

Port 1 LET'S EXPLAIN THE DIFFERENCE IN THE



Pasta is a food made from a kneaded mixture of flour, durum wheat semolina, buckwheat, rice, corn or other types of grain, water and sometimes egg and salt. With 28 kg per year and per person, Italy is by far the biggest consumer, followed by Venezuela and Tunisia. Pasta can be found on all continents, in all countries, and in various forms.

It's your turn!

To answer according to your age, use the difficulty levels.



Draw all the pasta shapes that you know



List the names of the different pasta that you know







As you have just understood, pasta has common characteristics, tastes and textures that are more or less similar. But, they can differ in terms of appearance and, depending on the person who cooks them, can even become a unique dish. It's basically the same thing with works of art...you notice at first glance that it's a painting or a sculpture, but each of them is different and will carry its own message, its own voice. Is it different for mankind?

It's your turn!

To answer according to your age, use the difficulty levels.



Draw a human being who is very different from you and circle or colour in red everything you have in common with them.



Human beings are unique but also similar.

To understand this, fill in the table

What you have in common with all humans	What you think is different
Ex: - two arms	Ex: -size



Being unique, different and similar at the same time....But why?

No matter which activity you have just completed, it is clear that all human beings are different, unique. Beyond our physical appearance or eye colour, we also do not have the same personality, character, abilities or health. So, knowing that everyone is somehow different, it doesn't make much sense to exclude another human for their physical appearance, beliefs or abilities. That person is, after all, as unique as the other 8 billion people living on Earth.

The treasure of humanity



To understand what makes us so different as well as similar, we need to take a journey into the incredible human body. Our body is a giant jigsaw puzzle made up of about 30,000 billion tiny pieces, called cells. By associating with each other, they form organs, bones, heart, blood, skin, brain, etc. The same is true for all living things on Earth, such as cats, fish or plants.

At the heart of each cell is our DNA (drawn on the left), which contains all the information that allows us to grow, live, think, run, be unique and look like all human beings. All human beings have unique DNA, but it is 99.9% similar.

It's your turn!

DNA is made up of two filaments that wrap around each other. They are intended to be read by our cells to produce all the constituents they need. DNA is very long, but also very simple. Only 4 different components!





On both strands of DNA, the G, A, T, C components face each other. Moreover, the "A" will always be associated with a "T", and the "G" with a "C" (and vice versa). Reconstruct this double strand of DNA using pens or colored pencils!





Could you decipher the genetic code?



Now that you have reconstructed your DNA...you might think that an almost endless succession of A, G, T and C doesn't mean much...but it does!

Indeed, this succession constitutes information (genetic) which is decoded by our cells. This information corresponds to all the instructions for making our proteins. By reading them correctly, the cell will be able to assemble in the right order all the components of our proteins, which are called amino acids. And proteins are very important! They are, for example, antibodies to defend us against bacteria or viruses; hormones like insulin; or they are essential to the functioning of our brain or our muscles... Proteins are essential to life, and there are more than 20,000 different ones.



Ingredients of the recipe :

What can we do with these ingredients?

Hint: pasta of course!

We found a second recipe



What is the difference with the first recipe?

How good do you think it will be?





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On this drawing, there are 1000 dots. These 1000 dots represent you and your DNA. Together you will define how you run, how you write, your height, weight, eyes, temperament, aptitute, heartbeat, bone size, foot shape, etc. Each blue dot represents everything you have in common with other humans, and each red dot represents your differences. Your difference is really a small thing and that's what makes you unique. After all, that's what it says on the two DNAs you decoded, meat or mushroom ravioli; it's different, but it's still pasta and we're enjoying both! Don't miss the next activity where we will continue to play with DNA and we will explore rare diseases!





This activity has been proposed by the Fondation Ipsen, in collaboration with Child & Youth Care Zimbabwe and Eurordis, as part of the International Rare Disease Day.





LET'S EXPLAIN R RE DISEASES



We have all been sick at one time or another. Cold, flu, Covid-19, migraine, stomach ache, etc. For the doctor, the list is long. In fact, there are thousands of diseases that can affect us. It is not easy for doctors to find the right diagnosis and to give you the right medication. Fortunately, the most frequent illnesses are generally not the most serious.

It's your turn!

The difficulty levels let you know if you will need help or not.







List the names of the different diseases you have had.







The diseases you just listed are generally common. Also, you have probably heard of other diseases, a little less common than the common cold or gastroenteritis, and unfortunately more serious like heart disease, cancer, vascular disease, etc. But have you ever heard of rare diseases?

A rare disease is defined in the European Union (EU) as a disease affecting less than 5 in 10,000 people in the general population, which is, indeed, very rare.

It's your turn!

These 100 squares represent the extent of diseases in the world population. For each disease group, colour the number of squares corresponding to the percentage of people living with that disease.

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5 out of 100 people live with cancer



cardiovascular disease



13 out of 100 people live with a respiratory disease

5 out of 100 people live with diabetes

5 out of 100 people live with a rare disease

So, are rare diseases... so rare?





A rare disease affects less than 1 in 2000 people, yet rare diseases affect as many people as diabetes or cancer. You must be thinking that this is not possible!

But it is! That's because there are many rare diseases: 6000! In fact, 300 million people live with a rare disease in the world!

What is a rare genetic disease?





In 80% of cases, rare diseases have a genetic origin, meaning that an error has crept into the DNA which does not allow the correct manufacture of a protein.

We can therefore say that almost all genetic diseases are rare diseases, but not all rare diseases are genetic. There are very rare infectious diseases, for example, as well as rare autoimmune diseases and cancers. For many rare diseases, the causes are unfortunately not known.

It's your turn!

As we saw in the previous activity, DNA, and the genetic information it contains, is essential for our bodies and cells to function properly. Here are 3 DNA sequences that are almost identical. Circle the differences you see in sequences 2 and 3 from the first.

At first glance, you might think that these differences don't seem to be important. They can be!

What is a rare genetic disease?



It's your turn!

Now that you have identified the mutations on the three DNA fragments, and as in Activity 1, you can decipher them using the genetic code below, and determine the three proteins that can be made. Before doing so, you must know that:

- The components of DNA are read 3 by 3
- The reading of the DNA always starts with ATG and ends with AGG, a stop signal, which does not correspond to any amino acid, and which indicates that the reading of the DNA is finished.









It's your turn!

Now let's see what impact these changes in DNA can have on the human body. The three proteins you have just decoded must bind to another protein, the red protein. This linkage is done thanks to the first three amino acids. For this example, this association of proteins is essential to the strength of the bones. First, draw the three proteins you have decoded and then try to see if they are able to bind to the red protein.





Conclusion

What protein(s) or DNA keeps bones strong?

Which protein(s) or DNA is/are the cause of a rare disease? What will be the consequence?







Thanks to this activity, you now know that:

- Rare diseases exist and that they affect less than one person in 2000;
- There are more than 6000 different diseases that can affect the heart, brain, lungs, muscles, etc.
- There are more than 300 million people in the world living with a rare disease;
- An error in the DNA is at the origin of 80% of rare diseases; and
- This error can affect the functioning of a protein which will trigger the disease.

But above all, don't forget that a person living with a rare disease or a disability is 99.9% like you. Nothing prevents you from being friends and having lots of fun together!

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