

Markus Riese is the head of a company that makes bicycles.



Markus Riese, *Engineer*



What would have happened if Markus Riese had not got cold ears while riding his bicycle?

Markus Riese is an engineer who designs bicycles. He was born in Darmstadt in 1968. Even when he was a little boy, he was interested in everything that ran on wheels. In the mornings he went to school. His favourite subjects were science, maths, arts and crafts and sports. In the afternoons he tinkered in his father's workshop. Most of all, he enjoyed working on bicycles. When Markus Riese rode his bike through his home town, he enjoyed being outdoors in the fresh air, free as the breeze.

After finishing his A-levels, Markus Riese studied mechanical engineering. One day it was bitterly cold – minus 15° Celsius, according to the thermometer. Markus Riese and his friend Heiko Müller were riding their bikes to the university. Both of them were wearing helmets so that they would be protected in case of a fall, but their ears were cold. With every kilometre he travelled, the pain got worse. Markus Riese became really cross. Bike riding was no fun anymore. But what should he do? Leave his helmet at home and wear a woollen cap instead?

That would have been far too risky, because after all the helmet was supposed to protect his head. But then he had an idea. When he got home, he took an old pair of jogging pants, used a pair of scissors to cut small pieces of cloth out of them and attached them to the bike helmet to serve as ear warmers. They worked so well that he could barely focus on his studies the next day. He kept thinking about how he could make his ear warmers even better. Maybe he could use fleece or Velcro fastenings, or even sell his ear warmers? This is how “Hot Ears” were invented.

Two friends start a company

Markus Riese told all this to his friend Heiko, who was enthusiastic about the idea. Heiko wanted straight away to start a company to make Hot Ears, and in 1993 the two friends did just that. The banks didn't want to lend them any money for material and tools, so friends and relatives lent them the money. The two young men worked hard and were full of energy. Markus Riese went on tinkering with new ideas for bicycles.



He thought it would be a great idea if you could fold up your bicycle very small, put it in a bag and take it with you on a train, for example, then unfold it again when you arrive at your destination and ride it out of the station. Folding bicycles already existed, but they were not really good enough for sporty bikers like Markus Riese at that time. So he thought it over, tried some things out, and finally welded together pieces from two old bicycles to create the world's first full-suspension folding bicycle. It looked a bit odd, but it worked perfectly. The two friends then worked day and night to create a presentable model made of aluminium.

The jury of a competition liked this bicycle so much that it gave Markus Riese and Heiko Müller the first prize. But it still took some time before the folding bicycle could be sold in bike shops all over Germany. That's because people who want to produce lots of bicycles need a factory. At a bicycle fair, Markus Riese and Heiko Müller met George Lin, the director of a bicycle factory in Taiwan. He offered to work together with them, and the folding bicycle became a runaway success.

Riese the engineer has his best ideas at night

Markus Riese, who by now had his engineering diploma, wasn't finished experimenting. He invented new kinds of bicycles, and won more prizes. His company in Darmstadt got bigger and bigger, and today it has several employees who organize the production and sale of the bicycles. Markus Riese enjoys doing this work. But sometimes he doesn't have enough time to spend on his hobbies, such as going in for outdoor sports and making music.

He says that he gets his best ideas for new kinds of bicycles at night when he can't sleep. That's when he has the peace and quiet he needs to think through his designs, invent new things or improve old designs. For example, he has invented a kind of



Markus Riese builds one of his first self-designed bicycles.

bicycle on runners that you can use to ride down a snow-covered mountain.

His most recent big invention is an especially sporty electric bicycle. It has a small electric motor and battery. When the rider's own muscle power is not enough, he can switch on the motor. The next mountain will then seem a lot flatter!





Now it's your turn!



1 Discussion

Normal bicycles use the energy produced by our muscles. Battery-supported bicycles, which are called hybrid bicycles, have a motor and battery. You can ride them either with or without the motor. The motor needs electricity, which can come from many different sources – for example, nuclear or coal-fired power plants or from wind farms or solar cells. Discuss this question: Are hybrid bicycles environmentally friendly?

2 Calculation

Many people are in a hurry in the morning. If you have a fast hybrid bicycle in the city, you can usually get to your workplace at least as fast as you could in a car. A fast hybrid bicycle that carries one person 1,000 kilometres uses up the same amount of energy that is produced by one litre of petrol. A small car that carries one person 1,000 kilometres uses up the same amount of energy that is produced by 60 litres of petrol. How many hybrid bicycles will it take to use up the same amount of energy as a small car?

3 Discussion

Collect arguments for and against the use of battery-supported hybrid bicycles. Form two groups (pro and contra) and have a discussion.

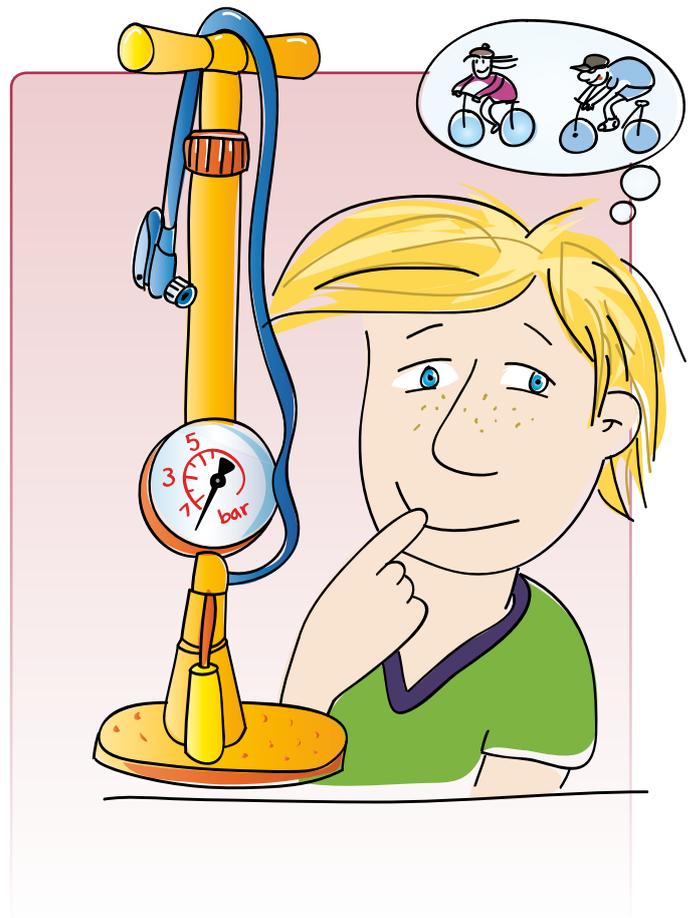
4 Bicycle design

What features should your bicycle of the future have? Do you want it to have special accessories? First, think individually about your dream bicycle, then tell each other what it would look like. You can also draw your dream bicycle and then present it to the whole class.

5 Experiment: Rolling resistance

For this you need a bicycle pump that also shows the air pressure. For the first bicycle the air pressure in the tires should be about 1 bar, and for the second bicycle it should be about 5 bar. In other words, the first bicycle should have almost flat tires and the second one should have fully pumped-up tires. Next, look for a cycle path that first goes slightly downhill and then is straight and level. Start your rolling resistance experiment at the top of the slope. The two riders should let themselves roll down the road without pedalling.

- ▶ Before you begin, guess which bicycle will roll further.
- ▶ Give reasons for your choice.
- ▶ Afterwards, discuss the results of the experiment.





Text in simple language

Markus Riese – Engineer

- 1 Markus Riese was born in 1968.
He is an engineer who designs bicycles.
After school, he went to his father's workshop and tinkered with all kinds of things that have wheels.
- 5 He studied mechanical engineering.



- One day it was very cold: minus 15° Celsius.
He was riding his bicycle.
He was wearing a helmet.
His ears got very cold and he got very cross.
- 10 Should he ride without a helmet – wearing just a cap?
He thought that was too risky.
So he cut pieces of cloth out of an old pair of jogging pants.
He fastened them to the helmet.
That made it warm.
- 15 He had invented “Hot Ears”.
He told a friend about it.

- The friend was enthusiastic.
The two of them wanted to start a company for selling Hot Ears.
But the banks didn't give them any money for it.
- 20 They had to borrow money from friends and relatives.
Markus Riese went on tinkering with new ideas for bicycles.
He made a bicycle that you can fold up very small and put in your bag.
He received a prize for this bicycle.
Many people wanted to buy it.
- 25 Markus Riese is still inventing things – for example, a sporty electric bicycle with a small motor.

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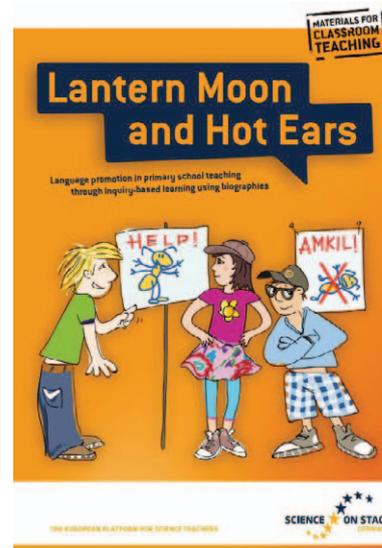
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