Objective

- The children know how a 3D printer works.

German language goals

- The children know adjectives to describe objects (*schnell, langsam, groß, neu, schön, alt, neu, rot, grün, …).*
- The children can describe objects (*Der/Die/Das … ist …).*
- The children can expand their active and passive German vocabulary (*das Auto* …).

*** Although the language of instruction is English, the lesson plan sequences highlighted in orange are taught in German.**

Materials

- Toy cars
- White 8.5 x 11 paper
- *Car (Auto)* image card
- Laptop and projector
- Audio speakers
- *At the 3D Printing Workshop (In der 3D-Druckerei)* worksheet and answer key
- Whiteboard markers/chalk
- Magnets
- *Group formation (Gruppenfindung)* image cards
- *Describing objects (Gegenstände beschreiben)* image cards
- "My word bank sheet: *3D Printer (3D Druck)*"
- Portfolios
- Certificates

Time	Social Form	Learning Objective	Content	Materials
5 min	Interactive classroom dialogue	The children can follow and give directions in German.	The instructor welcomes the children, then hands out toy cars and gives the children directions (*Fahr geradeaus/rechts ….*). The children follow the directions. They continue this activity with a partner: One partner gives directions, the other follows the directions. After one minute they switch roles.	Toy cars
8 min	Individual work/ partner work	The children can describe which digital devices they use at home and at school.	The instructor hands out pieces of white 8.5 x 11 paper and explains: *In today's lecture we will continue talking about cars. But before we start with today's lecture, I want you to put your right hand on the paper and draw the outline of your hand.* Once everyone is done, the instructor explains the task: *Think about all the electronic devices you work with in class and all the devices you use at home. What do you use these devices for? And how often do you use them? Write your answers to these questions inside your hand outline and create your digital handprint. You have 3 minutes for this task.* After 3 minutes the instructor asks the children to pair up with another child. The children present their digital handprints. After one minute they choose a new partner and once again present their digital handprints to each other.	White 8.5 x 11 paper

Time	Social Form	Learning Objective	Content	Materials
			The instructor asks the children to return to their seats.	
7 min	Interactive classroom dialogue	The children know what two-dimensional and three-dimensional shapes are.	The instructor shows the children a picture of a car and explains: *I found this picture of my favorite car on the Internet and printed it. Who has a printer at home?* The children raise their hands if they have a printer at home. The instructor asks: *Who knows how to print a picture?* The children explain how to print a picture from the Internet. The instructor adds information, if necessary. The instructor continues: *Imagine I would like to change something on my picture. For example, I might want to give the picture a title. I could do this by hand, but it would look much nicer if I did this with a computer. How would this work?* The children discuss how to solve the problem. The instructor helps and they formulate the answer together: I have to scan the picture, work on it on the computer, and then print it. The instructor now takes out a toy car and asks: *Do you think that if I wanted this car to look a little different, I could do the same thing we just discussed with the picture: I could scan it in, work on it on the computer, and print it?* The children answer the question: *No, that is not possible.* *You're right,* the instructor says*. That is not possible with these devices. Why?* The children formulate their ideas. The instructor summarizes*: It*	*Car (Auto)* image card Small toy car

Time	Social Form	Learning Objective	Content	Materials
			is not possible because the picture is two-dimensional, and the toy car is three-dimensional. What does that mean? The children share their ideas. Two-dimensional means it is flat, it is on a piece of paper; three-dimensional means it has another dimension, you can touch it. With the next question, the instructor transitions to the video: *What do you think? Are there new, more modern devices that we can use to scan in objects?*	

Time	Social Form	Learning Objective	Content	Materials
10 min	Interactive classroom dialogue	The children know how a 3D printer works.	The instructor invites the children to watch the video (minute 1:14-5:52). During the film the students work on the *At the 3D Printing Workshop* worksheet. They match the names of the devices used to recreate a modified version of the model car to their picture. After watching the video, the instructor asks: *How does a 3D printer work? What is the difference between a normal printer and a 3D printer?* With the help of the worksheet, the children first share their ideas with their partner and then discuss in class: In its cartridges, the 3D printer has a special plastic instead of ink. The model car is built layer by layer over the course of 15 hours with the plastic. Note: In order to test this or if the children do not know the answer, the class can watch the appropriate sequence again (starting at minute 3:19).	Laptop and projector Audio speakers *At the 3D Printing Workshop (In der 3D-Druckerei)* worksheet and answer key
5 min	Interactive classroom dialogue	The children know German adjectives (*schnell, langsam, groß, neu, schön, alt, neu, rot, grün* …).	The instructor puts the picture of his/her favorite car on the board and asks the children to describe the car with adjectives. The instructor collects the adjectives on the board and introduces the corresponding German adjectives. The children repeat. Afterwards the instructor describes the car using the structure: *Das Auto ist ...* and writes the structure on the board.	Whiteboard markers/chalk *Car (Auto)* image card

Time	Social Form	Learning Objective	Content	Materials
7 min	Group work	The children can describe objects in German.	To form groups for the next activity, the instructor passes out small picture cards to the children (4 picture cards show the same object). The instructor invites the children to stand up and find the other children with a picture card of the same object. The instructor hands out an 11 x 17 poster with a bigger picture of their object to each group. Then the instructor asks the children to find German adjectives to describe their object and to write them on the poster. The instructor hands out a word list with a collection of German adjectives (and their English translations). The children can either find adjectives from the list or ask the instructor for help. After 4 minutes the instructor asks the children to stop writing and to gather around the board. The children put their posters on the board and each group describes their objects.	Magnets *Group formation (Gruppenfindung)* image cards *Describing objects (Gegenstände beschreiben)* image cards
10 min	Individual work/group work	The children can describe objects in German. They can present their work in German.	The instructor invites the children to think about an object they would like to print in a 3D printer and to draw it on a piece of paper. The instructor helps the children find the German name of their object. Once they finish their drawings, the children find German adjectives that describe their objects. The instructor helps the children find adjectives. To present their results, the children get back into their groups from the previous activity. They describe their drawings to the other group members.	White paper

Time	Social Form	Learning Objective	Content	Materials
5 min	Interactive classroom dialogue	The children reflect on what they learned in today's lesson and repeat the German words they learned today.	The instructor and children end the unit with a reflection round in which they discuss what they learned. The instructor encourages the children to repeat the German words from the lesson. Each child then fills out "My word bank sheet: *3D Printer (3D Druck)*" for this lecture and writes down the German words and chunks they learned in today's lesson.	"My word bank sheet: *3D Printer (3D Druck)*"
3 min	Interactive classroom dialogue	The children know how they can continue working on the topic.	The instructor encourages the children to complete the online tasks for this lecture at home. The instructor previews the topic of the next lesson and ends the lesson. The children file today's materials in their portfolios. At the end of the reflection round, the instructor hands out the Kinderuni certificates to each child and thanks them for participating in the Kinderuni.	Portfolios Worksheets