

- PROFESSOR EINSTEIN:** Ms. Schlau? Ms. Schlauuu? Where are you? The lecture is about to start. What's wrong? Are you sick?
- MS. SCHLAU:** No. Or yes. I... umm... this morning I heard a famous song on the radio and now I can't get it out of my head.
- PROFESSOR EINSTEIN:** Aha! You must have an Oricula Vermis.
- MS. SCHLAU:** A what?
- PROFESSOR EINSTEIN:** An earworm! Ha! How amusing. You have an earworm, on today of all days, when we are learning about glow worms. Fireflies, Ms. Schlau.
- MS. SCHLAU:** Go ahead and make fun of me. But this song - it torments me. Simply awful.
- PROFESSOR EINSTEIN:** No worries, Ms. Schlau. A genius like myself always knows how to help. Chewing gum, for example, is a well-known antidote for the common earworm.
- MS. SCHLAU:** I hate chewing gum.
- PROFESSOR EINSTEIN:** Oh, I see. Well, to fight earworms, single-arm pushups, raw garlic, or a little shock of cold can also help. Hmm, we do have ice cubes. Wait here.
- MS. SCHLAU:** Don't you dare! Let's just start with the lecture.
- PROFESSOR EINSTEIN:** As you wish. JOWO, is field researcher Christoph's film ready? Well, dear students, I hope this film inspires you. Let's go! For Christoph, there is nothing nicer than sitting in the garden and reading in the summertime. What are you reading, Christoph? A poem? Can we see?
- “Little stars glimmer about me:
fireflies play the universe at the
forest's edge”.
- By Josef Guggenmoos. Nice.
- MS. SCHLAU:** It's mid-June. That's the time when the **fireflies (GLÜHWÜRMCHEN)** fly. It would be nice if one could film that, Christoph thinks. In the evening, he took his camera and went into the woods. He discovered some here at this spot just last year. It's still just a little bit too light. He has to wait for the darkness.
- PROFESSOR EINSTEIN:** There, Christoph discovers little, glowing spots. But through the camera he can't see anything. Strange.

He could see them without the camera. What to do?
Let's ask an expert. How much light does a firefly actually produce?
The answer: A candle is 1,000 times brighter than a firefly.

MS. SCHLAU: So you have to use **filters (FILTER)** like these to make the candle 1,000 times darker. They function like sunglasses. Christoph calculated an entire stack of them. Yes, that's definitely darker. So this is how bright a firefly would be. And this camera works particularly well to film in the dark.

PROFESSOR EINSTEIN: Close up: No problem. But if you move further away, the light becomes dimmer and dimmer. Now it's completely vanished. But here comes the trick – the light amplifier. First level – somewhat brighter. Second level – now you can really see better in the dark, but the image is pretty fuzzy. Still, this could work.

MS. SCHLAU: And Christoph got another tip from his expert. On the Elbe River in Saxony there's a region with thousands of fireflies. And this is where he met his expert, Matthias.

PROFESSOR EINSTEIN: This is exactly the right spot for fireflies, Matthias told him. A moist, natural meadow at the edge of the forest. There's a lot of **snails (SCHNECKEN)** here. The fireflies feed on the snails when they're larvae they don't even hesitate to eat slugs.

MS. SCHLAU: This evening is still a little cool, Matthias thinks. Let's see if Christoph can film anything. But first, it has to get dark. In mid-June, you have to wait a long time, because it's not until 10 pm that it gets dark enough for the fireflies.

PROFESSOR EINSTEIN: Christoph just saw one. There! And... Gone. It's not easy. Here comes the next one. There! Hmm. They're really fast. Christoph isn't quick enough with his camera.

MS. SCHLAU: Hmm, it won't work out tonight. They don't fly more than an hour each evening. But Matthias had another idea. You can attract fireflies, he revealed, with a firefly trap. First, cut open a **plastic bottle (PLASTIKFLASCHE)**. You will need two bottoms.

PROFESSOR EINSTEIN: He makes a hole in one of them. For this, he uses a soldering iron. This is a **light diode (LEUCHTDIODE)** with a short leg and a long leg. He puts the legs in the hole. Now they have to be soldered onto a battery. The red wire goes on the long leg – and the black wire on the short one. Blow a little to cool it, and it's all set.

- MS. SCHLAU:** Now we just need to connect the battery. The right way, of course. And then the diode lights up green. It's like a little firefly. And this should attract the fireflies. In the evening. And over the course of the day, Christoph built three more traps. After all, four are better than one.
- PROFESSOR EINSTEIN:** Christoph is really excited. And he got some additional help. Nils for the camera. He's also very excited. Now we wait. There's one already. Nils actually managed to capture it. With the camera, of course.
- MS. SCHLAU:** In the middle over the trap there's a dot and it's **flying (FLIEGEN)** to the left. And now - now it disappeared. Perhaps it's in the trap? Let's see. Flashlight... Nothing after all? There! A little **bug (KÄFER)**. You can see him crawling around. Could it be a firefly?
- PROFESSOR EINSTEIN:** It has two white stripes on its lower abdomen. That's unusual for a bug. Nothing surprising on his back. Let's turn him over again on a leaf. There - the two stripes can indeed light up. Amazing! And it goes out again. Apparently the bug can turn his light on and off. Without a flashlight you can see it even better.
- MS. SCHLAU:** But how does the bug do that? Where does the glow come from? It's just like this glow stick. When you bend one of those, two liquids come together and then it lights up. The firefly also combines two liquids to light up. It does this because it's looking for a **female (WEIBCHEN)**. The female waits on the ground because it can't fly.
- PROFESSOR EINSTEIN:** This is how it looks to the **male (MÄNNCHEN)** from above: Several points of light. But it's different from the male firefly in other ways as well. Actually, the female really looks a bit like a **worm (WURM)**.
- MS. SCHLAU:** It moves like one too. Although it's actually a bug. With their glowing points, the females on the ground give signals to attract the males. On, off. On, off. On, off. Radio signals in the meadow. And that's why the male strayed into the trap earlier. Well then. Time to get back on your feet.
- PROFESSOR EINSTEIN:** Ah. The two found each other. Let's turn our flashlights off. And let the two of them turn off their lights as well. We'll leave them alone and watch the wonderful firefly spectacle. Indeed: A universe at the edge of the forest. Just like in Christoph's poem. Beautiful, simply beautiful.

- MS. SCHLAU** Oh! How lovely...
- PROFESSOR EINSTEIN:** Thousands of dancing fireflies in the night are almost as beautiful as a Nobel Prize awards ceremony. Oh...and how is your earworm doing?
- MS. SCHLAU:** Huh! It's gone. Professor, the earworm is gone. Most likely because the nice film distracted me. Hooray! I'm free.
- PROFESSOR EINSTEIN:** Ha. Brilliant! But just out of curiosity: The melody that you couldn't forget - which one was it?
- MS. SCHLAU:** Um, the theme song from some film, I think. It's goes like this...
Alright, got to go. Bye.
- PROFESSOR EINSTEIN:** Oh...yes...I know this melody. Wait. Help! Now I have an earworm.
Help me! Oh, dear. JOWO, please get chewing gum, ice cubes and garlic. Oooh.