

- PROFESSOR EINSTEIN:** Hello...oh hello...Ms. Schlau. Have a look at what I brought today.
- MS. SCHLAU:** Oh, how nice. Colorful balloons.
- PROFESSOR EINSTEIN:** Yes. Haha! Lovely, aren't they? What...what was that? Lightning!? Yes, it's a thunderstorm. A thunderstorm? Oh, for heaven's sake. That's terrible. Help! We have to get to safety. Quickly!
- MS. SCHLAU:** But Professor Einstein, we're safe in here.
- PROFESSOR EINSTEIN:** I was once hit by lightning years ago.
- MS. SCHLAU:** By what?
- PROFESSOR EINSTEIN:** By lightning. I mean, I'm struck by brilliant ideas all the time, but lightning - it hurts! And my hair was charred.
- MS. SCHLAU:** You don't say. But why don't you just count the seconds between lightning and thunder? Then you can measure if the storm is coming closer or not.
- PROFESSOR EINSTEIN:** Brilliant idea. Hold on. Aha! One... two... three... four... five, six. Aha, six seconds. Which means...
- MS. SCHLAU:** Divided by three...
- PROFESSOR EINSTEIN:** Exactly, the storm is two kilometers away. Not an immediate danger.
- MS. SCHLAU:** Well, then we can start the lecture and show the students how these balloons right here are made. JOWO, start the film! Christoph landed in the deepest of **jungles (DSCHUNGEL)**. It's not so easy for him to fight through the undergrowth.
- PROFESSOR EINSTEIN:** Ah, Christoph found something. A leaf. A very special leaf. It belongs to a tree that Christoph wants to show us. There it is. Christoph found it. It's a large tree. And at the top there are a lot of these leaves.
- MS. SCHLAU:** Christoph takes the knife and cuts a notch in the tree. Strange. But don't worry, it doesn't harm the tree. This happens to be a very special tree. It can be milked. Something white immediately wells up out of the bark, a liquid that looks like **milk (MILCH)**.
- PROFESSOR EINSTEIN:** Christoph quickly holds a glass underneath and the milk trickles down into it. After about an hour, the glass is full.
- MS. SCHLAU:** Let's take a look. The milk smells **funny (KOMISCH)**. You definitely shouldn't drink it. But when Christoph rubs the milk between his fingers, it suddenly firms up, can be rubbed, and feels like an eraser. This is rubber milk. And the tree is called a rubber tree.

- PROFESSOR EINSTEIN:** Rubber milk can be used to make many wonderful things. In order to turn the milk into **rubber (GUMMI)** some chemicals need to be added. A stabilizer, for example. This ensures that the rubber doesn't age and fall apart too quickly.
- MS. SCHLAU:** And a so-called vulcanizing agent. This makes rubber elastic and flexible. And a deep blue color ensures that this milk will be light blue after it's stirred. This is now called a raw rubber compound.
- PROFESSOR EINSTEIN:** Factories need huge quantities of this raw rubber compound. These vats contain the compound in a variety of colors. Here is the light blue compound. It looks like it needs a little more color. This is poured into a hose.
- MS. SCHLAU:** Next, we move on to a huge **machine (MASCHINE)**. Many molds hang on top of the machine. They look like strange **bowling pins (KEGEL)**. The molds have a journey ahead of them. First, they are dipped in saltwater.
- PROFESSOR EINSTEIN:** The molds emerge again and are evenly moistened by the saltwater. Now they proceed on to the blue raw rubber compound. Here too the molds dip slowly and uniformly into the compound and are pulled through the tank. The saltwater ensures that the raw rubber compound clings well but doesn't stick. Brilliant!
- MS. SCHLAU:** At the other end of the tank, the molds emerge again, now coated with the light blue raw rubber compound. Right beside them are molds that have been dipped in a red mixture. What will they become?
- PROFESSOR EINSTEIN:** The journey continues. At the next station, a brush scrubs around the tops of the molds. It rolls down the upper edge a bit. Now a little closer and slower. Almost an inch is rolled. This is called ring-rolling. According to the **factory (FABRIK)** workers this is a very important step.
- MS. SCHLAU:** The ring-rolling takes place with many brushes and many molds. And now we begin to recognize what it's supposed to become. **Balloons (LUFTBALLON)** with a nice rolled edge. But the balloons aren't finished yet, because the raw rubber compound is not yet rubber, and can easily be pulled off the mold. To turn the raw rubber into rubber, the journey continues. Into the oven.
- PROFESSOR EINSTEIN:** It's far too hot to look inside. So we created a model. The air in the oven is very hot and it's blown across the balloons. This process is called vulcanization. Here raw rubber, which can be torn, is turned into finished rubber, which is **elastic (ELASTISCH)**. This time, the balloon can no longer be torn off of the mold. The rubber stretches and springs back.

- MS. SCHLAU:** Now the balloons just need to be removed off of the molds. The factory workers thought up something clever. First, each balloon is inflated. Compressed air comes from above. It inflates the balloons and then blows it off.
- PROFESSOR EINSTEIN:** Two turning rollers then pull the balloons from the mold. Balloon by balloon, they land one level down in a basket. The balloons are finished.
- MS. SCHLAU:** It's easily **inflated (AUFBLASEN)**. And let's not forget the rolled edge. Why is it so important? Christoph takes a new balloon. He cuts the rolled edge off. There. Let's see what happens.
- PROFESSOR EINSTEIN:** Christoph can blow as much as he likes - but he won't get any air into the balloon. It all blows past on the sides. That is why the rolled edge is so important. Christoph has another trick. With a needle. Now - watch closely. He sticks the needle in the top of the balloon without it bursting.
- MS. SCHLAU:** This trick only works at this specific spot, though. Why? When the molds come out of the raw rubber bath, they slowly drip off. You can see that better here. So at the bottom, the rubber will later be particularly thick, and that is why the balloon won't burst as easily. You can tell because the color around the hole is much darker. But Christoph, once again, can't resist.
- PROFESSOR EINSTEIN:** Buy yourself a colorful balloon, hold it firmly in your hand.
- MS. SCHLAU:** You're very happy, Professor Einstein.
- PROFESSOR EINSTEIN:** Haha! Yes! Partly because the storm is moving on. Now there are 12 seconds between flash and thunder.
- MS. SCHLAU:** I'm happy to hear that.
- PROFESSOR EINSTEIN:** Aha. Let's see. One... Aaaaah! Lightning! Ah, I've been struck. I've been struck! Oh, ow.
- MS. SCHLAU:** That wasn't lightning. It was a bang, the bursting of a harmless balloon, Professor Einstein.
- PROFESSOR EINSTEIN:** Uh? Oh!