The magical spring number π

A small dramatic text with a dash of mathematics

Ana (student of the 4th grade of Elementary School "Jovan Dučić", a wise girl, a big fan of apple pie and painting): What is that title? Numbers are numbers, there is nothing magical about them. Actually, they are a bit boring... And what about spring? They bother us with numbers also in autumn and winter. Maybe a little less in the summer, we are saved by the summer holiday. 😊

Ivana (professor, for some unknown reason a big fan of mathematics): This number is different. It is very stubborn, and persistent and is recorded in a very strange way. Let's use a fancy Greek letter (raise your hands all gyros fans!) to spell it out

π

We read that letter as pi.

Ana: I'm not convinced. And why do we write it with a Greek letter? Although, it's truly nice, we could paint it nicely, with nice brushstrokes.

Ivana: Of course, we can use digits to write it, but that number is so persistent that it won't stop. It is one of those numbers that is written with a dot.

For example, when you read a recipe for an apple pie, and it says 1.5 kg of apples. That's one whole kilogram and another half kilogram. That dot is placed after that whole kilogram and tells us that we need more than a kilogram of apples, but still less than two kilograms.

If we want to write π down, we need 3, then a dot after the three, and a lot more digits.

Someone from Switzerland took 108 days last year and found more than 62 billion (who knows how many zeros there are, raise your hand 😊) digits after the comma. And there is no regularity, no repetition, the digits appear as they please. Without a lot of math, we can’t know which one is next.

Here's how it looks, but let's not overdo it with the numbers after the comma, we have enough for e.g., 50 pieces

3.14159265358979323846264338327950288419716939937510

Ana: Well, it is really persistent! Who will remember that?

Ivana: Yes, it really exaggerates. That's why most people memorize only the first two digits after the dot 3.14 The rest is in books and on the Internet, so if you need it...

Ana: I understand now! That's why we're talking about this number today! It is 3 14, that's March the fourteenth! But why the spring number? Calendar-wise, spring hasn't started yet, we learn when spring starts, you can't confuse us...

Ivana: You are right. But spring is so close, so it didn't make sense to call it a magical winter number...

Ana: And what is it good for? Really, does it do anything, or do mathematicians have nothing better to do but make up numbers?

Ivana (laughing): Yes, they are very bored, so they make up numbers all day long.

Ana: I knew it! Surely that's why we must learn distributive property! I knew it, I knew it, I knew it,... *(Ana runs around the classroom and triumphantly sings "I knew it, I knew it...").*
Ivana: Stop, stop! I'm joking! Of course, it has a purpose. Let me show you. Do you know what a circle is?

Ana (slightly offended): What kind of question is that, of course, I know.

Ivana: I'm sorry, I didn't doubt it. Let's draw some circles.

On the floor of the classroom or in the schoolyard, draw three large circles of different diameters with chalk. Three volunteers carefully measure the lengths of the drawn circle lines in steps, i.e., the circumferences of the circles, for all drawn circles. Let's explain the concept of the circumference of a circle. Let's notice the radius and connect the radius with the number of steps. Compare the results and discuss. Drawing circles on paper and a blackboard is also possible, and with the help of a string that we place on the drawn circles, we explain the concept of circumference and compare the results.

Ana: But that's not fair, they all have different shoe numbers! Of course, the number of steps varies even for the same circle!

Ivana: Exactly. The number of steps will depend on the length of our feet. But, to avoid confusion, the exact circumference can be told to us by the number π. If you multiply the diameter of the circle by π, you get the circumference of the circle. Actually because of the circumference of the circle (and the surface, but that's another story) mathematicians began to calculate and discover the number π. As you can see

the number π is hidden from us in the circles!

Ana (laughing): It hid really well.

Ivana: Look at it like this, it is also hidden in the apple pie, the circular one, of course. On one hand, a pie is circular in shape, so it has a circumference that we calculate using π, on another pie is pronounced the same as the letter π.

Ana: I'm hungry now. Good thing lunchtime is near. I hope it's pie on the menu today. 😊

But, why magical? Yes, a pie has a bit of magic, but not enough.

Ivana: If you try hard and look closely at the digits of the number π, you can certainly find the date of your birthday.

Ivana: Sometimes it's immediately noticeable (for example, in the case of my uncle, it's March 14th), and sometimes you need to look at a lot of numbers, but it's definitely there. And you can make it magical too. You said yourself that you could draw him with fine brushstrokes, so let's draw.

Maestro, some light spring music please, so let's make it our π magic with tempera.

Ivana: Yes Sofia *(Anna's best friend, a bit of a computer freak, knows which graphics card is the best and why you should use a mechanical keyboard, and is also a big fan of apple pies)*, you can use modern methods. Turn on that computer, you will be in charge of the graphic design. Gather your team. And when you're all done with the drawings, we can move on to the brain teasers.