CLIL Module Plan

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School	Liceo da Vinci - Trento				
School Grade	○ Primary		○ Middle		◉ High
School Year	○ 1	○ 2	○ 3	◉ 4	○ 5
Subject	Fisica	**Topic**	Optics, electrostatics, circuits.		
CLIL Language	◉ English		○ Deutsch		

Personal and social-cultural preconditions of all people involved	INSTITUTIONAL FRAMEWORK CONDITIONS The scientific high school "Leonardo da Vinci" is one of the historical “Liceo” of the Province of Trento. Nowadays the high school proposes two curricula, the ordinary scientific curriculum and the applied sciences curriculum. ANTHROPOGENIC AND SOCIO-CULTURAL FACTORS OF THE GROUP OF LEARNERS The class consists of 17 students. there are no SEN students or students of foreign origin. LEARNING PRECONDITIONS The entirety of the lessons of the present CLIL module take place in the new physics lab: the room is large and contains 7 desks, each large enough for 5 or 6 students. The lab work is carried out in groups of 3 or 4, so one of the desks is used by the teacher while the other six are used by the groups. The lab is also equipped with a PC, an interactive whiteboard (IWB), two blackboards, and a projector. In addition every desk hosts a laptop that the students can use for calculations, data collection, and data analysis, The academic performance of the class for what concerns the scientific subjects is above average. but not excellent,. The behavior of the students is usually polite although the level of participation is not high. The majority of the students are well motivated and willing to learn new concepts, however there are elements that do not have a specific interest in the subject or perceive the foreign language as a barrier. TEACHER PROFILE The teacher Giovanni Lombardi, teaches Mathematics and Physics in various classes, ranging from the 1st to the 4th grade of the school and has the role of main teacher. CEFR level: C1 (IELTS certification dated 18/01/2018: overall score 8/9) STUDENT GROUP PROFILE All the students are Italian mother tongue, and their average CEFR level is B1+, but a few have a C1 certification. The students have limited CLIL experience, as they have followed CLIL lessons for a total of 30 hours during the previous school year.

Students' prior knowledge, skills, competencies	Subject	Language
	Knowledge of kinematics and of the laws of Newtonian dynamics. The students are able to calculate the resulting force on an object, the acceleration it experiences due to this force, and to describe the motion of objects in presence of a constant acceleration. The students have studied circular and harmonic motion and can work with trigonometric functions. Since this module is not carried out in a single block, but instead the lessons are planned in parallel to the standard program, some of the necessary competences are acquired during the module.	The students have adequate communication skills. They can interact both with the teacher and with their fellow students in English, but they do not have a specific knowledge of the scientific terms necessary to describe the physical phenomena considered in this CLIL module. The students have good reading and writing skills.

Timetable fit	◉ Module	Length 20 lessons of 50' each

Description of teaching and learning strategies	• The learning and teaching objectives are disciplinary-specific, interdisciplinary,and communicative. The lessons are designed to encourage the development of problem solving skills, critical thinking, creative thought, collaboration, communication, and time managing. • The methodological approaches are various, in order to meet different learning styles and to promote the development of different skills: interactive lessons, group work (especially when the task is complex), pair work, individual work, cooperative learning. During the “student-centered” activities the teacher acts as facilitator and guide. • Interaction and communication are promoted as much as possible by the teachers,(by asking questions and inviting the students to comment or express their ideas) and by activities focused on group or pair work. During these activities, the teacher circulates and models language, concepts and cognition. • A variety of multimedia resources (in particular videos and online applets) and of simple lab tools is used. • The teacher provides different materials to support content and language scaffolding, and to consolidate learning, e.g. worksheets, extra exercises, and homework. In particular the documents U1_L3_ALL1 (editable version U1_L3_ALL2), U1_L3_ALL3 (editable version U1_L3_ALL4), U1_L3_ALL5, U1_L6_ALL1 (editable versions U1_L6_ALL2, U1_L6_ALL3), U1_L8_ALL1 (editable version U1_L8_ALL2), U2_L1_ALL1 (editable version U2_L1_ALL2), U2_L8_ALL1 (editable version U2_L8_ALL2), U2_L10_ALL1 (editable version U2_L10_ALL2), as well as all the uncredited figures included in these documents, are original productions of the author of this module. • During most activities a formative assessment by the teachers is provided and peer- or self-evaluation are encouraged. At the end of the Module a summative assessment is provided.

Overall Module Plan

Unit: 1 Waves and optics **Unit length:** 10 lessons of 50' each	**Lesson 1** Sound waves – theory
	Lesson 2 Sound waves – Interactive online experiment
	Lesson 3 Reflection of light – theory
	Lesson 4 Reflection of light – experiment
	Lesson 5 Interference and diffraction – theory
	Lesson 6 Interference and diffraction – experiment: part 1
	Lesson 7 Interference and diffraction – experiment: part 2
	Lesson 8 Optics – Cooperative solution of a problem: part 1
	Lesson 9 Optics – Cooperative solution of a problem: part 2
	Lesson 10 Optics – Cooperative solution of a problem: part 3

Unit: 2 Electricity **Unit length:** 10 lessons of 50' each	**Lesson 1** Static electricity and Coulomb’s force
	Lesson 2 Electric field – theory
	Lesson 3 Electric field – online interactive experiment
	Lesson 4 Capacitors – theory
	Lesson 5 Ohm’s first law – theory
	Lesson 6 Ohm’s second law – theory and experimental demonstration
	Lesson 7 DC circuits – experiment: basic measurements
	Lesson 8 DC circuits – experiment: resistors in series
	Lesson 9 DC circuits – experiment: resistors in parallel
	Lesson 10 Unit test + discussion

CLIL Lesson Plan

Unit number	1	**Lesson number**	1	**Title**	Sound waves – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	5	Having an overview of the activities that will be carried out during this unit.	- T explains the lesson plan for the present unit and gives a brief overview of the activities. - Ss ask questions.	**Skills** L S R W **Key vocabulary** Plan, experiment, theory, theoretical, teamwork, pair/group work, perform/carry out an experiment, wave, sound, optics, light. **Communicative structures** Vocabulary and sentences about planning, e.g. - We/You are going to...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

2	25 [20 video + 5 written]	Learning some of the main properties of sound waves (e.g. sound speed, intensity, decibel scale) Understanding the main points of a short introductory video about sound waves Identifying important data, information, and keywords.	- Ss watch a video about sound waves. - T pauses the video a couple of times to allow the students to note down keywords and relevant definitions. In particular the parts of the video about the range of audible frequencies, the definition of intensity, and the decibel scale are complemented by a brief explanation at the blackboard. - During the video the Ss take notes and ask questions. - At the end of the video Ss have some time to work in pairs on the vocabulary, trying to clarify the meaning of the keywords through discussion and comparison.	**Skills** L S R W **Key vocabulary** longitudinal/transverse wave, frequency, pressure, diaphragm, wavelength, intensity, decibel, logarithmic scale, pitch, peak, crest, trough. **Communicative structures** Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - the sound waves spread outward - sound waves cause the air to compress and expand.	☒ Whole class ☐ Group work ☒ Pair work ☒ Individual work	T shows the video “Sound: Crash Course Physics #18”: link (uploaded on youtube by the channel CrashCourse). T stops the video at minute 9:38 before the Doppler effect is introduced.	The teacher goes around the class during the written part of the activity, checks the understanding of the keywords and gives advice if needed.

3	10	Understanding the relation between frequency and pitch of a sound. Consolidating the knowledge about the relation between frequency and wavelength.	- T uses an online tone generator to demonstrate the relation between the frequency of a sound and its pitch. - For each sound Ss are asked to calculate the wavelength. - The results are discussed with the whole class.	**Skills** L S R W **Key vocabulary** wave, tone, frequency, wavelength, pitch. **Communicative structures** Sentence structures related to mathematical relations, the description of physical phenomena, e.g. - as the frequency increases the wavelength decreases. - a higher frequency correspond to a higher pitch.	☒ Whole class ☐ Group work ☐ Pair work ☒ Individual work	T uses the pc connected to the IWB and to the audio system to run an online tone generator (link). Ss take notes on their personal notebooks.	None.

4	10	Understanding how the decibel scale works. Learning to estimate the relative loudness of two sounds, Becoming familiar with the concept of logarithmic scale.. Cooperation skills. Making links between theory and concrete situations.	T gives Ss instructions to find an online applet that challenges Ss to calculate the decibel level of a sound given the ratio of its intensity with respect to another given sound. The applet offers three levels of difficulty. - Ss can start from the first level and go on until they reach the end of the game. - Ss work in groups of 3 or 4 on the laptop available on their desk in the lab. The group members take turns to operate the app. - Ss take notes about the simulations made.	**Skills** L S R W **Key vocabulary** wave, intensity, decibel level, ratio, source, logarithm. **Communicative structures** Communicative structures Vocabulary and sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - sound source A is ... times more/less intense.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Ss work in groups of 3 or 4 on the laptops available on the lab desks. T gives Ss the link to find the interactive online applet “Decibel Scale Concept Builder” (link link)	T goes around the lab and supervises the work of the groups that are using the online applet. The level of participation of the students is informally assessed, as well as their ability to solve any issues encountered.

CLIL Lesson Plan

Unit number	1	**Lesson number**	2	**Title**	Sound waves – Interactive online experiment

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Identifying the relevant features of a phenomenon experienced in everyday-life: the Doppler effect. Making hypotheses on how this effect could be described in mathematical/physical terms. Learning to make connections between previously acquired knowledge and new concepts.	- T asks Ss questions about daily life events that involve the Doppler effect (e.g. what do you hear when an ambulance passes by you on the street?). Typically some student will immediately mention the Doppler effect. - T encourages Ss to reason about the main	**Skills** L S R W **Key vocabulary** wave, sound, pitch, crest, trough, frequency, wavelength, shift, source, observer, motion.	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the answers and the insight of the students based on both content and presentation.

			main quantities involved in this phenomenon. - The goal is to let the Ss discover that the relevant factors are the speed and the direction of motion of the sound source and of the observer, and that these influence the frequency of the sound heard by the observer.	**Communicative structures** Sentence structures related to mathematical relations, making hypothesis, to the description of physical phenomena, and to giving comments/opinions, e.g. - ... is moving towards/away from... - if ... the pitch gets higher/lower than...			
2	15	Visualising the physics of the Doppler effect. Understanding the main points of a short introductory video about the Doppler effect Identifying important data, information, and keywords. Formalising the observations made about the	- Ss watch a short video about the Doppler effect. The animation presented in the video is very helpful to visualise how the Doppler	**Skills** L S R W **Key vocabulary** wave, sound, pitch, crest, trough, frequency, wavelength, shift, source, observer, motion.	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	T shows the final part of the video “Sound: Crash Course Physics #18”: link (uploaded on youtube by the channel CrashCourse) used in the previous lesson. The video was interrupted at minute 9:38 and has to be resumed from that point.	None.

		Doppler effect.	effect works. - At the end of the video T works out the simple calculations that lead to the expressions for the frequency shift due to the motion of the sound source and to the motion of the observer. - Ss take notes both during the video and during the explanation at the blackboard, and can ask questions.	**Communicative structures** Sentence structures related to mathematical relations, and to the description of physical phenomena, e.g. - if the source moves towards the observer, then the frequency... - the frequency heard by the observer is equal to...			

3	20 [10 reading + 10 presentation]	Learning about the applications of the Doppler effect in astronomy. Learning about the “sonic boom” caused by the supersonic motion of	- Ss work in groups of 3 or 4 (6 groups in total). - Three groups examine a	**Skills** L S R W	☐ Whole class ▣ Group work ▣ Pair work ☐ Individual work	• U1_L2_ALL1.pdf • U1_L2_ALL2.zip Every S receives one copy of the document “Doppler effect and supersonic speeds” (file	Formative evaluation. Tr goes around the lab during the first group work

		a sound source. Identifying relevant information. Organising information. Describing/explaining a physical phenomenon to class mates. Cooperating.	short text about the “sonic boom”, the other three examine a text about the applications of the Doppler effect in astronomy. - The groups have 10 minutes to read the document and to prepare to give a brief explanation of the content to other groups. - It is important that Ss cooperate during the group work so that every member can comprehend and explain the content correctly	**Key vocabulary** wave, sound, sound speed, light, red/blue shift, crest, trough, frequency, wavelength, shift, source, observer, motion, center of mass. **Communicative structures** Sentence structures related to mathematical relations, and to the description of physical phenomena, e.g. - in astronomy the Doppler effect is used to... - the sonic boom is...	U1_L2_ALL1.pdf - editable version U1_L2_ALL2,zip, courrtesy of Daniele Taufer [daniele.taufer@unitn.it]) that contains a, review of the topics of this lesson, a paragraph about the “sonic boom”, and a paragraph about the applications of the Doppler effect in astronomy.	part of the activity and assesses the level of participation of the various members of the groups. During the pair-work part of the activity T listens to the explanation given by (some of) the Ss, and assesses the content, the presentation skills, and the correct use of the scientific terms.

			correctly. - After 10 minutes the groups split, the students form pairs and members of the groups that read about one topic explain it to Ss that read about the other topic, and vice versa.				

4	5	Reviewing the main concepts encountered during the first two lessons of this unit. Giving comments and opinions about the lessons and the activities.	The teacher reviews the main concepts and results encountered during this lesson and the previous one. The students can give comments and opinions.	**Skills** L S R W **Key vocabulary** all the vocabulary used in the first two lessons **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving comments and opinions, e.g. - i think these lessons were,,, - i found the part about... interesting/not useful because...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	1	**Lesson number**	3	**Title**	Reflection of light – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	5	Having an overview of the activities that will be carried out during the two lessons about the reflection of light	- T explains the lesson plan for the present and the following lesson, and a brief overview of the activities.	**Skills** L S R W **Key vocabulary** reflection, angle, incident, surface, laser, mirror. **Communicative structures** Sentence structures related to planning, and to asking questions,, e.g, - we/you are going to carry out an experiment about...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

2	15	Learning the main properties of visible light and light detectors. Identifying the main concepts and ideas.	- T gives a short presentation (with slides) about visible light and the main ways of detecting it. - Ss take notes and ask questions and clarifications.	**Skills** L | S | R | W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - I didn’t understand the part about...? - Can you explain how...?	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	T shows the presentation “Lab experience: reflection of light – A brief introduciton” (file U1_L3_ALL1.pdf —editable version U1_L3_ALL2.zip) on the interactive whiteboard (IWB),	None.

3	5	Learning that artificial detectors can detect light outside the visible spectrum. Using everyday objects to detect infrared light. Applying the knowledge acquired during the previous activity.	- Using the camera of their own smartphones, Ss detect the infrared signals of a remote control (e.g. the remote control of the IWB). - The silicon-based sensor of most digital cameras can detect light that is slightly outside the visible spectrum, such as the IR light used by remote controls. - Ss can ask questions and clarifications.	**Skills** L S R W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to giving and receiving instructions, and asking for explanations, e.g. - Why can’t I see the IR light with my smartphone?	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	T uses a remote control to send IR signals (e.g. the remote control of the IWB). Ss use the camera of their smartphones	T can informally assess the level of participation of Ss.

4	15	Recalling the law of reflection. Identifying keywords and main concepts. Learning the correct scientific terms.	- T provides each group with a copy of the document “Reflection of light – Lab report” (file U1_L3_ALL3.pdf), Sections 1 and 2 of this document set the goal of the experiments that will be performed in the next two lessons, and the necessary theoretical background. - Ss are randomly asked to read aloud fragments of the text. - The meaning of the text is outlined after each paragraph. - The whole class and T may help the reader to pronounce the words correctly and to understand the meaning of keywords and unknown expressions. - Ss note down the keywords on their personal notebooks.	**Skills** L | S | R | W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Vocabulary and sentence structures related to mathematical relations, specific scientific expressions, e.g. - a light ray is incident on a surface	☒ Whole class ☐ Group work ☐ Pair work ☒ Individual work	• U1_L3_ALL3.pdf • U1_L3_ALL4.zip A copy of the document “Reflection of light – Lab report” (file U1_L3_ALL3.pdf - editable version U1_L3_ALL4.zip), is handed out to each group of 3 / 4 Ss. T shows the same document on the IWB to enable each S to follow.	Formative assessment and peer-evaluation of reading and comprehension skills.

5	10	Vocabulary building. Processing the information collected during the previous lesson.	- Ss examine the document “Glossary” (file U1_L3_ALL5.pdf). - Ss complete the list of words by adding new words that they have encountered during the previous activities.	**Skills** L S **R** W **Key vocabulary** see the document “Glossary” (file U1_L3_ALL5.pdf) **Communicative structures** - Take a look at... - Memorise the meanings of...	☐ Whole class ☐ Group work ☐ Pair work ☒ Individual work	• U1_L3_ALL5.pdf T hands out to each student a printed copy of the document “Glossary” (file U1_L3_ALL5.pdf - editable version included in U1_L3_ALL4.zip)	None.

CLIL Lesson Plan

Unit number	1	**Lesson number**	4	**Title**	Reflection of light – experiment

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Learning the dangers connected to the use of laser light. Learning how to safely handle a laser source. Giving personal opinions and comments.	- T hands out to each S a copy of the “Laser safety” document, - Ss read carefully the document. - Ss are encouraged to ask questions and clarifications.	**Skills** L S R W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to receiving instructions, e.g. - never look directly into the beam.	☑ Whole class ☐ Group work ☐ Pair work ☑ Individual work	Document “Laser safety”. This document is part of the kit used in the lab to carry out the experiments about optics (kit purchasable at link), Other labs may have different equipment, and should use the safety document relative to that equipment.	Formative assessment: T goes around the lab and observes how carefully each S reads the document. T can ask questions to evaluate the level of comprehension of the text.

2	10	Vocabulary building. Recalling and employing the knowledge about reflection of light.	- T illustrates the steps needed to perform the experiment about reflection of light and gives a brief explanation of the physics involved. - Ss take notes. - Ss work in groups of 3 or 4 and fill the blanks in section 3,1 ("Calculations and measurements") of file document “Reflection of light – Lab report” U1_L3_ALL3.pdf.	**Skills** L S R W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to receiving instructions. e.g. - First you need/have to....then.. - Next you must... - The next step consists in...	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L3_ALL3.pdf	Formative evaluation: the teacher evaluates the correctness of the answers and whether the appropriate words were employed in the "fill the blanks" part of the activity.

3	25	Performing a physics experiment. Practicing the ability to carry out a physics experiment rigorously and safely. Teamwork and organisation skills.	- Working in groups of 3/4, Ss carry out the experiment as discussed in the previous parts of this lesson and in section 3,1 ("Calculations and measurements") of file document “Reflection of light – Lab report” U1_L3_ALL3.pdf.	**Skills** L S R W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to the organisation of a teamwork, and to giving and receiving instructions, e.g. - Measure ... - Note down the following data... - The goniometer reads...	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L3_ALL3.pdf Ss work with the lab tools described in detail in Section 3 (“Experimental tools”) of file document “Reflection of light – Lab report” U1_L3_ALL3.pdf.	T goes around the lab and supervises the work of the groups that are performing the experiment, checking that they carry out the measurements with rigour and in complete safety.

4	5	Summarising the key elements of the two lessons about the reflection of light. Giving opinions and comments on the lessons.	- T summarises the key steps followed in the two lessons about the reflection of light. - Ss can give personal/group comments and opinions.	**Skills** L S R W **Key vocabulary** see the "Glossary"\ document (file U1_L3_ALL5.pdf) **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - you carried out an experiment about...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	1	**Lesson number**	5	**Title**	Interference and diffraction – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	5	Having an overview of the activities that will be carried out during the three lessons about diffraction and interference of light waves.	- T illustrates the lesson plan for the present and the two following lesson, and a brief overview of the activities. - Ss take notes and ask questions.	**Skills** L S R W **Key vocabulary** wave, amplitude, phase, overlap, crest, trough, shift, slit, interference, diffraction. **Communicative structures** Sentence structures related to planning and to asking questions, e.g. - in the second lesson you are going to...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

2	15	Recalling the concepts of constructive and destructive interference Understanding the main points of a short introductory video about interference and diffraction. Identifying important data, information, and keywords.	T runs a video on the IWB, pausing it a few times to highlight the most important concepts. - Ss take notes and can ask questions and clarifications during the video. - At the end of the video T encourages and directs a discussion over the main points of the video.	**Skills** L S R W **Key vocabulary** wave, amplitude, phase, overlap, crest, trough, shift, slit, interference, diffraction. **Communicative structures** Vocabulary and sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - if two waves are in phase/out of phase, then..	☒ Whole class ☐ Group work ☐ Pair work ☒ Individual work	T runs the video “Interference, Reflection, and Diffraction” link from the youtube channel “Professor Dave Explains”	None.

3	15	Visualise the functioning of the double-slit experiment using an online applet. Understanding the concept of interference pattern. Cooperation skills. Making links between the theory and the concrete situations.	- T gives instructions to Ss to find an online applet that helps visualising the functioning of the double-slit experiment. - The applet enables Ss to observe how the interference pattern on the target screen changes with the distance between the two slits, with the distance between the screen with the slits and the target screen, and with the wavelength of the light. - Ss work in groups of 3 or 4 on the laptop available on their desk in the lab. - Ss take notes about the simulations made.	**Skills** L S R W **Key vocabulary** wave, amplitude, phase, overlap, crest, trough, shift, slit, interference, diffraction. **Communicative structures** Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - if two waves are in phase/out of phase, then...	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Ss work in groups of 3 or 4 on the laptops available on the lab desks. T gives them the link to find the interactive online applet about orbital motion (link link)	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to solve any issues encountered.

4	15	Discuss and comment the physics behind the phenomena observed during the previous activity. Learning to make connections between previously acquired knowledge and new concepts.	- T asks Ss questions about different scenarios that were simulated with the online app during the previous activity. - Ss answer on the basis of the simulations made and of their theoretical knowledge. - Ss can use their personal notes. - T writes relevant information emerged during the brainstorming on the blackboard. - T directs the discussion in a way that Ss understand clearly why the different parameters affect the result of the simulation. - Ss make hypotheses and can give opinions and comments on the hypotheses made by their classmates.	**Skills** L S R W **Key vocabulary** wave, amplitude, phase, overlap, crest, trough, shift, slit, interference, diffraction. **Communicative structures** Sentence structures related to mathematical relations, making hypothesis, and to the description of physical phenomena and giving comments/opinions, e.g. - I agree/disagree because. - I suppose that... - In my opinion...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the answers and the insight of Ss based on both content and presentation.

CLIL Lesson Plan

Unit number	1	**Lesson number**	6	**Title**	Interference and diffraction – experiment: part 1

Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment

1	15	Recalling and summarising the knowledge about interference and the double slit experiment. Using the correct scientific terms. Cooperation and organisation in the group work. Self-assessment.	- Ss work in groups of 3 or 4. - Every group receives a printed copy of the document “Interference and diffraction – Lab report” (file U1_L6_ALL1.pdf). - Ss work in teams to fill the blanks present in the section “Interference”.	**Skills** L | S | R | W **Key vocabulary** wave, amplitude, phase, overlap, crest, trough, shift, slit, monochromatic, coherent. Other useful words are included in the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena and of steps of a process, e.g. - the light that passes through the slits is...	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf • U1_L6_ALL2.zip • U1_L6_ALL3.zip Every group receives a printed copy of the document “Interference and diffraction – Lab report” (file U1_L6_ALL1.pdf – editable version with blanks U1_L6_ALL2.zip – editable complete version U1_L6_ALL3.zip).	Formative assessment on content and language (in particular writing skills). T assesses the answers of the Ss. If any answers are wrong the teacher poses questions to help the Ss detect and correct their own mistakes.

2	20	Practicing the skills necessary to rigorously carry out a scientific experiment. Reproducing the double slit experiment. Particular attention is paid to the correct use of the units of measurement.	- T reminds the main points of the “Laser safety” document considered in one of the previous experiemnts. - Following the instructions given in Section 4 of the file U1_L6_ALL1.pdf, Ss carry out the double slit experiment, using two different double slit screens.	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - place the screen 20cm far from the laser source. - measure the distance between the light fringes.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf + lab tools described in the document.	T goes around the lab and supervises the work of the groups that are performing the experiment, with particular attention to the safe use of the laser modules. The level of participation of Ss is informally assessed, as well as their ability to solve any issues encountered.

3	15	Learning to analyse the data collected in order to measure the wavelength of the laser employed in the experiment. Practicing critical thinking to interpret the results.	- Ss analyse the data collected and write their results in the spaces provided in the parts of Section 4 of U1_L6_ALL1.pdf dedicated to interference. - Ss can add their observations in the dedicated section at the end of the document.	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - we encountered an issue when [description of the step]. - We believe that this happened because….	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf + lab tools described in the document.	T goes around the lab and supervises the work of the groups, giving advice if required. The performance evaluation is done on the lab reports that will be handed in by the groups at the end of the next lesson.

CLIL Lesson Plan

Unit number	1	**Lesson number**	7	**Title**	Interference and diffraction – experiment: part 2

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Recalling and summarising the knowledge about diffraction and the single slit experiment. Using the correct scientific terms. Cooperation and organisation in the group work.	- Ss work in groups of 3 or 4. - Ss work in teams to fill the blanks present in the section “Diffraction” of the document “Interference and diffraction – Lab report” (file U1_L6_ALL1.pdf).	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena and of steps of a process, e.g. - a laser beam is shone through a single slit... - the diffraction pattern on the screen can be used to...	☐ Whole class ▣ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf	Formative assessment on content and language (in particular writing skills). T assesses the answers of Ss. If any answers are wrong the teacher asks questions to help the Ss detect and correct their own mistakes.

2	20	Practicing the skills necessary to carry out a scientific experiment rigorously and safely. Reproducing the single slit experiment. Particular attention is paid to the correct use of the units of measurement.	- T reminds the main points of the “Laser safety” document considered in one of the previous experiemnts. - Following the instructions given in Section 4 of the file U1_L6_ALL1.pdf, the Ss carry out the single slit experiment, using a screen with a single slit, and a screen with a single bar.	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - place the screen about 20 cm far from the laser source. - measure the distance between two light bands.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf + lab toole described in the document.	T goes around the lab and supervises the work of the groups that are performing the experiment, with particular attention to the safe use of the laser modules. The level of participation of Ss is informally assessed, as well as their ability to solve any issues encountered.

3	15	Learning to analyse experimental data in order to measure width of the single slit and of the single bar employed in the experiment. Practicing critical thinking to interpret the results.	- Ss analyse the data collected and write their results in the spaces provided in the parts of Section 4 of U1_L6_ALL1.pdf dedicated to diffraction. - Ss can add their observations in the dedicated section at the end of the document. - At the end of the activity each group hands in their lab report.	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - we encountered an issue when [description of the step]. - we believe that this happened because….)	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L6_ALL1.pdf	T goes around the lab and supervises the work of the groups, giving advice if required. The performance evaluation is done on the lab reports that will be handed in by the groups.

4	5	Summarising the key concepts examined during the three lessons about interference and diffraction. Giving opinions and comments about the lessons.	- T summarises the key steps followed in the three lessons about interference and diffraction. - Ss can give personal/group comments and opinions.	**Skills** L S R W **Key vocabulary** see the section “Glossary” of the document U1_L6_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - during these three lessons we/you have studied... - i think these lessons were... because...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	1	**Lesson number**	8	**Title**	Optics – Cooperative solution of a problem: part 1

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	50	Employing the theoretical knowledge about optics to solve a complex problem. Group work: cooperation, communication, and organisation. Problem solving. Critical and creative thinking.	- This role playing activity occupies three lessons. - Ss split up in 6 groups and cooperate to the solution of a common problem. - Each group has a problem to solve, but not all the data necessary to the solution. Only the cooperation between all the groups can lead to the solution. - T conducts the activity, determining the moments of group work, of cooperation between part of the groups, and of cooperation between all the groups. - The rules of the activity are explained in detail	**Skills** L S R W **Key vocabulary** see the "Glossary" and “Technical terms” sections in the document U1_L8_ALL1.pdf	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L8_ALL1.pdf • U1_L8_ALL2.zip Each group receives a printed copy instructions of the activity (pg. 1 to 3) of the document “Optics – Cooperative problem solving” (file U!_L8_ALL1.pdf). Each group receives a printed copy of one of the problems included U1_L8_ALL1.pdf. Ss use a paper (that will be handed in at the end of the three lessons) to take notes and solve the problems. Extra papers are used for	Formative evaluation during the course of the activity. T evaluates the communication and language skills (writing, listening, speaking), as well as the insight and the knowledge. The performance evaluation is done on the reports that Ss hand in at the end of the activity

			are explained in detail in the document “Optics – Cooperative problem solving” (file U1_L8_ALL1.pdf)	**Communicative structures** Sentence structures related to making hypotheses, to suggesting, to presenting and asking for data, to describing physical phenomena, and to mathematical formulas. e.g. - Since... (maybe) we should... - We observed that... - Do you know the value of...?		the communications between groups, and are also collected by T at the end of the activity. The editable version of all the files used in this and the following two lessons are included in U1_L8_ALL2.zip.	

CLIL Lesson Plan

Unit number	1	**Lesson number**	9	**Title**	Optics – Cooperative solution of a problem: part 2

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	50	Employing the theoretical knowledge about optics to solve a complex problem. Group work: cooperation, communication, and organisation. Problem solving. Critical and creative thinking.	- This role playing activity occupies three lessons. - Ss split up in 6 groups and cooperate to the solution of a common problem. - Each group has a problem to solve, but not all the data necessary to the solution. Only the cooperation between all the groups can lead to the solution. - T conducts the activity, determining the moments of group work, of cooperation between part of the groups, and of cooperation between all the groups. - The rules of the activity are explained in detail	**Skills** L S R W **Key vocabulary** see the "Glossary" and “Technical terms” sections in the document U1_L8_ALL1.pdf	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U1_L8_ALL1.pdf • U1_L8_ALL2.zip Each group receives a printed copy instructions of the activity (pg. 1 to 3) of the document “Optics – Cooperative problem solving” (file U!_L8_ALL1.pdf). Each group receives a printed copy of one of the problems included U1_L8_ALL1.pdf. Ss use a paper (that will be handed in at the end of the three lessons) to take notes and solve the problems. Extra papers are used for	Formative evaluation during the course of the activity. T evaluates the communication and language skills (writing, listening, speaking), as well as the insight and the knowledge. The performance evaluation is done on the reports that Ss hand in at the end of the activity

			are explained in detail in the document “Optics – Cooperative problem solving” (file U1_L8_ALL1.pdf)	**Communicative structures** Sentence structures related to making hypotheses, to suggesting, to presenting and asking for data, to describing physical phenomena, and to mathematical formulas. e.g. - Since... (maybe) we should... - We observed that... - Do you know the value of...?		the communications between groups, and are also collected by T at the end of the activity. The editable version of all the files used in this and the following two lessons are included in U1_L8_ALL2.zip.	

CLIL Lesson Plan

Unit number	1	**Lesson number**	10	**Title**	Optics – Cooperative solution of a problem: part 3

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	40	Employing the theoretical knowledge about optics to solve a complex problem. Group work: cooperation, communication, and organisation. Problem solving. Critical and creative thinking.	- This role playing activity occupies three lessons. - Ss split up in 6 groups and cooperate to the solution of a common problem. - Each group has a problem to solve, but not all the data necessary to the solution. Only the cooperation between all the groups can lead to the solution. - T conducts the activity, determining the moments of group work, of cooperation between part of the groups, and of cooperation between all the groups. - The rules of the activity are explained in detail	**Skills** L S R W **Key vocabulary** see the "Glossary" and “Technical terms” sections in the document U1_L8_ALL1.pdf	☑ Whole class ☑ Group work ☐ Pair work ☐ Individual work	• U1_L8_ALL1.pdf • U1_L8_ALL2.zip Each group receives a printed copy instructions of the activity (pg. 1 to 3) of the document “Optics – Cooperative problem solving” (file U!_L8_ALL1.pdf). Each group receives a printed copy of one of the problems included U1_L8_ALL1.pdf. Ss use a paper (that will be handed in at the end of the three lessons) to take notes and solve the problems. Extra papers are used for	Formative evaluation during the course of the activity. T evaluates the communication and language skills (writing, listening, speaking), as well as the insight and the knowledge. The performance evaluation is done on the reports that Ss hand in at the end of the activity

			are explained in detail in the document “Optics – Cooperative problem solving” (file U1_L8_ALL1.pdf)	**Communicative structures** Sentence structures related to making hypotheses, to suggesting, to presenting and asking for data, to describing physical phenomena, and to mathematical formulas. e.g. - Since... (maybe) we should... - We observed that... - Do you know the value of...?		the communications between groups, and are also collected by T at the end of the activity. The editable version of all the files used in this and the following two lessons are included in U1_L8_ALL2.zip.	

2	10	Summarising the key concepts studied during the last three lessons. Discussing the solution of the problem. Giving opinions and comments on the lessons.	- T summarises the key concepts encountered during the last three lessons. - Ss can give personal/group comments and opinions about the solution of the problem and about the lessons of this unit.	**Skills** L S R W **Key vocabulary** all the vocabulary used in this unit. **Communicative structures** Sentence structures related to giving opinions/comments, e.g. - I think the lesson about... was...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	2	**Lesson number**	1	**Title**	Static electricity and Coulomb’s force

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	5	Having an overview of the activities that will be carried out during this unit.	- T explains the lesson plan for the present unit and gives a brief overview of the activities. - Ss can ask questions.	**Skills** L S R W **Key vocabulary** Plan, experiment, theory, theoretical, teamwork, pair work, perform/carry out an experiment **Communicative structures** Sentences about planning, e.g. - We/You are going to…	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.
2	25 [20 video + 5 written]	Identifying important data and information. Writing down keywords and relevant	- Ss watch a video about static electricity and Coulomb’s law. - T pauses the video a	**Skills** L S R W	☑ Whole class ☐ Group work ☑ Pair work	T shows the video “Electric Charge: Crash Course Physics #25”: link (uploaded on youtube by the channel	T goes around the class during the written part of the activity, checks the

		definitions. Giving an opinion or an informed/educated guess over the meaning of a word/sentence.	couple of times to allow Ss to note down keywords and relevant definitions. - In particular the parts of the video about the conservation of charge and about Coulomb’s law are complemented by a brief explanation at the blackboard. - During the video Ss take notes and ask questions. - At the end of the video Ss have some time to work in pairs on the vocabulary, trying to clarify the meaning of the keywords through discussion and comparison.	**Key vocabulary** (net/overall) (electric) charge, rod, amber, wool, atom, shell, valence, attract/repel. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e.g. - ...is equal to ... times 10 to the negative 19 - two charges of equal/opposite sign attract/repel each other	☐ Individual work	CrashCourse) on the IWB.	understanding of the keywords and gives advice if needed.

3	10	Visualise the effects of the Coulomb’s force on two charges Understanding the vector nature of the force by observing how the magnitude and direction of the vectors change with charge and distance. Group work and communication. Practicing the ability of making links between the theory and the concrete situations.	- T gives instructions to Ss to find an online applet that helps visualising the effects of the Coulomb’s force on two charges - Particular attention is paid to the directions of the force and velocity vectors. - Ss work in groups of 3 or 4 on the laptop available on their desk in the lab. - Ss change the parameters in the applet and visualise how -the force vectors change as a function of the magnitude and the sign of the charges and of the distance between them. - Ss take notes about the simulations made.	**Skills** L S R W **Key vocabulary** charge, distance, sign, magnitude, direction. **Communicative structures** Sentence structures related to mathematical relations and to the description of physical phenomena and giving/receiving instructions, e.g. - try increasing the distance between the charges! - what happens if we change the value of the charges?	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Ss work in groups of 3 or 4 on the laptops available on the lab desks. T gives them the link to find the interactive online applet (by thephysicsclasroom.com) about the Coulomb’s force (link link)	T goes around the lab and supervises the work of the groups that are using the online applet. The level of participation of Ss is informally assessed, as well as their ability to solve any issues encountered.

4	10	Problem solving. Employing the knowledge acquired in the previous activities to solve a problem. Using an online applet to check the validity of own results. Group work and communication.	- Ss solve individually a simple exercise about the force between two charged objects. - Ss discuss the solution with their group mates. - When they reach an agreement they plug in the data in the online applet of the previous activity and qualitatively check the solution.	**Skills** L S R W **Key vocabulary** Calculate, solve, charge, distance, sign, magnitude, direction **Communicative structures** For the individual work part: vocabulary and sentence structures related to mathematical relations and to the description of physical phenomena. For the group work part: sentence structures related to giving opinion/comments. Giving/asking for advice, e.g. - What is/are...? - How did/can/would you...? - Are you sure that....? Why?”	☐ Whole class ☒ Group work ☐ Pair work ☒ Individual work	• U2_L1_ALL1.pdf • U2_L1_ALL2.zip T hands each S a paper with the text of the exercise that they have to solve. See file: U2_L1_ALL1.pdf (editable version U2_L1_ALL2.zip).	Formative assessment on content and language (in particular listening and speaking skills). T assesses the answers of the Ss based on both content and presentation.

CLIL Lesson Plan

Unit number	2	**Lesson number**	2	**Title**	Electric field – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Having an overview of the activities that will be carried out during this and the next lesson.	- T briefly reviews the concepts introduced in the previous lesson. - T illustrates the activities planned for the two lessons about electric fields. - Ss can ask questions.	**Skills** L S R W **Key vocabulary** force, field, charge, test charge, vector. **Communicative structures** Vocabulary and sentence structures related to planning, e.g. - We/you are going to...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

2	25 [20 video + 5 written]	Identifying important data and information. Writing down keywords and relevant definitions. Giving an opinion or an informed/educated guess over the meaning of a word/sentence.	- Ss watch a video about electric fields. - T pauses the video a couple of times to allow Ss to note down keywords and relevant definitions. - In particular the parts of the video about the derivation of the formula for the magnitude of the electric field and about the introduction of field lines are complemented by a brief explanation at the blackboard. - During the video Ss take notes and ask questions. - At the end of the video Ss have some time to work in pairs on the vocabulary, trying to clarify the meaning of the keywords through discussion and comparison.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, test charge, vector, field, space, radially, tangent. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e.g. - ... lines must be tangent to the direction of...	☒ Whole class ☐ Group work ☒ Pair work ☐ Individual work	T shows the video “Electric Fields: Crash Course Physics #26”: link (uploaded on youtube by the channel CrashCourse)	T goes around the lab during the written part of the activity, checks the understanding of the keywords and gives advice if needed.

3	20	Applying the knowledge acquired during the previous activity. Problem solving. Pair work. Critical thinking.	- T gives Ss an exercise about the electric field. - Ss solve the exercise in pairs. - A student is chosen to explain the solution of the exercise to her/his classmates. - The correction is discussed. - Since the solution of the exercise is quite lengthy, T can tell Ss to solve the first 3 points in class and leave the last 2 as a homework.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, vector, field, space, radially, tangent, direction, angle, degree, radiant. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e.g. - the vector must be directed [direction] - the intensity of the electric field in that point is...	☒ Whole class ☐ Group work ☒ Pair work ☒ Individual work	• U2_L2_ALL1.pdf T hands out to each pari of Ss a copy of the first page of the exercise “Electric field sketch” (file U2_L2_ALL1.pdf, available online at link). Page two and three of the file contain the solutions of the exercise, and T can choose whether to hand them out or not.	T goes around the lab and supervises the work of the pairs, giving advice if needed. By asking targeted questions T checks the level of comprehension of the basic concepts that will be useful in the next activities.

CLIL Lesson Plan

Unit number	2	**Lesson number**	3	**Title**	Electric field – online interactive experiment

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Reviewing the knowledge about operations with vectors. Peer-evaluation. Pair work.	- The pairs of Ss exchange their homework, and each pair corrects the homework of two classmates. - The correct solutions are then discussed with the whole class.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, vector, field, radially, tangent, direction, angle, degree, radiant.	☒ Whole class ☐ Group work ☒ Pair work ☐ Individual work	• U2_L2_ALL1.pdf	Peer-assessment. Ss assess the work done by their classmates.

				Communicative structures Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e.g. - I believe this is correct/wrong because... - I think the correct solution is...			

2	10	Observing an experiment that helps visualise the electric field lines.	- T conducts an experiment at his desk or shows a video of similar experiments. - In the experiment one or two electrodes are immersed in a solution containing iron filings. When the electrode(s) are connected to a power supply, the iron filings align following the field lines. - During the experiment T asks Ss questions to assess their understanding. - Ss take notes, and ask questions.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, vector, field, radially, tangent, direction, angle, iron filings. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e,g, - Why do the iron filings align that way?	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	The lab equipment needed to perform the iron filings experiment is available in most physics labs. In alternative T can show a video such as “10 ways to see the electric field – part 1” (link: link) uploaded on youtube by the channel “James Lincoln”	Formative assessment. During the experiment (or the video) T assesses the content and insight of the Ss' answers.

3	20	Applying the knowledge about electric fields acquired in the previous activities and lesson. Using the correct scientific terms to describe physical phenomena. Using an online applet to visualise theoretical concepts. Cooperating. Organising the group work.	- Ss work in groups of 3 or 4 on (a printed copy of) document “Electric field lines” (file U2_L3_ALL1.pdf). - Ss use an online applet to simulate the situations proposed, and answer the questions, using the correct terminology. - Ss have to organise the group work assigning roles to the various members (e.g. who operates the app, who tackles which question,...). - At the end of the lesson Ss hand in the completed document.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, vector, field, radially, tangent, direction, angle, degree, radiant. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving opinions and comments, e.g. - I believe this is correct/wrong because... - I think the correct solution is...	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Each group receives a printed copy of the document “Electric field lines” available online at link. The groups use the laptop available on their lab desk to operate the online app.	T goes around the lab and supervises the work of the groups, giving advice if needed. By asking targeted questions T checks the level of comprehension of the basic concepts that will be useful in the next activities. A performance evaluation is done on the documents handed in by Ss at the end of the activity.

4	10	Applying the knowledge about electric fields acquired in the previous activities and lesson. Using an online applet to visualise theoretical concepts.	- Ss play the online app “Electric field hockey” - The group that completes a level in the shortest time wins 3 points, the second group gets 2 point, the third one 1. The group with the most points at the end of the activity wins the competition. - The member of the group that operates the app must change for each level. The other group members can still give advice. - T keeps track of the points.	**Skills** L S R W **Key vocabulary** (net/overall) (electric) charge, vector, field, radially, tangent, direction, angle, degree, radiant. **Communicative structures** Sentence, to the description of physical phenomena, giving/receiving instructions, e.g. - Try placing a charge close to the goal. - Add one more positive charge.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	The groups use the laptop available on their lab desk to operate the online app. The app “Electric field hockey” (by thephysicsclassroom.com) can be found at the link: link	T goes around the lab and supervises the work of the groups, giving advice if needed.

CLIL Lesson Plan

Unit number	2	**Lesson number**	4	**Title**	Capacitors – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**

1	20	Learning the definition of capacity in terms of charge and potential difference. Learning the definition of capacity of a parallel-plate capacitor in terms of the area of the plates, the distance between the plates, and the dielectric constant of the material that occupies the space between the plates. Learning the main everyday-life applications of capacitors. Identifying relevant quantities and the relations between them.	- T introduces the capacity of a capacitor in terms of charge and potential difference (i.e. C=Q/V). - T introduces the equation that describes the capacity of a parallel-plate capacitor in terms of the area of the plates, the distance between the plates, and the dielectric constant of the material that occupies the space between the plates. - T mentions the main applications of capacitors (e.g. explaining how a keyboard works). - Ss take notes and ask questions.	**Skills** L S R W **Key vocabulary** (electric) potential, supply, battery, capacitor, uniform electric field, plate. dielectric. **Communicative structures** Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - the capacity is directly proportional to... and inversely proportional to...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.
2	15	Observing experimental demonstrations of the dependence of the capacity of a parallel-plate capacitor on the area of the plates, the distance between the plates, and the	- T conducts an experiment at his desk. - T uses a adjustable parallel-plate capacitor connected to a power supply, an electrometer (that measures current flow between the plates) and a voltmeter (showing the potential) - The	**Skills** L S R W	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	The materials needed to conduct this experiment are available in many physics labs.The tools needed to	Formative assessment. T informally assesses the content and the insight of the hypotheses made by Ss, as well as the correctness of

		dielectric constant of the material that occupies the space between the plates. Interpreting the experimental results on the basis of prior knowledge. Making hypotheses/educated guesses. Note taking.	experiment can be used to demonstrate how the capacity changes with the distance between the plates, and how it is affected by the presence of a dielectric material between the plates. If the lab is not equipped with an adjustable parallel-plate capacitor, a video can be shown (see the section Material). - Ss take notes. - During the experiment Ss are asked to explain the experimental results in terms of what they know about parallel-plate capacitors.	**Key vocabulary** (electric) potential, supply, battery, capacitor, uniform electric field, plate. dielectric, electrometer, voltmeter. **Communicative structures** Sentence structures related to mathematical relations, the description of physical phenomena, and to making hypothesis, e.g. - I think the voltage increases/decreases because...		perform the experiments are: a power supply, an electrometer, a voltmeter, and an adjustable parallel-plate capacitor. In alternative T can show on the IWB the youtube video by MITtech “MIT Physics Demo -- Adjustable Capacitor with Dielectric” (link). The video lasts about two minutes and has no audio, so it is up to T to do the explanation. The description under the video provides a good explanation of what is	the scientific terms used.

						shown.	

3	10	Applying the knowledge acquired during the previous activity. Visualising the electric field inside a capacitor. Visualising the electrostatic shielding effect. Critcal thinking.	- T gives Ss instructions to open the online applet “Electrostatics landscapes” (an interactive app by thephysicsclassroom.com). - Ss work in groups of 3/4. - Ss read the instructions and ask questions/clarifications. - Ss can use the applet to “build” a parallel-plate capacitor and visualise the electric field and the electric potential between the plates. - Ss can also place a conductor with a cavity between the plates and see how the electric field inside the cavity vanishes.	**Skills** L S R W **Key vocabulary** (electric) current, (electric) potential, probe, electrode, shielding. **Communicative structures** Sentence structures related the description of physical phenomena, and to making hypothesis, or giving opinions/comments, e.g. - we can observe that the electric field inside the cavity vanishes.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	T gives Ss the link to acccss the online app “Electrostatics landscapes”: link Ss work in groups and each group uses the laptop available on their lab desk.	Formative assessment. During the ativity T goes around the lab to supervise the work, giving advice if necessary, and assessing the level of comprehension and of participation of the various Ss.

4	5	Reviewing the definition of capacity in terms of charge and potential difference. Reviewing the definition of capacity of a parallel-plate capacitor in terms of the area of the plates, the distance between the plates, and the dielectric constant of the material that occupies the space between the plates. Commenting and reviewing the results of the experiment (or those observed in the video) and those of the simulations done with the online app in the previous activity.	- T reviews the main concept and results encountered during this lesson. - Ss can give comments and opinions.	**Skills** L S R W **Key vocabulary** (electric) potential, supply, battery, capacitor, uniform electric field, plate. dielectric. **Communicative structures** Sentence structures related to mathematical relations, to the description of physical phenomena, and to giving comments and opinions, e,g, - we have observed that... - we have demonstrated that...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	2	**Lesson number**	5	**Title**	Ohm’s first law – theory

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	20	Recalling the definition of electric current. Recalling the main notions about batteries. Learning the relation between voltage, current, and resistance in a circuit (Ohm’s firs law).	- T reviews the definition of electric current and the properties of batteries (already seen in lessons not included in this module). - T explains Ohm’s first law in the usual form V=R I. - T asks Ss to find I or R by manipulating that formula - Ss take notes during the explanation, and then carry out the task. - The correct answers are then wrtitten on the blackboard and discussed.	**Skills** L S R W **Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance.	☑ Whole class ☐ Group work ☐ Pair work ☑ Individual work	None.	None.

				Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - Ohm’s law states that... - the resistance is directly/inversely proportional to...”			

2	15	Applying the knowledge acquired during the previous activity. Problem solving. Critical thinking.	- T gives Ss a simple exercise about Ohm's first law. - Ss solve the exercise in pairs. - A S is chosen to explain the solution of the exercise to her/his classmates. - The correction is discussed. - An info-graphic is shown that helps to generalise the result of the exercise.	**Skills** L S R W **Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance, light bulb. **Communicative structures** Sentence structures related to giving/receiving instructions, to mathematical relations and to the description of physical phenomena, e.g. - the resistance results...	☒ Whole class ☐ Group work ☐ Pair work ☒ Individual work	T shows the webpage link (from thephysicsclassroom.com) on the IWB. In particular the exercise given as a task to Ss is the one labeled “Quick quiz”, and the info-graphic is the table found on the same page just above the exercise.	T goes around the lab and supervises the work of the pairs, giving advice if needed. By asking targeted questions he checks the level of comprehension of the basic concepts that will be useful in the next activities, assessing the answers for both content and language.

3	15	Applying the knowledge acquired during the previous activity.	- T gives Ss instructions to open the online applet “know your potential” (an interactive app by thephysicsclassroom.com). - Ss use their smartphones to run the app. - Ss “play”	**Skills** L S R W	☐ Whole class ☐ Group work ☐ Pair work	T gives Ss the link to access the online app “know your potential”: link Ss use their smartphones to solve the first two levels of the app.	Self-evaluation: the app gives feedback to Ss after each question. Ss can use this

		Problem solving. Applying theoretical knowledge to a practical problem. Critcal thinking.	the first two levels of the app: “color those wires” and ”Which bulbs light?”. - In the first level Ss evaluate the electric potential in various parts of a circuit. - In the second level Ss have to identify the light bulbs that would light in a given circuit.	**Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance, light bulb, connected in series/in parallel.], wire. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - i think that portion of the wire has a higher potential. - According to the legend the color corresponding to the highest/lowest potential is...	▣ Individual work			feedback to assess their own knowledge and level of comprehension. During the ativity T goes around the lab to supervise the work, giving advice if necessary.

CLIL Lesson Plan

Unit number	2	**Lesson number**	6	**Title**	Ohm’s second law – theory and experimental demonstration

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	20	Learning the relation between the resistance of a wire and its length, section, and resisitivity. Learning how the resistivity of a material determines its conduction properties (i.e. if it is a conductor, a semiconductor, or an insulator).	- T explains Ohm’s second law in the usual form R= ρ L/A. - Then T asks Ss to find the resistivity ρ, the length L or the section A by manipulating that formula - Ss take notes during the explanation, and then carry out the task. - The correct answers are then written on the blackboard and discussed.	**Skills** L S R W **Key vocabulary** resistor, (electrical) resistance, resisitivity, wire, length, section. **Communicative structures** Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - Ohm’s law states that... - the resistance is directly/inversely proportional to...	☒ Whole class ☐ Group work ☐ Pair work ☒ Individual work	None.	Formative assessment. T informally assesses the contributions of Ss to the discussion for both insight and language.

2	15	Observing experimental demonstrations of Ohm’s second law. Note taking and data handling. Orgainsing and analysing data.	- T conducts an experiment at his desk. - T builds a simple circuit using a battery and a long wire, and measures voltage and current with a multimeter. - The experiment is repeated with wires of different lengths, different sections, and made of different materials. - Ss note down the results and ask questions.	**Skills** L S R W **Key vocabulary** wire, copper, conductor, metal, multimeter, voltmeter, ammeter, length, section **Communicative structures** Sentence structures related to describing steps of a process, e.g. - let's measure the resistance for a wire [length] long. - the resistance of the wire is...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	The materials needed to conduct this experiment are available in most physics labs.The tools needed to perform the experiments are: a battery, a multimeter (to measure voltages and currents), and wires of different lengths, sections, and materials. The number of measurements can be chosen by T depending on the time available.	None.

3	15	Analysing experimental data. Visualising data. Cooperating. Organising the group work. Giving comments and opinions.	- Working in groups of 3 or 4, Ss analyse the data collected during the previous activity: for each wire they calculate the resistance R dividing the voltage V by the current I. - Ss organise the data and use them to draw 3 plots: resistance vs. length (for wires of fixed material and section), resistance vs. section (for wires of fixed material and length, resistance vs. resistivity of the material (for wires of fixed length and section). - It is important that Ss organise the group work well, distributing the data corresponding to different plots between the group members. - The results are discussed with the whole class.	**Skills** L S R W **Key vocabulary** wire, copper, conductor, metal, multimeter, voltmeter, ammeter, length, section **Communicative structures** Sentence structures related to describing steps of a process, and graphs. - let's create a table with all the data corresponding to copper wires. - the horizontal axis should represent the... - remember to indicate the units of measurement.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Ss analyse the data in their personal notebooks. The plots and the tables with the data used to create the plots, are then copied on a paper that is handed in at the end of the lesson.	T goes around the lab and supervises the work of the pairs, giving advice if needed. By asking targeted questions T checks the level of comprehension of the basic concepts that will be useful in the next activities.

CLIL Lesson Plan

Unit number	2	**Lesson number**	7	**Title**	DC circuits – experiment: basic measurements

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**

1	15	Applying the knowledge acquired during the previous activities. Reviewing the knowledge about Ohm’s first law. Problem solving. Applying theoretical knowledge to a practical problem. Critcal thinking.	- T gives Ss instructions to open the online applet “know your potential” (the interactive app by thephysicsclassroom.com already used in lesson 5). - Ss “play” the third level ”Volt on it” using their smartphones. - In this level Ss calculate the electric potential in various parts of a circuit knowing current and resistances thus reviewing their knowledge of Ohm’s first law.	**Skills** L S **R** W **Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance, light bulb, connected in series/in parallel.], wire. **Communicative structures** Sentence structures related to giving/receive instructions, giving opinions or comments, and describing steps of a procedure, e.g. - the voltage in this point of the circuit is...	☐ Whole class ☐ Group work ☐ Pair work ☒ Individual work	T gives Ss the link to acccss the online app “know your potential”: link. Ss use their smartphones to solve the third level of the app.	Self-assessment the app gives feedback to Ss after each question. Ss can use this feedback to assess their own knowledge and level of comprehension. During the ativity T goes around the lab to supervise the work, giving advice if necessary.

2	15	Practicing the skills necessary to rigorously carry out a scientific experiment. Using a circuit board to create simple circuits.. .	- T gives the main instructions necessary to use the circuit board. - T draws on the blackboard a simple cicuit composed by a battery, a wire, and a light bulb. - Each group of Ss, using a circuit board, replicates the same circuit, paying attention to the connections. - Then a slightly more complicated circuit, composed by a battery and two light bulbs connected in series is drawn at the blackboard. - Ss replicate also this circuit using the circuit board. - The behavior of the two circuits and the possible issues are discussed with the whole class.	**Skills** L S R W **Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance, light bulb, connected in series/in parallel.], wire. **Communicative structures** Sentence structures related to giving/receiving instructions, giving opinions or comments, and describing steps of a procedure, e.g. - connect one end of the wire to the battery, and the other hand to the light bulb. - don't connect directly one pole of the battery to the other.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Each group receives a circuit board equipped with a battery, various connection points, and 3 light bulbs. This kind of equipment is easily found in most physics labs.	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to communicate with their group mates and to solve any issues encountered.

3	20	Learning to use a multimeter: an instrument used to measure resistances, currents, and voltages. Understanding the connection between the experiment and the theory examined in the previous lessons.	- T shows Ss how to measure resistances, currents, and voltages with a multimeter. - The different ways of connecting the multimeter to a circuit (in series for currents, in parallel for voltages) are analysed. - With the help of T, Ss build a simple circuit consisting of a battery and a resistor and, employing the methods just learned, measure the current, the voltage, and the resistance.	**Skills** L S R W **Key vocabulary** (electric) current, (electric) potential, battery, electromotive force, resistor, (electrical) resistance, light bulb, connected in series/in parallel.], wire, voltmeter, ammeter, multimeter.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	Each group uses the same circuit board used in the previous activity, and receives a resistor that will be used to build a circuit. This kind of equipment is easily found in most physics labs.	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to solve any issues encountered.

				Communicative structures Sentence structures related to giving/receiving instructions, and describing steps of a procedure, e.g. - to measure a current you have to connect the multimeter "in series". - to measure a potential difference, the multimeter must be connected "in parallel".			

CLIL Lesson Plan

Unit number	2	**Lesson number**	8	**Title**	DC circuits – experiment: resistors in series

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	10	Practicing the skills necessary to rigorously carry out a scientific experiment. Practiing the use of a multimeter to measure the main physical quantities that describe the behavior of a DC circuit.. Particular attention is paid to the correct use of the units of measurement.	- Following the instructions given in Section 3 – Part 1 of the document “DC circuits – Lab report” (file U2_L8_ALL1.pdf), the Ss carry out an experiment about a simple DC circuit that includes a single resistor, and collect the experimental data required in the document.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - reproduce the circuit shown in figure... - measure the current flowing through the circuit connecting the multimeter...	☐ Whole class ▣ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf • U2_L8_ALL2.zip Each group receives a printed copy of the document “DC circuits – Lab report” U2_L8_ALL 1.pdf (editable version U2_L8_ALL2.zip) Each group receives the lab tools described in Section 3 of that document.	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to communicate with their group mates and to solve any issues encountered.

2	5	Using the theoretical knowledge acquired in the previous activities to find connections between the theory and the experimental results. Making educated guesses/hypotheses. Practicing critical thinking to interpret he results.	- Ss analyse the data collected and write their results and answers in the spaces provided in Section 3 – Part 1 of U2_L8_ALL1.pdf. - Ss compare the measured value of the resistance to the one obtained by using Ohm's law starting from the measured values of current and voltage.	**Skills** L S R W **Key vocabulary** see the "Glossary" section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, making hypothesis giving opinions or comments, and describing steps of a procedure. e.g. - the measured value of the resistance is equal to/greater than/less than the calculated value.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf	T goes around the lab and supervises the work of the groups, giving advice if required.

3	20	Practicing the skills necessary to rigorously carry out a scientific experiment. Practiing the use of a multimeter to measure the main physical quantities that describe the behavior of a DC circuit.. Particular attention is paid to the correct use of the units of measurement.	- Following the instructions given in Section 3 – Part 2 of the file U2_L8_ALL1.pdf, Ss carry out an experiment about a simple DC circuit that includes two resistors connected in series, and collect the experimental data required in the document.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - we need to connect one end of the first resistor to one end of the second resistor. - connect the multimeter to the two ends of one resistor.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf + lab tools described in the document.	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to communicate with their group mates and to solve any issues encountered.

4	15	Using the theoretical knowledge acquired in the previous activities to find connections between the theory and the experimental results. Making educated guesses/hypotheses. Practicing critical thinking to interpret the results.	- Ss analyse the data collected and write their results and answers in the spaces provided in Section 3 – Part 3 of U2_L8_ALL1.pdf. - They make hypothesis about the formula that describes the equivalent resistance of a circuit that includes two resistors in series.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, making hypotheses, giving opinions or comments, and describing steps of a procedure. e.g. - i think that the equivalent resistance is equal to the sum of the resistance of the two resistors. - i agree/disagree because...	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf	T goes around the lab and supervises the work of the groups, giving advice if required.

CLIL Lesson Plan

Unit number	2	**Lesson number**	9	**Title**	DC circuits – experiment: resistors in parallel

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	20	Practicing the skills necessary to rigorously carry out a scientific experiment. Practicing the use of a multimeter to measure the main physical quantities that describe the behavior of a DC circuit.. Particular attention is paid to the correct use of the units of measurement.	Following the instructions given in Section 3 – Part 3 of the file U2_L8_ALL1.pdf, Ss carry out an experiment about a DC circuit that includes two resistors in parallel, and collect the experimental data required in the document.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to giving/receiving instructions, e.g. - measure the current flow through each resistor.	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf + lab tools described in the document.	T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of Ss is informally assessed, as well as their ability to communicate with their group mates and to solve any issues encountered.

2	15	Using the theoretical knowledge acquired in the previous activities to find connections between the theory and the experimental results. Making educated guesses/hypotheses. Practicing critical thinking to interpret the results.	- Ss analyse the data collected and write their results and answers in the spaces provided in Section 3 – Part 3 of U2_L8_ALL1.pdf. - Ss make hypotheses about the formula that describes the equivalent resistance of a circuit that includes two resistors in parallel. When the task is completed, each group hands in the lab report.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, making hypothesis giving opinions or comments, and describing steps of a procedure. e.g. - we think that the equivalent resistance is equal to....	☐ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• U2_L8_ALL1.pdf	T goes around the lab and supervises the work of the groups, giving advice if required. The performance evaluation is done on the lab reports handed in by the groups.

3	10	Compare the results about the equivalent resistance obtained by the groups in the kessibs about DC circuits. Making and discussing hypotheses. Presenting results.	- T asks the class questions about the formulas for the equivalent resistance found during the previous activities. - The various answers are written on the blackboard. It is up to Ss to spot any wrong answers and to correct them, using examples to support their theses. - For what concerns the formula for the equivalent resistance in the case with two resistors in parallel T encourages Ss to consider the units of measurement to check the validity of their hypotheses. - The correct formula is then discussed with the whole class.	**Skills** L S R W **Key vocabulary** see the "Glossary" document U2_L8_ALL1.pdf **Communicative structures** Vocabulary and sentence structures related to suggesting and to mathematical formulas, e.g. - If the formula were... then the resulting unit of measurement would be...	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	None.	Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the answers and the insight of Ss based on both content and language.

4	5	Summarising the key concepts studied during the lessons about DC circuits Giving opinions and comments on the lessons.	- T summarises the key steps followed in the lessons about DC circuits. - Ss can give personal/group comments and opinions.	**Skills** L S R W **Key vocabulary** see the “Glossary” section of the file U2_L8_ALL1.pdf. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - we have calculated... - we have derived... - i think the lesson about... was...	☒ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.

CLIL Lesson Plan

Unit number	2	**Lesson number**	10	**Title**	Unit test + discussion

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1	35	Employing the knowledge acquired during this unit to solve a few short exercises. Understanding written instructions. Graph interpretation. Problem solving ability.	UNIT TEST. - Ss employ the knowledge acquired during this unit to solve three simple exercises. - T hands out the test and reads the questions out loud, making sure that all Ss have understood the tasks.	**Skills** L S R W **Key vocabulary** Scientific terms used in the rest of the unit. **Communicative structures** Sentence structures necessary to answer a question and describing steps of a procedure, e.g. - using Ohm's first law the current results...	☐ Whole class ☐ Group work ☐ Pair work ☑ Individual work	• U2_L10_ALL1.pdf • U2_L10_ALL2.zip Each student receives a printed copy of the document "Physics test", see file U2_L10_ALL1.pdf (editable version U2_L10_ALL2.zip)	Performance evaluation.

2	15	Correcting (parts of) the unit test. Self assessment. Giving opinions and comments on the CLIL module.	- Ss can ask for the correction of the exercises of the test. In this case T works out the exercises at the blackboard and answers the Ss' questions. - Ss can also give personal/group comments and opinions about the CLIL unit or the CLIL module.	**Skills** L S R W **Key vocabulary** Scientific terms used in the rest of the unit. **Communicative structures** Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - in exercise ... the ... had to be calculated using.... - i think the module was...	☑ Whole class ☐ Group work ☐ Pair work ☐ Individual work	None.	None.