

<b>Lesson (title):</b> A closed circuit	<b>Subject:</b> Physics <b>Topic:</b> Electricity
Language competence level  A1 <input checked="" type="checkbox"/> A2 <input type="checkbox"/> B1 <input type="checkbox"/> B2 <input type="checkbox"/> C1 <input type="checkbox"/>	Prerequisites / requirements: (e. g.: language or content revision or preparation; use of L1 in specified teaching segments) <b>Revision:</b> Students already know the basic vocabulary to describe an atom such as proton, neutron, and electron. <b>New:</b> Students talk about possible connections to make a circuit. They learn different material which they use to lighten up a light bulb. They also learn to talk about when a light bulb lightens up.
Class/grade: 5 <sup>th</sup> grade  Number of students in class: 11	Age of learners: 11  Duration of lesson(s): 80 minutes
<b>Content of lesson:</b> The structure of the atom. A closed circuit.	
<b>Teaching aims/objectives</b>  Content: Students a. revise what atoms are composed of and to describe the different particles. b. realize that in some metals the electrons are free. c. make a closed circuit and to describe when a light bulb lightens up.  Communication: Students can describe the atom. Students identify metals in which the electrons are free. Students make hypothesis about whether the free electrons of a wire in a light bulb can be moved.  Cognition: Students identify atomic particles in the picture. Students describe a closed circuit and the material used.  Culture/ community/ citizenship: Students talk about how we can save energy at home or in schools: turn off the lights when leaving the classroom, recycle plastic, bottles and paper, reuse paper, plant trees to help shade the home- school	

phase  time	Content	Objective/ Competence („can-do“ statements)	Student activity	Social form/ setting	Material , media, mobile lab	Language: subject specific terminology	Language communication & interaction	Teacher activity	Notes, comments on processes & outcomes = including affective outcomes, (self- evaluation  **
revision 10 min.	revision of prior knowledge about the <u>atom</u>	talk about the structure of the atom and read T/F questions	sts look at the pic. in ex. A on p. 2 and identify the particles of an atom  sts do T/F questions in ex B on p. 2  Feedback is given on SB Notebook	plenary  pairs	SB Notebook & worksheet p.2	positiv/ die Materie / negativ/ neutral / geladen /das Elektron,-en / der Kern,-e / das Neutron, - en/das Teilchen,- das Proton,- en /bestehen	<i>die Elektronen bewegen sich um das Atom Atome bestehen aus....</i>	Lang. T. activates sts' knowledge about the atom through elicitation	sts remembered and were actively involved
introduce new vocab/ scaffolding/ 10-15 min.	comparing different metals and identifying the <u>free atoms</u>	understand that in metals there is a large number of free electrons and identify these	sts answer T's questions and find the differences of the atoms on p. 3. Then they do ex. D on p. 4	plenary	worksheet p.3-4 plastic metal	Plastik/Metall sich frei zwischen den Atomen bewegen dDraht/Kabel	1. Aus Atomen 2. Aus Protonen , Elektronen, Neutronen 3. Im Kern 4. Um den Kern	Lang. T. asks: 1. Woraus bestehen diese Gegenstände? 2. Woraus bestehen die Atome? 3. Wo sind die Protonen und die Neutronen? 4. Wo sind die Elektronen?	sts participated actively activity was completed

<p><b>trigger/ hypothesis</b></p> <p><b>5 -10 min.</b></p>		<p>sts make hypothesis about whether the free electrons of a wire in a light bulb can be moved</p>	<p>s sts formulate their hypothesis orally by answering the questions on p. 5 and complete the words on the picture of the battery and the light bulb with the help of the teacher</p>	<p>plenary</p>	<p>worksheet p. 5</p>	<p>Mit einer Batterie leuchten</p>	<p>wir brauchen ..... Mit einer Batterie ...  die Lampe, leuchtet</p>	<p>Lang. T. asks the questions on p. 5. Stem T. shows a battery and a light bulb and explains the parts. Lang T. helps sts to formulate their hypothesis in German</p>	<p>carried out as planned</p>
<p><b>experimentation, (processes, results) verification of hypothesis</b></p> <p><b>20 min.</b></p>	<p><u>a closed electric circuit</u></p>	<p>to make a circuit and draw the possible connections of the light bulb and the battery</p>	<p>sts carry out the experiment Ex. F on p. 5-6 they also draw their connections and describe these to the whole class</p>	<p>pairs/ groups</p>	<p>worksheet p. 5-6 battery, wire, light bulb</p>	<p>Kabel/Lampe Kreislauf/ge- schlossen / Batterie/ Glühbirne/ offen/leuchtet</p>	<p>Sts work together to make the light bulb lighten: Ich nehme die Batterie/ das Kabel.. Die Lampe leuchtet/ leuchtet nicht/</p>	<p>Lang.teacher asks: Können wir die Lampe mithilfe der Batterie zum Leuchten bringen? STEM T. monitors and helps</p>	<p>sts were very excited , all sts participated and liked the experiment</p>

<p>conclusion 5-10 min.</p>	<p><u>a closed circuit</u></p>	<p>sts write the conclusion: Die Lampe leuchtet, wenn der eine <u>Pol</u> der Batterie mit dem Fußkontakt der Lampe verbunden ist (=ενωμένος) und der zweite <u>Pol</u> der Batterie mit dem Sockelkontakt der Lampe verbunden ist. Man sagt dann: Der Stromkreis (=το ηλεκτρικό κύκλωμα) ist <u>geschlossen</u>.</p>	<p>sts check their connections from the pic on the SB sts write the conclusion on p. 6</p>	<p>plenary</p>	<p>worksheet p. 6</p>	<p>verbunden sein, Stromkreis</p>	<p>Die Lampe leuchtet, wenn..</p>	<p>Stem T. shows SB pic</p>	<p>carried out as planned</p>
---------------------------------	--------------------------------	---	--	----------------	-----------------------	-----------------------------------	-----------------------------------	-----------------------------	-------------------------------

<p>transfer generalization application</p> <p>Community</p> <p>10 min</p>	<p>to be able to talk about electricity and ways to save energy</p>	<p>talk about everyday use of electricity</p>	<p>sts play the game: "The circuit" ex.G</p> <p>sts talk about electrical appliances in their everyday lives, ex. H</p> <p>Students talk about how we can save energy at home or in schools: turn off the lights when leaving the classroom, recycle plastic, bottles and paper, reuse paper, plant trees to help shade the home or the school</p>	<p>group</p> <p>plenary</p>	<p>worksheet p.7</p>		<p>Kühlschrank Computer , Herd Smart board Lampen...</p>	<p>Both Stem T. and lang. T. pretend to be a battery and Lang. T. says *:</p>	<p>sts were very excited during the game</p> <p>sts used the mother tongue, but they came up with ideas.</p>
<p>Homework</p>	<p>electricity</p>	<p>revise</p>	<p>sts do ex. A-B on p. 8</p>	<p>individual</p>	<p>worksheet p. 8</p>	<p>---</p>	<p>-----</p>	<p>----</p>	<p>----</p>

\* T. says: *“Wir können Elektrizität nicht sehen, weil die Elektronen sehr klein sind. Wir spielen das Spiel elektrischer Stromkreis. Kommt alle nach vorne und bildet einen Kreis. Ich bin eine Batterie und ihr seid das Kabel. Diese kleinen Papierbälle sind die Elektronen. Das Kabel ist voll mit Elektronen. Ich bin also die Batterie. Jede Batterie hat einen Plus pol und einen Minus Pol. Ich gebe dir jetzt mein Elektron.”* S. geben ihre Elektronen immer an den S. rechts weiter.

*„Weil Elektronen negativ geladen sind stoßen sie sich ab und bewegen sich immer weiter in die gleiche Richtung. Das ist ein geschlossener Stromkreis.*

*Solange die Elektronen sich bewegen ist er geschlossen. Das haben wir an der Lampe gesehen. Was passiert, wenn er nicht mehr geschlossen ist?“*

### FL/STEM and the domains of the 4Cs

C1	Content / Learning outcomes	“know” (content): “be able to” (content, communication): “be aware” (content, cognition):
----	-----------------------------	---

C2	Communication: Language learning & Interaction	Vocabulary (revisited) Vocabulary (new): subject matter specific (CALP) Vocabulary (new): general (BICS) Structures (focus on grammar) Language functions (information, argumentation, questioning, reasoning)
C3	Cognition / cognitive processing: LOTS & HOTS	Remembering / Identifying Comparing Classifying Predicting Reasoning Synthesizing / creating
C4	Culture / Community	Awareness (of scientific topic as relevant for the culture / community) Involvement (project continuation outside of classroom) Communication (proliferation of scientific results in community)

**\*\*Note:** *this column refers to the lessons implemented during the school year 2015-2016. The comments concern exclusively the academic hours the lesson was made and because of the uniqueness and diversity of each class, it should not be expected to be exactly the same during another lesson.*