

# CLIL Module Plan

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<b>School Grade</b>	<input type="radio"/> Primary		<input type="radio"/> Middle		<input checked="" type="radio"/> High
<b>School Year</b>	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input checked="" type="radio"/> 5
<b>Subject</b>	Scienze naturali	<b>Topic</b>		The chemical basis of heredity	
<b>CLIL Language</b>	<input checked="" type="radio"/> English			<input type="radio"/> Deutsch	

<b>Personal and social-cultural preconditions of all people involved</b>	<p>The group consists of 19 students, 17 females and 2 males. Science (biology) is not a core-subject of the curriculum (Linguistic High-school), thus students' personal motivation on the subject is heterogeneous. However, the profile of the class group is quite good, and they demonstrated through years maturity and engagement with school. Their English level is homogeneous: the average CEFR English level is around B2 or higher. About one third of the students is expected to attend to a C1 level certification during the school year. In the class there are no students with special educational needs. The teacher is a science teacher. His English CEFR Level is C1.</p>
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<b>Students' prior knowledge, skills, competencies</b>	<b>Subject</b>	<b>Language</b>
	Bacterial structure, Bacterial plasmids and bacterial transformation, the scientific method, proteins and enzymes, cell division	Passive forms, past simple, basic language to describe a process (First, then, next...), cause and effect (due to...;because of...; as a consequence of...) , expressing agreement and disagreement, predicting and justifying hypotheses (about a scientific experiment), giving instructions,

<b>Timetable fit</b>	<input checked="" type="radio"/> Module	Length 3
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**Description of teaching and learning strategies**

The whole module is structured on task-based activities, starting from simple exercises to verify understanding to problem solving situations. Almost all class activities are organized according to cooperative learning methodology, either in pairs or groups. To stimulate their interest in the subject, participation in class work and acceptance of challenges students are evaluated as individuals, pairs or group. Youtube videos, pptx slides and documents adapted by the teacher have been used.

# Overall Module Plan

<b>Unit: 1</b> Classic experiments: DNA as the genetic material <b>Unit length: 3</b>	<b>Lesson 1</b> Griffith's experiment
	<b>Lesson 2</b> Avery's experiment
	<b>Lesson 3</b> Hershey & Chase's experiment
	<b>Lesson 4</b> Test

# CLIL Lesson Plan

<b>Unit number</b>	1	<b>Lesson number</b>	1	<b>Title</b>	Griffith's experiment
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment				
1	5'	To introduce and explain the goals of the lesson; to know the state of knowledge and beliefs at that age about the genetic material.	The teacher introduces the goals of the lesson. Then, he briefly summarises the state of the art before Griffith's experiment, underlining most scientist suspected that proteins were the genetic material.	<p><b>Skills</b></p> <table border="1"> <tr> <td>L</td> <td>S</td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> genetic information, hereditary material, offspring, chromosomes,</p> <p><b>Communicative structures</b> Simple past, passive forms, "Do you wonder when... was discovered?" "What do you think about...?" "Proteins were believed to be..."</p>	L	S	R	W	<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"> <li>• U1_L1_ATT1.pdf</li> </ul> Blackboard; Introductory part of U1_L1_ATT1 document	Students express their belief about the topic; students express surprise or agreement.
L	S	R	W								

2	15'	To find new meanings of commonly used words, that are used in the biology context. To know how Griffith's experiment was set up.	Task 1: In group, students are asked to complete a gap-fill exercise on a text that explains Griffith's experiment (Second part of document U1_L1_ATT1). Missing words can be found at the bottom of the page. Teacher circulates and monitors, Students are encouraged to search the meaning of new words. Words that confuse students due to their multiple meanings (homonyms) are written on the blackboard. At the end the teacher clarifies the meaning of the trickiest words.	<p><b>Skills</b></p> <table border="1" data-bbox="1032 165 1373 212"> <tr> <td>L</td> <td><b>S</b></td> <td><b>R</b></td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> strain, smooth strain, rough strain, pneumonia, virulent, nonvirulent, bacteria, genetic material, plasmids, bacterial transformation, "transforming principle", petri dish, blood sample</p> <p><b>Communicative structures</b> Describing a sequence of events (past simple, when..., as it was ...); Cause-effect structures (so, since, hence, due to, as a result...)</p>	L	<b>S</b>	<b>R</b>	W	<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"> <li>• U1_L1_ATT1.pdf</li> </ul> <p>Second part of document U1_L1_ATT1</p>	Students discuss in group to decide how to fill the gaps. Students ask for the meaning of new words or ask for clarification about some meanings;
L	<b>S</b>	<b>R</b>	W								

3	10	To understand the results of Griffith's experiment and their meaning.	Students can check their answers to the previous task by watching a video explaining Griffith's experiment (from minute 0:00 to minute 4:30). Although the youtube channel is indian, speaker's accent is mild and not hard to understand. The video is played a second time in order to let students to summarise the new knowledge.	<p><b>Skills</b></p> <table border="1" data-bbox="1032 165 1373 212"> <tr> <td>L</td> <td>S</td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> strain, smooth strain, rough strain, pneumonia, virulent, nonvirulent, bacteria, genetic material, plasmids, bacterial transformation, "transforming principle", petri dish, blood sample</p> <p><b>Communicative structures</b> Describing a sequence of events (past simple, when..., as it was ...); Cause-effect structures (so, since, hence, due to, as a result...)</p>	L	S	R	W	<input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	youtube video: <a href="#">link</a>	Students check their own answers on activity two worksheet.
L	S	R	W								

4	15'	To understand that the "transforming principle" and the genetic material are the same thing. To be aware of the outcomes of this experiment. To be aware of the questions this experiment could not answer.	Key points of Griffith's experiment are summarised; in case, doubts and concerns are expressed by students and clarified by teacher.	<p><b>Skills</b></p> <table border="1" data-bbox="1032 165 1373 212"> <tr> <td>L</td> <td><b>S</b></td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b></p> <p><b>Communicative structures</b></p>	L	<b>S</b>	R	W	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work		Plenary correction of tasks and debate on the limits of the experiment
L	<b>S</b>	R	W								

# CLIL Lesson Plan

<b>Unit number</b>	1	<b>Lesson number</b>	2	<b>Title</b>	Avery's experiment
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment				
1	10'	To recall prior knowledge on Griffith's experiment To present the aims of the lesson	Students recall prior knowledge on Griffith's experiment and "the transforming principle". The process is helped by teacher's use of some slides and blackboard.	<p><b>Skills</b></p> <table border="1"> <tr> <td>L</td> <td><b>S</b></td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b></p> <p><b>Communicative structures</b>            "Could you tell me...?";            "What do you remember about...?"            "What</p>	L	<b>S</b>	R	W	<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"> <li>• U1_L2_ATT1.pdf</li> </ul> Slides prepared by the teacher (U1_L2_ATT_1) Blackboard	Students recall what they remember/understood the previous lesson. Students correct each other in case of inaccuracy of descriptions.
L	<b>S</b>	R	W								



2	20	To be aware of the key principles the experiment is based on	Students watch a video (from minute 4:33 to minute 7:30) that explains the set-up of Avery's experiment. Then students try to fill some gaps in a diagram explaining Avery's experiment, results and conclusion. Teacher circulates and monitors, clarifies some aspects of the diagram if necessary.	<p><b>Skills</b></p> <table border="1" data-bbox="904 165 1245 210"> <tr> <td>L</td> <td>S</td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> Enzymes, Protease, DNase, RNAse, Sugars, Heat-killed cells.</p> <p><b>Communicative structures</b> Do you think that is this one is the correct match for that gap? Do you agree with me? What do you think about..? Could you explain us this part of the diagram?</p>	L	S	R	W	<input type="checkbox"/> Whole class <input checked="" type="checkbox"/> Group work <input type="checkbox"/> Pair work <input checked="" type="checkbox"/> Individual work	<ul style="list-style-type: none"> <li>• U1_L2_ATT2.pdf</li> </ul> <p>Youtube video: <a href="#">link</a>  Task 1 worksheet: (U1_L2_ATT2)</p>	Students discuss in group how to fill the gaps. Do you think that is this
L	S	R	W								

3	15'	To realise how Avery and colleagues understood the chemical nature of “Griffith’s transforming principle”; To understand the limitations of these results.	Students watch the last part of the video (from minute 07:30 to the end) that explains the rationale, the result and conclusion of Avery's experiment. While doing so, they correct their own answers	<p><b>Skills</b></p> <table border="1" data-bbox="904 165 1245 213"> <tr> <td>L</td> <td>S</td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> Enzymes, Protease, DNase, RNAse, Sugars, Heat-killed cells, hydrolysis, degradation, transformation, culture</p> <p><b>Communicative structures</b> Why isn't it right? What does this result mean? What could we infer from this result? How does .... work?</p>	L	S	R	W	<input checked="" 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"> <li>• U1_L2_ATT2.pdf</li> </ul> <p>Youtube video: <a href="#">link</a></p>	Students share and check their own answers with the whole class and motivate their choices. Teacher gives the correct answers and explains the reason
L	S	R	W								

# CLIL Lesson Plan

<b>Unit number</b>	1	<b>Lesson number</b>	3	<b>Title</b>	Hershey & Chase's experiment
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment				
1	10'	To recall prior knowledge (Avery's experiment on the transforming principle).	Students recall the key aspects of Avery's experiment. Teacher draws on blackboard a diagram that represents what is said by students. Teacher underlines that Avery's experiment did not convince some scientists that DNA was the transforming principle. Another experiment that aimed to unravel the chemical nature of the transforming principle is so presented: Hershey & Chase's experiment.	<p><b>Skills</b></p> <table border="1"> <tr> <td>L</td> <td><b>S</b></td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b></p> <p><b>Communicative structures</b></p>	L	<b>S</b>	R	W	<input checked="" type="checkbox"/> Whole class <input type="checkbox"/> Group work <input type="checkbox"/> Pair work <input type="checkbox"/> Individual work	Blackboard	Students correct each other in case of inaccuracy of description
L	<b>S</b>	R	W								

2	30'	<p>To understand how isotope labeling can be used in biology. To understand how cells and viruses can be separated through centrifugation. To demonstrate that DNA is the genetic material</p>	<p>Students read about Hershey &amp; Chase's experiment using two different sources (U1_L3_ATT1 and U1_L3_ATT2). Students compare the two sources through a pair work. Teacher points the attention on the importance of dividing the text into paragraphs to ease comprehension and to highlight differences. Teacher circulates and monitors, clarifies about new experimental techniques. Students are encouraged to search the meaning of new words. Words that confuse students due to their multiple meanings (homonyms) are written on the blackboard and clarified.</p>	<p><b>Skills</b></p> <table border="1" data-bbox="1032 165 1373 212"> <tr> <td>L</td> <td><b>S</b></td> <td><b>R</b></td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> isotope labeling, bacteriophage, whirling, blender, batch, culture, centrifugation, pellet, debris, supernatant, radioactivity</p> <p><b>Communicative structures</b> How does this technique work? What happens if...? How can bacteria and viruses be separated? What did the authors conclude?</p>	L	<b>S</b>	<b>R</b>	W	<p><input type="checkbox"/> Whole class <input type="checkbox"/> Group work <input checked="" type="checkbox"/> Pair work <input type="checkbox"/> Individual work</p>	<ul style="list-style-type: none"> <li>• U1_L3_ATT1.pdf</li> <li>• U1_L3_ATT2.pdf</li> </ul>	
L	<b>S</b>	<b>R</b>	W								

3	10'	To realise how different sources can tell the path of a discovery in significantly different ways. To understand why the inaccuracy of one of the sources is intended as a matter of simplification rather than deception.	Students discuss about how the two sources differ in telling author's conclusion. The different nature of the two sources (academic vs. educational) is underlined by the teacher.	<p><b>Skills</b></p> <table border="1" data-bbox="1032 165 1373 212"> <tr> <td>L</td> <td><b>S</b></td> <td>R</td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> experimental model, bacteriophage, academic, educational,</p> <p><b>Communicative structures</b> "Which is the aim of...?" "The purpose of that publisher is..."</p>	L	<b>S</b>	R	W	<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"> <li>• U1_L3_ATT1.pdf</li> <li>• U1_L3_ATT2.pdf</li> </ul> blackboard.	Plenary discussion of key aspects that students noticed.
L	<b>S</b>	R	W								

# CLIL Lesson Plan

<b>Unit number</b>	1	<b>Lesson number</b>	4	<b>Title</b>	Test
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Activity	Timing	Learning Outcomes	Activity Procedure	Language	Interaction	Materials	Assessment				
1	45'	Students can prove their knowledge and understanding of Unit 1.	Teacher explains the tasks and monitors students' work. Students do some True and False exercises, some multiple choice texts and match some words with the proper definitions.	<p><b>Skills</b></p> <table border="1"> <tr> <td>L</td> <td>S</td> <td><b>R</b></td> <td>W</td> </tr> </table> <p><b>Key vocabulary</b> Review of all unit 1</p> <p><b>Communicative structures</b> The test doesn't have any communicative task</p>	L	S	<b>R</b>	W	<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"> <li>• U1_L4_ATT1.pdf</li> </ul>	Summative assessment: each test will be evaluated according to the scores provided in the test.
L	S	<b>R</b>	W								