



Written by Pavel Gabzdyl
Illustrations by Inna Chernyak

EVERYTHING YOU'VE EVER WANTED TO KNOW ABOUT THE MOON

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INTERESTING
FACTS ABOUT
THE MOON
IN A PLAYFUL
FORM

B4U PUBLISHING



1. WHAT IS THE MOON?



An **astronomical object** which orbits a planet or minor planet is known as a moon, and sometimes as a natural satellite. Our planet Earth has one, rather large natural satellite called **the Moon**. The great International Space Station and weather satellites orbit our planet too, but they are not natural satellites; they were made by humans. Although our Moon orbits Earth at a speed of 3,600 kilometres per hour, it takes it about 27 days to complete one round.

Don't worry, the Moon can't fall on us. Although Earth's gravity acts upon the Moon, the Moon counters it with centrifugal force as it moves around Earth. If it were to fall on Earth, the Moon would somehow have to slow in its orbital speed around Earth, and that isn't going to happen. The orbital velocity of artificial satellites and orbital stations that circle Earth is reduced by the **frictional drag** from Earth's atmosphere. The Moon, however, is far enough away from Earth to be out of range of the braking effects of Earth's atmosphere.

3. WHY DOESN'T THE MOON FALL TO EARTH?



5. HOW OLD IS THE MOON?



Our Moon is extremely old. It is older than all Earth's mountains and oceans – in fact, it's older than anything on our planet. From studying moon rock, scientists have discovered that our nearest neighbour in space was born over **4,470,000,000** years ago. If you could put 1000 candles on a birthday cake, for the Moon's birthday you would need four and a half million cakes!

2. HOW MANY MOONS ARE THERE IN THE SOLAR SYSTEM?



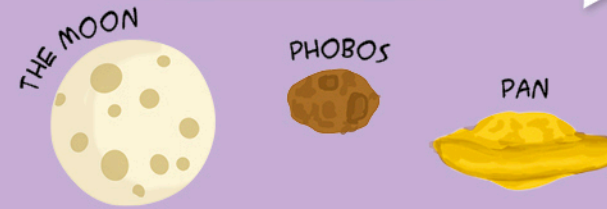
Let's count them. Earth has one moon, Mars two, Jupiter 67, Saturn 62, Uranus 27 and Neptune 14. Altogether, that makes **173** known satellites of planets. But planets aren't the only bodies in the Solar System with their own moons – smaller ones like dwarf planets and various types of asteroids have moons too. The dwarf planet **Pluto**, for instance, has five satellites!

4. HOW FAR AWAY FROM US IS OUR MOON?

The Moon is approximately 380,000 kilometres away from us. This means that you could fit about thirty planet Earths between it and us. It would take you about eleven years to cover such a distance on foot. An ordinary airliner would manage it in about 18 days and a spaceship in three. But the distance from the Moon to Earth isn't always the same. This is because the Moon revolves around Earth in a slightly elliptical orbit, not an absolutely circular one. As a result, sometimes it is closer to us (known as **perigee**), sometimes it is further away (known as **apogee**).



6. WHY IS THE MOON ROUND?



Stars, planets and many moons are round because of gravity. Each particle of matter attracts another: when there are many such particles together, a centrally symmetric object, notably a sphere, is formed. There are many moons in our Solar System that are not round, however. Mars's moon **Phobos** looks like a potato, while Saturn's satellite **Pan** reminds us of a flying saucer. It has been shown that a body must be at least 1000 kilometres in diameter to take on a spherical shape. With its diameter of 3476 kilometres, our round Moon meets this requirement easily.

8. COULD WE LOOSE OUR MOON?



We could lose our Moon, in one of several ways. It could be destroyed by a **collision** with another body. Such an intruder in our neighbourhood would in itself cause great changes in Earth's environment. The devastation would be completed by debris from the collision, which would soon crash into us. Earth might also lose its Moon as a result of the long-term gravitational influence of other planets.

9. WHICH MOON IS THE LARGEST?

The largest satellite in our Solar System is without doubt Jupiter's **Ganymede**. It was first seen on 13 January 1610, through the small telescope of Italian astronomer **Galileo Galilei**. Ganymede is 5,268 kilometres in diameter, making it one and a half times larger than our moon. It was first studied close up in 1973, by the US space probe Pioneer 10, when scientists established that it is covered with a thick layer of ice.



7. SHOULD THE MOON GO ON A DIET?



The Moon weighs 73,476,730,000,000,000,000 tons, so it's certainly no tot. But it makes very little impression on the universe's scales. It weighs about one hundredth as much as Earth. As a result, the Moon's gravity is about one sixth of Earth's. The Moon piled on all its matter when it came into being, as did Earth and the other planets of the Solar System. So the Moon could never slim down, as there are very few ways it could lose any of this matter. Anyway, the Moon doesn't need to lose weight: the matter it is made up of is much lighter than Earth's. We'd say that its weight is just as it should be.

THE MOON, OUR NEAREST NEIGHBOUR IN THE COSMOS



10. HOW DO THE MOON COME IN BEING?



Our planet Earth and its Moon make an exceptional couple, and their courtship must have been exceptional too.

21. WHAT ARE THE PHASES OF THE MOON?



No doubt you've heard of the phases of the Moon. How did they come into being? Well, as the Moon revolves around Earth, it shows us the part of its near-side hemisphere that happens to be lit by the Sun. In this way, the Moon takes on different appearances – from the **new moon** (when it can't be seen because it shows us its unlit side), through the **waxing crescent**, followed by the **first quarter** (when we see half the lit side and half the unlit), to the **full moon** (when Earth is between the Sun and the Moon and we see the whole of the lit side).

WHY DOES THE MOON CHANGE?

24. WHAT IS A SUPER FULL MOON?

It is a full moon bigger than the average. How does this happen? The Moon's course around Earth describes a slightly eccentric ellipse, not a perfect circle. This means that it is sometimes closer to Earth (**perigee**) and sometimes further away from it (**apogee**). When the moment of perigee occurs at the time of a full moon, the result is a super full moon. Some super full moons are more 'super' than others – it depends on how much the moment of perigee coincides with the period of the full moon and how far the Moon is from Earth at the time.



22. WHY DO WE SOMETIMES NOT SEE THE MOON?

If we don't see the Moon for a few days, this is no cause for panic; it's not as if someone has stolen it! It is hidden behind dense clouds or is wandering the heavens after midnight, when most of us would rather sleep sweetly than watch the sky. Besides, we lose sight of the Moon for a few days every month, around the time of the **new moon**, when our nearest neighbour keeps close to the Sun and turns its dark, unlit hemisphere towards Earth.



23. HOW LONG DOES THE FULL MOON LAST?



The full moon phase is when Earth is located directly between the Sun and the Moon. This means that in Earth's sky our nearest neighbour stands opposite our daystar. We can determine the length of this moment precisely if we are able to count it. If we know that the full moon occurs at 10:05, for instance, then at 10:04

it will wax for a minute and at 10:06 it will wane for a minute. So, if you're intending to make your cup of magical moon tea at the exact time of the full moon, you'd better get a move on!

25. WHEN DOES THE MOON WAX AND WHEN DOES IT WANE?

If the Moon in the sky is in the shape of the letter 'D', then in daytime we see an ever-bigger part of its lit hemisphere. That's why we say that the Moon is **waxing** (growing). Once the Moon reaches the full moon phase, its lit part begins to **wane** (decrease in size) from the right, towards forming the letter 'C'.

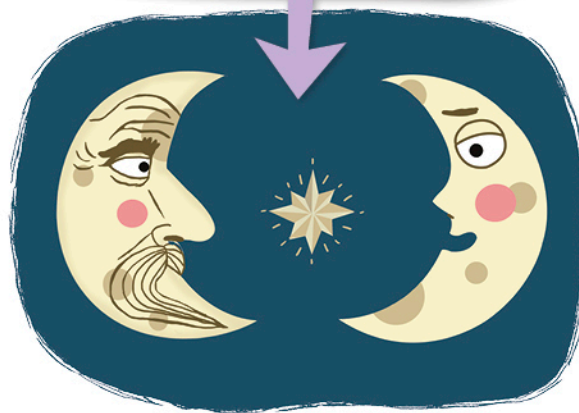


26. IS THE MOON TRANSLUCENT?

A translucent Moon!? Really? But we shouldn't be surprised – not so long ago, people had no idea how the Moon really looked like. When our ancestors saw a crescent moon filled with a strange, steel-grey light, they believed it to be translucent. It wasn't until the early 16th century that the amazing **Leonardo da Vinci**, painter of the Mona Lisa and a man of great and wide learning, got to the bottom of the matter and discovered a phenomenon known as **earthshine**. He realized that what we see is sunlight reflected from Earth to the dark side of the Moon.



28. HOW CAN WE TELL THE AGE OF A MOON?



We refer to the period within which the Moon goes through all its phases as the lunar cycle. Our ancestors believed that at the end of a lunar cycle lasting 29.5 days, the Moon died, followed by the birth of a new one that would live through the next cycle. Therefore, we call the first phase the new moon. The age of a moon is the number of days that have passed since its 'birth', i.e. from the new moon. At the beginning of the cycle, when our nearest neighbour looks like a slim crescent, we refer to it as 'young'. At the end of the cycle, when the Moon is visible before sunrise, we call it 'old'.

29. CAN WE SEE THE MOON IN DAYTIME, TOO?



We can indeed, as you've probably noticed. If you haven't, take a good look at the sky. Although the stars are invisible in the daytime sky, our nearest neighbour is so bright and striking that **daylight** doesn't make it disappear. Some people even favour a Moon in a blue sky over one in a night sky. For us to see it in daytime, though, the Moon must be in the right phase. Around the first quarter, it is visible in the afternoon; around the third quarter, we see it in the morning. When conditions are good, the planet Venus, too, is visible, although it may take you a while to find it.

27. WHEN IS EARTHSHINE AT ITS BRIGHTEST?

Earthshine is the name we give to the dim illumination by sunlight from Earth of the unlit side of the Moon. The brightness of this earthshine is determined first and foremost by the phases of the Moon. The thinner the Moon, the more noticeable the earthshine, as the brighter the shine from Earth. Seen from the Moon, the phase of Earth is the exact opposite of the phase of the Moon.



30. ARE THE PHASES OF THE MOON THE SAME EVERYWHERE?



Imagine that you have a friend on the other side of the world. Does he see the Moon in the same phases as you do? Believe it or not, he does. The Moon is too far away and the diameter of Earth too small for the size of the illuminated part to be influenced by the place on our planet you see it from.

EVERYTHING YOU'VE EVER WANTED TO KNOW ABOUT THE MOON

Written by Pavel Gabzdyl
Illustrations by Inna Chernyak

This book is dedicated to all little adventurers who are fond of the space, and especially the Moon. Would you like to know how old the Moon is? Why is it round? How many people have walked over it? If it can affect the weather? Or what connection it has to the famous Titanic? Don't wait any longer, just open the book and let's read! You will not only learn many new and interesting facts, but you'll also have loads of fun with interactive and playful mechanisms. Put on your spacesuits and start exploring! Why? Why not!

80
QUESTIONS
AND ANSWERS
ABOUT THE
MOON



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Author: Pavel Gabzdyl
Illustrator: Inna Chernyak
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WARNING: CHOKING HAZARD - Small parts.
Not suitable for children under 36 months.

ISBN + EAN

