

<b>Ages</b>	6 - 14 years approximately	<b>Number of people</b>	60 people approximately	<b>Topic</b>	Biology
<b>Date</b>					
<b>Purpose</b>	The student is introduced to scientific concepts of biology and learns about possible applications of science. They also reinforce the knowledge acquired through playful dynamics that stimulate their creativity.	<b>Time</b>	50 minutes		
<b>Name of the Activity</b>					
DNA and Biotechnology					
<b>Sequence</b>			<b>Resources</b>		
<b>Presentation (10 minutes)</b>					
Interactive biotechnology presentation with questions to students			Visual support material		
<b>Dynamics</b>					
<b>A) Hanged (10 minutes)</b>			Boards/Blackboard and markers		
The activity will be done in the classroom, using the blackboard or a poster board if not available. Spaces will be written for each letter of a word. By raising hands, children will take turns to guess the letters. They will be words that were mentioned in the presentation.					
<b>B) Simon says modified version (5 minutes)</b>					
The activity will be given in the classroom. Using the theme of Simon Says. Activity especially designed for smaller groups. You will say "DNA says..." followed by a simple instruction and the children must carry it out. For example, "DNA says everyone stand up" and all the children get up from their places. Chairs should be moved to the edges of the room to make room in the center.			No material required		
<b>Learning Reinforcement</b>					
<b>A) Comic (15 minutes)</b>					
The comics are handed out, they are read and questions are answered. At the end, the comic can be colored. The duration of the reading and questions is 10 minutes, coloring time may vary.			Comic, colors and classroom desks		
<b>B) Manual (10+ minutos)</b>					
The manual is distributed to the students, the students read it and reflect on what they have learned through a round table discussion.			Manual and classroom desks		

**DNA**

**RNA**

**Bacteria**

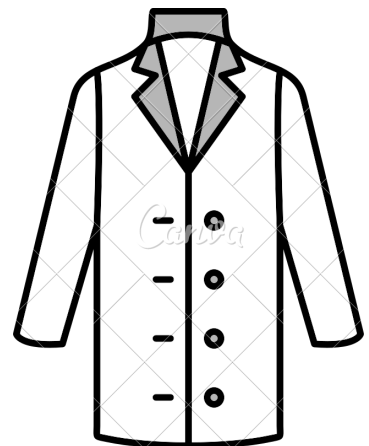
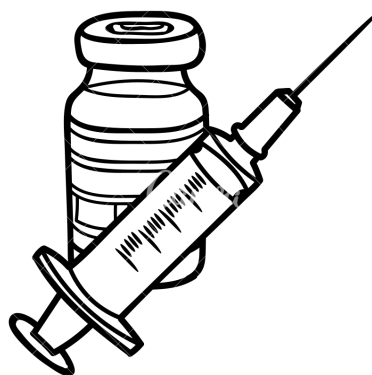
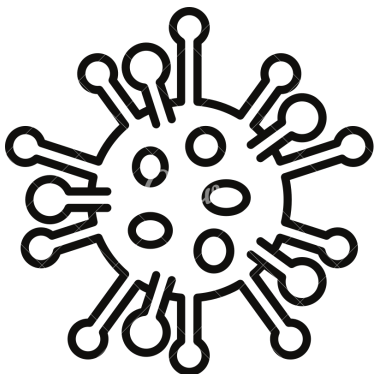
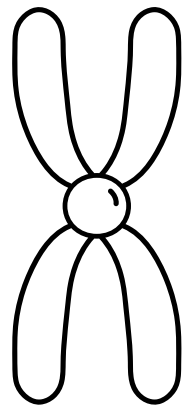
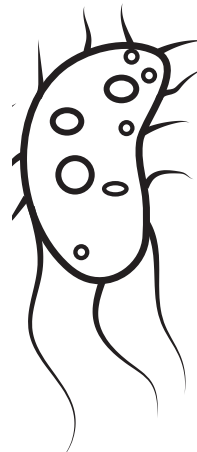
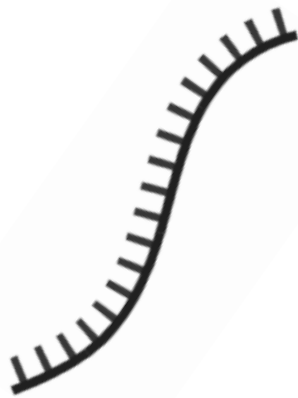
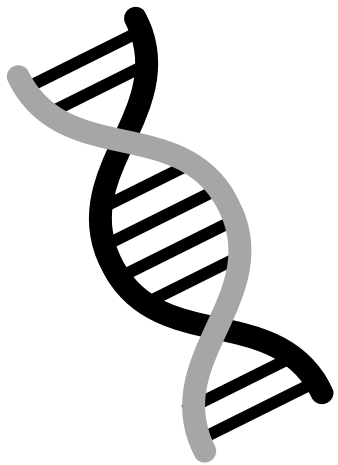
**Chromosome**

**Virus**

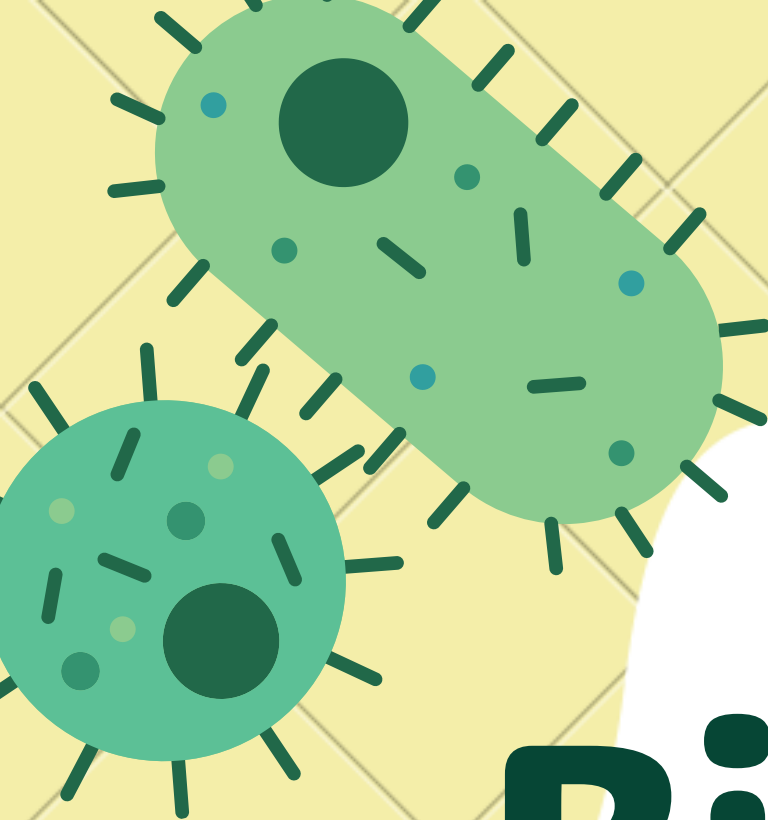
**Cell**

**Vaccine**

**Lab coat**

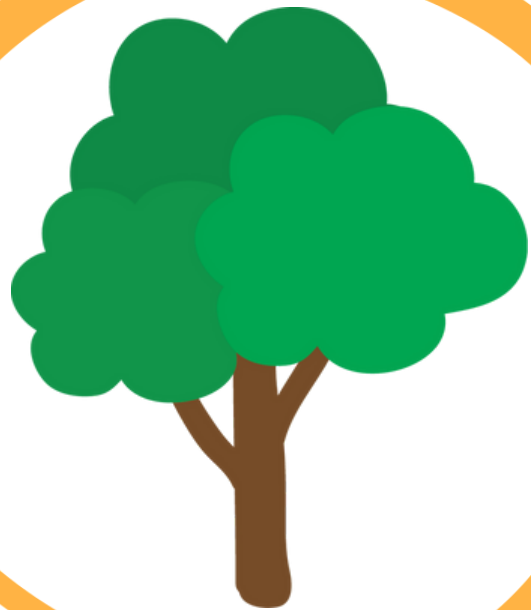


# Biotechnology and synthetic biology



# Living beings

Composed of cells



**Plants**



**Microorganisms**



**Animals**

# Cell Functions



**Listen**



**See**



**Breathe**

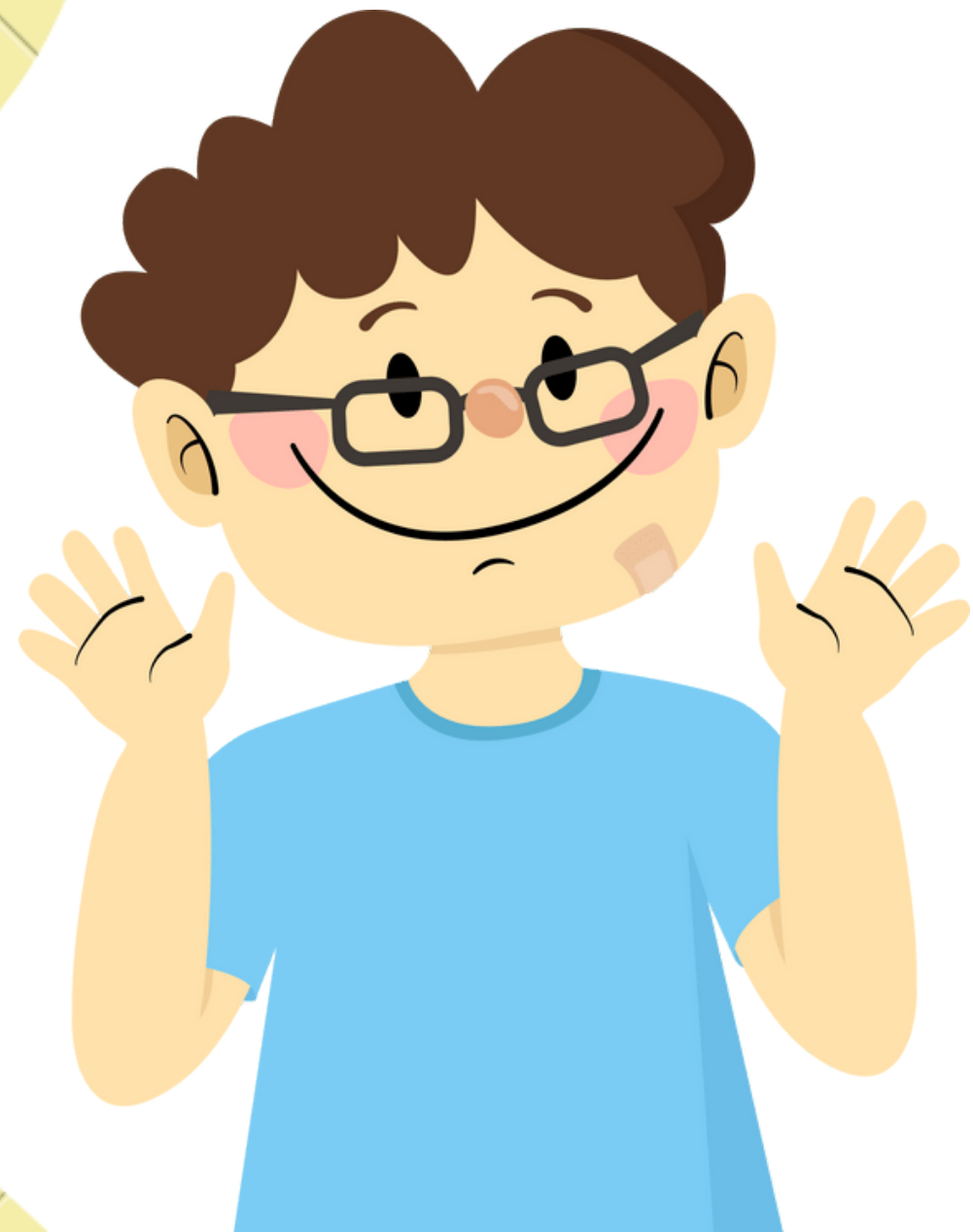


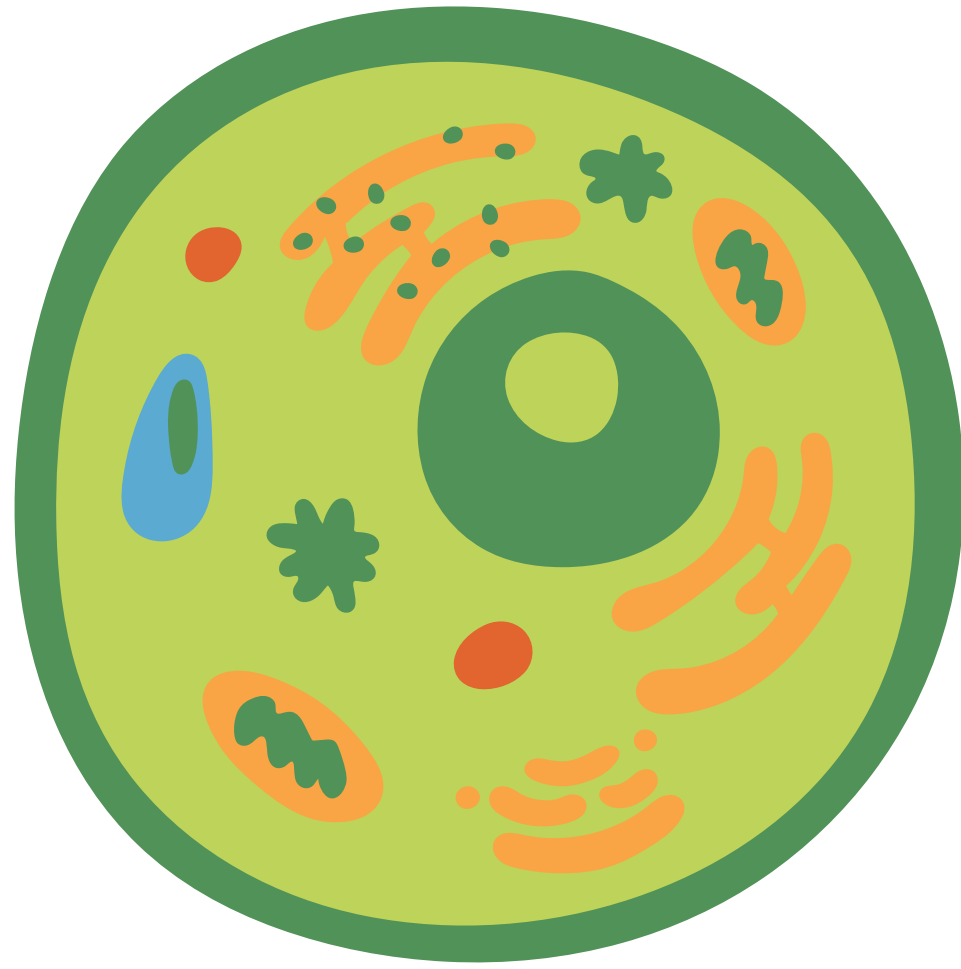
**Play**

**+200 types of cells**

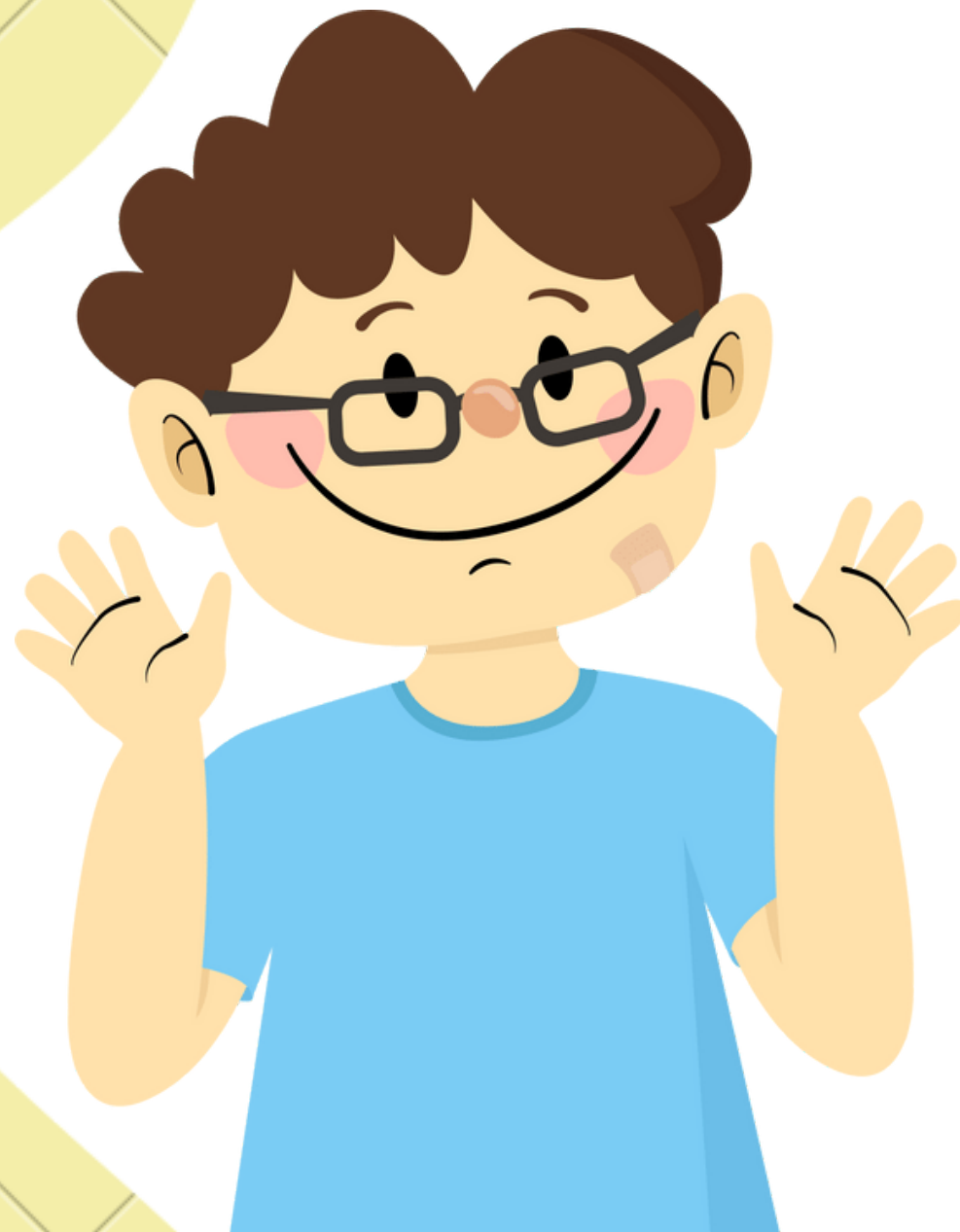


**How many cells do you think  
there are in your body?**



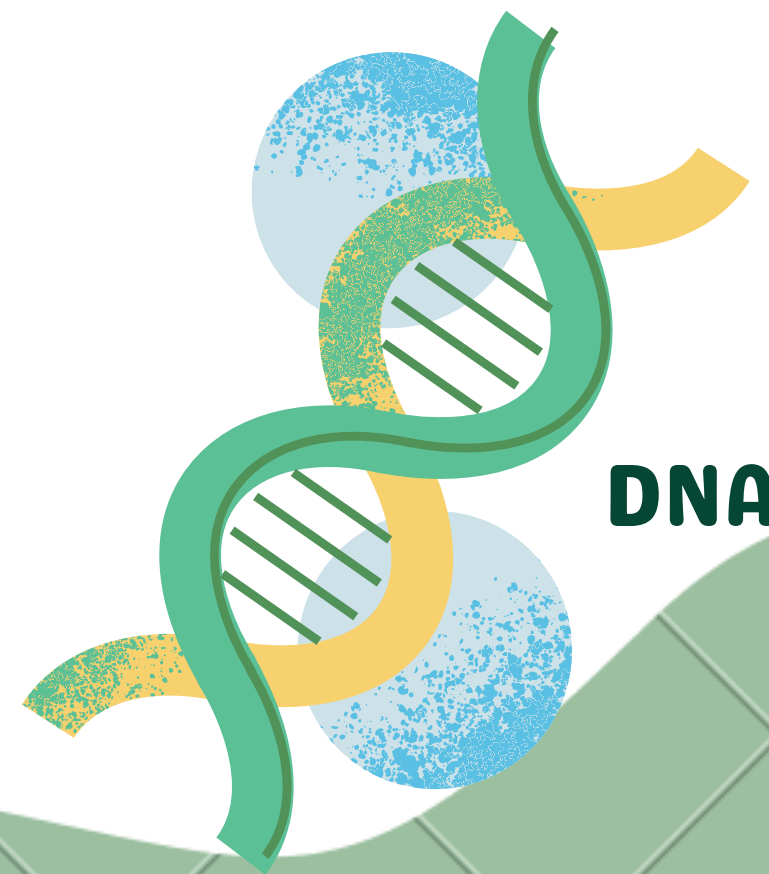


**+2 Billions**  
of cells in the  
palm of your hand



# How does each cell know what work to perform?

**Just like us, our cells follow instructions. Just as we read recipes or instructions for what to do, cells read a molecule called DNA.**





# What is DNA?

**DNA contains all the information about what each living being is like. It is found in the nucleus of cells and is made up of 4 letters (bases):**



**Guanine Cytosine Adenine Thymine**

Codon



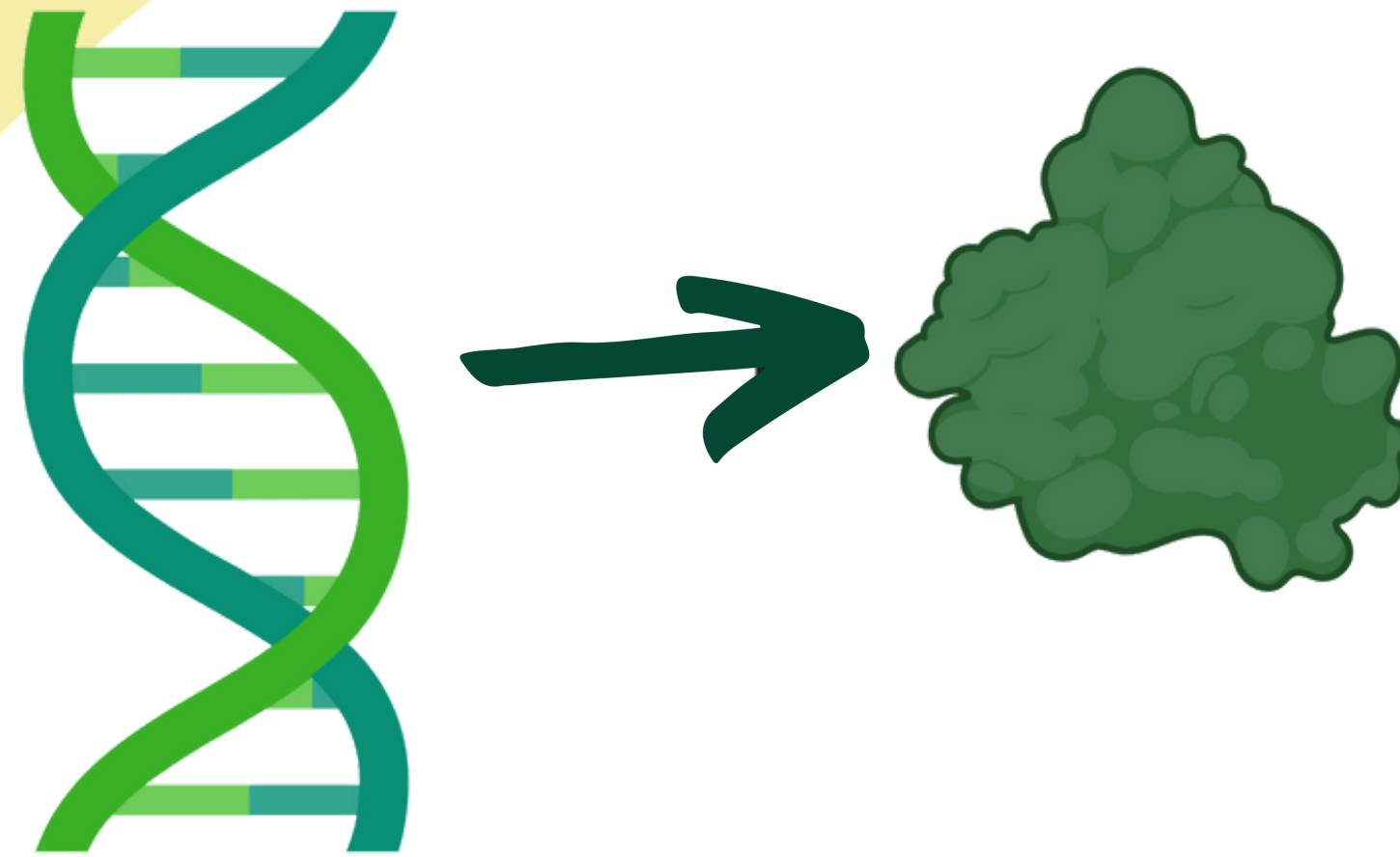
ATG CTA ATC TAT TTA



Gen

Letters → Words → Sentences

Bases → Codons → Genes



# What are proteins?

**Each gene tells the cell to build a special type of molecule called a protein. Proteins are responsible for controlling various processes in living things.**



# Hemoglobin

**In our body there is a gene that gives rise to a protein called hemoglobin, this protein is responsible for carrying oxygen to each of the cells of our body.**



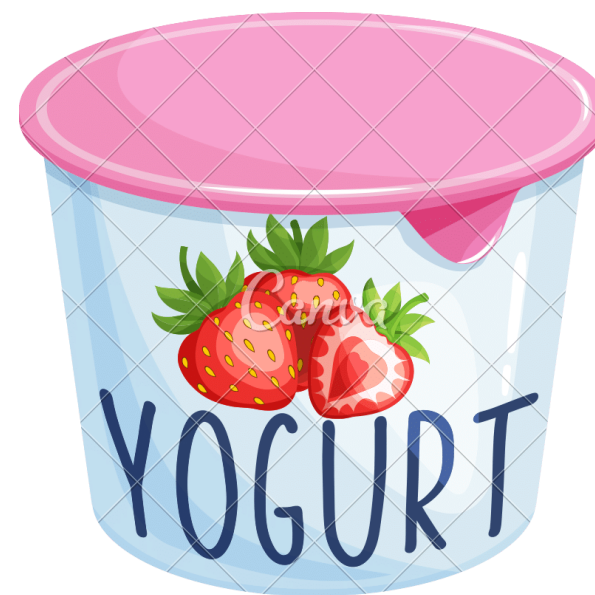


# Biotechnology

The application of living organisms to create products or processes.



**Crop rotation**



**Yogurt production**



**Bread production**



# Synthetic biology

**Synthetic biology is a science that seeks to combine engineering with biology by using microorganisms and giving them certain abilities as superpowers to create products that help us improve the quality of life.**

**Using microorganisms and giving them certain abilities as superpowers to create products that help us improve the quality of life.**

# Applications = super powers

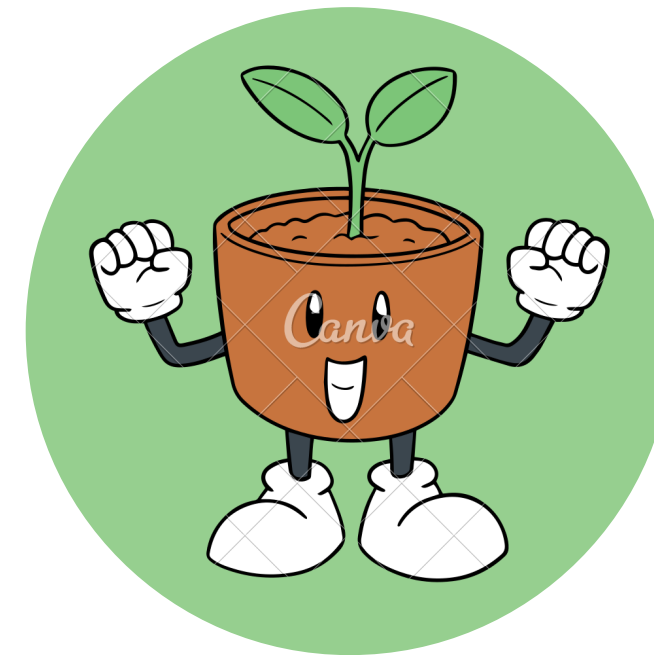
Helping to eliminate  
pollutants from rivers



Plants can fight pests  
and become stronger.



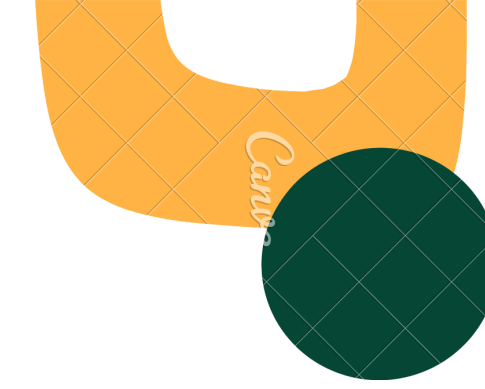
Making food more  
nutritious  
food



Making vaccines, so  
that people do not get  
sick







# Thank you

