

## Content

- Use of laser technology in cars for navigating
- Laser scanners and laser beams

## Target group

- Children ages 8 to 12
- Level: A1+ / A2

## Language goals

The children will be able to

- Understand a short (technical) film
- Find precise information in a text
- Expand their passive and active vocabulary
- Understand technical terminology in context
- Understand and answer simple thematic questions
- Formulate their ideas/opinions using simple verbal tools
- Use and develop learning strategies (use images to enhance understanding, make notes, make conjectures, reconstruct processes, and correctly spell words)
- Prepare and give a short presentation to the group
- Translate what was seen into acted-out scenarios
- Understand and follow instructions

## Word bank

*Daten in den Computer eingeben* (enter information in the computer), *Daten speichern* (save information), *Navigationssystem/Navi* (system), *das Auto fährt von alleine* (the car drives on its own), *einen Versuch machen* (do an experiment), *den Knopf drücken* (push the button), *Gas geben* (accelerate), *bremsen* (to brake), *halten* (to stop), *Laserscanner* (laser scanner), *Laserstrahl* (laser beam), *unsichtbar* (invisible)

## Materials

- Laptop and projector
- Audio speakers
- Blackboard and chalk/whiteboard and markers
- Pen
- Red chalk/red pen
- Magnets/Blu-tack
- Sheets of standard letter paper
- Colored pencils
- Students' portfolios

## Materials for printing and/or copying

- *Laser scanner* (Laserscanner) *photo*
- *Autopilot* (Autopilot) word bank
- My word bank sheet *Autopilot* (Autopilot)
- *Brushing your teeth in the car?* (Zähne putzen im Auto?) worksheet
- *Brushing your teeth in the car?* (Zähne putzen im Auto?) answer key (for instructor)
- Title of the exhibit *Our cars of the future* (Unsere Zukunftautos)
- *Now I know* (Ich kann schon) questionnaire

## Duration

3x45 minutes

Before the lecture/film		
Step	Content	Materials
1	Instructor welcomes the children and writes the word "autopilot" (Autopilot) on the board. The children think about what the word might mean, whether it has to do with cars (like the prefix "auto") and drivers or with airplanes and <i>pilots</i> .	Blackboard and chalk/whiteboard and markers;
2	After a round of guessing, the instructor writes "automat + pilot" under the word on the board and explains: <i>An autopilot is a computer that automatically steers vehicles without the driver having to do anything.</i> Instructor asks if the children recognize this from any other context, for example flying, computer games, or driving cars.	Blackboard and chalk/whiteboard and markers;
3	Instructor says: <i>Now we are all cars: I am a Volkswagen. What are you?</i> The children choose their favorite car maker and say: <i>I am a Mercedes/a Volvo/a Porsche etc.</i> Instructor says: <i>And now we are going to start driving.</i> Instructor gives instructions and acts them out. The children repeat the instructions and play along: <i>We start the car and begin driving. First gear. We give more gas. Second gear. We give more gas. Third gear. And more. Fourth gear. Fifth gear. Sixth gear. Now we're going very fast. We brake, we signal and turn right. We continue straight. Careful! A traffic light. It is red! Brake quickly and come to a stop. The light turns green, we move forward. First gear. Second gear. Third, fourth, fifth and then sixth gear. Stop! A crosswalk! Pedestrians!</i> etc. as long as the children are having fun with the game.	
During the lecture/film		
Step	Content	Materials
4		Laptop and projector; Audio speakers
5	Instructor asks: <i>What did you think of that?</i> The children collect adjectives: <i>interesting, strange, funny, new, modern, fantastic, exciting, etc.</i> Instructor writes the words on the board.	Blackboard and chalk/whiteboard and markers;
6	Instructor asks: <i>Did you understand how this modern/exciting/fantastic etc. navigation system works?</i> The children guess and come to the conclusion, if necessary with the instructor's help: <i>with a laser.</i> Instructor says: <i>That's correct. So all you need is a car, a computer and a laser scanner on the roof of the car.</i>	
7	<i>Let's see if that's true.</i> Instructor shows the next part of the film (Minute 2:55-3:56) and the children test out their conclusion.	Laptop and projector; Audio speakers

8	<p>Instructor says: <i>We just saw two experiments. Can we recreate the first experiment?</i>          One child pretends to be a pedestrian on the street and another pretends to be the car, imitating a laser scanner on their head with their hands. Instructor uses movement and pantomime to give instructions on how the car should drive and how the pedestrian should act.  <i>Car: starts moving, faster, even faster, driving very fast and stops, comes to a halt.</i>  <i>Pedestrian: stand calmly, show fear (as the car gets closer and closer), wipe sweat from the forehead (when the car stops)</i></p>	
9	<p>Now the instructor divides the group in two parts. One half plays the car with the laser scanner on their head, the other half plays the pedestrian like in the game in step 8.</p>	
10	<p>Instructor attaches a photo of the "revolving thing" on the board and writes laser scanner (Laserscanner) underneath. Instructor draws red laser beams coming from the laser scanner (Laserscanner) and writes laser beams (Laserstrahlen) underneath, then invites the children to watch the third part of the film (Minute 3:56-6:30) and to learn how laser beams work.</p>	<p><i>Laser scanner (Laserscanner) photo;</i>  <i>Magnets/Blu-Tack;</i>  <i>Blackboard/whiteboard;</i>  <i>Red chalk/red pen</i></p>
11	<p>After watching the next part of the film, the instructor and the children discuss the answer. In order to better understand how laser beams work, they create a game. The children gather in a corner of the room. They are now laser beams. Instructor types the destination in an imaginary computer, presses a button, and the children, one after the other, run in different directions on the instructor's command. They run until they reach, for example, the door, the window, the wall or an object in the room. They stay there and say with the help of the instructor: <i>Stop, a door! Stop, a window! Stop, a table! etc.</i> They stay where they are, touching the door, the window, the wall or the object until everyone has had a turn and then all bounce back at the same time, i.e., they run back to where they started. This can be repeated as long as the students are having fun with it.</p>	
12	<p>The word bank is hung up in 3-4 places throughout the classroom. The children each receive a word bank sheet with 12 cards on it, which remains at their place. They run to the word bank on the wall, memorize a word or a phrase, run back to their places and enter the word/phrase into their word bank sheet.</p>	<p><i>Autopilot (Autopilot) word bank;</i>  <i>Blu-Tack;</i>  <i>My word bank sheet Autopilot (Autopilot)</i></p>
13	<p>Instructor asks the children to close their eyes for a moment and imagine the following: <i>You're sitting in your car. Of course it has a laser scanner so you don't need to steer. What do you do in the meantime?</i> The children collect ideas: <i>I sleep, I study, I eat, etc.</i> Instructor hands out the worksheet <i>Brushing your teeth in the car? (Zähne putzen im Auto?)</i> and asks the children to mark down what the driver is doing while the car is driving on its own while they watch the last film sequence (Minute 6:30-7:03). The children write the solution on the dotted line: PUMP GAS -- the only thing that a driver will still need to do in the future. The group discusses the result.</p>	<p><i>Brushing your teeth in the car? (Zähne putzen im Auto?) worksheet;</i>  <i>Brushing your teeth in the car? (Zähne putzen im Auto?) answer key (for instructor);</i>  <i>Laptop and projector</i>  <i>Audio speakers</i></p>

After the lecture/film		
Step	Content	Materials
14	Instructor divides the children into groups and gives each group a sheet of standard letter paper. The children draw their car of the future from 2050 in the middle of the sheet, and around the picture they write what the car can do.	Sheets of standard letter paper Colored pencils
15	The images are hung on the wall. Instructor hangs the title of the exhibit, "Our Future Cars" (Unsere Zukunftautos) along with it.	Title of the exhibit, <i>Our Future Cars</i> (Unsere Zukunftautos) Blue-tack
16	Instructor and children end the unit with a reflection round, in which they discuss what they have learned. Each child then fills out the <i>Now I know</i> (Ich kann schon) questionnaire to find out whether they have achieved the learning objectives. Instructor also gives feedback on student performance.	<i>Now I know</i> (Ich kann schon) questionnaire
17	The children hold onto the following in their portfolios: - Worksheet <i>Brushing your teeth in the car?</i> (Zähne putzen im Auto?) - My word bank sheet <i>Autopilot</i> (Autopilot) - <i>Now I know</i> (Ich kann schon) questionnaire	Portfolios

### Further ideas for subject matter or CLIL teaching (Physics, Computer engineering, Technology):

- Research into the use of laser technology in the immediate vicinity of the students
- Class visits by experts who work with laser technology (engineers, doctors, policemen or -women, etc.)
- Organization of a workshop of the future at school: students design different means of transport and organize an exhibit on the topic
- Research into and presentation on "Google driverless cars," i.e., "Self-driving cars"

### Suggestion for the children at the end of the learning scenario

At the very end, the children gather around a computer or the instructor projects a computer desktop onto a screen. They look at the home page of the German Digital Kinderuniversity together. The instructor explains to the children that they now have completed the *Autopilot* (Autopilot) lecture in the *Technology* faculty together and draws their attention to the fact that there are many more interesting lectures in this faculty and in the *Humankind* and *Nature* faculties.

The instructor and the children click together on the At Home link and discover how the website works. As an example, the instructor logs in and goes to the lecture that they just worked through.

The instructor shows the children that the lecture begins with an introduction by Professor Einstein and Ms. Schlau and that their work is supported by Jowo and Christoph, the field researcher. Professor Einstein and Ms. Schlau also wrap up all the lectures and thereby frame the work on each theme.

The instructor explains to the children that they can re-watch the film at home and can even set the subtitles to German or English. That way, they can “catch” key words while watching and use these to collect points and solve three exercises and a bonus exercise on the film. The children can also get help from their parents or grandparents, from registering to solving the exercises. The whole family can have fun learning and everyone gradually becomes a professor at the Kinderuni.