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**ELABORACIÓN DE MATERIALES
PARA LA ASIGNATURA DE
SCIENCE EN EL AULA DE
EDUCACIÓN PRIMARIA**

Trabajo de Fin de Grado

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ABSTRACT: Learning languages is nowadays one of the most important aspects of children's education, in order to be integrated in the multicultural and multilingual society. Therefore, in the last few years, the governments of different countries have been in favour of bilingual policies. This is the case of Spain, where public and private schools have implemented several bilingual programmes. However, there are not many published materials for teachers who teach contents' subjects, such as Science, in a foreign language. That's why the main objective of this work is to create a set of appropriate activities and materials for Spanish Year 1 of Primary Education students, taking into account the topics and the contents they learn, to be used for Science teachers in their lessons.

Key words: Bilingualism, bilingual education, Content and Language Integrated Learning (CLIL), Science, activities and resources.

RESUMEN: En la actualidad, el aprendizaje de lenguas es uno de los aspectos de la educación de los niños considerados como más importantes, con el fin de que se integren de la mejor forma posible en nuestra sociedad multicultural y multilingüe. Por lo tanto, en los últimos años, los gobiernos de diferentes países han llevado a cabo políticas bilingües en el campo de la enseñanza. Se trata también del caso de España, donde tanto colegios públicos como privados han implantado diferentes programas bilingües. Sin embargo, no hay muchos materiales para profesores que enseñan asignaturas de contenidos, como Conocimiento del Medio, en una lengua extranjera. Consecuentemente, el principal objetivo de este trabajo es diseñar un conjunto de actividades y materiales apropiados para alumnos españoles de Primero de Educación Primaria, teniendo en cuenta los contenidos y los temas que aprenden en este nivel, para ser utilizados por profesores de Science en sus clases.

Palabras clave: Bilingüismo, educación bilingüe, Aprendizaje Integrado de Contenidos y Lenguas Extranjeras (AICLE), Science, actividades y recursos.

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1. INTRODUCTION

This final project is a written and original work whose title is “Elaboración de materiales para la asignatura de Science en el aula de Educación Primaria” which involves the application and development of the knowledge about teaching acquired during the Degree in Primary Education, and that has to be designed in its last year.

During the Degree there have been some subjects that are related with the topic of this work. By following the syllabus and the order in which they appear along the four university years, firstly we can find the subject called “Didáctica de las Ciencias Sociales”, which has to do in a way with the main topic of this work, although it was in Spanish. It involves a set of activities and materials to carry on in the teaching of Science and, during the mentioned subject we could learn about the main contents of the subject “Conocimiento del Medio” or “Science” in Primary Education, as well as some strategies and resources for the proper development in the teaching of these areas.

Another subject of the Degree from which I have learnt about teaching in another subject has been “Metodología del Inglés”. Although it is not related directly with the teaching of Science in Primary Education, we could learn several methods to be applied in the class of English language. However, they can be sometimes applied to teach Science, because although its main objective is the teaching of contents in English, it also has to be reinforced the learning of the English language.

Moreover, it has been really interesting to learn from the subject called “Fundamentos del Aprendizaje Bilingüe” in which we were informed about the main bilingual projects in Spain and in some countries of Europe and also about children’s foreign language learning process.

Finally, during the subject “Didáctica de la lengua inglesa” we learnt different ways of teaching English, and how to plan activities to work the four skills (reading, listening, speaking and writing) in learning a language, as well as different techniques to present contents, like vocabulary, grammar, etc. To sum up, we learnt how to plan the teaching-learning process elaborating teaching strategies, different kinds of activities and materials in relation with the diversity of the pupils.

I believe that all these areas and those of the English speciality have been essential to train future English teachers but also teachers of contents in English, as in the case of Science, Arts and Crafts and Physical Education, which are the subjects that, for sure, we English teachers are going to deal with in bilingual schools.

In relation with bilingual education, this work deals with the importance of using effective and accurate activities and materials when teaching contents in English through the design of new ones that can be useful in the future for Science teachers in Primary Education. So, as the title of the work is very general, I agreed with my tutor to specify and focus it in the creation of activities and materials for Year 1 of Primary Education in the subject of Science, because this was the Year in which I spent my training period.

2. AIM

The main objective of this work is to design a set of activities and materials to be used in the area of Science in Year 1 of Primary Education, in other words, to create a bank of resources and activities which aim to give some elements of variety and improvement in the teaching of that subject. However, there could also be a specific aim related with the analysis of the achievements and shortcomings of the educational proposal.

To create the teaching proposal it is going to be necessary to take into account the context, the learning characteristics, the needs and the interests of the children to whom this work will be aimed. Furthermore, it is required to bear in mind the contents and topics that children of Year 1 of Primary Education learn, as well as the objectives and methodological recommendations proposed by the British Council in coordination with the Spanish Ministry of Education.

3. MOTIVATION BEHIND THE STUDY

Recent research has shown that the acquisition of a second language from childhood is increasingly important, as well as enriching for children, because it contributes to their future development in the society. Nowadays, our society is constantly suffering significant changes, and it is even multicultural. So, in order to achieve a proper integration of the students in a global world, the governments of different countries are in favour of bilingual policies, because bilingual education is often known as a high quality education which aims that students are competent in both languages and are able to use them in an effective way.

In the last few years, a lot of public and private schools of Primary and Infant Education in Spain, have implemented several bilingual education projects. According to what has been explained before, bilingual education contributes preparing Spanish children necessarily for the future, in which they will study, work and live: an increasingly multilingual and integrated Europe.

These Spanish bilingual projects consist on teaching the contents of some non-linguistic subjects, as Science, Arts and Crafts and Physical Education, in a foreign language. This teaching entails some difficulties, such as the dependence on teachers' abilities and knowledge of the language. However, the most important trouble for teachers is to find good teaching resources to support their work. In our country, there are still few materials that teachers can use to teach Science, especially in the last years of Primary Education, partly because many bilingual projects have been recently implemented and they have not been developed yet in the third cycle of Primary Education. In these cases, teachers are often forced to use native speakers' materials that, sometimes, do not fit the real needs of the Spanish students. So what is really important is to take into account the skills, attitudes, needs and interests of the students to be able to deal with the learning of a second language.

In conclusion, there are not many published or created materials in relation to the teaching of the subject of Science and they have not been specifically designed for Spanish students who are also involved in the process of learning a foreign language. Due to this fact, this work aims to highlight the importance of teaching English and Science by designing a set of activities, materials and resources to be employed as a support for Science teachers of Year 1 of Primary Education. They have been planned for a particular group of students, but they can be totally readapted and planned again for any other group of pupils.

4. THEORETICAL BACKGROUND

4.1. Bilingualism

First of all, it is necessary to define the concept *bilingualism* and the different types that some authors have established, because it is a key concept in our study and we will understand what it means better when it is mentioned during the work.

The term bilingualism may mean different things to different people so there is not only one definition. As it is evident, each definition represents a different position in relation with the degree of proficiency.

There are several views expressed by experts such as Bloomfield (1933), Haugen (1953), Weinreich (1953) and Siguán and Mackey (1986), and they differ amongst themselves in many ways.

First of all, Bloomfield (1933:55) defines 'bilingualism' as the "native-like control of two languages", while, in contrast, Siguán and Mackey (1986:17) affirm that the term 'bilingual' refers to "the person who, apart from the first language, has a similar competence in another language and is able to use one or the other in all circumstances with similar effectiveness". In a similar way, Weinreich (1953:5) defines bilingualism as "the practice of alternately using two languages" while Haugen (1953:7) proposes "the point where a speaker can first produce complete meaningful utterances in the other language" to be a starting point for defining bilingualism. As it can be seen, these last definitions range from Bloomfield's rigorous expectations of totally balanced bilingualism to Siguán and Mackey's, Weinreich's and Haugen's requirements of just the ability or the practice of using two languages. These two extremes have been described as minimalist approach (Siguán and Mackey, Weinreich and Haugen) and maximalist (Bloomfield).

Regarding the degree of bilingualism, Macnamara (1969) emphasized the need to consider it not as a unitary component but as a degree of competence divided in sub-components. The sub-components are the four macro skills (speaking, writing, reading and listening) in learning a language, so, according to this theory, competence in bilingualism depends on the degree of competence in each one of the skills. So, it is important to assess the different abilities and skills in different contexts instead of trying to specify a level of bilingualism to qualify anyone as bilingual.

Several terms such as *balanced bilinguals*, *dominant bilinguals*, *recessive bilinguals* and *semilinguals*, have been used by Wei (2000) to classify bilinguals according to the degree of proficiency they have in both languages:

- **Balanced bilingual:** It is used to describe individuals who are totally competent in both languages. Most of the times, when the term balanced bilingual is used, it describes those who are thought to have perfect control of both languages in all

settings. Although it is possible to find bilinguals who are highly proficient and equally fluent in both languages, this degree of bilingualism is very difficult to achieve.

- **Dominant bilingual:** It refers to bilinguals who are more dominant in one language than in the other one. In this case, we can refer to the less dominant language as the *subordinate language*. However, one important aspect to highlight is that the term ‘dominance’ may not be applied to all situations. In cases where a special language is required, speakers may consciously choose to speak in the language they normally use when discussing this kind of topics.
- **Passive or recessive bilingual:** The term *passive* or *recessive bilingual* refers to bilinguals who are gradually losing competence in one of the languages, usually because it is not being used. In bilingual communities in which there are continuous changes from one language to another, usually from the home language to the dominant language in the society, it is very common to see bilinguals who can only understand, but cannot speak the other language.
- **Semilingual or limited bilingual:** The term *semilingualism* is used to describe bilinguals who seem to have a limited level of proficiency in both languages. Semilingualism can be defined in terms of deficit in six language competences: size of vocabulary, correctness of the language, unconscious processing of language, language creation, mastery of the functions of language, meanings and imagery.

4.1.1. Bilingual Instruction: The Content-based Approach

Content-based instruction is defined by Snow (2001:303) as “the integration of language teaching aims with subject matter instruction”. The notion of content in the Communicative Approach, which has provided the opportunities for the different models of Content-based instruction, refers to the aim with which language is used and the information transmitted during the teaching process.

According to Snow (2001) and depending on the setting, the instructional level and the emphasis on language and content, several models of CBI can be distinguished:

- **Immersion:** It is usually known as the prototypical model of Content-based instruction, in which English students receive the majority of their teaching hours in their second language and, when they finish Primary Education, they should be functional bilinguals.
- **Content-enriched foreign language:** It consists in the selection of some subjects from the standard curriculum to be coordinated with the school curriculum and the foreign language aims.
- **Theme-based model:** This model is built around some topics that are chosen as the instruction matter for teachers to extract and design the learning language activities. It has been implemented in elementary schools, special education schools, etc.
- **Sheltered model:** This model consists in the deliberate separation of second language learners from the native students who already know the language. We can find this model in elementary schools or post-secondary ones.
- **Adjunct model:** It is usually used in the highest levels of education, as universities or high schools and it combines language teaching and content instruction. Therefore, students' characteristics have to be taken into account to propose the activities in the foreign language.

Some methodological adjustments must be made in order to implement Content-based instruction in class. Firstly, the language and the contents teachers have to coordinate and adapt their methods in relation to the needs of their group of students. Also, the materials have to be elaborated and planned beforehand by the teacher and the use of project work and new technologies is important. Finally, the CBI approach involves the change of the student's role and he becomes the protagonist of his learning, so his assessment is important to measure the success of the model and his proficiency.

4.1.2. Bilingualism in monolingual settings

Bilingual education can be defined, following Mc Groarty (2001:345), as the "one in which two languages are used as media of classroom instruction for the same group of students". So it could be said that bilingual education is the teaching of non-linguistic subjects through a foreign language or it can also be known as content and language integrating learning (CLIL).

In relation with bilingual education, we can distinguish several education programmes, according to Mc Groarty (2001) and Richards et. al. (1986):

1. “Transitional bilingual education”: This is an educational model in which students start school and their native language is used as the medium of instruction. This language is later changed and replaced by the language proposed by the school.
2. “Maintenance bilingual education”: On the one hand, the native language of the students is used to teach some of the subjects and, on the other hand, the school language is used in other subjects.
3. “Immersion programmes”: This kind of programmes emphasize the use of the second language instead of the mother tongue for instruction at school.

Moreover, there are different contexts in which bilingual programmes can be implemented. First, there are bilingual or multilingual countries, such as Canada or Malta, where, according to Madrid and McLaren (2004:97), “pupils are exposed to a school language other than the home language”. In these cases, “the second language is often needed to live in the country and there are innumerable opportunities to practice it outside the school context”. There are also monolingual countries, such as the United States, with some areas where immigration is located, so “pupils are totally or partially immersed in school instruction in both their mother tongue and the school language”. Finally we can also find other countries like Spain, where “national students are immersed in a language other than the national language. This kind of teaching is an intensive way of learning English, French or any other language.

4.1.3. Methodology in bilingual programmes

When setting up a bilingual programme it is important to take into account some aspects like the students’ age, the amount of teaching hours that the students are going to receive in the second language, the pupil-teacher ratio, the subject or subjects that have been chosen for the programme, the methodology, the kind of activities and materials to be used, the assessment of the students, etc.

In relation to methodology, Mc Groarty (2001) proposes some issues to be highlighted in the implementation of a bilingual programme:

1. **Comprehensible input:** It is thought that the more comprehensible input the students obtain in the target language, the more acquisition takes place. That's why bilingual classes are supposed to be very good examples of use and communication through the foreign language.
2. **Code-switching:** In bilingual instruction, there are some situations in which there is a switch from one language to the other one or the contrary. Code-switching is supposed to be a natural event that usually occurs in the mind of bilingual people.
3. **Autonomy:** In terms of bilingual programmes, the role of both teacher and students should change, so that learning has to be focused on the student. This way, project work and activities about a concrete topic are very important.
4. **Materials:** It is important also for the teacher to create a new set of materials, that can be in some cases authentic materials from the second language, but they have to be specifically adapted to the students' needs.
5. **Evaluation and assessment:** In bilingual programmes there is a special need of other methods of assessment, such as portfolio systems, learning logs, checklists of variables, etc.

4.2. Bilingual Education: Content and Language Integrated Learning

Content and Language Integrated Learning (CLIL) involves teaching a curricular subject (contents) through the medium of a foreign language and learning a foreign language by studying a content subject. The subject or subjects can be entirely unrelated to language learning, so History, Physics, Geography or Art lessons, for example, can be taught in English at school. According to Marsh and Langé (2000:3) CLIL is “any educational situation in which an additional language, and therefore not the most widely used language of the environment, is used for the teaching and learning of subjects other than the language itself”.

CLIL has been found to be effective in all sectors of education from Primary to the highest levels. In English language teaching, CLIL has previously been known with several names, as 'Content-based instruction', 'English across the curriculum' and 'Bilingual education'.

4.2.1. Importance of CLIL

According to the European Commission (department of Education and Culture) (2008:5), the European Union considers learning languages essential, so it is encouraging its citizens to learn them:

To know another language, or maybe several, makes it possible to move and find a job in another country. This mobility on the labour market helps create new jobs and stimulate growth. Knowing other languages also promotes cross-cultural contacts, mutual understanding and direct communications between individual citizens in an ever-expanding and more diverse Union.

So it seems clear that diversity of languages and the need of communication are seen as central issues, so languages are very important in the curricula of most countries of Europe. That's why attention needs to be given to the training of teachers and the development of frameworks and methods that improve the quality of language education, as Content and Language Integrated Language.

4.2.2. CLIL main aims, advantages and disadvantages

The main point of CLIL is that content subjects are taught and learnt in a language which is not the mother tongue of the learners. However, and according to the Eurydice Report (2006:23) by the European Commission (department of Education and Culture), the main aim of this method is "to ensure first that pupils acquire knowledge of curricular subject matter and secondly develop their competence in a language other than the normal language of instruction". But we can also consider the following aims of this method:

- To prepare students to live in a multicultural, global and internationalized society, in order to help them to get as best job as possible in the future (socio-economic objectives).
- To transmit the students some values like tolerance and respect for other cultures, through use of the CLIL target language (socio-cultural objectives).
- To develop in the students:
 - Language skills, with a special emphasis on communication, trying to use the language in real and practical situations (linguistic objectives), so that they acquire the language naturally.

- Internalization of the subject contents through a new and innovative approach (educational objectives).

According to an article by Darn (2006) published in the British Council web, in a CLIL lesson, the four language skills should be combined:

- **Listening** is really important for language learning
- **Reading** is the most important skill in learning a language, with the help of meaningful materials.
- In relation with **speaking**, accuracy is not seen as essential as fluency.
- **Writing** is developed through “lexical activities” in which grammar is constantly reviewed.

In addition, and considering another article by Darn (2006), CLIL lessons should have the following traits:

- The target language is totally integrated in the curriculum.
- Students’ learning of the language is better when they are motivated because interesting topics are being treated and also when they learn a natural language that is practiced in the context of real situations.
- Content and Language Integrated Learning do not focus on enforced learning but on natural language acquisition.
- Learning a language through this method is a “long-term learning”, because the pupils seem to be finally academically proficient after “5-7 years in a good bilingual programme”.
- Making mistakes is considered as a “natural” part of the learning, that’s why this method is not so strict in accuracy. However, fluency is a more important aspect and one of the aims of the method is to be enough fluent to communicate in different situations.
- Although all the skills are worked, reading is the most important one.

In relation with the main characteristics of Content and Language Integrated Learning, this method has also several advantages in the learning of the foreign language, taking into account the ones proposed by the European Commission (2013):

- Content teaching creates a context where meaningful communication takes place because the focus is on the content and not on the language.
- The opportunities to use the foreign language and to be in contact with it are more frequent and lead to increase motivation and interest in students without requiring extra teaching hours.
- Content-based information is easier to remember in learning a language than information based on aspects of grammar, and thus leads to deeper learning.
- Integrated content and language takes into account the interests, needs and cognitive skills of students. It diversifies methods and forms of classroom practice so it increases learners' motivation and confidence in both the language and the subject which is being taught.
- Speaking and thinking in another language not only improve communication skills, but also cognitive skills and language competence.
- CLIL prepares students for the future studies or their working life, in which one or more foreign languages will be really necessary.

On the other hand, teaching through contents has some disadvantages due to the difficulties that the method implies, taking into account the words of Maza (2012):

- Sometimes, language teachers don't have enough knowledge about the contents they have to teach in the non linguistic subject, or, on the other hand, subject teachers may not be competent in the foreign language.
- There can also be some differences between teachers of non-linguistic and linguistic areas and in the methods they use to teach their students.
- In CLIL there is not a clear way to assess the students' performance and progress, so it will depend on the teacher.
- Nowadays, there are a few materials which have been created to teach non linguistic subjects in a foreign language, so for teachers it is difficult to find the most accurate resources for their students and they have to create materials by themselves.

4.2.3. CLIL in the classroom

Content and Language Integrated Language assumes that subject teachers are able to take full advantage of the opportunities the students have for language learning. Moreover, as Coyle (2008) affirmed, a successful CLIL lesson should combine elements related to the following issues (the four C's). These four principles are essential to the CLIL approach, so they should be used as the framework for creating and planning successful lessons:

- **Content:** It has to do with progression in knowledge, skills and understanding related to specific elements of the defined curriculum of the subject. Some examples of different content areas include history, science, mathematics, geography, etc. When planning the content of the lessons, it is essential to think of the knowledge, skills and understanding we want the students to learn and not only the content they should acquire.
- **Communication:** It refers to students using the target language to communicate their thoughts, opinions, attitudes and discoveries related to the lesson content. Both speaking and writing are emphasized as students “learn to use language and use language to learn”. Students should engage in meaningful interaction with each other, so their aim is to produce authentic language, and not to memorize grammar rules.
- **Cognition:** Cognition is related to the critical thinking skills the students use to understand the course contents, to solve problems and to reflect on their learning.
- **Culture:** It has to do with the learning community of a class or school, and more broadly to local and global cultures. Students are encouraged to understand themselves as citizens of the world, their own culture and other ones. The last goal is to promote international awareness and understanding.

4.2.4. CLIL in Europe

Taking into account an article by Wolff, published by the Goethe Institut (2007), Content and Language Integrated Learning has clearly become a very important aspect in the last decade in the European education. The main reason for this is that the

European Commission (department of Education and Culture) (2008) is pushing its requirement that every citizen of Europe should speak two languages in addition to their native language. In order to fulfil this requirement, many countries in the European Union have been introducing some integrated forms of language and content communication in the school systems. As a result of the diverse educational traditions and language contexts, several models of bilingual teaching have been developed in Europe.

One of the most important methods is Content and Language Integrated Learning (CLIL), which is well-established across Europe. Although before 1980 there were only a few countries in which CLIL was known and it was implemented in private schools, nowadays CLIL is offered throughout Europe, with some exceptions. These exceptions include Denmark, Greece, Lithuania, Portugal and Cyprus. According to the Eurydice Report (2006), CLIL is permanently established or there are some short-term projects in the rest of the countries of the European Union, where between three and thirty per cent of students in primary and secondary education are being taught this way.

The Eurydice Report also provides the languages that are used in CLIL teaching, so, as well as foreign languages, some regional minority languages or other official languages of the country concerned are taught. In most countries that offer CLIL, the languages used are both foreign languages and minority languages. This is the case, for example, of France, Spain, Italy, Germany, etc. where both minority languages and foreign languages are used as CLIL languages.

In lots of countries, CLIL is offered in Primary and Secondary Education. In some countries, for instance Belgium, Spain, Italy, Great Britain and Romania, there are already activities in another language at Infant Education. However, in most countries, CLIL is used in Secondary schools, although the length of CLIL commonly extends until the end of compulsory education.

Many countries allow schools to choose freely the content subjects that are going to be taught in another language, for example in Spain, France, Italy, Ireland, England and Wales, Poland, Hungary and Austria. In other countries, as the Czech Republic and Romania, the choice is restricted to Natural and Social Science subjects. In Sweden and Finland, the Netherlands and Bulgaria, Science is very important, as well as creative subjects.

So Natural Science subjects, Mathematics, Biology, Physics, Chemistry and Technology are the most frequent subjects in CLIL, although Social Science subjects such as History, Geography and Economics, and creative subjects as Music and Art are very usual too.

4.3. Bilingual education in Castilla y León

The “Junta de Castilla y León” has promoted the incorporation of bilingual education to the regular one. As the result, there have been implemented some bilingual programmes (Spanish-English, Spanish-French and Spanish-German) developed in approximately 305 schools, divided in 260 Primary schools and 45 Secondary ones.

From the programmes we can distinguish two different models: Some schools have implemented model 1 or Spanish-British integrated curriculum, emerged from the agreement of the Ministry of Education and Science / British Council in 1996, and others fit a newer model, developed by the Autonomous Community initiative, which is called model 2, or Bilingual Spanish-English sections.

4.3.1. MEC/British Council agreement (secciones lingüísticas)

In 1996 the Spanish Ministry of Education and Science and the British Council, signed a cooperation agreement that aimed to develop bilingual education programmes in Spanish public schools through an integrated Spanish-British curriculum, for children from 3 to 16 years old. This programme involved 82 Primary Schools and 42 Secondary Schools, according to the “Real Decreto” 717/2005, of 20th June, that regulates teaching in the schools of the agreement.

The formal agreement between the MEC/BC, states that the aim of this project is to provide children a bilingual and bicultural education through an integrated Spanish-English curriculum based on the Spanish National Curriculum and on some aspects of the National Curriculum for England and Wales. According to the “Guidelines for the Development of the Integrated Curriculum in the Primary Stage” (2004:31) the specific objectives of the project are:

- To promote the acquisition and learning of both languages through an integrated content-based curriculum.

- To encourage awareness of the diversity of both cultures.
- To facilitate exchanges between teachers and children.
- To encourage the use of new technologies in learning other languages.
- To promote the studies certification under both educational systems, where appropriate.

The main characteristics of this programme are the following:

- Apart from English Language, two or more subjects are taught in English, both at the stages of Primary Education and Secondary Education.
- Pupils who fulfil the objectives of the programme obtain at the end of Secondary Education the Spanish “Graduado en Educación Secundaria” and the “Certificate of Secondary Education” in the same conditions of British students.
- The programme is taught by English Language teachers (or specialists in Science, Geography or History with a very high level of English) and British or bilingual teachers, specifically hired to contribute with his knowledge of the National curriculum (British curriculum).
- All teachers follow the same teaching guidelines to harmonize and unify their work.
- All schools attached to the agreement can be twinned with British schools to encourage contact and exchange of experiences between students and teachers in both countries.
- The educational administration of Castilla y León schools supports a specific annual budget for the costs of the centre or to cover the expenses related to the development of the programme.

4.3.2 Secciones bilingües

In 2006, the Education Council considered necessary to establish a regulatory framework to encourage the development of bilingual projects in all Primary and Secondary schools supported by public funds of the Community of Castilla y León. Bilingual Sections are the programmes which are implemented in those schools that have been authorized to use a foreign language for teaching specific contents or non-linguistic subjects, in one or more groups of the same grade or level. Bilingual sections

were established in schools supported by public funds of the Community of Castilla y León, according to the Orden EDU/6/2006, 4th January, which regulates the creation of bilingual sections in public schools of Castilla y León. The main traits of the programme are the following:

- The bilingual programme is a part of the educational offer of the schools and it has to get started in the first year of the corresponding stage.
- Instruction can be provided in English, French, German, Italian and Portuguese and schools are able to choose more than one language for themselves, although learning the language of the programme is compulsory for all the pupils in the school.
- The chosen language may be used to teach contents in a minimum of two non-linguistic subjects, but no more than three. The number of hours taught in the specific language cannot represent more than 50% of the timetable of the students. Moreover, schools can modify their weekly schedule extending up to 27 hours a week in Primary Education, or until 32 hours, in the case of Secondary Education.
- Schools must progressively develop the bilingual project, from the first year of Primary or Secondary Education and the ratio of student groups is the same established generally for each level.
- Student assessment is made according to the legislation. It will be noted in assessment documents that the student has studied in a bilingual section and also the language.

5. LITERATURE REVIEW

In relation with the subject of this work, that is the use of activities and materials in teaching contents through Content and Language Integrated Language, there are some relevant opinions and investigations of authors that have to be taken into consideration for the design of activities, that is the practical part of this work, which is focused in the subject of Science.

First of all, Navés and Muñoz (1999) studied and described the state of CLIL experiences in Europe and Spain. Considering their words (1999:13), they maintain that “it is an extremely time-consuming task to gather, adapt and design teaching materials, a type of task for which, on the other hand, most teachers are not responsible in their

regular courses”. They affirm that creating materials for CLIL sessions requires a big effort by the teachers. Moreover, for them CLIL materials should be able to be used by “as many teachers and learners as possible”. This affirmation is in a close relation with the aim of this work, which is the creation of several activities about different aspects of the subject of Science that can be used in the future for Science teachers in their classes. However, the design of materials and activities is a very hard task that requires imagination, time and the ability to adapt them to the characteristics of the pupils they have been designed for.

Besides, Várkuti (2010:3), who did an empirical study about linguistic benefits of CLIL by measuring linguistic competences, affirms that the bilingual education system (in Hungary) “shows some deficiencies, which include the lack of appropriate textbooks and teaching materials (supplementary books, maps, posters, video films, etc.)”. Sometimes, teachers of contents in a foreign language may find that there are not many materials created. On the other hand, the materials used maybe hasn’t been created for the students in the country of the bilingual program, so the materials have to be appropriate and accommodated to the culture and the social and learning characteristics of the pupils that are being taught.

According to Ruiz de Zarobe (2008:3), who analyzed Content and Language Integrated Learning (CLIL) in the Basque Country in Spain, where many schools were progressively adopting a content-based methodology in the classroom, “CLIL teacher-training programmes are scarce and so is the development of content materials and instructional resources”. As it can be observed, Ruiz de Zarobe agrees with Várkuti’s opinion in the point that there are not many published materials and resources to teach contents in a foreign language.

Most of the authors agree in the facts of the lack of materials, inappropriate or deficient ones that do not fit the needs of the pupils they are being used with. That’s why the proposal of this work aims to contribute to these deficiencies with the creation of a set of activities and materials for Spanish pupils that are immersed in a bilingual program by which some subjects, such as Science in this case, are taught in English.

6. METHODOLOGY

The methodology that has been used for the development of this work can be divided in two parts. The first one is composed of a theoretical description based on several ideas and publications about the topic of this work. The sources that have been consulted are related with the main points of the theoretical background and with the key words, which are: Bilingualism, bilingual education, Content and Language Integrated Learning (CLIL), Science, activities and resources. The bibliographical search for this theoretical part of the work has been carried out mainly through specialized databases that provide access to numerous publications and by consulting text books in printed and digital format, as well as various websites. In addition, in this first part there is a section called “Literature review” that deals with a revision of some investigations that are relevant to the topic of the work, in this case about some authors that have written about materials, resources and methods in Content and Language Integrated Learning.

The second and practical part of the work has to do with a teaching proposal for pupils of Year 1 of Primary Education in the subject of Science. This proposal consists in the design of a set of activities that can be useful to teach different topics that are in close relation with the contents that the pupils of 6-7 years old have to learn. The selection of these topics has been made by consulting some textbooks of this subject and the publication “Guidelines for the development of the Integrated Curriculum” (2004) by the British Council and the Spanish Ministry of Education, in which the main contents and aims that the children of the different stages of Primary Education have to get, are included. Besides, some textbooks of Primary Education have been also consulted for the selection of topics. Finally, the activities designed try to be short and appropriate for the age and the learning and social characteristics of the pupils, and they can be individual or for small or large groups.

7. PROPOSAL OF DEVELOPMENT

7.1. Context of the classroom

The proposal of activities and materials for the subject of Science, which is the main objective of this work, will be created for a group of pupils of Year 1 of Primary Education in Castilla y León. Therefore, it has been interesting to investigate about

types of education and bilingual programmes in this region, because now the characteristics of the specific school programme of the students, are going to be studied (write it more clear), as well as the traits of the group of students.

The pupils in which this work is based, belong to “Los Doce Linajes” school, which is located in Soria. The main identifying mark of the school is that it is a bilingual school, as a result of the Ministry of Education/British Council agreement, that develops an integrated curriculum since 1996. The main aim of the programme is to promote mutual understanding and a sense of respect for different cultures, and it doesn’t consider the language as the main goal, but as a vehicle for the transmission of knowledge and sensibilities.

In the bilingual programme, the students are taught some non-linguistic subjects, such as Science and Art in English, apart from the subject of English Language. Another significant feature of teaching is that children are taught English since they arrive at school and this subject is carried out by linguistic assistants, who are native or bilingual teachers.

It is also important to highlight that groups of students are constantly divided into halves (flexible groups) for certain subjects, like Science, English and Spanish Language, so teaching is more individualized.

Regarding the personal characteristics of the students, Year 1 A group is composed of 24 pupils, 15 of them are girls and 9 boys. There are three students whose families come from foreign countries, such as Gambia, Ghana or Romania, but they were born in Spain and they are totally adapted regarding the language.

The pupils are 6-7 years old and physically, they are growing and increasing in weight and volume gradually, although most of them are thin. Their muscles and bones development already enables them to make numerous movements, so they seem to have a high degree of coordination and agility. They have a great physical strength and most of them are very active, so it seems that they never get tired when they are doing activities they enjoy.

In addition, children are starting a new phase of their life with the beginning of Primary Education, an intellectual change in which they begin to reason, which will last until they are 11-12 years old. Previously, their reasoning was more intuitive, changing and

subjective, but from now on, they are starting to apply logic reasoning for concrete facts. In relation with language, they have a very developed one, especially in Spanish, although they are also very good in oral English, in which their comprehension skills are really good. Their ability to concentrate is not very high yet, so creating habits in them and programming short activities is very important at this age.

It is necessary to keep in mind that some factors of social influence (family, school and friends) are beginning to be relevant for students. Friendship is becoming important for them, and therefore they prefer to play in groups than individually. Although there are some groups in class, they are constantly changing their friends, especially girls, and arguing and forgiving each other, although their anger quickly finishes. In general the group is academically and in behaviour a very good one, although there are some personality features to highlight. The boys are more easygoing and there are not big conflicts between them, however there are some girls with a strong personality, even bossy, so discussions are more usual. One of the girls is specially spoiled and bossy, so her attitude is starting to affect her relationship with her classmates. Nevertheless, all of them are also a bit competitive.

Most of the pupils have already learnt to read and write, although three of them have more difficulties because of some reasons. One child whose family is from Gambia has more problems in reading in Spanish and especially in reading and speaking English, although at the end of this school year, he is starting to understand what he reads. He has learning difficulties, and as he is already in Year 1 of Primary, he is not included in the “ATDI” census¹. He has most of these problems because of his family: they are immigrants, with few economic means and there doesn't seem to be any rules or habits at home, as well as no motivation or help with the homework or other school aspects, which causes that the child doesn't have any interest about school.. Another pupil is physically and psychologically more immature than the rest, so he learnt to read and write later than the others and his behaviour in class is not so good, because he's constantly moving. Apart from that, there is a boy who is supported by the Hearing and Speech specialist teacher, because he has reading and pronunciation problems.

¹ Classification of students with special educational needs, created by the Spanish Ministry of Education.

Students are learning to take care of their materials and they start to be organized, although most of the times they need the instructions of the teachers to take them and to tidy up.

The behaviour of the students in Science is good and they are usually quiet and paying attention. There are no special troublesome students, although in some punctual cases, it is necessary to attract the attention of two or three students who are more immature than the rest, so that they do not get distracted.

All these traits about the pupils, the school and its bilingual programme are going to be taken into account to plan the different activities and to design the materials of the teaching proposal.

7.2. Topics

The activities and resources of this work are going to be designed considering some topics that will be selected basing on the contents that the students of Year 1 learn in the subject of Science, according to the Integrated Curriculum Guidelines (2004). According to this source, the contents for all the Years of Primary Education are divided into four blocks: *The Human Body and Health*, *Living Things*, *Materials and their Properties* and *Physical Processes*.

However, and considering all the things the pupils of Year 1 have to study, the topics that have been chosen for the creation of the different activities are the following ones:

- Daily routines: Family and friends, routines at home and at school, daily meals, the days of the week and the months, the date, the weather, the seasons, clothes for the seasons, etc.
- The neighbourhood and the town: Different places in the town, means of transport, objects in the streets, jobs and services, etc.
- The human body: Names of some parts of the body, stages in life, abilities depending on the age, feelings, names of the senses and parts of the body, different things that can be perceived through them, tastes, smells, colours, etc.
- Living things and needs: Living things and non-living things, things they need to live, daily meals, favourite food, healthy and unhealthy food and habits, hygiene, etc.

- Animals: Names of animals and baby animals, mammals, birds, fish, body coverings, parts of their body, animal needs, habitats (forest, desert, savannah...), domestic and wild animals, how animals move, uses of animals for humans, animal products, etc.
- Plants: Names of plants, parts of the plant, plants' needs and cares, habitats, plants' growth, uses of plants for humans, parts of the plant we eat, vegetables, plant products, etc.
- Materials: Names of materials, objects made with these materials, natural materials and their origin, clothes' materials depending on the weather, materials properties, recycling, etc.
- Physical processes: Forces, human energy and electricity, electrical appliances, light, sound, communication, etc.

7.3. Contents

As it has been explained before, the contents proposed for the Integrated Curriculum are divided into four blocks. The first one is called *The Human Body and Health* and its main aim is that the students develop an understanding about the main human body characteristics, the process of nutrition and healthy habits. The second block is *Living Things* and aims that pupils develop an understanding about animals and plants' features and their life processes, as well as their importance for people. The name of the third block of contents is *Materials and their properties* and its main aim is to develop in the pupils of Primary Education an understanding about the different kinds of materials that are around them, as well as their main properties and uses. Finally, the last block is called *Physical Processes*, which is focused in developing an understanding of physical processes, forces, sound and light.

More specifically, the contents from which the activities and materials of this work will be designed belong to the first stage of Primary Education, although the ones that are going to be worked through the proposal have to be selected specially for Year 1:

The Human Body and Health	Living Things	Materials and their Properties	Physical Processes
<ul style="list-style-type: none"> - External parts of the body and features. - Recognition of simple differences between babies, children, adults and elderly people. - Comparison of themselves now from when they were babies. - The five senses, their function and organs. - Understanding that living things need foods and water to stay alive. - Importance of exercise and a healthy diet for our body. - Classification of food according to its origin: animals or plants. - Importance of basic safety rules at home, at school, on the street... 	<ul style="list-style-type: none"> - Differences between living and non-living things. - Understanding that animals move, feed, grow and reproduce. - Understanding that animals need water and food. - Main external parts of animals' bodies. - Animals' classification in wild or domestic. - Importance of soil, sunlight and water for plants. - Main parts of a plant. - Importance of animals and plants for humans. - Caring behaviour towards living things. 	<ul style="list-style-type: none"> - Types of materials: Plastic, metal, wood, paper, stone. - Similarities and differences between materials by using senses. - Simple material properties: hardness, roughness, water resistance, magnetism... - Recognizing natural materials. - Some processes that can change the shape of materials: bending, twisting, stretching... 	<ul style="list-style-type: none"> - Pushes and pulls as forces. - Identifying what makes things move. - Basic knowledge of electricity. - Identification of everyday appliances that use electricity. - Identification of light sources: natural and artificial light. - Identification of sound sources. - Identification of different sounds.

7.4. Methodology and resources

The methodology which is going to be used for this didactic unit is based in progressive learning because the contents increase their difficulty along the years. Teaching is going to be focused mainly on the students, although they will be influenced by the control and advice of the Science teacher. This methodology tries to make the teaching process dynamic, giving the pupils an active role and considering them the subject and not the object of the process.

This methodology will encourage the development of personal skills and ensures the continuity of the knowledge acquired during the teaching-learning process all along the year, the interrelation of prior knowledge that the students have and its use to solve the problems which can occur during the activities.

This methodology also involves some forms of grouping to make the activities and tasks, such as the following ones:

- **Class organization in a large group:** With this organization the group does the same at the same time and the teacher or the students explain to the group some ideas, questions or comments. In this work, some activities will be designed through this form of grouping.
- **Class organization in flexible groups:** In this type of organization only a half of the students (12) attend Science lessons, meanwhile the rest of the students are in Spanish Language or English Language lessons. These classes are supposed to be more active and dynamic and involve three of the four hours a week the students have for Science. This kind of lessons can be useful to design group activities and allows teaching to be more individualized, so that the problems and difficulties of the students can be better assisted.
- **Class organization in teams:** The organization in fixed groups consists in distributing the students in groups of 2, 3 or 4 students (depending on the activity). In each group, the teacher will give clear instructions because each pupil will have determinate functions in the activities. In fact, the reduced number of students for each group has been planned to make all the pupils work actively by doing a task and not getting distracted.
- **Individual work:** It consists in activities which each student does by himself/herself and this kind of work will be specified in the activities' development.

In this teaching proposal it is also important to specify the materials and resources that are going to be used for the activities. The available resources of the class and the school are going to be used as much as possible and specially the following ones for the designed activities:

Class Materials		Resources
Worksheets	Displays	Digital whiteboard Computer
Bingo cards	Games	
PowerPoint presentations	Videos	
Flashcards	Songs	

7.5. Activities for the topics

This section will be divided in three more ones. Firstly, the aims of all the activities will be noted. Then the names and the development and purpose of the different activities, divided by topics, will be explained, taking into account that the real material used for the activities and the exercises will be located in the “Appendix” of this work. Finally, some assessment criteria, in relation with the aims planned, may be found, as well as some other ways of assessment where necessary.

It is important to highlight that the aim of this proposal of activities is for Science teachers to be used as a support in their classes, so some activities for each topic will be explained.

7.5.1. Aims

The aims for the different activities are going to be divided in topics, so each section includes the aims that are expected to be achieved by the students in the activities of each topic.

- Daily routines:
 - To distinguish daily activities depending if they are developed at home or at school.
 - To learn and recognize elements of the different places in the school.
 - To distinguish and know the names of the actions children do since they get up until they go to school every day.
 - To review the main clothes’ names.
 - To know which kind of clothes people wear depending on the season.
- The neighbourhood and the town:
 - To review the main jobs’ names.
 - To learn and be able to describe the tasks of some jobs.
 - To be able to tell and write the main means of transport in the city and between different cities.
 - To be able to say and write where they live.
- The human body:
 - To know the names of the main external parts of the body.

- To be able to locate and write the main parts of the body.
- To realize that people has different abilities depending on their age and their degree of maturity, as well as animals and plants.
- To know the names of the five senses and the parts of the body associated to them.
- To distinguish and be able to identify objects and sensations we can appreciate through the five senses.
- To recognize and distinguish some general properties of the objects, that can be appreciated through the senses.
- Living things and needs
 - To distinguish living and non-living things.
 - To know that living things move and make sounds.
 - To be able to recognize and say the main needs of living things.
 - To know the main names of food.
 - To express likes and dislikes in relation with food.
- Animals:
 - To know the main physical features of animals.
 - To be able to classify animals depending on the groups they belong to: mammals, birds and fish.
 - To recognise the different ways animals can move.
 - To be able to describe the main characteristics of some animals.
 - To know the main products that animals give us and their names.
 - To distinguish products from different animals and classify them.
- Plants:
 - To be able to locate and write the main parts of plants (roots, stem, leaves, flowers, fruits, seeds).
 - To be able to distinguish the main features of plants depending on the season.
 - To know the main uses of plants and recognize them in daily situations.
 - To recognize the part of a plant that some fruits and vegetables are.
- Materials:
 - To be able to say if an object sinks or floats.
 - To know materials' names.
 - To associate objects with the materials they are made of.

- To be able to identify some properties of objects and materials.
- To appreciate the importance of recycling.
- To be able to classify products in different recycling dustbins.
- Physical processes:
 - To be able to distinguish some movements, such as pushes and pulls.
 - To be able to classify objects depending if they give us artificial and natural light.
 - To be able to say and write objects that give us light.
 - To be able to distinguish electrical and non-electrical appliances.
 - To be able to classify electrical appliances in the part of the house they have to be located.

7.5.2. Development

- Daily routines:
 - **At school or at home?:** In this written and individual activity, the students have to classify some photographs with actions they do in their daily life, depending if they do them at home or at school. The students have to complete the activity by writing next to each picture the words “at school” or “at home”. In some cases, both answers can be correct.

This activity can be developed in the following way: First of all, the teacher can hand out the worksheets, so that the pupils can observe the pictures and comment them in pairs. Then she or he can ask some questions to the students about the pictures and about what are the children doing, for example: “What’s the girl of the first picture doing?”. Then the pupils can do the activity on their own and it can be corrected by asking to the students one by one, so that each student says at loud one sentence about the picture, for example: “We brush our teeth at home”.
 - **Places in the school:** This activity also consists of a worksheet in which the pupils have to match some places at their school with some objects they can find there. First of all, they have to write the names of the places and, after matching, they have to write some sentences about the joints they have made with the help of a model.

Before starting to match the pictures, the teacher can speak with the children about the pictures, so that they say the names of the places at school. Then they can do the worksheet and compare it with a classmate. They can also tell each other the sentences they have written.

- **I jump out of bed:** In this case, a song will be used to learn the daily routines of children at home since they get up until they go to school. The song is available in the Internet² and it can be used for the pupils to learn it and sing it all together in the class, as well as to do some written activities about it.

First of all, the teacher can comment with the students and ask them what they do in the mornings. The song includes also a video to follow it better, so first it can be played and the pupils listen and watch it and also the teacher can use body language to represent the actions that appear in the video (I yawn, I stretch, I wash my face, I brush my hair...). In the video, the actions are constantly repeated, so the students can remember the song easily, sing it and make the gestures at the same time. Then, they have to complete a worksheet in which they have to write some actions under the correct picture. After that, they have to read some sentences with actions we can do in the morning and tick or cross them depending if they appear or not in the video, so that they have to recognise them also in a written way. After these activities they can make a picture of what they have for breakfast and write the names of the food.

- **What do you wear?:** This activity consists of a worksheet in which the pupils can observe the pictures of different clothes. Then they have to match the pictures with the correct names of the clothes by using numbers. After that, they have to circle the pictures in different colours depending in the season they wear the clothes.

The worksheet can be used in order to review the main vocabulary about clothes that the pupils study. This topic can be in a very close relation with the seasons, so, apart from reviewing vocabulary, the pupils have to know what to wear depending on the season. This way they demonstrate that they know how is the weather usually in each season.

² www.youtube.com/watch?v=FTZsipP0yHY

- The neighbourhood and the town:
 - **Working in the city:** This activity is included into a worksheet in which the students can see some pictures that represent some jobs (teacher, nurse, baker, policeman, and postman) they have studied. They have to do two tasks: First they have to observe the pictures to identify the jobs and then order the words of some sentences about the main activity of the jobs. After that, they have to match the pictures with the sentences with the use of numbers.
The aims of this activity are to review some jobs' names, to recognise the activities that some jobs entail, as well as to be able to say sentences about the jobs that appear in the worksheet and about more ones. After doing the sheet in a written way, the pupils can be asked to say at loud the sentences and to memorise to say them without looking. In a similar way, they should be able to tell more sentences about other jobs, as well as their names.
 - **Transport in the city:** This worksheet consists of a word search activity in which the pupils have to find the names of the means of transport they have studied (train, car, bicycle, bus, motorbike, boat, plane and underground) and that can be used to travel in the city or to travel anywhere else. After they find them, they have to write the names.
This activity can be very useful to practice the writing of some means of transport. The pupils should be able to say the names orally, but sometimes they find more difficult to write them or to recognise the written words and associate them with the sound.
 - **Jobs' book:** This is an individual activity in which each pupil has to think about what they would like to be when they grow up, or just choose a job because they like it. Then they have to write some sentences in their notebook about their job, such as the following ones, for example: "I am a nurse", "I work in the hospital", "I take care of people", "I wear a white uniform", etc. They can also add some pictures.
The teacher should copy examples of sentences in the blackboard so that the pupils can write their own ones in their notebook following a model. The teacher should also correct all the sentences and the pictures before creating the jobs' book. It can be made cutting the pages of the notebook in which they have done their work and sticking it in pieces of cardboard of different colours. The teacher

can also add a cover for the book and it will be ready to be passed to all the pupils' families, so that they can observe the work of their child and of the rest of the group.

- **Where do you live?:** In this activity the pupils have to make a picture of their house or flat into a rectangle and paint it. Then they have to complete some sentences about their house and the objects that are in their street. First of all they have to say the town where they live and then if it is in a house or a flat, the number and the floor.

When the students finish the activity, some of them can go in front of the class to tell the rest about their house. Before that, the teacher should have left some time for the students to memorise the sentences.

- The human body:

- **Parts of the body:** The worksheet in which this activity is included, is composed of eight simple definitions of some parts of the human body. The pupils have to read them carefully to guess the right part and write them into a crossword, trying to fit the letters in the spaces, so that there are not spaces left. First of all, the teacher should give clear instructions for the pupils and ask them to point to the different definitions meanwhile he or she is reading them. Sometimes, Year 1 pupils have some difficulties in reading because they don't know how to pronounce some words. They are more used to oral English, so the teacher can read the definitions for them to understand better. In addition, the crossword has been designed for the pupils to practise the writing of those words, that's why the number of letters of the words has been given.
- **Can they...?:** In this activity the pupils have to be divided in five groups, so that there are approximately four or five pupils in each group. Each group has to be given a card with an action (walk, swim, run, eat or paint) and first of all they have to think and discuss about different people who can do this actions depending on their abilities and their age. So, once they finish, they can comment their conclusions to the rest of the class with the help of the teacher. After that, the teacher has to hand out twelve cards with pictures of living things, such as plants, animals and people of different ages to the students. Then they have to classify the cards depending if the living thing of each picture has the

ability to do the action or not. When they finish, they can show their work to the rest of the class and the teacher can write some sentences with the conclusions on the blackboard for the pupils to copy them in their notebook. This activity can be used for other topics for Year 1 of Primary Education, such as Living Things.

- **My senses:** This activity consists in matching three columns. The first one is made up of different parts of the body that correspond to the five senses (hearing, sight, taste, touch and smell). In the second column there are some objects that can be appreciated by the senses, such as, music, a picture, rubbish, etc. Finally, in the third column there are five sentences about the actions we can do when we use our senses.

This activity can be used as an introduction for the topic, once the pupils know the names of the senses and to identify them with the actions and the things we can recognise through them.

- **What does it feel like?:** The teacher has to locate some real objects in front of the classroom for the pupils to observe them. Then he or she can ask some of the students to touch an object and match it with the card that contains the sentence that fits better with it. The objects that the teacher can bring to class can be the following ones: a teddy bear, a silk scarf, a seashell, a car toy, a straw hat, and a stone. These objects have to be matched with the sentences: “it’s soft and smooth”, “it’s smooth”, “it’s hard and rough”, “it’s hard and smooth”, “it’s soft and rough” and “it’s hard”. After they classify the objects, they have to complete a sheet about the conclusions.

This activity has to be developed using the technique of ‘realia’ for the pupils to use their senses to distinguish the properties of some real objects. It could be perfectly developed in flexible groups if it is possible because only a half of the students are in class. The aim of the activity is that the students use the sense of touch to identify the characteristics of some objects of their daily life.

- Living things and needs:

- **Mimes:** Each pupil has to be given a card with the name of a living thing. So they have to think and identify the living thing and make gestures to represent it, so that the rest of the classmates have to guess what it is. The pupils can imitate

some physical features, movements, sound, etc. When they think they know the living thing they can raise their hand and the first person will be asked to answer.

For this game, it is important that all the pupils have clear the difference between living things and non-living things, because they may think first about animals, but they have to realize that plants are also living things although they are fixed in the ground. This activity can be developed in flexible groups or in large group lessons, but in this case not all the pupils can do mimics

- **Draw and tell:** This activity has several parts. First of all, the pupils have to make and paint pictures of living and non-living things into a table. When they finish, they have to compare the pictures with the classmate next to them and tell sentences, for example: “cats are living things”. After that the teacher can ask some students to say the sentences at loud, so that everybody can listen and learn about more animals. Finally the pupils have to write the sentences about their living things at the end of the worksheet.

The pupils can do it by themselves but the teacher can help them in some moments. For example he or she can go around the tables telling examples of sentences for them to have a model and they can compare easily with their partner. Moreover, when the pupils have to write the sentences they may have more difficulties, so the teacher can write on the blackboard one or two examples.

- **Living things’ needs:** This activity consists in choosing essential elements that animals, people and plants need in a group of nine objects. The pupils are supposed to choose food, water, air and sun for people and animals, and water, soil, sun and air for plants. To do this, the students have to write “P” (plants) and “A” (animals) next to each object, or nothing if it is not an essential need.

Before doing this activity, the teacher can ask to the students what they need to live and give clues by asking questions, such as “do you need coke?”. So finally they have to decide what we exactly need and think about the same in plants. Then they are ready to do the activity.

- **What do you like?:** In this worksheet the pupils have to indicate their preferences in relation with food. They have to colour in red a sad face if they do not like the food or in green a happy face if they like it. They have to express

their likes about pizza, oranges, cheese, chicken, fish and lettuce and after that they have to complete some sentences.

All the answers can be compared between all the pupils in the class, who can make oral sentences. Then the teacher can ask some pupils also about other ones' preferences to check if they have listened and remember it.

- **Animals:**

- **Guess the animal:** This activity consists in guessing animals through some clues about them that the teacher can give to the students. For this purpose, the teacher can use a PowerPoint presentation in which the clues have to appear little by little. These clues are some sentences that describe the animals and include the main contents the children have studied, such as their physical appearance, the way they are born, the group of animals they belong to, etc.

The game can be played and it doesn't matter the number of children who participate. If all the students are in class, they would play individually and raising their hand when they know the animal. The teacher can also make groups to play, and the ones who guess more animals are the winners of the game.

- **Animals move!:** In this activity the pupils have to use their crayons to classify individually some pictures of animals depending on the way they move: walking, running, swimming, flying or slithering. So the students have to circle the animals that walk in blue, the animals that run in red, the ones that fly in green, the ones that swim in purple and the ones that slither in orange. In some cases they can circle the animals in more than one colour.

First of all, the teacher can introduce the movement of animals by using examples and asking questions to the students about this topic. So the sheet can be very useful to practice and explain and pay attention to some exceptions in the groups of animals, such as penguins, that are birds but they cannot fly.

- **Animal products' bingo:** This bingo game can be used to review the vocabulary about farm animal products. The teacher should say at loud the names of the products randomly and the children have to cover the pictures in their bingo card with a piece of paper. If the children cover all the pictures because all the names have been said, they have to raise their hand and say "bingo".

The ideal way of playing this game is in flexible groups with half of the pupils, because there are six bingo cards and they could play in pairs. When the game is finished, all the pairs can go in front of the classroom to tell the rest which animal gives us the products in their card.

- **Animal products' displays:** This activity has been designed to be developed in groups of 3-4 students, so that there are six groups. Each group has to be given a big piece of cardboard where the picture of an animal and its name have been previously stuck by the teacher, so that an animal is assigned to each group. In addition, the pupils have to look for some products that come from their animal in some supermarket magazines. They have to cut the products and stick them on the cardboard to make posters that can be located in the cork board of the class.

The main aim of this activity is to create a set of posters to be located in the classroom, so, although each group only makes a poster, they can finally see all the products that come from the animals studied in the different posters. Most of the animals with which the pupils have to work, are domestic or farm animals, so this activity could be developed after the students can classify animals into wild and domestic. The animals included are cow, pig, sheep (lamb) and chicken, and the two posters left can be completed also with plant products that come from the garden or from wheat. This way, both topics of animals and plants can be related, that's the activity can be carried out when both units are finished.

- **Plants:**

- **Which parts of the plant do we eat?:** This is a digital activity (in a PowerPoint presentation), that is a multiple choice game in which the pupils are given some photographs of plant products, such as fruits and vegetables, and they have to choose which part of the plant, from the ones that they have studied (fruit, leave, stem, root, seed), they are. If the option they choose is right, a smiling face appears, and if the answer is wrong, a black cross. However, if they first answer is not correct, they can continue trying by clicking the rest of the names of the parts of the plant until they get the right one.

This activity can be carried out in different ways. First of all, it can be used for a lesson in which the whole group is in class, so they can do it together and some pupils can go to the digital whiteboard to choose the answer. In addition, the activity can be also used in flexible group lessons, in which only a half of the students stay in Science. In this case, the pupils can be divided in groups of three or four to make a workshop, if the teacher has previously planned more activities, and move around the classroom in groups doing the activities, including this one. Finally, and if it is possible, the teacher can go with the students to the computers' room of the school, so that they can do the activity individually in their own computer.

- **Plants in the seasons:** This activity is included in a worksheet in which the students have four pictures of the same tree in different seasons, so each tree has different characteristics and the students can observe how plants change during the year. The pupils have to cut the pictures and stick them in the correct square with the name of the season. After that, the pupils have to complete a table about trees' features in the different seasons. They have to indicate with a tick or a cross if the trees have green leaves, yellow leaves, no leaves, flowers or fruits.

The worksheet has been designed for the topic of "Plants", although it could also be used for the topic of "The Seasons", because contents of both topics are worked. First of all, the teacher can talk with the pupils about the pictures in the sheet and also give clear instruction about how to complete the table.

- **Uses of plants:** Once the students have learnt the uses of plants, they have to start to distinguish them in real situations. So in this worksheet, the students are given some real photographs in which they have to deduce the use of plants that is reflected in each one and complete with the words "food", "furniture" and "decoration".

The activity can start by asking questions about the pictures to the pupils and, when it is finished, it can be corrected orally, on the digital whiteboard, on the blackboard, etc.

- **Parts of plants:** The pupils have to read little texts that describe each part of the plant: trunk, fruit, flower, leaf, stem and trunk. Then the pupils have to match the definitions with the correct part of the plant.

After doing this activity individually, the teacher can read each definition to the students so that they have to guess the words. They can raise their hand if they know it and the first child to do it will be asked. Then they can do it in the worksheet and when they finish the activity, they can compare their answers with their partners.

- **Materials:**

- **Does it sink or float?:** This is an experiment in which the pupils have to introduce some objects (sharpener, t-shirt, spoon, bottle, newspaper, glass) into a container of water to test if they float or sink. After that, they have to complete a table, in which they have to write the materials these objects are made of, as well as a tick or a cross in the right column depending if they sink or float. Finally, they have to complete some sentences about the experiments and about the data they have collected in the table.

The teacher can do this experiment if all the pupils are in class, in a way that all of them can see it properly. So the teacher should go around the classroom with the container of water to make some of them introduce the objects and for all of them to observe what happens. If it is possible to do this activity in flexible groups, the pupils can sit in a circle on the floor and then sit down in their places to complete the worksheet.

- **Materials' properties:** In this activity the pupils have to observe the objects in the worksheet and think about their properties depending on the material they are made of. Then they have to choose between the options that are given for each object and circle the correct ones.

First of all the teacher can make questions to the pupils to comment the characteristics of each object, such as the colour, the material and the properties of the materials in the sheet. Then, to correct the activities, the teacher can bring to class the real objects for the pupils to touch and manipulate them.

- **Let's recycle!:** The pupils are given a little dossier with four pages. In each of the first three pages there are three dustbins: a blue one for paper, a green one for glass and a yellow one for plastic. In the last page there are several pictures of objects that have to be thrown to the bins, so depending on the material they are made of, the pupils have to cut and stick them in the correct dustbin.

This activity can be developed individually giving each student the photocopies of the dossier. However the teacher can also print the dustbins in a bigger size to stick them on the board and make students go there to stick the objects.

- **Materials' memory game:** This game consists in making pairs with some cards. In half of the cards there are materials' names and in the rest there are some pictures of objects made of these materials and the pupils have to make pairs. Then one who makes more pair is the winner of the game.

This activity can be planned by the teacher to be played in groups of 3-4 students. If it is possible, the teacher can design more activities to be developed in groups, so the pupils can go around the different activities.

- Physical processes:

- **Push and pull:** Through this activity the pupils can do an interactive experiment about the movements push and pull with the help of an activity of the BBC³. It is inside divided into three activities, so after doing each one, the students have to note in the worksheet what they think it is going to happen with the horse toy. Then they can check their answers in the computer and finally write the real answers in the last table of each sheet.

There are two options to do this activity. If it is possible to use the computers' room of the school, the teacher can go there with the students, so that one pupil or two use a computer. The other way is to use the interactive whiteboard of the classroom, so all the pupils do the task at the same time.

After checking in the computer with the horse toy, the teacher can make some questions to the students to make they think, so they can write their previsions in the first table of each sheet. Then, they can check their answers in the computer or in the digital board with the help of the teacher, and finally they write their final answers in the last table of each activity. At the end, the teacher can check the activities with the students.

- **I push/pull when I...:** In this worksheet the pupils have to draw some of their favourite toys. Then they have to complete sentences about the movements they do when they play with the toys, for example, if it is a car toy, the sentence would be: "I push when I play with my car toy".

³ http://www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shtml

Before starting to work, the teacher can do a little review of names of toys, asking questions to the students about the toys they have at home and their favourite ones. This way, it will be easier for the pupils to remember toys' names.

- **Artificial and natural light:** In this worksheet the pupils have to write the names of the sources of light, such as, lamp, street light, torch, candle, fire and sun. For this task, the number of letters of each word is given to the pupils to help them. Then they have to circle in blue the objects that give us artificial light and in green the ones that give us natural light. Finally, they have to write sentences about the classification they have made.

The teacher can introduce this worksheet to the students with questions about the objects, their names, etc. He or she can also ask if these objects give us light during the day or at night. Then the teacher can also explain that some objects need electricity to work, so they produce artificial light and that other ones do not need it and they give us natural light.

- **Electricity:** The worksheets have been created from an Internet source that contains some activities⁴.

They consist of three parts that have to do with electricity and that can be done with the pupils in the digital whiteboard of the class. In the first activity the pupils have to draw a circle around the objects that need electricity to work, so after doing it among all the students, each one of them has to complete an exercise in the sheet. In it, they have to identify the names of the objects in the kitchen that are in the board and classify them in a table, depending if they need electricity or not. The second part consists in locating some objects in the correct part of the house, so the students can go to the board to place them. After that they have to do a similar written exercise in the worksheet, in which they have to match the names of the objects with the pictures of the rooms and with their names. Finally the pupils can do the third part in the board and go one by one to classify one object and say the complete sentence about it, for example, "the torch needs batteries".

⁴ http://www.ngfl-cymru.org.uk/vtc/using_electricity/eng/Introduction/whiteboard.htm

7.5.3. Assessment

The following assessment criteria will be followed to assess the work of the students in the activities of each topic:

- Daily routines:
 - To be able to distinguish correctly the activities they do at home or at school and say and write their names.
 - To know places in the school and the main elements we can find there.
 - To be able to say and write the names of actions pupils do in the mornings.
 - To be able to say and write main clothes' names.
 - To be able to classify clothes properly depending on the season we wear them.
- The neighbourhood and the town:
 - To be able to say and write the main jobs' names
 - To learn and be able to say and write the tasks of some jobs.
 - To be able to tell and write the main means of transport in the city and between different cities.
 - To be able to say and write where they live correctly.
- The human body:
 - To be able to say, write and locate the main parts of the body.
 - To be able to distinguish the different abilities of people depending on their age.
 - To be able to write and say the five senses and the parts of the body they are associated to.
 - To be able to say and write the main actions we can do through our senses.
 - To be able to recognize and write some properties of the objects that can be appreciated through the five senses.
- Living things and needs:
 - To be able to classify living and non-living things.
 - To be able to recognize the movements and sounds of living things.
 - To be able to say and write the main needs of living things.
 - To be able to say and write names of food.
 - To express orally and in a written way likes and dislikes in relation with food.

- Animals:
 - To distinguish animals regarding their main physical characteristics.
 - To be able to classify animals properly depending on the groups they belong to: mammals, fish and birds.
 - To be able to say and write the ways animals can move.
 - To be able to describe the main characteristics of some animals orally and in a written way.
 - To know the main products that animals give us and their names.
- Plants:
 - To be able to locate and write the main parts of plants (roots, stem, leaves, flowers, fruits, seeds).
 - To be able to distinguish the main features of plants depending on the season.
 - To be able to say and write the main uses of plants and recognize them in daily situations.
 - To be able to classify fruits and vegetables depending on the part of the plant they are.
- Materials:
 - To be able to say if an object sinks or floats.
 - To be able to say and write materials' names.
 - To associate objects with the materials they are made of properly.
 - To be able to tell and write some properties of objects and materials.
 - To be able to classify products correctly in different recycling dustbins.
- Physical processes:
 - To be able to distinguish properly the movements of push and pull.
 - To classify objects properly depending if they give us artificial and natural light.
 - To be able to say and write objects that give us light.
 - To be able to classify electrical and non-electrical appliances.
 - To be able to classify electrical appliances in the part of the house they have to be located.

In addition, the student's assessment of these activities will take place through the following aspects:

- Direct observation: Through the oral questions, activities and interventions in class.
- Indirect observation: Through the correction of the oral and written activities done in class.

8. CONCLUSIONS, CONSTRAINTS AND FINAL CONSIDERATIONS

This work has attempted to respond to the need expressed by several authors of more materials and activities to teach contents in a foreign language through a Content and Language Integrated Learning (CLIL) methodology, because there are only a few ones suitable to the characteristics of the pupils immersed in a bilingual project.

A set of activities ready to use with Spanish students of Year 1 of Primary Education in the subject of Science has been designed, divided in different topics that are included in the contents proposed by the Integrated Curriculum (British-Spanish) from the agreement signed in 1996 by the Spanish Ministry of Education and Culture and the British Council. The pupils of this proposal attend a bilingual school of these characteristics, so the activities have been thought to be used with these students, although they could be used also with pupils of the same age and characteristics.

Some of the activities have been carried out with the students so its development has been observed for a critical reflection on the result. It has been possible do to a training period at “Los Doce Linajes” school, where the pupils study. These activities belong to the topics “Animals” and “Plants” because they are the teaching units that have coincided with my stay at the school. These activities are “Animal products’ Bingo”, “Animal products’ Displays” and “Which parts of the plant do we eat?” and the pupils were in general very motivated and participative.

At the end, only three of the thirty-two activities of this proposal have been implemented with the students, because there hasn’t been enough time to do more. In addition, I arrived at school in the third term, so as it has been explained, the pupils were studying about animals and plants and they had almost finished all the units of the school year. So if the training period had started before, I would have had the opportunity to carry out more activities to check their effectiveness in the school reality.

In this point, I would like to thank the school, the teacher and the students of the class where I was able to carry out some of the activities.

As it has been observed, the elaboration of materials by the teacher of Primary Education is totally necessary for the development of the lessons and for the proper learning of the students. The materials that are published can be very useful, but most of the times, each teacher has to think about his or her pupils and create new materials specifically thought for them. The creation of activities and materials must try to increase the pupils' motivation and keep their interest in learning new things. This is especially necessary in a non-linguistic subject, such as Science, that in lots of schools in Spain is taught in a foreign language, so a difficulty is added for the pupils if the materials used are not appropriate for them.

Designing materials is a hard task that implies a great waste of time and efforts, but it is finally a rewarding work, because children are going to learn more and more motivated through the use of adapted materials, according to their level in the foreign language and their special characteristics.

This teaching proposal provides a wide range of topics to be treated with pupils of Year 1 of Primary Education in the subject of Science, as well as some activities and materials for each topic that aim to contribute to the few published materials especially for Spanish children. These materials have been also created to encourage other teachers in bilingual schools to create their own activities once they know the pupils they have to teach, to adapt them to their learning features.

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10. APPENDIX