CLIL Module Plan

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School Grade	○ Primary		○ Middle		◉ High
School Year	○ 1	○ 2	◉ 3	○ 4	○ 5
Subject	Fisica	**Topic**	Heat, Temperature and change in phases of gases		
CLIL Language	◉ English		○ Deutsch		

Personal and social-cultural preconditions of all people involved	There are 24 students and almost all the students have a good understanding of the English language (B2/C1). Some of the students have already obtained a C1 level certificate of the English language. The class has recently participated in a cross curricular project in English with a school in the Netherlands. There are no learning difficulties or any set backs among students and almost all of them eagerly participate in class. The class is used to CLIL modules. Last year I taught them chemistry in CLIL. Besides this module on Heat and Temperature, there are also CLIL lessons in physical education and philosophy presently underway.

Students' prior knowledge, skills, competencies	**Subject**	**Language**
	This lesson is a mixed lesson with physics. Students have previously dealt with topics concerning temperature and heat. They have practical knowledge on heat expansion in solids, liquids and gases. The present lesson is based on the knowledge acquired in the lab. Students worked in groups on experiments and with the conclusions they had reached, this lesson helps put those conclusions in context.	The students are familiar with basic language skills (BICS). There are no subject specific lexis that were needed to be taught.

Timetable fit	◉ Module	Length about 12 hours

Description of teaching and learning strategies	The methodological approach used in this lesson is task based and cooperative learning. Students work in groups and apply theory in a practical setting. In this specific lesson besides the cultural approach the other C's relevant to CLIL are addressed (content, cognition and communication), while in the previous lessons even the cultural aspect was dealt (for example the different scales of temperature and units of measurements).The teacher used a power point presentation to allow interaction/communication with students.

Overall Module Plan

Unit: 1 Temperature and 1st law of Thermodynamics **Unit length:** 2 hours	**Lesson 1** zero principle of thermodynamics
Unit: 2 Thermal Expansion **Unit length:** 3 hours	**Lesson 1** Behaviour of water and heat expansion
Unit: 3 Calorimetry **Unit length:** 2 hours	**Lesson 1** Specific heat and heat capacity
Unit: 4 Kinetic theory **Unit length:** 2 hours	**Lesson 1** Speed of molecules and energies
Unit: 5 Phases of change & Gas Laws **Unit length:** 3 hours	**Lesson 1** Lab work on gas laws
	Lesson 2 Ideal Gas Law

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Unit number	1	**Lesson number**	1	**Title**	zero principle of thermodynamics

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

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Unit number	2	**Lesson number**	1	**Title**	Behaviour of water and heat expansion

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

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Unit number	3	**Lesson number**	1	**Title**	Specific heat and heat capacity

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

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Unit number	4	**Lesson number**	1	**Title**	Speed of molecules and energies

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

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Unit number	5	**Lesson number**	1	**Title**	Lab work on gas laws

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

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Unit number	5	**Lesson number**	2	**Title**	Ideal Gas Law

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

1	10-15 minutes	Students should be able to predict the basis for the many relations in thermodynamics (previously dealt theory and practical lessons). Students should be able to understand the need to use standard quantities and units in calculations.	1. Teacher encourages students to answer the questions that are on the slides from the prepared power point presentation (Slide 1 & 2). After a warm up, students work in groups on Task 1 (attached below). 2. Teacher uses slides 3-10 to discuss the answers in a plenary session with the class.	**Skills** L S R W **Key vocabulary** Temperature Pressure Volume Gases **Communicative structures** BICS	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• Task 1.docx • Gas Laws1 (1).ppt GAS LAWS (Theory lesson) Task 1 Work with your group and discuss amongst yourselves the list of terms and units. • Based on the experiments you have done in the lab previously, list the properties of gases you have observed - • Pressure – what is it? • What are the various units of Pressure you think can be used? • Volume – what is it? • How can you represent volume? • Why is it important to use moles in understanding gases? • Temperature – what are the different scales you know? • Which temperature scale is most suitable for you to use in your experiments? Why?	The focus of the assessment based on the learning outcomes of this activity are self assesment and formative. Students understand the need for precise units and terms to move forward with the lesson.

2	10-15 minutes	Students should be able to draw a relationship between pressure & volume; volume & temperature; pressure & temperature based on the experiments carried out previously. Students should be able to think about real life applications related to pressure, volume and temperature.	1. In the groups that were previously created, students come up with real life examples related to the experiments carried out in the lab in previous lessons and discuss Task 2. 2.Teacher uses the power point presentation (slides 12-18) to explain and justify the relationship between pressure-volume; volume-temperature and pressure-temperature and uses the examples which student groups suggest.	**Skills** L S R W **Key vocabulary** same as in the previous activity **Communicative structures** BICS	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• Task 2.docx Task 2 Think of examples you can relate from your daily life to the three experiments (pressure-volume; volume-temperature; pressure-temperature).	The expected learning outcomes of this activity are formative and ongoing.

3	10-15 minutes	Students should be able to justify the relationship between volume and number of moles. Students should be able to reason the ideal gas law.	1. Teacher ellicites answers from the students using slides 19 -23. 2. Teacher uses the board to write the equations and juggle around them to make students understand the relationship between the different factors (pressure, volume, temperature).	**Skills** L S R W **Key vocabulary** moles Avagadro number **Communicative structures** BICS	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• Gas Laws1 (1).ppt	The goal is to assess if students are able to understand the combined Gas Law and the Ideal gas law, which is ongoing and formative.
4	10 -15 minutes	Students should be able to apply the gas laws and solve problems mathematically.	1. Teacher provides exercises to the groups and students work out the problems mathematically. 2. Teacher invites students to write the solutions on the board and discusses their approach in a plenary session.	**Skills** L S R W **Key vocabulary** as in the previous activities **Communicative structures** BICS	☒ Whole class ☒ Group work ☐ Pair work ☐ Individual work	• Gas Laws1 (1).ppt • TASK 3.docx	A continuous and formative assessment is used to foster motivation and language understanding, use and fluency. At the end of the module a summative assessment was used to verify the acquisition of both content and language.