THE INTRIGUING HUMAN BEING:

A cooperative CLIL material package for teaching human anatomy and senses through

English in elementary school

Master's Thesis

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Tiivistelmä – Abstract

Koulutusjärjestelmät ovat kautta aikojen pyrkineet vastaamaan tarpeisiin, joita sen hetkinen maailma on sille luonut. Nykyaikana globalisaatio ja kansainvälistyminen ovat tuoneet omat haasteensa koulutusjärjestelmille. Vastineeksi näihin tarpeisiin on muodostunut erilaisia opetusmenetelmiä, joista yhtenä Suomeenkin levinnyt CLIL (Content and Language Integrated Learning).

CLIL on nimeke opetukselle, joka tapahtuu oppijalle vieraalla kielellä. CLIL:iä ei kuitenkaan tule sekoittaa perinteisiin kielikylpymenetelmiin tai kaksikieliseen opetukseen vaan sillä on omat erityispiirteensä. CLIL opetuksella on kaksoisfokus kieleen ja sisältöön. Samanaikaisesti pyritään siis opettamaan niin kielellisiä kuin sisällöllisiäkin asioita kommunikaation ja luonnollisten kielenkäyttötilanteiden ollessa opetuksen keskiössä.

CLIL:in suosio viime vuosina on Euroopassa kasvanut, mutta Suomessa suunta on ollut päinvastainen. Yhtenä syynä CLIL:in suosion hiipumiseen sitten 1990-luvun on pidetty opetusmateriaalin puutetta. Tämä onkin yksi suurimmista motivaattoreista tämän maisterintutkielman takana. Tässä maisterintutkielmassa on luotu yhteistoiminnallinen opetusmateriaalipaketti ihmisen anatomian ja aistien opetusta varten englannin kielellä alakoulun viimeisille luokille. Kyseisiä asioita käsitellään yleensä viidennellä luokalla.

Perinteistä kielenopetusta on usein kritisoitu kommunikatiivisuuden puutteesta. CLIL onkin usein nähty vasteena myös tähän ongelmaan. Tavoitteena tätä materiaalipakettia luodessa oli erityisesti keskittyä kommunikatiivisiin tehtäviin ja siksi varsinaiseksi opetusmetodiksi valittiin yhteistoiminnallinen opetus.

Yhteistoiminnallinen opetus on jo pitkään käytetty tieteellisesti tehokkaaksi todistettu opetusmenetelmä. Sen menetelmiin kuuluvat erilaiset ryhmä- ja parityöt. Kaikenlaiset ryhmätyöt eivät kuitenkaan lukeudu yhteistoiminnallisen opetuksen piiriin, vaan on erityisen tärkeää varmistaa, että kaikki ryhmän jäsenet osallistuvat työhön ja jokaisen panoksella on merkitys. Yhteistoiminnallista opetusta käytettäessä keskitytään myös erilaisiin ryhmätaitoihin, jolloin opitaan taitoja jotka ovat hyödyllisiä yhteistyötä tehdessä myös luokkahuoneen ulkopuolella.

Kattava CLIL, kuten opetus yleensäkin, vaatii kuitenkin erilaisten opetusmenetelmien käyttöä. Tämän materiaalipaketin tarkoitus onkin vastata kommunikatiivisten tehtävien tarpeeseen. Opetusmateriaalipaketti ei siis ole yhtenäinen kokonaisuus joka tulisi käyttää alusta loppuun, vaan se on kokoelma erillisiä tehtäviä, joita voidaan käyttää tarpeen tullen.

Materiaalipakettia luotaessa osaa tehtävistä myös testattiin, jotta varmistettaisiin materiaalin käytettävyys. Testaus observoitiin ja testanneet opettajat haastateltiin. Aineisto hyödynnettiin loppumateriaalia luotaessa. Siitä eroteltiin palautetta, olemassa olevia tehtäviä muokattiin palautteen puitteissa ja ideat ja ehdotukset hyödynnettiin loppumateriaalia tehtäessä. Testaus osoitti, että materiaali oli pääosin käyttökelpoista. Kuitenkin muutamia hyödyllisiä käytännön vinkkejä materiaalipakettia varten löytyi.

Itse materiaalipaketti koostuu kahdeksasta osiosta, jotka käsittelevät eri elimistöjä ja aisteja. Viimeinen eli kahdeksas osio on kokoava osio ja sitä voidaan hyödyntää ihmisen anatomia ja aistijakson päätteeksi.

Asiasanat – Keywords Content and Language Integrated Learning (CLIL), cooperative learning, material package

Säilytyspaikka – Depository

Muita tietoja – Additional information

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1 INTRODUCTION

Throughout times the educational systems have tried to answer to the demands of the world of that time. Changes have been made to the school systems, new subjects have emerged while some have been dropped out and new methodologies have been created. In the modern world the educational systems have yet new challenges to overcome. Coyle, Hood and Marsh (2010, 9-10) state that the changes in the world today, such as globalization and technological development, create special demands for the educational systems. Also Dalton-Puffer (2007, 1) notes that educational systems have been pressured by globalization and internationalization to provide students with skills that allow them to manage in the international world.

The skills needed in the globalizing world are, of course, various. Coyle et al. (2010, 9 – 10) note that, for example, mastering languages, especially English, has become more and more important. The importance of English also in schools cannot be denied. Therefore, different solutions for these demands have been created. One of the outcomes of this is Content and Language Integrated Learning, CLIL. CLIL has its origins in immersion. French immersion was created in Canada to reinforce the bilingualism in the country. Over time, different versions of bilingual education have spread to other parts of the world as well (Mehisto, Marsh and Frigols 2008, 9-10). There have been different practices close to CLIL and different names to describe teaching through a foreign language. However, according to Pihko (2010, 15) CLIL has been established as a common term used for teaching content in a foreign language also in Finland.

According to the European commission the success of CLIL has been growing over the past 10 years and continues to do so. However, in Finland the trend has been different. Comparison of the situation in 1996 and 2005 showed that the amount of CLIL had decreased (Nikula and Marsh 1996; Lehti, Järvinen and Suomela-Salmi 2006). Several reasons have been suggested for this, one of them being the lack of teaching material (Lehti, Järvinen and Suomela-Salmi 2006, 310). Thus, in this thesis the demand for CLIL material is met by introducing material for teaching biology through English.

According to the European commission CLIL has been found to be effective in Europe. Furthermore, CLIL takes place in all sectors of education from primary to adult and

higher education (see also Coyle 2007, 545). Also in Finland, CLIL teaching is offered at all levels (Pihko 2010, 16). Furthermore, some scholars also suggest early introduction of CLIL (Marsh 2002, 75). Thus, CLIL material for elementary school students can be regarded important. In fact, that is one of the inspirations behind creating this material package, which will address the contents usually taught in the fifth grade.

According to Dalton-Puffer (2007, 2) traditional language teaching is often criticized for creating unsatisfactory language learning environment. Furthermore, as she points out, it is said that no true language learning can appear in a regular language classroom. Although this might be rather strongly put, practices such as CLIL have been considered to be a solution to some of the problems of regular language classrooms. In fact, one of the main goals of CLIL is to offer the students the possibility to communicate with each other while learning. Thus, CLIL offers solutions to some of the problems generally considered part of traditional language teaching. Furthermore, the authentic language using situations presented through CLIL have been regarded motivational for the students.

Of course, CLIL and regular language learning cannot completely be compared to each other. They have different goals and purposes. Furthermore, according to one of the interviews carried out for the present thesis, regular language learning is also used aside CLIL to reinforce learning (see also Mehisto, Marsh and Frigols 2008, 11, 29). However, CLIL clearly addresses some of the demands set for language learning in Finland and for that reason, it is important to develop it further. To further develop CLIL, I would argue that it is helpful to provide teachers with teaching material, as otherwise the workload for CLIL teachers grows. However, within the scope of this thesis, it is only possible to address some issues and for that reason the content of the material package had to be limited to a small unit. In fact, the content aims on the present material package concentrate on human anatomy and senses.

There are clear reasons for choosing human biology related topics as the content of the present material package. Firstly, in addition to teaching English I am specializing in teaching biology and for that reason have a better understanding on that subject than some others. Also, of course, my interests lie in this subject. Secondly, according to Tanner, Chatman and Allen (2003, 1) collaboration needs to be taught in biology.

Collaboration, then again, requires good communication and for that reason biology offered good ground for creating exercises for CLIL. Finally, the specific area of human anatomy and senses was selected for the content of the present material package since it was a clear unit inside the subject of biology that could be limited as a subject of focus. It offered many possibilities to create exercises that are close to the students and yet belong to a clear unit. It was preferable to choose a unit such as this, instead of choosing several unrelated topics.

An important fact to remember is that CLIL is not considered to be a teaching method. Rather it is framework under which a variety of different methods can be implemented. In the present thesis cooperative learning was chosen as the method to be concentrated on. There were reasons for choosing a single method. Firstly, since communication is one of the main foci of CLIL and since the lack of it is one of the most criticized factors in traditional language teaching, it seemed important to choose a method that supports communication. Secondly, choosing a single method enabled me to explore and understand the method properly, which made it easier to create material that had a strong theoretical basis both in terms of CLIL and the chosen method. However, since the ideal in CLIL is to use several different methods, the purpose was not to create a pedagogical unit that could be taught as such. Rather, the purpose was to create a variety of exercises related to a certain content area which could be used separately.

Thus, the main pedagogical approach applied in the exercises is the cooperative approach. Cooperative learning has been implemented in schools for decades. Although it is an old method, it has been proven to be effective through several studies over the years (Johnson and Johnson 2009, 365). In fact, the research no longer concentrates on whether cooperative learning is effective, rather, the focus is on under what conditions it is effective (Slavin 1996, 53). Thus, cooperative learning has proven to be an effective way to learn. Furthermore, different types of group work exercises, pair work and games are considered as part of cooperative teaching (Johnson and Johnson 1999, 30). Thus, the cooperative method offers a great framework for creating communicational exercises for CLIL. Furthermore, also the teaching of biology yearns for methods that teach student to collaborate from an early age as it is expected of them in the subjects of sciences also later (Tanner, Chatman and Allen 2003, 1).

Cooperative learning concentrates also on other important issues in learning in addition

to communication. Johnson, Johnson and Johnson Holubec (1991) describe cooperative learning as follows: The purpose of cooperative learning is to offer the students the chance to not only learn together, but to learn even better. In the cooperative learning setting the students are positively interdependent and each individual is accountable to the group. Thus, freeriding is not accepted in a cooperative group. Furthermore, the group learns to reflect on their actions and improve them, in order to improve learning.

Furthermore, according to Johnson et al. (1991, 5:2) different and important group skills are practiced through cooperative learning. These skills include, among other things, skills on how to act in a group work situation, how to give and receive feedback and how to come to a common conclusion. Thus, the method can be seen to provide students with important skills that they can use in their lives and also for that reason cooperative learning is a useful method for the present material package.

As has been mentioned, the attempt in this thesis was to create material that had a strong theoretical basis. To further ensure the usability of the material, some of the exercises were also tested in a school where CLIL is implemented. The lessons where the material was tested were observed and the teachers who tested it were interviewed. The results from the testing, then, affected the final version of the material package.

In short, the aim of this Pro Gradu thesis is to provide teachers, including myself, material for teaching Biology through English. Furthermore, the focus is on contents taught in primary school. The topics of the teaching material are the senses and the different systems in human body, i.e. human anatomy. These issues are first introduced in primary school in fifth and sixth grades (Finnish National Board of Education, 2004). In most cases these themes are concentrated on during the fifth grade (Kortepohjan Koulun CLIL-opetus, n.d.; Parent friendly curriculum, n.d.; Opetussuunnitelma/OPS, n.d.).

The thesis is structured in the following way: In section 2 the concept of CLIL is introduced. The focus is on the history, theoretical framework and distribution of CLIL in Finland. Also some of the deficiencies of CLIL are discussed in this section. In section 3, the concept of cooperative learning is introduced and discussed. A brief review is taken upon the history and research on cooperative learning. This is followed by a discussion on the important underlining factors related to cooperation. Finally,

discussion upon the deficiencies of cooperation is covered and also comparison with some other methods is provided. This is followed by the introduction of the cornerstones of the material package in section 4. In this section the curricular basis of the material is introduced. In addition, this section explains how the theories of CLIL and cooperative learning are implemented in the material. In section 5, a brief description of the material package is given.

Section 6 concentrates on the testing of the material. The section covers a description of the target group and the teachers that tested the material. Also the methods used in the collection of the data, i.e. observation and interview, are discussed. In this section also the description of the method of analysis, i.e. content analysis, is given. The results are introduced in section 7. In section 8, the results and how they affected the final version of the material package are discussed. Finally, the conclusions are presented in section 9. Finally, the material package "The Intriguing Human being: A cooperative CLIL material package for teaching human anatomy and senses through English in elementary school" is presented.

2 CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL)

Content and Language integrated learning (CLIL) tries to respond to different needs of education. In the CLIL compendium (2013) some goals that have been developed for CLIL are listed. One of CLIL's important tasks is to offer the students skills in the globalizing world where intercultural communication skills are extremely important. Language skills are supported, for example, by creating a safe and enriching learning environment (Mehisto, Marsh and Frigols 2008, 29-30; Marsh, Maljers and Hartiala 2001, 16). Thus, according to the CLIL compendium, language competence in all areas can be developed through CLIL.

Furthermore, in the CLIL compendium it is suggested that CLIL is supposed to offer the students access to different perspectives than an ordinary language or content classroom. For example, CLIL also focuses on providing students with target specific vocabulary (see also Coyle, Hood and Marsh 2010, 10). Furthermore a different perspective is achieved by the dual focus on both language and content during one lesson. Mehisto et al. (2008, 29) also suggest that the CLIL setting should provide students with more authentic learning situations where their role should be active rather than passive. Thus, also teachers' role should be rather guiding than giving. In other words, the teacher should not solely control the learning situation.

According to the goals and core features set for CLIL presented above, CLIL can be said to have a purpose in the modern educational systems. In the following CLIL will be explored in more detail. First, the focus is on the definition of CLIL, on how CLIL has developed and what it developed for. Also the understanding of CLIL is deepened by discussing the CLIL setting and its target groups. Second, the basic principles behind CLIL are discussed. Third, an overview is presented upon CLIL's status and distribution in Finland. Finally, some of CLIL's deficiencies and how they are taken into account in the present thesis are discussed.

2.1 HISTORY AND DEFINITION OF CLIL

Teaching with a language other than the learners' first language is not a modern idea. Instead it has been practiced for over centuries in different countries and cultures for several reasons (Mehisto, Marsh and Frigols 2008, 9; Dalton-Puffer 2007, 2; Coyle 2007, 543). For example, according to Coyle et al. (2010, 2) already in Ancient Rome

the multicultural society, which formed through expansion of the empire, created demands for learning other languages. The demands present in the Ancient Rome were not too different from the demands of the modern world. Now globalization and mobility have created demands for learning languages in order to succeed in and benefit from the modern society.

Of course, traditional language teaching answers to the language learning demands of today. However, CLIL offers a different, in some cases seen as even more effective tool for achieving the language learning needs and goals. As has been mentioned, CLIL has its origins in Canada where the desire to increase the proficiency of French increased in the 1960's as the country became officially bilingual. The traditional methods for learning French were insufficient, thus immersion was seen as a possible resolution (Mehisto, Marsh and Frigols 2008, 9–10).

After the success of French immersion in Canada, the ideology expanded to other parts of the world as well and different variations of it emerged. According to Pihko (2010, 15) there have been several different ways of describing teaching in a foreign language in different countries. These variations in terminology have emerged from different emphases on the goals of different practices. However, during recent years also in Finland the term CLIL has been established to describe the teaching of content though a foreign language.

The European commission (2011) defines CLIL as an approach which involves teaching a curricular subject through a language other than the native language. The subject is often unrelated to language learning such as biology or history. However, Coyle et al. (2010, 1) remind that CLIL should not be confused with other similar practices such as bilingual education or immersion. Rather, they emphasize the dual focus of CLIL. In other words, it is important to remember, as Pihko (2010, 15) points out, that CLIL binds together teaching of language and teaching of content, thus it has a focus both in learning content as well as acquiring language. Furthermore, Coyle et al. (2010) continue by noting that CLIL should be understood to be content-driven.

Now the focus will move on to a more precise description of a CLIL classroom setting and its benefits and goals. The description will shed light on CLIL practices, its specific

features and purposes. Then a brief description of the target groups of CLIL is given, in order to get a general idea on how and to whom CLIL is implemented.

2.1.1 THE BENEFITS OF CLIL AND A CLIL SETTING

Researchers claim that CLIL type of teaching has many benefits (Coyle, Hood and Marsh 2010, 10; Pihko 2010, 18). Pihko (2010, 16-19) describes CLIL to be a challenging setting, especially since language is both a vehicle and target of learning. However, she also adds that it is regarded as a rewarding surrounding according to Canadian research. In addition, Pihko summarizes European research by Dalton-Puffer (2009) and Ruiz de Zarobe and Jimenez Catalan (2009) and states that the results in learning the new language have been positive. For example, receptive skills, vocabulary, fluency, risk taking and creativity seem to be favorably affected by CLIL. Studies also show that content goals have been achieved at least as well as in a regular classroom setting. Pihko (2010, 19-20) also summarizes Finnish research, for example by Järvinen (1999) and Rauto (2003), which has given positive results in learning in CLIL settings. She also states that other Finnish studies have shown positive results both in learning the language and content. In addition, Pihko introduces her own research (2007), which has shown positive effects of CLIL on motivation and the learners' conception of themselves.

CLIL also offers students the possibility to familiarize themselves with a new language while learning something else. Thus, CLIL offers the learning of a language a clear purpose. The students get to use the language learned in an authentic situation immediately (Coyle Hood and Marsh 2010, 17; Mehisto, Marsh Frigols 2008, 31). This is a clear difference between a regular language classroom and a CLIL classroom. Furthermore, Dalton-Puffer (2007, 3) argues that the authenticity of the learning situation enhances the development of communicative competence.

In order to understand the CLIL setting properly, it needs to be recognized that CLIL is not seen as a single method of teaching. Rather according to Snow (as quoted by Dalton-Puffer 2007, 2) different kinds of educational practices can be used in CLIL as long as some other language is used in the classroom in addition to the learners' first language (see also Coyle Hood and Marsh. 2010, 1; Mehisto, Marsh and Frigols 2008, 11). Furthermore, Mehisto et al. (2008, 27) point out that although CLIL seeks to enrich

regular classroom settings it cannot be disconnected from regular practices of education (see also Dalton-Puffer 2007, 293).

Nevertheless, the CLIL setting is also rather different from a regular classroom setting. One of the most important differences in the CLIL settings, depending of course on the situation, is that two languages may be present, one of them being the learners' first language and the other the "foreign language" (Coyle, Hood and Marsh 2010, 16). "The foreign language" used in the CLIL setting can be any other than the native language of the learners. In addition, it can also be the learners' second language or any other heritage or community language. Therefore, there are different expressions used for the second language used in the CLIL settings. Some use the term vehicular language whereas others use the term additional language. (Coyle, Hood and Marsh 2010, 1) The purpose of the additional language is to work as a vehicle in learning the content (Pihko 2010, 15). Thus, in this thesis "the foreign language" will be referred to as vehicular language, as it describes the purpose of that language in CLIL well.

Coyle et al. (2010, 15-16) introduce different models in which different amounts of the vehicular languages are used. The models range from extensive use of vehicular language to partial use. The model of *extensive instruction through the vehicular language* involves teaching that is almost solely executed in the vehicular language. In this model 50 per cent or more of the curriculum should be taught in the vehicular language. In the *partial instruction through the vehicular language* limited periods of time are taught through CLIL. Also more of the learners' first language may be present on the lessons.

Also other features differentiate a CLIL setting from regular classroom settings. As has been established, the focus of teaching is not solely on either language or content but on both. Marsh (2002, 17) describes CLIL lessons to have different amounts of focus on the language content and non-language content. In fact, CLIL may have anywhere from 10 per cent to for example 75 per cent of language focus during a lesson. However, Marsh (ibid.) emphasizes that whether the focus during one lesson is more on the content or the language, the dual focus needs to present on each lesson if the learning is referred to as CLIL.

Furthermore, Marsh, Maljers and Hartiala (2001, 16) suggest that CLIL aims at motivating the students to work with the foreign language as there are authentic communication routes offered for the students. Furthermore, the students get additional skills for future studies and working life as the contents are taught in the vehicular language.

Above just a few, nonetheless important factors that differentiate CLIL from a regular classroom setting are presented. CLIL seems to aim at achieving important educational goals. However, it can be seen as demanding as well. Nevertheless, CLIL is widely introduced to different target groups, which will be presented in the following.

2.1.2 TARGET GROUPS

Although CLIL could be regarded as a demanding setting, it is offered on many levels of education. In fact, Mehisto et al. (2008, 11) as well as Dalton-Puffer (2007, 2) note that CLIL is offered for children from kindergarten to tertiary level. In Finland, Pihko (2010, 16) describes CLIL teaching to be offered also at all levels. Furthermore, CLIL is offered to students with different kinds of backgrounds and language proficiency levels. Thus, CLIL groups are often very heterogeneous (Marsh 2002, 75).

The CLIL programs are diverse and the starting ages for CLIL are various. Marsh (2002, 75) states that there is no optimal starting age for CLIL. However, early introduction has been considered advantageous. Also, Garcia (cited in Coyle, Hood and Marsh 2010, 18) notes that introduction of CLIL at an early age is supported widely. He bases the claim on the generally made notion that early introduction to new language is better. Furthermore, he suggest that the general belief that language learning should be as naturalistic as possible also supports early introduction of CLIL.

The ages of the students need to be considered in order to organize successful CLIL. Coyle et al. (2010, 16-26) describe CLIL teaching in different levels from 3 year-olds to tertiary education. In different stages CLIL has a different function. With the youngest children Coyle et al. (ibid.) describe CLIL to resemble immersion and consist often of games and other play activities. Moving on to higher levels, the practices become more complex. This creates pressure especially on secondary level to provide students with the needed skills to manage at tertiary level.

The most important age group in terms of the present thesis are children at the age of 10-12. Coyle et al. (2010, 19-20) group children from the age of 5 until the age of 12 into the same group. Of course, this range is rather wide and thus there are various different ways to implement CLIL to children in this age group. However, what Coyle et al. (2010, 18) consider important is that teaching at this stage should aim at increasing motivation towards language learning. This is important especially since at this early stage the knowledge of the vehicular language is rather limited and the language is not necessarily very close to the students' everyday lives. Furthermore, Coyle et al. (ibid.) also point out that it is important to build learners' self-confidence at this stage.

Regardless of the age of the target group and other issues, Marsh (2002, 75) points out that the most important factor in successful early language learning is that the teaching is naturalistic. Furthermore, the quality of the exposure to the vehicular language is regarded more important than the amount of exposure. Thus, it could be argued that it is important to provide students with properly designed learning material, especially during the time of early exposure to CLIL and of course later on as well.

No matter what the level of the target group of CLIL is, there are certain basic elements that need to be taken into account in CLIL. In the following these elements are discussed.

2.2   BASIC ELEMENTS OF CLIL

When the French immersion in Canada started, there were no ready set theories and practices behind the teaching. Instead, it developed into a successful practice through trial and error (Mehisto, Marsh, Frigols 2008, 10). This need not be done with CLIL, as it has been based on stronger theoretical frameworks. In other words, CLIL has got theories as its basis that need to be considered in order to create successful CLIL.

As has been established, there are various goals that are thought to be achieved by CLIL. In order for those goals to be achieved, there are basic principles that need to be noted. The conceptual framework of CLIL consists of four elements: content, communication, cognition and culture. Furthermore, other elements such as the language triptych and CLIL-matrix are used in creating and determining CLIL. These basic concepts will be introduced in more detail next.

2.2.1   THE 4CS FRAMEWORK

The 4Cs framework works as the basis of CLIL. This framework is used to describe the symbiosis of the different factors that need to be taken into account. Coyle et al. (2010, 41) suggest that taking this symbiosis into account, effective CLIL can take place. The different components of the 4Cs framework are content, communication, cognition and culture, as portrayed in Figure 1 (see also Coyle 2007, 549-552). Also Mehisto, Marsh and Frigols introduce a similar division but use the concept of community instead of culture (2008, 30-31). However, the description of the concept of community is similar to the description of culture given by Coyle et al. (2010, 41). Thus, as Coyle et al. (ibid.) explain, content refers to the subject or themes that are being taught whereas communication includes language learning and using. Cognition, naturally, refers to the learning and thinking processes and culture covers the development of intercultural understanding and global citizenship. According to Mehisto, Marsh and Frigols' (2008, 31) also the role in the local community is an important part of functional CLIL. However, the focus in the present thesis will be on the 4Cs introduced by Coyle, Hood and Marsh (ibid.), as it is a widely used framework.
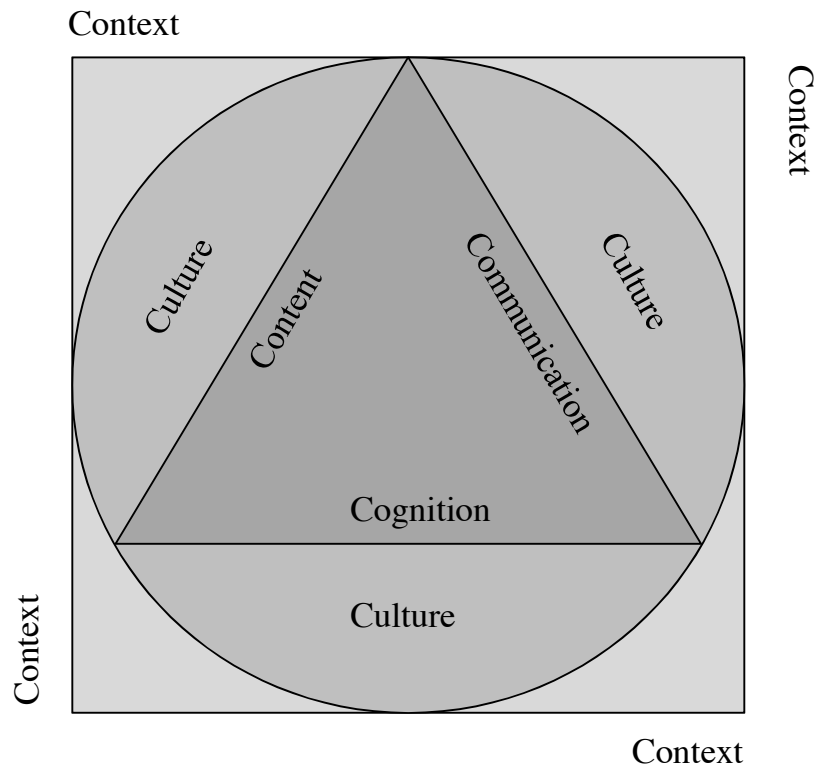
Figure 1. The 4Cs Framework (Coyle, Hood and Marsh 2010, 41)

The content of CLIL can be decided on different basis. Coyle et al. (2010, 53) note that content does not have to be decided on a curricular subject such as chemistry etc. Rather, other issues such as integration of subjects can be considered in the process of choosing the content. In fact, Coyle et al. (ibid.) point out that the learning of new knowledge, skills and understanding should work as the basis of choosing the content, rather than barely curricular subjects. However, Mehisto et al. (2008, 27) note that CLIL can also be incorporated into the regional or national curriculum and also Coyle et al. (2010, 27-28) point out that in some cases curricular bases are an appropriate way of determining the content.

As was expressed previously, communication in the 4C's framework refers to the language learning and using aspects of CLIL. As the term *communication* implies, the focus of the language learning is on communicative issues rather than in the issues traditional language learning emphasizes. Coyle et al. (2010, 54) suggest that the traditional understanding of language learning often emphasizes grammatical progression, whereas in the CLIL context communication and learning demands of the learning moment are focused on. Of course some grammatical issues need to be considered so that the students are able to produce and understand language needed in the learning situation, however the focus should not be solely on grammar, but rather, other aspects of language using need to be considered as well. In order to succeed in this, language needs to be approached from different perspectives and this is taken into account in CLIL with the help of *the language triptych*. The language triptych will be introduced in more detail next.

2.2.2   THE LANGUAGE TRIPTYCH

In CLIL language has a complex role. Instead of simply understanding language as means for learning content, it should be examined from different perspectives. Coyle et al. (2010, 36-38) introduce a conceptual representation of language: the language triptych. It describes the relationship between language and content objectives (see also Coyle 2007, 552-554).

As the name suggests there are three different aspects taken into account in the model. In other words, language is described in three ways: *language of learning*, *language for learning* and *language through learning*.

Coyle et al. (2010, 37) describe *language of learning* as the basic knowledge of language that students need in order to be able to study a particular subject. First of all, the basic knowledge includes identifying the key words and phrases related to a specific topic (Coyle, Hood and Marsh 2010, 61). Secondly, the knowledge on how to use the key concepts is also important in terms of *the language of learning*. In other words, it is not enough to know just some words or phrases related to the topic but also grammatical requirements need to be recognized.

Language for learning, then again, according to Coyle et al. (2010, 37), refers to language that is needed to operate in a foreign language setting (see also Coyle 2007, 553). Coyle et al. (ibid.) add that it is crucial to provide students with language skills, which enable them to learn effectively. As language skills for effective learning, they list, for example, describing, evaluation and drawing conclusions. Furthermore, also the language skills needed for different kinds of learning situations are included in the language for learning. These situations include, for example, group work and organizing research. Thus, as Coyle et al. (2010, 62) point out, *language for learning* is a crucial element for successful CLIL.

Finally, *language through learning* according to Coyle et al. (ibid.) refers to the language that is learned during the learning situation. This learning of the language cannot be predicted as it appears and happens only in the learning situation. Coyle et al. (2010, 63) point out that noticing the existence of *language through learning* should encourage teachers to notice the situations where new language learning happens in the learning moment. Then it can be utilized in the moment or later on. Since *language through learning* emerges in the learning situation, it is, however, important to consider beforehand how the new linguistic elements can be noticed and further developed, so that the students actually get the chance to learn new language. Coyle et al. (ibid.) note that it should be thought of beforehand, how the language the students already know could be practiced and extended. Also important aspects to consider are the strategies learners need in order to access new language.

2.2.3   COGNITIVE ENGAGEMENT

Coyle et al. (2010, 29) suggest that in order to achieve effective learning, the students need to be cognitively engaged (see also Coyle 2007, 554). In other words, the students need to be active participants in learning. Furthermore, they emphasize the importance

of cooperation and remind that it is important to provide the students with skills to work together in a foreign language.

In order to determine cognitive engagement, Anderson and Krathwohl have created a revised version of Bloom's taxonomy of cognitive skills according to Coyle et al. (2010, 30). Krathwohl (2002, 213-215) introduces the model by explaining that cognitive processes are divided into two dimensions: *lower-order processing* and *higher-order processing*. The skills that have been listed under the *lower-order processing* category include remembering, understanding and applying. Remembering is further described to include recognizing and recalling. Understanding includes features such as interpreting, exemplifying, classifying, summarizing, inferring, comparing and explaining, whereas applying means executing and implementing.

The *higher-order processing* category contains more complex skills such as analysing, evaluating and creating. Analysing is further explained to describe features that can be used when concepts are broken down into parts and how they fit into the whole. These features are for example differentiating, organizing and attributing. Evaluating includes actions such as checking and critiquing. Finally, creating means the construction of something new or recognizing components of a new structure by, for example, generating, planning or producing.

In addition to the cognitive process dimension, Krathwohl (2002, 213-215) introduces the knowledge dimension. This dimension provides a framework that can be used to explore the demands of different types of knowledge. Thus, the knowledge dimension includes four elements: factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge. Factual knowledge includes basic information such as terminology and specific details or elements. Conceptual knowledge then again means the understanding of how to put pieces of a larger structure into whole. In other words, it includes classifications and categorizations, basic principles and generalizations, theories, models and structures. Procedural knowledge is the knowledge on how to do something. It includes knowledge of subject-specific skills and algorithms, subject techniques and methods and knowledge of criteria for determining when to use appropriate procedures. Finally, metacognitive knowledge includes strategic knowledge, knowledge about cognitive tasks and self-knowledge.

It is important to take these dimensions into account when planning and executing teaching. Coyle et al. (2010, 30) note that the dimensions can and should be used to ensure that the students get to learn the skills for different dimensions. Furthermore, the students should be provided with language skills that enable them to practice also the cognitive skills.

2.2.4 THE CLIL MATRIX

Implementing CLIL on students is not an easy task as there are several issues that need to be considered in order to do it successfully. Coyle et al. (2010, 43, 67) note that one of the most demanding tasks for the teacher is to provide students with material that is both linguistically and cognitively appropriately demanding. To help the teachers' task of offering the students appropriate material, Coyle et al. (2010, 43-45) introduce the CLIL matrix portrayed in Figure 2. The figure is adapted from Cummins' (1984, 138-139) description of language proficiency needed in a classroom. The CLIL matrix is a figure consisting of four quarters. Each quarter represents different levels of language and content knowledge. In other words, the CLIL matrix is a useful way of understanding the linguistic and cognitive demands for the students, for example, in individual exercises.

Figure 2. The CLIL Matrix (Coyle, Hood and Marsh 2010, 43)

The first quadrant demands the least linguistic and cognitive effort. According to Coyle et al. (2010, 44) the exercises that can be classified as belonging to the first quadrant are tasks which build up the students confidence. The language should mostly be familiar for the students. The first quadrant should be regarded as a transitory step towards quadrant two.

Coyle et al. (2010, 42-44, 68) continue by describing the quadrant two. In it the new terminology is used further and also more is introduced. Also abstract terminology can be added to the exercises. This quadrant should support the learning of new knowledge and expand the language knowledge. In the third quadrant the new language and content knowledge is reinforced further. Finally, the fourth quadrant has lower cognitive demands but the language demands can be developed further. For example specific demanding grammar issues could be included into this quadrant.

2.3   CLIL IN FINLAND

According to Laurén (2000, 40) CLIL started to be implemented in Finland in 1987 in Vaasa where the purpose was to offer Finnish students the possibility to learn in Swedish. The teaching followed the Canadian model of early total immersion. According to the current understanding of CLIL the teaching in Vaasa could not be regarded as CLIL. Nevertheless, the model used in Vaasa was the basis of the CLIL in Finland. From Vaasa the model spread to other parts of the country, for example to the area surrounding Helsinki (Laurén 2000, 89). At present CLIL has spread to many parts of the county.

In the early 1990's CLIL spread quickly to all levels of schooling. However, the amount of CLIL decreased between 1996-2005 (Nikula and Marsh 1996, 21-34; Lehti, Järvinen and Suomela-Salmi 2006, 298). Nevertheless, it is still implemented at all levels, only the percentage is somewhat lower. In addition, Pihko (2010, 16) states that the interest towards teaching through a foreign language has stayed strong among the Finnish society and education system.

Mehisto et al. (2008, 12) note that CLIL is often used as an umbrella term for many different types of foreign language teaching. This is also the case in Finland. There are many differences in the programmes as they vary from language showers to many other types of teaching. Furthermore, according to Nikula and Marsh (1996, 45-46) CLIL can be occasional or more permanent. In other words, it can be implemented when learning a single separate theme on single subject, during separate semesters or academic years, or it can continue throughout school.

2.4   DEFICIENCIES OF CLIL

Although CLIL is often regarded as a solution for many needs that have formed for modern education, it still has its deficiencies. Research reveals that often the resources, whether it is qualified teachers or material, create restrictions for successful implementation of CLIL (Mehisto, Marsh and Frigols 2008, 22; Pihko 2010, 16). Mehisto et al. (ibid.) also note that CLIL demands much effort and time from the teachers as they need to cooperate in order to create proper CLIL teaching. For example, each lesson demands goals set for content, language and learning. This might create opposition towards CLIL among teachers. The present thesis tries to answer to the need of material that is created for CLIL purposes and based on theories which support efficient CLIL. At the same time it hopefully offers teachers valuable material that is ready for use. This could help teachers to reduce the time needed for creating material and they could use their time more efficiently.

There are also some misconceptions about CLIL. Mehisto et al. (2008, 20) explain that it is often thought that CLIL students cannot learn as much content as students in regular classrooms or that their first language skills suffer. This might seem as a logical conclusion as the students' language skills in the vehicular language are often lower than in their first language and the first language does not get as much practice as in other settings. However, research shows that CLIL students have as good content skills as their peers from regular classrooms. In fact they often outperform the other students. Mehisto et al. (ibid.) suggest that a reason for this could be the metacognitive skills students learn in CLIL. In other words, they, for example, are more aware of their word choices and they are more concerned with making sure the listening party understands the message correctly.

CLIL is also sometimes thought to be suitable only for talented students with great language skills (Mehisto, Marsh and Frigols 2008, 20-21). However, also this claim has been overturned by research as it has been shown that also average students do well in the CLIL settings. Still, although research does show that students with different proficiency levels can master CLIL, Marsh (2002, 75) points out that one of the important issues to remember in CLIL is that often students have heterogeneous skills in the vehicular language. In case the skills in the vehicular language are not sufficiently advanced, there can be a negative impact on learning. Thus, it is important to remember to take this factor into account in teaching and creating material.

Pihko (2010, 12) concluded in her study that although most students had positive feelings towards CLIL, others had, for example, language anxiety. This factor is an important one to recognize. Teachers should be aware of the possible language anxiety in the classroom and try to create surroundings, which help the students to overcome the anxiety.

Finally, Dalton-Puffer (2007, 295) also stated that a CLIL setting often offers good grounds for practicing listening and reading but not equal grounds for practicing interaction. She suggests that efforts should be put in creating a CLIL curriculum which addresses these issues. In other words, special attention should be paid on deciding which interactional or other language related issues are focused on and when. Although the purpose of the present thesis was not to create a curriculum for CLIL, special attention was paid on the aims of the exercises where interaction related aims were also added.

3   COOPERATIVE LEARNING

Cooperative learning is a widely used method in teaching and it has been proven through great number of studies to be effective in achieving many important cognitive and social goals set for students (Johnson and Johnson 1999, 190; Gillies 2007, 25; Slavin 1996, 43). In fact, Brent and Felder (2007, 1) note that studies have shown the benefits from using cooperative learning instead of some other methods such as instruction-centred lectures, individual assignments or competitive grading:

> …cooperatively taught students tend to exhibit higher academic achievement, greater persistence through graduation, better high-level reasoning and critical thinking skills, deeper understanding of learned material, greater time on task and less disruptive behavior in class, lower levels of anxiety and stress, greater intrinsic motivation to learn and achieve, greater ability to view situations from others' perspectives, more positive and supportive relationships with peers, more positive attitudes toward subject areas, and higher self-esteem.

Furthermore, Brent and Felder (2007, 1-2) state that cooperative learning enhances the learning of both weaker and stronger students. Firstly, the stronger students help the weaker students through stages that might in other occasions conclude in giving up. Thus, the weaker students perform better than alone. Secondly, the stronger students gain from explaining material to others as they have to process it in more detail.

Cooperative learning seems to be an effective method. Furthermore, because of its communicational nature, it can be regarded also as functional in terms of CLIL teaching. Thus, it was chosen as the method of teaching for the present material package. In the following cooperative learning will be examined from different viewpoints. This section begins with a brief introduction to the history of cooperative learning. Then cooperative learning as a method will be introduced in more detail in section 3.2. where the basic principles that cooperative learning is based on, the different group types used in cooperative learning and the ways cooperative groups are formed will be covered. Then the deficiencies of cooperative learning will be introduced and finally brief comparison is made between cooperative and other learning types.

3.1   HISTORY OF COOPERATIVE LEARNING

Cooperative method has its roots in the late 19th century (Sahlberg and Sharan 2002, 10). However, according to Johnson and Johnson (2009, 365) it was not a widely accepted or known method during 1940-1970 as the competitive methods were more

common. After criticism against competition arose it the late 1960's, competitive methods were to some extent replaced by individual learning methods. Individual learning was then challenged by social scientists as they thought interaction had an essential role in learning. Finally, in the 1980's cooperative learning gained popularity among education.

At present, it can be said that cooperative learning is one of the most successful methods in the world. It has spread into many parts of the world and it is also used at all levels of teaching from kindergarten to upper secondary schools in several different subject matters (Johnson and Johnson 2009, 365; Slavin 1996, 43-44). Furthermore, according to Johnson and Johnson (ibid.) more than 1200 research studies have been conducted related to cooperative learning, which has created a strong basis for the method. However, Slavin (1996, 44) suggests that also further research is needed in order to understand what it is in the cooperative setting that affects learning positively. This viewpoint is also supported by Sahlberg and Saharan (2002, 13-14).

Sahlberg and Sharan (2002, 11) note that cooperative learning arrived in Finland in the beginning of the 1990's. At that time, studies where cooperative learning had an important role started to be carried out in Tampere. Although cooperative learning has gained more foothold in the educational system during the years, Sahlberg and Saharan (ibid.) state that the understanding of cooperative learning among educators in Finland is often rather simplistic. Furthermore, the research has not spread into universities, at least not in the extent that could have helped to promote the method further.

3.2   WHAT IS COOPERATIVE LEARNING?

Cooperative learning naturally refers to activities performed through cooperation. Thus, it is a form of interactive learning. However, there are also other approaches that have similar characteristics. One of the similar approaches is collaborative learning. In fact, the terms cooperative learning and collaborative learning are often used interchangeably (Bruffee 1995, 12; Panitz 1999, 3). Both of these concepts refer to a rather similar underlying idea: students learn better working together than alone (Bruffee 1995, 12). However, Bruffee (ibid.) emphasizes that although there are similarities between these two, there are also differences between them.

Firstly, Panitz (1999, 5) points out that it seems that these two approaches have been developing independently, collaborative learning in Britain and cooperative learning in the United States. Thus, they have different origins. Secondly, Panitz (1999, 3) summarizes collaborative and cooperative learning as follows:

> Collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers.
> Cooperation is a structure of interaction designed to facilitate the accomplishment of a specific end product or goal through people working together in groups.

Thus, the aims of the approaches are somewhat different. Furthermore, Panitz (ibid.) also clarifies that collaborative learning is often seen as more of a personal philosophy than classroom practice. Finally, Panitz (1999, 12) concludes that cooperative learning is sometimes regarded as more structured with the teacher having more control over what the students do and how they work than in collaborative learning where the students have more responsibility. Thus, some differences between the two approaches are evident.

The idea of the cooperative method as a classroom practice that could be used to improve social skills seemed beneficial in terms of the present thesis. However, also collaborative learning with its freedoms has positive characteristics. Nevertheless, the chosen method for this thesis is cooperative learning as the target group is young students at the age of 10-12 who might benefit from the more instructive role of the teacher. It needs to be remembered, nevertheless, that also in cooperative learning the students play a central role in the learning and, in fact, Johnson and Johnson (1999, 17-18) describe the teachers' role in a cooperative setting to be "a guide on the side".

The basic idea in cooperative learning is that students work together to achieve shared goals (Johnson and Johnson 1999, 5). Furthermore, it is considered desirable to learn content simultaneously with interpersonal and small-group skills (Johnson and Johnson 1999, 30). Thus, cooperative learning includes methods from working in groups to working in pairs. However, Johnson and Johnson (1999, 5, 29-30, 70-71) emphasize that any group cannot be called a cooperative group. In fact, in order for a group to be cooperative the members of the group need to adopt a so called "*sink or swim together*" mentality. In other words, in cooperative learning it is important that students recognize that they are not only responsible for their own learning but also for the learning of the

other group members. Furthermore, it is also important that the group members share the workload so that all work is not left only to some group members.

Johnson and Johnson (1999, 72) continue to define the term cooperative learning group by explaining that working in a cooperative group motivates students to strive for goals that they would not strive for alone. Furthermore, a cooperative group will not let a member fail as it would mean that the whole group fails. In addition, in cooperative groups the members have the responsibility to contribute to the group's efforts. In other words, the group members themselves make sure everybody contributes to achieving the best possible outcome.

According to Johnson and Johnson (ibid.) in cooperative learning groups it is possible and even desired to share information and perspectives. However, a proper cooperative group benefits from its members even more, as it is possible for the members to not only help but rather promote each other's success. Furthermore, the goal for cooperative groups is to learn social skills. Thus, as they are taught these skills they can use them in working with each other and be successful in achieving the desired goals. Finally, self-reflection is also an important part of a functional cooperative group. In other words, the members of the group reflect on their own as well as the group's actions and analyze how well they have been able to succeed in achieving the set goals.

To clarify the ideology behind cooperative learning even further, Johnson and Johnson (1999, 5) explain that in order for cooperative learning to work, the group members need to understand that they benefit from the other members' efforts and, in addition, they work as a beneficial part of the group. In other words, the goals achieved are achieved with a common effort.

In order for the groups to be able to function as it has been explained in this chapter, there are a few basic elements that need to be taken into account. Next these basic elements are introduced and discussed.

3.2.1   BASIC COMPONENTS

There are different components that need to be considered in order for cooperative learning to be successful, and for the groups to be cooperative. According to Johnson and Johnson (1999, 75) the key components are *positive interdependence*, *face-to-face promotive interaction*, *individual and group accountability*, appropriate use of *social*

skills, and *group processing* (see also Gillies et al. 2007, 4-5; Johnson, Johnson and Johnson Holubec 1991, 1:9, Johnson and Johnson 2009, 366). In the following these basic components will be introduced in more detail.

Positive interdependence

The most important component of cooperative learning is positive interdependence (Johnson and Johnson as quoted by Gillies 2007, 33). In fact, Johnson et al. (1991, 4:6) state that successful positive interdependence promotes a situation where all group members maximize their learning. Positive interdependence basically means the ideology of striving for the common good instead of reaching for individual achievements (Kagan and Kagan 2002, 41). According to Johnson et al. (1991, 4:8) positive interdependence requires cooperation in trying to accomplish a shared goal. Furthermore, social interdependence means the responsibility that group members have, to make sure everybody learns everything. In fact, Gillies (ibid.) points out that the group members need to coordinate their efforts so that everyone completes the goals set for them. In other words, the students should recognize that they cannot succeed if all members of the group do not succeed (Johnson and Johnson 1999, 29).

When people are working in groups, the interaction between the members of the group is either cooperative or competitive (Gillies 2007, 33). In order for interaction to be cooperative between group members, positive interdependence is needed. Thus, positive interdependence is at the heart of cooperative learning as it guarantees that the members of the group are striving for common good and not competing with each other.

There are different types of positive interdependence. Johnson et al. (1991, 4:11-4:18) list positive goal interdependence as well as reward, resource, task, role, identity and environmental interdependence (see also Johnson and Johnson 1999, 29; Gillies 2007, 35). Furthermore, there are three different types of positive goal interdependence: learning goals interdependence, outside enemy interdependence and fantasy interdependence. Learning goals interdependence means that the students have shared goals that all of them need to reach. This can be achieved, for example, by demanding a mutual product from the group. Outside enemy interdependence takes place in a situation where the groups are placed in competition with each other. Fantasy interdependence, then again refers to a situation where the students imagine that they are in an emergency situation and they have to find a solution to it together.

According to Johnson et al. (ibid.) positive reward interdependence exists when all group members receive a common reward (a grade, extra points, praise etc.) for completing the assignment. Positive resource interdependence, then again, exists when each group member only has a part of the information needed to complete the assignment whereas in positive role interdependence the members each have their own role that they need to fulfill in order for the assignment to be completed (see also Johnson and Johnson 2009, 367). Positive task interdependence means that actions of one group member need to be finished before another can begin their work. Finally, positive identity interdependence exists when the group reinforces their identity, for example with a flag, name or a motto, whereas in positive environment interdependence the group members are bound together by the physical environment.

Face-to-face interaction

According to Gillies (2007, 201) in order for a group to succeed in working cooperatively, it is important that the group members negotiate their actions and expectations for behaviour before beginning the group activities. Gillies (ibid.) calls this action face-to-face promotive interaction which is crucial in order for positive interdependence to occur in a group. In the following face-to face positive interaction is discussed further.

In face-to-face interaction, the students promote each other's success (Johnson and Johnson 1999, 47). Furthermore, according to Gillies (2007, 4) face-to-face interaction includes discussions among the group members where the students negotiate different issues concerning the group's tasks. For example, as was mentioned earlier the expectations for group behavior can be discussed among the group members. However, also other aspects are included into face-to-face promotive interaction. Gillies (2007, 37) further describes face-to-face promotive interaction to include encouragement by students to other members of the group. In other words, students facilitate each other's efforts by providing information and assistance to each other. Students can also introduce resources and materials to each other that are needed to complete the tasks. In addition, also constructive feedback given by the students to each other is a part of face-to-face promotive interaction. According to Gillies (ibid.), the feedback can then be used to improve performance.

Individual accountability

Another important component of cooperative learning is individual accountability. According to Gillies (2007, 5) it is required in cooperative learning in order for the students to understand that everyone must contribute (see also Kagan and Kagan 2002, 42). In fact, it could be argued that cooperative learning can create possibilities for freeloading. However, Gillies (ibid.) points out that if individual accountability is present in cooperative learning situation freeloading is not tolerated and everybody is held responsible for their contributions.

Johnson and Johnson (1999, 30) introduce ways to ensure individual accountability. Firstly, a rather simple rule is to keep the group size small. Secondly, the testing can be carried out with individual tests (see also Jonhson and Johnson 2009, 368). This way all of the students need to learn everything and freeriding is not as easy. Thirdly, observation plays an important role. By monitoring the students the teacher can keep record on how frequently each student takes part in the groups' assignments. Finally, the teacher can have the students teach each other what they know and what they have learned about different issues. This way everybody needs to contribute to the learning of others and the accountability is ensured.

Cooperative skills and group processing

As has been mentioned earlier, a group is not necessarily cooperative even if the members were put together to work on something. Thus, it is important to teach the students the cooperative skills they need in order for the group work to be effective and, in fact, cooperative (Johnson and Johnson 1999, 30). In other words, as Gillies (2007, 5) describes, the students need to be given tools for effective communication, so that they will be able to express their ideas and also notice the effort others put into the assignment. Gillies (ibid.) also mentions that it is important to give the students ways of dealing with problems and conflicts. These skills are called interpersonal and small-group skills and they are, of course, extremely important in order for a cooperative group to function properly.

Gillies (2007, 41-42) lists the interpersonal skills as follows: active listening of each other, stating ideas freely, accepting responsibility for one's behavior, providing constructive criticism. According to Gillies (ibid.) the small-group skills include taking turns, sharing tasks, making decisions democratically, trying to understand the

perspective of others, clarifying differences. Johnson et al. (1991, 5:9-5:13) have divided the interpersonal and group skills into four categories represented in table 1.

Table 1. Group skills

Forming	Functioning	Formulating	Fermenting
Move into groups quietly	Share ideas and opinions	Summarize out loud	Criticize ideas without criticizing people
Stay with the group	Ask for facts and reasoning	Seek accuracy (correct)	Extend answers
Use quiet voices	Give directions to the groups work	Seek elaboration	Ask for justification
Take turns	Encourage everybody to participate	Check understanding (demand vocalization)	Differentiae ideas and reasoning of group members
Other	Ask for help or clarification	Help the group remember	Probe by asking in-depth questions
	Express support and acceptance	Ask for others to plan out loud	Generate further answers
	Offer to explain or clarify		Test reality by checking the groups work
	Paraphrase		
	Energize the group		
	Describe feelings		

The above listed skills are rather diverse. Thus, there are several skills that can be practiced and should be present in cooperative learning.

Gillies (2007, 41-42) also mentions other elements that need to be employed in order to create a cooperative environment. For example, group processing needs to be practiced. It involves self-reflection from the students' part on how they have learned the needed contents and how they are managing the learning process. The self-reflection, thus, includes also the groups' assessment on what is needed from the students' part in order for goals to be reached. Furthermore, Johnson et al. (1991, 6:3) state that group processing involves description of which actions performed by the group members were helpful and which not, and making decisions on which actions to continue and which change. Gillies (2007, 41-42) also adds that the teachers' role is to ask metacognitive questions, which help the students to self-reflect. However, group processing should not only be understood as self-reflection performed by the students alone, rather, the purpose is to discuss the issues with the other group members, in order for the group to improve their learning and practices (Johnson, Johnson and Johnson-Holubec 1991, 6:2).

As an example Gillies (2007, 44) describes a situation where group processing was implemented. In that particular case every student had their own task in monitoring the group. The tasks were summarizing the ideas of the group, encouraging group members to discuss with each other and making sure members supported the decisions made within the group. Thus, for example in this rather simple way the element of group processing can be implemented into a group and the cooperative nature of the group is enhanced. However, Johnson and Johnson (1999, 31) also remind that practicing these skills requires repetition. In other words, it is important to practice the skill until the behavior becomes automatic and a part of the students' habits.

Now that the basic elements of cooperative learning have been established, the focus shifts into implementing cooperative learning, i.e. what needs to be considered in cooperative learning setting.

3.2.2   IMPLEMENTIG COOPERATIVE LEARNING

There are many ways to implement cooperation. In fact, Brent and Felder (2007, 2) state that cooperative learning can be implemented with any type of exercises. However, there are some issues that need consideration when cooperative learning is implemented.

Firstly, Gillies (2007, 49) points out that the cooperative skills that the students need to use should be such that the students feel capable of using the skills. However, also challenges should be provided to the students. Taking into account these factors, the maximization of students' involvement should be guaranteed.

Secondly, an important factor to consider when implementing cooperative learning is the class environment. Gillies (2007, 199) emphasizes the importance of letting students know what is expected of them. In other words the students need to understand that they are expected to work together, contribute to the group's efforts, help each other, resolve problems together, and share ideas and material.

Thirdly, Johnson and Johnson (1999, 18) point out that the teacher should specify the cooperative objectives for each lesson. In other words, the interpersonal and small group skills that should be practiced during a lesson should be decided beforehand.

3.2.3   GROUP TYPES

There are different types of cooperative learning groups. According to Johnson and Johnson (1999, 5) the basic types of cooperative learning groups are cooperative base groups, formal cooperative learning groups and informal cooperative learning groups. There are certain typical characteristics that separate these groups from each other and in this section these characteristics are discussed. The descriptions are based on Johnson and Johnson's (1999, 15) ideas on the group types.

A cooperative base group is a a group that lasts the longest in comparison with the other types of learning groups. It can last even for a whole academic year. Another typical characteristic for a cooperative base group is that it has heterogeneous students. In other words, the students are not divided into groups, for example, according to the level of their knowledge on the subject, rather it is important to have variation in the skills of the students.

The second type of cooperative group is the formal cooperative learning group. These groups can last from one class period to multiple weeks. There are no specific tasks that would be the most suitable for formal cooperative groups. Rather very different types of tasks can be implemented. In formal cooperative groups the intellectual involvement of students should be guaranteed. In other words, the students should take part in organizing material, explaining it and integrating it into already familiar knowledge.

The third type of cooperative group, the most important in terms of the present material, is the informal cooperative learning group. These groups are short-term groups, which last from a few minutes to one class period. Different goals can be set for the informal cooperative groups. These goals include setting a conductive mood to learning and drawing students' attention to what they need to learn. Furthermore, these groups can also be used in ensuring that students cognitively process what is to be learned. In addition, these groups are suitable for the exercises that provide closure to an instructional session. Also, informal cooperative groups can assure that misconceptions are avoided and also gaps in understanding are noticed and corrected, as the group works together to make sure everybody understands everything (Johnson and Johnson 1999, 55). In other words, informal cooperative groups can be implemented in many ways and they can achieve many goals during a class period.

3.2.4 FORMING A COOPERATIVE GROUP

Group size is a matter that is always important to consider in teaching. In cooperative teaching there are some general outlines drawn about an appropriate size of a group. According to Johnson and Johnson (1999, 19-20) it is important to remember that students should work in groups that are the size which they are able to cooperate in. In other words, group size can be rather large if the students have the required skills to work in a large group. The teacher should remember that the larger the group the more resources the group needs in order to succeed. Furthermore, in case a larger group size is chosen, the students must be more skilled in performing group work as the number of interactions increases with the group size. Thus, it takes a lot of effort and learning before students can work in groups of, for example, five or six. For that reason, most commonly the group size is from two to four students (see also Kagan and Kagan 2002, 45). In fact, Johnson and Johnson (ibid.) point out that usually it is better to work in smaller than larger groups.

There are also other factors that need to be considered when choosing the size of the group. For example, even though the amount of interactions increases with the group size as more members need to cooperate with each other, the amount of interactions between single participants of the group decreases. In other words, there is not as much time for each individual to interact with all of the other group members. Furthermore, Gillies (2007, 7) also argues that it is difficult to enable face-to-face interaction in a large group. This of course, may create a problem as face-to-face interaction is a crucial element of cooperative learning. Thus, if larger groups are created, it is important to consider how face-to-face interaction is guaranteed.

In addition, Johnson and Johnson (1999, 19-20) state that the group size should reflect the time available for working in groups. In other words, the shorter the time period available the smaller the groups should be. They also note that a smaller group size also prevents the possibility of the students free riding in the group and it is easiest for the teacher to recognize if some students have difficulties with working together. In addition, according to Johnson and Johnson (ibid.) the amount of the material available is an important factor that needs to be taken into account in choosing the size of the group.

According to Gillies (2007, 7) even more issues need to be remembered when forming a cooperative group. One factor that the teacher needs to consider is the level of knowledge of the students. Gillies (ibid.) points out that low-ability students, in other words the students with poor achievements, often benefit from being included in a group with mixed-ability students. In fact, Kagan and Kagan (2002, 44) state that the most commonly used group type is mixed-ability groups, where students knowledge is heterogeneous. They note that mixed-ability in terms of knowledge in the group maximizes the support for learning between the members and also helps in keeping the order in the classroom. Furthermore, they note that in addition to the knowledge abilities, heterogeneity of the group can refer also to other factors such as students' sex, ethnic and language background.

Gillies (2007, 7), however, points out that although low-ability students benefit from mixed ability groups, the benefits are not similar to students with other levels of ability. In fact, high-ability students often perform as well in mixed-ability groups as in same-ability groups. However, medium-ability students learn better with students who have similar abilities. Thus, also Kagan and Kagan (2002, 44) suggest that different types of groups should be formed, in order for the students with similar abilities to be able to learn together as well.

Kagan and Kagan (2002, 44-45) suggest that groups should be chosen according to heterogeneity, homogeneity or the students' interests. Also random selection can be used. All of these group types have their advantages and disadvantages, thus Kagan and Kagan (ibid.) remind that the teacher should change the group types so that they maximize the achievement of the goals set for each activity. Furthermore, they suggest that even heterogeneous groups that seem to function well should be changed occasionally. This way the students can use the skills learned in one group in another.

3.3   PROBLEMS IN COOPERATIVE LEARNING

As has been described, cooperative learning has many benefits as a method. However, as probably any method, it has its deficiencies as well. Johnson and Johnson (1999, 74) describe some factors that may hinder the effectiveness of cooperative learning that they have adopted from their own work from 1997. As one of these factors they mention the lack of maturity of the students. In other words, the students might sometimes be too childish to work effectively in a group. In addition, it might be that a student gives a

dominant solution to a problem without having it critically evaluated. This relates to another hindering factor mentioned by Johnson and Johnson: motivation loss due to feeling unequal. Brent and Felder (2007, 2) describe similar situations where the students with different levels of abilities get frustrated. For example, high-ability students may feel as if low-ability students hold them back whereas low-ability students feel like they are discounted or ignored in their groups. Also Gillies and Boyle (2010, 938) found in their research that teachers felt that the composition of the group occasionally created problems in the classroom. However, for example careful consideration on how the group is formed may help to overcome some of these issues.

Johnson and Johnson (1999, 74) mention also other hindering factors. For example, if the teacher is not alert the students might be able to hide in the crowd and the teacher might, for example, miss if they are not learning anything. For that reason, the teacher has an important role in the classroom evaluating the students' actions and achievements. Furthermore, as has already been mentioned, free riding can occur during group work. This may create resentments towards other team members if they fail to pull their weight (Brent and Felder 2007, 2). However, as shown above in section 3.2.1, there are several actions the teacher can take to prevent this from occurring.

Johnson and Johnson (1999, 99) continue by stating that the students might not have sufficient teamwork skills. Also Gillies and Boyle (2010, 938) state that teachers who participated in their research felt that preparation is necessary in order to achieve efficient cooperative learning. The preparation included the teaching of social skills, especially how to manage conflict. Thus, as has been mentioned, it is important to practice the skills and highlight the importance of the skills to the students. Finally, inappropriate group size can also be harmful in terms of efficient learning. Thus, it is important to consider the size of the group carefully.

Teachers also seem to have some other concerns according to Gillies and Boyle (2010, 938). The socializing in the groups was sometimes for some reason a matter of concern for the teachers. Also time management and the organization required to implement cooperative learning were issues that bothered the teachers. Furthermore the teachers found it somewhat challenging to find exercises that would motivate the students.

As becomes clear, implementing cooperative learning does not come without problems. In fact, Brent and Felder (2007, 2) note that "instructors who attempt it (cooperative learning) frequently encounter resistance and sometimes open hostility". However, they also state that if teachers find the patience to deal with these issues, they will benefit from it.

3.4   COMPARISON WITH OTHER APPROACHES TO LEARNING

There are, of course, also other types of learning in addition to cooperative learning. As have been mentioned earlier, for example, competitive and individual learning are common types of learning in the field of education. According to Johnson and Johnson (1999, 6) competition means that the students work against each other in order to achieve a goal that can be attained by only one student at a time. In other words, in competitive situations the individuals strive for their own good to some extent at the cost of others. However, although the idea of competition can be seen in a negative light Johnson and Johnson (1999, 148) remind that learning to compete for fun and enjoyment is an important skill. In fact, competitive learning can be structured in a way that teaches the students to, not only win, but also to lose with dignity. This way, also competitive learning can be seen constructive. Furthermore, Johnson and Johnson (1999, 132) add that if competition is constructive it can, for example, motivate, build character and teach important live values.

Another widely used learning method is individual learning. Johnson and Johnson (1999, 7-8) explain individual learning to concentrate on the individual achievements. However, they describe the setting to be somewhat different in comparison with the competitive learning setting. In individual learning, the students strive for their own good, but their achievements do not affect the other students. Even if one student achieves his or her goal, also other students can achieve their goal. Furthermore, no interaction with others is necessary in an individual learning setting. Johnson and Johnson (1999, 153) remind that it is also important to learn to work independently as it, together with other types of learning, works as the basis for effective learning.

All of these types of learning are used in schools. However, Johnson and Johnson (1999, 47) state that there are more benefits in cooperative learning than competitive or individual learning (see also Brent and Felder 2007, 1). They argue that research proves that using cooperative learning encourages students to strive for better achievements.

Also the relationships between students develop to be more positive. Furthermore, students' psychological health and self-esteem become greater with cooperative learning. Gillies (2007, 33-34) introduces a famous study by Deutch from 1949, in which students working in cooperative setting communicated in a more effective fashion, they were more motivated in their efforts, they listened to others more effectively and they were more productive in comparison with students learning in competitive setting.

4   CORNERSTONES OF THE MATERIAL PACKAGE

In this section important factors that have impacted the creation of the material package are introduced. The section begins with a description of four curricula that have demands for teaching through a foreign language. In addition, a brief description on the demands for biology and language teaching at the level of the target group is given. This will be followed by a description on how the CLIL and cooperative learning theories were considered in the creation of the material.

4.1   CURRICULAR ISSUES

The national core curriculum for basic education (POPS) (2004) made by the Finnish National Board of Education sets the outlines for teaching in Finland. It includes sections where the goals and contents of different school subjects are determined. This means, of course, that the general outlines of teaching are set in the POPS and every school in Finland needs to aim at achieving those goals. In addition, there are also local curricula, which are based on the POPS but have more detailed descriptions of the contents and goals for each year. Furthermore, some schools also have a school-specific curriculum which is similar to the local curricula.

In addition to describing the goals and contents of each subject, the POPS includes a section of the goals of teaching in a foreign language. This section was added to the POPS in 2004 (Pihko 2010, 15). Furthermore, there are also some local or school-specific curricula which determine goals for CLIL.

Since the education is based on the decisions defined in different curricula, this section will concentrate on introducing some of those issues in terms of CLIL (i.e. teaching through a foreign language), Biology and English both in school-specific and national level. In other words, in addition to the POPS, three curricula or other school-specific pages defining CLIL from different schools where CLIL is implemented were chosen for comparison. The three schools were chosen randomly but the effort was made to choose schools that are situated in different parts of Finland, thus, giving an overview on some of the conventions of CLIL in Finland. One of the schools is situated in southern Finland, one in central Finland and one in the North. The different findings worked as the basis of the material package.

4.1.1   TEACHING THROUGH A FOREIGN LANGUAGE

The Finnish National Board of Education (2004, 272) lists the general outlines for language bath type of teaching together with the outlines for teaching through a foreign language. The outlines present in the national core curriculum for basic education (POPS) are rather vague and a lot of authority in terms of goals and contents are given to the towns and municipalities. However, they emphasize the fact that the students need to be given comprehensive knowledge on the vehicular language, in order for them to be able to acquire also content knowledge on different subjects. Thus, one of the constitutive goals is to offer the students the possibility to gain a wider understanding on the vehicular language. It is also stated in the POPS that the more specific goals in terms of contents should be the same in teaching through a foreign language as they are in the teaching that is carried out in Finnish or Swedish. Furthermore, the amount of teaching through a foreign language should be determined in the local or school-specific curricula.

Although the POPS gives rather unrestricted instructions on teaching through a foreign language, some instructions on how the fundamental goals and contents should be determined on local level are listed. The instructions for the goals and contents listed in the POPS are common for the grades from one to nine i.e. the primary and secondary school. Thus, the POPS does not restrict the contents or material used in teaching in any way. In other words, it should be possible to use the material created for the current material package nationwide.

The separately listed instructions for setting goals for the vehicular language in the POPS state that the goals should be determined according to the extent of CLIL. In other words, if CLIL teaching gains a lot of foothold in education, the goals should be determined as more demanding in comparison with situations where CLIL is used only to little extent. The goals should determine the requirements for listening and reading comprehension, speaking, writing and cultural knowledge. The goals for content should, according to the POPS, take into account the amount of CLIL as well.

The aspects listed in the instructions for teaching through a foreign language mentioned in the POPS have been incorporated into the material package. For example, the exercises include aims such as reading, listening, speaking and writing. In other words, since the aims are separately listed in the instructions for the exercises the teachers

know when they should and could emphasize and have the students practice these skills. Furthermore, the aim in the creation of the exercises was to produce exercises with different difficulty levels. For example, the more difficult exercises could be executed with students who have higher abilities in the vehicular language and the easier exercises could be gone through with students who have lower abilities. However, since the instructions in the POPS give such unlimited possibilities for schools and municipalities to create the terms in which they organize CLIL type of teaching, the focus in the following is on some of the local curricula.

The different schools define general outlines for teaching through a foreign language in their curricula or explain these issues outside the curricula. The descriptions include information on the nature of CLIL teaching and the requirements of language skills. Furthermore, the schools also specified the terms in which students are chosen for the CLIL classes. However, the subject specific details were in most cases the same as for teaching with the first language. Nevertheless, one school had determined the details for subjects separately for CLIL.

The extent of CLIL varied between the schools to a considerable extent. In one of the schools the teaching was described to be mostly in the vehicular language with the exception of other language classes (OIS Mission Statement, n.d.). Furthermore, in this school the aim was to achieve high language skills and provide the students the skills for being balanced bilinguals. In the other two schools, then again, the amount of CLIL was not as extensive. In one of the schools CLIL was implemented the minimum of one lesson per week (Englanninkielinen opetus: CLIL ja EKL-luokat, n.d.). It was added that CLIL should be implemented when it is seen pedagogically appropriate and the purpose is to provide the students language skills that they could use in the globalizing world. The third school did not specify the amount of CLIL but the notion was made that CLIL is implemented when it is seen appropriate (Opetussuunnitelma/OPS, n.d.). The aim in this school was to provide the students with the required skills to understand the vehicular language. Furthermore, the students should develop a will and courage to use the language. In fact, there was a clear focus in producing spoken language in CLIL. Also cultural interest and extensive vocabulary were listed as goals for CLIL in this school.

There were also differences in the way the students were selected to the schools. In one of the schools all the students of the school are included in CLIL and there is no separate application for the school (Englanninkielinen opetus: CLIL ja EKL-luokat, n.d.). Furthermore, CLIL is also offered to students with special needs if it is seen appropriate in terms of the needs of the student (Kortepohjan koulun CLIL-opetus, n.d.). However, in the other two the CLIL students are selected. In both schools the students need to apply to the program with the difference that one school offers also teaching in Finnish whereas the other only has CLIL. One of the two schools lists proper maturity for school, ability to concentrate and sufficient level in language development as features that are tested when applying for the CLIL program (Opetussuunnitelma/OPS, n.d.). In the other school a test is held for the students applying for the school. The test varies according to the grade that the student is applying to. However, the tests are related to the different language skills: reading, writing, listening and speaking (Enterance to OIS & Application forms, n.d.).

As can be concluded from the previous, the extent to which CLIL is implemented in Finland differs between schools. Furthermore, the student material is diverse as in some schools the students apply for CLIL programs whereas in others everybody is included in them. These factors were considered in creating the present material package. As was mentioned earlier the exercises have different difficulty levels, which should correspond to the need of students with different ability levels. Furthermore, the aim was to create modifiable material. Therefore, in case the exercises are too difficult or easy, most of them should be rather easily modified into the different needs by adding ingredients to or omitting them from the exercises.

4.1.2 BIOLOGY

The target group of the present material package was fifth graders. Thus the following will focus on issues concerning this age group. The aims for biology and geography in the fifth and sixth grade are described under a common heading in the POPS (2004, 176-177). The aims include themes such as the organisms and the environment, the human being, the diversity of the nature, Europe as a part of the word and the diversity of human life and peoples' environment on the globe. The outlining of the contents leaves room for local administrators to decide which content is to be taught during which year.

In the case of the schools chosen for comparison, one school determined that CLIL teaching should follow the same content goals as traditional teaching and had a school-specific curriculum for all teaching (Opetussuunnitelma/OPS, n.d.). Another had only CLIL programs and determined the content goals also in the school-specific curriculum (Parent friendly curriculum, n.d.). The third school had separate curricular demands for CLIL. However, in case of this school also, the demands did not differ from the demands of traditional teaching to a large extent (Kortepohjan koulun CLIL-opetus, n.d.). In these curricula the goals and time for implementing the contents were determined more specifically than in the POPS. Furthermore, there was only little difference between the three schools. In other words, there were several themes that were mentioned to belong to the fifth grade in all of the curricula. These themes were human anatomy and senses, adolescence and sexual development, valuing one's own body, the organisms and diversity of nature and preserving it. Since these themes were mentioned in all of the curricula, it seemed natural to choose the theme for the material package from these themes.

However, the variety of themes that could be taught in a CLIL setting during fifth grade was still extensive. Thus, taking into account the scale of the present thesis and the material package it would have been impossible to create material for all of the themes. Thus, the choice was made to concentrate on issues concerning human anatomy and senses. This enabled the creation of a logical and coherent package with topics relating closely to each other. Furthermore, issues concerning human anatomy are close to the students and they are also a universal theme, which reinforces the cultural aspect of the material. In addition, questions concerning the human body and its development were an important theme in the curricula as all of the curricula mentioned it and it seemed that quite a lot of time was preserved for these issues. Finally, since the themes relate closely to the students and human anatomy and senses are a part of everyday life, it enabled the creation of cooperative CLIL exercises where the focus could be on speaking. In other words, it might be easier for the students to use the vehicular language when the themes are closely related to everyday life. Thus, the focus in the current material package is on the following: muscular system, skeletal system, digestive system, circulatory system, respiratory system, nervous system and senses.

4.1.3 ENGLISH

Although CLIL and traditional language teaching differ from each other to quite an extent and they have different aims, a brief description on the demands of the level of

knowledge on English as a second language at fifth grade is given here. The reason for this is that CLIL teaching in many cases appears to be part time, which was, for example, the case with two of the schools chosen for comparison. In other words, it is implemented together with traditional teaching. This was also the case in the school where the material was tested, which will be further discussed in section 6.1. Thus, a general understanding of the demands of traditional language teaching was used to get an approximate idea of the requirements for English on the fifth grade.

The POPS covers a description of the language skills that are regarded as good if they are achieved by the end of sixth grade if the language has been studied since the third grade. The description was based on the Common European Framework of Reference of Languages (CEFR). The level of language skills in speaking should be A1.3, in writing A1.3, in listening comprehension A2.1 and in reading comprehension A2.1. The descriptions of the levels are presented in table 2. They are the descriptions adopted in the POPS and they are translated for the purposes of this thesis.

Table 2. Language proficiency levels adopted from CERF (POPS, 2004)

The Skill	The Description
Speaking (Level A1.3)	• Can talk about themselves and relatives. Manages the most simple dialogues and service situations. Needs the help of the partner occasionally. • The most familiar phrases are fluent. However, pauses are common. • The pronunciation may sometimes cause problems with understanding. • Has the knowledge on a restricted amount of short, memorized expressions, essential vocabulary and the basic sentence structure. • Many errors occur even in the most basic talk.
Listening comprehension (Level A2.1)	• Can understand simple talk or follow a conversation on topics that are important to him/her. • Can understand the core message of conversations and messages that are short, simple or the student has personal interest in them. Is able to notice the changes in themes in television news. • Understanding even the simplest message requires speech spoken in regular pace and with clear standard language. Repetition is often needed.
Writing (Level A1.3)	• Is able to manage in the most common, easily anticipated situations that deal with everyday needs and experiences. • Can produce simple messages (simple postcard, personal details, simple dictation). • Knows the most common vocabulary and phrases, which deal with the student's personal life or concrete needs. Can produce one clause sentences. • Even the most simple output includes many mistakes.
Reading comprehension (Level A 2.1)	• Can understand texts with simple and basic vocabulary (private letters, small pieces of news, simple manuals). • Can understand the main idea in a text. In addition can understand some details in a text the length of a couple of paragraphs. Is able to locate and compare information. Is able to draw conclusions with the help of context. • Reading and understanding even a short piece of text is slow.

The descriptions of the students' language skills suggest that they still have many deficiencies in their language skills even after the sixth grade. Thus, the skills of fifth graders might be even lower. However, in case of CLIL students the language proficiency level could be expected to be somewhat higher, as they have had more exposure to the language and using the language than students in the traditional language teaching. Thus, more ability to take part in communication could be expected from the CLIL students.

Furthermore, the school-specific curricula were examined to get a general understanding, for example on the aims for the structures that are covered during the

fifth grade. This was done as CLIL and traditional language teaching can support each other (Kortepohjan Koulun CLIL-opetus, n.d.). Thus, some of the structures could be adapted to the created material.

There were several structures and topics mentioned in the school specific curricula as well as in the POPS. The curriculum of Oulu International School, however, had a different approach to the goals and the topics were not described as specifically as in the other curricula. Thus, the curriculum of Oulu International school is not included in the following. The other schools and the POPS included, for example the following as the goals for fifth grade: the present tense, some past tense structures, questions, prepositions, comparing adjectives and adjectives in general (Opetussuunnitelma/OPS, n.d.; OPS Jyväskylä, n.d.; Perusopetuksen opetussuunnitelman perusteet 2004, n.d.). These structures can be rehearsed through the present material and some of the topics are also listed as aims for the exercises.

4.2 CLIL CORNERSTONES

This section describes how the concepts and theoretical framework of CLIL is manifested in the material. As was mentioned earlier, Coyle et al. (2010, 18) suggest that it is important to strengthen the learners' self-confidence in using the vehicular language at the early stages of CLIL. Since the material was created for fifth grade students, this was one of the most important issues considered in creating the material. Hence, exercises with a less demanding level of difficulty in terms of language use were created. Also the students were provided with other support to have the courage to use the vehicular language. However, as was suggested earlier, the student material in CLIL classes is often heterogeneous. Furthermore, even in Finland the CLIL programs are various. Thus it was important also to create material that had higher demands as well.

As Marsh (2002, 75) pointed out, there can be fluctuation between students' vehicular language skills. It is, of course, up to the teacher to recognize the variation between students and their skills. However, taking the variation between students into account, I have also tried to create material that can be used to individualize teaching by making the exercises easily modifiable by making omissions or additions to the material. However, it is probably impossible to create material that would correspond to every learner's needs. Thus, this material package can hardly be expected to cover every need that there might be for the different students.

In addition, in the theoretical background different models for CLIL according to the amount of vehicular language use were presented by Coyle et al. (2010, 15-16). The most important model in terms of the current material package was the model of *partial instruction through the vehicular language*. This is because the school where the material was tested conducted CLIL that could be described to be *partial instruction through the vehicular language*. However, since the attempt was to create material that could be modified for different needs, also other types of groups should be able to use the exercises. In other words, an important factor that was considered in the creation of the material was the modifiability of the exercises. The purpose was to create material that could be molded into the need of different types of groups and students.

An important aspect of CLIL, of course, that needs to be considered here is the 4Cs framework which included content, communication, culture and cognition (Coyle, Hood and Marsh 2010, 41). Although Coyle et al. (2010, 53) suggest that curricular subjects should not be the only basis for the content aims of material, they were an important factor in deciding the content of the present material. The reason for this is that the purpose of this material was to correspond to the needs of different schools and groups in Finland. Consequently, since the different curricula examined for the present thesis suggested certain content aims for CLIL, they were a useful principle which to base the content aims on. Furthermore, it needs to be remembered that Mehisto et al. (2008, 27) suggested that CLIL can well have basis on curricula.

Culture was somewhat complicated aspect in terms of the current material package although some cultural details were added to the exercises. Thus, the aspect of culture could be understood on a different level in terms of the present thesis. Issues of human biology relate to each human being and for that reason they can be regarded also cross-cultural and thus culture is present in the topic of the material. In addition, the way in which the topic of human biology is presented to the students could also be regarded to depend on culture. In the case of the present thesis the topic is dealt with an open attitude through discussion-based exercises. Thus the package in itself promotes an interactional and student centered view of learning.

Communication was an underlining theme in the current material package. In fact, all of the exercises created were communicational exercises. The themes chosen for the

material package covered issues that the students can experience in their own body and for that reason they could easily relate to the topics and also form discussions on them. However, of course there were issues that needed to be considered in order to enable the discussion. For example, in order to provide students more proficiency in the vehicular language, practice of some grammatical issues was included in the exercises. However, also other factors needed to be considered in order to create functional material and for that reason the language triptych was taken into account.

The language triptych was a useful tool in the creation process of the material. Taking into account the elements of the language triptych presented by Coyle et al. (2010, 36-38), language anxiety might be hindered as the purpose of considering the triptych is to provide the students the language needed for producing the vehicular language. Thus, firstly the *language of learning,* i.e. the important concepts and phrases, needed to be presented in the exercises. In other words, exercises were created that introduce key concepts that related to each topic. Otherwise the language demands were not high. The exercises were in most cases also provided with example phrases that the students could use in order to complete them and produce the vehicular language. Of course these helping sentences could also be omitted in case the students' lingual skills were sufficient without them.

Secondly, the *language for learning* needed to be considered in the creation of the exercises. Again, sentences that helped the students perform elements of the *language for learning* were provided to the students. The exercises also were created so that they provide the students opportunities to implement the *language for learning*, for example group work situations where the students needed to describe, evaluate or draw conclusions.

The *language through learning* connects to the learning situation so strongly that it was impossible to take it into account in the creation of the type of material package as the present package. The *language through learning* should be taken into account in the lessons following the session where the *language through learning* has taken place. Thus, since the exercises are supposed to be used separately and, therefore, do not necessarily relate to each other, it would be impossible to predict the language learning that happens during the sessions or try to take it into account in the exercises. Thus, it is

left to the teacher to notice situations where language through learning occurs and utilize it in the following sessions.

The final component of the 4Cs frameworks that needs to be considered is the cognition. It was taken into account in all of the exercises as all of them had different cognitive demands. In order to indicate the demands of cognitive skills, the CLIL matrix introduced by Coyle et al. (2010, 43-44) was used. Furthermore, it was not only used in the material package to give the teacher an idea on how demanding each exercise was in terms of cognition but also to indicate how demanding each exercise was in terms of language. Hence, the matrix helps the teacher to recognize the function of the exercises and use them according to the skills of the learners. However, it can only be regarded as directional, as it is impossible to evaluate the true knowledge of groups that are foreign for the creator of the material. The directional evaluation of the cognitive demands was based on Bloom's taxonomy revised by Anderson and Krathwohl (Coyle et al. 2010, 30), introduced in section 2.2.3. The main parameters used were the *lower-order processing* and the *higher-order processing*. The four dimensions of knowledge were taken into account by creating exercises that offered the chance to develop the dimensions. The language demands follow the description presented by Coyle et al. (2010, 43-44) and explained in section 2.2.4.

As was mentioned earlier, implementing CLIL does not come without problems, one of which is the lack of resources (Lehti, Järvinen and Suomela-Salmi 2006, 310). Thus this material package tries to answer to the need of usable CLIL material and at the same time ease the burden of teachers as all the responsibility of creating material does not fall upon them. Furthermore, as was mentioned, in CLIL it is useful to include goals set in terms of several areas: language, content and learning. Thus, in order for the material to be easily usable the aims of the exercises are separately described.

4.3 COOPERATIVE CORNERSTONES

This section includes discussion on how the important elements of cooperative learning are present in the material package. Furthermore, also other crucial aspects related to implementing cooperative learning through the present material package are introduced and discussed.

The basic elements of cooperative learning, positive interdependence, face-to-face promotive interaction, individual accountability, group work skills and group processing, of course, worked as the cornerstones of the material, positive interdependence at the heart of it. Special focus was given to positive interdependence in all of the exercises, as it is a crucial factor in successful cooperative group work (Johnson, Johnson and Johnson-Holubec 1991, 4:6). The aims always include the aspect of positive interdependence as without it, the cooperative nature of the exercises would not be achieved. Furthermore, an effort was made to include different types of positive interdependence into the exercises. In fact, most of the versions of positive interdependence introduced by Johnson et al. (1991, 4:11-4:18) are present in the material package. The reason for this was to provide the teachers with the possibility to try out different ways to create positive interdependence and possibly find the most suitable versions for their groups that could be used in the future.

Face-to-face promotive interaction was another important element of cooperative learning. It included discussion among the group members, giving feedback and encouraging others in different ways (Gillies 2007, 4). Some of these features are present also in the social skills that the students need to practice. Thus, in some exercises these features are listed in the cooperative goals. On those occasions the teachers were instructed to emphasize the importance of these skills. However, not all the exercises have face-to-face promotive interaction separately listed in the goals. For that reason a separate sheet, which help the students to execute face-to face promotive interaction, was created for the material package. The teachers were instructed to use the sheet to the students when they find that the students might benefit from it, for example, because they are not familiar with practicing face-to-face promotive interaction.

Individual accountability guarantees that no freeloading is tolerated during group work (Gillies 2007, 5). Individual accountability was ensured in the exercises, for example, by keeping the group sizes small in all exercises. Also other issues were considered, for example, by making sure each group member had their own task in the exercise that needed to be executed in order for the exercise to be successful. In addition, in some exercises each student was instructed to be prepared to present the group's work. Thus, it could be said that several measures were taken in order to ensure the individual accountability. Furthermore, as was suggested by Johnson and Johnson (1999, 30) in

some exercises the students also needed to teach each other what they had learned. However, the monitoring of the groups is left to the teachers. In order for the teachers to be aware of this, the instructions included the suggestion that the teachers need to monitor this aspect of group works as well.

Johnson et al. (1991, 5:9-5:13) introduced several different group skills that could be practiced in cooperative group work. The skills were divided into four categories: forming, functioning, formulating and fermenting skills. The forming skills, as the title suggests, include basic skills on how to work in a group. A separate sheet was included to the material package which demonstrates the actions needed in order to work in a group effectively and without bothering others. However, these skills are rather basic and the students might already possess them, thus the sheet can be used only when needed. Other group work skills were chosen as the goals for each exercise according to the nature of the exercise. An exercise was first sketched and then the decision was made on which social skills were appropriate to be practiced in it. However, since the variety of the skills was very extensive, only some of the skills could be chosen for the present material package.

The final basic element of cooperative learning that needed to be taken into account in the material package was group processing. The separate sheet mentioned in accordance with face-to-face promotive interaction is a fusion that helps to promote both aspects of cooperative learning; face-to-face promotive interaction and group processing. The teachers then could use the sheet in their teaching to draw the students' attention to how the group is functioning and what could be done to improve the group work. However, it was not suggested that this should be performed with each exercise. Rather the teacher could decide to use it when they see fit. Of course, group processing is somewhat crucial in terms of cooperative learning but some compromises had to be made in order to ensure the easy usability of the material. Group processing takes time and for that reason the teachers might not want to draw the focus on it with each used exercise.

Another important issue that needed consideration in the creation of the material package was the group formation. Firstly, the group type needed consideration. According to Johnson and Johnson (1999, 15) there were three different types of cooperative groups: cooperative base group, formal cooperative group and informal

cooperative group. The cooperative base groups lasted the longest whereas informal cooperative groups could be used for short-term purposes. Due to the nature of the present material package, informal cooperative groups were chosen as the main group type for the exercises. In other words, since the exercises in the material package can be used separately, the informal cooperative groups were more suitable than the other group types. However, for example, in one combining exercise it is suggested that a long-term group is created, where the students gather together to collect all new information that they learn during the whole period of dealing with human anatomy and senses. Thus, also formal cooperative groups were used in the material.

Second, the sizes of the groups in each exercise had to be determined. Since the target group of the material consisted of relatively young students, small groups were regarded as the best option for the exercises. The students at the age of the target group might not yet have developed extensive group skills. In such cases practicing cooperative group work in smaller groups can be regarded beneficial (Johnson and Johnson 1999, 19-20). The choice of using small groups was reinforced by the fact that the students were supposed to perform the exercises in English which created additional challenge. Furthermore, Johnson and Johnson (1999, 19-20) suggested that if only a little time is available, the group size should be small. Thus, the group size mostly varied between two and four students.

Third, the heterogeneity or homogeneity of the group needed consideration. Of course, the main responsibility of choosing the members to the group is left to the teacher. Thus, in the present material package this issue was addressed by introducing to the teachers the different conventions of forming the group: mixed-ability groups, groups with similar ability, students with similar interest.

Finally, the practices for implementing cooperative learning in the material package needed to be determined. As has been mentioned, Sahlberg and Saharan (2002, 11) stated that the teachers in Finland have a rather limited image on what cooperative learning is. In fact, they note that most teachers understand cooperative learning to include only the Jigsaw technique, in which students are divided into home groups and further into specialist groups. Then the specialists explain in the home groups what they have learned together in the specialist group. This is, of course, one of the ways to implement cooperative learning and it was also used in the present material package.

However, it is hardly the only version of cooperative practices. As was mentioned, Brent and Felder (2007, 2) note that cooperative learning can be used in almost any type of an assignment that can be given to students during classes. Thus, introduction to other forms of cooperative activity is needed. The exercises in the present material package are created so that they hopefully diversify the understanding of cooperative learning and offer the teachers different ways of implementing the method.

4.4   CLIL AND COOPERATION

As has been established, the theoretical bases of this material package lie in CLIL and cooperative theories. Thus, the theoretical background was rather rich. This of course created some problems in creating the material. It was impossible to take all the factors related to CLIL and cooperative learning into account in each exercises of the material package. Thus some compromises needed to be made in order to create easily usable material. For example, some exercises have a stronger focus on language or content goals, whereas in some exercises the focus is on cooperative issues. Furthermore, the teacher has the chance to choose when to implement and concentrate on some of the time consuming features, such as group processing.

Another issue that needed consideration in the creation of the material was the setting where the material would be implemented. Both CLIL and a cooperative learning environments have typical characteristics, which separate them from other learning environments. The assumption in creating the present material was that the classes were, of course, CLIL classes. Thus, the characteristics that need to be considered in a CLIL setting were taken into account. Some of these characteristics supported also a cooperative setting, for example, giving the students language they could use in cooperative exercises. However, some compromises needed to be made in terms of a cooperative classroom setting.

Since the exercises were designed to be used separately, it was not expected that the classrooms would be implementing cooperative learning in their daily routine. Rather, the exercises provided a glimpse into the world of cooperative learning. Thus, the fact that the students might not be familiar with some of the cooperative practices had to be taken into account. Furthermore, it also needed to be recognized that by using random cooperative exercises it would not be possible to create a fully cooperative classroom.

However, the two theoretical backgrounds also complement each other in many ways. For example, since in a CLIL setting it is not unusual to use different practices, the practices of cooperation are justified. In fact, group work is seen as one of the important practices that should be provided in CLIL classrooms (Mehisto, Marsh and Frigols 2008, 27).

In addition, in a CLIL setting cooperation and especially communication can be seen as the underlying concept that needs to be implemented in teaching. Communication is, of course, a crucial element of cooperative learning as well since without functioning communication, cooperation cannot exist. Thus, it could be said that the two methodologies complement each other well.

Furthermore, as Coyle et al. (2010, 29-30) point out, the cognitive engagement of the students is crucial in terms of achieving proper learning. In order to achieve cognitive engagement, the students need to be active learners. Coyle et al. (ibid.) emphasize the importance of students' cooperation in order to benefit from each other's knowledge. Thus, taking into account the features of cooperative learning, it seems to provide a solution for this demand as one of the most important elements of cooperative learning is activating the learners and teaching them the skills needed in cooperation. Thus, there are important connections between CLIL and cooperative learning which enable the infusion of these two ideologies.

5 DESCRIPTION OF THE MATERIAL PACKAGE

As has been established, the current material package aims at providing teachers English teaching material for biology for Finnish-speaking students. The methodological basis of the material lies on cooperative learning and the emphasis is on communicative use of English language. The aim was to address the need for practical CLIL material that has strong theoretical basis. As the early introduction of CLIL can be seen advantageous, the target group chosen for the material package was fifth grade students. Thus, the material can be used in all elementary school CLIL programs in Finland. The content decisions were made according to three school specific curricula which followed the outlining presented in the national core curriculum for basic education (POPS).

Furthermore, the purpose in this material package was to provide exercises that could be used when seen appropriate. In other words, the material was not designed to be used as such, one exercise after another. Rather the purpose was to provide a material archive of communicative and cooperative exercises. Furthermore, it needs to be recognized that also other types of exercises are important in creating comprehensive learning. For that reason it needs to be noted the material was created for communicational purposes and the exercises can and should be used separately

The themes in the material package concern human anatomy and senses. Furthermore, human anatomy at fifth grade consists of the different systems in human body. Thus, the package consists of eight sections: muscular system, skeletal system, digestive system, circulatory system, respiratory system, nervous system, senses and systems combined. Each section then focuses on a different theme with the exception of the final section, *systems combined*. The final section includes exercises that deal with all the themes included in the material. Thus, the final section could be regarded to be a concluding section.

Each section includes three to six exercises. Each exercise reviews the theme from different perspective or is of different difficulty level. There are some introductory exercises as well as exercises that are supposed to be used after some content has already been learned. Furthermore, each section in the material package begins with a vocabulary list which includes the important theme specific vocabulary that is needed in

each section. The vocabulary list is followed by the exercises. Each exercise, then, has a teacher's page and a students' page. On the teachers page the aims, preparations needed for the exercises and procedures of the exercises are introduced. Thus, the page functions as the teacher's tool in understanding the function and purposes of the exercises. Furthermore, each exercise in the material package includes aims set in terms of content, language and cooperative learning. Thus, as the aims are specifically listed, the teacher knows which issues should be focused on in each exercise. This should improve the usability of the material and help the teachers in managing their workload.

In addition, one of the important tools that could be of help for the teachers that was incorporated into the material package was the CLIL matrix. In order to get an idea on the level of difficulty in terms of language and cognition, the exercises in the material package were divided into different categories according to the CLIL matrix. The CLIL matrix was situated on the teachers' page. The matrix helps the teacher to choose an appropriate exercise for the particular student group and situation.

The content aims for the material package were decided on curricular basis. In addition to the content aims, also the cooperative and language aims needed to be chosen. The language aims in the material package reflect the aims for language learning set for CLIL. Thus, there were some communicational aims as well as subject specific vocabulary aims for the exercises. Furthermore, some elements were drawn from the language learning aims set in the three school specific curricula for foreign language learning, as the traditional language learning and CLIL can complement each other. Thus, some grammar-related goals were also set for the exercises. In addition, the basic skills reading, writing, listening and speaking were focused on.

The cooperative aims for each exercise included some group skills. The group skills that could be practiced through cooperative learning, however, were various. Since there are so many skills to be practices, it was impossible to include all of them into the current material package, especially when the scale of the present thesis was considered. However, the aim was to include as many group skills into the material as possible, but in addition to the overall scale of the package also the incorporation of CLIL aims restricted the possibilities to concentrate on all of the group skills. Thus, the nature of the exercises and content dictated the selection of the group skills that could be practiced through the material.

Furthermore, also other aspects of cooperative learning needed to be taken into account in the material package. Since the cooperative method has many features crucial for it, it cannot be expected that all teachers are aware of these features. For that reason the most important features are briefly presented to the teacher in the beginning of the material package. Furthermore, the important issues that the teacher needs to consider in implementing cooperative learning are also discussed in the beginning of the material package. For example, group formation was an issue that was discussed in the beginning. Different ways of choosing group members were presented for the teacher and also the suggestion of using different ways to form the group was made. In addition, other important factors that could not be incorporated into each separate exercise were included in the material package as appendices. For example, a group processing sheet was added to the material. This way the teacher can choose according to appropriate situation, when to focus on group processing. Thus, also the appendices in the material are an important tool for the teacher.

6 TESTING THE PACKAGE

The aim of this thesis was to provide the teachers material that that they could easily use in their teaching. One of the ways to ensure the usability of the material was to test it and take into account the advice from professionals working in the field. Thus, after creating some exercises and sections for the material package, some of the exercises were tested by teachers working in CLIL classes. This was done in order to find out whether there were some issues that needed revision in the material. Also other comments were gathered and changes were made to the material according to the feedback received from the teachers. Furthermore, observation of lessons was used in the process. The observations were used as the basis for interviews conducted with the teachers and also some of the observations were used as ideas for improvement. Thus the research questions were the following:

1. Are the aims of the exercises achievable and realistic?
2. Are the exercises usable and practical?
3. What practical improvement ideas arise from the use of the material?
4. Is the material modifiable for different needs?

A qualitative method for collecting and analysing the feedback was chosen, as it would have been impossible to test the material in many places and analyse enormous amounts of data considering the timeframe and size of this thesis. Furthermore, this method enabled me to build trust with the participants, thus the feedback could be considered more reliable.

In this section the process of testing the material is described. First, the participants of the study are introduced. The description of the participants and the school where the material was tested is based on facts gathered through general observations during the cooperation with the school, during the actual observation of lessons and in the interviews. Second, the focus moves on to the methods of collecting the data: observation and interview. Third, the process of collecting the data is covered and finally, the method of analysis is introduced.

6.1 PARTICIPANTS

The material was tested in a Finnish school situated in central Finland in a school where CLIL is implemented. The school has long traditions in teaching content through English, as this type of teaching has been implemented there since 1991. The degree of using English as the vehicular language has varied during the years. At the moment the school has their third syllabus, which is based on the general syllabus of the city made in 2009. The school's own syllabus also covers CLIL.

CLIL is used in the school from the first grade on and English is used as the vehicular language for a minimum of one lesson per week. However, sometimes the amount is greater. The exercises were tested in two different classes of fifth graders who have had CLIL since the first grade, as is usual for the school. The groups will be referred to as group A and group B. The references are randomly selected. At the moment the pupils have CLIL teaching in several subjects. The basic principle is that English is used when it is seen suitable and appropriate. The amount of English used during the lessons increases as the pupils grow older. For example, the amount of written English material increases from one level to the next. However, most of the material is still in Finnish. Furthermore, the students are allowed to use Finnish during CLIL lessons, even though they are encouraged to use as much English as possible.

The two groups with whom the material was tested, were different from each other. According to the observations and interviews, in group A group work was a suitable method for teaching. However, group B seemed to have more difficulties. The interviews revealed that group B had had some issues related to the atmosphere among the students. The group had had several teachers and a proper team spirit had never formed among the students. Nevertheless, the teacher of the group mentioned during the interview that some progress during the year had occurred as effort had been put on improving the atmosphere. Thus the group offered an interesting testing group for the material with the focus on cooperation.

Two different teachers tested the material. The genders of the teachers are randomly selected in order to guarantee anonymity for them. One of them has CLIL teaching experience from the past ten years. Before that she studied in the University of Jyväskylä in the department of Education on the Juliet-line, which concentrates on CLIL methods. The other teacher has taught English speaking classes previously for

three years and has been a traditional English teacher for about ten years. Presently he has been working for a year as a regular class teacher who occasionally teaches also CLIL. This teacher also had experience on using cooperative methods for a period of fifteen years.

6.2 OBSERVATION

As has been mentioned observation and interview were used in the process of creating this material package. Thus, in the following I will introduce observation as a method and also clarify the reasons why it was chosen for the present study.

Observation is generally regarded as a qualitative method and it has long traditions in different fields of study (Hirsjärvi and Hurme 2000, 37; Hirsjärvi, Remes and Sajavaara 2009, 213). One of the fields it is often related to, mentioned by Hirsjärvi and Hurme (ibid.), is education. It offers the researcher the possibility to observe different situations and interaction in their natural environment where interesting and versatile information can be collected.

Although observation is a useful method, it has its problems. Critique towards observation concentrates on the fact that the observer might disturb the observation situation with his or her presence and thus, the observations could not be relied on (Hirsjärvi, Remes and Sajavaara 2009, 213). However, Hirsjärvi et al. (ibid.) state that this problem is often solved with having the observer visit the class before the actual observation. This solution was also used in the present study. I visited the classes where the exercises were tested beforehand. I spent three lessons with each class during the previous week before the observations. Furthermore, I also taught both groups before the observation. One group I taught for three lessons and the other for one lesson. Thus, the pupils did not seem to have a reaction on having me as an observer in the classroom. Furthermore, I maintained a connection to the school and the teachers for the whole fall semester before the actual observations. I also tried to create a trustworthy relationship with the teachers before the observations mainly by staying in contact with them face-to-face and by email. Thus, it could be expected that also the teachers felt comfortable with having me as an observer in their classes.

According to Hirsjärvi et al. (2009, 214) there are different observation styles varying from observation with participation to the other end, observation without participation.

If the observation is done with participation, the observer tries to be a part of the group being observed, whereas in observation without participation the observer is an outsider with no relationship with the group. Hirsjärvi et al. (2009, 214-215) also divide observation into systematic observation or unrestricted observation. These two also represent the opposites of observation styles. Systematic observation is extremely restricted and has strictly specified units being observed. In unrestricted observation, the observation does not have any restrictions and the targets of observation arise during the observation situation. Hirsjärvi et al. (ibid.) state that there are very many variations in between the opposites.

The observation style used was closer to what Tuomi and Sarajärvi (2011, 81-82) call observation without participation. They describe that in this observation style the interaction between the targets of observation and the person observing is not essential. However, the targets of observation are aware of the fact that they are observed. This description is the most convenient in terms of the present study as the students as well as the teachers were aware of my presence in the classroom but I did not take part in the lessons.

However, also the continuum between the systematic observation and unrestricted observation needs to be considered. Again, the present study does not fit into either extremity. Rather it could be situated in between the extremes. There were themes chosen that were closely paid attention to during the observation. The themes were based on the aims of the exercises, in other words CLIL and cooperative theories. However, the observation was not strictly structured and there was room to make notes on issues that arose during the observation. The observation sheets can be found at the end of this thesis as appendix 1.

The themes chosen for observation were partly based on the theoretical background of the present thesis. In other words, the exercises were supposed to reflect the theories of cooperation and CLIL and had also goals set according to the theories, thus the observation focused on finding out whether the goals for the exercises were achieved or whether they seemed possible to achieve. Some concrete ways in which the goals could be noticed were listed in the observation sheets in order to make it easier to mark down answers during the observation. For example, in some cases there were products the students produced which implemented the achievement of a certain goal or some type of

behaviour could be expected when a certain groups skill was being implemented. In addition, close attention was paid to the difficulty level of the exercises during the observations, for example by observing whether the students were able to complete the exercises or perform in expected ways. Also room was left for making other notes about issues that occurred during the lesson. The general observations made during the lessons did not necessarily relate to the theories, instead the observations were issues that in one way or another seemed important in terms of the present thesis. After conducting the observations, the remarks made during the lessons were discussed further in the interviews with the teachers. Thus, the teachers were able to elaborate on some of the issues that had arisen during the observation.

The themes of the observation reflected the goals set for each exercise that was tested. A separate observation sheet was used for each exercise, since each exercise had its own goals. Thus, there were many different issues that needed to be observed. It has been acknowledged that making notes during the observation is a demanding task (Hirsjärvi and Hurme 2000, 38; Hirsjärvi, Remes and Sajavaara 2009, 214). However, an observation form with specific observation targets that still left room for observations that could not be anticipated helped to answer the demands.

The main focus in the observations was on the goals set for the exercises. This enabled the focus on the most practical issues related to the material. However, the weakness in the observation sheet was that there was no separate section for face-to-face promotive interaction. Of course some aspects of face-to-face promotive interaction were observed when issues related to it were listed as the group skills, but during some exercises the focus on observing face-to-face promotive interaction was left to little attention. Also individual accountability was left for little attention in some occasions. The other section of the observation sheet made it possible to mark notes on this issue as well, however, the results reveal that sometimes this factor could have been focused on in more detail. Nevertheless, the clear focus on the goals revealed important issues concerning the exercises, thus concentrating on them could be argued to be important. Furthermore, since there was only one observer, it could be expected that everything could not be focused on and some deficiencies in the observations could be present.

6.3   INTERVIEW

Now the focus moves on to interview as a method. The general idea of interview as a method will be introduced and also its suitability and purpose for the present study will be discussed.

Although observations were useful they would not have given a comprehensive image on the studied issues alone. Thus, the interviews were an important component in the thesis. In comparison with some other methods that might have been used instead of an interview, the interview seemed the most efficient and useful way for conducting a part of this study and collecting the feedback. The interview situations provided the opportunity to discuss the exercises with the interviewees rather than try to figure out beforehand the relevant points that could have been asked, for example, in a questionnaire. In fact, Hirsjärvi et al. (2009, 205) point out that one of the accepted benefits of an interview is that the interview situation enables the collection of data to evolve towards the needed direction in the moment of collection. Also, it might have been easier for the interviewees to tell interviewer personally about their thoughts rather than try to write them down. Moreover, the fact that the interview is used widely in different fields of study including linguistics (Dufva 2011, 132; Eskola and Vastamäki 2010, 26; Peräkylä and Ruusuvuori 2011, 529) reinforced the decision to conduct interviews.

According to Tuomi and Sarajärvi (2011: 73) an interview provides an opportunity to clarify some issues that might be otherwise unclear, for example, after observations. Also Hirsjärvi et al. (2009, 205) state that many researchers justify the interview as a chosen method because it enables more in depth results. These factors were also beneficial in terms of the present study. Firstly, there were issues that needed clarification after the observations. Secondly, some feedback that was collected during the observations might have remained unclear without the interviews. Thus, the possibility to clarify issues was one of the underlying reasons for choosing an interview as the method.

Although there are both good and bad sides in the interview as a method, I believe that in the case of the present study the good features overcome the bad. Of course also the disadvantages of an interview still need to be noted. An issue that needed consideration was that since I designed the exercises and the rest of the material, the interviewees

might have had difficulties in giving genuine feedback to me directly. This type of situation was described as problematic by Hirsjärjvi et al. (2009, 206) as they list the fact that the interviewees might want to provide answers that are socially acceptable. However, in case of the present study I tried to minimize this problem by getting to know the interviewees beforehand. Thus, a rather comfortable setting was created for the interviews in advance. Furthermore, it had been made clear for the interviewees that any comments and suggestions critical or not would be regarded useful in terms of the study.

Another issue that is often mentioned as disadvantageous according to Hirsjärvi and Hurme (2000, 35) is that it would be beneficial if the interviewer had previous experience on interviewing. This issue of course needs to be noted in the analysis of the data since I did not have previous experience or training for making interviews. Tuomi and Sarajärvi (2011, 74; see also Hirsjärvi and Hurme 2000, 35) also point out that interviews are often considered to be a difficult approach since conducting an interview takes much time. One way of solving the problem might have been conducting a group interview (Hirsjärvi and Hurme 2000, 63). Group interview is in some cases seen as a useful method since group members can encourage each other to speak about difficult issues or they can help each other in remembering issues and events (Hirsjärvi, Remes and Sajavaara 2009, 210-211). However, the benefits of the group interview were not very essential in terms of the present study. Instead, the individual interview was more suitable since the teachers taught separate classes and had separate experiences on testing the material. In addition, the timeframe was not an issue since there were only two interviews that needed to be conducted.

Dufva (2011, 133) emphasizes the fact that the interviewer should remember to minimize their personal effect on the interviewee. In other words, for example, the questions, themes and/or interview style should be as neutral as possible. However, she also recognize that the interview is also seen as one way of interaction, thus it is impossible and needless even, to be completely objective in an interview situation. In the present thesis, the question of objectivity was an important issue to consider. Naturally it was difficult for me to be completely objective as the exercises tested were designed by me and I naturally had some thoughts and ideas about their use that I might not have even consciously acknowledged. However, the observations helped in constructing the interview on more objective base as some ideas arose from the

incidents that happened during the lesson. For example, some problems in achieving goals or some other notions helped to conduct the interview and ask relevant questions.

All in all, it could be said that the interview was a valid method to be chosen to accompany observation for the present thesis. However, other issues needed consideration. According to Fontana and Frey (2000, 645) there are different types of interview styles, which fall in between a structured interview and an unstructured interview. A structured interview has strong boundaries that have been determined before the interview. For example, the questions are predefined and all the interviewees are asked the same questions. An unstructured interview reminds a conversation situation and the path of the interview can change as the interview goes on (Hirsjärvi, Remes and Sajavaara 2009, 209).

Neither of the previously mentioned interview types, however, fitted the objectives of the present study. The structured interview would have limited the interviews too much as the answers should have been limited and the questions strictly predefined. The unstructured interview then again would have given no opportunity to focus on some issues that definitely needed concentration during the interview. Thus, a semistructured interview type had to be chosen.

Characteristic for a semistructured interview is that some aspect or aspects of the interview are predefined. However, it is not strictly determined which aspect needs to be defined (Hirsjärvi and Hurme 2000, 47). Thus, the nature of a semistructured interview is rather open. This feature was important in choosing the interview method, as it seemed that a semistructured interview would enable focusing on issues that would arise from the discussion. This was more desirable in terms of the present study than keeping the focus solely on issues that were thought to be essential in advance. However, I also wanted to make sure that some basic themes and issues were covered during the interview, in order to ensure the concentration on all the aspects important in terms of the material package.

Hirsrjärvi and Hurme (2000, 47) introduce a semistructured interview called the theme interview (see also Dufva 2011, 133; Hirsjärvi, Remes and Sajavaara 2009, 208; Eskola and Vastamäki 2010, 26-29). In a theme interview, the interviewer must decide the general outlines of the interview beforehand. In other words, some themes that will be

covered during the interview need to be designed before the interview is conducted (Hirsjärvi and Hurme 2000, 48). This was the most convenient interview style in terms of the goals of the present study. Thus, an interview form, which included predefined themes, was created for the interview. The form can be found at the end of the thesis as appendix 2.

Eskola and Vastamäki (2010, 35) remind that in addition to intuition, it is important to use other basis for choosing the themes for an interview as well. According to them the basis for the themes can be found from literature or theories. In the case of the present study, it was appropriate to mirror the themes to the goals of the exercises and draw themes from that. Thus, the theories of CLIL and cooperation worked as the basis of the themes. In addition, the observation results had an effect on the interview form. Furthermore, a considerable amount of time was used in deciding the themes with the aim of designing an interview as objective as desired and making sure that the research questions would be answered.

Thus the interview form included themes according to the aims of the exercises as well as teachers' ideas on the material package and exercises. Also some background information was gathered through the interviews as it was important to learn about the teachers, groups and school in order to get an understanding of the context where the exercises were tested.

The original interview form included several rather specific questions. Although there were such specific questions the idea was to let the interview flow in the situation as long as all the basic themes were covered. The questions were, however, important since I had no previous experience in interviewing and the questions helped me to ensure all important aspects were covered.

6.4 OBSERVATION AND INTERVIEW COMPLEMENTING EACH OTHER

As has been mentioned, the methods for collecting the data for the present thesis were interview and observation. In fact, the observation is often used together with other research methods, for example, with the interview (Aarnos (2001) and Grönfors (2001) as quoted by Tuomi and Sarajärvi 2011, 81; Aarnos 2010, 175). Furthermore, Hirsjärvi and Hurme (2000, 38-39) suggest that it is often regarded desirable to use more than

one method in research, in order for the methods to complement each other and give more reliable results. For that reason, in the case of the present study observation was used together with interview partly for creating more reliability.

Interview was the first data collection method considered for the present thesis. However, observation gave a more comprehensive image on how the exercises worked in practice. Relying solely on interview would have made the results less comprehensive. In addition, the points made by the teachers during the interviews might have been difficult to understand in case the observations would not have been a part of the research. Furthermore, some viewpoints might have been left without attention if there had not been the observations. Thus, the observations complemented the interviews.

In addition, Aarnos (2010, 175) states that observation can be regarded as an important part in preparing for an interview. Thus, as has been mentioned, this was also utilized in the present thesis by going through the observation results before the interviews and picking up some issues that needed further discussion. Also the observations were of help in designing the interview form. The observations, for example, reinforced the idea on the themes designed for the interview.

In addition to the observations complementing the interviews, the interviews also enabled the building of a more comprehensive image on the tested issues. Thus, as has been described earlier, there were many benefits in including the interviews as a part of the present thesis.

6.5   THE PROCESS OF COLLECTING THE DATA

The testing of the material started with the teachers choosing the exercises. The teachers were provided with a variety of exercises on the themes of skeletal system, muscular system and senses. These systems were chosen after discussions with the teachers. The teachers suggested them because they were the first themes that they were going to cover on the topic, which fitted the schedule of making the thesis well. In addition, they were interested in testing exercises related to these themes. The teachers then had the chance to choose the exercises according to their needs for each lesson. There were fourteen exercises to choose from and the teachers chose altogether 7 of them. One of the teachers chose five exercises from the muscular system and the senses for group A:

"Smile" (1), "Find the muscles (1)" (2), "Which muscle" (3), "Aim for the cup" (4) and "Which sound" (5). The other one chose three exercises from the skeletal system and senses for group B: "Which bone" (6), "Joints" (7) and "Aim for the cup" (4). The numbers given to the exercises here are for the purposes of identification in the following text. In other words, the numbers of the exercises in the material package are different.

While the teachers tested the exercises I was in the classroom observing the lessons. As has been explained, an observation form had been prepared beforehand, which included basic themes that needed observation. The form helped in focusing on issues considered important in terms of the objectives set for the observation. The objectives included the fact that the observations needed to be the basis of the interview and also they needed to help in modifying the exercises. Thus, the aims of the exercises were in focus as well as the challenges of the exercises. As has been mentioned, the observations were then used as guidelines for the interview. For example, some issues that arose during the observations were discussed in the interviews. Furthermore, the observations helped to keep the focus on the most important issues that needed consideration and clarification In addition to being of help for the interviews, some observations helped in modifying the exercises.

Two teachers were then interviewed for collecting feedback. The interview place was chosen according to the teachers' convenience. Eskola and Vastamäki (2010, 29) suggest that the interview place should be chosen so that the interviewee feels comfortable. They suggest places such as the interviewees' home or work place and other places where the interviewee could feel comfortable. Thus, I decided to hold the interview at the teachers' work place after consulting the teachers for their wishes. The interviews were recorded and later transcribed. The recording was done with quick time player, a program customary for Macbook pro. This enabled me to get the data directly to my computer, which made the transcription process easy to conduct soon after the interviews. The fact that the interviews were transcribed soon after the actual interview, also affected the reliability/validity of the process positively as it was easier to make precise transcriptions. The transcriptions were written literally. In other words, everything the teachers said was written down. However, some insignificant notions, such as "joo" (yeah), by the interviewer were omitted. Also intonation was omitted from the transcripts. This level of detail seemed reasonable in terms of the present thesis

since the analysis focused on the content of the interview rather than language or discourse. The interviews were analysed after the transcription process with content analysis, which will be discussed further in the following section.

6.6 THE METHOD AND PROCESS OF ANALYSIS

The analysis method used in the present thesis was content analysis. Content analysis is a widely used method and it can be used as a tool or a wider theoretical framework for different types of research (Tuomi and Sarajärvi 2011, 91). Tuomi and Sarajärvi (2011, 108) note that the purpose of content analysis is to create a verbal description of the phenomenon being studied (see also Reinard 2008, 303). This description fit the purposes of the present study, as the observations and comments from the interviews needed to be presented in a descriptive verbal form. Furthermore, in content analysis categorization of the material is used in creation of easily understandable units that describe the contents of the original material. This also was important, as the data needed to be categorized in order to be able to improve the different parts of the material.

Traditionally content analysis is divided into two subcategories, which are theory-based analysis and content-based analysis. Tuomi and Sarajärvi (2011, 95-100), however, introduce three different subcategories: content-based analysis, theory-directed analysis and theory-based analysis. A similar division is used by Eskola (2010, 182-183) except that he uses the term theory-related instead of theory-directed analysis. The differences in the subcategories have to do with the approach to the material. According to Tuomi and Sarajärvi (2011, 95-100) in content-based analysis the aim is to create a theoretical concept out of the material being analysed. In theory-directed and theory-based analyses, as their names imply, the analysis relies on some predefined theories. In other words, the theories determine what is looked for in the material.

In the case of the present thesis it was rather difficult to determine the different subcategories. Rather, the analysis adapts different content analysis types. However, since the purpose in the present thesis was to analyse and describe ideas for improvement and other comments gathered through the interviews and observations in a summarized form, content analysis fit the purpose well.

The data of the present study consists of notes as well as transcriptions. Content analysis seemed to meet the needs of analysing these different types of material as Tuomi and Sarajärvi (2011, 103) state that content analysis can be used in the analysis of various different kinds of documents, whether they are written documents, pictures, interviews or something else.

There were different aspirations for different parts of the interview. The interviews in this study had themes that strongly concentrated on the theoretical framework of CLIL and cooperative learning. Also the observations were on most parts strongly based on the theories. However, other parts of the interview concentrated on other issues such as the background of the teacher and the students, general notions made during the lessons and the teachers' ideas about the material or the package. Especially the beginning of the interview concentrated strongly on finding out about background information. This part was used in the description of the participants and the teachers and also in the description of the school.

The analysis began with finding and underlining the important notions from the observation notes and interview transcripts. The material was not complete at the time of testing. Thus, some aspects of, for example cooperative learning or CLIL such as cognition, were not yet thought of at the time of the testing. Thus, the observations and interviews could only have the focus on the issues that were already present in the exercises. Nevertheless, after underlining the important notions they were categorized. The categories were based on the themes used in the observations and interviews. Thus, the theories of CLIL and cooperation defined the categories. In addition, the background information was a separate category. Finally the notions were formed into more understandable expressions. In other words, the core idea was separated from the comments made by the teachers or from the notes and the idea was then listed under the suitable category. The results are introduced in the following section.

7 RESULTS

In this section I will introduce the findings from the observations and interviews. The results will be introduced under different sections. There is a clear emphasis in some of the sections on the observations and in some on the interviews. The observations mainly focused on the execution of the exercises, thus most of their results are presented in section 7.1. Further observations are presented in the final section of this chapter. The results of the interviews are present in all of the sections in this chapter. However, some of the results of the aims of the exercises were focused on more in the observations than on the interviews. Thus, section 7.1 has a clear emphasis on the observations whereas the other sections have the emphasis on the interviews. This division of the data into the sections resulted from the different emphasis that the gathered data had on the studied issues. However, in some cases the same issues were addressed in both the interviews and the observations. Thus, in order to avoid unnecessary overlap, some sections include results from the data of both methods.

In the results section the exercises are referred to by the number appointed to them in section 6.1: "Smile" (1), "Find the muscles" (2), "Which muscle" (3), "Aim for the cup" (4) and "Which sound" (5), "Which bone" (6), "Joints" (7). The results are presented in the following order: first, the focus is on the tested exercises. The results from the observations and the interviews are introduced under subcategories. More precise description of the exercises can be found from the material package at the end of this thesis. Second, the teachers' thoughts and ideas on the present material package are presented. Finally, some general issues that arose from the data are addressed.

7.1 THE EXERCISES

In this section the results of the observations and interviews related to the tested exercises are presented. The results are divided into categories. The categories represent the different areas of the theoretical background of the material package. In other words, issues related to content are addressed in one category, cooperation in another, language and communication in the third and cognitive issues in the fourth category. Finally, some additional notions related to the exercises are addressed.

7.1.1 CONTENT

Each of the tested exercises had their own specific content goal of biology. Thus, each exercise will be presented here separately, starting from exercise number 1. The content

goal for this exercise was to introduce the concept of muscular system and muscles. The content goals were accomplished well. The groups understood that muscles are used to create movement, which could be seen from their answers to the questions.

The content goals set for exercise 2 were the terminology, placement and use of certain muscles: biceps, triceps, chest muscles, calves, thighs and abdominal muscles. Observation of the lesson showed that, the students were able to execute the exercises mostly well. In fact, in the interview the teacher noted that the progression of the exercise was logical and the students were able to follow the exercise and understand the content.

However, some problems emerged with the exercises for triceps. The students felt the muscle work in places that they were not supposed to feel it. The problems were solved together with the teacher and the teacher mentioned that it is important for the teacher to be alert in these situations. Furthermore, the teacher added that there could be several exercises available that focus on same muscles, in case the students do not feel the muscle work in the right place by doing the first exercise. In addition, the observation revealed that the exercises seemed to need to be repeated several times in order for the work to feel in the muscles. However, the exercises stimulated discussion and the students were able to find the correct placement of most of the muscles. Also they were able to find the correct terms for each muscle. These could be noted from the product which was the human figure where the students coloured the placement and named the muscles.

The content aim in exercise number 3 was to practice the key concepts. During the course of testing the material, this exercise was used as a revising exercise, thus the concepts were familiar from exercise number 2. The content aims were accomplished well. The exercise was executed in the form of a quiz and most of the pairs were able to find the correct muscle with the help of the hints. In fact, most pairs got all the answers right. Also the teacher stated that the exercise was suitable for the students in terms of the content.

Exercise number 4 was designed for testing sight. The content goal set for the exercise was to learn about depth perception. The testing of depth perception worked well, as almost all the groups were able to notice the difference between seeing with one eye

versus two eyes. Also in the interviews both of the teachers stated that the content goal of understanding depth perception was achieved. Furthermore, one of the teachers thought the idea to test depth perception was interesting and it brought a positive challenge to the understanding of sight.

The term depth perception was, nevertheless, difficult as the students did not know it beforehand and were not able to name it as such. This was noticeable during the observations and also mentioned in one of the interviews. However, the students figured out other ways to express what they noticed during the testing. For example, one group suggested that with one eye people see in 2D whereas with two eyes they see in 3D. Also one group was able to figure out the term of depth perception in Finnish. In any case, the purpose of the exercise was not necessarily to find the term depth perception. Rather, the purpose was to understand the concept. Thus, the aim was achieved well.

Exercise number 5 was supposed to test the sense of hearing. Furthermore, it was supposed to stimulate discussion on how accurate the sense of hearing is. The teacher commented in the interview that the aim to test hearing and listen carefully in order to be able to find out the source of the sound was achieved well. Furthermore, in the observation the remark was made that the students seemed interested in the exercise and they were eager to listen to the different sounds. There was some discussion on how difficult it was to hear what made the sound. Thus, the content goals were accomplished to some extent. However, there was only little time to discuss the exercise further during the lesson, thus the conclusions that could have been drawn from the discussions were left for little attention.

The content aim for exercise number 6 was to practice the terminology of bones. The aim was achieved to some extent. The students were able to guess the bones and ask about them. However, based solely on the observations it is difficult to say how well the students were able to learn the terms. Nevertheless the teacher mentioned during the interview that the exercise was suitable for the students in terms of the content. In addition, the teacher gave the students a task to practice a few of the names of the bones as homework. Thus, during the next lesson it could be noted that the students remembered at least some of the terms.

The content aim for exercise number 7 was to learn the concept *joint* and to learn which kinds of joints there are in the human body and where they are. The students were able to find the joints from different places, which means that the aim to find the placements was accomplished and the term *joint* was found during the lesson. Also the teacher mentioned during the interview that the joints were found and that it was good that they were marked in the human figure.

How joints move seemed to stir some discussion but it was difficult for the students to explain how they actually moved, especially in English. Also the teacher pointed out the difficulty that the students had in explaining how joints move. Furthermore, she noted that the students had some difficulties in concluding whether the subject was joints and bones or muscles. This resulted from the form of the questions as the students were asked to think whether bones move or not and what moves them if they do move.

7.1.2 COOPERATION

In this section the different cooperative aims are discussed separately. Thus, several exercises are discussed under the same category as some exercises had the same cooperative goals.

Interdependence

The observation data showed that the goals of *interdependence* set for each exercise for both groups were accomplished. During the interviews the goals of interdependence were not addressed. The exercises included *goal interdependence, role interdependence* and *outside enemy interdependence*. In *goal interdependence* a common output is needed and this demand was fulfilled in case of all the exercises that had goal interdependence as one of their aims. The outputs included notes, coloured and marked pictures and filled forms. The roles that were set, for example, for exercise number 4 were embraced in both groups by all the students, thus *role interdependence* was accomplished. *Outside enemy interdependence* can be noticed through competitiveness and enthusiasm that arises from the competition against other groups. In the case of the tested exercises, the enthusiasm was in most cases achieved. However, for example in the case of exercise number 6, some students were not quite as excited as others. Nevertheless, in most cases *outside enemy interdependence* was successful. Also, exercise number 3 was conducted as a quiz and *outside enemy interdependence* was apparent also in the execution of that exercise.

Sharing ideas and opinions

Sharing ideas and opinions was set as a goal for several of the tested exercises: 1, 2, 3, 4, 5 and 7. This goal was reached in many different ways, which was evident both in the observations and in the interviews. The observations revealed that the students had discussions where they shared ideas and they suggested different answers to questions. In addition, they reacted to other students' ideas. For example, in exercise number 2 the students tried to indicate to others the places where they felt the muscles working and asked whether the others felt it in the same place. However, on some occasions the discussions did not stem from the issues dealt with and the students seemed rather passive in terms of sharing ideas or opinions. Furthermore, the sharing also at times required the teacher's assistance, for example in the form of further questions.

In the interviews this issue was discussed somewhat briefly but in the case of exercise number 4 both of the teachers stated that discussion and pondering among the students appeared during the exercise. However, for some students group work in general especially in group B was difficult. Also the appearance of this cooperative aim was not clear with all of the students. Nevertheless, in the case of exercise number 3 the teacher stated that sharing ideas and opinions was notable during the exercise.

Making sure others understand

In exercise number 2 one of the group skills that was supposed to be practiced was *making sure others understand*. The teacher confirmed in the interview that the students, in fact, understood well what they were supposed to do. However, the observation revealed that during the testing the exercise was gone through comprehensively by the teacher. For that reason, the students understood the exercise well and there was no real need for them to make sure others understood what needed to be done.

Expressing support and acceptance

Expressing support and acceptance was a group skill goal set for several of the exercises: 2, 3, 5 and 6. This skill can manifest in verbal and nonverbal ways. In the case of the tested exercises both verbal and nonverbal expressions were present. The teacher noted, for example in exercise number 2 that the students needed to agree on what they were doing and also needed to agree on the result. Thus, expressing support

and acceptance was apparent in the execution of the exercise. Furthermore in exercise number 3 the support for other students was evident according to the teacher.

The notes made during the observation revealed that the students expressed approving statements such as "yeah, there (joo, tuolla)" and asked questions such as "Do you agree (ootteks samaa mieltä)?", "What do you think?". They also nodded as a sign of acceptance and agreement and cheered for each other. Also, they gave "the thumbs up" for each other. However, although all these different ways to express support and acceptance were noted during the observations, it was not as effective in all the exercises. In addition, in exercises 3 and 5 it was difficult to observe whether this aspect of cooperation was present since the students spoke very quietly.

Integrating ideas

Integrating ideas was a cooperative aim set for exercise number 4, which was tested in both of the groups. To some extent the aim seemed to be accomplished according to the observation data. The students discussed the questions and came to a common conclusion. However, especially in group B the language was very simple, for example the answer for the question "Why do people have two eyes?" was in many groups "Because they see better". Thus, little thought was put into the answers and for that reason it is difficult to determine the true integration of ideas. Nevertheless, in group A the discussions were a little more diverse and the answers somewhat more complex which could suggest more integration of ideas.

Energizing the group

Energizing the group was set as a goal for exercise number 3. Expressing new ideas, humour and enthusiasm are signs for *energizing the group*. It can be noted based on the observation that all the signs for this skill were not present on the lesson. However, enthusiasm was noticeable during the exercise, thus the skill of *energizing the group* was practiced. This notion was reinforced by the teacher's statement that the students cheered for each other, some more enthusiastically than others.

Taking turns and paraphrasing

Taking turns and *paraphrasing* were set as goals for exercise number 7. *Taking turns* appeared to be a success during the observation. The group members took turns one after the others both in discussion as well as in testing the movement of joints. Turn

taking seemed to be achieved by the students themselves. In other words, the teacher did not have to instruct them on it. *Paraphrasing*, on the other hand, proved to be difficult for the students. The students did not seem to paraphrase without the help of the teacher. In other words, the teacher had to ask further questions from the students in order for them to develop their ideas.

Encouraging others to participate

The students managed to express *encouragement for others to participate*. This skill was set as a cooperative goal for exercise number 7. The skill was noticeable during the observation from comments such as "What do you think?" when students wanted the other people in the group to take part in the conversation.

Other cooperative learning-related issues

One of the teachers pointed out that some of the aims for cooperation could be regarded difficult if they need to be achieved using English. Rather, it could be expected that the students use Finnish instead. However, the teacher also pointed out that the cooperative goals are important on their own. Thus, the achievement of them in any language is desired in the teacher's opinion.

The groups had a different attitude towards doing cooperative exercises. Group A had no problems in executing the exercises or forming groups. Group B, then again, had some issues in forming a group as there were students who did not want to work with some others. Also some other attitude problems were noticeable during the lessons, as some students, for example, did not want to execute the exercises without full attention from the teacher. Nevertheless, some cooperative goals were accomplished in both groups and also in group B the cooperativeness was more successful during the two latter lessons.

One of the teachers stated during the interview that in exercise number 4 pair work was a good option for the exercise. Furthermore, especially the small group size was good. In addition, the teacher also made the remark that cooperation seemed to work very well in the exercise, although some of the students seemed to have some difficulties in throwing themselves into acting out the different feelings. The teacher added that it is important to execute an exercise such as exercise number 1 in a group where the

students are familiar with each other to ensure that the students feel comfortable acting out different feelings.

One of the teachers reminded about the fact that a teacher has an important role in cooperative learning as well. The teacher's role is emphasized if the students are not able to come into a common conclusion alone.

7.1.3 LANGUAGE AND COMMUNICATION

This section is divided into categories in the similar way as the cooperation section. In other words the observation and interview results are divided into categories according to the different aims set for language and communication in the exercises. Also challenges and other language related results are presented under a category of their own. Thus, again several exercises are discussed under one category.

Speaking, negotiating, discussion

Speaking, negotiating or discussion was set as a goal for all of the tested exercises. These goals were achieved to some extent. In the observations, it was discovered that all the exercises stirred conversation but the language used on most of the occasions was Finnish. In other words, while talking to each other, the students mainly used Finnish. However, there were times, for example, when the students in group A were working on exercises 4 and 1 when most of them used English at least partly in their talk. In addition on some other random occasions the students used some English, but as was said, most of the talk was in Finnish.

Also one of the teachers paid attention to the difficulties in the accomplishment of the different speaking-related aims. The teacher pointed the difficulties out, for example, in exercise number 2. The teacher mentioned that the actual discussion seemed challenging for the students especially if the aim was to use English. The teacher made this notion also related to other exercises. However, she added that the students can be encouraged to produce English at least by pointing out the more simple ways of using the language, for example, answering an asking question such as "Can you feel it here?".

Writing

The goals for written outputs set for the exercises were quite successful. According to the observations, in most cases the output was in English and the students, in fact, were

able to produce a written product. However, on some occasions the product was not very complex. For example, in some cases the answers to the questions consisted of a few words, instead of, for example, full sentences. In addition, some students also wrote the products in Finnish. However, as was mentioned, in most cases the products were in English.

The teachers mentioned difficulties in producing written output. For example, in exercise number 7 the students were supposed to produce some writing and the teacher mentioned that for some students this was difficult and the language was simple. Also in exercise number 1 the teacher mentioned the writing to be the most challenging part of the exercise. However, for exercise number 7 the teachers suggested that words for describing the movement of joints could be added to the exercise to help the students produce full sentences.

Reading

Reading was set as a goal for only one of the tested exercises, exercise number 2, although of course, in others reading was an important skill as well. In the exercise where reading was mentioned as a goal, it was rather difficult to observe whether the students were able to read the instructions and understand them as the exercise was gone through comprehensively together with the teacher.

Listening

Listening was set as a goal for exercise number 6. It was important for the students to listen the tips the students gave to each other in order to be able to conclude which bone was in question. This was noticeable in the lesson and the students managed to pay attention to what other students explained and also guess the correct bones.

Questions

Understanding questions was an important aim in two of the tested exercises: 1 and 4. The students were mostly able to understand the questions. This could be noticed from the fact that they were able to answer them. Furthermore, on many occasions the students answered the question in English and even further discussion arose from the questions and answers, especially in exercise number 4. However, for some students some of the questions were rather tricky. They needed teacher assistance especially in

group B in order for the exercise to continue. After receiving some help, the students were, nevertheless, able to finish the exercise.

Vocabulary

The vocabulary as such was set as a goal for two of the tested exercises: 2 and 3. Exercise number 3 was used as a revising exercise for exercise number 2. Thus, since the students mostly remembered the rehearsed terms from the previous time, in exercise number 3 it can be said that the aim of learning the vocabulary was achieved. The teacher noted, however, that for some students it was difficult to remember all the terms even if they knew which muscle was in question. Nevertheless, as was mentioned, most of the terms were remembered well.

The teacher pointed out during the interview that some of the terms in the muscle exercises were rather difficult, especially the ones derived from Latin. The teacher explained that this might be a challenge, especially for the students with lower lingual skills. However, the teacher added that it is good to have some challenge for the students and in this case also easier terminology was provided for the students, which balanced the difficulty level.

Adjectives

Adjectives were an important aspect of exercise number 1. The students needed to know what the adjectives meant and also understand their purpose as words that are used to describe things. The aims of understanding the adjectives and what their purpose is were achieved. The students knew what the words meant and what adjectives are used for. Also, although not all students were enthusiastic about acting the adjectives out, they were able to do it. Even the teacher stated that the vocabulary in the exercise was suitable for the students.

Prepositions

Prepositions were used in exercise number 6. The goal of using them was achieved by some students. However, on some occasions the students did not understand how the prepositions were supposed to be used, or they forgot to use them. Instead they explained the bones in some other ways, for example, by describing the appearance of the bone. The teacher also made the remark that the students did not seem to be able to use the prepositions and suggested a revised page layout, in order for the prepositions to

pop out. This way the students might notice the importance of prepositions and be able to use them.

Challenges

There were different issues that the teachers considered as difficult for the students in terms of language. For example, in exercise number 7 the vocabulary was challenging according to the teacher and one option could be to make it easier. However, the teacher mentioned that the vocabulary can also be challenging but then there could be some more visual aids to help the students' understanding. All in all both of the teachers made it clear that visual input is very important in CLIL teaching and it can be used to help the students who have difficulties with the language understand it.

In exercise number 4 one of the teachers mentioned that understanding the phrase "as well as" might be tricky for the students, as they usually learn it in sixth grade. Furthermore, a suggestion was made to change the order of the questions in the exercises in order to motivate the students to answer all the questions. In other words, the students might have more patience to answer the questions if they answered the question seeming easier first, and the more difficult question later.

Exercise number 4 was executed in both groups. Group A did not seem to have difficulties in understanding or producing the language in this exercise whereas group B had more difficulties.

Other observations

Exercise number 1 was used as an introductory exercise during the testing. The teacher noted that it worked as such an exercise very well. Furthermore, according to the teacher the exercise was extremely suitable for the students, especially in terms of language demands as the students were able to complete the exercise using solely English.

Exercise number 4 was praised for the visual layout of the text. In other words, one of the teachers mentioned that it was good that the most important instructions and words were bolded as it helped the students to follow the instructions. Furthermore, the teachers emphasized the importance of providing also other visual aid for the students to help them understand, for example, the testing part in the case of this exercise. Also the

other teacher suggested that some sort of a picture could be added to the instructions to help the understanding on the execution of the testing that was a part of the exercise.

Exercise number 3 according to the teacher was suitable in terms of language. However, the aims of speaking and discussing were difficult to observe during the lesson and it could not be said if they were achieved.

The language used by the teachers with both of the groups was always English. All the instructions and explanations were given in English and the students seemed to understand them. Also in some cases the student teacher interaction was in English, especially in group A. In group B, the student spoke in Finnish as well as in English to the teacher.

7.1.4   COGNITION

The cognitive challenges did not seem too difficult for the students on many of the exercises. Rather, it seemed that other issues were more challenging, such as the language. However, as the observations and testing of the package was executed so early on, the division into the categories of Krathwohl and Anderson's revision of Bloom's taxonomy were not yet final in the material. Thus, the observations were not as exact as they should have been and more specific observations were left out of the observation. Nevertheless, the observation was made that, for example, in exercise number 7 the sections where the student had to create something new seemed more challenging than other sections.

7.1.5   ADDITIONAL ISSUES RELATED TO THE EXERCISES

The teachers were asked about the modifiability of the exercises as groups are, of course, different from each other and it would be desirable to have material that could easily be modified to varying needs. In general, the teachers thought the exercises were modifiable if needed. For example, exercise number 4 could be made easier by omitting some of the questions. Also in other cases the omission of difficult words, phrases or questions was seen as a way to make the exercises easier by both of the teachers. In addition, for example in the case of exercise number 5 it could be made sure the objects making sounds are familiar to all students. Furthermore, some terms could be simplified. For example, in exercise number 2 the terminology could consist of "arms, legs, chest etc.". Finally, pictures could be used as help.

However, also ways to make the exercises more difficult are important. The teachers mentioned different ways to achieve this. For example, further discussion could be derived from different exercises if the students had the language skills for that. Also more terminology could be added to the exercises. Furthermore, one of the teachers mentioned exercise number 7 to be an exercise that could be made more difficult by giving the students challenging written material on joints. Then the exercise could be used as material for students with better language skills.

There were also some general observations made during the lessons that were used in improving the material package. Furthermore the teachers had some notions about the exercises that could be regarded as important. These will be introduced here next.

There were some small deficiencies in the material. For example, in the bone exercises some bones that could be regarded as important were missing such as the spine. Also the teacher pointed out missing terms such as spine and pelvis. Furthermore, some spelling mistakes were noticed during the observation, for example, guilty was written quilty. In addition, as one of the word lists created for the exercises was used during one of the lessons, it became apparent that the lists might need some revision and the chosen words need to be even more carefully considered. Some words would have been needed on the list, for example some additional verbs. In addition, the terms for bones were quite difficult thus the list could be revised.

Other observations concerning the practicality of the exercises were also made. For example, in exercise number 1, the questions often lead to the same conclusion and answer. The instructions for the muscle exercises in exercise number 2 needed some revision as it was sometimes difficult to find the correct muscle by doing the exercise as it was instructed. In addition, in exercise number 7 the students' page seemed rather clustered and the attention of the students wandered at times. In addition, the questions might need revision in order for the students to keep their motivation on executing the exercise.

Exercise number 5 may cause some problems for the students to keep the objects making the sound in secret. This was noticeable during the observations and also the teacher mentioned this factor in the interview.

During the interviews, the teachers' described their ideas on how suitable the exercises were for the students. According to the teacher of group B the exercises were suitable for the students. However, exercise number 7 was, in the teachers' words, quite challenging for an average student. He mentioned that, for example, the language was rather challenging especially for children with difficulties with languages. However, in general the exercises seemed to be possible to use in teaching.

The teachers also shared their opinions on the instructions of the exercises. In general, the instructions were regarded sufficient and understandable. For example, the exercises 1, 2, 3, 4, 5 and 6 got praise on the instructions. Exercise 2 was very logical and did not have too much text on it according to the teacher who used the exercises. Furthermore, the teacher felt that the pictures and text complemented each other well and made the exercise easy for the students to understand. The other teacher also mentioned that it was good that the aims, preparations and procedures were mentioned separately for the teacher. It made it easy for the teacher to use the exercises.

The exercise with most difficulties was exercise number 7, where the teacher who used the exercise suggested that, for example, the layout of the page could be altered so that it would be easier for the students to follow the instructions. Also in case of exercise number 4 the teachers mentioned that it was somewhat difficult to understand how the object was supposed to be moved above the cup. Furthermore, one of the teachers mentioned that in case of exercise number 5 it is important to concentrate on giving the instructions in order for the students to properly understand what they are supposed to do.

7.2 TEACHERS' COMMENTS ON THE MATERIAL PACKAGE

The teachers had some ideas and comments on the material package which had to do with the teachers' opinions on the package at the time of testing, exercise suggestions, language and cooperation related suggestions for the material and opinions on the contents of the material. The ideas and comments will be introduced in this section.

The teachers described the material package to be suitable for fifth grade students. In addition, they appreciated the possibility to use such material.

Example 1.
No musta se (materiaalipaketti) on hirveen se on musta hyvin semmonen niinkun öö sopiva ja siis semmonen et siino- varmaan just oikeen oikeen hyvä siis sillä tavalla käytännön työhön.

Well I think it (the material package) is very it is, in my opinion, very like, uhm suitable and like ther- probably just very very good for practical work.

Example 2.
Tämmösiä materiaaleja kun sais opetuksen tueks nin ottasimme sylikaupalla niitä vastaan.

If we only could have material such as this to support the teaching we would take a whole bunch of them.

In addition, one of them emphasized the importance of exercises that focus on the students experimenting on their own body. The teacher reminded that the subject of human biology can be rather difficult for the students in terms of, for example, terminology. Thus, the fact that the exercises are practical and relate to the students' personal experiences on themselves and their bodies, help the understanding of the content in the CLIL settings.

Example 3.
Tässähän totaa tulee tosii hyviä semmosia kokemusperäsiä tehtäviä. Ihan täysin toteutettavissa olevia tehtäviä oppilaille että ne totaa pääsee nimenomaan itse kokeilemaan ja kokemaan asioita, mikä on tosi tärkee mun mielest semmosessa totaa asiat asioitten käsittämisessä ja sisäistämisessä ja oppimisessa

Here we have, uhm, very good experimental exercises. They are completely practicable with students and they (the students) can, in fact, try out and experience the things, which is, in my opinion, very important in, uhm, understanding and learning the content.

The teachers pointed out that the material seemed usable in a classroom setting. In other words, there were no major issues why it could not be used in teaching. However, there were some suggestions that the teachers made. One of the teachers suggested that in the beginning of each section dealing with the different biological systems, there should be a combining exercise as it would lead the thoughts of the students into the subject being dealt with. For example, the teacher suggested an exercise where senses could be connected to their organs, which would introduce the subject of senses.

The teachers described the content of the material to be suitable for fifth graders. Furthermore, they acknowledged that it included the content goals set for human biology in fifth grade.

Example 4.
…musta tää on aika, mitä mä katoin niitä sisällysluetteloo niin sehän on aikalailla just senmukaan mikä se nyt on just niinku joku vitosen esmes vitosen biologian paketti.

…I think this is quite, from what I checked from the table of contents, it is quite just what the contents of biology are.

However, one of the teachers commented that some of the themes of the package were rather challenging and probably not suitable for all groups. For example, the respiratory system and nervous system might be themes rather difficult for fifth grade students. Nevertheless, the teacher also stated that, of course, it depends on the group that is being taught whether the exercises can be used with them or not. Furthermore, the teacher also noted that the exercises seemed practical enough to be tried with student, even if the themes were more complex.

Some cooperation-related issues, which the teachers thought were important, were mentioned during the interviews. One of the teachers reminded that it is important to remind the students what is important when doing group work. The other teacher, then again, made a comment on the importance of group and self-evaluation. The teacher suggested that it would be good if there was the possibility to perform evaluation with at least some of the exercises.

The teachers mentioned in the interviews that the language in the exercises was at a suitable level. Sometimes the exercises were challenging but as one of the teachers mentioned, the students are supposed to have challenges in the exercises as well. However, the other teacher also reminded that as the students are studying in a foreign language, it is important to create an atmosphere where the students feel comfortable about being wrong and feeling something is difficult. Furthermore, the teacher was pleased with the nature of the current material, as the exercises seemed pleasant for the students.

When asked about language related contents that could be added to the material, one of the teachers pointed out that there are many nouns and verbs used in the material, which could be drawn attention to. Furthermore, for example exercise number 1 could be altered according to the adjectives that the students are learning for example in the traditional language lessons. Furthermore, the teacher pointed out that learning to listen to instructions in a foreign language is also an important skill that needs to be practiced.

7.3 COMMENTS ABOUT CLIL, CLIL MATERIAL AND OTHER ISSUES

It was noticed during the observations that there were instances where different issues could have affected the students' behaviour. For example, in the beginning of the first lesson with group A, the teacher went through rules that are important in completing group work. Also other factors might have had an effect on the students, for example, after the first lesson for group B the school had the town manager as a guest and some of the students seemed nervous and excited about that.

It was noticeable during the observations, especially in group B, that concentrating on the exercises seemed difficult on some occasions. Furthermore, the attitude towards learning in English seemed sometimes a bit negative as during the first lesson the students were asking several times why they had to learn these issues in English. Also in the interview, the teacher of group B stated that the attitude towards learning in English was negative or to say the least the students questioned it. Especially since the teacher usually taught the group in Finnish, the teaching in English seemed to be a problem. Thus, the teacher reminded that it is important, in case of any group, to remind the students why they have CLIL. The teacher noted that teachers often get carried away with new good ideas, but forget to explain their advantages and reasons to the students. Then the students might feel that for example studying in a foreign language is an unreasonable demand.

The teachers mentioned that there are different amounts of produced language required from the students. Sometimes, minimal production of the vehicular language, in this case English, is required but the students are also encouraged to use as much as possible.

The teachers stated that the material they most often use in teaching is found from the Internet. There are some sites that provide the material. However, in many cases the material is too challenging and the teachers have to modify it. The teachers also prepare some of the material by themselves and they get some material from their colleagues. However, the teachers mentioned that additional material is needed and material such as the present material is desired.

Example 5.
Mä ajattelin niinku itte et mulla on ens vuonna viies luokka ja mulla on se biologia et kyllä mä meinaan, mä käytän ihan varmasti näitä juttuja siinä sitte sillon.

I was thinking like that I have the fifth grade next year and I have the biology so I will, I'll definitely use these things in it then.

Now after reporting the results they will be further discussed in section 8. The discussion includes reflection on how the results affected the creation and revision of the final version of the material package and what else the data revealed on the use or function of the material. Also the issues related to the background information are discussed.

8 DISCUSSION

The results from the observations and interviews were used in creating the final version of the material package. In some cases the results reinforced the decisions already made for the exercises. However, in some cases ideas for improvement emerged from the results. This section covers the discussion on how the results affected the creation process of the material. Furthermore, some other issues that arose from the material will be discussed. For example, the interviews revealed that there is in fact a need for such material as the present material, as most often the source of material is either the internet or other teachers and easily accessible material is rarely at hand.

The discussed issues are divided thematically in this section beginning with discussion on content related issues and other issues regarding the usability of the exercises. Then issues concerning cooperation are discussed and finally issues related to language are covered. The division hopefully helps to create a coherent understanding on which factors affected the material and how.

8.1 CONTENT AND PRACTICALITY

Usually the content aims were achieved rather well in the exercises. Only some problems arose with the content that demanded more cognitive skills. For example, the understanding of how joints move was a little more difficult than finding the placement of joints. However, the problems related to content were not extensive and many of the problems seemed to relate to other issues such as language. Furthermore, also the teachers thought that the content demands were suitable for the students. For that reason the rest of the exercises followed the example of the tested exercises in terms of difficulty.

Although the content aims were successful, the testing revealed some practical issues that could improve and diversify the learning of content especially in the tested exercises. Firstly, for exercise number 6 some additions were made to the bones. The observations and interviews revealed that, for example, some basic bones, such as pelvis, were missing from the exercise. Thus, taking into account the observations and teacher's suggestions some bones were added to the exercise later. Consequently, since additions were made to the vocabulary in the exercises also the wordlists were revised in order to make sure that the vocabulary in the exercises and the wordlist match and no

words are missing. In addition, all of the wordlists were paid close attention to regardless of the exercises, so that they would, in addition to the basic concepts of human body, include also important verbs and other terms needed with the different systems.

Secondly, some exercises also needed revision in terms of layout. As one of the teachers suggested, the layout of exercises 6 and 7 were changed. In exercise number 6 the prepositions needed to be highlighted. The execution of the exercise revealed that the students did not seem to understand or remember to use the prepositions. Thus, highlighting them in the layout was considered to draw the students' attention to them and help the students remember that also the prepositions are a crucial part of the exercise. The layout of exercise number 7 was clarified so that also the layout implies that there are three different actions that need to be performed. This might help the students to focus more on the exercise and also find better answers.

Thirdly, the questions that were supposed to stir conversation or deepen the understanding of the themes were revised in some of the exercises. The order of the questions was changed in one of the exercises and in others, for example in exercise number 1 some of the questions were provided with suggestions for answers on the teachers' page since it became apparent during the observations that the questions all seemed to aim at the same answer although they did not. Thus, in order to create more meaningful discussion, the teacher was provided with more instructions in order for it to be easier to take the conversation in the right direction in case it is needed. The reconsideration of the questions for the tested exercises also encouraged even more careful consideration of the questions created for the rest of the exercises.

Fourthly, the instructions for some of the exercises needed to be changed or modified. For example, in exercise number 2 some alternations were needed, as the workout for triceps was originally too difficult. Thus, the workout was replaced with a different movement. Furthermore, a note was added to the teachers' instructions, which recommends the teacher to try out the exercises beforehand and think of other exercises that could help the students feel the workout in a correct place. Also the instructions for exercise number 4 were made more specific as the teachers mentioned that it was somewhat difficult to understand how the object needed to be moved above the cup. In

addition, careful consideration was implemented in determining the instructions for the exercises created after the testing.

In addition to the practical improvement ideas of the tested exercises, other practical ideas arose from the testing. For example, one of the teachers suggested that there could be a simple exercise in the beginning of each section that could introduce the topic. The suggestion was a simple exercise where, for example, pictures and basic concepts would be connected to each other. However, as such it would have been difficult to create exercises that had also been cooperative. For that reason, introductory exercises were created but they were somewhat different than suggested. Of course the idea presented by the teacher was very good in terms of CLIL and such exercises could be used, however, the connection with the present thesis was not possible.

Furthermore, as becomes clear from the results some of the exercises were already used in some specific context. For example, exercise number 1 was used as an introductory exercise. Also other exercises were used for specific purposes as, for example, exercise number 3 was used as a revising exercise. Since some of these purposes for the exercises emerged during the testing, the ideas of their purpose were added to the instructions to help the teacher decide when to use a specific exercise. Also the new exercises were created so that each topic includes exercises for different purposes as it seemed useful to have exercises with different functions.

Other observations were also useful. For example, when observing exercise number 6, it became clear that it could well be used in practicing the terminology. However, it was noticeable that the exercise should not be left alone, out of proper context. In other words it should, for example, introduce the concepts but if the exercise is too separate from other learning it might not give the best results in terms of content learning either. Of course, this is the case with most of the other exercises as well and therefore it is important to remember to connect the exercises into the learning meaningfully.

As Johnson and Johnson (1999, 17-18) suggest, the teacher's role is also important in cooperative learning. It was obvious that on some occasions during the testing the students needed additional help. However, they were also able to execute the exercises rather independently. Thus, the expression "a guide on the side" seems convenient also according to the results of the present study. Furthermore, the teacher's knowledge on

the students seemed important also for other reasons. For example, one of the teachers gave feedback that exercise number 1 was suitable for the group where the testing was conducted. However, the teacher pointed out that it might not be the case with every group as the students need to feel comfortable in their group in order to be able to conduct the type of exercises as number 1.

The observations and interviews revealed also other interesting issues concerning the material. For example, when executing exercise number 4 the students introduced the idea of 2D and 3D sight while lacking a proper term for depth perception. The idea was great and it was interesting to see how the students were able to derive the answer from the exercise. Thus it created trust in the students' abilities to create answers and understand the content.

Also other positive remarks were made in the observations and interviews. The human figure and the skeleton were mentioned in a positive light during the interviews. Also some other factors, for example the layout of exercise number 4 got positive feedback. Also some other exercises received such feedback. In addition the fact that visual aids, such as bolded letters, were used received positive feedback. Furthermore, other remarks were made by the teachers, which reinforced the idea to utilize pictures and visual additions in the material. On many occasions it became apparent that the layout of the page is important as well as the support the students get from, for example, pictures.

All in all, it was positive to notice that the teachers seemed to be rather satisfied with the material and thought it was usable. This reinforced the fact that the rest of the material could be made similar to the tested material. For example, the difficulty-level seemed to be suitable and the least modifiable. Furthermore, since modifiability of the exercises was an important theme in the interviews, it was important to learn that the teachers felt that the exercises were rather modifiable. Especially omission of certain things, such as vocabulary, and their addition could be regarded as a way to modify the material. This suggestion was also added to the teachers' section in the material package.

However, in some occasions the exercises were rather challenging for the students. Nevertheless major simplifications were not made to the exercises, as it is important

that there is some challenge in the exercises. However, the teachers were encouraged to modify the material by adding, for example visual aid to it in order to make it easier for the students if necessary.

Although the exercises have clear suggestion for the aims, it is possible that also other goals are reached through the exercises. Thus, it could be said that the aims only give some direction on what could be achieved by the exercises. For that reason, the teachers were encouraged to focus on the aims that they thought were the most important and also possibly focus on some other aims that they thought the exercises could be used for.

It has become obvious that different amount of output in English is required from students in different CLIL settings. Thus, although the aims of the exercises seem hard for some students, they might be applicable for other settings and vice versa. This factor on one hand made it difficult to design the material but on the other hand it reinforced the idea that it was important to include exercises with different difficulty level into the material and that the material should be modifiable.

One issue that became apparent from the observations and interviews was that the students' attitude towards learning has an important role in the learning process. As has been mentioned, group B had difficulties in cooperation. Furthermore, the group's attitude towards CLIL was often not positive. Group A, then again, did not have problems with either group work or cooperation. It was noticeable that group A was more efficient and they were also able to execute more exercises in comparison with group B. Thus, the problems related to the present material are presented here rather well. Firstly, group work might not work in every situation or with every group. Thus, in some occasions it might be more useful and effective to use other methods in teaching. However, in case there is the desire to improve groups' working skills, it is important that positive attitude is created in the group towards cooperative learning. Thus, it is important to, for example, utilize the tools added to the material that help to create functional cooperative work. However, it needs to be noted that creating a positive and fruitful atmosphere requires a lot of work. In addition, also the attitude towards CLIL is important, since according to the results positive attitude seems to have an effect on how productive CLIL can be.

8.2 COOPERATION

The cooperative goals were accomplished rather well. However, as it becomes clear from the results some goals were more challenging than others. Next the different cooperative goals will be discussed starting with positive interdependence. Since positive interdependence is such a crucial factor in cooperative learning as explained in section 3.2.1, special attention was paid to it in the exercises. It was also important to find out if the goals for positive interdependence could be achieved, as without it true cooperation would not exist and the cooperative nature of the exercises would be challenged. Thus, it was reassuring that the results for positive interdependence appearing in the exercises were positive. Especially the observations revealed that the different forms of positive interdependence were present while doing and completing the exercises. Thus, it could be argued that the way the exercises were designed was appropriate in terms of positive interdependence and a similar strategy could be used in the creation of further exercises.

The issues concerning the goals set for interdependence were not addressed in the interviews although the teachers were asked to reflect the exercises on the set goals. There might be several reasons for why positive interdependence was not focused on, one of which could be the fact that the idea of positive interdependence was unfamiliar for the teachers, especially since the introductory section of the material package was not complete at the time of testing. Thus, some additional information on the theory of cooperation was added in the introductory chapter, which enabled the teachers to familiarize themselves with the important aspects of cooperation and pay attention to the different aspects of it that need to be accomplished.

Face-to-face promotive interaction and individual accountability as such were left for little attention during the observations and interviews, although as has been mentioned, some characteristics of face-to-face promotive interaction relate to some of the group skills. Nevertheless, comments were made by the teachers which related to these issues and reinforced the idea that these factors were present and functional in the exercises. In addition, for example, the idea that group sizes should stay small, which then again supports individual accountability and also face-to-face promotive interaction, was reinforced by one of the teachers. The small group size, of course, had basis also in the theoretical background (see chapter 3.2.4) but the results further supported the decisions

to keep the sizes of the groups small. Thus, also the material created after the observations and interviews consists of exercises for small groups.

One major component concentrated on the observations and interviews were the different group skills. Some of the group skills were practiced rather successfully in the exercises. For example, turn taking seemed natural for the students. It is probably a handy skill that the students need to practice and perform in all subjects throughout school. Since it seemed so natural and the students performed it without any additional encouragement, it was not chosen as a particular aim for many of the later created exercises.

As the results show, *sharing ideas and opinions* was a rather successfully achieved goal in the tested exercises as in many cases the students managed to share their ideas on the discussions. However, on some occasions the students were not very active. This could be due to many factors, for example, in some cases there were other disturbing factors that demanded the students' attention, such as visitors. Furthermore, it cannot be assumed that the students would always be at their best and most active. Thus, I believe that sharing ideas and opinions is a skill that could easily be developed through the exercises created for this material package.

Expressing support and acceptance was another cooperative aim set for the exercises. As was mentioned, it was present both verbally and nonverbally. However, as was the case with sharing ideas and opinions, the students were not active at all times in executing this skill, although they seemed to be able to implement it. One issue that might affect this was that during the testing the teachers rarely emphasized the group skills being practiced to the students. Gillies (2007, 199) pointed out that the students should be aware of the general expectations that are set upon them in cooperative learning, Thus, it could be said that also the specific group skills could be emphasized to the students, so that they would know what is expected of them. For that reason and in order to ensure that the skills are truly practiced and that the students can also be more aware of the skills, the fact that the teachers should highlight the cooperative skills that the students should practice was emphasized more in the teachers' instructions.

In competitive circumstances it could be expected that the group skill of *energizing the group* was present. As it was explained in the results, this was the case to some extent in

exercise number 3. Thus, it could also be expected that it might work with other such exercises, i.e. competitive exercises with the goal also for outside enemy interdependence. However, as was mentioned not all of the aspects of energizing the group were present, for example humour was at least not recorded in the data. There might be several reasons for this. In case of the present thesis, the exercise was conducted in a quiz form, which led to the students speaking very quietly in the group. Thus it was difficult to hear what the students were saying and some of the humour might have been unnoticed. Furthermore, it might also be difficult for the students to be humorous with another language, especially at an early age such as the target group of this material. Also in other situations the problem in not achieving the cooperative goals could have been considered to result from language issues. Thus, different measures were taken in order to help the students achieve these goals. In case of this exercise, however, there were no massive alternations made in terms of cooperation to the exercise as the cooperative goals were achieved rather well.

Making sure others understand is an important group skill in order for the group to work effectively. This was set as an aim for one of the exercises tested. However, in a CLIL setting this goal might be rather ambitious, since the language might set additional challenges for performing the skill. In case of testing exercise number 2, the language challenges could be the reason why the teacher made sure everybody understood the exercise before the group work started. Thus, the students did not need to perform the skill after the teacher's directions and for that reason it is difficult to evaluate the success of this goal. However, the language demands were further considered. The result was that for some groups this goal might be appropriate as such, even in the tested exercise. For example, in case the group doing the exercise has advanced language skills the group skills could be emphasized. In other words, it could be regarded as an advanced goal for groups with sufficient lingual goals. Thus, the addition was made to instructions for the tested exercise that the goal should be evaluated in terms of the groups' lingual skills and emphasis should only be put on it in case the language skills are sufficient.

Some group skills were clearly difficult for the students to perform. For example, integrating ideas was a challenging aim set for exercise number 4. As the results reveal the language used in the exercise was rather simple. However, integrating ideas could be considered to require rather good skills in language as the ideas should be bound

together and explained in a new way. The cooperative aims cannot, therefore, be separated from the language aims in this case. However, it is difficult to determine solely based on the results of this study whether the difficulty of integrating the ideas resulted from poor language skills or poor skills in performing the group skill. However, one possible solution for the problem, whether the problem was in the language or other skill, could be the addition of helping sentences and questions into the exercises as for example, Gillies (2007, 5) pointed out that the students should be provided with tools for effective communication.

Another similar goal in terms of lingual demands was paraphrasing. The students were unable to paraphrase without the help of the teacher. However, when the teacher asked the students questions that lead to paraphrasing the students were able to practice the skill. Thus, questions that could be provided to the students were added to exercises that demand paraphrasing.

Although the aim of encouraging others to participate was achieved by the students to some extent, there was room for improvement in executing this skill. Thus, some sentences were added to the instructions of the students that might help them in using the language and asking appropriate questions that could improve the group's achievement. In fact, many of the cooperative aims could be achieved by adding helping language, especially since the purpose was to help the students achieve the goals using English.

Also other issues related to cooperative learning arose from the results that affected the material package. For example, group processing was not greatly focused on in the tested exercises. As one of the teachers also pointed out in the interview, it is nevertheless, an important part of cooperative learning. For that reason the final version of the material package includes a separate sheet for group processing, which can be used together with any of the exercises. Thus, the teacher can incorporate the aspect into the teaching whenever it seems appropriate. However, it is not necessary to include a group processing section into all of the exercises rather it should be used when appropriate.

An important issue was mentioned in the interviews regarding the teacher's role in the classroom. One of the teachers mentioned that the teacher, regardless of the

expectations set for the students, has an important role also in cooperative classroom. This is supported also by Johnson and Johnson's (1999, 17-18) notion on the teacher's role as a "guide on the side". Thus, the teacher should be aware of the difference of the role in a cooperative setting versus a regular classroom setting but also remember that the role is important in both settings.

All in all the teachers seemed to have a positive attitude towards the cooperative goals set for the exercises, which implies that in terms of cooperation the material was usable. Furthermore, the teachers commented that the cooperative goals were very important and sometimes it should not matter whether the students achieve them in Finnish or in English. However, of course the goal in a CLIL setting is to focus on the vehicular language. The issue of using the vehicular language will be discussed further in connection with the language related discussion.

8.3 LANGUAGE AND COGNITION

As has been established the cooperative and communicational goals naturally overlapped to some extent as the students need sufficient language skills in order to succeed in the cooperative actions. Speaking, negotiating and discussion were aims that were partly achieved as the students managed to discuss issues to some extent during the exercises. However, the main issue with accomplishing these goals was that the students did not use much English in their talk. In fact, according to the observations the students mostly used Finnish during the exercises. The complexity of understanding the content in a foreign language might have been one factor in influencing the fact that the talk between students was in Finnish. However, it did not seem as if the content goals, language set aside, were too difficult. Thus, other issues needed to be considered to understand the unwillingness to use English. Another factor could have been the lack of proper tools to perform the group skills. However, since some discussion arose during the exercises, this could not have been the only reason. Thus, a rather obvious factor influencing the students' language choice could have been the lack of skills in the vehicular language. Thus, this aspect definitely needed attention in improving the material, as it brought up the question: How to help and encourage the students to use more English instead of Finnish?

As Coyle et al. (2010, 18) noted, in the early stages of CLIL it is important to boost the learners' self-confidence with rather undemanding exercises. Thus, exercises were developed for this purpose with low demands for language skills. However, of course the students need challenges as well, especially in order to fulfill the need for cognitive engagement. Thus, other solutions for encouraging the use of the vehicular language with the more demanding exercises were needed. The attempt, of course, from the beginning was to utilize the language triptych introduced by Coyle et al. (2010, 36-38). The triptych was used to provide the students with *language of learning* and *language for learning*, which would help them in using the vehicular language. However, the result showed that even more language resources were needed in order to achieve more output in the vehicular language. Thus, sentences, phrases and vocabulary that could help the students were carefully considered and added.

However, it needs to be noted as the teachers mentioned in the interview that the policy in CLIL teaching in the school where the material was tested was that the students may use Finnish in their speech, although the teachers encourage them to use English. Furthermore, the goals related to speaking are important goals even in terms of cooperation, and for that reason, the fact that the students managed to talk with each other, regardless of the used language, is important. Nevertheless, actions naturally were taken in order to motivate the students to use English instead of Finnish.

Another factor that caused pondering was the written output. The teachers, again, expressed that the students in the school of the testing are in general expected to produce only minimal amounts of written products in the vehicular language. In fact, the written material produced in the tested exercises often consisted of only a few words. Since the general policy in this particular school were as described, of course expectations for the written output in case of the tested exercises could not have been very high either. However, as the CLIL programs in Finland are diverse (see chapter 2.3), more written output could be expected from the students in some other programs. Furthermore, the students could be encouraged to produce as much written material as possible even in programs where the general conventions are different. Thus instructions such as "Answer with a full sentence" were added to the exercises.

Reading and listening were also listed as separate goals for certain exercises and the goals were met to some degree. However, it needs to be noted that both of these skills

are present in the execution of all the exercises and, therefore, are an important part of the exercises in all cases. In case of the exercises where these skills are separately mentioned as aims, the teacher could draw the students' attention on these skills although in case of the testing the attention was rarely drawn on the language aims. Thus, the addition was made to the general instruction for the teacher that they should emphasize the aims to the students, so that the focus is on the correct skill. However, it needs to be noted, that the situations where the exercises are used vary and for that reason, sometimes it might not be either necessary or useful to mention the skill separately to the students. For that reason, the teachers' judgment is important in determining which issues are concentrated on in which situation.

Furthermore, the teacher's judgment is also important in other situations. For example, in case of one of the tested exercise the exercise was gone through with the teacher and the teacher made sure everybody understood the assignment, even though the aim was to let the students read the instruction. The execution of the exercise otherwise was successful and thus it might be that the teacher made the right decision on how the exercise was introduced. It might have been for example that the teacher felt that the students' language skills were not sufficient enough for understanding the reading. Another factor might have been the timeframe where the exercise was supposed to be executed. Thus, of course the abilities of the group and other factors need to be taken into account and in some cases it might be important to focus on other issues than the ones mentioned in the teachers' instructions.

The teachers mentioned that some of the vocabulary related to human biology can be rather challenging for the students, for example, some discussion around this issue arouse related to exercise number 2. The difficulty of the vocabulary is probably an issue also with some of the other biological systems that are also in other ways difficult for the students, such as digestive system and circulatory system mentioned by one of the teachers in the interview. These systems could be regarded as difficult since they are not visible and the students cannot test them as easily as, for example, muscles. In any case, since the vocabulary can sometimes be rather challenging, most of the exercises were formed in a way that it should be easy for the teacher to add or remove some words if necessary. This way, the material should be easily usable and modifiable for the needs of different kinds of groups.

In addition to vocabulary some phrases could be tricky for the students. For example, "as well as" was mentioned as a difficult concept in one of the interviews. However, it is important for the students also to have some lingual challenge. The exercise is a good way to familiarize the students with a new phrase in connection with the content. Thus, much alteration around this issue was not made.

There were also some grammar related aims set for the exercises. These were, for example, adjectives and prepositions. As it was mentioned in the results, the aim of using and understanding the adjectives was reached well. One of the teachers also mentioned that she had wondered how to connect CLIL and formal language teaching. Thus exercises such as this one could be an answer to that. Then again with prepositions, also some problems emerged. The students often did not understand how to utilize the prepositions in the exercise. This issue was discussed also during the interview with one of the teachers. The discussion revealed that for example by improving the layout of the exercise some of the practical problems could be solved. Thus, this was in fact done in order to improve the exercise.

The teachers' talked about some exercises which were easy for some students and difficult for others. In fact, as Marsh (2002, 75) pointed out, there can be fluctuation between students' vehicular language skills. Thus, the teachers' responsibility is to recognize the variation between students and their skills and provide the students with the required tools to complete the exercises. However, in order to help the teachers' job of modifying the exercises suitable, some of the additional help for using English is are situated so that they can only be provided to the students in need of them.

Exercise number 7 was considered rather difficult by the teacher. Also some of the questions seemed challenging for the students. For that reason the form of the questions was reconsidered so that in the future the answers would more likely lead to the designed solution. Thus, improvements were made to help students use the vehicular language. In addition, some *language for learning* was added to the exercise, for example models on how to explain the movement of joints were added to the exercise. Furthermore, the idea to add *language for learning* was taken into account also in creating the rest of the material.

As has been mentioned, cognition was left for little attention during the observations and interviews. This was partly due to the fact that the material was not yet final and the aspects related to cognition were not yet fully thought trough. However, during the creation of the rest of the material, special attention was paid to the issues related to cognition. In addition, the exercises of course already included the cognitional aspects although they were left for little attention during the observations and interviews.

9 CONCLUSION

The aim of the present thesis was to create usable cooperative material for the CLIL settings. In more detail, the material was created for teaching human biology in elementary school level, in fifth grade. The material was aimed for Finnish speaking students who are learning the subject in English. The reason for creating such material was to respond to the need for CLIL material in Finland.

In order to ensure the usability of the material, some of the exercises were tested. The testing of the material was observed and the teachers testing the material were interviewed. The observations and interviews revealed interesting issues about the material. Firstly, it became obvious that the material was usable and suitable for the target group. Furthermore, the need for material also was noted. Thus, the usefulness of the material was confirmed. Secondly, the observations and interviews pointed out several practical issues that could be improved in the material and issues that should be considered in the creation of the rest of the material package. Most importantly the importance of visual aids became apparent from the results. Thus, it was focused on also in the improvement and creation of the material package. Finally, the testing of the material also revealed other deficiencies of the material, for example in the instructions for teachers. Thus, it was easy to modify the material package into a more comprehensive package with the help of the feedback received from the observations and interviews.

Although the observations and interviews were helpful, there were also places for improvement in conducting the study. For example, although the observations were carefully planned in advance, some elements such as cognition were left for too little attention. However, since there was only a single observer present in the observations, it could be expected that could not be covered. However, the interviews complemented the observations rather well.

Although the incorporation of CLIL and cooperative learning was successful and the two methodological approaches mostly complemented each other well, incorporating them also created some problems. For example the level of language skills of the students might cause difficulties in developing and using the cooperative skills needed

for the exercises. Thus, further consideration on this issue when creating material of this kind could be given.

Furthermore, although there are several valid reasons for using cooperative methods, there is always a need for other types of teaching methods as well. Thus, the material could be improved by addressing the subject of human biology from other perspectives by using other teaching methods.

As becomes clear, there are issues that could be considered more carefully when creating material for the present thesis. However, in creating the present material package many issues were successfully solved and the package can be regarded as a useful tool for CLIL teachers in teaching human anatomy and senses. Furthermore, hopefully the exercises broaden the teachers' ideas on what cooperative learning is and possibly inspire them to use it even more in their teaching. Until further, more comprehensive material is created for this subject, this material package can be regarded as a useful storage for communicational exercises for CLIL classes.

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APPENDICES

APPENDIX 1: THE OBSERVATION FORMS

OSERVATION FORM:

COOPERATIVE GOALS:

Exercise1. Smile

Output goal interdependence (shared product)

Sharing ideas and opinions

Level of difficulty:

Cooperation:

Seems to understand:

Doesn't seem to und.:

Language used:

Teacher

OTHER OBSEVATIONS:

CONTENT GOALS:

Terminology

Testing use

Content:

Cognition:

Pupils

LANGUAGE GOALS + COMMUNICATION:

Speaking

Writing (notes)

Adjectives

Questions

Language:

OSERVATION FORM:

COOPERATIVE GOALS:

Exercise2. Find the muscles

Goal interdependence

Making sure others understand
    Asking others:

Expressing support&acceptance
    Nonverbal:
    Verbal:
        Praising
        Seeking others ideas

Level of difficulty:
    Cooperation:

Seems to understand:

Doesn't seem to und.:

Language used:
Teacher

OTHER OBSEVATIONS:

CONTENT GOALS:

Terminology

Use of muscles

Placement

Content:

Pupils

LANGUAGE GOALS + COMMUNICATION:

Negotiating

Vocabulary

Reading

Cognition:

Language:

LANGUAG E GOALS + COMMUNI CATION:

Negotiating

Vocabulary

Reading

Culture

Language:

CONTENT GOALS:

Key concepts

entusiasm

Content:

Cognition:

Pupils

humor

OSERVATION FORM:
COOPERATIVE GOALS:
Exercise4. Which muscle
Outside enemy interdependence

Sharing ideas and opinions

Expressing support&acceptance
    Nonverbal:
    Verbal:
        Praising
        Seeking others ideas

Energizing the group:
    New ideas

Level of difficulty:

Cooperation:

Seems to understand:

Doesn't seem to und.:

Language used:
Teacher

OTHER OBSEVATIONS:

OSERVATION FORM:

COOPERATIVE GOALS:

Exercise1. Aim for the cup

Goal interdependence
Role interdependence

Sharing ideas and opinions

Integrating ideas

Level of difficulty:

Seems to understand:

Doesn't seem to und.:

Language used:
Teacher

OTHER OBSEVATIONS:

CONTENT GOALS:

Depth perception

Cooperation:

Content:

Pupils

LANGUAG E GOALS + COMMUNI CATION:

Speaking

Writing

Understanding questions

Cognition: Language:

OSERVATION FORM:

COOPERATIVE GOALS:	CONTENT GOALS:	LANGUAGE GOALS + COMMUNICATION:
Exercise2. Which sound?		
Goal interdependence	Hearing	Negotiating
Sharing ideas (and opinions)	Not expected results	Writing
Expressing support&acceptance		
Nonverbal:		
Verbal:		
Praising		
Seeking others ideas		

Level of difficulty: Cooperation: Content: Cognition: Language:

Seems to understand:

Doesn't seem to und.:

Language used:

Teacher   Pupils

OTHER OBSEVATIONS:

OSERVATION FORM:

COOPERATIVE GOALS:　　　　CONTENT GOALS:　　　　LANGUAGE GOALS + COMMUNICATION:

Exercise1. Which bone

Outside enemy interdependence　　Key concepts　　Preposition

　　　　　　　　　　　　　　　　　　　　　　　Negotiating

Encouraging others to participate

　　　　　　　　　　　　　　　　　　　　　　　Speaking

Expressing support&acceptance

　Nonverbal:　　　　　　　　　　　　　　　Listening

　Verbal:

　　Praising

　　Seeking others ideas

Level of difficulty:　　Cooperation:　　Content:　　Cognition:　　Language:

Seems to understand:

Doesn't seem to und.:

Language used:　　　　　Pupils

Teacher

OTHER OBSEVATIONS:

OSERVATION FORM:

CONTENT GOALS:

LANGUAGE GOALS + COMMUNICATION:

COOPERATIVE GOALS:

Exercise3. Joints

Goal interdependence

Key concepts

Discussing

Where in the body?

Writing

Speaking

Sharing ideas (and opinions)

Taking turns

Paraphrasing
(So you think that, so you mean etc)

Level of difficulty:

Cooperation:

Content:

Cognition:

Language:

Seems to understand:

Doesn't seem to und.:

Language used:

Teacher

Pupils

OTHER OBSEVATIONS:

APPENDIX 2: THE INTERVIEW FORM

THE INTERVIEW:

1. Taustatietoja

- Milloin CLIL opetusta aletaan toteuttaa oppilaille koulussa yleensä? Miten?
- Kuinka paljon CLILiä kyseiselle luokalle?
  - o Miltä luokalta asti?
  - o Kuinka paljon viikossa yleensä?
  - o Kuinka monessa aineessa?
- Onko luokka tottunut käyttämään englantia?
  - o Miltä luokalta CLIL alkanut tms?
- Kuinka paljon englantia vaaditaan oppilailta (esim englannin suullista tuottamista, kirjallista tuottamista tms)?
- Onko luokka tottunut tekemään ryhmätöitä?
- Kuinka paljon opettajalla itsellään on kokemusta CLIListä?
- Kuinka paljon yhteistoiminnallisuudesta?
- Mitä CLIL materiaalia käytätte yleensä? Mistä sitä löytyy?
- Teettekö paljon CLIL materiaalia itse?

2. Tehtävien käytöstä heränneet ajatukset

Tehtävä kerrallaan:
- Miten kuvailisit tehtävien soveltuvuutta opetukseen?
  - o Esimerkiksi sisällön osalta?
  - o Entä työtapojen osalta?
  - o Kielen osalta?

Haastavuus:
- Koitko tehtävissä olevan joitain haasteita? Millaisia kieleen liittyviä haasteita? Tai yhteistoiminnallisuuteen?
- Olivatko tehtävät liian haastavia tai helppoja?
- Johtuiko haastavuus mielestänne enemmän kielestä vai yhteistoiminnallisuudesta?

Toteutettavuus:
- Tuntuuko että tehtävät olisivat yleisesti ottaen toteutettavissa?`
  - o Oman ryhmän kannalta/ mahd. muissa ryhmissä?
- Ovatko tehtävät muunneltavissa ja sovellettavissa erilaisten ryhmien tarpeisiin?

Tehtävänannot:
- Millaisina koit tehtävänannot? Opettajan ja oppilaan kannalta?
- Olivatko tehtävän annot selkeät opettajalle/oppilaalle?
  - o Jotain liikaa, liian vähän?
  - o Oliko esim. tarpeeksi kielellistä avustusta?

Tavoitteisiin peilaaminen:
- Jos ajattelet tehtäville asetettuja tavoitteita, mitä mieltä olet niiden toteutumisesta tehtävissä?
- Mitä mieltä tavoitteiden täyttymisestä?
- Muita huomioita näistä testatuista tehtävistä)

3. Materiaalipaketti yleensä:
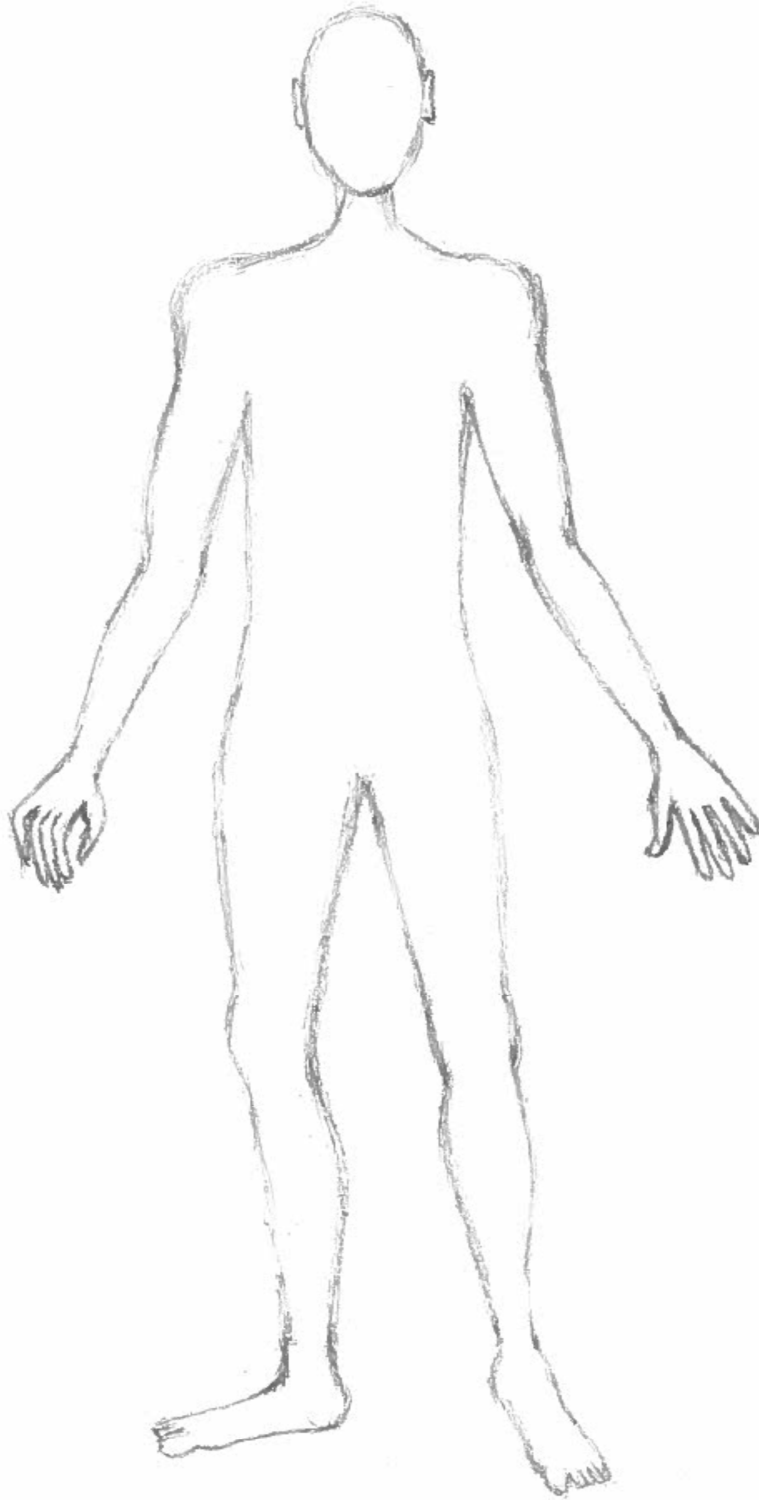- Jos ajattelet materiaalipakettia kokonaisuutena, mikä on päällimmäinen ajatuksesi?

- Parannusehdotuksia?

4. Vinkkejä ja ideoita
- Millaisia tehtäviä materiaalipaketissa kannattaisi olla?
- Onko jotain kielellisiä asioita joita olisi hyvä harjoitella?
- Tai yhteistoiminnallisuuteen liittyviä asioita?
- Tai sisältöön liittyviä asioita?
- Onko jotain erityistä, mitä kannattaa ottaa huomioon?
- Kumpuaako käytetyistä tehtävistä tai muusta materiaalista jotain ideoita?

5. Muuta?

THE INTRIGUING HUMAN BEING

Eeva-Maija Ainikkamäki

TABLE OF CONTENTS:

FOR THE TEACHER

This material package is created for YOU to work as a material bank for teaching human anatomy and senses at elementary level through English. The material includes exercises, which can be chosen for use separately. In other words the use of this material does not require the commitment of a long period, instead the exercises can be chosen for use when seen appropriate.

Cooperative learning and CLIL (Content and Language Integrated Learning) work as the basis of the material. The underlying idea behind CLIL is that content and language learning are integrated. In other words, the teaching always has a dual focus and the aims are set for both language and content. In the current material package the exercises are created to provide the students with the chance to practice their language skills as well as learn human anatomy and senses.

Cooperative learning is a widely used teaching method based on group work and students' interaction. The cooperative aspect is present in each exercise. All of the exercises are designed to be executed in small groups and each exercise addresses the important components of cooperative learning. The cooperative nature of the exercises is also used to reinforce the communicative nature of the exercises and CLIL at the same time.

The material package is divided into eight sections: the muscular system, the skeletal system, the digestive system, the circulatory system, the respiratory system, the nervous system, the senses and the systems combined. Thus, each section focuses on a different theme with the exception of the final section, *the systems combined*. The final section includes exercises that deal with all the themes included in the material. Thus, the final section could be regarded to be a concluding section.

Each section includes three to six exercises. Each exercise reviews the theme from a different perspective or is of different difficulty level. There are some introductory exercises as well as exercises that are supposed to be used after

some content has already been learned. Furthermore, each section in the material package begins with a vocabulary list, which includes the important theme specific vocabulary that is needed in the section.

The vocabulary list is followed by the exercises. Each exercise, then, has a teacher's page and a students' page. On the teacher's page the aims, preparations needed for the exercises and procedures of the exercises are introduced. Thus, the page functions as YOUR tool in understanding the function and purposes of the exercises. Furthermore, each exercise includes aims set in terms of content, language and cooperative learning. Thus, as the aims are specifically listed, it is easy for YOU to know which issues should be focused on in each exercise. However, consideration can be used to decide on which aims are, in fact, appropriate to be focused on in case of each teaching situation. In addition, the students can be made aware of the aims that should be focused on in order for them to be able to concentrate on the selected aims.

The students' page includes the material designed for the students. In addition the material package includes appendices that include, for example, pictures and instructions that can be used in teaching. The use of the appendices is instructed in the exercises.

Feel free to make alternations to the material according to YOUR and your students' needs. For example, omission or addition of vocabulary or visual aid is suggested.

Now CLIL and cooperative learning are introduced in order to give YOU an overall understanding on their theories and underlining aspects. Furthermore, their incorporation into the present material will be explained.

CLIL

CLIL is a combination of methodologies, which have the dual focus (Coyle, Hood and Marsh 2010, 1). It is based on a framework of four elements, the 4Cs: content, communication, cognition and culture (Coyle et al. 2010, 41). These aspects have been incorporated into the material package in different ways.

The content aspect focuses on learning human anatomy and senses. Communication is then again focused on through the cooperative exercises, which require communication. The exercises include language tips and vocabulary that should help the students in using the target language. The exercises demand different levels of abilities in terms of language and cognition, as some of them are designed to be more challenging than others. YOU will find a CLIL matrix (presented below) from the beginning of each exercise, which will help you get an idea on the level of difficulty of each of the exercise. The level of cognitive difficulty rises vertically. In other words, the quadrants 1 and 4 are cognitively less demanding and the quadrants two and four are more demanding. The linguistic difficulty level rises horizontally, i.e. quadrants 1 and 2 are less demanding in comparison with quadrants 3 and 4.

Figure 1. The CLIL matrix (Coyle, Hood, Marsh 2010, 43)

Finally the aspect of culture is present throughout the material package as it is culture specific how the topic of human related biology is introduced to students. Furthermore, some exercises refer to cultural issues in more detail.

COOPERATIVE LEARNING

All group work is not necessarily cooperative. In order for cooperation to work, certain aspects of working need to be achieved. At the heart of cooperative learning lies positive interdependence, which means that everybody in a group is responsible for the group's learning. Other important aspects of cooperative learning are face-to-face promotive interaction,

individual accountability, group processing and group skills (Johnson, Johnson and Johnson Holubec 1991, 1:9).

These different aspects of cooperative learning are addressed in the material in different ways. The goals set for learning cooperative interaction are mentioned separately in each exercise. They include the interdependence goals and goals for learning group skills. Also face-to-face promotive interaction includes skills that relate to the group skills and are in some exercises listed among the group skills.

Also other material that promote functioning cooperation are provided in the material. The appendices include material to help the students work in a group (APPENDIX D) and also perform group processing and improve face-to-face promotive interaction by evaluating the actions of their own and other group members (APPENDIX E). These tools can and should be used whenever seen appropriate or required. For example, APPENDIX D is useful when first introducing cooperative learning to the students. APPENDIX E includes sections that need to be filled in before use. There YOU can mark skills or features that YOU think need to be evaluated by the students. The skills or features can be, for example, the ones listed as the aims for the exercises.

Finally the aspects of individual accountability are taken into account in the exercises as well. One of the main actions taken in order to guarantee individual accountability is the small group sizes. This should ensure that the group members all need to take part in the group's work. In addition some exercises include a role or an assignment for each student, which also should ensure the individual accountability. However, this aspect needs to be monitored during the lessons.

Although the group sizes have already been suggested in the material, also other aspects of group formation need to be taken into account. The groups can be chosen, for example, according to interest or abilities. It has been proven that students benefit in different ways when they have a chance to learn in different kinds of groups (Gillies 2007, 7; Kagan and Kagan 2002, 44-

45). Thus, the suggestion for the present material is that YOU form different kinds of groups if the material is used often. Examples of the groups are as follows: mixed-ability groups, groups with similar ability and/or students with similar interest.

Finally, goals related to cooperative learning (especially the group skills) that are mentioned in the exercises are selected skills that can be practiced through the exercises. However, it can also be decided to emphasize only some of them according to the need. It is useful to let the students know which skills are being practiced so that those skills can be paid attention to by both by YOU and the students.

I would like to wish you enjoyable moments using and utilizing the material.
Hopefully it will be of help! ☺

Eeva-Maija Ainikkamäki

MUSCULAR SYSTEM

Vocabulary:

kolmipäinen olkalihas/ojentaja = triceps

hauislihas = biceps

jänne = tendon

rintalihas = chest muscle

vatsalihakset = abdominal muscles (abs)

reisi = thigh

pohje = calf

hengästyä = get out of breath

supistua = contract

rentoutua = relax

venytellä = stretch

Aims:

Content

- Introduction to the concept **muscular system** and **muscles**

Language

- Adjectives, question
- Speaking, writing

Cooperative

- Output goal interdependence (shared product)
- Group skills: sharing ideas and opinions

The CLIL Matrix:

2	3
𝕏 1	4

Preparations:

- The students need to have something to make notes on, either printed sheets of the questions or notebooks.

Procedures:

- Groups of 3.
- In the first section tell the students to choose an adjective and **act it out** with their face. One student makes the face, the rest guess. The students should take turns.
- An adjective list is included on the *students' page*.
- In the second section the students figure out answers to questions, which should lead to the conclusion that people need muscles to create movement.
- As a product there should be some notes that the students have made when answering the questions.
- The questions for the students are included on the *students' page*
  - o How do we make the faces? (move our face)
  - o What moves our face? (muscles)
  - o What do we need to smile? (the feeling and muscles)

Other:

- This exercise can be used as an introductory exercise.
- For creating additional challenge, the exercise can be modified by omitting the adjective list.

SMILE

PART 1

Form groups of 3.

One of you needs to choose an adjective from the list.

Act it out with your face.

Two of you will guess which adjective it is.

Take turns. Everybody guesses and acts out!

HAPPY

SAD

ANGRY

SCARED

HOPEFUL

GUILTY

HORRIFIED

CLEVER

PART 2

Think in your group and answer the questions:

How do we make the faces?

What moves our faces?

What do we need to smile?

Exercise 2. FIND THE MUSCLES (1)

Aims:

Content

- Muscles:
    - o terminology
    - o use
    - o placement

Language

- Reading
- Muscle vocabulary training
- Negotiating

Cooperative

- Goal interdependence
- Group skills: making sure both members understand the assignment, expressing support and acceptance.
- Extension: Helping the group member

Preparations:

- You need printed sheets of the human figure (APPENDIX A)
- Color pens
- After the lesson the filled sheets can be copied to both of the members of the group, or separate sheets can be filled

Procedures:

- Groups of two
- The purpose is to try out exercises which help to find certain muscles from the body.
- There are six different exercises prepared for this task. Helpful pictures are provided for each exercise on the *students' page.* (Ex1. biceps, ex2. triceps, ex3. calves, ex4. abdominal muscles (abs), ex5. chest muscle, ex6. thighs)
- After trying out the exercises repeatedly the students are supposed to color the place on the human figure, where they felt the muscle working.
- After that the students are supposed to find the correct term for the muscle from the muscle bank (found on the second *students' page*).

The CLIL Matrix:

X 2	3
1	4

- In the end either of the members of the pair can introduce their findings. This also ensures individual accountability.

Other:
- In order to increase the difficulty level the teacher can make up more exercises and more terminology. Furthermore, it is useful to test the exercises beforehand.
- The pictures can be used as help but they can be left out
- In case it is too difficult for the students to go through the exercise on their own, the teacher can help them. In other words, *making sure others understand* should be set as an aim if the language skills allow it.
- An extension proposal: The pairs can think about useful tips for remembering the terms. This will reinforce the language learning aims of this exercise.

FIND FROM YOURSELF AND THE OTHER

1. Do the exercises listed below. Repeat many times.
2. Think about the following questions with your partner.
   - Where do you feel the movement the most?
   - Does your partner feel it at the same spot?
3. Color each spot where you feel something. Use different colors for different spots.
4. What is the name of the muscle? Find it in the muscle bank.

Before starting,

make sure both of you know what to do!

Exercise 1.

Put your hands under the desk. Lift it.

Exercise 2.

Push against your partner's hand.

Exercise 3.

Stand on your toes.

Exercise 4.

Lie down on your back. Sit up. Do it again.

Exercise 5.

Stand next to a wall. Put your hand against a wall away from your body. Where do you feel the stretch?

Exercise 6.

Put your back against a wall. Sit down without a chair.

Ex 1.

Ex 2.

Ex 3.

Ex 4.

Ex 5.

Ex 6.

Muscle bank:

Chest muscle

Tricep

Calf

Abdominal muscles (abs)

Bicept

Thigh

Aims:

Content

- Muscles
- Some information about the purpose of muscles in the human body

The CLIL Matrix:

2	X3
1	4

Language

- Muscle vocabulary training
- Negotiating
- Speaking
- Writing
- Summarizing

Cooperative

- Role interdependence
- Individual accountability: each student needs to be prepared to introduce the product
- Group skills: summarizing, checking understanding, making sure everything gets done, paraphrasing

Preparations:

- Camera/s
- Printed sheets of info for each group
- Access to computers or other sources where they might find information on the subject and access to dictionaries
- The teacher needs to fill in each group's muscles on the blank spots on the *students' page*'

Procedures:

- Groups of 3 or more
- Each group in the class gets a section of the body that they need to study: arms, legs, middle section. Some groups might have the same parts.
    o The muscles in an arm: biceps, triceps
    o The muscles in a leg: thigh, calf
    o The muscles in the middle section: abdominal muscles (abs), chest muscles

- In the small group the students need to create a little information handout in English for the others, which includes pictures, the terminology and a few facts about the muscles or their function, location etc.
- The handout also needs to include photos and there is a role for each group member in this process. The roles are:
    o Camera person → in charge of taking the photos
    o "Model"
    o Mediator → helps the camera person and the model to ensure quality pictures
- The creation of the handout should be done together. However, the group can decide roles for each member, so that each person finds certain information.
- The *students' page* includes helping questions on what the students could tell about the muscles.
- The first section of the *students' page* is common information for the whole class.
- The following sections include information that could be printed for each group separately.
- After creating the material the students can introduce their findings to others.

MUSCLES:

In small groups

- create **a handout** of muscles

- each group gets their own muscles:

    o muscles in the arm

    o muscles in the leg

    o muscles in the middle body

_____

YOUR GROUP'S MUSCLES: The muscles in _____

The muscles:_____ and _____

The handout should include:

- a photo

- information, for example

    o The names of the muscles

    o The location of the muscles

    o What are these muscles used for?

    o Some other important information.

    → Each group member finds an answer to at least one question. Decide who finds what!

In taking the photo each member has a role:

- photographer → takes the photo

- model

- mediator → helps the photographer and the model so that the picture is good

Make sure everybody is ready to introduce the handout to others. Make sure everybody understands everything!

The CLIL Matrix:

2	3
X 1	4

Aims:

Content

- Key concepts

Language

- Reading
- Vocabulary
- Speaking: negotiating
- (Culture)

Cooperative

- Goal interdependence: outside enemy interdependence (competition)
- Group skills: sharing ideas and opinions, energising the group, expressing support and acceptance

Preparations:

- The sheets with the explanations of the muscles can be shown together to everybody or they can be printed to every group.

Procedures:

- This exercise can be a little competition between the groups in the class. The first group who gets all the muscles right wins.
- Groups of 3-4
- The group members take turns in reading the tips for the muscles and they all need to negotiate what might be the correct muscle.
- When the group has come to a common conclusion, they should write the name down.
- When they have guessed all the muscles they can check the answers with the teacher.
- The correct answers: 1. biceps, 2. abdominal muscles (abs) 3. triceps 4. thigh 5. chest muscle 6. calf

Other:

- The list of the name of the muscles can be provided for the students if the vocabulary is still very new. However, the exercise can also function as a revising exercise.
- The exercise can be extended so that the students make up their own explanations on the muscles. (See Exercise 2. WHICH BONE (2))

WHICH MUSCLE

1. Popeye has huge these.

   They help you lift stuff.

   They are in your arms.

2. They help you sit up when you are lying down.

   They help you roll your spine (selkäranka).

   People can call them a six pack.

   They are in your stomach.

3. These are not a very large muscle.

   They help you straighten your arm.

   They are on the backside of the arm.

4. This is big muscle.

   People who ride bicycles a lot have big these.

   These help you run and squat.

5. You can see these on men more easily than on women.

   They support your upper body.

   You can do push-ups with their help.

6. These are in the lower body.

   These help you stand on your toes.

   These are between your knee and your ankle.

SKELETAL SYSTEM

Vocabulary:

kallo	= skull
leukaluu	= jawbone
solisluu	= collarbone / clavicle
lapaluu	= shoulder blade
kylkiluu/t	= rib/s
olkaluu	= humerus
rintalasta	= breastbone
selkäranka	= spine
lantio	= pelvis
värttinäluu	= radius
kyynärluu	= ulna
sormen luut	= finger bones
reisiluu	= thighbone
polvi	= knee
polvilumpio	= kneecap
nivel	= joint
sääriluu	= shinbone
pohjeluu	= fibula
varpaan luut	= toe bones
nilkka	= ankle
slekäydin	= spinal cord

The CLIL Matrix:

2	3
X 1	4

Aims:

Content

- Placement and purpose of bones
- The composition of bones

Language

- Discussion
- Listening (to other's ideas)

Cooperative

- Goal interdependence
- Group skills: encouraging the other to participate, expressing support and acceptance

Preparations:

- Printed sheets of the human figure (APPENDIX A), one per pair

Procedures:

- Groups of 2
- The idea is to work with a pair and find bones from one's body.
- The pair can touch their arms, legs, chest, back, head, fingers, toes etc. trying to figure out where there are bones in a human body
- The pair gets a printed sheet of the human figure and should color the places where bones are found onto it.
- The human figure works as a common end product.
- After finding the bones (or some of them) the pair should discuss and try to figure out what the purpose of the different bones is.
- The end product can be presented to the rest of the group and should be done together to ensure individual accountability.
- Also the ideas on the purpose of the bones can be presented to others.

Other:

- The exercise can work as an introductory exercise.
- To make the exercise easier, some adjectives or other helping words can be added to the instructions to help the students answer the questions.
- The answers can also be written down if seen appropriate.

BONES

1. Find your bones together with your partner
   a. touch your legs, arms, chest, back, head, fingers, toes to find the bones
2. Color on the human figure the places where you think the bones are placed.
3. Answer the questions together with your partner:
   a. What do bones feel like?
   b. Why are bones in the places where you found them?

Exercise 2. WHICH BONE? (1)

The CLIL Matrix:

2	3
X 1	4

Aims:

<u>Content</u>

- Key concepts

<u>Language</u>

- Prepositions
- Negotiating
- Speaking and listening

<u>Cooperative</u>

- Goal interdependence: outside enemy interdependence (competition)
- Group skills: encouraging the other to participate, expressing support and acceptance

Preparations:

- Printed sheets of bones without the names (APPENDIX B)
- One sheet of a human skeleton with the names of the bones shown to everybody, also a list of prepositions needs to be supplied (*students' page*)

Procedures:

- Groups of 4 → 2 against 2
- This is a game two against two
- Each pair needs to choose **five** bones which the other pair will try to figure out with the help of prepositions. While giving the instructions, the emphasis should be on the pair making the decisions **together** so that both agree on the choices.
- When the choices have been made, the pair needs to write them down in their own sheet. They can also mark on the sheet the bones that they have guessed.
- The pair that guesses the other team's bones first wins.
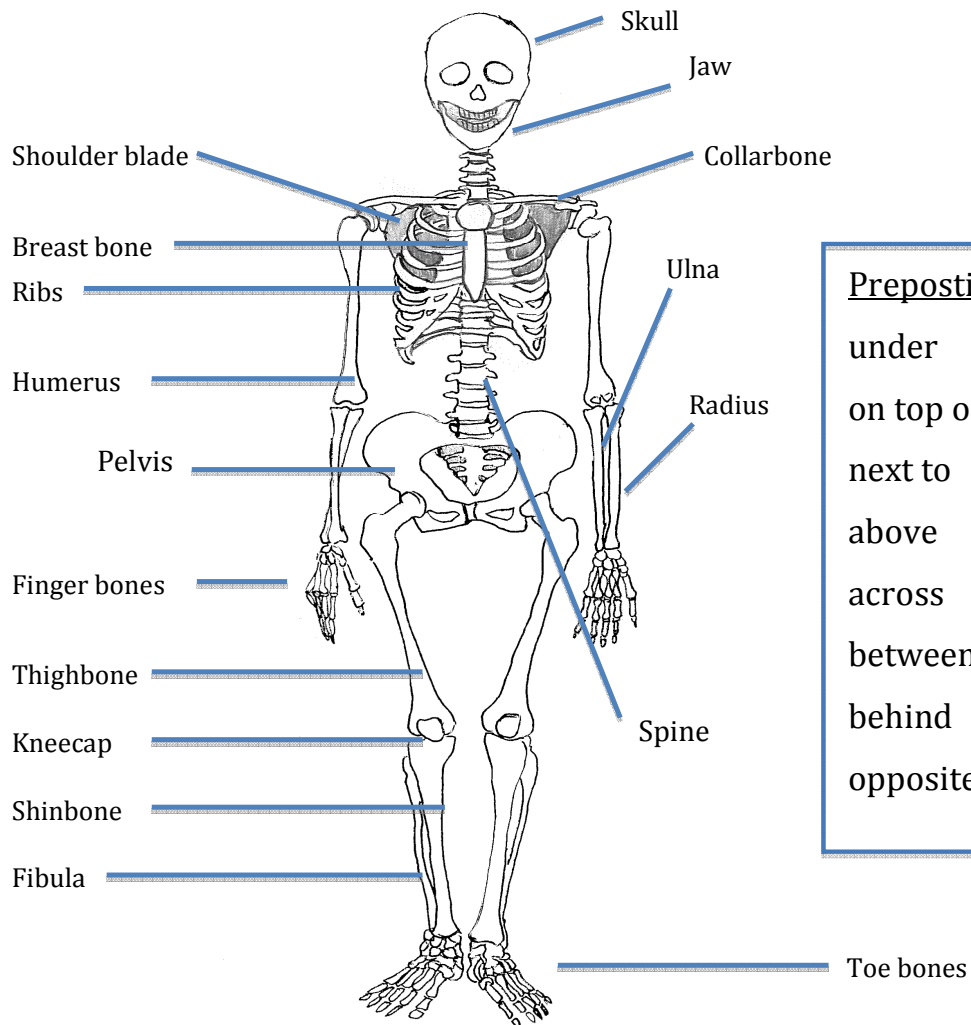
Other:

- The difficulty level can be increased with not showing the helping prepositions or the names of the bones or the helping sentences.
- Also not all of the bones have to be used in the exercise and the names in the picture can be covered.

WHICH BONE?

1. Choose 5 bones with your partner.

2. Write the names down on your sheet.

3. Guess the other pair's bones.

       - use prepositions to locate the bone

       - take turns in guessing

4. The pair that guesses all the bones first wins.

Skull

Jaw

Shoulder blade

Collarbone

Breast bone

Ulna

Ribs

Humerus

Radius

Pelvis

Finger bones

Thighbone

Spine

Kneecap

Shinbone

Fibula

Toe bones

Prepostions:
under
on top of
next to
above
across
between
behind
opposite

HELP!

- Is the bone next to…? Are the bones..?

- Is the bone under…?

- Is it the (skull)?

Aims:

Content

- Key concepts

Language

- Negotiating
- Speaking
- Writing
- Using descriptive language, adjectives

Cooperative

- Goal interdependence
- Group skills: Sharing ideas, taking turns, checking groups work e.g. the time frame
- Individual accountability (in the first group everybody is responsible for understanding the explanations and everybody needs to be able to tell them to others)

Procedures:

- Part one: groups of 3
- The group needs to choose 3-5 bones and create explanations for them. At least 3 sentences per bone.
- The group needs to make sure everybody chooses and participates in the creation of the explanations. They also need to make sure they get through the first part in time.
- Part two: new groups of 3-4
- Using the explanations made in part one, each member of the new group tries to explain the bones and the rest guess.
- APPENDIX C can be used as help.
- Depending on the time available, each member can explain for example only two bones etc.

The CLIL Matrix:

2 X	3
1	4

WHICH BONE?

PART 1

1. Form groups of _____
2. Choose 4-5 bones in your group.
   o Everybody chooses
3. Create explanations for the bones.
   o Use simple sentences

   e.g. This bone is big.

   It is in the lower part of the body.
   o Write them down!
4. Use max _____ min. Make sure you make it!

PART 2

1. Form groups of _____
2. Explain the bones to the others.

   -Take turns
3. The others guess.

Aims:

Content

- Key concepts, joints
- What in the body?

Language

- Writing
- Speaking and discussion

Cooperative

- Goal interdependence
- Group skills: Taking turns, sharing ideas, paraphrasing

Preparations:

- Printed sheets either of the skeleton sheet (APPENDIX B) or the human body (APPENDIX A) and/or the *students' page*. One per group or per person.
- Access to dictionary or computer.

Procedures:

- Groups of 3
- The groups need to try to move their shoulder, knee and fingers. They can try it on themselves and/or on the others.
- Then they need to find out answers to the questions (shown on the *students' page*).
- They also need to color on their printed sheet the places where they can find movement.
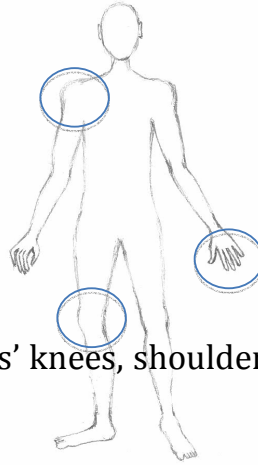
The CLIL Matrix:

2 X	3
1	4

EXPLORE YOUR BODY

1. **Move** your
- knee
- shoulder
- fingers.

Try to move your group members' knees, shoulders and fingers too.

2. What is **different** or **similar** in the way these parts move? Discuss and write down the answer.

    (go around, back and forth…)

_____

_____

_____

Answer with a full sentence!

3. **Do bones move**? Why, why not?

_____

_____

_____

Answer with a full sentence!

4. What are the parts where the movement happens called? Write the answer down with your group or discuss.

_____

Answer with a full sentence!

5. Where else can you find these parts? Mark in the picture!

The CLIL Matrix:

2	✗ 3
1	4

Aims:

Content

- Purpose of bones
- Structure of skeleton: how bones are connected
- What moves bones and how

Language

- Reading: summarizing, understanding
- Negotiating
- Writing: Summarizing, modifying information
- (Presentation, clear speech)

Cooperative

- Resource interdependence
- Group skills: asking help or clarification, summarizing out loud, criticizing ideas
- (Presentation: goal interdependence, individual accountability as everybody should participate in the presentation)

Preparations:

- Printed and cut sheets of the resource material

Procedures:

- Groups of 3
- Each group member gets their own piece of information which has facts about bones and their purpose etc.
- Each member needs to read the info and decide what is important in it.
- Then the group needs to come together and collect a common leaflet which combines the most important things about bones
- The handout can then be copied to all group members.

Other:

- The product can then be introduced to others in class which adds dimensions to the aims
- The exercise can also be executed so, that the members who receive the same piece of information, can cooperate in learning their content. Then together they can also discuss and decide what is important in their piece of information in their opinion.

WHAT ARE BONES FOR?

- Work in groups of 3
- Each group member gets a **text** that tells about **bones.**
- **Read** the text.
- **<u>Underline</u>** the important things.
- **Explain** the things to you group.
    - o Don't explain everything. Only the most important things.
- You have _____ min

- Together decide what are **the most important facts**
- **Make a handout**.
- You have _____ min
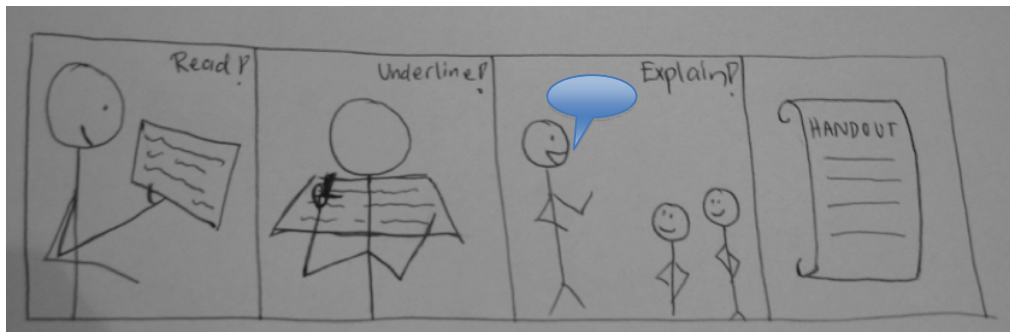
BONES:

People have over 200 bones. The bones are very different from each other. Bones are very hard and they support the human body. Some bones also protect the organs (sisäelimet). For example, the brains, lungs and heart are protected by bones. The spine protects the spinal cord.

BONES:

Bones are very hard and they don't bend. Bones are connected to each other through joints. There are joints all around human body: for example the knee joint and shoulder joint. In the joints the bones are close to each other. In between the bones there is fluid to help the movement. Ligaments (nivelsiteet) attach the ends of the bones together.

BONES:

Bones can't move on their own. They need muscles to move. Muscles are connected to bones by tendons. The muscles are often attached to two different bones. When the muscle contracts it pulls the bones and the bones move. For example, when the bicep contracts, it pulls the radius and bends your arm. When the tricep contracts the arm goes straight.

DIGESTIVE SYSTEM

Vocabulary:

suu	= mouth
hammas, hampaat	= tooth, teeth
sylki	= saliva/spit
niellä	= swallow
ruokatorvi	= gullet
maha	= stomach
ruuansulatusneste	= digestive juice
bakteeri, bakteerit	= bacterium, bacteria
pilkkoa	= cut
suolisto	= intestines
ravintoaine	= nutrient
sokeri	= sugar
rasva	= fat
valkuaisaine	= protein
elimistö	= system
ohutsuoli	= small intestine
paksusuoli	= large intestine
peräsuoli	= rectum
uloste	= faeces (mon br), feces (mon am)
maksa	= liver
jäte	= waste

Aims:

Content

- Introduction to the concept of **digestion**

Language

- Discussion

- Word formation

Cooperative

- Goal interdependence: Environmental interdependence

- Group skills: sharing ideas and opinions, encouraging others to participate, expressing support and acceptance, energizing the group

Preparations:

- Print out the letters, cut them and hide them.

Procedures:

- Groups of 4

- The group should find the hidden letters from different parts of the classroom.

- The letters are color coordinated so that each group has their own color. Thus, they should only collect the letters which are in the color given to them.

- The groups should be told how many letters they need to find, i.e. the "FOOD"-groups need to find four letters and "ENERGY"-groups five.

- After finding each letter the groups should bring the letter to their "home nest" where they finally can solve the puzzle.

- They need to figure which word can be formed from the letters.

- In the end the class, as a whole, should discuss how the two concepts "FOOD" and "ENERGY" relate to each other.

- Finally the concept of digestion can be presented to the class: When **food** is made into **energy**, it needs to be **digested**.

Other:

- This exercise can function as an introductory exercise.

- All of the groups can also find both words. Then the small group can figure out the relation between the words "FOOD" and "ENERGY".

The CLIL Matrix:

2 X	3
1	4

DIGESTION

F	O	O	D
F	O	O	D
E	N	E	R
G	Y	E	N
E	R	G	Y
E	N	E	R
G	Y		

Exercise 3. ALIAS

Aims:

Content

- Key concepts
- Facts about the digestive system

Language

- Reading
- Explaining
- Vocabulary
- Listening comprehension

Cooperative

- Goal interdependence
- Group skills: taking turns

The CLIL Matrix:

2	3
1	4

Preparations:

- Printed sheets of the *students' page* in case there is no opportunity to use a projector to show the picture to all at the same time
- Dictionaries

Procedures:

- Groups of 2
- The pair should first get to know the facts and vocabulary on the *students' sheet*.
- If there are words (in blue) or sentences (in green boxes) that they do not understand they can check them in a dictionary. However, the idea is not that they should translate everything word to word. The most important thing is to get familiar with the material.
- After a short familiarization, the students can start explaining the words to each other taking turns. They can use the sentences in the boxes as help in explaining. Also they can explain the location.
- After a couple of rounds or in the following lesson the students can try to explain the words without the sheet. Then APPENDIX C can be used as help to remind which organs should be explained.

ALIAS

SPIT COMES FROM THESE

MOUTH

- In the **mouth** the food is mixed with **spit**.
- Spit makes the food easy to swallow.
- The spit **digests** the food a little.

- The food does not travel through the **liver**.
- The liver **cleans** the blood.
- Blood transfers the **nutrients** into the body
- The liver cleans the toxic things that are in the blood.

GULLET

- In the stomach digestive juices mix into the food.
- The **digestive juices** make the food warm.
- The digestive juices help to split the food into smaller pieces.

LIVER

- In the **intestines** the **food digests** into pieces (sugars, fats, proteins) called the **nutrients**.
- In the **small intestine** the nutrients get into the **blood circulation**.
- Through the blood circulation the nutrients go where they are needed.

STOMACH

RECTUM

LARGE INTESTINE

SMALL INTESTINE

- The waste travels through the large intestine into the **rectum**.
- From the rectum the **waste leaves** the body

- From the small intestine the food travels into the **large intestine**.
- In the large intestine **water separates** from the food and goes into the blood circulation.
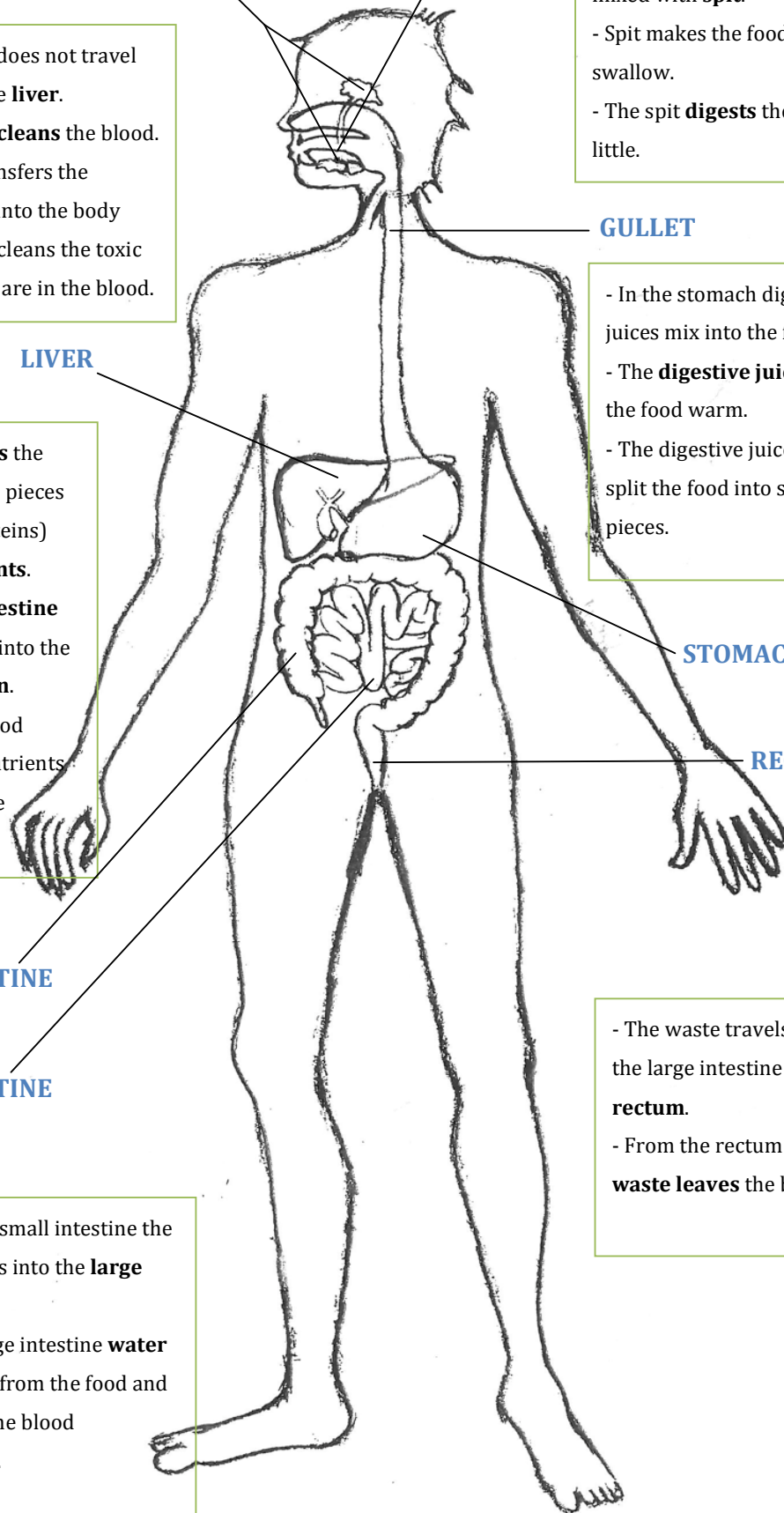
Exercise 3. STORY OF MR./MRS. KEY

Aims:

Content

- Function of the different organs

Language

- Present tense or past tense

- Listening

- Clauses

- Storyline

- Vocabulary

Cooperative

- Goal interdependence

- Group skills: elaborating (relating the story to something already learned), planning out loud, integrating ideas, paraphrasing

Preparations:

- The students need a notebook to write the story on.

- (Printed sheets of the *students' page* from exercise "ALIAS" or APPENDIX C.)

Procedures:

- Groups of 3

- The idea in this exercise is to **write a short story about Mr./Mrs. Key who travels through the digestive system. He/she is accidently swallowed by someone mixed in with food. Since he/she cannot be digested he/she sees what happens in the digestive system and what happens to the food around him/her.**

- The story (**bolded** above) should be told to the students first and then they can begin to write the story together.

- The students need previous knowledge on this before executing the exercise. However, for example, the *students' page* from exercise "ALIAS" can be used as help. If the students already know the facts well APPENDIX C can be used as help.

- The students can write the story in the present or past tense, depending on their language abilities.

The CLIL Matrix:

	X
2	3
1	4

- The *students' page* includes questions to help the students write the story.
- A number of sentences that need to written should be added to the instruction.
- Finally the stories can be presented to the rest of the group.

STORY OF MR. KEY

1. Listen to the story.
2. Write what happens to Mr./Mrs. Key in the digestive system.

Here are some questions to help you write the story:
   a. Where does Mr./Mrs. Key go? What organs does he/she meet? Remember the names?
   b. In what order does he/she meet them?
   c. What happens to him/her in the different places? _____ sentences per organ.
   d. How does he/she get out of the system.

3. Present your story.

Exercise 4. DRAW A PICTURE TOGETHER

Aims:

Content

- Key concepts
- Placement

Language

- Vocabulary
- Negotiation

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, express support and acceptance, helping the group remember

The CLIL Matrix:

2	3
1	4

Preparations:

- Printed sheets of the human figure APPENDIX A.
- Color pens (optional)

Procedures:

- Groups of 3
- The students should draw a picture of the digestive system on the empty human figure (APPENDIX A).
- They should try to remember which organs are part of the digestive system and where they are situated.
- They should also try to remember the order in which food and nutrients go through the digestive system. (What is the route?)
- The *students' page* includes the instructions the students need to follow to complete the exercise. It also includes helping questions.

Other:

- In case the exercise is too difficult to be executed with the empty human figure APPENDIX C can be used as help.
- This exercise should be used for revision.

DIGESTIVE SYSTEM

Fill in the digestive system on the human figure.

1. Try to remember:
    a. Which organs are part of the digestive system?
    b. Where are they situated?
    c. What is the route of food in the digestive system?
2. Draw them on the figure.
3. Name the organs.
4. Draw an arrow (→) to show the route that food travels.

CIRCULATORY SYSTEM

Vocabulary:

sydän	= heart
nyrkki	= fist
pumpata	= bump
supistua	= contract
kiertää	= circulate
syke	= pulse
rasitus	= strain, stress
verisuoni	= blood vessel
valtimo, valtimot	= artery
aortta	= aorta
hiussuoni, hiussuonet	= capillary, capillaries
laskimo, laskimot	= vein
verineste	= plasma, plasm
punasolu	= red blood cell
valkosolu	= white blood cell
verihiutaleet	= platelet
haava	= cut
hyytymä	= clot
rupi	= scab
mustelma	= bruise

Exercise 1. PULSE

Aims:

Content

- Key terminology
- Measuring of pulse
- The concept of blood flow and heart beat

Language

- Discussion
- Vocabulary

Cooperative

- Goal interdependence
- Groups skills: taking turns, integrating ideas into single position

The CLIL Matrix:

2	3
1	4

Procedures:

- Groups of 3
- The students should first check their pulse while resting.
- They should mark down the amount of heartbeats per minute by each member of the group.
- Then they should do 20 X-jumps and check the pulse again.
- Then they should compare the results and discuss what happens and why.
- The *students' page* includes step-by-step instructions on what to do and questions to help the students discuss the issue.
- The students should come into some kind of common conclusion on the discussed issue.
- Each member should prepare himself/herself to present the group's ideas to the rest of the class.

Other:

- This exercise can be used as an introductory exercise.

PULSE

1. Check your pulse

- Put your **fingers** on the side of your **neck**

  or on the side of your **arm**.
- When you feel the **pulse** you need to **count** it.
- **One of you takes time** and the **others count**:
  - o How many times does the heart beat in a minute?
- Mark down your answers.

2. Jump 20 X-jumps

3. Check your pulse again

- Mark down your answers.

4. Answer the questions.

- What do you notice?
- Does something change? Why?
- What happens in the heart?

Exercise 2. BLOOD FLOW

Aims:

Content

- Key concepts
- The direction of blood flow

Language

- Reading comprehension
- Vocabulary
- Some plural forms

Cooperative

- Goal interdependence, (resource interdependence)
- Group skills: offering to explain, summarize out loud, integrating ideas

Preparations:

- Printed sheets of the *students' page.*

Procedures:

- Groups of 4
- The first page for the students includes the instructions for the exercise.
- The second *students' page* includes a description on how blood flows. In the description the key terms are bolded.
- The students should read the story and place the bolded terms in the correct places.
- The text is divided into four sections. Thus, the students in the group can each pick a section to read through and understand, after which the pieces of information should be put together.
- The places are marked with lines that point on the correct spots in the picture that is also on the *second students' page*.
- In addition, the students should add colors into the picture. They should color the blood with oxygen (the arteries) with red color and the blood without oxygen (the veins) with blue color.
- Finally the students should also mark the direction of the blood flow.

Other:

- In case it is seen necessary, the students can be provided with the vocabulary lists.

The CLIL Matrix:

2 X	3
1	4

BLOOD FLOW

1. In your groups, read and understand the text.

2. Mark the **bolded terms** into the picture.

3. Color the arteries with red color. (the blood with oxygen)

4. Color the veins with blue color. (the blood without oxygen)

5. Mark down the direction of the blood flow with arrows (→).

BLOOD FLOW

The heart muscle bumps blood into the body. When the heart contracts the blood goes from the **left side of the heart** into a blood vessel called **the aorta**. The aorta is an artery. There are many arteries in the body.

      Arteries take the blood that has oxygen into the body. In the small blood vessels (**the capillaries**) the oxygen goes into the cells and carbon dioxide comes into the blood vessels.

      The blood vessels that transport the blood with carbon dioxide are called **veins**. The veins take the blood back into the heart. The blood is returned into the **right side of the heart**.

      The heart and lungs interact so that the carbon dioxide gets away from the blood and oxygen gets into the blood.

left side of the heart
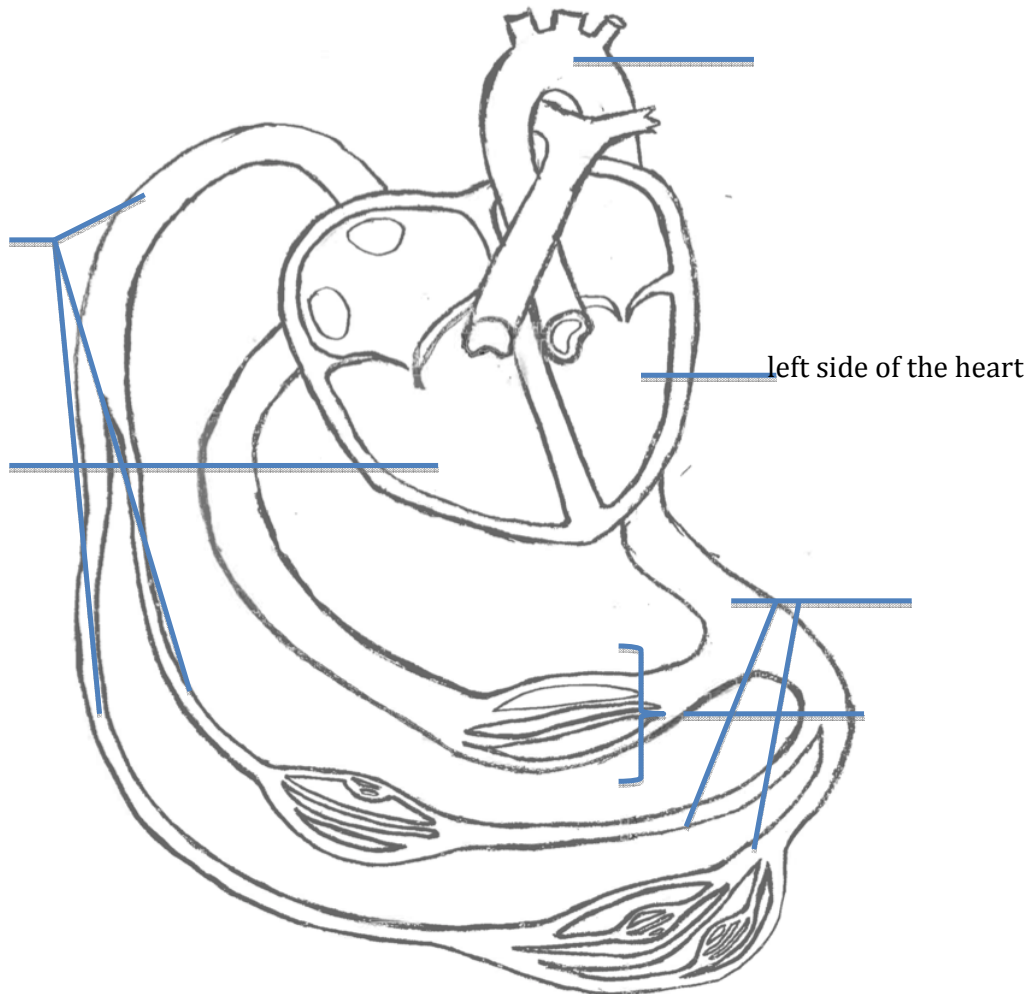
Exercise 3. BLOOD CIRCULATION

Aims:

Content

- The purpose of blood flow

Language

- Reading
- Negotiation
- Storytelling
- (Writing)

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, paraphrasing, asking others to plan out loud, criticizing ideas (not people)

Procedures:

- Groups of 2
- The students should make up a story based on the pictures on the *students' page*. (written or oral)
- Then they should read a description on blood flow and substance exchange that happens in the capillaries.
- Then they should discuss how they would change the original story or write or tell a completely different new story.
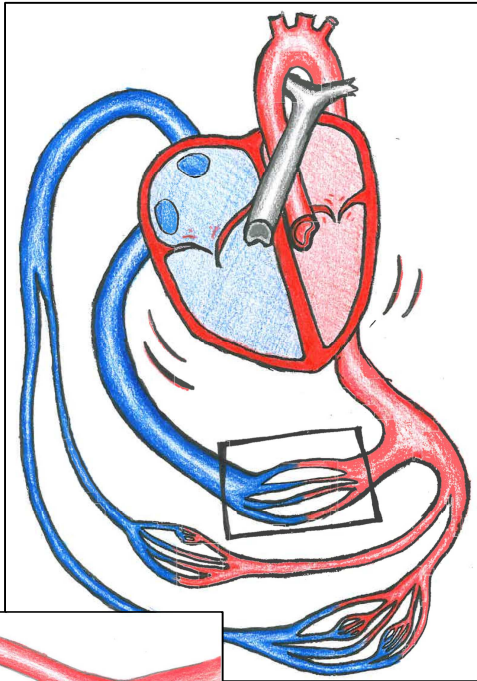
Other:

- The exercise can be used with or without previous knowledge on this issue.
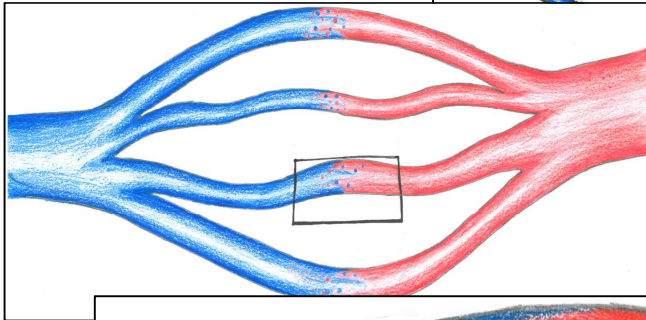
The CLIL Matrix:

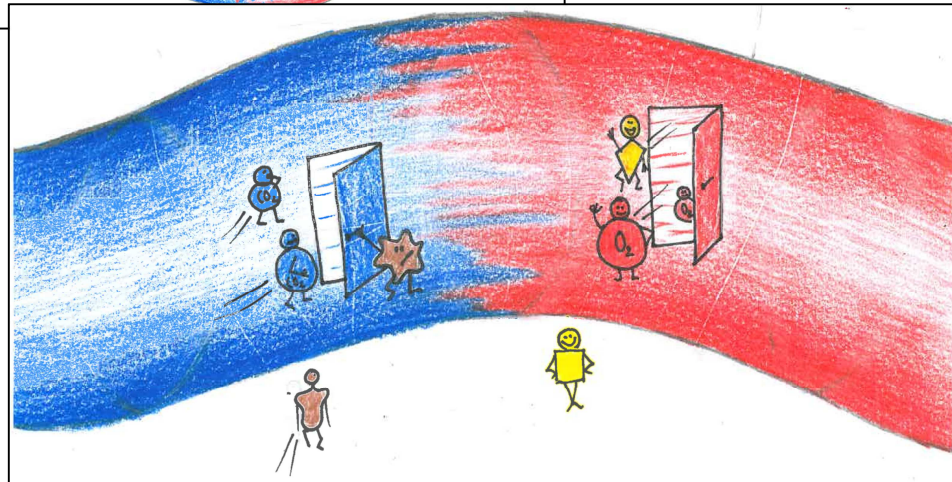|	
2	3
1	4

BLOOD CIRCULATION

1.

2.

3.

What happens in the pictures? Make up a story in your group.

Read through this text.

The heart muscle pumps blood into the body. When the heart contracts the blood that has oxygen goes from the heart into the body. The blood travels in **arteries**.

In the small blood vessels (**the capillaries**) the **oxygen** (O) and **nutrients** go into the cells and carbon dioxide and waste come into the blood vessels.

The blood vessels that transport the blood with carbon dioxide are called **veins**. The veins take the blood back into the heart.

Make up a new story about the pictures. How would you change the old story?

Exercise 4. CUTS AND BRUISES

Aims:

Content

- Key concepts
- What is a bruise.
- How do cuts and bruises heal.

Language

- Discussion
- Reading

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, paraphrasing, offering to explain or clarify, giving direction to the group's work, planning out loud

Preparations:

- Access to a computer

Procedures:

- Groups of 3
- The students first need to discuss if they have any cuts or bruises.
- Then they need to think about how one gets them.
- Then the group should find out more about cuts and bruises using google search, for example. Suitable search words are for instance
    o cut healing
    o bruises
- Then they should present their findings to another group and discuss whether they had similar results or not.

Other:

- The teacher should pay attention to the students while they use the search machines in order to avoid going on inappropriate sites.
- However, the mentioned words have been tested in google and many appropriate sites appear among the very first search results.

The CLIL Matrix:

2	3
X 1	4

CUTS AND BRUISES

Discuss in your group,

- Do you have cuts or bruises?
- When do you get them?

Find out in your group:

- What happens to a cut when it heels?
- What is a bruise?
- How long does a bruise last?

Present your findings to another group.

Did you have the same answers?

RESPIRATORY SYSTEM

Vocabulary:

keuhko, keuhkot	= a lung, lungs
hengittää	= breath
nenäontelo	= nasal cavity
henkitorvi	= windpipe
keuhkoputkiet	= bronchial tubes
hengittää sisään	= inhale
hengittää ulos	= exhale
pallealihas	= diaphragm
happi	= oxygen
hiilidioksidi	= carbon dioxide
keuhkorakkula	= alveolus
vesihöyry	= steam
nuha	= cold
yskä	= cough
yskiä	= cough
allergia	= allergy
laajeneminen	= expansion
laajeta	= expand
supistuminen	= contraction
veltto	= limp
rasitus, rasittaa	= stress

Aims:

Content

- What happens physically while breathing

Language

- Discussion
- Terminology

Cooperative

- Goal interdependence.
- Group skills: sharing ideas and opinions, asking for facts and reasoning

The CLIL Matrix:

2	3
1	4

Preparations:

- Printed sheets of the *students' page*, one per pair.

Procedures:

- Groups of 2
- The students' should observe their bodies and what happens in them when they breathe in and out.
- They should put their hands on their chest and belly, try for them selves and observe the partner.
- The *students' page* includes questions that the pair should find answers to.
- Then, the pair should color in the picture the lungs with blue color and the diaphragm with red color.
- Also they should connect the terms "lungs" and "diaphragm" to their place. The term "lungs" might be more familiar to the students and help them connect the terms to correct places.
- Finally the students should fill in the gaps in the sentence which introduces the idea what happens in lungs and the diaphragm during breathing.

Other:

- In case it is seen appropriate the translations of the terms could be introduced to the students since the term and concept of "diaphragm" might be unfamiliar for the students.
- This exercise can work as an introductory exercise for the respiratory system.

FEEL THE BREATHING
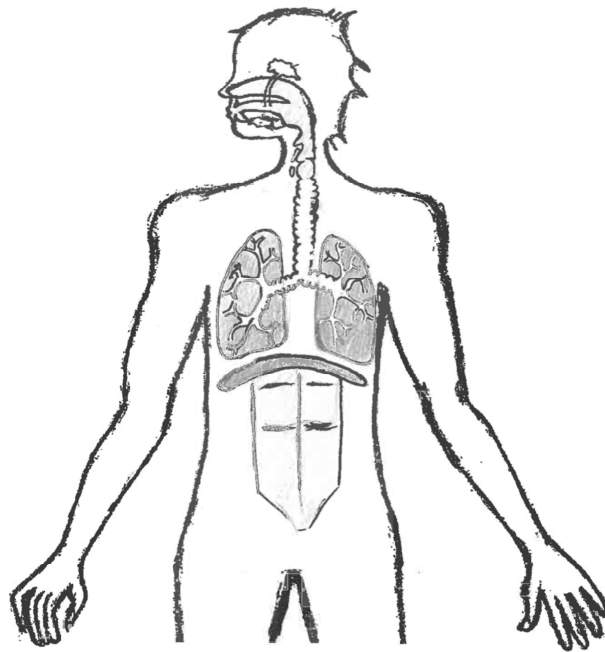
1. Put your hand on your chest and stomach. Feel what happens.
2. See if the same thing happens with your partner.
3. Answer the questions with your partner:
    a. What happens under your hands?
    b. What expands (laajenee)?
    c. Why?

_____

Color the **lungs** with blue color.

Color the **diaphragm** (pallealihas) with red color.

The _____ and the _____ expand while breathing.

Exercise 2. OUT OF BREATH

Aims:

Content

- What is breathing for?
- What happens to breathing during exercise and why?

Language

- Discussion
- Terms: breathe, breathing, stress
- Reading

Cooperative

- Goal interdependence.
- Group skills: taking turns, sharing ideas and opinions, integrating ideas

Preparations:

- The group needs a sheet to mark the results on. For example a printed *students page* could be used as the sheet.

Procedures:

- Groups of 4
- First the group should discuss why people breathe, what is breathing for.
- Then each member of the group should count, with the help of others, the amount of breaths per minute while they are calm and sitting down.
- The amounts should be marked down.
- Then each group member should jump 20 X-jumps after which the breaths should be counted again.
- After that the group should discuss if they can see changes between the results. Furthermore, they should discuss why the possible changes take place.

Other:

- The instructions for the students include quite a bit of text. Thus, this exercise can be used to improve reading comprehension.
- The instructions can be given to the students in pieces not to overwhelm them.

The CLIL Matrix:

2	3
X 1	4

OUT OF BREATH

1. Discuss in your group:

- Why do people breathe?

_____

2. Count **how many breathes** you take **in a minute** when you are **sitting** down.

Mark your answers down.

_____

3. Jumping **20 X-jumps**. Take turns. 2 people jump 2 wait then change.

- After the jumps, count **how many breathes in a minute** you take now.

Mark your answers down.

_____

4. Together **answer** the questions:

- Can you notice a difference in the results?
- So, what happens to breathing, when the body is stressed (rasittaa)?
- What could cause this?

Exercise 3. THE ROUTE

Aims:

The CLIL Matrix:

2	3
1	4

Content

- Key concepts
- The route of air and oxygen

Language

- Discussion
- Vocabulary
- Listening

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, encouraging others, expressing support and acceptance

Preparations:

- Printed sheet of the *students' page.*

Procedures:

- Groups of 2.
- First the students should think about breathing. They should be instructed to think about the air around us. Then they should think how it travels inside of us. → These instructions should be given orally, in order for the students to practice their listening comprehension.
- The students need to come up with a list of the places where air goes when breathing.
- After this a picture of the upper body should be handed to them (the *students' page*). There they can mark the places they already thought of (e.g. nose, mouth, lungs…).
- Then they should fill in the rest of the places. The *students' page* includes a word bank in order to help the student figure out the terms. The bank can be excluded if the students' language skills are appropriate.
- Finally the students should mark the direction of the airflow. From the air outside the people to the lungs and back. If they already have knowledge on the circulatory system, they can also include it into the route of the airflow.

THE ROUTE

Fill in the names of the places where the air goes.

Mark the route with an arrow.
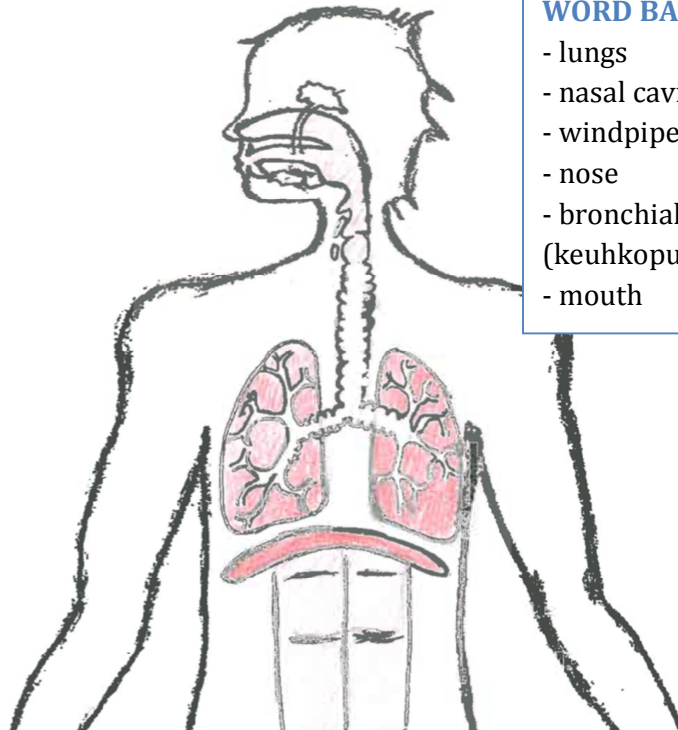
THE ROUTE

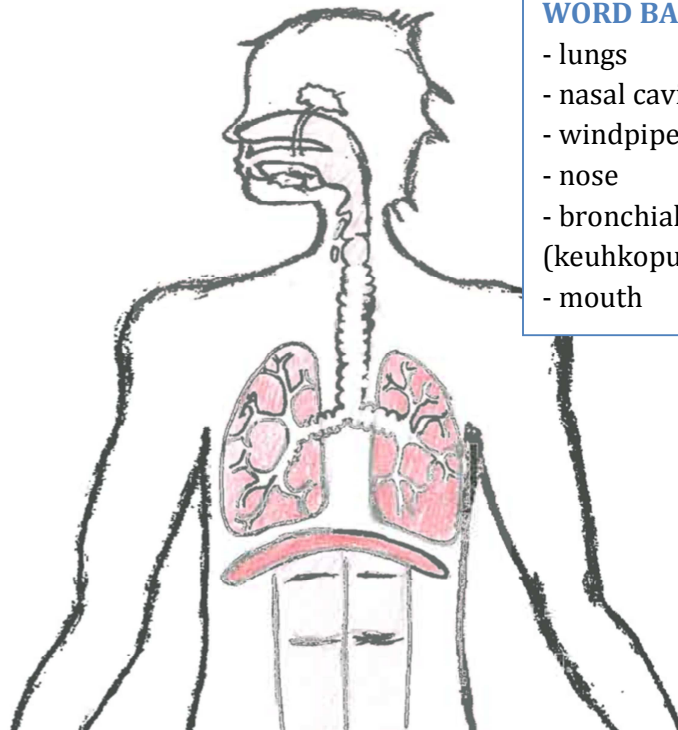Fill in the names of the places where the air goes.

Mark the route with an arrow.

WORD BANK:
- lungs
- nasal cavity (nenäontelo)
- windpipe
- nose
- bronchial tubes (keuhkoputket)
- mouth

Exercise 4. LUNGS: Purpose and function

Aims:

<u>Content</u>

- Purpose and function of lungs

<u>Language</u>

- Explaining
- Reading
- Writing
- Vocabulary

<u>Cooperative</u>

- Resource interdependence
- Group skills: sharing ideas and opinions, paraphrasing, summarizing out loud, asking to plan out loud, criticizing ideas (not people), integrating ideas, checking for understanding, asking help or clarification, offering to explain or clarify

Preparations:

- Printed and cut sheets of the *students' page*. Each student should have his or her own piece of information. Each pair should have two different information sheets.
- Dictionaries

Procedures:

- Groups of 6 (three pairs) or groups of four (two pairs)
- In this exercise the purpose is to utilize expert and home groups. Depending on the language skills of the students, the class can be divided into groups of six or four.
- In case the class is divided into groups of six, three students can work together to translate and understand the information given to the expert group. In case the class is divided into groups of four, only two people belong to the expert group.
- Regardless of how the class is divided, the home group is a pair. Each member of the pair is given different piece of information
- First the students need to form home group pairs, then move into expert groups.

The CLIL Matrix:

2	3 X
1	4

- In expert groups the students find out what their pieces of information are about.
- Then the students move back into home groups and explain what they have learned in the expert group.

Other:

- This exercise can be rather demanding, but is good for students with strong language skills.
- The information sheet for student A is a little easier in terms of language and content. It is also somewhat shorter.
- The cartoon from exercise 5. "What are bones for?" can be used as help also in this exercise if necessary.

LUNGS: Purpose and function

1.

- **Home group**: work in pairs
- Both group members get a **text** that tells about **lungs.**

2.

- Move into **expert groups.**
- In the expert group:
    - **Read** the text.
    - **Underline** the important things.
    - **Translate** if necessary.
    - **Make sure all** of you **understand** everything.

3.

- Go back to you **home group**.
- **Explain** what you learned to your partner.
    - Don't translate or explain everything. Only the most important things.
- Make sure both of you understand everything.

Why are we breathing?

Our cells use nutrients to function. They can't function if they don't have oxygen. Oxygen helps the cells cut down the nutrients. With oxygen the cells cut the nutrients into pieces that can be used easily in the cells.

After using the nutrients, some waste is formed. The waste that goes away from the body through lungs is called carbon dioxide. When we exhale carbon dioxide and some water leaves the body.

What happens in the lungs?

People have two lungs. Inside the lungs there are many bronchial tubes. When we breathe in (inhale), the air flows into the lungs. In the lungs the air travels to the ends of the bronchial tubes.

The ends of the bronchial tubes are surrounded by blood vessels. The ends of the bronchial tubes and the blood vessels exchange gasses (oxygen and carbon dioxide). The oxygen goes into the blood and the waste, carbon dioxide, comes from the blood into the bronchial tubes. When we exhale, the carbon dioxide leaves the body.

NERVOUS SYSTEM

Vocabulary:

elin	= organ
hermosto	= nervous system
aivot	= brain
selkäydin	= spinal cord
keskushermosto	= central nervous system
hermo, hermot	= nerve, nerves
aistit	= senses
ajattelu	= thinking
oppiminen	= learning
muisti	= memory
tunteet	= feelings
liikkeet	= movements
toiminta	= function
refleksi	= reflex
react	= reagoida

Aims:

Content

- The concept of reflex.
- What is a reflex.

Language

- Discussion
- Vocabulary
- Reading

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, expressing support and acceptance, integrating ideas

The CLIL Matrix:

2	3
✗ 1	4

Preparations:

- Printed sheets of the *students' page*.

Procedures:

- Groups of 2
- The pair is instructed to tap each other under the kneecap. The person being tested needs to be sitting, for example, on a table so that the legs are hanging in the air relaxed.
- The knee reflex should cause the leg to rise.
- Then the pair should discuss what causes this. Do they have any previous knowledge? What is the phenomenon called?
- Then the pair should fill in the gaps in the sentences found on the *students' page*.
  - When you tap under you knee cap, a <u>reflex</u> causes the leg <u>to rise.</u> The <u>reflexes</u> help people…

Other:

- This exercise can be used as an introductory exercise for the nervous system.

TAP THE KNEE

1. One person needs to sit on a table.
2. The other should <u>gently</u> tap the partner under the knee cap.
3. Take turns.
4. Discuss:
   a. What happens?
   b. What is this called?
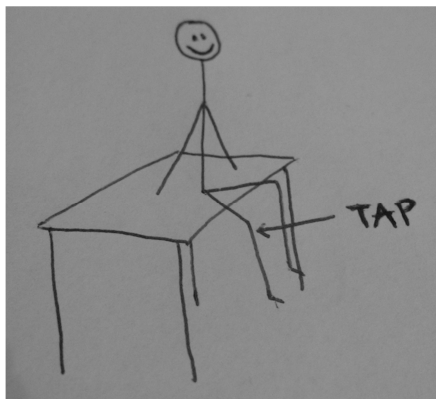
When you tap under your knee cap, a _____

causes the leg to _____. The _____

help people to react on different things faster because the message

does not have to go to the brain. The message only goes to the

spine.

Exercise 2. NERVOUS SYSTEM

Aims:

Content

- The organs and their placement

Language

- Vocabulary

Cooperative

- Goal interdependence
- Group skills: helping the group to remember, expressing support and acceptance

Preparations:

- Printed sheets of the human figure (at least one per group)
- Printed sheets of the *students' page* (at least one per group)

Procedures:

- Groups of 3
- The students need to cut the parts of the nervous system from the *students' page* and glue them on the human figure on the correct places. They should help each other remember where the parts belong and what the names are.
- Then they should find the correct term for the organ from the word bank.
- The spinal cord should start from the middle of the brain!

Other:

- This exercise functions best as a revising exercise.

The CLIL Matrix:

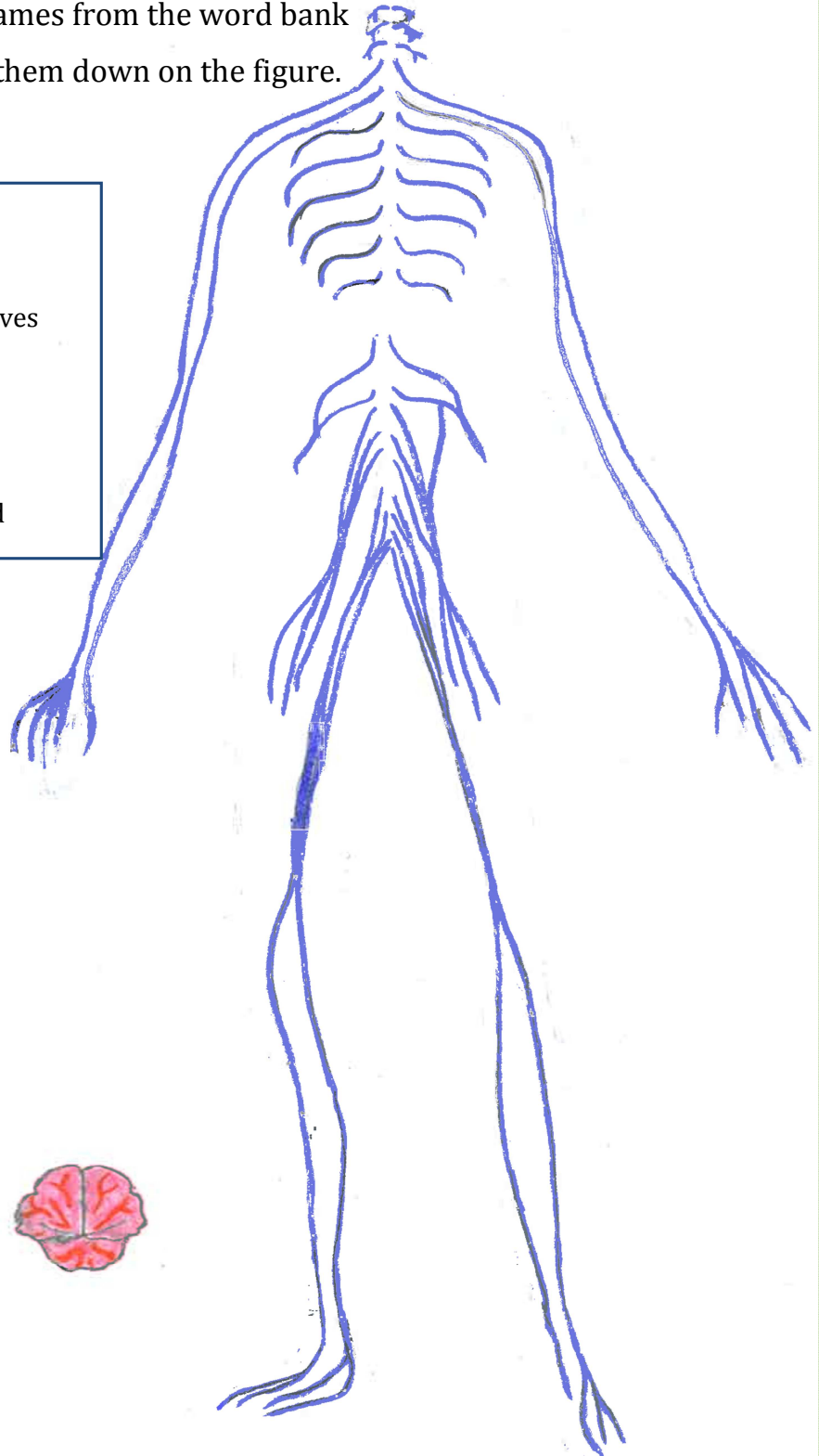|	
2	3
1	4

NERVOUS SYSTEM

1. Cut the pictures.

2. Place and glue them on the correct places on top of the human figure. Discuss where each part belongs!

3. Find the names from the word bank and write them down on the figure.

WORD BANK:

nerves

brain

spinal cord

Aims:

<u>Content</u>

- Using brains
- Memory

<u>Language</u>

- Listening comprehension
- Discussion

<u>Cooperative</u>

- Goal interdependence
- Group skills: sharing ideas and opinions, integrating ideas, extending answers/ideas, help the group remember, encouraging others to participate

Preparations:

- The students need something to make notes on.
- One paper where the mind maps can be combined into the group's common mind map.

Procedures:

- Groups of 3
- The teacher should read the story once or twice.
- Then the students need to make themselves a mind map according to what they remember.
- Then they should combine the mind maps into a new mind map for the group.
- Then they should discuss the process.
- The question and instructions for the students can be found from the *students' page*.

The CLIL Matrix:

2 ✗	3
1	4

THE STORY:

It was a lovely spring afternoon. Miranda was wearing her favourite green blouse. She had just gotten it for her 12th birthday. She was on her way to see her friend Michael, when suddenly as squirrel ran across the street with a huge, grey cat chasing after it. Miranda got scared and slipped on some ice that was still on the ground. Oh no! Now her new blouse was all muddy and wet. What would she do?

MEMORY

1. **Listen** to a story.

2. Make a **mind map** about **what you can remember**. (in English)
- Don't worry if you don't know how the words are spelled!

3. **Combine** the mind maps in your group. Make **new mind map** for the group.

4. Discuss:
- Was it difficult to remember the story?
- Did you remember different things in your group?
- What organ/s did you have to use in this exercise?

SENSES

Vocabulary:

aisti	= sense
näköaisti	= sight
kuuloaisti	= hearing
tuntoaisti	= touch
makuaisti	= taste
hajuaisti	= smell
nähdä	= see
kuulla	= hear
tuntea	= feel
maistaa	= taste
haistaa	= smell
kieli	= tongue
suolainen	= salty
makea	= sweet
hapan	= sour
karvas	= bitter

Exercise 1. AIM FOR THE CUP

The CLIL Matrix:

2	3
1	4

Aims:

Content

- Testing depth perception

Language

- Speaking

- (Writing)

- Understanding questions

Cooperative

- Role interdependence. Goal interdependence.

- Group skills: sharing ideas and opinions, integrating ideas

Preparations:

- Something to drop into a cup

- Cups for each pair

- Printed instructions

Procedures:

- Groups of 2

- The pair is first supposed to think about eyesight. Helping questions can be found on the *students' page*.

- Then they can test how it works.

- One member of the pair needs to be close to the cup which is about 70cm away from the other. The member close to the cup needs to move something above (about 50cm) the cup that they can drop in it.

- The movement should go towards and away from the student who is testing their sight, i.e. back and forth.

- The other member first covers one eye and tells when s/he thinks the object hits the cup. Then s/he does it with the other eye. Finally with both eyes opened.

- Then they switch.

- The findings of the experiment can then be discussed (and written down).

- The first section of the *students' page* is meant to be shown before testing. The second section after the testing. The instructions for the students for the actual test can be found on the second page.

AIM FOR THE CUP

Work in pairs.

<u>Answer the questions</u>:

- Do you think people can see **as well** with one eye **as** with two?
- Why do people have two eyes?

Test your sight.

_____

<u>Answer the questions</u>:

What did you notice?

What was difficult?

What was easy?

Why do people have two eyes?

<u>Testing sight</u>

<u>Preparations:</u>

- **Get a cup** and **an object** to drop in it.

- Put the cup about **70cm** away from you on the desk.

<u>The experiment:</u>

Member 1.

- Stand close to the cup.

- Hold the object **50cm** above the cup.

- **Move** the object slowly towards and away from your partner.

- **Drop** the object **when your partner thinks** it is above the cup.

Member 2.

- Sit about **70 cm away from the cup.**

- **Cover** your **left eye**.

- Your partner moves the object in the air.

- **Tell your partner to stop** when you think the **object is above the cup**.

- Do the same with your **right eye covered**.

- Finally, do the same with **both eyes open**.

Switch the roles!

Exercise 2. WHICH SOUND?

Aims:

Content

- Testing hearing
- Understanding hearing: it might not

  be as precise as we think or it might be more precise than we think.

Language

- Negotating
- Writing

Cooperative

- Goal interdependence
- Group skills: sharing ideas, expressing support and acceptance

Preparations:

- Access to different objects that the students can use in making sounds
- Printed sheets of the form (found on the *students' page*)

Procedures:

- Groups of 2-3
- If needed, the whole class can be provided with a list of objects that can
  be used in the exercise.
- The students can be encouraged to use everything they can imagine
  that they already have to make sounds and some objects can be
  provided to them. (Examples on the objects: books, pens, paper, cups,
  sand, beans, dices, bottles, rocks etc.)
- The students need to make up different sounds. They need to come to a
  common conclusion on a couple of different sounds that they will
  present for the rest of the class.
- After everybody is ready, each pair or group of three gets to present the
  sounds to the rest. The class should only be able to hear the sounds and
  not see what makes them and then they can guess the sounds.
- After each pair the guesses and correct answers should be checked.
- On the *students' page* there is also a form which can be used to mark
  the guesses on. The amount of sounds should be marked on the sheet.
- In the end a common discussion can be held on how accurate the
  guesses were and what that tells about hearing.

The CLIL Matrix:

2	3
✗ 1	4

WHICH SOUND?

In your group,

- think about objects that can be used to make sounds.
- try to make different sounds.
- decide _____ sounds that you will present to the whole class.

WHICH SOUND?		
	The guess:	The answer:
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Aims:

Content

- The cooperation of taste and smell

Language

- Speaking, stating opinion
- Adjectives

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, encouraging everybody to participate, integrating ideas
- Individual accountability: the discussion with the whole class creates a possibility to ensure individual accountability as all group members should be able to contribute if they are asked to.

Preparations:

- For example, onion and apple, sugar and eucalyptus pastille, lemon, salt etc. A little for each group.

Procedures:

- Groups of 3-4
- First some discussion on different tastes and how taste works → questions on *the students' page*
- Then the group should taste the chosen things. First without the help of smell, in other words, with the nose closed. Then with the help of smell.
- After tasting the group should discuss their findings.
- Either of the discussion parts can be also written down if necessary.
- The results should be discussed together with the whole class in the end.

The CLIL Matrix:

2	3
X 1	4

TESTING TASTE

- In your group discuss (keskustelkaa):
    o What does sugar taste like?
    o What does lemon taste like?
    o Do you taste well when you have the flu and your nose is stuffy (tukkoinen)?

Tasting:
- Close your nose.
- Taste one of the things given to you.
- Wait for a while.
- Taste the same thing with your nose open.
- Is the taste different?
- Make sure everybody gets to taste everything!

- In you group discuss:
    o What did the things taste like? Do you agree or not?
    o Were the tastes different with the nose closed and open?
    o Were the tastes stronger with the nose closed or opened?

Help!
It tasted like…

sour   bitter   salty

          sweet

Exercise 4. HOW DOES IT FEEL?

Aims:

Content

- Testing touch: how touch can be manipulated

Language

- Writing
- Speaking: describing
- Adjectives

Cooperative

- Goal interdependence, role interdependence
- Group skills: sharing ideas and opinions, integrating ideas into single position, generating further answers

Preparations:

- 3 buckets or some other containers per group
- Access to water
- Printed note sheets

Procedures:

- Groups of 3
- The group members need to fill the containers with warm, cool and cold water.
- The idea is that each group member tries out how it feels after their hand has been in warm/cold water and they put them in the cool water.
- There is a sheet to make notes on the *students' page*. And the students can take turns in making the notes and trying the experiment.
- Finally the students should look at the notes and answer the final questions (on the first *students' page*).
- The answers to the questions can be written down on the conclusions section of the notes-sheet.

The CLIL Matrix:

2	3
X 1	4

HOW DOES IT FEEL?

Preparations:

- Work in groups of 3.
- You have got 3 containers.
    - Fill one with cold water.
    - One with cool water.
    - One with warm water.
- Place the containers on your desk.
- Make sure you have a pen and a sheet to make notes on.

The experiment:

- Put your **left hand in the cold** water and **right hand in the hot** water.
- **Wait** for a while
- Then put **both hands in the cool** water.
- **Describe** to others how it feels.
- **One member** of the group **makes notes** when others describe the feeling.
- **Take turns** so that everybody gets to try!!

Finally:

- Together look at your notes.
- What do you notice?
- What did the cool water feel like in your left hand/ in your right hand?
- Where else can you have these feelings?

HELP!

I have noticed this when…

Name:	What does the cool water feel like? **Left hand:**	What does the cool water feel like? **Right hand**

Conclusions:

Name:	What does the cool water feel like? **Left hand:**	What does the cool water feel like? **Right hand**

Conclusions:

Aims:

Content

- What stimulates different senses

Language

- Vocabulary
- Speaking: negotiating

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, planning out loud, helping the group to move ahead, checking the group's work, expressing support and acceptance and criticizing ideas (not people)

Preparations:

- Color pens, colourful cardboard, paper, scissors, things that smell strong (for example soap, some foods etc.) for the students.

Procedures:

- Groups of 4
- In the group, using the material given to them the students should make up things that stimulate different senses.
- They can also draw pictures of things that, for example, smell, if they cannot actually make something smell.
- The teacher can decide on how many stimuli the students need to come up with.
- After this the group can demonstrate their products to the rest of the class and the others can guess the sense.

The CLIL Matrix:

2	3
1	4

WHICH SENSE?

1. In your group, **make up things** that **stimulate**
   a. sense of **smell**
   b. sense of **taste**
   c. sense of **sight**
   d. sense of **hearing**
2. Use the material given to you to create these things. (You can also draw pictures.)
3. **Negotiate** (neuvotelkaa) in your group:
   a. **Who** does **what**?
   b. **Which** things will you choose?
4. Give **feedback** on the ideas to your group mates! ☺
5. **Present the products** to the rest of the class. (Make sure all members of the group know the products and can present them!)
6. **Guess** which senses the others mean.

The CLIL Matrix:

2	3
1	4

Aims:

Content

- Facts about senses
- Reinforcing the vocabulary and understanding of different senses

Language

- Listening
- Understanding
- Vocabulary
- Writing
- Culture (This is the English version of a well-known game.)

Cooperative

- Goal interdependence
- Group skills: sharing ideas and opinions, encouraging everybody to participate, extending answers, generating further answers
- Individual accountability →everybody needs to present "the product"

Procedures:

- Groups of 3
- The students should make up commands in their group for the game "Simon says".
- All the commands should concern senses and there should be a few commands for each sense.
- Emphasize that the students all need to take part in making up the commands. In addition, everybody needs to understand what is said in them.
- The students need to write the commands down.
- Rearrange the groups into new groups of three or more. Taking turns each person can say his/her commands.

SIMON SAYS

Part 1

- Work in groups of _____.
- Make up 2-3 commands for each sense
    o sight
    o hearing
    o taste
    o smell
    o touch
- Write your ideas down.
- Make sure everybody gets to share ideas!
- Make sure everybody understands the commands!

Examples:

Simon says touch your toes.

Simon says smell a flower.

Simon says listen to music.

Part 2

- Work in groups of _____.
- Everybody plays "Simon" in their turn.
    o say the commands you have made up in part 1
- The rest of the group
    o act out the commands.

SYSTEMS COMBINED

Exercise 1. GROUP'S OWN HUMAN

Aims:

<u>Content</u>

- Revision of the different systems

<u>Language</u>

- Discussion

- Writing

- Vocabulary

- Cultural awareness: self vs. other

<u>Cooperative</u>

- Goal interdependence

- Group skills: helping group to remember, sharing ideas and opinions, integrating ideas, extending ideas generating further answers

The CLIL Matrix:

2	3
1	4

Preparations:

- Printed sheets of the human figure (APPENDIX A) in the size A3.

Procedures:

- Groups of 4 or more.

- The idea is that in the beginning of the theme of human biology the class is divided into base groups. In these base groups the students collect information on the different systems into one human figure.

- In other words, after dealing with each system, the base group gathers together to add information to their group's own human figure.

- The information can include notes and drawings.

- After the theme is completed the group gathers together to recall what has been learned.

- Then a personality and story can be created to the human figure:
    - o Hobbies; favourite food and drinks etc.
    - o How do these affect the different systems:
        - ▪ E.G. Tim runs a lot so he has good muscles and lungs. He also reads a lot, uses his eyes a lot and needs glasses. He drinks a lot of milk and has strong bones etc.

- This way the cooperation of the different systems can also be established.
- The *students' page* includes questions to help to write the story.

OUR PERSON

Discuss in your group,

        what have we learned ?

        what is similar in each human being?

        what can be different?

Write a story on your human being. Find help from the following questions.

1. What is his/her name?
2. Who belong to his/her family?
3. What are his/her hobbies?
4. What is his/her favourite food?
5. What is his/her favourite drink?
6. How do his/her hobbies, likes and lifestyle affect his/her systems?
7. Which systems work together in his/her hobbies?
8. Which systems work together while he/she eats?

Aims:

Content

- Revision of the different systems

Language

- Vocabulary
- Reading

Cooperative

- Outside enemy interdependence.
- Group skills: helping group to remember, sharing ideas and opinions, energizing the group

Preparations:

- Printed and cut memory cards

Procedures:

- Groups of 2 against 2
- This game is a traditional memory game where the students need to find corresponding pairs.
- There are few different ways how the pairs are formed:
  - o a picture and a term
  - o an explanation and a term (e.g. explanation on nervous system)
  - o a translation + explanation and a term. If needed, the translations can be erased from the cards.
- The cards should be placed on the table in a random order.
- Each time a pair of students finds a correct combination in the game, they can collect the cards. The pair with the most cards in the end wins the game.
- There are 15 pairs of cards in the game. The cards are situated on the *students' page* so, that the first part is on *the first students' page* and the explanation/picture/translation etc. is on *the second students' page*.

The CLIL Matrix:

2	3
1	4

MEMORY GAME

NERVOUS SYSTEM	DIGESTIVE SYSTEM	CIRCULATORY SYSTEM
SPINAL CORD	INTESTINES	SCAB
RESPIRATORY SYSTEM	TRICEPS	BLOOD VESSEL
DIAPHRAGM	CONTRACT	SENSES
RADIUS	BREASTBONE	TOUCH

|		THE SYSTEM THAT TRANSPORTS NUTRIENTS AND OXYGEN IN THE BODY.
PROTECTED BY THE SPINE.	THE TUBES THAT ARE A PART OF THE DIGESTIVE SYSTEM AND THAT START FROM THE STOMACH.	FORMS WHEN BLOOD CLOTS IN A CUT.
BRINGS OXYGEN INTO THE BODY AND TAKES CARBON DIOXIDE AWAY FROM THE BODY.	A MUSCLE IN THE BACKSIDE OF THE ARM	THE BLOOD FLOWS IN THESE.
THE MUSCLE BENEATH THE LUNGS THAT HELPS IN BREATHING. (PALLEA)	THE MUSCLES DO THIS WHEN THEY ARE WORKING.	TOUCH, SIGHT, HEARING, TASTE AND SMELL.
		THE SENSE OF FEELING.

The first cell reads: THE BRAINS, SPINAL CORD AND NERVES.

Aims:

The CLIL Matrix:

2	✂ 3
1	4
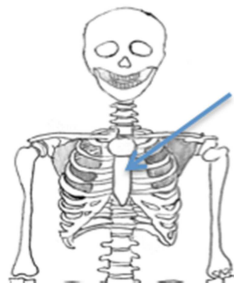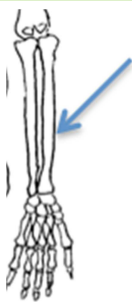
Content

- How do the different systems interact in the human body?

Language

- Discussion
- Writing
- Vocabulary

Cooperative

- Goal interdependence
- Group skills: shearing ideas and opinions, criticizing ideas (not people), expressing support and acceptance, helping the group to remember, seek accuracy extending answers, summarizing out loud

Preparations:

- Printed human figures for the groups (APPENDIX A)
- Color pens

Procedures:

- Groups of 3.
- The blank human figure can be used as the starting point for the exercise.
- The idea is that in the group the students discuss and try to remember the different systems in the human body. Then they should write them down on the paper or draw them in the human figure.
- They should think about the purposes of the different systems and write down the answers.
- In addition, they should discuss and think about how the systems relate to each other and write down ideas.
- Each member needs to be able to present the ideas of the group and the products of the different groups can be gone through together in the class.
- The groups filled out sheet could be copied to all members of the group.

SYSTEMS INTERACTION

Answer the questions in your group:

1. Which are the different systems in human body? (write down or draw)
2. What do the different systems do? Why are they all important?
3. How do the different systems work together?

Write the answers down on your sheet.

Answer with a full sentence!

Be prepared to **present** your answers.

_____

_____

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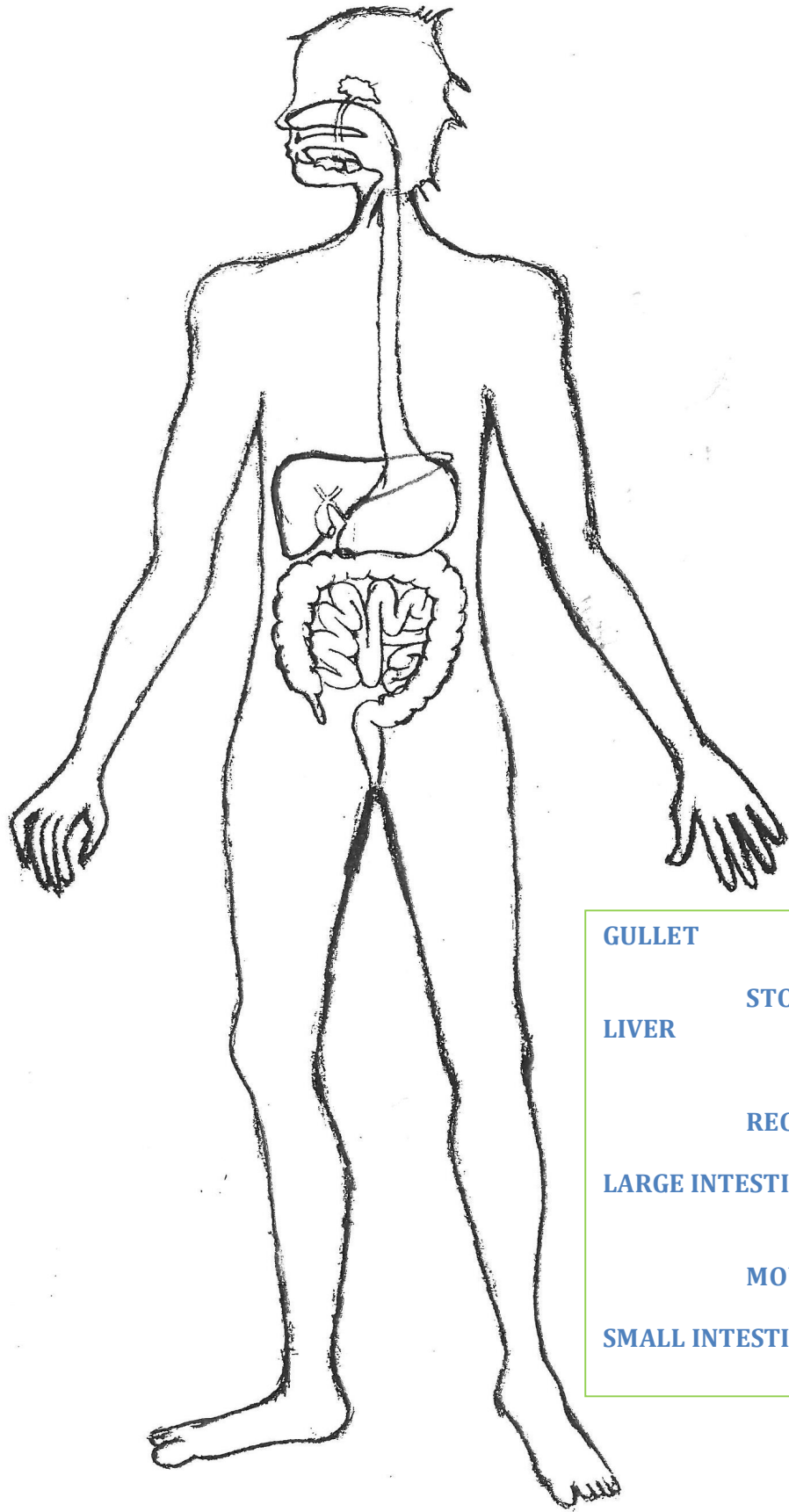Hearing (Audition). http://faculty.washington.edu/chudler/chhearing.html. (10th November, 2013).

APPENDIX C
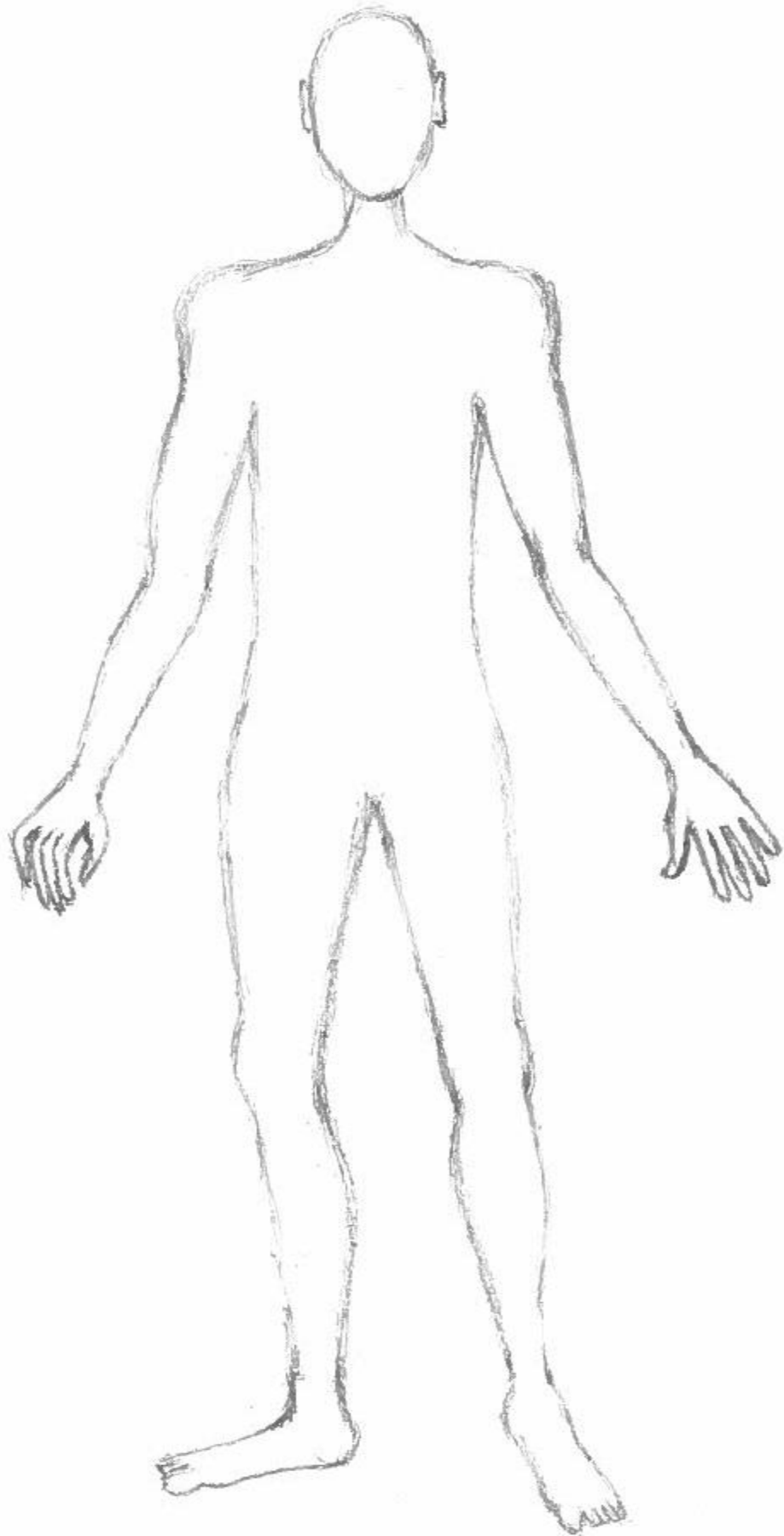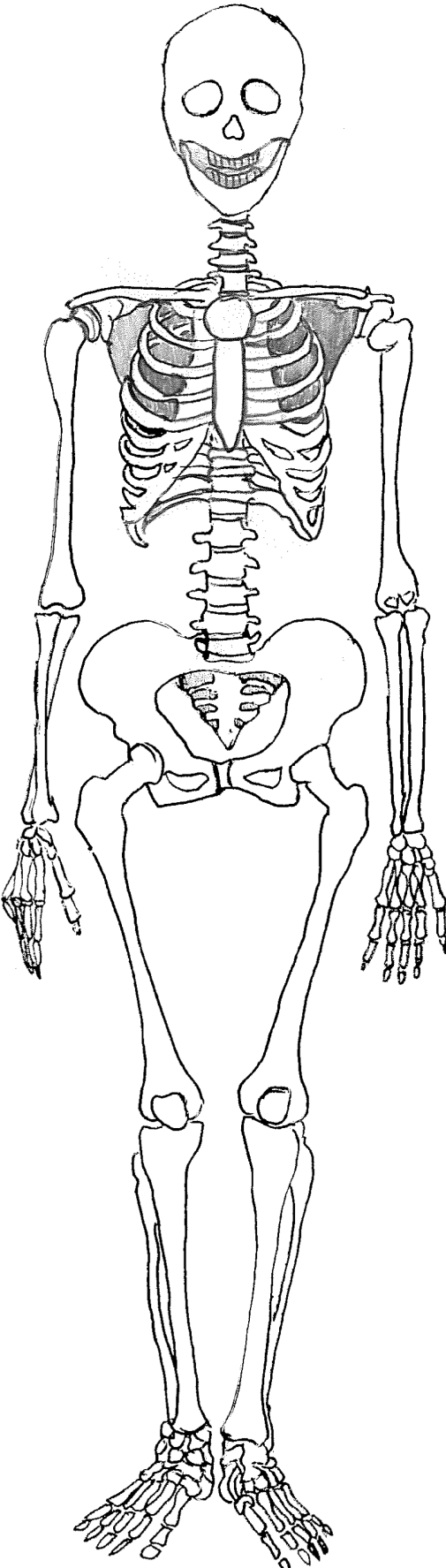
GULLET

STOMACH

LIVER

RECTUM

LARGE INTESTINE

MOUTH

SMALL INTESTINE

<u>HOW TO WORK IN A GROUP</u>

1. Move into groups quietly

2. Stay with your group.

3. Use quiet voices.

4. Take turns.

(Adopted from Johnson, Johnson and Johnson Holubec 1991, 5:9-5:10)

GROUP PROCESSING

1. Was our group work good? Did we do well?

2. Did I do my best? How or how not?

3. How well did I do,

   a. _____ ☹----------------------☺

   b. _____ ☹----------------------☺

   c. _____ ☹----------------------☺

4. How well did the group members do?

   a. _____ ☹----------------------☺

   b. _____ ☹----------------------☺

   c. _____ ☹----------------------☺

_____

Feedback

It was helpful when the members of the group_____

_____.

The group work did not work when_____

_____.

I think we succeeded in _____

_____.

I think we need to improve _____

_____.

Discuss in your group.