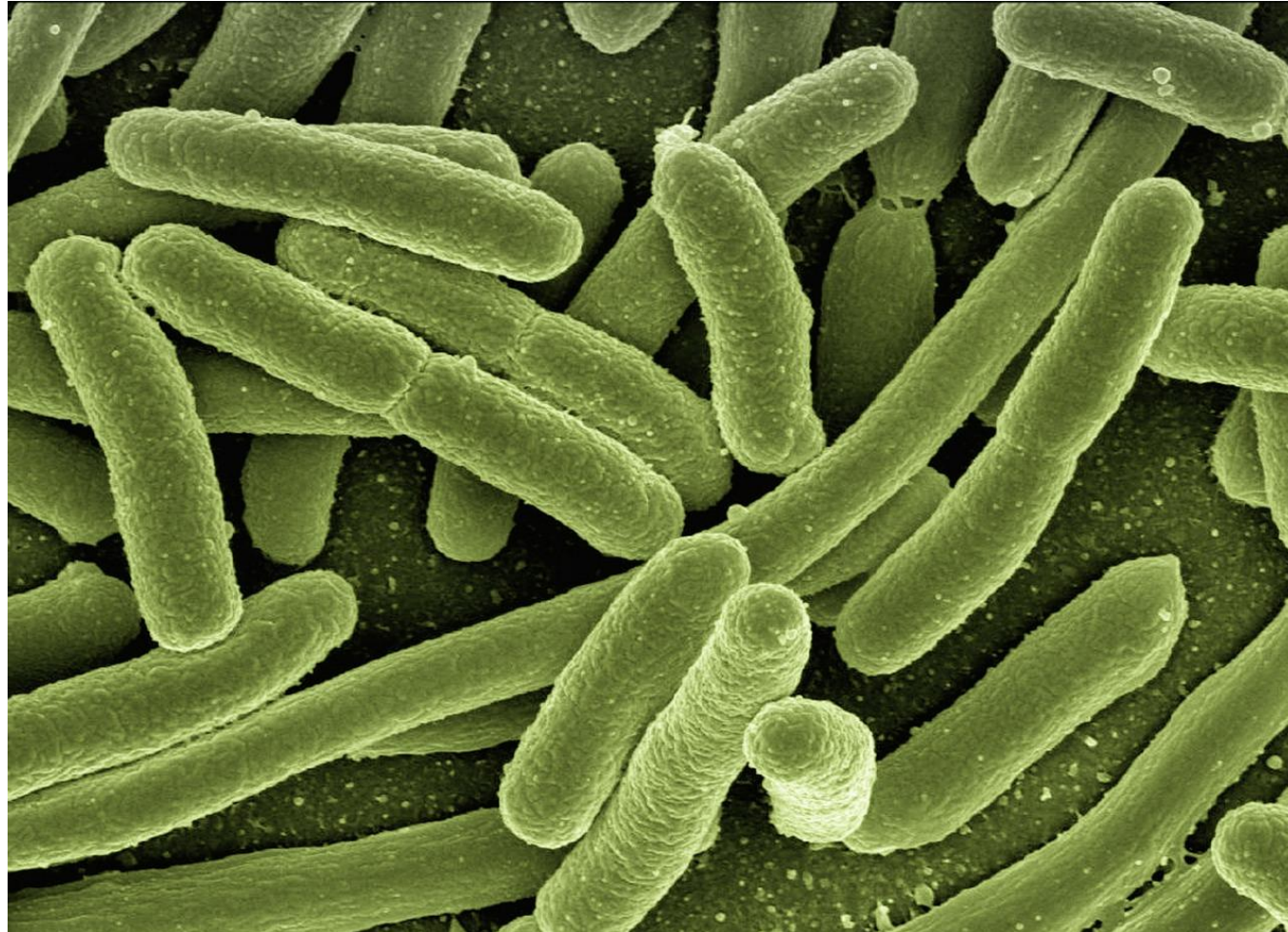
Wash your hands frequently





Bacterial

02



Escherichia coli

resource : pixabay

**How many bacteria
are there in an
unwashed hand?**





4000 bacteria



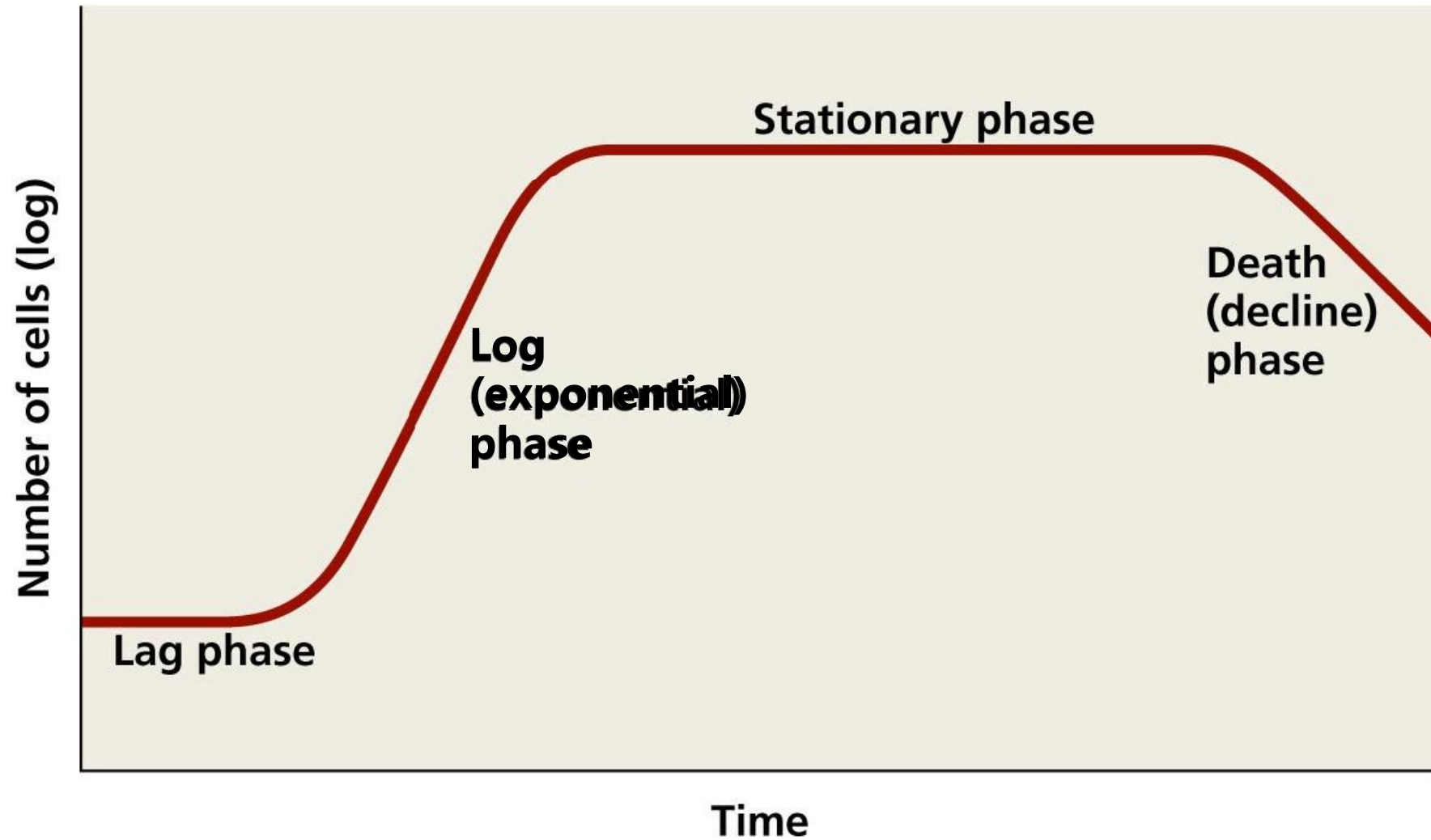
Hand washing is very important!!!

The difference between washing hands and not washing hands



How colonies are formed?

Bacterial growth curves

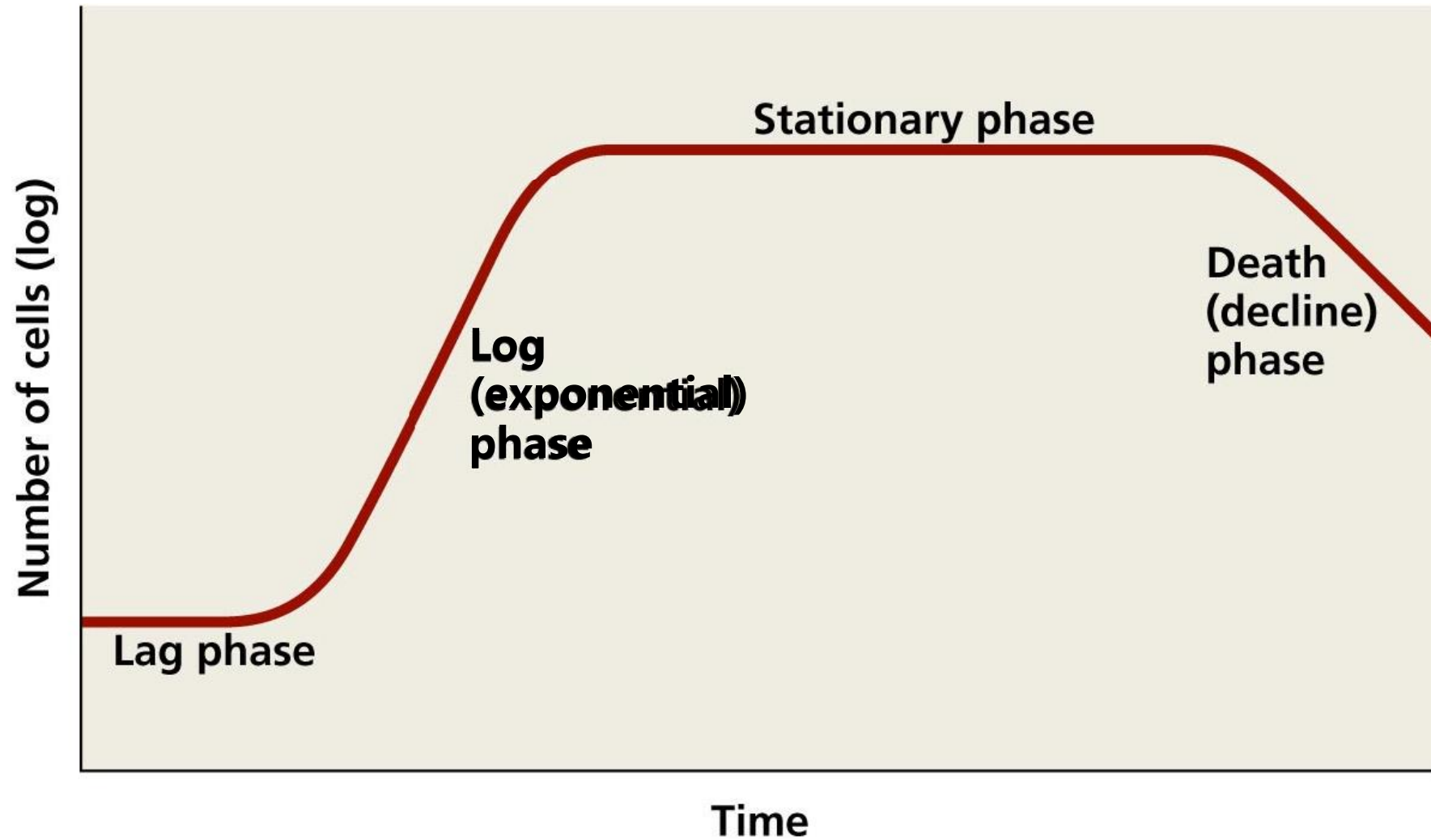


Lag phase

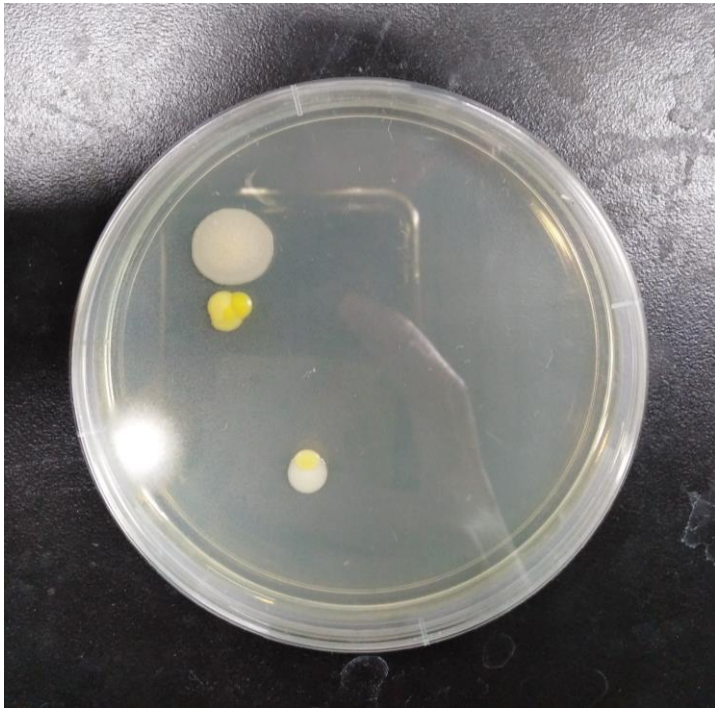
surroundings

food

Bacterial growth curves



Colony pairing



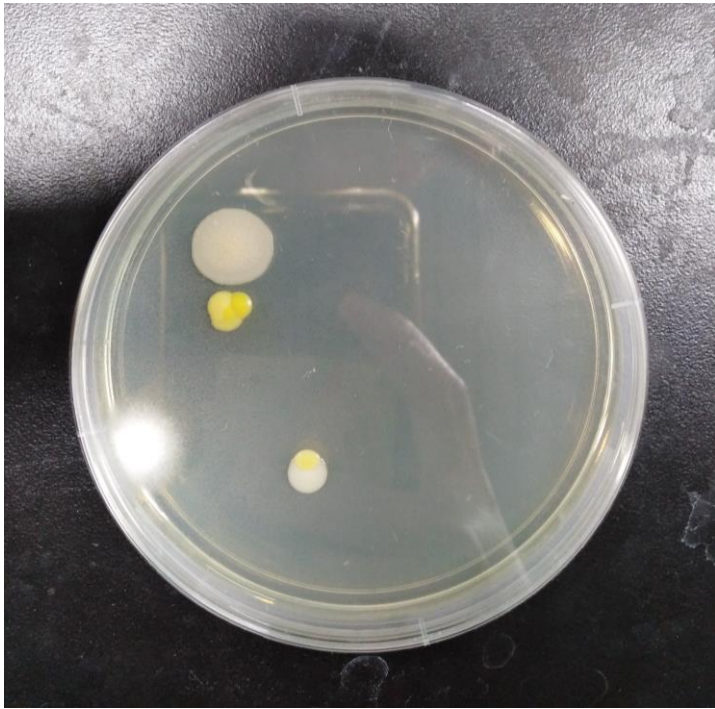
toilet lid



Ditch cover



phone case



phone case



toilet lid



Ditch cover

What is the dirtiest thing?

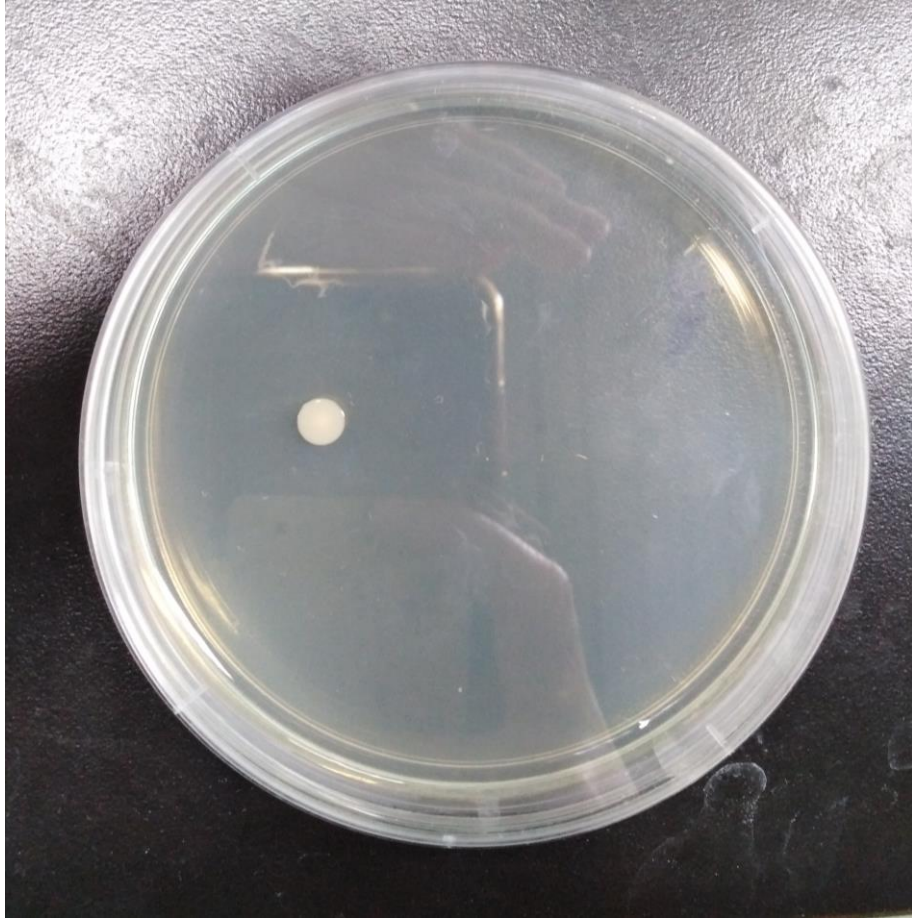
sole

doorknob

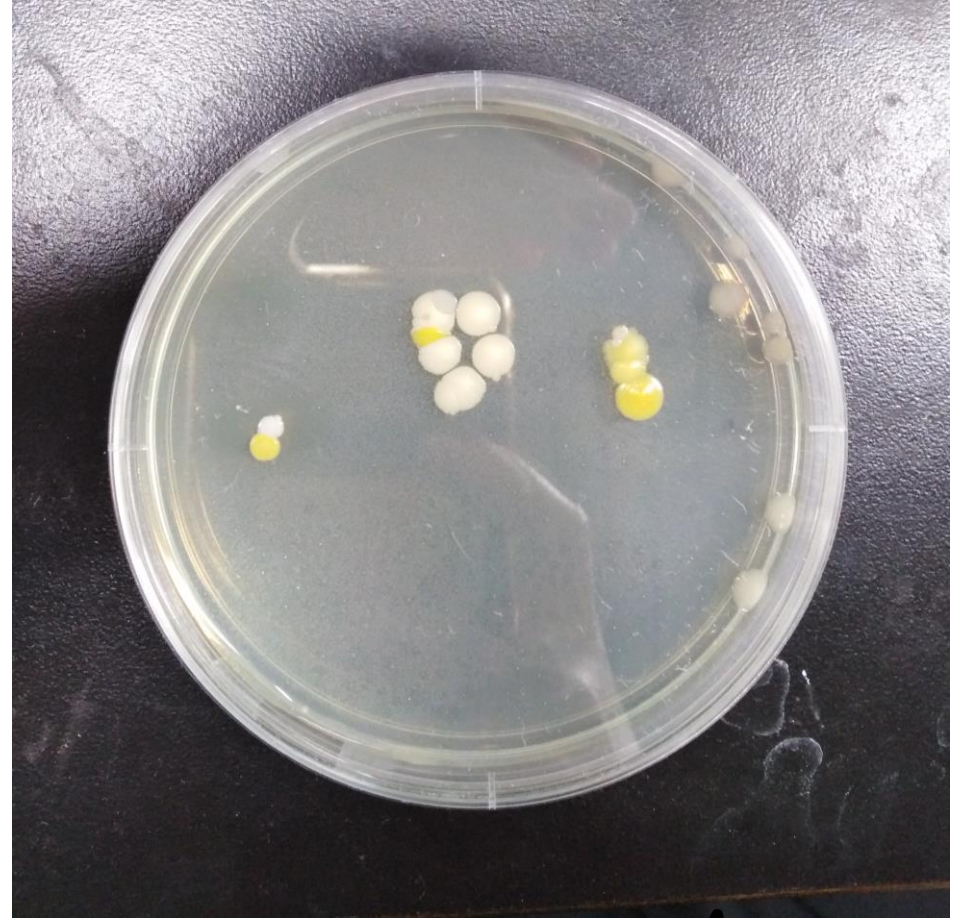
coin



sole



coin



doorknob

Guess



A. Saliva

B. nostril

C. scalp

