

CLIL Module Plan

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School	Liceo da Vinci - Trento				
School Grade	<input type="radio"/> Primary		<input type="radio"/> Middle		<input checked="" type="radio"/> High
School Year	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Subject	Fisica	Topic	Dynamics, conservation laws, gravitation		
CLIL Language	<input checked="" type="radio"/> English		<input type="radio"/> Deutsch		

Personal and social-cultural preconditions of all people involved	<p>INSTITUTIONAL FRAMEWORK CONDITIONS The scientific high school "Leonardo da Vinci" is one of the historical "Liceo" of the Province of Trento. Nowadays the "Leonardo da Vinci" high school proposes two curricula: the ordinary scientific curriculum and the applied sciences scientific curriculum.</p> <p>ANTHROPOGENIC AND SOCIO-CULTURAL FACTORS OF THE GROUP OF LEARNERS The class consists of 20 students. there are no SEN students or students of foreign origin.</p> <p>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 desk 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. For what concerns the academic performance, the level of the class is above average, but not excellent,. The behavior of the students is usually polite and participating. The majority of the students are well motivated and willing to learn new concepts, however there are elements of the class that do not have a specific interest in the subject or perceive the foreign language as a barrier.</p> <p>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).</p> <p>STUDENT GROUP PROFILE All the students are Italian mother tongue, and their average CEFR level is B1+. The students have no CLIL experience, but they are also following a CLIL module with the science teacher, and one carried out in cooperation by the maths and the physics teachers.</p>
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Students' prior knowledge, skills, competencies	Subject	Language
	<p>Knowledge of kinematics and of the laws of Newtonian dynamics. Definitions of kinetic energy, linear momentum, and angular momentum. 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. 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 skills are acquired during the module.</p>	<p>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. Students have good reading and writing skills.</p>

Timetable fit	<div> <div>☉</div> <div>Module</div> </div>	Length 20 lessons of 50' each
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Description of teaching and learning strategies	<ul style="list-style-type: none"> • 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. • The data collection/analysis software SparkVUE is massively used throughout the module. The choice of this software is due to the compatibility with the lab equipment. Other equivalent software and lab equipment can be employed. Moreover a variety of multimedia resources (in particular videos and online applets) is used. • The teacher provides different materials to support content and language scaffolding, and to consolidate learning, e.g. worksheets, extra exercises, and homework. • 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.
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Overall Module Plan

Unit: 1 Dynamics and forces Unit length: 10 lessons of 50' each	Lesson 1 Free fall
	Lesson 2 Centripetal force - experiment: part 1
	Lesson 3 Centripetal force - experiment: part 2
	Lesson 4 Static and dynamic friction - theory
	Lesson 5 Static and dynamic friction - experiment: part 1
	Lesson 6 Static and dynamic friction - experiment: part 2
	Lesson 7 Work and kinetic energy - theory
	Lesson 8 Work and kinetic energy - experiment: part 1
	Lesson 9 Work and kinetic energy - experiment: part 2
	Lesson 10 Presentations + unit test

Unit: 2 Conservation laws Unit length: 10 lessons of 50' each	Lesson 1 Elastic collisions - theory and graphical representation
	Lesson 2 Elastic collisions - experiment: part 1
	Lesson 3 Elastic collisions - experiment: part 2
	Lesson 4 Inelastic collisions - theory and graphical representation
	Lesson 5 Inelastic collisions - experiment: part 1
	Lesson 6 Gravitation - history
	Lesson 7 Gravitation – Newton’s law of gravitation
	Lesson 8 Gravitation - Kepler’s laws
	Lesson 9 Gravitation - Orbital motion: conservation of angular momentum
	Lesson 10 Presentations + unit test

CLIL Lesson Plan

Unit number	1	Lesson number	1	Title	Free fall
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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. Setting the main goals for the unit.	T explains the lesson plan for the present unit and gives a brief overview of the activities. Ss take notes and can ask questions.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary Plan, experiment, theoretical/experimental, teamwork, pair work, perform an experiment, dynamics, force, acceleration, work.	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None
				Communicative structures Vocabulary and sentences about planning. We/You are going to...			

2	5	Recalling the equations that describe the motion of an object in free fall.	BRAINSTORMING. - T asks the class what are the equations that describe the motion of an object in free fall and writes the answers on the blackboard. - It is up to Ss to spot the possible wrong answers, using examples to support their thesis, and to correct them.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary frame of reference, time interval, initial/final position, coordinate, velocity, function, free fall, constant acceleration, gravitational acceleration,	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	None	Formative assessment on content and language (in particular listening and speaking skills). T assesses the answers of Ss based on both content and exposition.
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3	15	Improving problem solving skills. Communicating and cooperating in a pair work.	- Ss solve individually an exercise about the motion of an object in free fall (see file U1_L1_ALL1.pdf). - Ss pair up and discuss the solution with their group mate. When they reach an agreement they ask the teacher for the correct solution of the exercise and compare the results.	Skills	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input checked="" type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L1_ALL1.pdf • U1_L1_ALL2.zip <p>T hands out to each S a paper with the text of the exercise that they have to solve. See file: U1_L1_ALL1.pdf (editable version U1_L1_ALL2.zip).</p>	Peer evaluation: the students discuss the solution of the exercise with their pair-mate. Formative/on-going evaluation: the teacher walks around the classroom and observes/evaluates what the students say and write, giving support when necessary.
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary Calculate, solve, height, under the influence Communicative structures - What is/are...? - How did/can/would you...? - Are you sure that....? Why?			

4	20	Applying theoretical knowledge to a concrete problem. Employing the knowledge about the motion of objects in free fall to design an experiment that can be used to test a person's reflexes.	Ss work in groups of 3 or 4. Following the instructions given by T, Ss set up an experiment that can give a measurement of a person's reflexes. Ss collect the results of the experiment from every member of the group, discuss and interpret them. T suggests questions to promote a reasoning about the results of the experiment.	<div data-bbox="958 92 1326 129">Skills</div> <div data-bbox="965 167 1319 210"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="958 247 1326 339"> Key vocabulary reflex, test, experiment </div> <div data-bbox="958 359 1326 515"> Communicative structures - Let's compare... - Does it make sense? </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	The instructions to design the experiment are given orally by T and summarised on the blackboard. In alternative the teacher can show the video link (from the youtube channel "science with bobert") that demonstrates how the experiment works.	T walks around the classroom and observes/evaluates the work done by the groups, giving support when necessary.
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5	5	Improving the ability to interpret and discuss the results of an experiment. Summarising and recalling the knowledge used during the lesson.	COMPARISON AND DISCUSSION. Ss write down their results on the blackboard. T manages and directs the discussion of the results by posing relevant questions. Ss answer the questions and give opinions/comments.	<div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary experimental result, outcome, comparison, order of magnitude, unit of measurement </div> <div> Communicative structures - My result is... - If we compare... to... we can see that... </div>	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None	Formative: language and content. T assesses the insight of the Ss as well as their ability to communicate and discuss their results.
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CLIL Lesson Plan

Unit number	1	Lesson number	2	Title	Centripetal force - experiment: part 1
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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 and the next lesson.	T explains the activities programmed for the two lessons "Centripetal force - experiment: part 1" and "Centripetal force - experiment: part 2"	Skills	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None	None
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary Centripetal force, experimental tools, sling, cork, washer.			
				Communicative structures Vocabulary and sentence structures related to planning, e.g. - We/you are going to...			

2	10	<p>Recalling the quantities and the equations that describe the uniform circular motion.</p> <p>Highlighting the link between the centripetal acceleration and the centripetal force. Giving opinion/comments.</p>	<p>BRAINSTORMING. - T asks the class what are the quantities and the equations that describe the uniform circular motion of an object, and writes the answers on the blackboard. - It is up to Ss to spot any wrong answer and to correct them, using examples to support their thesis. - In addition T steers the conversation towards Newtonian dynamics and lets Ss find out that the centripetal acceleration must be linked to the presence of a centripetal force.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary": file U1_L2_ALL3.pdf </div> <div> Communicative structures Vocabulary and sentence structures related to suggesting, and to mathematical formulas, e.g. - I think... - It should... - x equals/is greater than/is less than y - x times/divided by y equals ... - If we add/subtract... - The right/left hand side of the equation/inequality is... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	None	<p>Formative assessment on content and language (in particular listening and speaking skills). T assesses the answers and the insight of the Ss based on both content and their ability to communicate.</p>
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3	10	Vocabulary building. Recalling and summarising the knowledge about uniform circular motion.	FILLING THE BLANKS. - Ss work in groups of 3 or 4. - Every group receives a printed copy of the file U1_L2_ALL_1.pdf ("Centripetal force - Lab report") and works as a team to fill the blank spaces in sections 1 and 2 of the document.	<div data-bbox="1019 92 1373 209"> Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> </div> <div data-bbox="1019 245 1373 416"> Key vocabulary See the document "Glossary": file U1_L2_ALL3.pdf </div> <div data-bbox="1019 443 1373 895"> Communicative structures - I would write... - I think that word/formula is right/wrong. - I would write ... instead. </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L2_ALL1.pdf • U1_L2_ALL2.zip Every group receives a printed copy of the document "Centripetal force - Lab report": file U1_L2_ALL_1.pdf (editable version U1_L2_ALL2.zip)	Formative assessment on content and language (in particular writing skills). The teacher assesses the answers of the students. If one or more answers are wrong the teacher asks questions to help the students detect and correct their mistakes.
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4	5	Vocabulary building.	<p>Ss have some time to examine the document "Glossary" (file U1_L2_ALL3.pdf). Ss also have the task of completing the list by adding new words that they have encountered/will encounter during this or the following lesson.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" U1_L2_ALL3.pdf. </div> <div> Communicative structures - Take a look at... - I believe this word means... - Try to memorise the meanings of... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U1_L2_ALL2.zip • U1_L2_ALL3.pdf <p>Each S receives a printed copy of the document "Glossary": file U1_L2_ALL3.pdf (editable version included in U1_L2_ALL2.zip).</p>	None
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5	10	Following written instruction and assembling the experimental apparatus. Organising the group work. Cooperating.	<p>- Ss examine section 3 ("Experimental tools") of the document U1_L2_ALL1.pdf and assemble the experimental apparatus following the instructions. - Ss organise the group work assigning roles to each group member (e.g. one S takes care of the stop watch, one prepares a table to record the data,...) - T goes around the lab and supervises the work of the groups that are building the apparatus necessary to carry out the experiment.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary See the document "Glossary": file U1_L2_ALL1.pdf </div> <div> Communicative structures - I think I/you should [description of the role] - Where is [tool]? - Can you hand me [tool]? - Is somebody already using [tool]? </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U1_L2_ALL1.pdf Each group of Ss receives the lab tools described in section 3 of the file U1_L2_ALL1.pdf. These are very common objects that can be found in most physics labs. </div>	Formative: T models and elicits language.
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6	10	Vocabulary building. Recalling and employing the knowledge about uniform circular motion and the laws of dynamics. Listening and understanding an explanation in English.	FILLING THE BLANKS. - T explains the steps needed to perform the experiment and gives a brief explanation of the physics involved. - Ss take notes. - Based on this, every groups fills the blanks in section 4 ("Lab indications") of file U1_L2_ALL1.pdf.	<div data-bbox="1019 92 1373 151"> Skills </div> <div data-bbox="1019 167 1373 212"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1019 247 1373 419"> Key vocabulary see the document "Glossary": file U1_L2_ALL3.pdf </div> <div data-bbox="1019 438 1373 754"> Communicative structures Understanding a list of instructions, e.g. - First you need/have to....then... - Next you must... - The next step consists in... </div>	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L2_ALL1.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.
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CLIL Lesson Plan

Unit number	1	Lesson number	3	Title	Centripetal force - experiment: part 2
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	5	Having a clear picture of the steps that need to be followed to successfully perform the experiment. Recalling the contents of the previous lesson.	- By asking the groups questions about the different steps of the experiment, T summarises the contents of the previous lesson. - Ss can ask questions to other groups and/or to the teacher about any doubts risen during their re-elaboration of the contents of the previous lesson.	Skills <div>L S R W</div> Key vocabulary see the "Glossary"\document (file U1_L2_ALL3.pdf) Communicative structures Sentence structures related to asking questions, suggesting, and giving advice, e.g, - I am not sure if i understood the part about... - Can you explain....?	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None	Formative evaluation: the teacher evaluates both the content and the form of the answers.

2	10	Learning how to use the experimental apparatus properly. Learning the basic safety tips.	<p>- T demonstrates how to use the experimental apparatus correctly and safely. - Alternatively the teacher can show a video with the instructions. - Ss watch, listen and take notes, asking for clarifications if needed.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the "Glossary"\ document (file U1_L2_ALL3.pdf) </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, e.g. - I didn't understand the part about... - Can you explain how...? </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	T can either give the instructions directly or run the video link (from the youtube channel "FiziksPhun") on the IWB.	None.
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3	10	Performing a physics experiment. Practicing the ability necessary to carry out a physics experiment rigorously and safely, Improving teamwork and organisation skills.	Ss carry out the experiment as discussed in the previous parts of this lesson. 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..	<div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div>Key vocabulary</div> <div>see the "Glossary"\ document (file U1_L2_ALL3.pdf)</div> <div>Communicative structures</div> <div>Sentence structures related to the organisation of a teamwork, and to giving and receiving instructions, e.g. - Start/stop measuring. - Note down the following data... - The stopwatch reads....</div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L2_ALL1.pdf 	None
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4	15	Employing the knowledge about the basic methods of data analysis. Critically examining the results obtained. Critical thinking and comprehension of the physical phenomenon considered. Cooperating	Ss carry out the data analysis of the results obtained by following the steps described in Section 4 of the document U1_L2_ALL1.pdf.	Skills	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L2_ALL1.pdf The students are allowed to use a calculator or one of the laptops available in the physics lab.	T goes around the lab and supervises the work of the groups, giving advice if required
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary see the "Glossary"\ document (file U1_L2_ALL3.pdf)			
				Communicative structures - Calculate the average/mean value of... - Have we considered...?			

5	10	<p>Comparing the results obtained and the correct ones. Self/peer assessment: correction of own mistakes Giving opinions/comments on the lesson.</p>	<p>- T suggests a way to check the correctness of the results. - In case the results don't match the theoretical predictions Ss are encouraged to make hypotheses about the reason for the incongruences, - Ss also add their observations and conclusions in Section 5 of U1_L2_ALL1.pdf. - Ss give their comments on the lab experience. - At the end of the class each group hands in their lab report.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the "Glossary"\ document (file U1_L2_ALL3.pdf) </div> <div> Communicative structures - I think that... - I suppose that... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U1_L2_ALL1.pdf <p>Ss can use a calculator or one of the laptops available in the physics lab.</p> </div>	<p>Informal evaluation of the oral contributions: T evaluates both the content and the form of the answers. Summative evaluation of the lab reports handed in by each group.</p>
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CLIL Lesson Plan

Unit number	1	Lesson number	4	Title	Static and dynamic friction - theory
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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 and the next two lessons.	- T explains the activities planned for the three lessons "Static and kinetic friction – theory", "Static and kinetic friction – experiment – part 1" and "Static and kinetic friction – experiment – part 2". Ss take notes.	Skills	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.
				<div><div>L</div><div>S</div><div>R</div><div>W</div></div>			
				Key vocabulary Static/kinetic friction, coefficient, frictional forces.			
				Communicative structures Vocabulary and sentence structures related to planning, e.g. - We/you are going to...			

2	15	<p>Improving the ability to comprehend the physical phenomena behind everyday life actions. Identifying the main properties of the various forms of frictional forces. Making hypotheses. The teacher asks questions to the whole class in order to highlight the relevant properties of friction, The answers are used to make an educated guess of the mathematical formula that describes this force. In particular the students are required to think of examples of everyday activities that involve friction. Developing reasoning, enquiry, and creative thinking skills. Giving opinions/comments.</p>	<p>BRAINSTORMING. - T asks the whole class questions in order to highlight the relevant properties of friction, - The answers are used to make an educated guess of the mathematical formula that describes this force - In particular Ss are required to think of examples of everyday activities that involve friction.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div> Communicative structures - Can you think of an example...? - Does [quantity] play an important role when....? - What are the relevant properties...? - I think/suppose... - I agree/disagree... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<p>T writes on the blackboard the main concepts emerged during the discussion.</p>	<p>T informally evaluates both the insight and the form of the suggestions of the students.</p>
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3	20 [15 video+5 writing]	Identifying important data and information. Writing down keywords and relevant definitions. Vocabulary building. Giving an opinion or an informed/educated guess over the meaning of a word/sentence.	- Ss watch a video about friction in daily life. - T stops the video a couple of times to allow Ss to note down keywords and relevant definitions. - Ss have some time to work in pairs on the vocabulary, trying to clarify the meaning of the keywords through discussion and comparison.	<div data-bbox="1151 92 1500 209"> Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> </div> <div data-bbox="1151 268 1500 443"> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div data-bbox="1151 464 1500 895"> Communicative structures Vocabulary and sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - I think/believe [keyword] means... - I agree/disagree because </div>	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input checked="" type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	The T runs the video link by Mexus Education (uploaded on youtube by their fellow channel Iken Edu) on the IWB.	During the pair work activity T goes around the class, checks the understanding of the keywords, and gives advice if needed.
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4	10	<p>Formalisation of the concepts learned in the previous parts of the lesson: obtaining the relations that describe the intensity of frictional forces.</p> <p>Modelisation: translating intuitions and knowledge into correct mathematical symbols and relations. Making and discussing hypotheses. Developing reasoning, inquiry, and discussion skills.</p>	<p>- All the information about frictional forces obtained from the first brainstorming session and the video is re-elaborated and translated into mathematical relations and definitions. - Ss have to motivate their hypotheses and pay particular attention to the mathematical / logical consistency of their hypotheses.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div> Communicative structures - I think/believe... - I agree/disagree because... - According to me... - Given that.... ...must depend on... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<p>T writes on the blackboard the main concepts emerged during the discussion.</p>	<p>T evaluates both the insight and the form of the suggestions of the students. Ss can informally self-evaluate their level of comprehension by comparing their hypotheses with the correct answers obtained from the brainstorming directed by T.</p>
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CLIL Lesson Plan

Unit number	1	Lesson number	5	Title	Static and dynamic friction - experiment: part 1
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	10	Recalling the quantities and the equations that describe static and dynamic friction derived in the previous lesson.	- T asks the class what are the quantities and relations useful to describe static and dynamic friction, and in what situations do they apply, - The answers are written on the blackboard. - It is up to Ss to spot any wrong answer and to correct them, using examples to support their thesis.	Skills <div>L S R W</div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf).	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> 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 their ability to communicate.

				Communicative structures Sentence structures related to suggesting, and to mathematical formulas, e.g. - I think... - It should... - x equals/is greater than/is less than y - x times/divided by y equals ... - If we add/subtract... - The right/left hand side of the equation/inequality is...		
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2	15	Correct use of the specific terminology. Reviewing and summarising the knowledge about static and kinetic friction. Self assessment.	- Ss work in groups of 3 or 4. - Each group receives a printed copy of the document "Frictional forces - Lab report" (file U1_L5_ALL1.pdf) and works as a team to fill the blank spaces in sections 1 and 2 (until the title “Static friction”) of the document. - After 10 minutes T gives the correct answers and Ss correct their mistakes.	Skills	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none">• U1_L5_ALL1.pdf• U1_L5_ALL2.zip Each group receives a printed copy of the document "Frictional forces – Lab report" (file U1_L5_ALL1.pdf – editable version U1_L5_ALL2.zip)	Self-assessment: the group members correct their answers comparing them to those given by the teacher.				
				<table><tr><td>L</td><td>S</td><td>R</td><td>W</td></tr></table>				L	S	R	W
				L				S	R	W	
				Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf).							
Communicative structures - I would write... - I think that word/formula is... right/wrong. - I would write ...instead.											

3	5	Vocabulary building. Learning new (scientific) terms.	- Ss have some time to examine the “Glossary” document (file U1_L5_ALL3.pdf). - Ss add the new words and expressions learned and note down during the previous lesson.	<div data-bbox="1019 75 1373 151"> Skills </div> <div data-bbox="1019 151 1373 228"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1019 228 1373 422"> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div data-bbox="1019 422 1373 815"> Communicative structures - Take a look at... - Try to memorise the meanings of... </div>	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L5_ALL3.pdf T hands out to each student a copy of the document “Glossary” (file U1_L5_ALL3.pdf – editable version included in U1_L5_ALL2.zip)	None.
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4	20	Learning how to correctly set up an experiment. Organising the group work.	<p>- Ss examine sections 3 and 4 ("Lab indications – static friction experiment", and "Lab indications – dynamic friction experiment") of the document U1_L5_ALL1.pdf, and assemble the experimental apparatus for the two experiments by following the instructions. - Ss organise the group work assigning roles to each group member (e.g. one S will measure the angle formed by the track and the desk, one S will record the data,...).</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div> Communicative structures - I think I/you should [description of the role] because... - Where is [tool]? - Can you hand me [tool]? - Is somebody already using [tool]? </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U1_L5_ALL1.pdf <p>In addition each group receives the lab tools described in section 3 of the file U1_L5_ALL1.pdf. The lab equipment required is quite simple and can be found in most physics labs.</p>	T goes around the lab and supervises the work of the groups that are building the apparatus necessary to carry out the experiment.
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CLIL Lesson Plan

Unit number	1	Lesson number	6	Title	Static and dynamic friction - experiment: part 2
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	10	Recalling, re-elaborating, and employing the knowledge about static and dynamic friction acquired during the previous two lessons.	- Ss work in groups. - Ss fill the blanks in subsections "Static friction" and "Dynamic friction" of section 2 in the document U1_L5_ALL1.pdf	Skills <div>L S R W</div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). Communicative structures - I would write... - I think that word/formula is right/wrong. - I would write ... instead.	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> U1_L5_ALL1.pdf 	The answers are evaluated for both content and spelling (this task does not require writing complete sentences but only words or formulas). NB: this part is assessed when the students hand in their lab reports at the end of the lesson.

2	20	<p>Practicing the skills necessary to rigorously carry out a scientific experiment. Learning how to precisely note down the results of an experiment and organise them. Particular attention is paid to the correct use of the units of measurement.</p>	<p>- Following the instructions given in subsections 3.1 and 4.1 of the file U1_L5_ALL1.pdf, Ss carry out two experiments about static and dynamic friction, and collect the experimental data.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, e.g. - note down the following data:... - let's check... - maybe we should repeat this measurement. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U1_L5_ALL1.pdf + lab tools described in the document. 	<p>T goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of the students is informally assessed, as well as their ability to solve any issues encountered.</p>
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3	15	Analysing experimental data. Calculating averages and estimating errors. Critical interpretation of the results. Critical thinking.	- Ss analyse the data collected and write their results, together with additional observations, in the section "Discussion and observations" of the document U1_L5_ALL1.pdf. - When Ss complete the task, each group hands in their lab report.	<div data-bbox="1032 92 1377 129"> Skills </div> <div data-bbox="1032 165 1377 209"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1032 245 1377 416"> Key vocabulary see the document "Glossary" (file U1_L5_ALL3.pdf). </div> <div data-bbox="1032 443 1377 959"> 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.... </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L5_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.
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4	5	Summarising the key elements of the three lessons about static and kinetic friction. Giving opinions and comments on the lessons.	- T summarises the key steps followed in the three lessons about frictional forces. - Ss give personal/group comments and opinions.	<div>Skills</div> <div><div>L</div><div>S</div><div>R</div><div>W</div></div> <div>Key vocabulary see the "Glossary" document (file U1_L5_ALL3.pdf)</div> <div>Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - We found out that static friction is... - We have experimentally demonstrated that... - You have studied... then you carried out an experiment about...</div>	<div><input checked="" type="checkbox"/> Whole class</div> <div><input type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	None.	None.
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CLIL Lesson Plan

Unit number	1	Lesson number	7	Title	Work and kinetic energy - theory
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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 and the next two lessons.	- T illustrates the activities programmed for the three lessons “Work and kinetic energy - theory”, “Work and kinetic energy - experiment: part 1” and “Work and kinetic energy - theory”. - Ss take notes.	Skills	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.
				<div><div>L</div><div>S</div><div>R</div><div>W</div></div>			
				Key vocabulary Work, force, displacement, experiment, kinetic energy, mass, velocity.			
				Communicative structures Vocabulary and sentence structures related to planning, e.g. - We/you are going to...			

2	10	<p>Learning the relation between the work done by a force, and the variation of the kinetic energy of an object that experiences said force. Identifying keywords and main concepts. Learning the correct scientific terms.</p>	<p>- T provides each group with a copy of the document “Work and kinetic energy – Lab report” (file U1_L7_ALL1.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. - Ss and T may help the reader to pronounce the words correctly and to understand the meaning of keywords and unknown expressions.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary Work, kinetic energy, difference, variation, vector, scalar, scalar product. Other keywords and useful expressions are listed in the document “Glossary” (file U1_L7_ALL3.pdf) that will be handed out to the students at a later stage of this lesson. </div> <div> Communicative structures Vocabulary and sentence structures related to mathematical relations, specific scientific expressions, e.g. - An object experiences a force... - The work done by a force is... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U1_L7_ALL1.pdf • U1_L7_ALL2.zip <p>A printed copy of the document “Work and kinetic energy – Lab report” (file U1_L7_ALL1.pdf – editable version U1_L7_ALL2.zip) is handed out to each group of 3 / 4 students. T shows the same document on the IWB to enable each student to follow. Ss note down the keywords on their personal notebooks.</p> </div>	<p>Formative assessment and peer-evaluation of reading, speaking, and comprehension skills.</p>
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3	15	Improving graph interpretation ability. Employing theoretical knowledge about the relation between work and kinetic energy to solve a problem. Improving problem solving skills. Self-assessment.	- Ss work in teams to solve Exercise 1 from the document "Work and kinetic energy – Lab report". - After 10 minutes the solution is discussed with the whole class. (A student is chosen to solve the problem at the blackboard for the whole class)	Skills	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L7_ALL1.pdf 	Formative assessment of the solutions, and self-evaluation of comprehension level and graph interpretation skills.
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary see the document "Glossary" (file U1_L7_ALL3.pdf)			
				Communicative structures Vocabulary and sentence structures related to mathematical relations, specific scientific expressions, giving/discussing opinions, and describing a graph, e.g. - The horizontal axis represents... - The value of the force increases as...			

4	15	Improving graph drawing ability. Employing theoretical knowledge and creative thinking skills to solve a problem about the kinetic energy theorem. Self-assessment.	- Ss work in teams to solve Exercise 2 from the document "Work and kinetic energy – Lab report". - After 10 minutes the solution is discussed with the whole class. (A student is chosen to solve the problem at the blackboard for the whole class)	<div data-bbox="1003 92 1355 129"> Skills </div> <div data-bbox="1003 165 1355 212"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1003 248 1355 419"> Key vocabulary see the document "Glossary" (file U1_L7_ALL3.pdf). </div> <div data-bbox="1003 443 1355 995"> Communicative structures Vocabulary and sentence structures related to mathematical relations, specific scientific expressions, giving/discussing opinions, and describing parts of a graph e.g. - Draw a line that goes from ... to - The function must be/have... </div>	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L7_ALL1.pdf 	Formative assessment of the solutions, and self-evaluation of comprehension level and graph drawing skills. The intra-group discussion and correction enable the students to self-assess their level of understanding and their graph drawing skills,
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5	5	<p>Learning new (scientific) terms. Comparing the actual meaning of a series of new words with the meaning grasped during the earlier parts of the lesson,</p>	<p>- Ss examine the document "Glossary" (file U1_L7_ALL3.pdf). - Ss add the new words and expressions learned and noted down during the previous lesson.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf) </div> <div> Communicative structures - Take a look at... - Add the new words that you have noted down during the lesson. </div> </div>	<div> <input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U1_L7_ALL3.pdf Every student receives a printout of the file U1_L7_ALL3.pdf </div>	<p>Self-assessment of the vocabulary.</p>
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CLIL Lesson Plan

Unit number	1	Lesson number	8	Title	Work and kinetic energy - experiment: part 1
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	10	Recalling the kinetic energy theorem and the related scientific terms. Reviewing the knowledge acquired during the previous lesson.	- T asks the class questions about the kinetic energy theorem and the relation between work and kinetic energy, - The 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.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf).	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> 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 language.

				Communicative structures Vocabulary and sentence structures related to suggesting and to mathematical formulas, e.g. - I think... - It should... - x equals/is greater than/less than y, - x times/divided by y equals ... - If we add/subtract... - The right/left hand side of the equation/inequality is...		
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2	5	Having an overview of the steps needed to perform an experiment designed to prove the validity of the kinetic energy theorem.	- T briefly explains the steps that Ss are going to take during the present and the next lesson. These steps are explained in detail in Sections 3 and 4 of the document U1_L7_ALL1.pdf.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf). Communicative structures Sentence structures related to planning, e.g. - We/you are going to...	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.
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3	25	Learning to use a software for data collection and analysis.	- Ss learn to use the main tools of a software for data collection and analysis, following the detailed indications given in Section 3 of the document U1_L7_ALL1.pdf.	<div>Skills</div> <div><div>L</div><div>S</div><div>R</div><div>W</div></div> <div>Key vocabulary see the "Glossary" document U1_L7_ALL3.pdf</div> <div>Communicative structures Vocabulary and sentence structures related to giving/receiving instructions, e.g. - click on the ... button - press Play, then...</div>	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input checked="" type="checkbox"/> Individual work</div>	<div>• U1_L7_ALL1.pdf</div> <div>Every group receives the lab tools described in Section 3 of the document U1_L7_ALL1.pdf and uses a laptop equipped with the software PASCO sparkVUE* (pre installed). Screenshots illustrating the main tools of the software are shown to the students on the IWB. (see file U1_L8_ALL1.zip). *This software is used because it is compatible with the equipment of the lab. Other similar software and equipment can be used instead.</div>	None
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4	10	Using a software for data collection and learn to interpret the resulting graphs,	- Ss make simple measurements using the experimental apparatus. - Ss try to move the cart up and down the track and to interpret the resulting graphs describing its motion. - Ss are free to choose how to move the cart on the track, so that every group ends	<div>Skills</div> <div><div>L</div><div>S</div><div>R</div><div>W</div></div> <div>Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf).</div>	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	<div><div>• U1_L7_ALL1.pdf</div><div>Each group uses the lab tools described in Section 3 of the document U1_L7_ALL1.pdf and a laptop equipped with the software PASCO sparkVUE* (pre installed).</div></div>	T goes around the class supervising the work of the groups, giving advice on how to solve issues with the software.
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...every group ends up having a different physical situation to interpret.

Communicative structures

Sentence structures related to instructions and suggestions, e.g. - Try moving the cart in the other direction. - Try moving the cart faster. - How can we interpret this part of the graph? - This part of the graph tells us that the cart was moving in ... direction at a speed of...

CLIL Lesson Plan

Unit number	1	Lesson number	9	Title	Work and kinetic energy - experiment: part 2
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	5	Practicing the skills necessary to rigorously set up a scientific experiment.	- Following the instructions given in Section 3 of the file U1_L7_ALL1.pdf, the students set up the experimental apparatus.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf). Communicative structures Sentence structures related to giving/receiving instructions, e.g. - Place the track on top of the tale. - Check that the thread stays parallel to the track. -	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U1_L7_ALL1.pdf + lab tools described in the document.	The teacher goes around the lab and supervises the work of the groups that are building the apparatus necessary to carry out the experiment.

2	20	<p>Practicing the skills necessary to rigorously carry out a scientific experiment. Learning how to use specific software to collect experimental results and organise them. Cooperating. Particular attention is paid to the correct use of the units of measurement.</p>	<p>- Following the instructions given in Section 3 of the file U1_L7_ALL1.pdf, the students carry out an experiment about the kinetic energy theorem. - Ss collect the experimental data required in Section 4 of the same file.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf). </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, e.g. - Start recording the data. - Make sure the weight is not moving. - Let's repeat this measurement. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U1_L7_ALL3.pdf • U1_L8_ALL1.zip <p>+ lab tools described in the document.</p>	<p>The teacher goes around the lab and supervises the work of the groups that performing the experiment. The level of participation of the students is informally assessed, as well as their ability to solve any issues encountered.</p>
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3	20	<p>Learning to analyse experimental data using specific software. Critical interpretation of the results. Critical thinking.</p>	<p>- Ss analyse the data collected and write their results, in the spaces provided in Section 4 of U1_L7_ALL1.pdf, adding their conclusions and observations. - When Ss complete the task, each group hands in their lab report.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the "Glossary" document (file U1_L7_ALL3.pdf). </div> <div> Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - We have observed that... - We encountered an issue when [description of the step]. - We believe that this happened because... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<p>• U1_L7_ALL1.pdf + lab tools described in the document.</p>	<p>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.</p>
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4	5	Summarising the key elements of the three lessons about the kinetic energy theorem. Giving opinions and comments on the lessons.	T summarises the key concepts examined in the three lessons about work and kinetic energy. Ss can give personal/group comments and opinions. As a homework the groups are asked to prepare a short presentation (about 5 minutes, with the possibility of using slides) about one of the experiments carried out during this unit. In the next lesson 3 groups will give a presentation to the rest of the class.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - you have carried out an experiment about... - you demonstrated that... - i believe these lessons were...	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	None.	None.
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CLIL Lesson Plan

Unit number	1	Lesson number	10	Title	Presentations + unit test
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	25	Practicing presentation skills. Reviewing the knowledge acquired during the unit. Describing (steps of) a process. Presenting results. Giving opinions/comments. Asking questions.	- Three groups are selected to give a 5 minutes presentation about one of the experiments carried out in this unit. - The rest of the class can ask questions during and/or at the end of the presentation.	Skills <div>L S R W</div> Key vocabulary present, show, result + all the vocabulary used during the present unit.	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	Ss can load their slides on the PC of the lab, which is connected to the IWB.	T evaluates the oral presentations as well as the slides for both content and language. Peer-evaluation: the students can ask questions and give comments on the presentations.

			Communicative structures			
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Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure (using past tenses), e.g. - to performed the experiment we have taken the following steps:.... - the apparatus of the experiment consisted of... - we organised the group work as follows:....

2	25	Employing the knowledge acquired during this unit to answer a few short questions. Drawing/interpreting graphs.	Ss employ the knowledge acquired during this unit to answer a few short questions. T hands out the test (file U1_L10_ALL1.pdf) and reads the questions out loud, making sure that all the students have understood the tasks.	<div data-bbox="987 75 1361 151"> Skills </div> <div data-bbox="987 151 1361 228"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="987 228 1361 384"> Key vocabulary Scientific terms used in the rest of the unit. </div> <div data-bbox="987 384 1361 890"> Communicative structures Sentence structures related to receiving instructions, answering a question and describing steps of a procedure, e.g. - Determine the centripetal force... - The kinetic energy of the object when... is... </div>	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L10_ALL1.pdf • U2_L10_ALL2.zip Each student receives one copy of the document "Physics test - CLIL unit 1" (file U1_L10_ALL1.pdf - editable version U1_L10_ALL2.zip).	Performance evaluation.
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CLIL Lesson Plan

Unit number	2	Lesson number	1	Title	Elastic collisions - theory and graphical representation
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	5	Having an overview of the activities included in this unit. Setting the main goals for the unit.	- T illustrates the activities planned for this unit, all related to conservation laws. The lessons about collisions concern the conservation of energy and linear momentum, while the lessons about gravity regard the conservation of angular momentum. - Ss take notes.	Skills <div>L S R W</div> Key vocabulary collision, conservation, law, momentum, energy Communicative structures Sentence structures related to planning, e.g. - We/you are going to...	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.

2	10	Understanding the main points of a short introductory video about collisions. 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.	Skills	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	The teacher runs the video “Elastic and Inelastic Collisions” link from the youtube channel “Professor Dave Explains”.	None.
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary collision, conservation, law, momentum, energy, direction			
				Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena. - Object A approaches object B at a speed of...			

3	15	Learning the basic concepts about elastic collisions. Using the conservation of linear momentum and the conservation of kinetic energy to describe the motion of two objects involved in an elastic	- T works out the equations describing the motion of two objects involved in an elastic collision starting from the conservation of linear momentum and energy. - Ss take notes and ask questions.	Skills	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	T writes on the blackboard the equations and the mathematical steps necessary to reach the solution.	None.
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary collision, conservation, law, momentum, energy, set, simplify.			

collision.
Taking notes.
Identifying
relevant
information.

Communicative structures

Sentence structures
related to mathematical
relations and to the
description of physical
phenomena, e.g. - the
kinetic energy is
conserved, so... - the
law of conservation of
linear momentum
states that... - the sum
of the momenta of the
two objects before the
collision must be equal
to the sum of the
momenta of the two
objects after the
collision.

4	20	<p>Reading a text out loud, using the correct expressions to read mathematical relations. Practicing the ability to interpret a graph and extracting data from it. Using the appropriate scientific terms to present results and describe trends.</p>	<p>- Ss work in groups of 3 / 4 students. - Each group is provided with a printed copy of the document "Elastic collisions - Lab report - Introduction": file U2_L1_ALL1.pdf). - Ss are randomly asked to read aloud fragments of the text of the subsection "Part 1" of Section 2. - The meaning of the text is outlined after each paragraph. - T and Ss may help the reader to pronounce the words correctly and to understand the meaning of keywords and unknown expressions. - At the end of the subsection under consideration there is an exercise that involves the interpretation of a graph: Ss solve it in groups.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary collision, conservation, law, momentum, energy, set, simplify, x/y-axis, increasing/decreasing, slope. </div> <div> Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena. - From the graph we can observe that... - The trend is increasing/decreasing... - The full/dashed/dotted line represents... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U1_L1_ALL1.pdf • U1_L1_ALL2.zip <p>T provides each group of 3 / 4 students with a printed copy of the document "Elastic collisions - Lab report Part 1: Introduction": file U2_L1_ALL1.pdf - editable version U2_L1_ALL2.zip), The document is also shown to the whole class on the IWB to enable all the students to follow.</p> </div>	<p>Formative assessment and peer-evaluation of reading and comprehension skills.</p>
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CLIL Lesson Plan

Unit number	2	Lesson number	2	Title	Elastic collisions - experiment: part 1
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment				
1	5	Vocabulary building. Processing the information collected during the previous lesson.	- Ss examine the document “Glossary” (file U2_L2_ALL1.pdf). - Ss complete the list of words by adding new words that they have encountered during the previous lesson.	Skills	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	• U2_L2_ALL1.pdf The teacher hands out to each student a printed copy of the document “Glossary” (file U2_L2_ALL1.pdf - editable version included in U2_L1_ALL2.zip).	None.				
				<table><tr><td>L</td><td>S</td><td>R</td><td>W</td></tr></table>				L	S	R	W
				L				S	R	W	
				Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf)							
Communicative structures - Take a look at... - Memorise the meanings of...											

2	5	<p>Proving (qualitatively) the validity of an equation derived only from theoretical considerations during the previous lesson, Critical thinking.</p>	<p>- Using the carts and the track described in the first unit of this module, Ss observe what happens when two objects of different masses collide. - In particular Ss reproduce the physical situation described in the subsection "Part 1" of Section 2 of the document U2_L1_ALL1.pdf. - By observing the results of the experiment Ss qualitatively confirm the analytical results obtained during the previous activity.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf). </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, and describing steps of a process, e.g. - push the cart - the cart that was still now is moving. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U2_L1_ALL1.pdf + carts and tracks already used in the previous unit of this module. </div>	<p>Informal evaluation of the participation level of the various members of the groups, and of the rigorousness of the work by the groups.</p>
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3	15	Employing the knowledge about elastic collisions acquired in the previous lesson. Improving the ability to interpret and draw a graph. Using the appropriate scientific terms to present results and describe trends. Self- and peer-assessment.	<p>- Ss carry out the task described in the subsection “Part 2” of Section 2 of the document U2_L1_ALL1.pdf. The task involves the interpretation of a graph, the use of the equation describing the motion of two colliding objects derived in the previous lesson, and the drawing of a graph.</p> <p>- One group is chosen to present the correction of the exercise to the class.</p>	<div>Skills</div> <div><table><tr><td>L</td><td>S</td><td>R</td><td>W</td></tr></table></div> <div>Key vocabulary collision, conservation, law, momentum, energy, set, simplify, draw, plot, graph.</div> <div>Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, and to the description of trends, e.g. - the dashed line represents object 1. - the full line should be...</div>	L	S	R	W	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	<div>• U2_L1_ALL1.pdf</div>	Formative assessment. The answers given by Ss are assessed for both content and language.
L	S	R	W								

4	5	Proving (qualitatively) the validity of an equation derived only from theoretical considerations during the previous lesson, Critical thinking.	- Using the carts and the track described in the first unit of this module, Ss observe what happens when two objects of different masses collide. In particular they reproduce the physical situation described in the subsection “Part 2” of Section 2 of the document U2_L1_ALL1.pdf. - By observing the results of the experiment they qualitatively confirm the analytical results obtained during the previous activity.	<div>Skills</div> <div><div>L</div><div>S</div><div>R</div><div>W</div></div> <div>Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf)</div> <div>Communicative structures Sentence structures related to giving/receiving instructions, and describing steps of a process. - add a weight to the red/blue cart - push the red/blue cart.</div>	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	<div><div>• U2_L1_ALL1.pdf</div><div>+ carts and tracks used in the previous unit of this module.</div></div>	Informal evaluation of the participation level of the various members of the groups, and of the rigorousness of the work by the groups.
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5	15	<p>Employing the knowledge about elastic collisions acquired in the previous lesson. Improving the ability to interpret and draw a graph. Using the appropriate scientific terms to present results and describe trends. Self- and peer-assessment..</p>	<p>- Ss carry out the task described in the subsection “Part 3” of Section 2 of the document U2_L1_ALL1.pdf. The task involves the extraction of data from a graph and the use of the equation describing the motion of two colliding objects derived in the previous lesson. - One group is chosen to present the correction of the exercise to the class.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary collision, conservation, law, momentum, energy, set, simplify, draw, plot, graph. </div> <div> Communicative structures Vocabulary and sentence structures related to mathematical relations, to the description of physical phenomena, and to the description of trends, e.g. - the full line represents the heavier/lighter cart. - after the collision the full line is... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L1_ALL1.pdf 	<p>Formative evaluation: the teacher evaluates both the content and the form of the answers by the students.</p>
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6	5	<p>Proving (qualitatively) the validity of an equation derived only from theoretical considerations during the previous lesson, Critical thinking.</p>	<p>- Using the carts and the track described in the first unit of this module, Ss observe what happens when two objects of different masses collide. In particular they reproduce the physical situation described in the subsection "Part 3" of Section 2 of the document U2_L1_ALL1.pdf. -By observing the results of the experiment they qualitatively confirm the analytical results obtained during the previous activity.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf) </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, and describing steps of a process. - add a weight to the red/blue cart - push the red/blue cart. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U2_L1_ALL1.pdf + carts and tracks used in the previous unit of this module. </div>	<p>Informal evaluation of the participation level of the various members of the groups, and of the rigorousness of the work done by the groups.</p>
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CLIL Lesson Plan

Unit number	2	Lesson number	3	Title	Elastic collisions - experiment: part 2
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	5	Practicing the skills necessary to rigorously set up a scientific experiment. Cooperating. Organising the group work.	- T hands out to each group a printed copy of the document “Elastic collisions – Lab report Part 2:experiment” (file U2_L3_ALL1.pdf). - Following the instructions given in Section 3 of the file U2_L3_ALL1.pdf, Ss set up the experimental apparatus. - Ss organise the group work assigning roles to each group member (e.g. one S operates the laptop, one S pushes and stops the carts,...)	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf) and the section "Glossary" in file U2_L3_ALL1.pdf. Communicative structures Sentence structures related to giving/receiving instructions, e.g. - start/stop measuring - push/stop the carts	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L3_ALL1.pdf • U2_L3_ALL2.zip <p>T hands out to each group a printed copy of the document “Elastic collisions – Lab report Part 2:experiment” (file U2_L3_ALL _1.pdf – editable version U2_L3_ALL2.zip). The students use also the lab tools described in the document.</p>	The teacher goes around the lab and supervises the work of the groups that are building the apparatus necessary to carry out the experiment, assessing the level of participation of the different group members, and the organisation of the group work.

2	20	<p>Practicing the skills necessary to rigorously carry out a scientific experiment. Learning how to use a software to collect experimental results and organise them. Particular attention is paid to the correct use of the units of measurement. Cooperating.</p>	<p>- Following the instructions given in Section 3 of the file U2_L3_ALL1.pdf, Ss carry out an experiment about elastic collisions, and collect the experimental data required in Section 4 of the same file.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf) and the section "Glossary" in file U2_L3_ALL1.pdf. </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, e.g - add a weight to the blue/red cart. - push the blue/red cart. - start/stop the data collection. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<div> <ul style="list-style-type: none"> • U2_L3_ALL1.pdf + lab tools described in the document. </div>	<p>The teacher goes around the lab and supervises the work of the groups that are performing the experiment. The level of participation of the students is informally assessed, as well as their ability to solve any issues encountered.</p>
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3	20	Learning to analyse experimental data using specific software. Practicing critical thinking to interpret the results.	- Ss analyse the data collected and write their results in the spaces provided in Section 4 of U2_L3_ALL1.pdf, adding their conclusions and observations. - When the task is completed, each group hands in the lab report.	<div data-bbox="1032 92 1377 129"> Skills </div> <div data-bbox="1032 165 1377 209"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1032 245 1377 491"> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf) and the section "Glossary" in file U2_L3_ALL1.pdf. </div> <div data-bbox="1032 512 1377 1038"> 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... </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L3_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 handed in by the groups.
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4	5	Summarising the key concepts encountered during the three lessons about elastic collisions. Giving opinions and comments on the lessons.	T summarises the key steps taken in the three lessons about elastic collision, focusing in particular on the importance of the conservation laws in the description of elastic collisions. The students can give personal/group comments and opinions.	<div> Skills </div> <div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> </div> <div> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf) and the section "Glossary" in file U2_L3_ALL1.pdf. </div> <div> Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - We have observed that... - When [description of a step of the experiment] we noticed that... </div>	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.
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CLIL Lesson Plan

Unit number	2	Lesson number	4	Title	Inelastic collisions - theory and graphical representation
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	15	Learning the basic concepts about inelastic collisions. Using the conservation of linear momentum to describe the motion of two objects involved in an inelastic collision. Taking notes and identifying relevant information.	- T works out the equations describing the motion of two objects involved in an inelastic collision starting from the conservation of linear momentum. - Ss take notes and ask questions.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary collision, conservation, law, momentum, energy, set, simplify Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, e.g, - two objects involved in an inelastic collision... - a collision is completely inelastic if...	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	T writes on the blackboard the derivation of the equations describing an inelastic collision.	None.

2	15	Employing the knowledge about inelastic collisions acquired in the previous activity. Improving the ability to interpret a graph and extract data from it. Using the appropriate scientific terms to present results and describe trends. Self- and peer-assessment.	- Ss work in groups of 3/4. - T hands out to each group a printed copy of the document “Inelastic collisions – Lab report” - Ss carry out Exercise 1 in Section 2 of the document U2_L4_ALL1.pdf. The task involves the extraction of data from a graph and the written description of the properties of the physical situation. - One group is chosen to present the correction of the exercise to the class.	Skills	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	<div><div>• U2_L4_ALL1.pdf</div><div>• U2_L4_ALL2.zip</div></div> <div>Each group receives a printed copy of the document “Inelastic collisions – Lab report”: (file U2_L4_ALL1.pdf – editable version U2_L4_ALL2.zip),</div>	Formative assessment: the teacher evaluates both the content and the form of the answers by the students.
				<div>L</div> <div>S</div> <div>R</div> <div>W</div>			
				Key vocabulary			
				Communicative structures			
				collision, conservation, law, momentum, energy, set, simplify, draw, plot, graph.			

3	20	<p>Employing the knowledge about inelastic collisions acquired in the previous activity. Improving the ability to draw graphs. Cooperating. Using the appropriate scientific terms to present results and describe trends. Self- and peer-assessment.</p>	<p>- Ss carry out Exercise 2 in Section 2 of the document U2_L4_ALL1.pdf. The task involves calculation and drawing graphs. One group is chosen to present the correction of the exercise to the class.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary collision, conservation, law, momentum, energy, set, simplify, draw, plot, graph. </div> <div> Communicative structures Sentence structures related to mathematical relations, to the description of physical phenomena, and to the description of trends, e.g. - the horizontal full line represents... - the final velocity results... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L4_ALL1.pdf 	<p>Formative assessment: the teacher evaluates both the content and the form of the answers by the students.</p>
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CLIL Lesson Plan

Unit number	2	Lesson number	5	Title	Inelastic collisions - experiment: part 1
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
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1	5	Practicing the skills necessary to rigorously set up a scientific experiment. Cooperating and organising the group work.	- Following the instructions given in Section 3 of the file U2_L4_ALL1.pdf, Ss set up the experimental apparatus.	<div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary see the document "Glossary" (file U2_L2_ALL1.pdf): the key words are the same already encountered during lessons 1-3 of this unit. A few minor additions are listed in the section "Glossary" of the file U2_L4_ALL1.pdf. </div> <div> Communicative structures Sentence structures related to giving/receiving instructions, e.g, - check that the track is perfectly horizontal, - add a weight to the blue/red cart. </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L4_ALL1.pdf + lab tools described in the document.	T goes around the lab and supervises the work of the groups that are building the apparatus necessary to carry out the experiment, assessing the level of participation of the different group members, and the organisation of the group work.
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2	20	Practicing the skills necessary to rigorously carry out a scientific experiment. Learning how to use specific software to collect experimental results and organise them. Particular attention is paid to the correct use of the units of measurement.	Following the instructions given in Section 3 of the file U2_L4_ALL1.pdf, Ss carry out an experiment about inelastic collisions, and collect the experimental data required in Section 4 of the same file.	Skills	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L4_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 solve any issues encountered.
				<div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <p>Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf): the key words are the same already encountered during lessons 1-3. A few minor additions are listed in the section “Glossary” of the file U2_L4_ALL1.pdf.</p> <p>Communicative structures Sentence structures related to giving/receiving instructions, e.g. - start/stop the data collection. - push the blue/red cart.</p>			
3	20	Learning to	- Ss analyse the data			<ul style="list-style-type: none"> • U2_L4_ALL1.pdf 	T goes

analyse experimental data using specific software. Practicing critical thinking to interpret the results.	collected and write their results in the spaces provided in Section 4 of U2_L3_ALL1.pdf, adding their conclusions and observations. - When the task is completed, each group hands in the lab report.	<div><div><div><div><div>L</div><div>S</div><div>R</div><div>W</div></div></div></div><div>Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf): the key words are the same already encountered during lessons 1-3. A few minor additions are listed in the section “Glossary” of the file U2_L4_ALL1.pdf.</div><div>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....)</div></div>	<div><div><div><input type="checkbox"/> Whole class</div><div><input checked="" type="checkbox"/> Group work</div><div><input type="checkbox"/> Pair work</div><div><input type="checkbox"/> Individual work</div></div></div>	+ lab tools described in the document.	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.
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4	5	Summarising the key elements encountered during the two lessons about inelastic collisions. Giving opinions and comments on the lessons.	T summarises the key steps followed in the two lessons about inelastic collision, focusing in particular on the importance of the conservation of linear momentum in the description of elastic collisions. Ss can give personal/group comments and opinions.	<div>Skills</div> <div><div>L</div><div>S</div><div>R</div><div>W</div></div> <div>Key vocabulary see the document “Glossary” (file U2_L2_ALL1.pdf): the key words are the same already encountered during lessons 1-3. A few minor additions are listed in the section “Glossary” of the file U2_L4_ALL1.pdf.</div> <div>Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure,e.g. - You have carried out an experiment using... -</div>	<div><input checked="" type="checkbox"/> Whole class</div> <div><input type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	None.	None.

CLIL Lesson Plan

Unit number	2	Lesson number	6	Title	Gravitation - history
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	10	Learning the main properties of the geocentric model by Ptolemy. Having a clear picture of the historical context at the time of the Copernican revolution. Learning the main concepts introduced by Copernicus in his heliocentric model. Identifying keywords and relevant information.	- T briefly explains the main properties of the Ptolemaic system and gives a brief description of the historical context of the XV/XVI century. - T analyses the revolutionary ideas introduced by Copernicus and shows a conceptual map that summarises these concepts on the IWB. - Ss take notes and ask questions.	Skills <div>L S R W</div> Key vocabulary star, planet, moon, orbit, circle, heretic. Communicative structures Sentence structures related to description of past events. e.g. - Ptolemy thought/observed that... - Copernicus observed that...	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L6_ALL1.pdf T uses the blackboard to highlight the main points of the explanation. T shows the concept map (file U2_L6_ALL1.pdf - courtesy of Eleonora Castelli [eleonora.castelli@unitn.it] editable using specific software, e.g. Adobe Illustrator) on the IWB.	None.

2	15	<p>Understanding the main points of two short videos about Galileo Galilei and Johannes Kepler. Learning the main events of the lives of Galileo Galilei and Johann Kepler. Reading a concept map. Identifying important data, information, and keywords.</p>	<p>- T runs two videos (one about Galileo Galilei, and one about Johann Kepler) on the IWB, pausing them a few times to highlight the most important concepts. - T integrates the videos with additional information about Galilei and Kepler, showing concept maps on the IWB and explaining the main points. - Ss take notes can ask questions and clarifications.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary telescope, star, planet, moons of a planet, Jupiter, inquisition, heretic. </div> <div> Communicative structures Sentence structures related to describing past events and actions, e.g. - Galileo invented... - Kepler thought that... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L6_ALL2.pdf • U2_L6_ALL3.pdf <p>T runs two videos on the IWB: “Galileo Galilei – in a nutshell” link (from the youtube channel “NutshellEDU”), and “Famous scientist – Johannes Kepler” link (from the youtube channel Vancouver public schools). T shows two concept maps on the IWB (files U2_L6_ALL2.pdf, U2_L6_ALL3.pdf - courtesy of Eleonora Castelli [eleonora.castelli@unitn.it], editable using specific software, e.g. Adobe Illustrator)</p>	None.
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3	15	<p>Recalling and summarising the knowledge about Copernicus, Galilei, and Kepler. Completing a concept map. Using the correct scientific terms. Cooperation and organisation in the group work.</p>	<p>- Ss work in groups of 3 or 4. - Each group receives a printed copy of two files chosen randomly between those included in U2_L6_ALL_4.zip. These are copies of the concept maps used in the previous activities where parts of the text are replaced by blanks. - T makes sure that a group does not have to fill two concept maps about the same character. - Ss work in teams to fill the blanks present in the documents they receive</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary telescope, star, planet, moons of a planet, Jupiter, inquisition, heretic, orbit, law, ellipse. </div> <div> Communicative structures Sentence structures related to describing past events and actions, e.g. - Copernicus introduced... - Galileo invented... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L6_ALL4.zip <p>Each group receives a printed copy of two files chosen randomly between those included in U2_L6_ALL_4.zip.</p>	<p>During the activity T goes around the lab and supervises the work of the groups, assessing the level of participation of the various group members.</p>
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4	10	<p>Recalling and summarising the knowledge about Copernicus, Galilei, and Kepler. Using the correct scientific terms. Cooperation and organisation in the group work. Presenting own work to the rest of the class. Self- and peer-assessment.</p>	<p>-The groups present to the rest of the class the content of the blanks that they have filled during the previous activity. - Ss in the audience can ask questions and clarifications.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary telescope, star, planet, moons of a planet, Jupiter, inquisition, heretic, orbit, ellipse. </div> <div> Communicative structures Sentence structures related to describing past events and actions, e.g. - Galilei invented... - Kepler formulated three laws. </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L6_ALL4.zip 	<p>Formative assessment on content and language (in particular speaking skills). T assesses the answers of the students. If one or more answers are wrong T and Ss in the audience can ask questions to help detect and correct mistakes.</p>
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CLIL Lesson Plan

Unit number	2	Lesson number	7	Title	Gravitation – Newton's law of gravitation
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	15	Identifying the main quantities that determine the strength of the gravitational force between two bodies. Determining the direction of the gravitational force vector. Making educated hypotheses. Critical thinking. Giving opinions and comments.	BRAINSTORMING. - T asks the class questions about the gravitational force (e.g. is the gravitational force stronger on the surface of the Earth or on the surface of the Moon?). - Ss answer by using knowledge not necessarily acquired at school. - T writes on the blackboard the key concepts emerged during the discussion. - T steers the discussion in order to let the class consider all the main quantities that describe the gravitational force between two objects, and how these quantities should affect it.	Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> Key vocabulary gravity, gravitation, gravitational constant, mass, acceleration, distance, radius, planet, moon, proportional, direct/inverse/quadratic proportionality. Communicative structures Sentence structures related to suggesting and to mathematical formulas. e.g. - I think the force should decrease with the distance	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work		Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the insight of the hypotheses made by Ss.

2	15	<p>Understanding the main points of two short videos about Newton's law of gravitation. Identifying important data, information, and keywords.</p>	<p>- T runs a video on the IWB, pausing it a few times to highlight the most important concepts. - Ss take notes and ask questions and clarifications.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary gravity, gravitation, gravitational constant, mass, acceleration, distance, radius, planet, moon, proportional, direct/inverse/quadratic proportionality, </div> <div> Communicative structures Sentence structures related to describing past events and actions, and to mathematical formulas. e.g. - G is equal to 6.67 times 10 to the negative 11 </div> </div>	<div> <input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	<p>The teacher runs the video "Newtonian gravity: Crash Course Physics #8" from the youtube channel "CrashCourse" (link link)</p>	<p>None.</p>
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3	10	<p>Making links between different topics. Using previously acquired knowledge and combining it with new information to autonomously derive a formula for the gravitational acceleration on a planet. Making hypotheses and connections. Creative and critical thinking, Giving comments and opinions.</p>	<p>- T asks the class questions about the gravitational force and the second law of Newtonian dynamics. - T conducts the discussion in a way that Ss can derive the formula for the gravitational acceleration on a planet.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary gravity, gravitation, gravitational constant, mass, acceleration, distance, radius, planet, moon, proportional, direct/inverse/quadratic proportionality. </div> <div> Communicative structures Sentence structures related to suggesting and to mathematical formulas. Questioning hypothesis, e.g. - Does it make sense...? </div> </div>	<div> <input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work </div>	None.	<p>Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the insight of the hypotheses made by Ss.</p>
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4	10	Practicing problem solving skills. Searching for data online. Group work and communication.	- Ss work in groups of 3 or 4. - T assigns to each group the task of calculating the gravitational acceleration on the surface of a planet of the solar system. - Ss can use the laptop at their disposal to find the values of mass and radius of the different planets.	<div data-bbox="1093 92 1451 129"> Skills </div> <div data-bbox="1102 167 1442 209"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="1093 247 1451 459"> Key vocabulary Calculate, solve, radius, mass, planet, solar system, gravitational acceleration. </div> <div data-bbox="1093 481 1451 874"> Communicative structures Sentence structures related to giving\receiving instructions, mathematical relations, e.g. - According to Google the mass of Jupiter is... </div>	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	Each group solves their problem on a paper that will be handed in to T at the end of the lesson. Each group can use the laptop available on their desk to find data online.	Formative assessment on content and language (in particular writing and speaking skills). During the activity T goes around the lab and assesses the level of participation and comprehension of the different group members.
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CLIL Lesson Plan

Unit number	2	Lesson number	8	Title	Gravitation - Kepler's laws
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	20	Learning the three laws of Kepler. Understanding the implications of these laws and the ways they affected the history of mankind. Taking notes and identifying relevant information.	- T presents the three laws of Kepler (already mentioned in the previous lessons) in a more rigorous and precise form. - T outlines some of the main consequences that the discovery of this three laws had on the history of mankind. - Ss take notes and can ask questions and clarifications.	Skills <div>L S R W</div> Key vocabulary orbit, ellipse, focal point, focus, semimajor/semiminor axis, sweep, period. Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - All planets move around the Sun in elliptical orbits... - -	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none"> U2_L8_ALL1.pdf T shows the document "The 3 Kepler's laws" (file U2_L8_ALL1.pdf - courtesy of Eleonora Castelli [eleonora.castelli@unitn.it]) on the IWB.	None.

2	10	Verify the validity of Kepler's third law from experimental data. Using Kepler's third law to calculate the semi-major axis of the orbit of a planet, Applying previously applied knowledge. Problem solving. Critical thinking.	- T gives the students the task of solving the two exercises included in file U2_L8_ALL1.pdf without showing them the solution. - Ss solve the problem working individually. - After 7 minutes the solutions are shown and Ss compare their own work to the solution. - Ss can ask questions and discuss the solution.	<div data-bbox="958 92 1301 129">Skills</div> <div data-bbox="958 165 1301 209"> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div data-bbox="958 245 1301 448"> Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period. </div> <div data-bbox="958 485 1301 951"> Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - the semimajor axis of the orbit of Jupiter is equal to... - The period of revolution of the Earth is... </div>	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L8_ALL1.pdf 	Formative assessment on content and language (in particular writing and speaking skills). T assesses the content and the form of the answers of Ss.
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3	5	<p>Visualise the effects of Kepler's third law and of Newton's gravitation law using an online applet. Understanding the concept of eccentricity of an ellipse (and that a circle is a special kind of ellipse). Cooperation skills. Practicing the ability of making links between the theory and the concrete situations.</p>	<p>- T gives instructions to the students to find an online applet that helps visualising the effects of Kepler's third law and of Newton's law of gravitation. 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 orbit of a planet changes with eccentricity and how the orbital speed of a planet changes during one period of revolution. - Ss take notes about the simulations made.</p>	<table><tr><th colspan="4">Skills</th></tr><tr><td>L</td><td>S</td><td>R</td><td>W</td></tr></table> <p>Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.</p> <p>Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena and giving/receiving instructions. e.g. - how does the trajectory change if the eccentricity increases/decreases?</p>	Skills				L	S	R	W	<div><input type="checkbox"/> Whole class</div> <div><input checked="" type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	<p>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 about orbital motion (link)</p>	<p>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.</p>
Skills															
L	S	R	W												

4	15	<p>Processing the knowledge and information acquired about orbital motion. Writing complete answers using the appropriate scientific terms. Cooperation and organisation in a team work.</p>	<p>- Working in groups of 3 or 4, Ss answer to questions 1 to 5 of the document “Orbital motion interactive” (file U2_L8_ALL2.pdf). also using the applet of the previous activity..</p>	<div><div>Skills</div><div><div>L</div><div>S</div><div>R</div><div>W</div></div><div><div>Key vocabulary</div><div>orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.</div></div><div><div>Communicative structures</div><div>Sentence structures related to mathematical relations and to the description of physical phenomena and giving/receiving instructions, e.g. - Describe the object's velocity during the course of the elliptical orbit. - describe the object's velocity during the course of the elliptical orbit - describe the net force acting upon the object...</div></div></div>	<div><div><input type="checkbox"/> Whole class</div><div><input checked="" type="checkbox"/> Group work</div><div><input type="checkbox"/> Pair work</div><div><input type="checkbox"/> Individual work</div></div>	<div><div>• U2_L8_ALL2.pdf</div><div>T hands out to each group a printed copy of the document “Orbital motion interactive” (file U2_L8_ALL2.pdf (available at link))</div></div>	None.
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CLIL Lesson Plan

Unit number	2	Lesson number	9	Title	Gravitation - Orbital motion: conservation of angular momentum
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	10	Processing the knowledge and information acquired about orbital motion. Writing complete answers using the appropriate scientific terms. Cooperation and organisation in a team work.	- Working in groups of 3 or 4, Ss answer to questions 6 to 8 of the document “Orbital motion interactive” (file U2_L8_ALL2.pdf) , also using the applet of the previous lesson.	Skills	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	<ul style="list-style-type: none">• U2_L8_ALL2.pdf Each group works on their copy of the file U2_L8_ALL2.pdf received in the previous lesson.	None.
				L S R W			
				Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.			

				Communicative structures			
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Sentence structures related to mathematical relations and to the description of physical phenomena and giving/receiving instructions, e.g. - Draw the vectors... - Complete the following sentences... - Fill in the blanks...

2	10	<p>Discuss and comment the physics behind the phenomena observed during the previous activity and the previous lesson. Learning to make connections between previously acquired knowledge and new concepts.</p>	<p>- T asks questions about different scenarios that were e simulated with the online app during the previous activities. - Ss answer on the basis of the simulations made and the answers given during the previous activities.. - T directs the discussion in a way that Ss realise that Kepler’s second law must have something to do with angular momentum. - Ss take notes, make hypothesis and can give opinions and comments on the hypothesis made by their classmates.</p>	<table><tr><td colspan="4">Skills</td></tr><tr><td>L</td><td>S</td><td>R</td><td>W</td></tr><tr><td colspan="4">Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.</td></tr><tr><td colspan="4">Communicative structures Sentence structures related to mathematical relations, making hypothesis, and to the description of physical phenomena and giving comments/opinions, e.g. - Our simulation showed that... - We observed that... - the orbital velocity of the planet was higher when... and lower when...</td></tr></table>	Skills				L	S	R	W	Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.				Communicative structures Sentence structures related to mathematical relations, making hypothesis, and to the description of physical phenomena and giving comments/opinions, e.g. - Our simulation showed that... - We observed that... - the orbital velocity of the planet was higher when... and lower when...				<div><input checked="" type="checkbox"/> Whole class</div> <div><input type="checkbox"/> Group work</div> <div><input type="checkbox"/> Pair work</div> <div><input type="checkbox"/> Individual work</div>	None.	<p>Informal formative assessment on content and language (in particular listening and speaking skills). T assesses the insight of the hypotheses made by the Ss based on both content and form.</p>
Skills																							
L	S	R	W																				
Key vocabulary orbit, ellipse, focal point, focus, semi-major/semi-minor axis, sweep, period of revolution, eccentricity.																							
Communicative structures Sentence structures related to mathematical relations, making hypothesis, and to the description of physical phenomena and giving comments/opinions, e.g. - Our simulation showed that... - We observed that... - the orbital velocity of the planet was higher when... and lower when...																							

3	10	<p>Recalling the definition of angular momentum. Introducing the conservation of angular momentum. Combining Newton's law of gravitation and Kepler's laws.</p>	<p>- T asks Ss the definition of angular momentum. - The correct answer is written on the blackboard and the different quantities and units of measurement are briefly analysed. - T introduces the law of conservation of angular momentum and shows that the second Kepler's law can be derived from it. - Ss take notes and ask questions and clarifications.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary mass, velocity, vector product, direction, angular momentum, torque. </div> <div> Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena, e.g. - the angular momentum can be calculated as the vector product of... - the total angular momentum of a system remains constant unless... </div> </div>	<div> <input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	None.	None.
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4	15	<p>Processing the knowledge and information acquired about orbital motion and its relation to the conservation of angular momentum. Writing complete answers using the appropriate scientific terms. Cooperation and organisation in a team work.</p>	<p>- Working in groups of 3 or 4, Ss complete the "Conclusion" section of the document "Orbital motion interactive" (file U2_L8_ALL2.pdf). - In particular Ss highlight the link between the variation of the orbital velocity along the orbit and the conservation of angular momentum. - At the end of the activity each group hands in the complete document.</p>	<div> <div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary mass, velocity, potential/kinetic/total energy, work, vector product, direction, angular momentum, torque. </div> <div> Communicative structures Sentence structures related to mathematical relations and to the description of physical phenomena and giving/receiving instructions, e.g. - the variation of the orbital speed of the planet can be explained by.... - the orbital velocity of a planet is lower when... and higher when... </div> </div>	<div> <input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work </div>	<ul style="list-style-type: none"> • U2_L8_ALL2.pdf 	<p>Performance evaluation. The answers are assessed for both content and form.</p>
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5	5	Summarising the key concepts examined during the lessons about gravitation. Giving opinions and comments on the lessons.	<p>- T highlights the importance of conservation laws in particular in relation to the topics encountered during the present unit. - Ss can give personal/group comments and opinions. - As a homework the groups are asked to prepare a short presentation (about 5 minutes, with the possibility of using slides) about one of the experiments (or the interactive activity on gravitation) carried out during this unit. In the next lesson 3 groups will give a presentation to the rest of the class.</p>	<div>Skills</div> <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> <div> Key vocabulary mass, velocity, potential/kinetic/total energy, work, vector product, direction, angular momentum, torque. </div> <div> Communicative structures Sentence structures related to presenting results, giving opinions or comments, and describing steps of a procedure, e.g. - We have studied that.... - I think the lessons about gravitation were... </div>	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	None.	None.
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CLIL Lesson Plan

Unit number	2	Lesson number	10	Title	Presentations + unit test
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment
1	25	Practicing presentation skills. Reviewing the knowledge acquired during the unit. Describing (steps of) a process. Presenting results. Peer-assessment.	- Three groups are selected to give a 5 minutes presentation about one of the experiments carried out in this unit. - The rest of the class can ask questions during and/or at the end of the presentation.	Skills <div>L S R W</div> Key vocabulary present, show, result + all the vocabulary used in this unit.	<input checked="" type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	Ss can load their slides on the PC of the lab, which is connected to the IWB.	T evaluates the oral presentations as well as the slides for both content and language. Peer-assessment: the students can ask questions and give comments on the presentations.

2	25	Employing the knowledge acquired during this unit to answer a few short questions. Understanding written instructions. Drawing and interpreting graphs.	- Ss employ the knowledge acquired during this unit to answer a few short questions. - T hands out the test and reads the questions out loud, making sure that all the students have understood the tasks.	<div data-bbox="1003 92 1357 209"> Skills <div> <div>L</div> <div>S</div> <div>R</div> <div>W</div> </div> </div> <div data-bbox="1003 245 1357 378"> Key vocabulary Scientific terms used in the rest of the unit. </div> <div data-bbox="1003 399 1357 794"> Communicative structures Sentence structures necessary to answer a question and describing steps of a procedure, e.g. - the final speed of the object is... - Kepler's second law states that... </div>	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> • U2_L10_ALL2.zip • U2_L8_ALL2.pdf <p>Each S receives a printed copy of the document "Physics test - CLIL unit 2" (U2_L10_ALL1.pdf - editable version U2_L10_ALL2.zip).</p>	Performance evaluation.
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