

EVERYDAY STEM

constellations

oxygen

Learn physics and chemistry with us!

centre of mass

Science is so fun!

gravity

speed of light
300,000 km/s

OUR Amazing HOLIDAY

atoms and molecules



chemical reaction

water cycle



01 METEOROLOGY – 4

WHAT'S THE WEATHER GOING TO BE LIKE?

02 SIMPLE MACHINES – 6

WHY CAN'T WE GO UP STRAIGHT?

03 SPATIAL GEOMETRY – 8

HOW DO WE PUT UP THE TENT?

04 GRAVITY – 10

WHY DOES THE BALL ALWAYS FALL BACK DOWN?



05 ATOMS AND MOLECULES – 12

WHAT ARE THE SMALLEST PIECES WE CAN CHOP WOOD INTO?

06 CHEMICAL REACTIONS – 14

WHY DOES THE FIRE BURN?

07 READING A MAP – 16

HOW DO WE READ A MAP?

08 NAVIGATING IN THE TERRAIN – 18

HOW DO WE FIND OUR WAY WITHOUT A MAP?

09 MIXTURES AND SOLUTIONS – 20

HOW DO WE CLEAN THE WATER?

10 SPEED OF SOUND AND LIGHT – 22

WHAT HAPPENS DURING A STORM?

11 WATER CYCLE – 24

WHERE DOES RAIN COME FROM?

12 ROTATION OF THE HEART – 26

WHERE DOES THE SUN GO AT NIGHT?

13 ASTRONOMY – 28

HOW FAR AWAY ARE THE STARS?



ON HOLIDAY WITH THE BRIGHT FAMILY

It was the beginning of summer and that meant only one thing for the Bright family: a holiday adventure!



I'm coming with the torches!

I can't wait to get going!

I hope we haven't forgotten anything ...

Hurry up, Teresa!

Once the Brights were sitting in the car, which was jam-packed with all their things, Mum said "Let's hope it's a wonderful holiday," smiling at Dad. And as the landscape opened up before them, full of forests, hills, mountains and lakes, all kinds of questions ran through the children's minds. Even then, they knew that they would learn many new things during their holiday in the countryside ...

WHY CAN'T WE GO UP STRAIGHT?

The Brights were driving up a steep hill along a winding road and Teresa was wondering why the road couldn't be straight. "We'd get to the top faster, at least!" she said in annoyance. "We'd be more likely to wreck the engine," laughed Dad.



Pulley

That's all well and good, but what if we wanted to lift something heavy to a higher place, for example, into a treehouse? Would we have to build a gigantic inclined plane? No, what we would need is a pulley. A pulley is a wheel that rotates around its axis. It has a groove around its circumference which holds in place a rope or a chain. All you have to do is pull the rope downwards, which is much easier than lifting the load upwards!

Just one more pull, and our bags will be here!



Lever

Isn't it great that we have simple machines that make our work easier? And let's not forget the lever. An ordinary seesaw is an example of a lever. A lever has two arms supported by a fixed point, such as the pivot point of a seesaw. The longer one arm is, the less force we need to lift the weight that is placed on the opposite arm.

The Brights used a lever on their journey, when they came across a large boulder blocking the road. It would've been a back-breaking task to pick it up and carry it to the side of the road, even for Dad, but thanks to the long arm of the board, shifting the rock was a piece of cake.



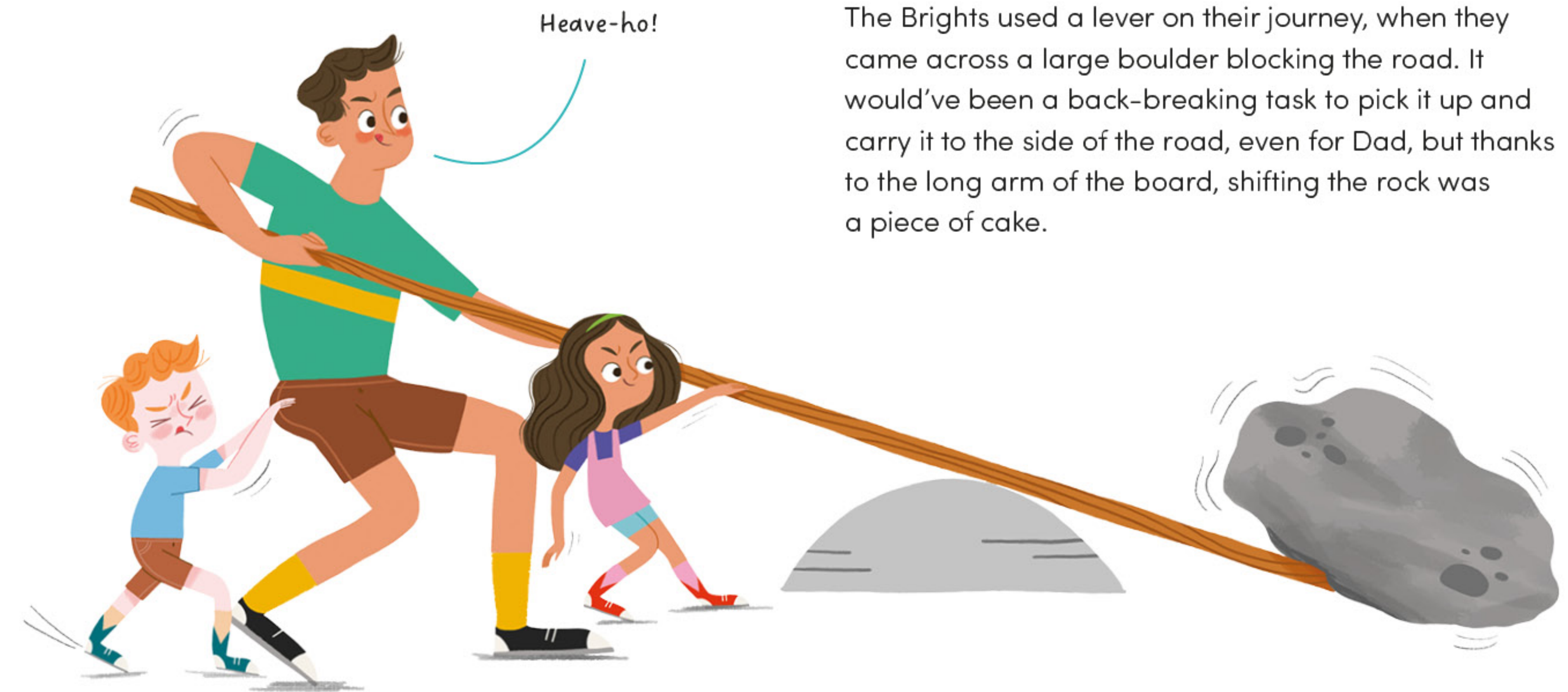
EXPLANATION

Inclined plane

A road that climbs a hill slowly and is longer than the direct route to the top is an example of an inclined plane. An inclined plane is a sloped surface that allows us to carry heavy loads to higher places, because although the distance is longer, we don't need as much effort. If a road went straight up a steep hill, no car would ever get up it.



Teresa doesn't have to carry her stroller up the stairs.



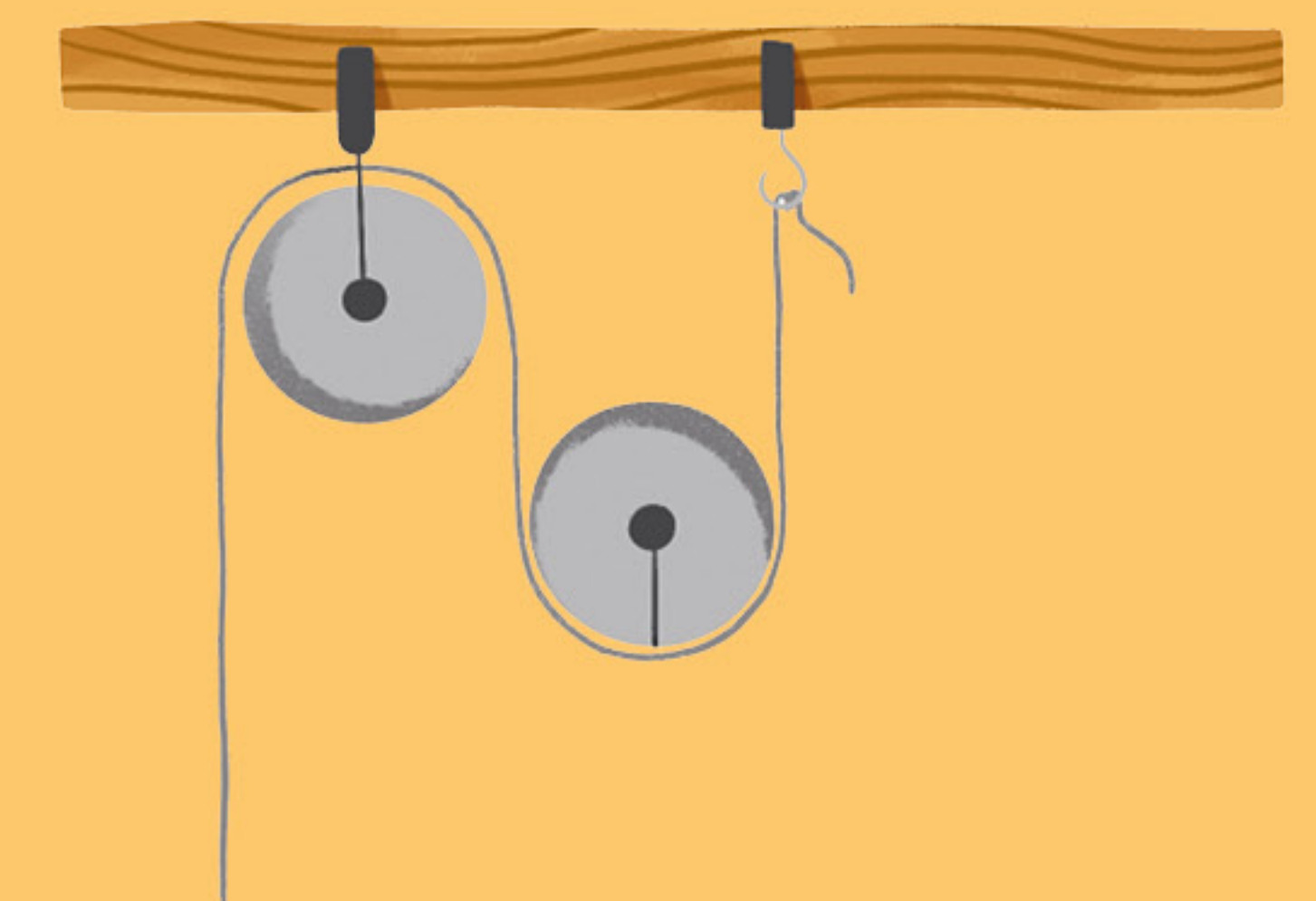
COMPARE

You can discover for yourself the advantage of an inclined plane with a baby's pram. First, try to lift it from the ground up to the top step. Then try pushing it up the sloped ramp that leads to the building's entrance. Which do you think would be easier? Bricklayers often use an inclined plane for transporting heavy loads in wheelbarrows. Just imagine how hard it would be to lift such a load straight up!



ONE MORE THING

The more pulleys we connect together, the more weight we are able to lift. Each pulley takes a certain amount of the weight of the load. If you were to pull on a rope attached to six pulleys, for example, you could easily lift an elephant ...



WHERE DOES THE SUN GO AT NIGHT?

Well, that day was full of adventure! The children decided to peel potatoes for dinner, and in the pleasant light of the setting sun, it didn't feel like a chore. "Does the Sun really go to sleep when it falls below the horizon?" asked Teresa suddenly. "Of course it doesn't! It's something completely different." Victor laughed.



Just imagine when you go to sleep at night that someone just like you is waking up on the other side of the world!



As you see the Sun setting in the west, your friend is seeing the same Sun rising in the east.

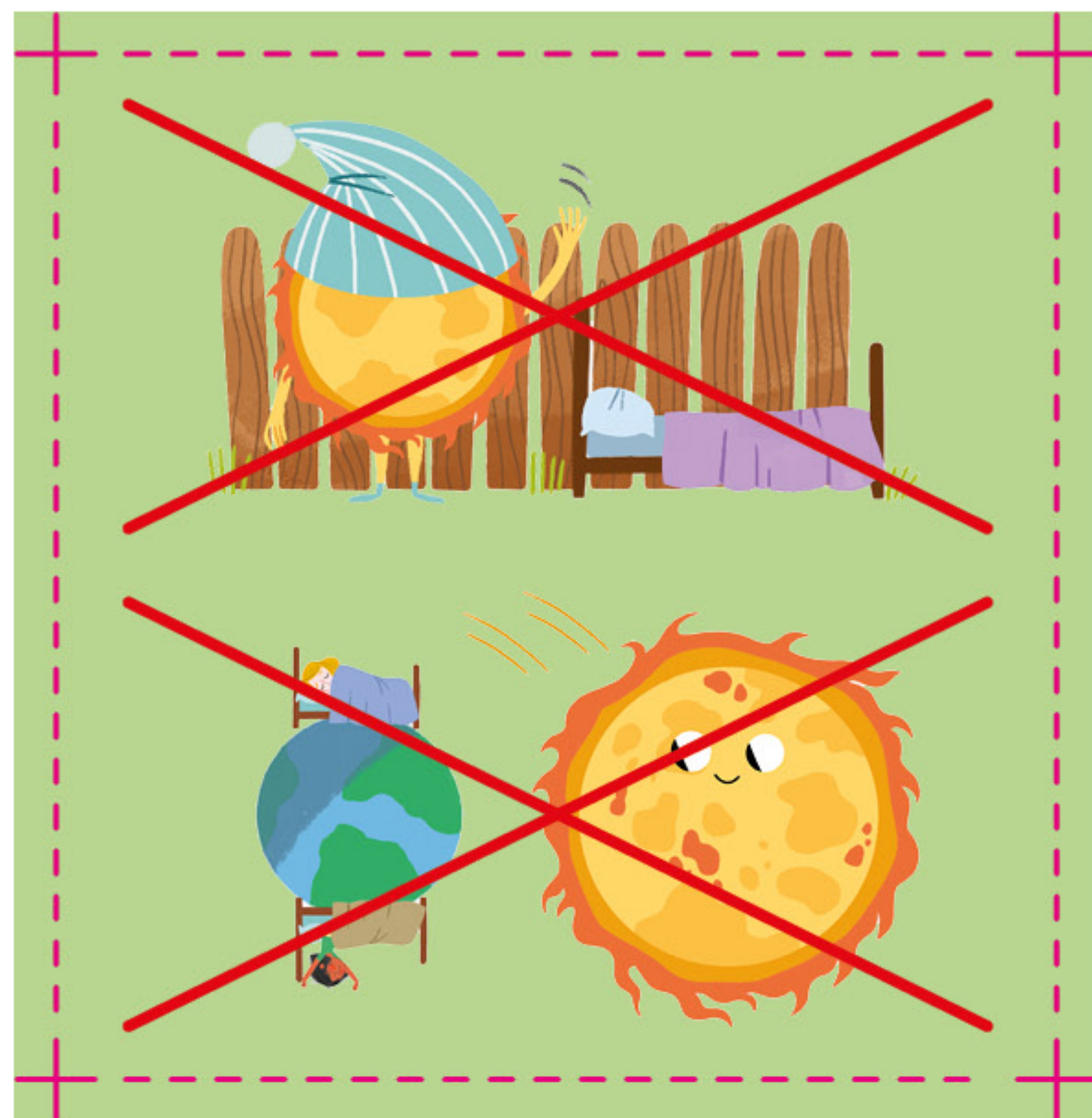
EXPLANATION

Which is the one that rotates and orbits?

When you were little, did you also think that the Sun puts on his nightcap, snuggles under a duvet and falls asleep behind a hill every evening?

Or did you imagine that the Sun revolves around the Earth and decides where it is day and where it is night, depending on the side it is passing?

Both are simple ideas, but the reality is a little more complicated. The Sun does not actually move – it is our planet that orbits the Sun. And not only that, **the Earth also rotates around its axis**, which means it spins, and also at a slight angle.



OBSERVING

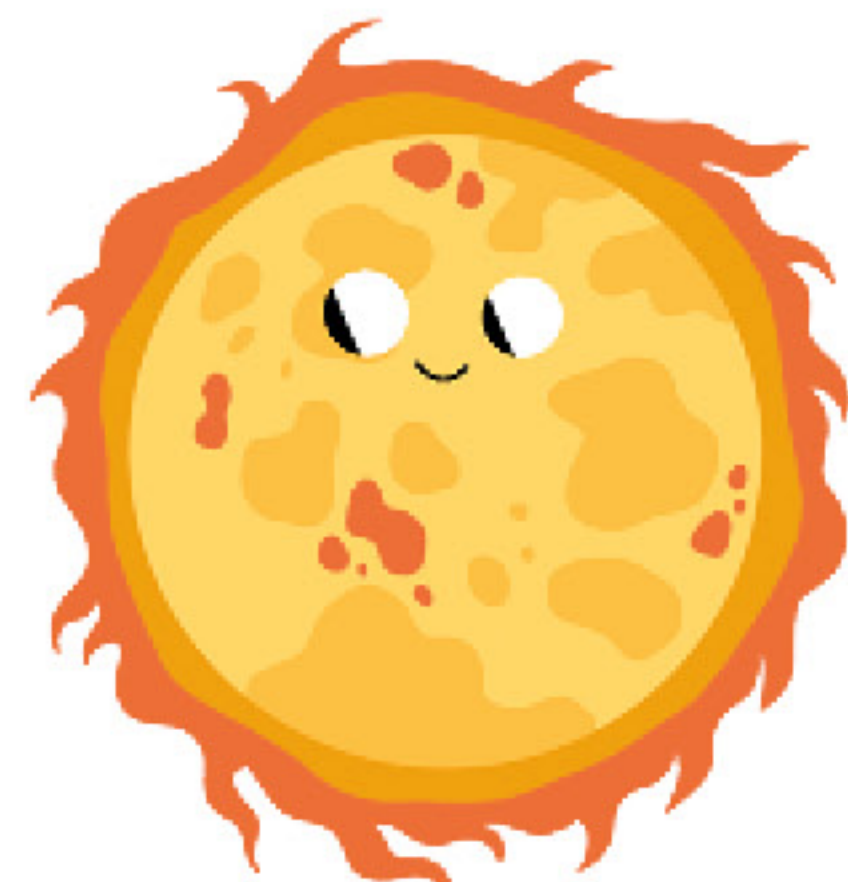
Day and night

You can see how day and night take shifts if you use a turned-on lamp and a tennis ball. Hold the ball in your hand and slowly rotate it around its axis near the lamp – can you see how the shadows are moving?

This side is turned away from the Sun, that's why there is darkness here – night.



This side is facing the Sun, that's why there is light here – day.



TRY IT YOURSELF

The Sun does not move in the sky, but because our planet rotates with us, we move in relation to the Sun. You can see this nicely with your shadow.



Morning: The Sun shines from one side and your shadow is quite long, longer than you.

Noon: The Sun is high above your head, so your shadow is short.

Afternoon: The Sun shines from the other side and your shadow is long again, it is just on the opposite side to where it was in the morning.

THE HOLIDAY IS STILL ON!

Pass, Teresa!

The dinner is ready!

I've found a great spot for our tomorrow's trip!

Teresa and Victor are going to have plenty more holiday adventures, from which they'll learn many things. Go through again what you've already learned from their holiday ...

EVERYDAY STEM

OUR AMAZING HOLIDAY

Written by Helena Haraštová & Lenka Chytilová
Illustrated by Xiana Teimoy



EXPLANATION

Chemistry, physics ... They say they're boring and complicated sciences. Nothing for kids, longing for fun and adventure! But what if it's just the opposite? What if chemistry and physics CREATE the wonderful, fascinating world we love to play in and explore so enthusiastically? What if these sciences are the CAUSE of all the breathtaking wonders around? Seriously, that's how it is. Why don't I ever fly into space while

jumping on a trampoline? How do I move a giant boulder? Why does dough rise in the oven? And where does the salt go when I mix it in water?

Let's discover the laws of science and engineering in the most natural way – by encountering them every day. Together with Teresa, Victor and the whole Bright family, you will go on a holiday and see that science is all around us. It's life itself. Let's learn to understand it!



ISBN + EAN

 **b4u publishing**
www.albatrosmedia.eu
Author: Helena Haraštová & Lenka Chytilová
Illustrations © Xiana Teimoy
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**FOR BRIGHT MINDS
FROM 6 YEARS OLD**