



**Universidad Internacional de La Rioja**  
**Facultad de Educación**

**Trabajo fin de máster**

Toward implementing the CLIL approach  
at the CHMS School (Colegio Hebreo  
Monte Sinai) in Mexico City: An  
intervention proposal for 7<sup>th</sup> grade Biology  
course

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## **Abstract**

In this Master's Dissertation, we present CLIL (Content and Language Integrated Learning) as an approach that promotes motivation for the students, bringing; as a result, a positive attitude toward subject and language learning in a cross-curricular way. In Mexico, there is a need for learning English due to globalization and because of its geographical location to the United States of America and Canada. Government authorities and schools are putting much emphasis on delivering bilingual programs, adapting them to different contexts. The purpose of this Master's Dissertation is to present CLIL as an innovative approach to teaching Biology through the English language at the Colegio Hebreo Monte Sinai Secondary School. Identifying, the core features and making the school aware of its potential and the benefits that it has mainly around Europe and some countries around the world and that some private schools in Mexico have already implemented it in Secondary Education. The school, with coordination between the entire learning community, can move forward with an effective strategy to achieve this goal. This proposal efficiently sets its basis that hints the interest of students in learning a second language, making content more enjoyable to acquire, which helps them to become skilled citizens in society.

**Keywords:** bilingual education, education in Mexico, content teachers, biology course, secondary education

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### **3. Introduction**

Thinking of what CLIL is, we can say that it is a necessary approach to be implemented at the Colegio Hebreo Monte Sinai School (CHMS) as a response to the students' and parents' demands. English Language Teaching (ELT) at the CHMS Secondary School has been taught for the last ten years based on repetition drills, textbooks, workbooks and teacher-centered education; therefore, there exists a lack of motivation in the students regarding English as a Foreign Language (EFL). There are many ways in which CLIL is implemented and it also involves the content of compulsory subjects, but not doing it right can also bring demotivation and worries to the students and the teachers. As Coyle, Hood, & Marsh (2010) explain, "Poor quality CLIL could contribute to a lost generation of young people's learning" (p. 161). CLIL is a dynamic approach that is accompanied by active didactics and student-centered strategies and would be an innovation for the school, teachers, parents, and students. It is important to understand when we refer to "innovation" that we mean searching for new ways in teaching to make it more interesting and comprehensible. The European Commission, in its Green Paper on Innovation (1995), defines it as

The renewal and enlargement of the range of products and services and the associated markets; the establishment of new methods of production, supply and distribution; the introduction of changes in management, work organization, and the working conditions and skills of the workforce (p. 1).

A way of innovation in a school is fostering collaboration and creativity into the classroom, and it will boost student achievement giving students the opportunity to create and solve problems. We certainly believe that innovation in schools refers to not to be afraid of change, to make mistakes and learn from them having a plan to improve, to let know the school community the reasons to move forward, to use technology as a tool and to connect with other schools and teachers from around the world.

#### **3.1 Justification of the research question and problem**

The current situation of English Language teaching is a concern to the government and the whole society. It is very clear that English language in Mexico has to deal with a lot of challenges that need to be addressed so that the goal of preparing students to live effectively in this modern age of science and technology, will not become something impossible to do. If we don't take the correct steps to be followed in the school, our students will not be able to develop useful scientific literacy to cope in this scientific and technological world. Efforts must be made in developing scientifically literate students by improving the quality of science and English in teaching and learning in schools.

This starts with the strong belief that the CLIL approach is suitable for the Colegio Hebreo Monte Sinai Secondary School and it would enable the school to respond to the demands of parents and students by having an innovative way of learning a foreign language. Currently, within the school context, the traditional instruction is still the standard method, and it doesn't allow for active learning based on hands-on tasks related to real world situations.

A questionnaire was applied to 34 students in the 7th grade (Appendix A), which was aimed to support whether CLIL could be a powerful tool to improve students' language performance and how students would feel about participating in a bilingual program. The students' answers revealed (Appendix B) a positive attitude towards English as a vehicular language for biology; they also like English taught as a foreign language as it helps them to communicate when they travel. Most of them think that having some compulsory subjects using English as the vehicular language will help them in their everyday life when going to a boarding school or entering the university. Students also like a more co-operative way of learning and working; their answers showed that they like doing their activities in teams and in pairs. The results also showed that even though they are excited about this alternative. They feel anxious about having the biology class in English, but they are willing to participate in a bilingual program. Researchers explain that if students understand the relationship and interaction between science, society, English, and technology, they will be able to develop a better language performance, deeper understanding of scientific concepts, the scientific inquiry processes, and the nature of science to cope in this technological world.

We will design an intervention proposal with reliable information so the school community can decide whether CLIL is a viable approach in the school's context. Currently; English, science, technology, engineering, and mathematics (STEM) skills have been identified as necessary competencies in education that students must have to face the challenges of this globalized world, and CLIL is a good way to develop these skills for the 21st century. Someday, in this school, CLIL will evolve from being a proposal in biology to a more broadly-based integration of language with parts of the curriculum.

### **3.2 Brief analysis of state-of-the-art**

As English is a lingua franca, and in many instances, it is the language of wider communication among individuals from different countries, CLIL is an approach that makes students improve their language proficiency in different ways.

Gallagher (2014) explains this bilingual transformation:

The worldwide transformation occurring in bilingual/multilingual education revolves around two areas: Common European Framework of Reference (CEFR) and Content and Language Integrated Learning (CLIL). Fifty countries, since 1991, have adopted these two movements as part of their national plan (Council of Europe, 2001). The United States is one of the major countries that has not yet unified objectives of bilingualism (para. 1).

According to what Gallagher explains about bilingual transformation in education, English Language Teaching has become more challenging; we should look for innovative ways to motivate and engage our students. We live at a time when language has a global status, and this implies that we must adapt the strategies we already use to the real-world demands and apply new methodologies. CLIL promotes multiculturalism, intercultural knowledge, and understanding. With CLIL, we also have the chance to develop diverse learning strategies. This approach is seen more as an alternative to English Language Teaching, and CLIL can be implemented using very different models because there is no official curriculum, and each curriculum is determined by the context of the school and the learners.

Research has shown that CLIL develops confidence in students' use of language. Ringbom (2012) comments that "while students learning with both traditional ELT and CLIL show generally positive attitudes to the learning of English, CLIL learners were more satisfied with a confidence about their English proficiency" (p. 503). Regarding positive attitudes, motivation is a determinant factor for successful language learning. A well-known researcher on CLIL, David Marsh (2000) said "to learn how to master a musical instrument, or football, requires that we gain both, language and skill simultaneously" (p. 6). What Marsh mentions is true, when we start new things, we face challenges, and it takes time to manage them and to be successful we need commitment, energy, and creativity.

### **3.3 Objectives**

The overall objective of the present Master's Dissertation is to design an intervention proposal to offer an alternative in the teaching-learning process through a non-native language (English) for 7<sup>th</sup> grade biology class to give continuity to bilingualism in primary school.

The specific aims are:

- To present CLIL as a powerful tool that can have a substantial impact and motivation on language learning in the future for our students at the Colegio Hebreo Monte Sinai Secondary School.
- To integrate CLIL as a compatible approach to the International Baccalaureate, New Educational Model in Mexico and the School's Mission.

- To explore the potential of CLIL approach as a way to prepare students for globalization.
- To integrate English language, receptive and productive skills in biology class.

## **4. Literature Review**

In this section of the Master's Dissertation, we will provide significant information about an overview of education in Mexico, paying special attention to national policy regarding additional languages; secondly, there will be a brief explanation of different approaches; and at the end, we will talk specifically about CLIL.

### **4.1 Education in Mexico**

#### **4.1.1 Legal Framework of Education in Mexico**

The Constitution of Mexico is the supreme law in this country. It includes the rights of every person being part of society and the rights related to freedom of partnership and liberty to express our thoughts and right to access education. The Constitution of Mexico was established on the 5th of February 1917 (Guerra, 2016).

The Secretaría de Educación Pública (SEP) was created on the 25th of September 1921, which is a Federal authority and has a Cabinet representation. It was created to inspect the development and implementation of the national educational policy.

At the beginning of 1993, the Secretaría de Educación Pública started to pass jurisdiction to the Ministries of Education in each of the 31 states of the Mexican Republic, and now the Secretaría de Educación Pública's role is one more of supervision rather than regulation (SEP, 2017). Since 2015, the Secretary is Aurelio Nuño Mayer.

In Mexico, there is a Plan Nacional de Desarrollo (PND) and The Programa Sectorial de Educación (PROSEDU). The Plan Nacional de Desarrollo sets the goals for policy actions in the country that boosts Mexico's social and economic growth and development, which are determined by the president every six years. The Programa Sectorial de Educación talks about the actions to be taken for education in the governing period of each president. For Enrique Peña Nieto, it is the 2013-2018 sexennial period. Therefore, in the Plan Nacional de Desarrollo, Acuerdo 1/2013, May 20 and the objectives outlined in the Programa Sectorial de Educación Acuerdo 1/ 2011 September 11, along with the legal principles established in Article 3 of the Mexican Constitution, have all set the basis for the action in public education policies to be coherent and to be directed under good basis (SEP, 2013).

Since 2013, Mexico has had several reforms including the one related to Education in the Reforma Integral de la Educación Básica (RIEB) Acuerdo 592/2011, August 19, SEP has declared 12 years of compulsory education instead of 9, and it is expected to have full

accomplishment by the year 2020. These new constitutional reforms look forward to the following aims:

- Have more students in secondary and tertiary education.
- Provide more curricular autonomy to schools.
- Improve teacher quality at the primary and secondary levels.

Magazine and Monroy (2016), in their article, mention that in this same year, the Instituto Nacional para la Evaluación de la Educación (INEE) was created to avoid corruption in teacher hiring practices and to guarantee quality on education services.

In Figure 1, we show the structure of Education System in Mexico, which is structured in a very similar way in relation to other countries.

Education	School/Level	Grade From	Grade To	Age From	Age To	Years	Notes
Primary	Educación Preescolar/Educación Básica			3	5	3	
Primary	Escuela Primaria/Educación Básica	1	6	6	11	6	
Middle	Secundaria/ Educación Básica	1	3	12	14	3	The term "secundaria" always refers to lower-secondary study and never higher-secondary study.
Secondary	Educación Media Superior / Preparatoria	1	3	15	17	3	
Tertiary	Técnico Superior / Licenciatura			18	20	4	
Tertiary	Maestría / Especialidad			22		2	
Tertiary	Doctorado					2	

Figure 1. Education System in Mexico (from Classbase, 2012)

A very important thing is that we have the New Educational Model for Mexico which will be implemented in the upcoming 2018-2019 school year, and for the first time, it will exist as a common curricular framework for Secondary and High School.

As the Secretaría de Educación Pública, in the New Educational Model (2017), declares:

The updated Educational Model will take off contents that weren't useful for the actual world so they will be able to learn how to learn; it will favor comprehension over memorization in language and mathematics and will designate English classes and social and emotional skills as obligatory, and the exploration of the natural and social world, along with civic and ethical academic training, and it will be complemented with the development of social and emotional skill, critical thinking, and a strengthening of physical and artistic education (pp. 50-54).

Mexico will be required to make significant efforts to lead this new educational model to success.

#### **4.1.2 Background of National Policy on Foreign Language Teaching**

In Mexico, language policy exists, but it has not obtained the expected results. According to Moore (2013), "Attention is directed to the lack of explicit policy statements in key documents for educational planning (the Ley General and the Plan Sectorial de Educación) in relation to the teaching of foreign languages" (p. 4). According to Kaplan and Baldauf (1997), "The first articulates good feelings toward change and the latter articulates specific steps to be taken" (p. 11). According to the British Council Report (2015), "The English language has been taught in Mexican public schools since the 1960s. The decentralization of basic and teacher education began in May 1992 with the signing of the National Agreement for the Modernization of Basic Education" (p. 8). In response to this lack of explicit policy statements, educational authorities made significant reforms. As a good start, they presented the New Educational Model where English language classes will be compulsory, from preschool to higher education. Implementation of this model will begin in the 2018-19 school year. As the Secretaría de Educación Pública (2011) declares in the Programa Nacional de inglés en Educación Básica (PNIEB), in its Curricular Foundations,

The purpose of English language teaching in Basic Education is for students to get the necessary knowledge to engage in social practices with spoken and oral language to interact with native and non-native English speakers by means of specific competencies with the language (p. 62).

This means that students will obtain skills in production and interpretation of oral and written texts in different context such as academical, familiar, and real-life situations. As the Secretaría de Educación Pública, in the Programa Nacional de inglés en Educación Básica, in its Curricular Foundations (2011) indicates, "From the curricular reforms carried out in Preschool (2004), Secondary School (2006), and Elementary School (2009) and consequently since the incorporation of Second Language: English as a subject is stated in the Integral Reform of Basic Education" (p. 52).

The following principles were established from the curricular articulation in Basic Education (SEP, 2011).

- a) The profile of Basic Education should be reflected when graduating.
- b) The three levels of Basic Education should provide the competencies for life to face this complex society.

- c) The curricular achievements should indicate the progress of students indicating the level of development, knowledge, skills and values acquired after having completed the content units in the subjects' curriculum.

The Secretaría de Educación Pública launched the Programa Nacional de inglés en Educación Básica (PNIEB) in 2008. As the British Council (2015) reports, "The Programa Nacional de inglés en Educación Básica was released as a pilot programme by the Secretaría de Educación Pública. The first were Aguascalientes, Coahuila, Durango, Nuevo León, Sinaloa, Sonora, and Tamaulipas. The programme has since expanded throughout the country" (p. 22).

In Figure 2, we see that there is a contact and familiarization stage where the main purpose is to get students familiarized with the English language by means of social practices that are planned for later learning and the formal foreign language stage where the students will acquire the competencies in using English in an effective way in different social learning environments.

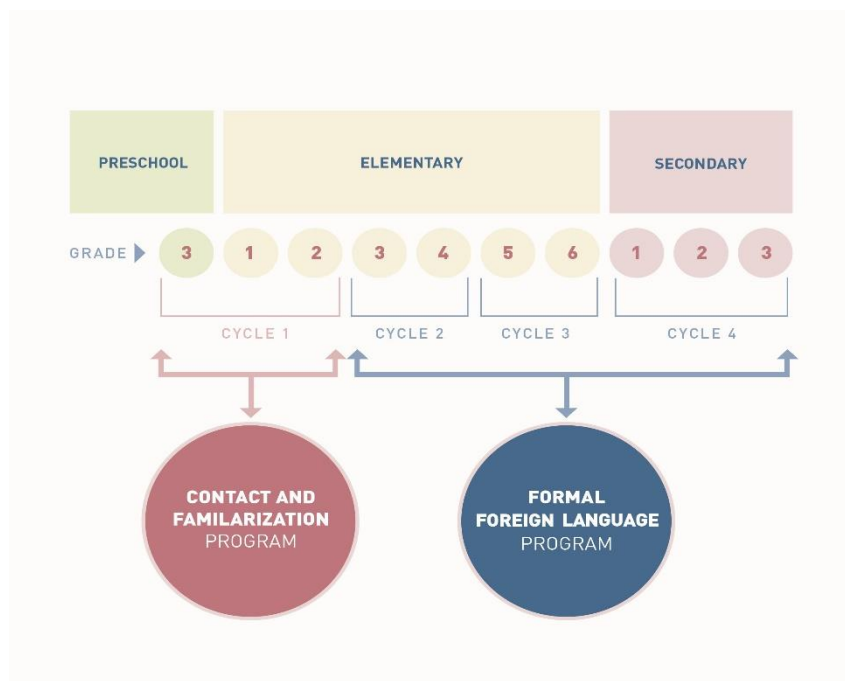


Figure 2. The PNIEB Two-Stage Process (Adapted from British Council, 2015, p. 15)

The Secretaría de Educación Pública, in the Programa Nacional de inglés en Educación Básica, in its Curricular Foundations (2011) explains,

The design of the Programa Nacional de Inglés en Educación Básica is organized by cycles and not by school grades. For cycle, one comprises 3rd grade of preschool and 1st and 2nd grades of elementary school; Cycle 2 includes 3rd and 4th grades of elementary school; Cycle 3, 5th and 6th grades, while cycle 4 includes 1st, 2nd, and

3rd grades of secondary school, and they offer a guided sequence of contents. (p. 54).

Figure 3, English, unlike the rest of the subjects, consists of four cycles that articulate the levels of Basic Education. During Cycles 1 to 3, English lesson can be conducted three times a week in 50-minute sessions, and during Cycle 4, they can be conducted three times a week in 40 to 45-minute sessions. This will give a total of 1,060 hours, which correspond to the total number of hours designated to this subject in each school grade.

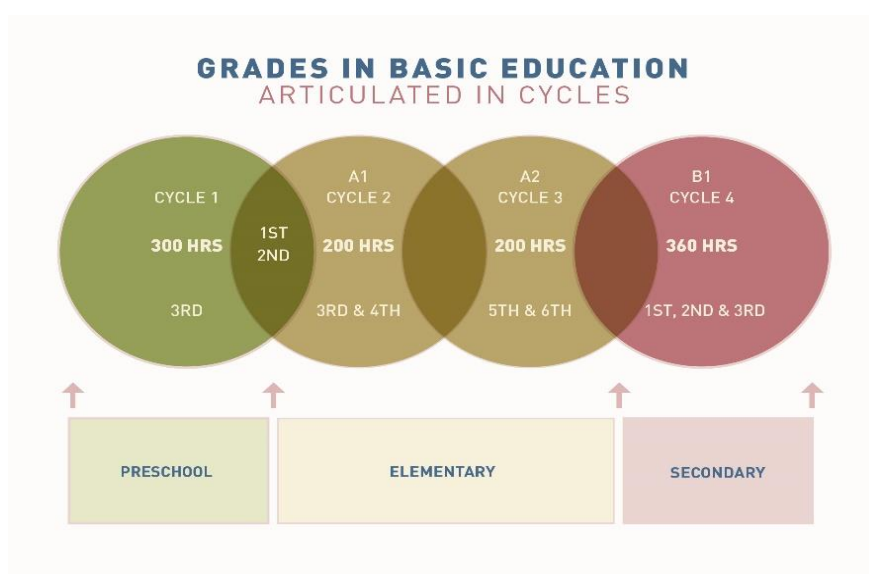


Figure 3. Grades in Basic Education Articulated in Cycles (Adapted from Programa Nacional de Inglés en Educación Básica, 2011, p. 59)

The Programa Nacional de Inglés en Educación Básica is based on the Common European Framework of Reference for Languages (CEFR), The Association of Language Testers in Europe (ALTE), and the Secretaría de Educación Pública (SEP). This has developed a national standard for foreign languages and led to the creation of the Certificación Nacional de Nivel de Inglés (CENNI). The CENNI standards were adopted in order to establish the minimum level that students should attain.

Figure 4 is intended to illustrate how Basic Education, the Common European Framework, and the CENNI standards are interrelated.

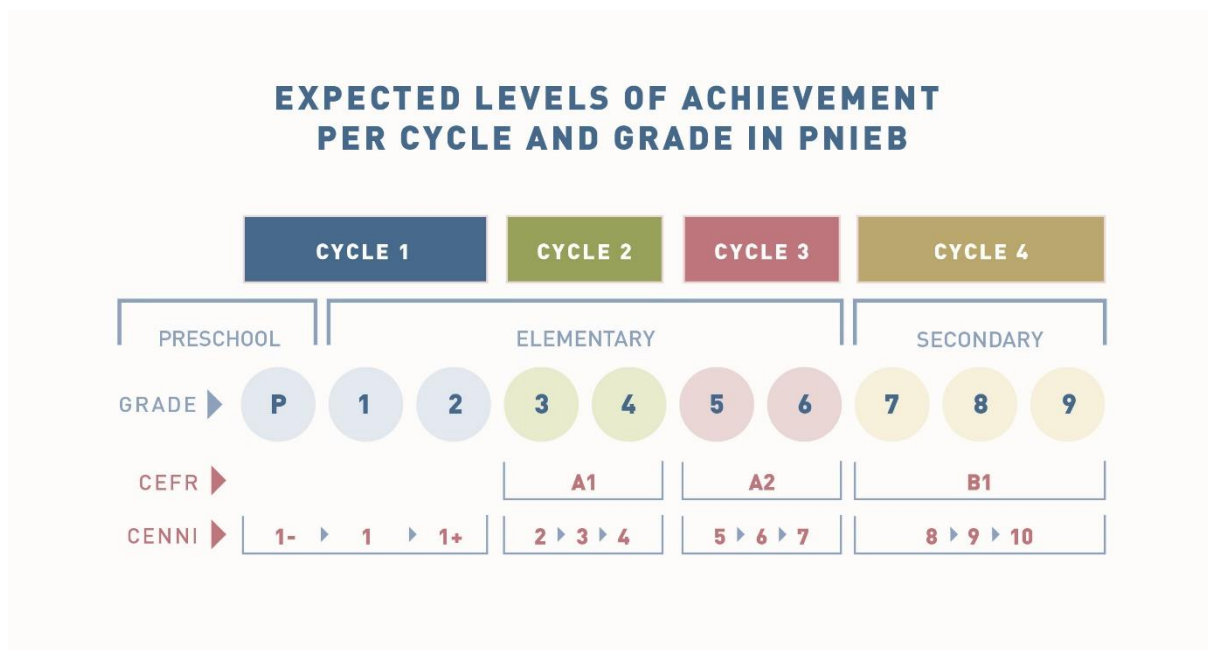


Figure 4. Expected levels of achievement per cycle (Adapted from Calderón, 2015, p.62)

The PNIEB describes three different types of languages for the programmed contents where communicative interactions take place (British Council, 2015). These are:

- "Learning to do" with the language, where the students interact with specific activities.
- "Learning to know" about the language, where students will develop confidence on their previous knowledge and will improve the four skills (reading, writing, speaking, and listening)
- "Learning to be" through the language, where students realize they are part of a society and that there are opportunities to socialize through an intercultural and inclusive atmosphere.

Regarding English teachers in Mexico, the reality is that there are a few non-native English faculties and the native English speakers are hired to work in very expensive schools, at least in basic education.

English teachers in the Programa Nacional de Inglés para la Educación Básica, are required to be at least one level above of the ones they are responsible for teaching, according to CEFR. Hence, the teachers should be a B2 level by the time students complete 9th grade. Teachers should look to improve their English level to reach C1 or more with the passing of time (SEP, 2011).

In Figure 5, we show that teachers should reach at least the level above in which they are responsible for teaching and it would be ideal to reach level C1, so teachers will need training and support to complete a higher level.

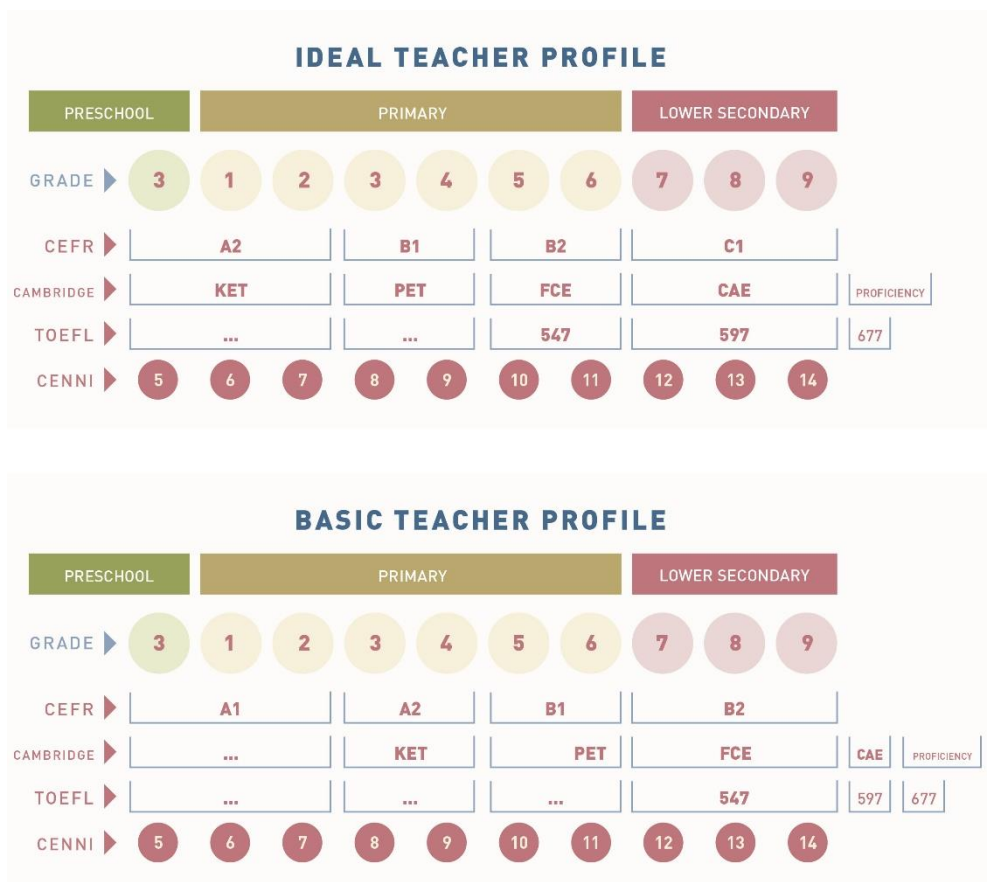


Figure 5 Teachers' profile for English Language Teaching (Adapted from Calderón, 2015, p.67)

#### 4.1.3 The importance of English in Mexico

Mexico's participation in the world economy has made English necessary as a second language. Besides that, the advances in Information and Communication Technologies (ICT) and since the North America Free Trade Agreement (NAFTA) that was signed in 1994, English became for Mexicans necessary if we want to apply for better jobs and improve in personal life. In every country of the world, English is used every day; we hear it on TV, on the radio, movies, YouTube tutorials, and manuals to use devices; also, English is becoming the language of scientific publications.

As Calderón (2015) mentions,

English as a lingua franca now implies a great responsibility for school systems that aspire to fulfill and exercise the right to learn. It can no longer be conceived as an elegant, peripheral addition that is more or less optional in the curriculum; not to

actively propose its mastery as part of the education system through a national public policy is to relapse into irrelevance and lack of pertinence (p. 17).

Mexico is one of the members of the Organization for Economic Co-operation and Development (OECD), and it's always been below the international standards. According to Moore (2013), "The poor results obtained in PISA 2006 goaded the authorities into a plethora of planning and policy making." (p. 10). After these results, Mexican authorities have worked on all the reforms and the New Educational Model regarding the observations made by OECD, and simultaneously, UNESCO indicated that educational systems must be designed and applied so the students can be prepared to face the challenges of this globalized world in which different languages and cultures are more common every day (UNESCO, 1996).

Some of the perceptions Mexicans have towards the English language are positive, as Despagne (2010), comments, "positive perceptions towards English generally refer to international business possibilities, use of a lingua franca, technological development, communication, bilingual education and therefore study abroad possibilities, international job offers, better incomes" (p. 65).

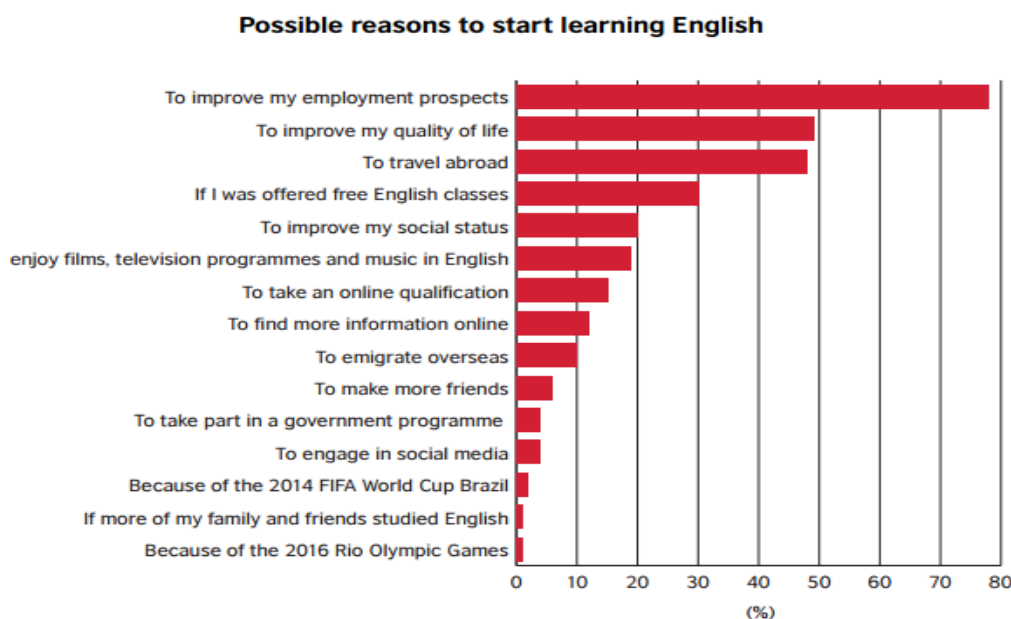


Figure 6 Possible reasons to start learning English. (Adapted from British Council, 2015, p.40)

British Council, Education Intelligence, Latin America Databank 2014

As we can see, Mexicans need English as the medium to improve employment opportunities for the first reason to learn it.

In Mexico, there are ways in which teachers and people enroll to learn English, but the most notable ones are the Anglo Mexican Foundation, British Council, Centro de Enseñanza de Lenguas Extranjeras (CELE) at Universidad Nacional Autónoma de México (UNAM), and the Mexican Association of Teachers of English (MEXTESOL), affiliated member of the Teaching English to Speakers of other languages (TESOL).

## **4.2 English Language Teaching**

### **4.2.1 Approaches to English Language Teaching**

English Language Teaching has always been a matter of continuous change, and its importance has increased for the 21st-century competencies that we must have and our students. More than any other curricular subject, it can be very flexible and adaptable to any context according to the need of the school and the students. When we talk about innovation and refer to CLIL, it doesn't mean that other methods are wrong, teachers, depending on the age of the student. The context of the school and the topic decide which one to use in different classes. Besides CLIL, there are many approaches to teaching methodology in ELT. Crandall (1993) and Richard & Rodgers (1986) provide information of the different approaches in English language teaching. These are the following:

#### ➤ **Audiolingual Method**

**Context:** It had its origins during World War II, it became known as the army method, which fosters communicative competence, gives emphasis on spoken language through innovative methods, and its basis is with Skinner's principles of behavior theory.

**Principles:** Errors must be avoided; language teachers should provide students with a native-speaker-like model and language is structured in discourse and morphemic.

**Role of the Teacher:** They are central and active and correct learners' performances.

**Role of students:** they play a reactive role by responding to stimuli, and they listen to the teacher and imitate accurately.

**Types of didactic materials:** Teacher's book to follow a sequence, dialogues, drills, practice activities, tape recorders, audiovisual equipment and language laboratory.

**Strengths:** Continued training of the ear and tongue. As language laboratory is used, it provides further drill work.

**Weaknesses:** Little provision for grammatical explanation and shortening of the time span between a performance and the pronouncement.

➤ Oral approach, also called "Situational Language Teaching" (SLT)

Context: It has its origins in the 1930s, it is a scientific approach, created by Palmer and Hornby (presentation, practice and production), with emphasis on spoken language and automatic use of sentence patterns.

Principles: It makes sure that learners achieve accuracy in grammar and vocabulary.

Reading and writing are introduced.

Role of teachers: Teachers act as model of imitation, control the outputs produced by learners in the repetition phase.

Role of students: Students are imitators; they are required simply to listen and repeat what the teacher says.

Types of didactic materials: Mainly course textbooks and visual aids.

Strengths: Learning words in a situation, enhance reading and it helps learners internalize the English rules.

Weaknesses: Not all learners are able to use language freely. Exposure to real language is limited.

➤ Total Physical Response (TPR)

Context: It has its origins in the 1940s. Language through physical motor activity, developed by James Asher.

Principles: Receptive oral skills should be learnt before productive ones.

Role of teachers: They decide what to teach and give feedback.

Role of students: They are listeners and performers, and evaluate their own progress.

Types of Didactic Materials: Realia, teacher's voice, actions and gestures.

Strengths: Absence of stress, successful adult second language learning.

Weaknesses: Learners have little influence over the content of learning and imperative lessons.

➤ Silent way

Context: Developed by an individual educator, Caleb Gattegno. Communication consists of exchanging verbalizations.

Principles: Teachers should be silent to encourage learners to produce language.

Role of teachers: Teachers should be silent as much as possible and be a neutral observer.

Role of students: Student is an individual group member, a teacher, a support system and self-evaluator.

Types of didactic materials: Cuisenaire rods (color charts), structures, repetitions, drills, commands, and questions.

Strengths: Enhances students' autonomy. Learners discover and create rather than remember and repeat.

Weaknesses: It can cause discipline problems because of the silence period. There are no provided details for the selection of grammatical and lexical items.

➤ Suggestopedia

Context: Suggestopedia was created by psychiatrist Georgi Lozanov in the 1960s.

Principles: Foreign language teaching must occur through non-rational or nonconscious learning approaches.

The role of teachers: Teachers create situations that improve learners' reception and retention.

The role of students: Students are committed and maintain a passive state.

Types of didactic material: Imitation, question-and-answer, role play, and listening activities related to a text.

Strengths: An optimal, detailed learning environment and the use of music helps students to relax.

Weaknesses: Memorization is required, and if the music doesn't have the correct rhythm, poor results are achieved.

➤ Content-based instruction

Context: This approach is associated with immersion programs developed in Canada in 1967. The approach teaches content through a foreign language and is concerned with meaning, not form.

Principles: It erases the distinction between content and language. It teaches real communication and encourages the exchange of Information.

The role of teachers: Teachers monitor students' progress and provide immediate feedback.

The role of students: Students respond in a variety of ways with verbal to non-verbal responses.

Types of didactic materials: Realia, redundancy, and the use of graphic organizers.

Strengths: This approach emphasizes the communicative function of language. It is a way to encourage the development of intellectual skills.

Weaknesses: Language proficiency is limited to the subject matter.

➤ Task-based language teaching(TBLT)

Context: A task-based approach focuses on meaning, real-world language, and any of the four skills.

Principles: Learners should focus on meaning rather than on repeating structures.

Role of teachers: Act as a coach, motivator, and teaching role.

Role of students: Students speak among themselves to organize the task.

Types of didactic materials: Visual materials, printed material and realia.

Strengths: Students are encouraged to use language creatively. Tasks are based on real-world activities.

Weaknesses: No acquisition of new grammar features. Not all students will be motivated by TBLT.

#### ➤ Content and Language Integrated Learning (CLIL)

Context: It has its origins in Europe around 1976.

Principles: Language seen as an instrument to learn the content of a subject. It focuses on meaning rather than on form. Related to real world.

Role of teachers: Act as a coach, guide and donor of knowledge.

Role of students: Center of the class and active participants.

Types of didactic materials: Templates, ICT'S (presentations, word worksheets (fill-ins), research projects, communication and social networks.

Strengths: A real way of approaching a language. Fosters the language and thinking skills. ICT potential.

Weaknesses: Lack of material. Not all workmates and parents see a need to foster CLIL methodology.

### **4.3 CLIL**

#### **4.3.1 Defining CLIL**

CLIL is considered a new approach to second language education. It was first originated and implemented in Europe, and its acronym is Content and Language Integrated Learning. In 1994, David Marsh named this approach so as to refer to the dual focused form of instruction, in which the foreign language and content are equally important, but the language is the means of instruction to develop the units in a class. Consequently, we cover aspects of language culture and cross-curricular material. Some of the definitions we can find are: "The term 'content language integrated learning' refers to educational settings where a language other than the students' mother tongue is used as a medium of instruction" (Dalton-Puffer, 2007, p. 1). Dalton's Puffer definition refers to the teaching of the content subject and the use of a foreign language as a means to consolidate the learning of the contents.

CLIL is an umbrella term because it covers several education approaches depending on the amount of time devoted to teaching or learning the foreign language. "CLIL is an umbrella term for a flexible pedagogical approach to dual-focused, content/language instruction" (Marsh, 2002, p. 56). For example, one or more subjects or modules. As an

optional subject, a project can also be taught through this approach in secondary schools and language showers, which can be delivered in primary schools with an L2 instruction of 10-20 minutes a day, giving priority to oral skills (Marsh, 2002)

This approach also provides balanced attention to language and subject content, and involves personalised learning where each student is supported in both, taking the school curriculum into account. "Content and Language Integrated Learning (CLIL) is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language" (Coyle, Hood, & Marsh, 2010, p. 1).

To provide useful guidelines and to set the basis for a useful tool for teachers and students involved in a CLIL programme, the 4Cs framework is needed, and it refers to Content, Communication, Cognition, and Culture. These four components should have an interrelationship. Content for the subject (themes or units), communication for the language (the medium of instruction), cognition with level thinking skills based on Bloom's Taxonomy and culture for the use of Internet to connect with others around the world and be aware of other cultural backgrounds (Coyle, 2006).

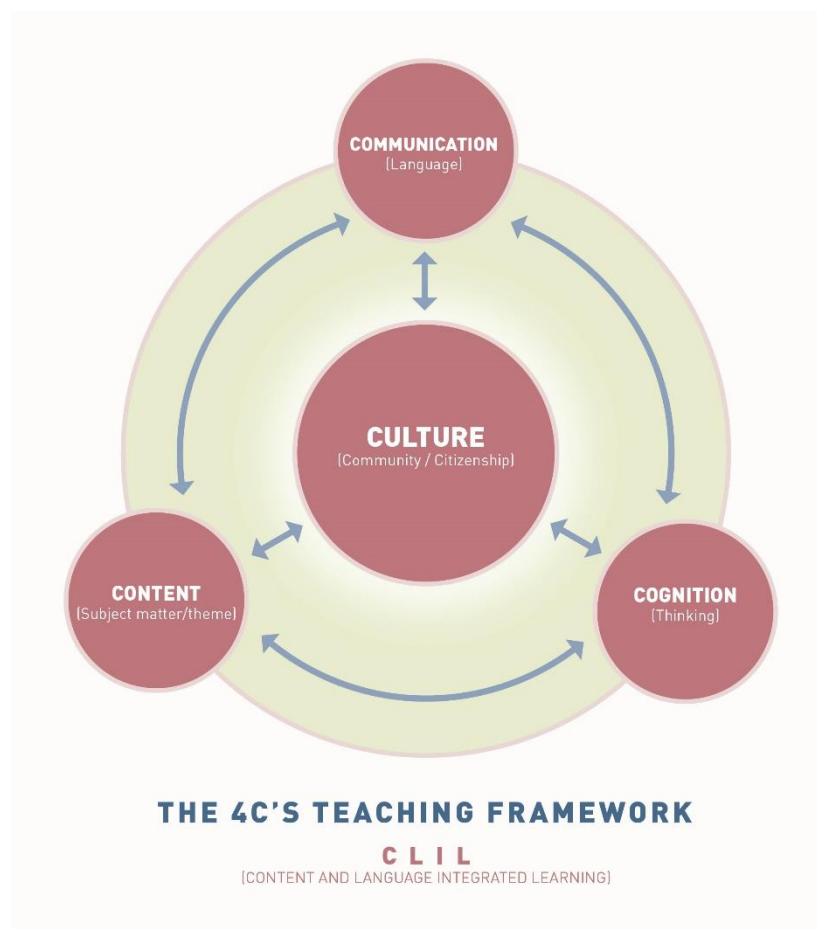


Figure 7. The CLIL 4Cs Framework (Adapted from Coyle, 2006 in Coyle, 2007, p. 551).

Regarding communication, the language triptych is very useful for teachers and students for an active CLIL where the language of learning is related to the understanding of the language subject so the students can carry out the learning experiences. The language for learning refers to the interaction in the classroom so the students can communicate among themselves and with the teacher and the language through innovative methods refers to the new language rising according to each learner's needs (Coyle, 2010).

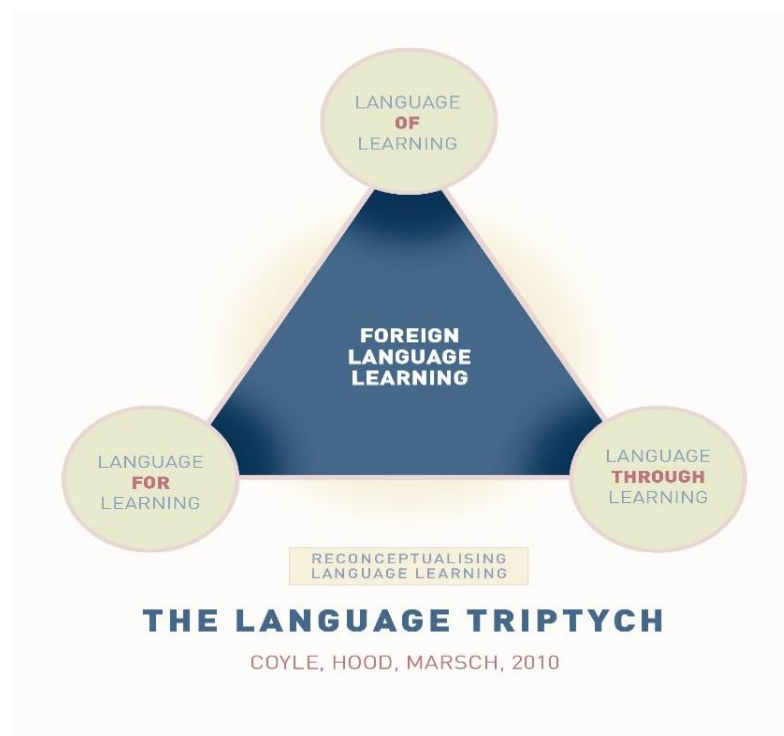


Figure 8 The Language Triptych (Adapted from Coyle, Hood, Marsh, 2010)

The cooperation between the content teacher and the English language teacher is one of the main factors where this approach is based on. The L2 teacher, from the perspective of CLIL should consist of collaborating in evaluating the linguistic challenges, going from the Basic Interpersonal Communication Skills (BICS), which are the necessary languages to social situations such as the everyday language to interact with other people to go to Cognitive Academic Language Proficiency (CALP). This is about reading, listening, writing and speaking about subject areas and content material; it is the essential language to succeed in school. The L2 teacher can support the content teacher with parallel tests, language structures for a certain topic, and glossaries, but the content subject is responsible for managing the subject content (Costa, F., & D' Angelo, L., 2011).

### **4.3.2 The required teachers' profile for a bilingual context**

There are several types of teachers who can be involved in a CLIL bilingual program; we must remember that CLIL is an adaptable and flexible approach. As Pavesi, Betuccini, Hofmamova, & Kasiasku (2011) explain,

- a) Teachers are qualified in both the content subject and foreign language.
- b) Classroom teachers use an additional language, to a greater or lesser extent, as the medium of instruction.
- c) Foreign language teachers instructing learners on non-language subject content
- d) A content subject teacher and a foreign language teacher working as a team
- e) Exchange teachers supported by foreign ministries of education, educational authorities or European programmes (p. 87).

As the language is the vehicle for instruction, there are different qualification requirements in various European countries. In some countries, like Spain, they ask the content teacher to have knowledge of a B2 level or a certificate of advance knowledge of the target language, and in other countries, like Poland, they require a C2.

Every CLIL teacher must be conscious that this approach implies a lot of work and commitment to generate the best learning environment for the students and to attend different learning styles and special needs (Eurydice, 2006).

Teachers involved in a CLIL context should reflect on the need to change their teaching habits used in the native mother tongue when teaching the content in the non-native mother tongue. The content subject should be able to manage his/her linguistic competence and the students.' So, good linguistic skills in the target language are necessary, and the ones with limited linguistic skills should rely on a good lesson planning.

Bilingual teachers must be able to demonstrate great communication skills in English or in the target language and also be qualified with a teacher preparation program.

### **4.3.3 CLIL in Mexico**

Private schools have always included English in the curricula, some of them offering bilingual programs based on the CLIL approach and the CEFR standards, besides the traditional English language teaching. Public schools have always had the English language in secondary school as a compulsory subject, but since the creation of the Programa Nacional de Inglés para la Educación Básica approved by the Congress of Mexico in 2008, this unified program was a real need. This national program is also based on the CEFR standards and CLIL approach (Gallagher, 2014).

As the PNIEB (2011) maintains,

An important goal of the NEPBE is for the study of English to encourage tolerance for cultural diversity; therefore, it explicitly specifies the connection to some of the other subjects through the cross-curricular topics. These topics can be grouped into three general categories: personal information (health and human development); social (culture, human rights, consumer education); and environment (biodiversity, protecting nature, sustainable development) (p. 35-36).

There are some guidelines to link the cross-curricular topics. In doing so, we can select the contents that will allow the use of materials that include examples of real life situations. Students will also develop the ability to explain differences between cultures, reflect on their values and the values of others, propose role plays, and demonstrate their communicative competence (PNIEB, 2011). The Programa Nacional de Inglés en Educación Básica and CLIL contribute to the development of lifelong learning competencies, learning how to be part of society, communicative performance (they focus on meaning rather than in form), and add to the intercultural element.

Before the new educational model was presented to the country of Mexico, there was a problem with the educational system. When teaching English as a foreign language in any school, private or public, hired people didn't need to finish any major to teach the language, it was just enough to know the language. This is the reason why most teachers in Mexico don't have the necessary knowledge to teach a subject through L2. In Mexico, the teaching knowledge test (TKT) for CLIL is given by the University of Cambridge, and the ESOL examinations and the TKT essentials are given online by the British Council.

As Mexico cannot be left behind in this globalized world, Aurelio Nuño Mayer, the Secretary of Education, in recent days, presented a national strategy to teach English as a compulsory language even for indigenous people, for whom it will be their third language. Those teachers who are preparing to be former teachers will also become bilingual, and a major will be created for them to become a specialized English teacher for basic education. The University of Cambridge will supervise all of the curricula and will assess the program. Twelve-hundred English teachers will be hired to educate those former teachers preparing to be qualified under the new system, six hours a week, with six hours of collaborative workshops. It is expected to last 432 hours per year. The first generation will start in the year 2018, and the first bilingual generation will be in four years and so on. It is expected that Mexico will become bilingual in English language use in twenty years (SEP, 2017).

## **5 .Intervention proposal**

The intervention proposal settles its basis on the Reforma Integral de la Educación Básica (RIEB) Acuerdo 592/2011, August 19, which establishes the articulation in basic education. With this proposal, 7<sup>th</sup>-grade secondary students will experience a CLIL context where they will be able to recognize the core features of the approach while using a second language in biology class about nutrition and its importance. It is necessary that they learn that nutrition is the basis for human health and that it is related to the different and various nutrients that exist in food.

### **5.1 Aims of the proposal**

The general objective of this CLIL unit is to learn about nutrition as the basis for human health and how it is related to different features. The specific aims of this unit are related to the key competencies of the curriculum that we list in the methodology section.

- To remember previous knowledge about energy, nutrition, food pyramid, the importance of water in the human body, diversity of food around the world, geography (location of continents), digestive and eating disorders (childhood obesity) and math (percentages and amounts).
- To be able to learn the relationship between food and energy levels that we have during the day and the impact on physical and mental health and apply it to their real life.
- Use of Information and Communication Technologies( ICT 's) as a mean of learning for in-depth reading, research and practice.
- Identify an awareness of diversity of food around the world.
- Identify the parts of the digestive system and nutrition.
- Design and conduct a scientific investigation.
- Communicate procedures and explanations.
- Make and use models for explanation with representations.
- Apply to their real life what they have learned about nutrition.

### **5.1 Educational Context and/or Target Group**

The Colegio Hebreo Monte Sinai (CHMS) is an International Baccalaureate school member. The school considers Hebrew to be a second language, and it has been taught since 1967, 11 years before English was introduced as a third language. Currently, content subjects are not taught with a CLIL approach in the secondary school: each of the language classes is taught as a foreign language using different approaches.

In 1943, the school was created for the Damascene Jewish Community in Mexico. It started with just a primary school, and in 1956, the secondary school was opened. In 1967, the Damascene Jewish Community in Mexico signed an agreement with Israel's Educational Department to provide Israeli teachers to teach the Hebrew Language. After this agreement was signed in 1968, high schools were created. Ten years later, English language teaching (ELT) was implemented and started in the third grade at primary school, continuing on through high school. In 1994, ELT was expanded to include first grade at primary school, continuing on through high school. Four years later, ELT began in kindergarten, and two new classrooms are created called the Language Development Center (LDC): one for Hebrew and one for English. We use these classrooms twice a week. They are equipped with Internet access, fifteen computers, audio and DVD player, overhead projectors, reading books, etc. Teachers and students are able to use different resources in the teaching-learning process. In 2002, the Educational Inclusion Department began attending to students and supporting teachers to generate collaborative work and assist students with different learning needs within the community. In 2005, kindergarten adopted Martin Buber's philosophy of personalized education. In 2006, the school became a member of the International Baccalaureate, adopting the Primary Years Programme (PYP) and the Middle Years Programme (MYP). In 2010, the school decided that the kindergarten would adopt a bilingual program and have all of the instructions and activities in English. They call these students "The Generation Gap." Currently, this generation gap is in the fourth grade of primary school and receives ten hours of English per week, including Science and Arts.

This intervention proposal focuses at one group in the seventh grade. There are four groups: A, B, C, and D, and there are 15 students in each group. The proposal is to start with only one group, the seventh-grade A group, which contains one student with special needs. There are only Mexican Damascene Jewish children in the group. They currently receive ten hours of English as a foreign language (EFL) per week divided into two hours per day. The exception is Biology, which has only five hours per week.

Teachers and students in the secondary school are not familiar with the CLIL approach in any Content Subject, so this will be something new for the secondary school. The students have different levels of proficiency in English, and as per the International Baccalaureate, the school divides them into different phases for their English lessons. The parents demand a high level of English education for their children, and they expect new things from the school in this regard. This is required by them because many of them intend to send their children to boarding schools in the United States of America and Canada for at least one year during their secondary school education. Furthermore, many of them travel every holiday or during summer, either to the above mentioned countries or to the State of Israel or Europe. Even where they are in 9th or 10th grade, depending on the Jewish School they attend in Mexico City, they travel to Israel with their classmates for a holiday trip and the ones who have achieved excellent grades are chosen to stay two more weeks to have an academic trip so they can visit the most important companies and meet the very important people. Even though they know Hebrew, English is also very important to communicate in the State of Israel because it is an official language besides Arabic and Russian. They also have family members there and can decide whether they want to live there or in Mexico. Israel is their second home.

Figure 9 shows the common features that apply to our school's context. Some valuable possible contributions to the education system are life-long learning skills, developing critical thinking, autonomous learning, cooperative learning, attending diversity, intercultural literacy that refers to be able to communicate in different international contexts, including the understanding of cultural diversity integrating the language aspect and all these relate to what the 21st century students need (Weenick, 2008).

## Common Features of CLIL, IB, SEP and CHMS School principles



Figure 9. Common Features of CLIL, IB, SEP and CHMS School principles

Own elaboration

## 5.1 Timing

The intervention proposal is for two weeks, which will correspond to 10 sessions. As we mentioned before, the students have five hours of biology class a week. Each class lasts 45 minutes, so we prepared activities to the respective time. Our unit, 'Nutrition as the Base for Health and Life,' is the second one in the study program for basic education in secondary school, and we will work on two themes: 'Relations Between Nutrition and the Integral Functioning of the Human Body,' and 'The Importance of Having a Balanced Diet to Keep Us Healthy.' The sessions are as follows:

Table 1 Structure of the timing to develop the CLIL unit.

Topics	Activities	Duration (minutes)
Lesson 1 <b>Introduction: Food and Mood</b>	-Activation of students' previous knowledge -Students, in small groups, plan a meal and present it to the class.	20 25
Lesson 2 <b>The importance of water in nutrition</b>	-Computer-based activities. Students work individually. -In groups, students design a five-question interview and ask their classmates to answer. -Finally, they explain their results according to their classmates' answers.	15 10 20
Lesson 3 <b>The Food Pyramid</b>	-Activation of students' prior knowledge -In teams, they create a Food Pyramid Booklet. -The teacher explains an activity to do at home.	10 25 10
Lesson 4 <b>Food Labels</b>	-Video and questions -In groups, they work with different products and read their labels. -They design a healthy eating wallet card which will include the information to a portion of food they need each day.	10 10 25
Lesson 5 <b>Food, Nutrition, and Culture</b>	-Activation of students' prior knowledge through visual aids -Video and discussion in teams - Individually, they write down the facts they learned and the ones pupils didn't know before, two things that surprised them and one thing they want to start doing.	10 20 15
Lesson 6 <b>Digestion</b>	-Students work with new vocabulary and work individually with a paper-based activity. -Video and questions -Creating a storyboard	15 15 15
Lesson 7 <b>Experimenting</b>	-Teacher explains the different procedures to follow. -Each team works in the assigned experiment -Each team presents to the class their explanations and results	10 25 10
Lesson 8 <b>Task preparation</b>	-Teacher explains the whole process for the presentation, explains the rubric and assigns the groups. -Students work in teams and discuss their organization and research for the final task. - Students present to the teacher the follow up of their work.	15 25 5

Lesson 9 <b>Prepare the final task</b>	-Students work on the creation of their pyramid, revise their written information about their solutions to obesity in childhood and organize their roles for the next day. The teacher acts as a coach for the follow-up.	45
Lesson 10 <b>Presentation: "Food Pyramid and how to reduce childhood obesity."</b>	-Appraisalment  - Each team will have seven minutes to present.  -Have a reflection with the students.	5  35  5

### 5.1 Methodology of the Proposal

As the current official curriculum doesn't have accessible learning results for content and language-integrated learning, if the school wants to implement a bilingual project it has to set the goals for the bilingual subjects; in this case, it is biology for seventh grade students. The teachers develop the unit planner and the lesson plan in the classroom, then the school and the teacher participating in the bilingual program take the set of contents and the learning standards of the official curriculum and adapt it according to the needs of the students. We have taken de Programas de Estudio 2011 de Educación Básica Secundaria, and we will use the syllabus of the second block 'Nutrition as the Basis For Health and Life.'

For this unit, we present the content, the expected learning outcomes, and the basic competencies that are established in the official curriculum (Table 2).

Table 2 Science study program. Secondary Basic Education, 2011. Block 2.

Content	Learning outcomes	Competencies
-Relation between nutrition and the integral functioning of the human body.  -The importance of having a balanced diet to keep us healthy	-Explains the general process of transformation and the use of food, in terms of the correct integral functioning of the human body.  -Argues the reason why keeping a healthy diet and consuming water are important to avoid eating disorders such as anemia, obesity, diabetes, and bulimia.	-Comprehension of the phenomena and natural processes from a scientific perspective.  -Makes informed decisions to take care of the environment and the promotion of health oriented to a prevention culture.  -Comprehension of the limitations and further scope of science and the technological development within different contexts.

Adapted from *Programas de Estudio 2011* (p.43), by Secretaría de Educación Pública, 2011, Mexico City: Secretaría de Educación Pública

**The curricular standards for science in the Mexican curriculum are:**

- Scientific knowledge
- Applying scientific and technological knowledge
- Skills related to science
- Attitudes associated with science

**The progression of science standards should be understood as:**

- The acquisition of a basic vocabulary to advance in the construction of scientific knowledge.
- Development of a major capacity to interpret and represent phenomena and natural processes, and its appliance in different contexts and situations with social and environmental relevance.

**Key competencies for Basic Education in México**

- Language and Communication
- Mathematical Thinking
- Exploration and Comprehension of the Natural and Social World.
- Personal Development and interaction with other people.

As the school is a member of the International Baccalaureate Middle Years Programme (IB MYP), the elements of a CLIL unit are integrated into the Planner Unit MYP (Appendix C); we cannot use another template because it is a requirement of the Middle Years Programme. This Planner Unit MYP is done bi-monthly, and there are five bi-monthlies during the school year. Once in each school year, students in the Middle Years Programme work in one collaboratively planned interdisciplinary unit that involves at least two subject groups. The subject groups are eight: Language Acquisition, Language and Literature, Individuals and Societies, Sciences, Mathematics, Arts, Physical and Health Education, and Design. To develop the unit planner, the teachers work collaboratively to define its purpose, which has its fundamentals in the inquiry cycles that give the framework to the teaching and learning process in the IB World Schools (inquiry, action, reflection). The elements of an MYP Unit Plan are the following (IBO, 2015):

- The inquiry section: This section establishes the purpose of the unit. To establish it, we need to relate it to different concepts that are used as vehicles of inquiry, These concepts must be relevant to the disciplines and to various global contexts that connect to the students' lives. The IB MYP gives the following frameworks: identities and relationships, personal and cultural identity, orientation in space

and time, scientific and technical innovation, fairness and development, and globalization and sustainability. The inquiry questions are factual, conceptual, and debatable, thereby giving guidance to the statement of inquiry. The summative assessment tasks provide information for assessing the students' achievements using the required MYP subject-group criteria that form the basis of the IBO curriculum. Approaches to learning: Skills for thinking, self-management, social interaction, communication, and research.

- The teaching and learning through inquiry section: This section has the content that describes the disciplinary knowledge and the skills to be taught and learned throughout the unit. Secondly, learning experiences and teaching strategies, where students learn in a variety of settings and through different methods used to deliver the information. Thirdly, formative assessment that is all the ongoing knowledge in the classroom and then, the part of differentiation that refers to accepting diversity and finally the resources that are the necessary teaching materials.
- The reflection section where the teacher reflects on the instruction process before, during, and after the unit.

Content and Language Integrated Learning (CLIL) and the International Baccalaureate Middle Years Program (IB MYP) provides contributions to a more international education system.

We developed a suggested lesson plan because even though the school said in 2014 that lesson plans were not necessary anymore and that we should guide our instruction in the unit planner, in CLIL, it is very important to have a lesson plan because teaching content through a vehicular language requires a lot of structure.

The methodology of this intervention proposal presents everything that involves CLIL in practice, and we are going to do it through different activities.

Students will develop productive and receptive skills along with knowledge of the content subject. We will develop activities to enhance peer communication, to help develop reading strategies, and to engage higher cognitive skills. To accomplish these, we will use task-based learning (TBL), which is a student-centered approach to second language instruction. We will also base it on its cycle (pre-task, task-cycle, and post-cycle). In the pre-task reporting period, some examples are the use of scaffolding that can be audio text, a video clip, a brainstorm activity, a small exercise like cross words, or photos to activate previous knowledge. Secondly, on the task cycle, we will be working with and using the target language, activities like pair work, group work, gap activities, and gradual increase in planning, reporting, and presentation. The post-task refers to the

practice of language and building personal dictionaries. We will consider how the task is going to be performed by the students and how they are going to achieve the goal. Students will have a final task for the culmination of the set of lessons, and the students continue to be guided with intermediary activities of exercises. As the final work will be a presentation, students must use all their language resources; their needs will direct the aspects to cover in the lesson with their selections rather than the teachers' decisions. Students will enjoy and will be very motivated. The learning process will move the students to come to the realization and to solve real-world problems. They will use reason and logic to decide what information to convey and what resolution to make for the problem at hand, students will develop skills to request information, ask for clarification and negotiate, and will express their preferences. We will adopt positive assessment for content and language to build students' confidence.

### **5.1 Sessions and activities**

In this section, we present the various aspects that form part of the current proposal such as lesson plans, which include the themes of the unit with its objectives, content, cognition, communication, culture, activities, resources, materials, and assessments. We describe in detail the ten lessons and all of them have the same structure: warm-up, pre-task (introduction of the topic), task breakdown (language, content, competencies such as speaking, reading, giving opinions, teamwork, etc.), and post-task (assessment and learning application). The tools for formative assessment will be observations (checklists and field notes), conversations, and exit slips. At the informal formative assessment, we will use whiteboards and mini quizzes. The activities presented consist in learning from the process, assure greater motivation of learners, foster autonomy, enhances critical thinking and problem solving, and may involve different skills and knowledge. The teacher acts as a guide and provides all the necessary scaffolding so students can achieve the objective of the lesson. Our CLIL module will end with a performance-based activity as a form of authentic and alternative assessment that will be a presentation, and we will use a rubric to assess the student's abilities. The following tables show the different lesson plans structure with the timing for each activity to develop the CLIL unit.

### 5.5.1 Session 1. Introduction: “Energy and Group of nutrients”

This first session will take place in the classroom. We will start by presenting the name of the unit, "Nutrition as the base for health and life." After that, we will start activating the students' prior knowledge using the factual, conceptual, and debatable questions that we determined during the previous MYP unit planner. These issues are the following:

- What is energy?
- How much energy do you need to keep yourself healthy?
- To what extent do my food choices affect my health?

Then, on the whiteboard and using the overhead projector, we will play the video "Food and Mood," restate the previous questions, and discuss them. After that, the students will split into groups of three, and each team will be given a reading assignment (Annex 4) with information about nutrients (proteins, carbohydrates, fats, vitamins, and minerals). We will take a look at the information on the tables given (vitamins, minerals, and daily recommended amounts of each food group for ages 9 to 13 year) (Annex 4) and comment on it. To foster critical thinking, the students will keep working in teams, plan a meal that contains food from each of the six food groups, and present it to the class. Before they leave, they will write on an "exit slip," which will allow the teacher to measure students' understanding and allow the students to express what they think about the new theme.

Table 3. Lesson Plan 1

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Food and mood	
<b>Previous Knowledge/skills</b>  Students may know many facts about food but may have difficulty explaining them.	
<b>Objectives</b>  -To describe the relationship between food and the energy levels that we have during the day. -To distinguish between food/eating habits which may have a positive or negative impact on physical and mental health.	
<b>Content</b>  -The concept of energy - Groups of nutrients - Recommended amount of each food group for 9-13 years old.	<b>Cognition</b>  -Explain what energy is -Recognize different groups of nutrients. -Hypothesize about what would happen if we don't have a balanced diet. -Design a meal according to the recommended amount for adolescents and explain them orally.

<b>Communication</b>	
<p><b>Language of learning</b> (topic particular essential vocab &amp; grammar)</p> <p>-Understand, know and use-orally and written lexicon and expressions related to food: grains, vegetable fruit, fats, milk, meat, beans, diet minerals, vitamins, carbohydrates, proteins, calories, joules.</p> <p>- Use present, future and conditional tenses to express solutions, suggestions, cause-effect regarding the topic food.</p> <p>-Listen and understand a video and carry out the meal presentation.</p> <p>-Interpret a text related to the importance of diet and group of nutrients.</p>	
<p><b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)</p> <p>-Express agreement or disagreement</p> <p>-Express hypothesis</p> <p>-Ask and answers questions</p>	
<p><b>Language through learning</b></p> <p>-Use dictionaries to make a glossary.</p> <p>-Present-orally- their meal designs.</p>	
<p><b>Culture/Citizenship</b></p> <p>Raise awareness about the importance of having a healthy diet.</p>	
<p><b>Materials &amp; Resources</b></p> <p>-Smart board</p> <p>-Video “How the food you eat affects your brain ( Nacamulli, 2016)</p> <p>-Concept map about nutrients (Appendix D), cardboards, colors, pens, pencils, white sheets of paper and markers.</p>	
<b>Activities</b>	<b>Time</b>
<p>1.Warm-up asking the students</p> <ul style="list-style-type: none"> <li>• What is energy?</li> <li>• How much energy do you need to keep a healthy weight?</li> <li>• To what extent do my food choices affect my health?</li> </ul>	5 minutes
<p>2. We watch the video “Food and mood” and comment on it.</p>	4.52 minutes
<p>3. We read the concept map with the information about the topic and discuss possible doubts and information.</p>	10 minutes

4. In groups, in a sheet of paper, students organize information about food groups and list some examples.	10 minutes
5. With, the cardboards, in groups, the students create a typical daily menu and present it to the class.	15 minutes
<b>Assessment:</b>  Completion of collaborative work, observation of participation, exit slips.	

### 5.5.2 Session 2. The Importance of Water in Nutrition

The second session will take place at the Language Development Center (LDC) or the computer laboratory; we must book the venue in advance. In the second lesson, we will recall the things we learned in the previous lesson, using the following questions:

- How does the food you eat affect your brain?
- What are lipids?
- Where can we find different types of omega?
- How can amino acids affect our mood?
- Which micro nutrients help keep the human brain healthy?

Then, we will discuss water and its nutritional role. We will discuss its functions and the meaning of hydration and dehydration. We will watch a video that explains it and answer the following questions:

- What would happen if you didn't drink water?
- How much water do you need to keep yourself healthy?
- To what extent does my water intake affect my health?

Students will work individually and answer an online quiz containing four multiple choice and three open questions related to the video. They will also read online about the best fruits and vegetables for getting water into their bodies. After reading the information, students will work in groups of three and design a five-question interview on the study of the behaviors and attitudes of their classmates' water intake habits.

The teacher will help on formulating the questions so we can obtain the data we want.

For example:

- How often do you drink plain water?
- What other types of drinks do you have?
- What types of sports do you do?
- Which of the fruits that contain the major percentage of water do you consume?

- Which of the vegetables that contain the major percentage of water do you consume?
- How important is it for you to be hydrated every day?

After collecting data, they will explain the percentages of daily water intake, types of drinks, the frequency of drink intakes, types of fruits and vegetables their classmates eat that contain water, and what solutions they propose to generate a social behavior on maintaining hydrated.

Table 4. Lesson Plan 2

<b>Group</b> 7th A Secondary		<b>Time</b> 45 minutes
<b>Topic</b> The importance of water in nutrition		
<b>Previous Knowledge/skills</b> Students should be familiar with the theme in previous lessons and math concept of percent.		
<b>Objectives</b> -Learn about how important is water for the human body. -Use ICT (computer) as a mean of learning about the importance of water in the human body		
<b>Content</b> -Water properties -Nutritional role of water -Sources of water -Dehydration, causes, and consequences.		<b>Cognition</b> -Explain water properties and nutritional role of water -Recognize different sources of water. -Hypothesize about what would happen if we didn't drink water -Design a questionnaire to interview their classmates according to what they watched and read and take out percentages of the results.
<b>Communication</b>		
<b>Language of learning</b> (topic particular essential vocab & grammar) -Understand, know and use-orally and written lexicon and expressions related to hydration: - Use adverbs of frequency, present habits, suggestions, cause-effect regarding the topic hydration. -Listen and understand a video and carry out an investigation. -Interpret results of the questionnaire applied and discuss it with the classmates.		

<b>Language for learning</b> (= language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)	
-Express agreement or disagreement -To ask for information and to give an opinion.	
<b>Language through learning</b>	
-Language through peer interaction during the interviews -Language through activities and questions during the session. -Language through interpreting data.	
<b>Culture/Citizenship</b>	
Promote the understanding that water and culture are common elements of human life. It encompasses lifestyle and habits to live healthily.	
<b>Materials &amp; Resources</b>	
-Smart board and audio -Video “What would happen if you didn’t drink water?” (Nacamulli, 2016) -Link to have an online quiz (Nacamulli, 2016) -Computer -Notebook	
<b>Activities</b>	<b>Time</b>
1. Warm-up activity Ask the students the following questions: <ul style="list-style-type: none"> <li>• What would happen if you didn’t drink water?</li> <li>• How much water do you think you need every day to stay healthy?</li> <li>• To what extent do my water intake affect my health?</li> </ul>	5 minutes
2. We watch the video “What would happen if you didn’t drink water?” and comment on it.	4.51 minutes
3. Students answer a quiz on line and go to the ed.ted link where they will answer four multiple choice and three open questions related to the video the section “think”	5 minutes
4. After that, in the same link, students will go to” Dig deeper” and press the sentence “the best fruits and vegetables for getting your H <sub>2</sub> O” where they will find information about this topic.	10 minutes
5. In groups of three, students design a five-question interview as a study of the behaviors and attitudes of their classmates about their habits on water intake.	10 minutes

6.After collecting data, they will explain the percentages of daily water intake, types of drinks, the frequency of drinks intake, types of fruits and vegetables their classmates eat that contain water.	10 minutes
<b>Assessment:</b>  Computer-based activities and observation of participation.	

### 5.5.3 Session 3. The Food Pyramid

In this lesson, we will start reading the article "You are what you eat, "(Annex 5) and we will discuss the factors that influence our decisions around food, and this will lead us to the grouping of foods. The activity of creating a "food pyramid booklet" will provide the opportunity to engage students with content, and it involves team work that will support learning, communications, and thinking skills. Students will split into groups of three. After finishing their booklets, the teacher explains the activity that students have to do at home, and that they will comment it with their classmates in further lessons. They will write a food diary for four days so pupils can recall what they ate. They have to use the template: "MyPlate Daily Checklist Calculator," which they can download as a PDF, and they can find it on the internet and bring it later to comment on it.

Table 5. Lesson Plan 3

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> The Food Pyramid	
<b>Previous Knowledge/skills</b>  Students should be familiar with the theme in earlier lessons.	
<b>Objectives</b>  -Apply to their real life what they have learned about nutrition.	
<b>Content</b>  -Types of Food Groups and Levels	<b>Cognition</b>  -Create a food pyramid booklet
<b>Communication</b>	
<b>Language of learning</b> (=topic particular essential vocab & grammar)  -Understand, know and use-orally and written lexicon and expressions related to nutrition and types of food. -Listen and follow instruction. -Use present, future and conditional tenses to express cause-effect and suggestions regarding the topic "Food Pyramid".	

<b>Language for learning</b> (= language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)	
<ul style="list-style-type: none"> <li>-Express agreement or disagreement</li> <li>-Language to ask for information and to give an opinion.</li> <li>-Label a picture</li> <li>- Write a diary with their different meals for four days.</li> </ul>	
<b>Language through learning</b>	
<ul style="list-style-type: none"> <li>-Language through peer interaction.</li> <li>-Language through activities and questions during the session.</li> </ul>	
<b>Culture/Citizenship</b>	
Understand that our food choices have to do with our culture we live in, the ethnic background and religious beliefs and that every person has a culture of their own.	
<b>Materials &amp; Resources</b>	
<ul style="list-style-type: none"> <li>-Reading article “ You are what you eat”(Appendix E)</li> <li>-Magazines, Newspapers, Scissors, Glue, construction paper, colored sheets of paper and ribbon.</li> <li>-PDF Food diary ( 4 photocopies) (Appendix F)</li> </ul>	
<b>Activities</b>	<b>Time</b>
-As a warm-up activity, we will read "You are what you eat, " and while reading, students match the paragraph to the correct part of the pyramid (Appendix E).	10 minutes
-Students work in teams of three and create their Food Pyramid Booklet. Students hang their booklets on the walls.	25 minutes
-The teacher explains the activity about the diary (Appendix F)	10 minutes
<b>Assessment</b>	
The students' performances in the team and the teachers feedback at the end of the session are the basis to know students' progress. They will keep at home a food diary for three days so they can recall what they ate. They have to use the template “MyPlate Daily Checklist Calculator” and bring it later to comment on it.	

#### 5.5.4 Session 4. Food Labels

The lesson is meant to follow-up previous ones and is practice for students reading the labels of packaged food.

The teacher starts asking the following questions:

- How frequently do you read the nutrition facts panels on the foods you eat?

- Do people want to know about the ingredients in their diet?
- Who decides what information should be on food labels, the food industry or the government?

Then, the teacher displays an image on the whiteboard and explains the facts to take into account at the time of reading a label. The teacher also gives the vocabulary related to different names of fat (beef fat, butter, coconut oil, cocoa butter), for sugar (brown/raw sugar, corn syrup, cane sugar, honey, glucose, fructose) and for salt (celery, chicken, garlic, sea salt, sodium, table salt). Students will watch the video "How to read a label," and when it finishes, they will split into groups of three, pick up three different products, read the tags, and comment on them. At the same time, they will design a "healthy eating wallet card," where they will write down the most important facts about reading a label. Some of these facts are:

- Choose foods with the lowest saturated fats and the least amount of sodium.
- Each day, you need one or two pieces of fruit, five different vegetables, and three servings of dairy, like milk, yogurt, or cheese.
- One meal a week should contain meat, two or three meals should contain red meat, and about two must contain fish. Bread and cereals help the body fill up.

Students will reflect on their learning.

Table 6. Lesson Plan 4

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Food labels	
<b>Previous Knowledge/skills</b>  Students may be familiar with how to read food labels and mathematics involving figuring percentages.	
<b>Objectives</b>  Identify ingredients listed on nutrition facts of packaged food to make healthier food choices	
<b>Content</b> -Food Labeling	<b>Cognition</b> -Knows how to maintain personal health. -Exemplify nutrients that can go undercover and use a different name
<b>Communication</b>	

<b>Language of learning</b> (topic particular essential vocab & grammar)	
-Understand, know and use-orally and written lexicon and expressions related to food labels. -Listen and follow instruction. -Language of describing, defining and explaining.	
<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)	
-Express agreement or disagreement -Language to ask for information and to give an opinion. -Language for project work	
<b>Language through learning</b>	
-Language through peer interaction. -Language through activities and questions during the session. -Using feedback	
<b>Culture/Citizenship</b>	
People choose food according to their personal reasons (Religion, dietary reasons, etc.)	
<b>Materials &amp; Resources</b>	
-Whiteboard, overhead projector, speakers, colors, cardboards, markers, notebook, different packaged food. (at least three products for each team) -Labels of packaged food ( Amibolt, 2014) -Video “How to read a label” (Nestle, 2013)	
<b>Activities</b>	<b>Time</b>
-As a warm up, we will start the lesson asking the following questions: <ul style="list-style-type: none"> <li>• How frequently do you read the Nutrition facts panels on the foods they eat?</li> <li>• Do people want to know about the ingredients in their diet?</li> <li>• Who decides what information should be provided on food labels? Food industry or the government?</li> </ul>	5 minutes
-The teacher displays on the white board the explanation for food labels and watch the video that will help to do the next activity .	15 minutes
- The students are split out into groups of three and work with 4 different products and will read the label and explain to the rest of the team, at the same time they will design a "Healthy eating wallet card" which will include the information to food they need each they.	25 minutes

**Assessment**

The organization and content of their statements, contribution to class discussions and participation in the group work.

**5.5.5 Session 5. Food, Nutrition, and Culture**

The students will have this lesson in the classroom. As a warmup, the teacher will write down the names of different continents at the top of each of the five chart papers: Africa, Asia, Europe, North America, and South America. The teacher will ask the students which of the different continents they believe have the healthiest food choices and eating habits and discuss their perceptions of poverty, climate, culture, and any other observations they may have. Ask them, how do they know that? Students write their comments on each of the charts with the continents. After that, they look at some photos of people from around the world with their most typical food from "Hungry Planet: What the world eats" to give an overview, with a classmate, students discuss why there are different types of food around the world, the differences they see in the pictures, availability, cost, and health of food. They will watch the video "The Dollar Menu," and in pairs, they will comment the economics of food industry and how it affects their choices. As some closing activity students reflect on the facts, they learned and write them down and identify those they didn't know before, two things that surprised them about the topic and one thing they want to start doing with what they have learned.

Table 7. Lesson Plan 5

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Food, Nutrition, and Culture	
<b>Previous Knowledge/skills</b> Students may be familiar with the food some cultures have.	
<b>Objectives</b> Develop an awareness of the diversity of food around the world.	
<b>Content</b> -Stereotypes -Diversity -Culture	<b>Cognition</b> -Explain how food choices depend on the resources, culture, and geography each country has. -Compare and contrast their food choices with the eating habits of others, locally and globally.
<b>Communication</b>	

<b>Language of learning</b> (topic particular essential vocab & grammar)	
<ul style="list-style-type: none"> <li>-Understand, know and use-orally and written lexicon and expressions related culture and food insecurity: beliefs, perceptions, and values that a community share and the fear of not having access to food that meet people's dietary needs to grow and to be healthy. --Listen and follow instruction.</li> <li>-The language of describing, defining and explaining.</li> </ul>	
<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)	
<ul style="list-style-type: none"> <li>-Express agreement or disagreement</li> <li>-Language to ask for information and to give an opinion.</li> </ul>	
<b>Language through learning</b>	
<ul style="list-style-type: none"> <li>-Language through peer interaction.</li> <li>-Language through activities and questions during the session.</li> <li>-Using feedback</li> </ul>	
<b>Culture/Citizenship</b>	
Geography, culture, and resources set the limits for food choices.	
<b>Materials &amp; Resources</b>	
<ul style="list-style-type: none"> <li>-Whiteboard, overhead projector, sheets of chart paper and markers.</li> <li>-Photos from “Hungry Planet: What the world eats” (Menzel, 2005)</li> <li>-Video “The Dollar Menu” ( Kenner, 2015)</li> </ul>	
<b>Activities</b>	<b>Time</b>
<ul style="list-style-type: none"> <li>-As a warm up, the teacher starts writing the names of different continents at the top of each of the five chart papers: Africa, Asia, Europe, North America, and South America. Ask the students which of the different continents they believe has the healthiest food choices and eating habits and discuss their perceptions of poverty, climate, culture and other observations they may have. Ask them, how do they know that? Writing their comments on each of the charts with the continents</li> </ul>	10 minutes
<ul style="list-style-type: none"> <li>-Students look at some photos of people from around the world with their most typical food from, "<i>Hungry Planet: What the world eats</i>", to give an overview, with a classmate, students discuss why there are different types of food around the world, discuss the differences they see in the pictures, availability, cost, and health of food.</li> </ul>	10 minutes
<ul style="list-style-type: none"> <li>- Watch the video “<i>The Dollar Menu</i>”</li> </ul>	5.14 minutes

-After watching the video, students will discuss the economics of food industry and how it affects their choices.	10 minutes
- As a closing activity student reflect on the facts they learned and write them down and identify those they didn't know before, two things that surprised them about the topic and one thing they want to start doing with what they have learned.	10 minutes
<b>Assessment</b>  Contribution to class discussions, students' presentation on what they learned about foods and culture, peer interaction, observations and exit slips.	

### 5.5.6 Session 6. Digestion

The teacher presents the new vocabulary words related to "Digestion." After that, the students work with a handout and fill in the missing words (Appendix) Students read out their answers. As another activity students watch the video "Digestive System of Human Body" and in groups of three students answer the following questions:

- What is the role of teeth?
- What factors improve the correct functioning of the intestine?
- Why does the gut need villi?

After working collaboratively, the students work individually to complete a text and fill in the gaps.

Table 8. Lesson Plan 6

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Digestion	
<b>Previous Knowledge/skills</b>  Students have learnt about human digestive system in elementary school.	
<b>Objectives</b>  Identify the parts of the digestive system and nutrition.	
<b>Content</b>  -Definition of digestion -Digestive organs, its function, and reaction involved in the human body.	<b>Cognition</b>  - Label the parts of the process. -Explain how digestive system works -Illustrate the way digestive system works. -Hypothesize how we can improve the workout of intestine

<b>Communication</b>	
<p>Language of learning (topic particular essential vocab &amp; grammar)</p> <p>-Understand, know and use-orally and written lexicon and expressions related to digestive system: fuel, digest, repair, chyme, gallbladder, bolus, pepsin, feces, large intestine, epiglottis, pancreas, peristalsis, absorption, rectum, villi, anus, liver, esophagus, enzymes, bile, mucus.</p> <p>-Use present tense and expressions of cause-effect, regarding the topic "digestion."</p>	
<p><b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)</p> <p>-Express agreement or disagreement</p> <p>-Express hypothesis.</p> <p>-Language to ask for information and to give an opinion.</p>	
<p><b>Language through learning</b></p> <p>-Use dictionaries to make a glossary.</p> <p>-Language through activities and questions during the session.</p> <p>-Using feedback.</p>	
<p><b>Culture/Citizenship</b></p> <p>Become aware of the importance of having a balanced diet so that all the systems in our body can work efficiently.</p>	
<p><b>Materials &amp; Resources</b></p> <p>-Whiteboards, overhead projector, speakers, handouts, white sheets of paper, colors</p> <p>- Diagram to label ( Appendix G)</p> <p>-Reading about “Digestion process”( Appendix H)</p> <p>- Video “Digestive System of Human body” (Smart Learning, 2014)</p>	
<b>Activities</b>	<b>Time</b>
-The teacher presents the new vocabulary and revises meaning with the students.	10 minutes
-Students work individually with a diagram and the information in the text, they label it.	10 minutes
-Before watching the video , we read together about the process of digestion.	5
-Watch the video “Digestive System of Human body”	3.48 minutes
-In groups of three, students answer the following questions:	
➤ What is the role of teeth?	
➤ How can we improve the workout of the intestine?	
➤ Why do we need villi in the gut?	5 minutes

-They continue working in groups and create a storyboard that discusses about the digestive system and has 6 frames. They do it by hand and create their own drawings.	15 min
<b>Assessment</b>  Contribution to class discussions, students' completion of handouts, peer interaction, observations and exit slips.	

### 5.5.7 Session 7. Experimenting

This seventh session will take place in the Science Lab. There will be three large tables, and students will be split into three teams of five students. The teacher presents the protective equipment and tells the students not to begin any experiment without the proper protective equipment. Each group will have a different operation that lasts 20 minutes: one team will model digestion, and the second team will test how food compares. They must use the scientific method (observe, ask questions, form a hypothesis, test the hypothesis, analyze, conclude, and communicate results). The experiments are the following:

**Model digestion:** In the cellophane paper bag, set 5 ml from the starch solution and a bit of glucose in powder. Tie the thread very securely to the opened extreme side of the bag, avoiding letting the solution come out. Immerse the bag in a precipitation glass with the distillate water. Let it rest for 10 minutes. Take two samples of water from the glass with the dropper and put it separately into each of the watch glasses. Add Lugol to one of the samples and the other the Benedict reactor. Observe what goes on.

Ask your teacher what the Lugol and Benedict reactor are. Now, what happened when you added the Benedict reactor and Lugol? Which substances could trespass the cellophane paper bag? What similarities are there between what occurred in the cellophane paper bag immersed in the glass of water and with the process of nutrients absorption? What relation can you find between this experiment and what goes on in your body? Write a brief reflection in two sentences about how food transforms and how it is used.

**Finding energy in food:** Burn the snack under a test tube containing water and observe what happens. Do it with different snacks (almond, cheese, chips, peanuts, chocolate). What happens if you burn food under a test tube containing water? How is chemical energy in the food transferred into heat energy? What happens the hotter the water gets? Draw and explain to the class your five different diagrams.

**Comparing food:** Draw four circles on your extended grocery bag. Now, write the name of each food in each of the circles and place the food in the corresponding circle. Leave the food there for 15 minutes and write down what you observe (for example: if it left a

greasy mark, a wet mark, or no mark) and write the size of the spot (diameter). Describe the spots' appearance and mention the characteristics of each food and how they are alike. Explain the importance of eating a diversity of foods.

Each team presents to rest of the class how they did the procedure, their results and how they compare the experiment to their real life.

Table 9. Lesson Plan 7

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Experimenting	
<b>Previous Knowledge/skills</b>  Students have learned about energy, nutrition and human digestive system in the previous lessons.	
<b>Objectives</b>  -Comprehend through a model how food absorption occurs through the intestinal wall and the blood flow for the essential function of the body. -Understand how we find energy in food. -Identify different fat contents in food to choose a healthy.	
<b>Content</b>  -Nutrition absorption -Energy in food. -Fat contents	<b>Cognition</b>  - Classify the foods studied by all groups of nutrients. -Explain the function of the digestives system. -Compare and contrast foods.
<b>Communication</b>	
<b>Language of learning</b> (topic particular essential vocab & grammar)  -Understand, know and use-orally and written lexicon and expressions related to scientific and technological knowledge -Use present tense and manifestations of cause-effect.	
<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)  -Express agreement or disagreement -Express hypothesis. -Language to ask for information and to give an opinion.	

<b>Language through learning</b>  -Language through activities and questions during the session. -Use data to develop descriptions. -Use logic to make relationships between data and explanations.	
<b>Culture/Citizenship</b>  Become aware of the importance of having a balanced diet so that all the systems in our body can work efficiently.	
<b>Materials &amp; Resources</b>  Protective equipment (goggles, apron, soap, and gloves). For the first experiment: cellophane paper bag, thread, glucose in powder, starch to the 5% distillate water, Benedict and Lugol reactor, two watch glasses, dropper and precipitation glass. For the second experiment: clamp, test tube, water, different snacks, snack holder. For the third test: grocery bag, permanent marker, different food (ham, carrots, banana, and chocolate).	
<b>Activities</b>	<b>Time</b>
-The teacher will guide understanding and procedure. She/he gives a sheet of paper to each team where the students find the procedure for the experiment.	10
-Each team works in the assigned experiment.	25
-Each team presents to the rest of the class the results and explanation.	10
<b>Assessment</b>  Teacher observation of team work, open-ended questions, oral presentation skills, self and peer observation.	

### 5.5.8 Session 8. Preparing for the Task

There will be two sessions devoted to doing the final work for the closure of our CLIL Module. We will reinforce the knowledge about the theme "Nutrition as the Base for Life and Health," check if the content was understood, and if the students can communicate in a written and oral form using the vocabulary and the expressions they learned during the previous seven sessions. We can also witness their creative capacities. This final presentation is about creating a food pyramid, with any material and also think about how to reduce childhood obesity. At the time of the presentation, they must explain the food pyramid and talk about their solutions to reduce childhood obesity and hand in an essay about it. For these eight sessions, we will be at the language development center so the students can research more.

To start, we will hold a class discussion about food and water and its importance to the human body, then group the students into three and have them discuss how they will organize, do, and create their final presentation.

Table 10. Lesson Plan 8

<b>Group</b> 7th A Secondary		<b>Time</b> 45 minutes
<b>Topic</b> Task preparation		
<b>Previous Knowledge/skills</b>		
Students have learned about energy, nutrition and the food pyramid in previous lessons.		
<b>Objectives</b>		
-Understand that not meeting nutritional needs can lead to weight gain.		
<b>Content</b>		<b>Cognition</b>
-Group of nutrients -Nutritional role of water -Food groups and levels		-Recognize the different types of nutrients. -Understand the cause-effect of water intake. -Explain different food groups and levels. -Carry out an investigation (in groups) into possible solutions to obesity and discuss findings.
<b>Communication</b>		
<b>Language of learning</b> (topic particular essential vocab & grammar)		
-Understand, know and use-orally and written lexicon and expressions related to diet, energy, carbohydrates, nutrients, protein, serving, hydrate, weight gain. -Use future and conditional tenses for the expression of cause/effect, solutions, suggestions, regarding the topic "nutrition." -Interpret different types of texts for their investigation.		
<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)		
-Express agreement or disagreement -Write a research report		
<b>Language through learning</b>		
-Language through peer interaction -Language through questions during the sessions.		
<b>Culture/Citizenship</b>		
Investigate possible solutions to childhood obesity		
<b>Materials &amp; Resources</b>		
Computer, previous readings, and exercises, notebook, pens.		

<b>Activities</b>	<b>Time</b>
-Class discussion about food and water and its importance to the human body.	5 minutes
-Students split out into three and discuss their organization and research for the presentation.	25 minutes
- Students present to the teacher their advances of their organization.	15 minutes
<b>Assessment</b>  Teacher observation of team work, classroom interaction, small groups discussions.	

### 5.5.9 Session 9. Preparing the Final Task

This session is the students' second and last chance to finish drafting the final work and to get ready for a final presentation. The whole class will be devoted to the construction of the "3D Food Pyramid" and the organization of the theme. The students have previously organized themselves regarding the materials to bring and the design of their pyramids.

Table 11. Lesson Plan 9

<b>Group</b> 7th A Secondary	<b>Time</b> 45 minutes
<b>Topic</b> Task preparation	
<b>Previous Knowledge/skills</b>  Students have learned about energy, nutrition and the food pyramid in previous lessons.	
<b>Objectives</b>  -To complete a food pyramid by placing the correct number of meals on each level.	
<b>Content</b>  -Group of nutrients -Nutritional role of water -Food groups and levels	<b>Cognition</b>  -Recognize the different types of nutrients. -Understand the cause-effect of water intake. -Explain different food groups and levels. -Create a food pyramid
<b>Communication</b>	
<b>Language of learning</b> (topic particular essential vocab & grammar)  -Understand, know and use-orally and written lexicon and expressions related to a group of nutrients, food groups, and levels-Use future and conditional tenses for the expression of cause/effect, solutions, suggestions, regarding the topic "nutrition." -Describing, defining, explaining, hypothesizing.	

<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)  -Express agreement or disagreement -To build arguments and disagreements. -In groups, asking and answering questions using evidence.	
<b>Language through learning</b>  -Group discussion -Using communicative skills	
<b>Culture/Citizenship</b>  Peer review, points of view on nutrition	
<b>Materials &amp; Resources</b>  Students use the materials they brought to create their 3D pyramid. (they can use any material)	
<b>Activities</b>	<b>Time</b>
-Students work on the creation of their pyramid, revise their written information about Nutrition and obesity and organize their roles for the next day that will be the presentation.	45 minutes.
<b>Assessment</b>  Teacher observation of team work, classroom interaction, small groups discussions.	

#### 5.5.10 Session 10. Presentation: "The Food Pyramid and How to Reduce Childhood Obesity"

In this last session, students have their presentations on the topic we assigned to close the CLIL module. The presentation can be done with PowerPoint, Prezi, or any digital tool. Students also explain their Food Pyramids and comment on their solutions for reducing childhood obesity. There will be five groups integrated by three students each. We will have the opportunity to reinforce the knowledge of the theme "Nutrition Is the Base for Life and Health." For this session, the students have seven minutes to present, and they will have the chance to practice their communication skills. This will be the structure of the presentation:

- Students present themselves and give the theme.
- They explain the food pyramid.

- In the presentation, they must describe the number of food groups in the Food Pyramid, list the recommendations for daily servings from each cluster for teenagers, and mention the drinks included in the tip of the pyramid.
- They will explain how to read a food label so we can make healthy choices and how the digestive system helps in nutrition.
- They will present solutions for reducing obesity and hand in their essays, which have to contain its causes, obesity in teenagers, and solutions to it.
- We will also record the presentations and upload them to the YouTube channel of the school. Students will work collaboratively in an autonomous way, and we will intervene when necessary.
- After the presentations, we will have five minutes to have a reflection of the CLIL module, how they felt, and if they enjoyed participating.

Table 12. Lesson Plan 10

<b>Group</b> 7th A Secondary		<b>Time</b> 45 minutes
<b>Topic</b> Presentation		
<b>Previous Knowledge/skills</b>		
Students have learned about energy, nutrition and the food pyramid in previous lessons.		
<b>Objectives</b>		
-To demonstrate all the knowledge students have internalized through an oral presentation and the representation of the "Food Pyramid."		
<b>Content</b>		<b>Cognition</b>
-Group of nutrients -Food groups and levels -Digestion		-Explain different types of food and levels -Recognize the various kinds of nutrients. -Understand the cause-effect of digestion -Describe different food groups and levels. -Carry out a presentation
<b>Communication</b>		
<b>Language of learning</b> (topic particular essential vocab & grammar)		
-Understand, know and use-orally and written lexicon and expressions related to "Nutrition." -Future and conditional tenses -Define and describe		

<b>Language for learning</b> (language needed to operate in the learning environment or a particular lesson – discuss, justify, explain, etc.)  -Express agreement or disagreement -To build arguments and disagreements. -In groups, asking and answering questions using evidence.	
<b>Language through learning</b>  -Language through peer interaction -Questions among classmates	
<b>Culture/Citizenship</b>  Carry out a presentation about how the "Food Pyramid links to nutrition and how if we know what exactly to eat, we can reduce obesity. The students record the presentation and upload it to the YouTube account for discussion with other groups of the school.	
<b>Materials &amp; Resources</b>  -Food Pyramid. -Presentation (Power Point, Prezi, etc. or any tool students used to create it) -An essay about their solutions to reduce Obesity.	
<b>Activities</b>	<b>Time</b>
-Appraisalment	5 minutes.
-Presentations (There are five presentations)	7 minutes per each presentation
-Reflection with the students	5 minutes

## 5.6 Assessment

In this section, we refer to the explanation on how we assess students' learning processes and how we evaluate our intervention proposal. Assessing students' learning processes and the intervention proposed is significant because teaching always involves assessments, and students take responsibility for their learning, which is fundamental to the success of CLIL. In both cases, we will use a rubric.

### 5.6.1 Learning Assessment

In CLIL, assessments are integrated into the learning process, and there are three main concepts associated with them.

An assessment for learning is the formative assessment where the teacher and the student are in a continual feedback. We will use an ongoing assessment such as quizzes, end-of-chapter tests, essay writing, informal classroom observations, and behaviors.

Assessment of learning refers to the summative assessment to check progression, and it uses different assessment tools. Teaching and assessment of learning are viewed as

complementary because they aim to benefit the teacher outcomes and the students learning quality. The ultimate success of students depends on their motivation and their commitment to learning.

Assessment of learning is when the teacher shares the learning objectives and the assessment criteria and use alternative forms of assessment to evaluate learning. Some examples are peer and self-assessment and tools such as portfolios, observation grids and other instruments that help to assess learning, with the criteria, students will improve their outcomes.

For the assessment of learning, to obtain the summative grade required in the evaluation registration in the corresponding term, we take into account the following aspects shown in table 13.

Table 13 Summative Grade

<b>Name of the student</b>	
<b>IN CLASS DAILY WORK</b> <b>50%</b>	<b>GRADE</b>
SPEAKS ALL THE TIME IN ENGLISH 10%	
EXIT SLIPS 10%	
PARTICIPATION IN CLASS 10%	
COLLABORATIVE WORK 10%	
BEHAVIOUR 10%	
<b>TASK (PRESENTATION)</b> <b>40%</b>	
<b>ESSAY WITH SOLUTIONS TO OBESITY</b> <b>10%</b>	
<b>TOTAL</b>	

For the assessment of learning, we use a rubric (Appendix I) to assess the final task and to provide pupils with feedback. Using a rubric, we will indicate the criteria to achieve any work that students do with the levels of achievement, and it will relate to the School's definition of grades, each concept of the criterion will have in detail the performance for each achievement.

As rubrics have the purpose of assessing performances, we will use one to observe a presentation, and it will also help clarify the content and the outcomes. Rubrics also cover evaluating as learning because they allow students to reflect on their learning, so we must focus the rubric on learning and not on tasks.

### 5.6.2 Assessment of the Proposal

In this part, we assess and evaluate our work. To do so, we need to gather as much information as we can such as the students' work (check quality of outcomes), the following of the programming, if we adjusted teaching to maximize the students' learning, students' opinions and their feelings, review materials, classroom observations so the students know and learn from the process to improve, and so on. This part is where the teaching and learning process will throw results. Effective teachers stand out for frequent assessment and feedback, so we will have to think about the aspects with which we want to evaluate our proposal and take the negative results to improve them and the positive results to keep up with the good work and create new aspects to consider.

To evaluate our proposal, we will use the following criteria at the moment of implementing our unit to catch up the information and present it in Table 14.

Table 14 Aspects to evaluate the proposal and teacher's performance.

Aspects to Evaluate	To improve	Adequate	Good
Classroom management			
Accomplishment of the teaching objectives and the unit content			
Presentation of instruction			
Integration of language and subject curricula			
Appropriate use of subject specific terminology and the syntax structures.			
Use of the target language to clarify and check understanding			
Making input comprehensible (verbal scaffolding, visual aids, key vocabulary)			
Variation of classroom activities (individual, pair and group work, warm up, laboratory, multimedia)			
Support to individual and differentiated learning			
Selection of material			
Integration of the 4C's			
The use of assessment tools to help improve students' learning.			
Use of ICT			

## 6. Discussion

The main objective of the Master's Dissertation has been to design an intervention proposal to offer an alternative in the teaching-learning process through a non-native language (English) presenting the Biology class as a starting point in 7th grade to give continuity to bilingualism for the students that come from primary school. To achieve this objective we made a literature review about CLIL to get to know this approach because we believe it is suitable for the school and it has things in common with the international baccalaureate, The school principals and the secretaria de educación pública new educational model where English is one of the most valuable skills that Mexican students must have to act and be functional in this 21st century, and these shared features allow us to implement our proposal in an integrated way. Currently, within the school context, the traditional instruction is still the standard method, and it doesn't allow for active learning based on hands-on tasks related to real world situations. With the questionnaire that we applied to the students, we reaffirm that CLIL could be a powerful tool to improve students' language performance and because most of them have a positive attitude toward English as a vehicular language for biology and they are willing to participate in a bilingual program. Nevertheless, non-language and language teachers should also be educators for the competencies of this present century. CLIL is a teaching and learning relation where the teachers can bring in any useful idea, pedagogy, and practice to education; the lesson is better if they constantly make students aware of the content, roles of language (for, of, and through), information processing (from LOTS to HOTS), and the development of Culture through classroom activities, communication and collaboration, and global citizen skills.

As this proposal is just an introduction of CLIL to the school and currently is not in the school, we cannot provide results on how effective it is; we can only guess that students will be more motivated and gain more self-confidence. Regarding teachers, we suppose it will be a motivation to work collaboratively because they usually do it by a group of disciplines as the School and the International Baccalaureate way of working, so it will be a new thing for a subject teacher to work with a language teacher.

## **7. Conclusions**

To get to an end of this Master's Dissertation, we draw some conclusions from the described justification of the research question and problem. The current situation of English Language teaching in Mexico has to deal with a lot of challenges that will need a solution so that the goal of preparing students to live productively in this globalized world will be possible to do because the Government, Educational Authorities, and Schools are working to develop this possibility. In Mexico, the use of CLIL in classrooms is becoming more known in private schools due to their interest in providing a bilingual education to children; furthermore, each bilingual institution has a different approach.

The need to learn English in Mexico has transformed the government actions by implementing a New Educational Model, and this bilingual transformation is taking its first steps by implementing English in public schools, and teachers of English will also train former teachers, so they can acquire this foreign language, and, bearing in mind the different contributions that CLIL could offer to our educational system, we found that CLIL is suitable to implement in our school context. We created a CLIL unit adjoining as many aspects as we could include, thinking in the characteristics of our students. We believe that we have now taken a step forward by making this attempt to give continuity to bilingualism of the elementary school at the Colegio Hebreo Monte Sinai

We can also conclude that if we implement this approach, classes will meet several real standards in methodology and assessment. Regarding content, it prepares students for future studies in sciences, and it also gives a real access to accurate information. Referring to language, students will use the language for a real purpose and real situations. In cognition, they will acquire different skills from something abstract to something concrete, and in the cultural aspect, students are part of a community and have knowledge about different cultural aspects around the world. The concept of awareness for others will keep students in an intercultural connection.

## **8. Limitations and Further Research**

Through the development of the theoretical framework of the present Master's Dissertation, we focused our objective on suggesting CLIL as an alternative way to improve English language performances in students and how it links with the school's mission, the International Baccalaureate, and the New Educational Model for Mexico.

We will mention that there were some limitations to the research. First, we could not find studies related to CLIL in secondary schools in Mexico even though they apply it in some private schools. We have only found that in Mexico's educational system, English language teaching has existed since the 1960s. There was a lack of explicit policy statements, but fortunately, in response to this, educational authorities have made

significant reforms. As a good start, they presented the New Educational Model where English language classes will be compulsory from preschool to higher education. Thus, as a second limitation, we only found the theoretical framework of the New Educational Model and some actions that will significantly change the English language teaching in Mexico. This lack of information on all the measures regarding the New Education Model referring to the English language is because a lot of people are working this year to start implementing it for the school year in 2018-2019. As a third limitation, we didn't find studies of CLIL within an International Baccalaureate school; we wanted to know how they faced the different obstacles in the implementation process because implementing both to cater to this twofold goal for international education is considerably more complex.

For future research, it would be advisable to look for deeper information on collaborations between content teachers and language teachers to see the benefits and have a much greater network of cooperative relationships, and we also suggest extending the CLIL programming to a whole school year and carrying out a comparative study among two different groups with the same characteristics to have results on the experimental and control groups to compare their written and oral productions to see if the implementation is going the right way.

We would like to think that someday, this type of approach will be a reality in mainstream education.

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## Appendices

### Appendix A

#### CLIL Questionnaire

Your answers will be very helpful in letting us know if we can improve your English Language Learning and make it more meaningful to you.

Instructions: Circle your answer. Just one answer, please.

1. Why are you studying English?

- a) Because it is a compulsory subject in my school.
- b) Because I like it, and it helps me to communicate with other people when I travel.
- c) To pass the exam.

2. Do you prefer traditional EFL (English as a Foreign Language) classes without any content subject in English, or would you like to have compulsory subjects like Biology in English and your EFL lessons at different times?

- a) Traditional EFL classes without any compulsory subjects in English.
- b) Biology in English plus my EFL classes.

3. How much do you enjoy your EFL lessons?

- a) A lot
- b) More or less
- c) Not interested

4. How much do you enjoy the tasks and activities that you must perform during your EFL lessons?

- a) A lot
- b) More or less
- c) Not interested

5. How do you prefer to work?

- a) Individually
- b) In groups
- c) In pairs

6. Can you speak basic things in English when you travel abroad?

- a) Yes
- b) No

7. Do you think that having some compulsory subjects like Biology, would help you in your everyday life?

- a) Yes
- b) No

8 What kind of learning style do you think you have?

- a) Visual (you learn through images, colors)
- b) Auditory (by listening)
- c) Kinesthetic (you learn by doing, moving)

9 Would you be afraid to take biology in English?

- a) Yes
- b) No

10 Would you like to participate in a bilingual program with your content teacher (biology) and your English teacher (EFL) to try this approach?

- a) Yes
- b) No

## Appendix B

### CLIL Questionnaire Results

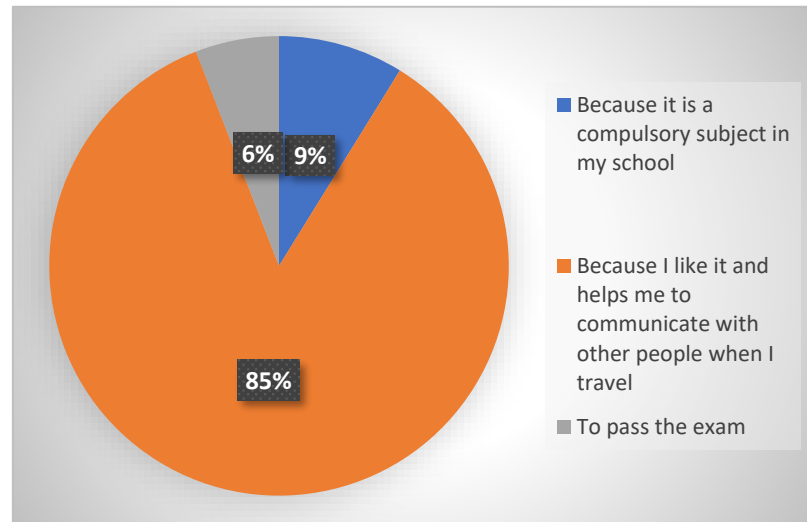


Figure 10. Reasons to study English. Created with data from CLIL Questionnaire. (2017).

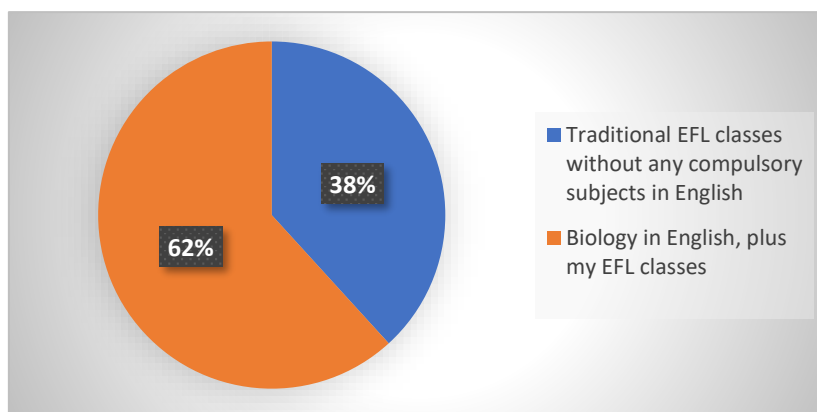


Figure 11. CLIL vs EFL classes. Created with data from CLIL Questionnaire. (2017).

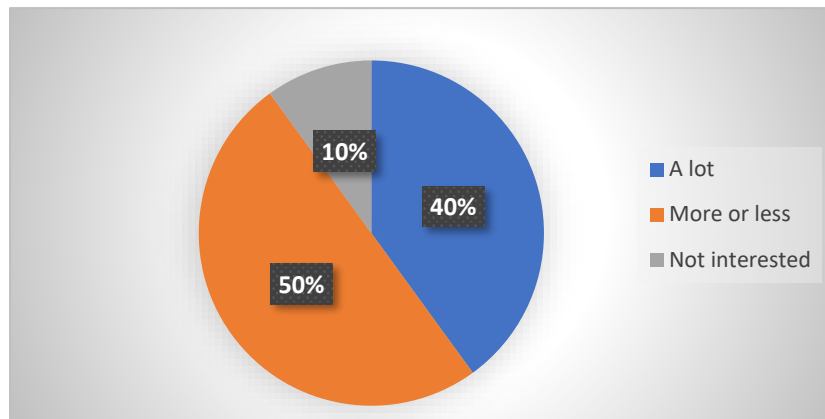


Figure 12. How much students like their EFL lessons. Created with data from CLIL Questionnaire. (2017).

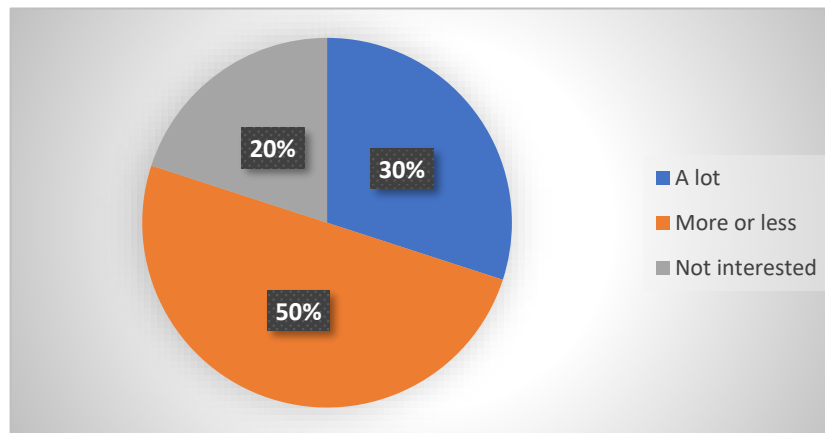


Figure 13. How much students like their activities in EFL lessons. Created with data from CLIL Questionnaire. (2017).

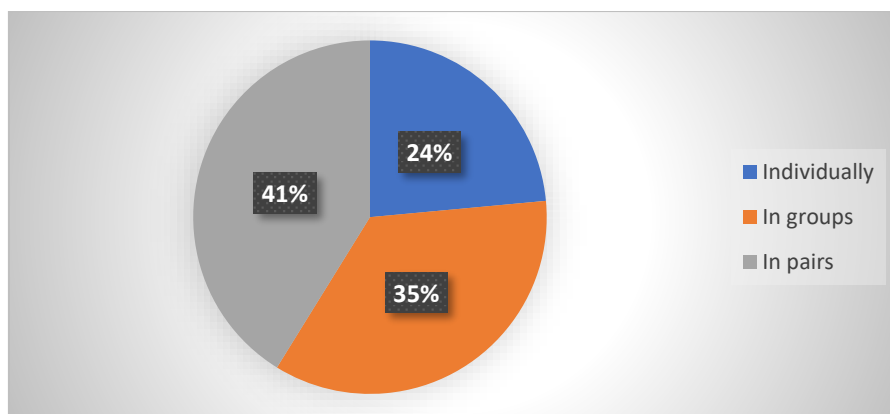


Figure 14. Students' Preferences in how to work. Created with data from CLIL Questionnaire. (2017).

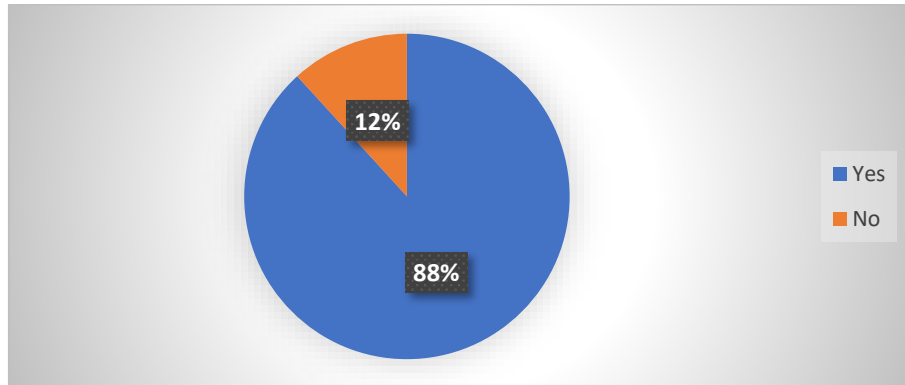


Figure 15. English proficiency when students travel abroad. Created with data from CLIL Questionnaire. (2017).

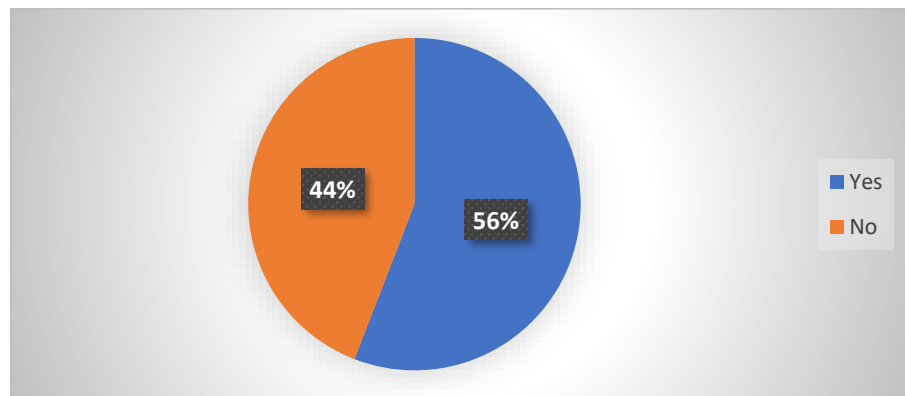


Figure 16. Students' beliefs about compulsory subjects in English. Created with data from CLIL Questionnaire. (2017).

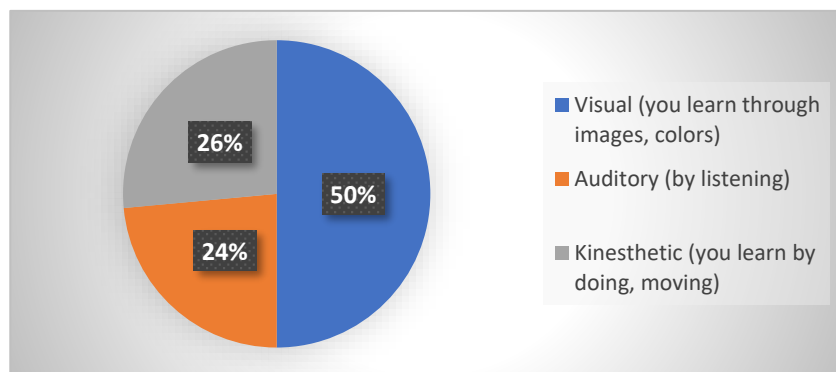


Figure 17. Students' learning style. Created with data from CLIL Questionnaire. (2017).

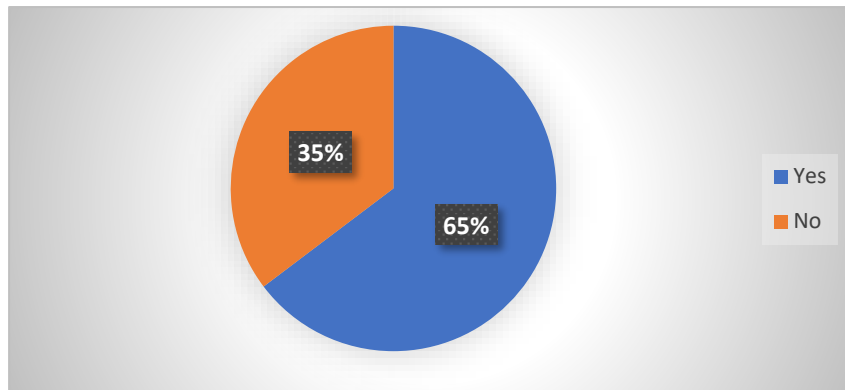


Figure 18. Students' Attitudes toward taking Biology in the English language. Created with data from CLIL Questionnaire. (2017).

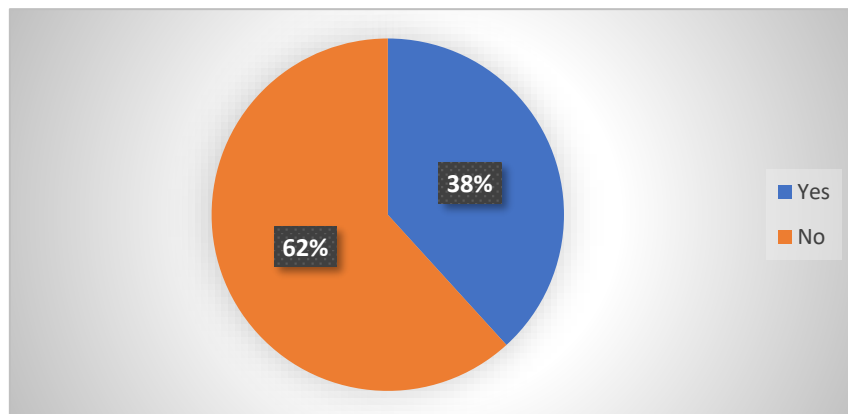


Figure 19. Students' Willingness to participate in a Bilingual program. Created with data from CLIL Questionnaire. (2017).

## Appendix C

### Middle Years International Baccalaureate Unit Planner

Teacher(s)		Subject group and discipline	
Unit title		MYP year	Unit duration (hrs)

#### *Inquiry: Establishing the purpose of the unit*

Key concept	Related concept(s)	Global context
Statement of inquiry		
Inquiry questions		
Factual— Conceptual— Debatable—		
Objectives	Summative assessment	
	Outline of summative assessment task(s) including assessment criteria:	Relationship between summative assessment task(s) and statement of inquiry:
Approaches to learning (ATL)		
.		

#### *Action: Teaching and learning through inquiry*

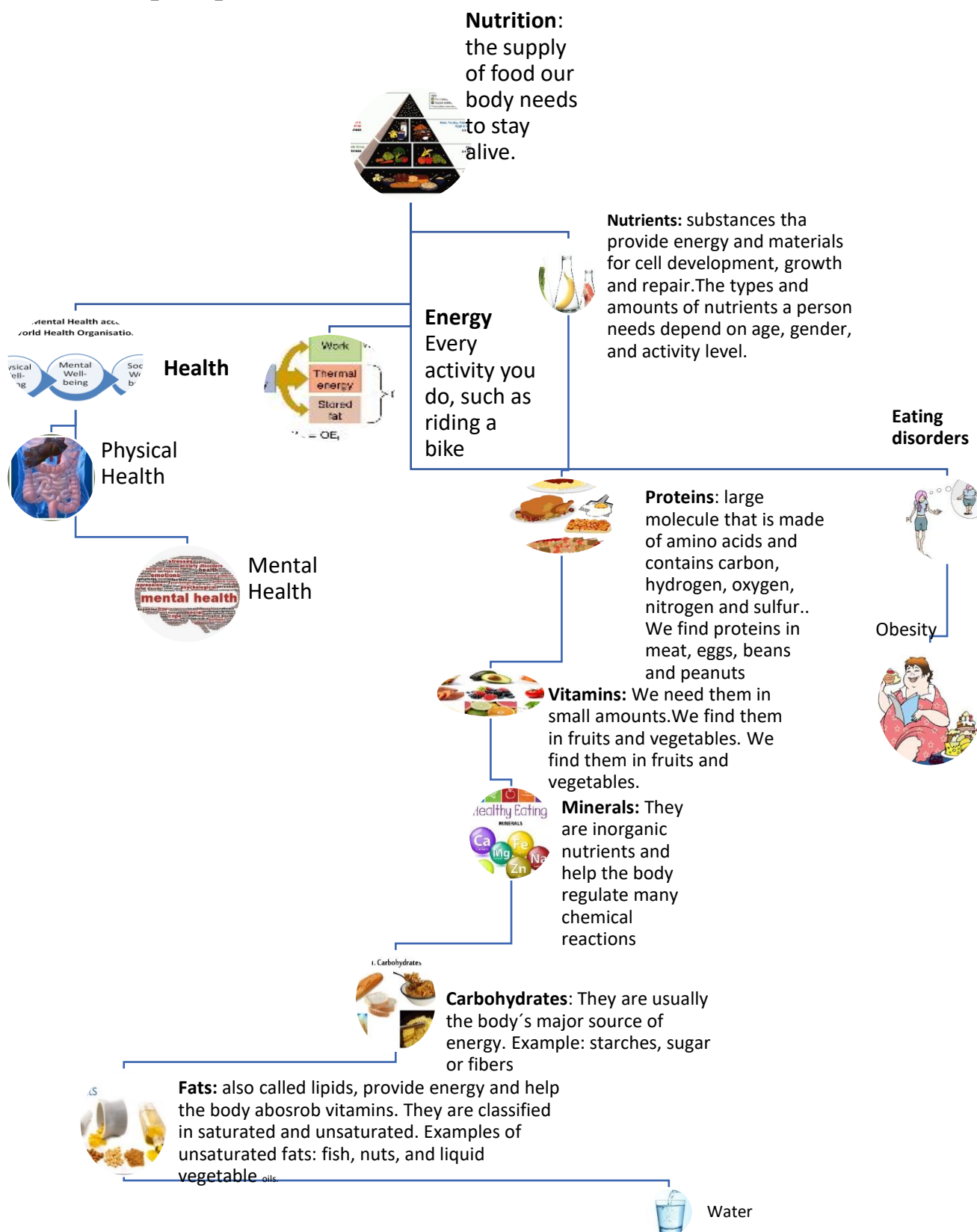
Content	Learning process
	Learning experiences and teaching strategies
	Formative assessment
	Differentiation:
Resources	

#### *Reflection: Considering the planning, process and impact of the inquiry*

Prior to teaching the unit	During teaching	After teaching the unit

## Appendix D

### Concept Map and Tables for Lesson 1



Source: Adapted from

<https://www.davis.k12.ut.us/cms/lib09/UT01001306/Centricity/Domain/6967/7th%20Grade/Human%20Body%20Systems/14%20Digestion%20and%20Excretion.pdf>

## Appendix D

### Concept Map and Tables for Lesson 1

#### Vitamins

<b>Vitamin</b>	<b>Good Sources</b>	<b>Health Benefit</b>
Vitamin B (riboflavin)	Milk, meats, vegetables	Helps release energy from nutrients
Vitamin C	Oranges, broccoli, tomatoes, cabbage	Growth and repair of body tissues
Vitamin A	Carrots, milk, sweet potatoes, broccoli	Enhances night vision, helps maintain skin and bones.

#### Minerals

<b>Mineral</b>	<b>Good Sources</b>	<b>Health Benefit</b>
Calcium	Milk, spinach, green beans	Builds strong bones and teeth
Iron	Meat, eggs, green beans	Helps carry oxygen throughout the body
Zinc	Meat, fish, wheat/grains	Aids protein formation

#### Daily Recommended Amounts of Each Food Group for 9-13-Year-Old

<b>Food Group</b>	<b>Daily Amount males, 9-13-year-old</b>	<b>Daily Amount females, 9-13 years old</b>	<b>Examples of foods</b>
Grains	6-ounce equivalents	5-ounce equivalents	Whole-wheat flour, rye bread, brown rice
Vegetables	2 ½ cups	2 cups	Broccoli, spinach and carrots
Fruits	1 ½ cups	1 ½ cups	Apples, strawberries, oranges
Fats	5 teaspoons or less	5 teaspoons or less	Canola oil, olive oil, avocados
Milk	3 cups	3 cups	Milk, cheese, yogurt
Meat and beans	5 ounces or less	5 ounces or less	Fish, beans, lean beef, lean chicken

Source: Adapted from

<https://www.davis.k12.ut.us/cms/lib09/UT01001306/Centricity/Domain/6967/7th%20Grade/Human%20Body%20Systems/14%20Digestion%20and%20Excretion.pdf>

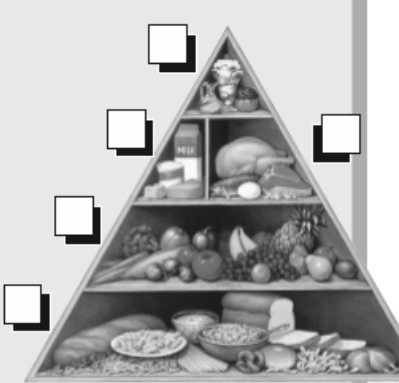
## Appendix E

### You are what you eat

While you read, look at the diagram and match the paragraph to the correct part of the pyramid.

### YOU ARE WHAT YOU EAT

- 1 The food pyramid is a guide for planning a healthy diet. If you eat the recommended portions of each food group every day you will get all the nutrients you need and you will have enough calories to keep you healthy. It is also important to vary the food you eat as much as possible within each food group, because different foods contain different kinds of nutrients.
- 2 Carbohydrates make up the biggest part of the pyramid. Nutritionists recommend that 60-65% of the food we eat every day should be made up of carbohydrates. They provide vitamin B, minerals and fibre. Foods in this group include bread, cereal, rice and pasta. Nutritionists recommend we eat 6-7 portions of these foods per day.
- 3 Fruits and vegetables also contain carbohydrates and are also a good source of vitamins, minerals and fibre. We should eat between 3-5 portions of fruit and of vegetables each day.
- 4 Protein is important but should be eaten in moderation. We can find it in dairy products such as milk, cheese, and yoghurt. These foods also contain calcium and vitamins. We should choose dairy products with lower levels of fat and only eat 1-2 portions per day.
- 5 Meat, fish, beans and eggs contain the most protein. Beans are very healthy as they contain high levels of protein and fibre, but do not contain much fat. Proteins which come from animals are called 'complete proteins' as they contain essential amino acids. But our cholesterol level can rise if we eat too much red meat.
- 6 Fats, oils and sweets are at the top of the pyramid: this means that we should not eat them too much. Remember that fats are also contained in other food groups too. But not all fats are bad. Saturated fats like butter should not be eaten too often, but unsaturated fats like olive oil are good for us in moderation.



*The food pyramid*







Source: [www.onestopclil.com](http://www.onestopclil.com). Written by Chris Dawson and Daniela Morini. ©

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## Appendix F

### My Plate Daily Checklist

Write down the foods you ate today and do it for three more days

Food group targets for a 1,600 calorie* pattern are:		Write your food choices for each food group	Did you reach your target?	
 <b>Fruits</b> <b>1 1/2 cups</b> 1 cup of fruits counts as <ul style="list-style-type: none"> <li>• 1 cup raw or cooked fruit; or</li> <li>• 1/2 cup dried fruit; or</li> <li>• 1 cup 100% fruit juice.</li> </ul>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="checkbox"/> Y <input type="checkbox"/> N	 <b>Limit</b> <b>Limit:</b> <ul style="list-style-type: none"> <li>• Sodium to <b>1,900 milligrams</b> a day.</li> <li>• Saturated fat to <b>18 grams</b> a day.</li> <li>• Added sugars to <b>40 grams</b> a day.</li> </ul> <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> Y <input type="checkbox"/> N         </div>	
 <b>Vegetables</b> <b>2 cups</b> 1 cup vegetables counts as <ul style="list-style-type: none"> <li>• 1 cup raw or cooked vegetables; or</li> <li>• 2 cups leafy salad greens; or</li> <li>• 1 cup 100% vegetable juice.</li> </ul>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="checkbox"/> Y <input type="checkbox"/> N		
 <b>Grains</b> <b>5 ounce equivalents</b> 1 ounce of grains counts as <ul style="list-style-type: none"> <li>• 1 slice bread; or</li> <li>• 1 ounce ready-to-eat cereal; or</li> <li>• 1/2 cup cooked rice, pasta, or cereal.</li> </ul>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="checkbox"/> Y <input type="checkbox"/> N		
 <b>Protein</b> <b>5 ounce equivalents</b> 1 ounce of protein counts as <ul style="list-style-type: none"> <li>• 1 ounce lean meat, poultry, or seafood; or</li> <li>• 1 egg; or</li> <li>• 1 Tbsp peanut butter; or</li> <li>• 1/4 cup cooked beans or peas; or</li> <li>• 1/2 ounce nuts or seeds.</li> </ul>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="checkbox"/> Y <input type="checkbox"/> N		
 <b>Dairy</b> <b>2 1/2 cups</b> 1 cup of dairy counts as <ul style="list-style-type: none"> <li>• 1 cup milk; or</li> <li>• 1 cup yogurt; or</li> <li>• 1 cup fortified soy beverage; or</li> <li>• 1 1/2 ounces natural cheese or 2 ounces processed cheese.</li> </ul>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="checkbox"/> Y <input type="checkbox"/> N		

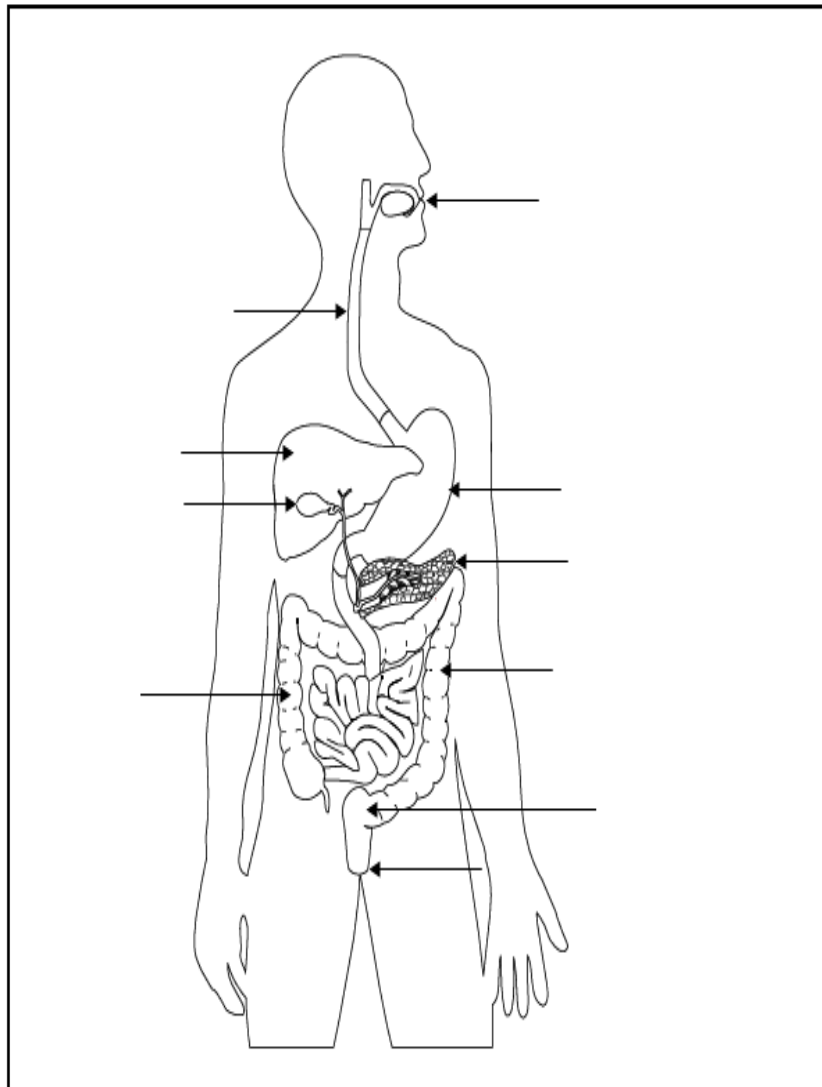
\* This 1,600 calorie pattern is only an estimate of your needs. Monitor your body weight and adjust your calories if needed.

Source: [https://choosemyplateprod.azureedge.net/sites/default/files/myplate/checklists/MyPlateDailyChecklist\\_1800cal\\_Age14plus.pdf](https://choosemyplateprod.azureedge.net/sites/default/files/myplate/checklists/MyPlateDailyChecklist_1800cal_Age14plus.pdf)

## Appendix G

### Digestion

Instructions: Use the descriptions of the digestive organs to correctly label the diagram above



**Anus** - the opening at the end of the digestive system from which faeces (poo) leaves the body.

**Oesophagus** - the long tube between the mouth and the stomach.

**Gall bladder** - a small sac below the liver. It stores and releases bile into the small intestine.

**Large intestine** - the shorter wider tube that follows the small intestine.

**Liver** - a large organ which makes bile that neutralises stomach acid.

**Mouth** - the first part of the digestive system, where food enters the body.

**Pancreas** - a gland below the stomach which makes lots of chemicals called enzymes that help break down food.

**Rectum** - the lower part of the large intestine, where faeces (poo) is stored before it leaves the body.

**Small intestine** - the long, thin winding tube that food goes through after it leaves the stomach.

**Stomach** - a sack-like, muscular organ that is attached to the oesophagus. When food enters the stomach, it is churned with lots of acid.

Source: <https://www.tes.com/teaching-resource/label-the-digestive-system-6109934>

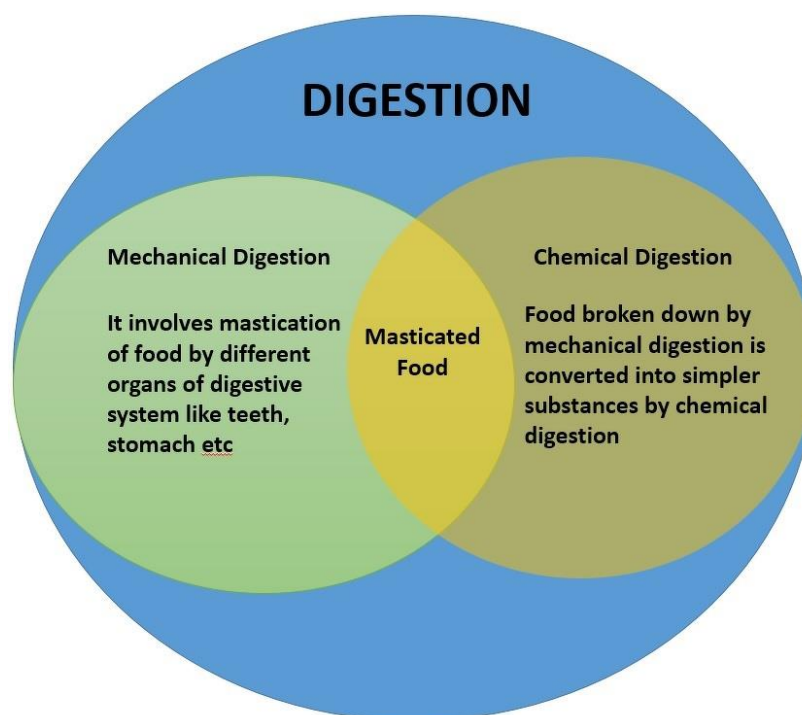
## Appendix H

### The Process of Digestion

The digestive system changes the food into a form that can be used by the cells and that enables the nutrients to get into the blood so they can be transported throughout the body. The digestive system consists of one long tube and the organs that attach to it. The organs produce digestive chemicals (enzymes and acids) that break down the nutrients into simpler forms so that absorption through the intestinal wall and into the blood stream can occur.

#### Mechanical and Chemical Digestion

There are two kinds of digestion: mechanical and chemical. **Mechanical digestion** involves physically breaking the food into smaller pieces. Mechanical digestion begins in the mouth as the food is chewed. **Chemical digestion** involves breaking down the food into simpler nutrients that can be used by the cells. Chemical digestion begins in the mouth when food mixes with saliva. Saliva contains an enzyme (amylase) that begins the breakdown of carbohydrates. (An enzyme is a protein that can catalyze certain biochemical reactions).



Source: Adapted from [http://www.e-missions.net/cybersurgeons/?/dig\\_teacher/](http://www.e-missions.net/cybersurgeons/?/dig_teacher/)

## Appendix I

### Rubric for the Final Task

Table 15 Assessment of Learning Rubric

Categories	Level 1	Level 2	Level 3	Level 4	Total score
<b>Content</b> Students learn about nutrition, importance of water in nutrition, food groups and levels, food labels and the process of digestion as well as research on obesity in teenagers and create a 3D Food pyramid.	Students show basic knowledge about nutrition, in the presentation, only tell 1-2 characteristics about nutrition, food groups and levels, the process of digestion and few research to create the 3D Food pyramid.	Students show more than basic knowledge about nutrition in the presentation, tell 3-4 characteristics about nutrition, food groups and levels, the process of digestion and more research to create the 3D Food pyramid.	Students show a reasonable knowledge about nutrition in the presentation, tells 4-5 characteristics about nutrition, food groups and levels, the process of digestion and more confident research to create the 3D Food pyramid.	Students show their mastery knowledge about nutrition, tells 5-6 characteristics about nutrition, food groups and levels, the process of digestion and more confident research to create the 3D Food pyramid.	
<b>Cognition</b> Students recognize the different kinds of nutrients Understand the cause-effect relationship of water in nutrition, explain different types of food and levels to others using examples, hypothesize how digestion might influence in nutrition and health, carry out an investigation into possible solutions, represent visually through a 3D diorama the food pyramid.	Students recognize superficially different kinds of nutrients. Understand superficially the cause -effect relationship between water and nutrition. Explain different types of food and levels to others using one example. Barely hypothesize how digestion might influence in nutrition and health  Carry out an investigation with superficial significance with possible solutions to represent visually the 3D Food Pyramid.	Students recognize adequately different kinds of nutrients. Understand adequately the cause-effect in relationship between water and nutrition. Explain different types of food and levels to others using 2-3 examples. Hypothesize quite a bit on how digestion might influence in nutrition and health.  Carry out an investigation with adequately significance with possible solutions to represent visually the 3D Food Pyramid.	Students recognize consistently different kinds of nutrients. Understand consistently the cause-effect relationship between water and nutrition. Explain different types of food and levels to others using 3-4 examples. Hypothesize a bit on how digestion might influence in nutrition and health.  Carry out an investigation with consistently significance with possible solutions to represent visually the 3D Food Pyramid.	Students recognize thoroughly different types of habitats. Understand consistently the cause-effect relationship between water and nutrition. Explain different types of food to others using 4-5 examples. Hypothesize totally on how digestion might influence in nutrition and health. Carry out an investigation with thoroughly significance with possible solutions to represent visually the 3D Food Pyramid.	

<b>Communication</b>  Students express organization of ideas in the oral presentation (e.g. clear expression, tone, logical organization)	Can produce simple mainly isolated phrases types of food and levels, various kinds of nutrients, cause-effect of digestion and possible solutions to teenagers' obesity.	Can give a simple description or presentation of food and levels, various kinds of nutrients, cause-effect of digestion and possible solutions to teenagers' obesity.	Can reasonably fluently sustain a straightforward description or presentation of food and levels, various kinds of nutrients, cause-effect of digestion and possible solutions to teenagers' obesity.	Can give clear and detailed description and presentation of food and levels, various kinds of nutrients, cause-effect of digestion and possible solutions to teenagers' obesity.	
<b>Cooperation</b>  How well the student worked and focused with the group, and punctuality for group meetings.	Rarely focuses on the task and what needs to be done. Let's other do the work. Late for all most group meeting. Rarely provides useful research or ideas. Doesn't try to solve problems or help others.	Focuses on the task. Other group members must sometimes remind this person to keep on task. Sometimes late for the group meetings. Sometimes provides useful research of ideas. Doesn't suggest solutions but tries to do it.	Focuses on the task and what needs to be done most of the time. Other group members can count on this person. Usually punctual for group meeting. Visually provides useful research and ideas. Refines solutions suggested by others.	Consistently stays focused on the task and what needs to be done. Consistently punctual for group meetings. Routinely gathers research and shares it. Actively looks for and suggests solutions to problems.	
<b>Culture</b>  Students demonstrate all the elements related to Nutrition as the Base for Health through a 3D Food Pyramid to simulate real world performance and share the information through the YouTube School's account to hint a Culture in Nutrition.	Students 3D Food Pyramid show difficult materials and it is hard to tell the different kinds of foods, levels and servings and there are few connections between the research and the presented 3D Food Pyramid.	Students 3D Food Pyramid show a few realistic looking. Moderately realistic. There are some connections between the research and the presented 3D Food Pyramid.	Students 3D Food Pyramid show good use of realistic materials. There are more connections between the research and the 3D Food Pyramid.	Students diorama show very realistic looking. There is existence of connections between the research and the presented 3D Food Pyramid.	

Final score \_\_\_\_\_ Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_