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Teaching Biology through the CLIL Method

Diplomová práce

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Teoretická část práce se zaměří na charakteristiku metody CLIL, její pozitiva a negativa. Praktická část popíše možnosti propojení výuky biologie s cizím jazykem, součástí bude tvorba příkladových materiálů, případně drobný výzkum na školách.

MEHISTO, P., FRIGOLS, M., MARSH, D. Uncovering CLIL, United Kingdom. Macmillan Education. 2008. ISBN 0230027199.

COYLE, D., HOOD, P., MARSH D. Content and Language Integrated Learning. Cambridge: Cambridge University Press. 2007. ISBN 9780521130219

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DALE, L., TANNER, R. CLIL Activities. A Resource for Subject and Language Teachers (Cambridge Handbooks for Language Teachers). Cambridge University Press. 2012. ISBN -10 0521149843. ISBN 13 978-0194425780

Anotace:

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Prohlašuji, že jsem tuto diplomovou práci vypracovala (pod vedením vedoucí diplomové práce) samostatně a uvedla jsem všechny použité prameny a literaturu.
V Hradci Králové dne

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Anotace

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Cílem této diplomové práce je zjistit, zda mají učitelé biologie povědomí o metodě CLIL a zda je využívána v jejich hodinách. Dalším cílem práce je zjistit, zda školy plánují tuto metodu implementovat. Teoretická část práce se nejprve zaměří na charakteristiku metody CLIL a její vývoj. Dále budou popsány přínosy této metody pro učitele a žáky, a také role, jakou mají učitelé jazykových i nejazykových předmětů. Další kapitola se zmíní o výzvách pro učitele a žáky v hodině vyučované touto metodou. Následující kapitola představí oblasti, které musí být brány v potaz při plánování hodiny CLIL, s názvem jazykový trojúhelník. Poslední kapitola teoretické části popíše, jak probíhá plánování hodiny vyučované metodou CLIL, a také se zaměří nejprve všeobecně na zkušenosti s vyučováním metodou CLIL v České republice, a poté konkrétně na vyučování biologie touto metodou. Součástí praktické části je drobný výzkum na vybraných školách, a také tvorba příkladových materiálů. Cílem práce bude vytvořit pracovní listy pro žáky na druhém stupni základní školy a poznámky pro učitele.

Klíčová slova: metoda CLIL, biologie, cizý jazyk, příkladový materiál, výzkum

Annotation

BENEŠOVÁ, Petra. *Teaching Biology through the CLIL Method*. Hradec Králové: Faculty of Natural science, University of Hradec Králové, 2016, 109 pp. Diploma Dissertation.

The aim of the diploma thesis lies in learning if biology teachers are aware of the CLIL method and if they apply it in biology lessons. The thesis is supposed to ascertain if the schools intend to implement the method. First of all the theoretical part of the diploma thesis focuses on the characteristic of the CLIL method. After that benefits of the method for both teachers and learners, and language and subject teachers' role are described. Challenges for teachers and learners in a CLIL lesson are mentioned. The next chapter of the thesis entitled Language triptych presents the areas that should be taken into consideration during planning a CLIL lesson. The last chapter of the thesis' theoretical part describes the process of planning a CLIL lesson, and it focuses on experience with general teaching through the CLIL method in the Czech Republic and after that on teaching biology through the method. The practical part of the thesis consists of small-scale questionnaire-based survey and creation of sample materials. The aim of the diploma thesis lies in creating sample materials for lower secondary school's students and teacher's notes.

Keywords: CLIL method, biology, foreign language, example material, research

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Introduction

Content and Language Integrated Learning represents a teaching method that brings considerable advantages and innovations not only into the teaching language but also into non-language subjects. The main aim of the CLIL is to progress teaching strategy, learners' critical thinking, creativity and key competences as well. There are many advantages of CLIL e.g. working with real content used in everyday life, rising of the possibility of assertion on the work trade, preparation for higher education and rising of professional qualification of the teacher etc.

Theoretical part of the diploma thesis will focus on the characteristic of the CLIL method. First of all, the definition and the development of CLIL and its consequences will be presented. Furthermore, the thesis will aim at benefits of CLIL not only for learners but also for teachers and schools. After that the role of the CLIL subject and language teachers will be discussed. Furthermore, the main part of the thesis follows. Firstly, the diploma thesis will concentrate on the methodology of CLIL for example the availability of materials, their usage and suitability for different subjects. Secondly, it will focus on planning a CLIL lesson mainly on the structure of a successful CLIL lesson.

Practical part of the thesis will focus on teaching biology through the CLIL method. At first, experience with teaching biology through the CLIL method at different primary and grammar schools in the Czech Republic will be mentioned. The practical part of the diploma thesis consists of small-scale questionnaire-based survey and sample materials that comprise second volume of the practical part. The materials consist of worksheets, teacher's notes and glossary.

The main aim of the survey lies in finding out if the respondent biology teachers are aware of the CLIL method and if they have any experience with teaching biology through the method. Another aim focuses on getting to know if the schools plan to implement the CLIL method. I also want to discover if the teachers from different primary and grammar schools find the method beneficial. Finally, I am interested in the teachers' view on appropriateness of teaching biology through the CLIL method.

1. The definition of CLIL

„Content and Language Integrated Learning (CLIL) is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. “(Coyle et al., 2010, p. 1) Coyle et al. state an additional language is often a learner’s second (foreign) or non-native language. There is focus not only on content, but also on language. They assume CLIL is not a new form of language education and not form of subject education but it is an innovative fusion of both. (Coyle et al., 2010, p. 2) Dale and Tanner present that CLIL is the way of teaching where subject content (history, science or physical education) is taught in another language (often English). Further, CLIL subject teachers implement language into their lessons and CLIL language teachers interweave the subject into their language lessons. Sometimes teachers focus on both the content and the language. (Dale & Tanner, 2010, p. 3)

1.1. The Development of CLIL

According to Coyle et al. the term CLIL was adopted in 1994 within the European context to describe and further design good practice as achieved in different types of school environment where teaching and learning take place in an additional language. CLIL set out to capture and articulate that not only there was a high degree of similarity in educational methodologies, but also an equally high degree of educational success. Identifying this success was one major driver within the education professions. (Coyle et al., 2010, p. 3)

Šmídová et al. present that in 1996 CLIL was used in UNICOM (Universal Integrated Communications) for the first time in Jyväskylä, at the university in Finland within the framework of European programme for education in the Netherlands. A CLIL approach was used for the description of the teaching methods in which technical subjects are taught in a foreign language and the education of the given educational system goes simultaneously with the education of the foreign language. In 1995 the White book of education was accepted by the European committee and it emphasized multilingual education in Europe. The advantages of CLIL for the development of foreign languages were emphasized in these times.

As Šmídová et al. state nowadays we know that CLIL brings inconsiderable advantages and innovations also into the teaching non language subjects. The main aim of the CLIL method is to progress teaching strategy, learners' critical thinking, creativity and also key competences. They assume there are many other advantages of CLIL, for example working with real information used in everyday life, rising of the possibility of assertion on the work trade, also in abroad, and preparation for higher education, rising of professional qualification of the teacher. (Šmídová et al., 2012, p. 9)

Furthermore, the work of Coyle et al. presents that as individuals from different language groups have lived together some have been educated in an additional language. This is true of Ancient Rome and also multilingual societies being created through mobility and globalization in the 21st century. Globalization and the forces of economic and social convergence have had a significant impact on learners of a language, at stage in their development, and in which way. There is a need to adapt content-teaching methodologies so as to raise the level of proficiency, particularly since the introduction of global comparative measures ranking individual countries through the Programme for International Student Assessment (PISA) of the Organization for Economic Cooperation and Development (OECD). (Coyle et al., 2010, p. 2)

Moreover, according to Mehisto et al. in today Europe, there is a desire to improve language-learning opportunities for all young people in order to increase European cohesion and competitiveness. The authors suppose new technologies are facilitating the exchange of information and knowledge. The reality of life in a mixed global society is having an impact on teaching, and this concerns language education, as much as any other form of subject learning. (Mehisto et al., 2008, p. 10)

2. The use of CLIL in schools

2.1. Benefits for teachers and schools

As Dale and Tanner present there are many benefits for CLIL teachers and schools. The implementation of CLIL can be an impulse for a school to think about language policy not only for English but also for other languages. CLIL teachers may reconsider how children learn both language and content and as a consequence may often develop a completely new curriculum. Teachers who are non-native speakers improve their language skills when they have an opportunity to attend language development courses where they can teach their subject in another language and use their language skills in practice. CLIL teachers also can take part in CLIL methodology courses where they are exposed to new ideas about their subject and how their subject is best learned and taught. Thanks to these new perspectives teachers can comprehend both the subject and the teaching of the subject. During preparation for CLIL lessons or cross-curricular projects, subject and language teachers start to cooperate more. (Dale & Tanner, 2010, p. 14) It means that they can improve their interrelations, share their opinions and provide a help to each other because the preparation of a CLIL lesson should be sometimes difficult especially from the beginning of teaching through the CLIL method.

2.2. Benefits for CLIL learners

According to Dale and Tanner CLIL provides extra motivation for learners. Subject taught in another language may be more appealing to learners. They feel the development of their language skills along with the subject. Learners also feel challenged because they learn both a subject and a language. Secondly, CLIL learners also develop cognitively because their brains work harder. “Cognitive learning theories suggest that people remember things more effectively if their brains have to work harder to complete a task.” (Dale & Tanner, 2010, p. 11) Dale and Tanner state that when children learn a subject through another language it can broaden and deepen their understanding of subject concept, thinking skills and their creativity. CLIL learners also develop communication skills because they develop an ability to understand a wide range of spoken and written language

in both general and more specialized topics. Thirdly, a CLIL approach helps learners to learn another language more efficiently than separate language lessons. Dale and Tanner suppose that they will learn the language quickly and become fluent and accurate. In CLIL lessons children learn a language because they can hear and read it, understand it and use it to speak and write in meaningful interactions. They can also notice how the language is used in practice. CLIL learners not concentrate mainly on grammatical accuracy. A CLIL approach provides meaningful interaction between both the content needed for language acquisition and the language needed for subject development. CLIL teachers encourage their students to speak and write that helps them to become more proficient users of language. (Dale & Tanner, 2010, p. 11)

2.3. The role of the CLIL teachers

2.3.1. CLIL subject teachers

According to Dale and Tanner the teachers need to know how their subject uses language and support them in overcoming the specific challenges associated with the language of their subject. Another important fact is that they should know how to activate learners' existing knowledge about the topics they are teaching to provide appropriate input and guide learners to understand the input. Furthermore, they should encourage learners to interact in their lessons. Subject teachers also need to know the how to do assessment of learners' progress in content and language. Teachers should also provide their learners a feedback which will help them to develop in both areas content and language. Moreover, Dale and Tanner present that content teachers undergo a number of phases in their development. How long it takes to become a proficient CLIL teacher depends mainly on teachers' motivation. School should encourage teachers to take CLIL methodology examinations to send them to CLIL methodology workshops to help them reach this aim. One of the phases is developing language skills. Subject teachers are often non-native-speakers so they can feel insecure about their language skills and knowledge. During these phase teachers prefer using learners' mother tongue, because they are worried that ideas about their subject do not come across. "The realization that their own language skills are less important

than encouraging learners' use of the second language is an important step in CLIL subject teachers' development." (Dale & Tanner, 2010, p. 19) However, Dale and Tanner suppose the language of the subject teachers is not the only source of language input for learners. Audio, video, written material from TV, radio, the Internet and published course materials can be other source which can supply teachers' fluent, accurate spoken and written language of the non-native speakers. From the beginning of teaching through the CLIL method it is rather advantage to be non-native speaker because these teachers can use simple, direct language which is easier to understand than native speakers who are not able to adapt their level of language to the level of the learners. Another phase is the development of learners' vocabulary. Subject teachers become more aware that they are also language teachers as well as subject teachers. They should encourage learners to learn new vocabulary in other language and help them to acquire new vocabulary. We need to mention that subject teachers can feel more confident about their language skills and less concerned about making mistakes.

Concerning another phase which is called facilitating learners' language, CLIL subject teachers realize that language consists of more than vocabulary and they look at their materials as language learning material as well as content material. teachers use different kinds of writing and speaking activities. They feel more confident about their knowledge of vocabulary, grammar and text-types of their subject. During these phase teachers can assess input for appropriateness at different levels and they can also teach Basic Interpersonal Communication Skills (BICS). Furthermore, Dale and Tanner state that they can encourage learners to communicate in the second language at all stages of the lesson so they do not have to use their mother tongue during lessons. CLIL subject teachers should be able to give feedback on language as well as content to their learners. (Dale & Tanner, 2010, p. 15-19)

According to Coyle et al. the motivation of the learners is also very important. It means that pupils want to participate voluntarily in learning *through* the additional language and they are more motivated towards the subject itself.

Coyle et al. also present that subject teachers should adapt subject-specific methods in order to adjust the additional language focus. The authors emphasize that a subject teacher does not have to adopt the role of a language teacher. They should choose some alternative ways of using methodologies which can be rewarding not only for them but also for their learners. A CLIL approach not only promotes linguistic competence but also stimulates cognitive flexibility. (Coyle et al., 2010, p 9-12)

2.3.2. CLIL language teachers

According to Dale and Tanner CLIL language teachers may also find themselves taking on new roles. Their main role lies in correcting their colleagues' (subject teachers') language, observe and give them feedback. Unlike subject teachers, they have no problem with a language, however, they may have lack of subject knowledge and the specific terminology. The reason why they have a lack of it is that language teachers have no specialized training in non-language subjects. The way how to integrate subject and language for learners is the close cooperation of subject and language teachers. Sometimes it is very difficult to cooperate because teachers have different interrelations and opinions on their teaching so only some amount of teachers are able to plan lessons and teach classes together. First of all, the time before the subject lesson the language teacher can work with the subject teacher to prepare lesson and find appropriate materials and assess the language of the materials. After that the language teacher can identify the language used in an activity (grammar, vocabulary or words which have difficult pronunciation) and practice it with learners. (Dale & Tanner, 2010, p. 21) Furthermore, Dale and Tanner suppose that language teacher can identify specific language skill and learning strategies needed for an activity. Language teachers can also introduce and practice with a correction code so learners know which language point learners can pay attention to.

Dale and Tanner also present what language teacher can do during and after a lesson. During a lesson teacher can monitor and support the production of the learners' language, give feedback on common language mistakes, help learners to

speak by eliciting and encouraging useful language through questioning. The subject teacher can support and give feedback on ideas or content. After the subject lesson language teacher can provide feedback on learners' language by writing learners' mistakes and discuss them with a subject teacher. Teachers can do follow-up activity on language (grammar, vocabulary or pronunciation) or follow-up skill activity related to the practical activity done by a subject teacher. Language teachers also can use subject material as input for language lessons. (Dale & Tanner, 2010, p. 21-23)

Furthermore, Coyle et al. suppose that a language teacher should distinguish and know the difference between acquiring and learning languages. Children adapt well to learning languages if it is carried out in a naturalistic environment that is typical for learning at primary level. However, older children and adults are often taught in language-learning classrooms through the use of textbook. "Successful language learning can be achieved when people have the opportunity to receive instruction, and at the same time experience real-life situations in which they can acquire the language more naturalistically." (Coyle et al., 2010, p. 11) According to Coyle et al. the language lessons are essential for learners to understand grammar, vocabulary and so on, but there is rarely enough time in the lessons for a language teacher to go beyond this part of the learning process. Learners need more time to put the theory into practice. CLIL approach is not simply education *in* an additional language, but it is education *through* an additional language based on connected pedagogies and using contextual methodologies. (Coyle et al., 2010, p 9-12)

3. The challenges of CLIL

3.1. Challenges for CLIL teachers

Dale and Tanner introduce challenges in activating. Teachers can ask themselves questions like: How can I activate content? How can I activate language? There are given some pieces of advice to teachers. At the beginning of the lesson teachers should have a brief discussion on the new topic with learners as warm-up activity. After that they should ask questions and use visuals (e.g. photographs, diagrams) to find out what learners already know about the topic. Teachers should also find out what learners know about the language of the topic for example by creating a mind map on the board and using words relating to the topic. Secondly, there are mentioned challenges in guiding understanding. Teachers may ask themselves how they could evaluate the level of the materials they were using. Some pieces of advice are given to teachers again. First advice relates to finding readability test for learners on the Internet. Teachers should estimate how much the visual support (e.g. photographs, charts and other illustrations) really support the input. Other advice is to look at the vocabulary in the text. It is said that learners can understand a text if there are no more than fifteen new words per page in it, otherwise the text will be too difficult for them. Another teachers' questions could be: What sort of input can I provide? The answer is to use "multimodal" input. Authors advice for example using video input, teachers' own written or spoken stories or texts with accompanying visuals. Teachers should look for texts that are clearly organized and well-illustrated and simplify their own language and repeat information in different ways. They can also ask themselves how to help learners to understand the input. "(Dale & Tanner, 2010, p. 31)

According to Dale and Tanner teachers should formulate clear subject and language aims. They suppose that teachers should provide a task to guide learners through the input, starting with a general task the first time. When learners have understood the general meaning of the input, teachers should provide more specific and challenging tasks by using some higher order thinking skills (HOTS). Teachers also should get learners to write their own questions for each other. However, teachers should not ask them to read new material aloud because it will

not help them to understand difficult written input. To sum up, teachers should provide scaffolding for both language and content learning. “Builders use temporary scaffolds to support a building during construction, and then – once the building can stand alone – the scaffold is removed. “(Dale & Tanner, 2010, p. 31)

Dale and Tanner emphasize that there is a big difference between help and scaffolding. When a student asks a teacher how to spell a word and a teacher tells the word, it is an example of help. However, when a teacher asks the student to sound out the word and write down the sound, the teacher is providing scaffolding that helps learners to solve a similar problem themselves next time. Teachers should give learners e.g. a Venn diagram to complete if input is comparing two things. A Venn diagram is one of the examples of scaffolds. Another teacher’s question for themselves may be what sorts of questions they could ask learners. When the input is difficult for learners, teachers should use questions which appeal to lower-order thinking skills (LOTS), for example remembering and understanding. Teachers can also use higher-order thinking skills (HOTS), such as applying, analyzing, evaluating and creating (mentioned in Bloom’s taxonomy). (Dale & Tanner, 2010, chart p. 33)

According to Dale and Tanner focusing on language is another example of appeal in CLIL. Possible way of facing difficulties in language is to use a checklist that will help teachers to assess the difficulty of text and identify the kind of language that they will focus on in their lessons. Teachers should check their materials with a language teacher and discuss their answers to questions like: Which type of texts is your material? Does it recount, report, instruct, explain, persuade, discuss, predict or hypothesize? etc. After consideration their answers, teachers should decide which language aspect of their material it is relevant to pay attention to in their lesson. (Dale & Tanner, 2010, chart p. 33)

Dale and Tanner present that teachers often discuss how they could deal with new vocabulary. Learners need to hear and read it several times before it becomes part of their productive language. Therefore, teachers should pre-teach only the key words which are really needful for learners to understand a new input. They should help learners to guess the meaning of new vocabulary for example according to suffixes or context. Learning is more effective if learners do active tasks with the new vocabulary. Pupils should use vocabulary notebook to learn

new vocabulary and teacher should check if they write new words down in the notebook (word alone and in a sentence). (Dale & Tanner, 2010, p. 30)

According to Dale and Tanner another point in challenges for teachers is focusing on speaking. Teachers often question how they could get beginners to speak in English. Relating to Dale and Tanner teachers should make very easy tasks when learners can respond with only one or two words, but gradually are able to build up to sentence level. It is very important for learners to be often encouraged and praised by teachers. Learners should get some thinking time to prepare for speaking, and pair and group work should be used as much as possible. Moreover, teachers have to face many difficulties with a language very often. One of the difficulties may be a situation when many teachers do not feel confident about speaking English and learners even correct them sometimes. In this case they should set up pair and group-work tasks so learners have to interact with each other. Other possibility to cope with the lack of teachers' confidence is to thank learners for correcting teachers' language and make a joke of it. Teachers whose level of English is low should ask their school if they can go on a course to improve the language. Teachers ought to use production scaffolds or speaking frames to help learners prepare for speaking. It is mentioned that before speaking learners should write down their arguments about the given topic. Teacher should also formulate questions which involve higher-order thinking skills because in this case learning process becomes effective. (Dale & Tanner, 2010, p. 32)

Moreover, Dale and Tanner suppose that teachers often question what kind of writing they could do with CLIL beginners. The first advice is to write short model texts with a whole class on the board. Other possibility is to provide a model paragraph and ask learners to write a similar paragraph on a different topic. The advice is to keep writing tasks that are short, simple and realistic such as email to a friend, a note to a member of the family etc. (Dale & Tanner, 2010, p. 35)

Dale and Tanner state that teachers ought to use not only written assessments, magazine article or an essay, but also spoken assessments like dramatic presentations, drawings to show if learners understand the topic. During speaking or writing teacher should note students' mistakes to be able to give them feedback. Teachers ask learners to correct their mistakes that help learners to

become able to self-correct. Other teachers' frequent question may be if they should assess content and language separately or together. Dale and Tanner advice teachers to ignore language mistakes or pass them on to language teachers to deal with them. It is benefit for them to provide marks for both content and language. (Dale & Tanner, 2010, p. 38-39)

3.2. Challenges for CLIL learners

Dale and Tanner mention three different types of challenges for CLIL learners: affective, linguistic and cultural challenges. Relating to affective challenges, they are the emotional challenges learners have to face when they hear, read or use a second language. Learners may feel disempowered, helpless or silly and this affects how long they can listen or read. This fact also affects their willingness to take risks when they use another language because of a lack of confidence. These emotional factors may also affect concentration when learners listen or express their emotions, keep talking in the language during pair or group work. Teachers should encourage and motivate their students to use a second language for social talk in the classroom as much as possible.

As a second type of challenges for CLIL learners Dale and Tanner mention linguistic (language-related) challenges. These challenges are associated with the language of texts learners read or listen, input they watch, or the language they use when they speak or write. Students can face challenges on three levels: discourse-level, sentence-level and word-level. "Discourse-level challenges are challenges which affect learners' ability to understand or produce longer pieces of spoken or written information, for example a newspaper article, a video clip or an explanation." (Dale & Tanner, 2010, p. 42)

According to Dale and Tanner sentence-level challenges means that CLIL learners are able to understand and use grammatical structures in sentences (tenses, word order, verb patterns, phrases and clauses, comparisons etc.) Word-level challenges are connected with learners' difficulties to understand the meanings or form of words. Students may find challenging to understand for example subject-specific, non-standard, archaic, technical vocabulary or everyday words with specialized meanings for example the word cell in biology, pitch in music etc.

Dale and Tanner state that the third type is cultural challenges which relate to the differences in learners' cultural background and the cultures where a second language is used. CLIL learners may find challenging to understand culturally specific references, interpret the use of visual, historical or cultural images (e.g. the use of the colours orange and green in Ireland and Scotland history) etc. (Dale & Tanner, 2010, p. 41-45)

4. Integrating content and language learning

4.1. The 4C_S Framework

Coyle et al. present that teachers should concentrate on four areas during planning a CLIL lesson. These areas are: content, communication, cognition and culture. “The 4C_S Framework integrates four contextualized building blocks: **content** (subject matter), **communication** (language learning and using), **cognition** (learning and thinking process) and **culture** (developing intercultural understanding and global citizenship).” (Coyle et al., 2010, p. 41) The theory suggests that effective CLIL takes place as a result of this symbiosis, through progression in knowledge, skills and understanding of the content. Second point of this theory is engagement in associated cognitive processing. Third point is interaction in the communicative context, fourth development of appropriate language knowledge and skills. The last point is the acquisition of a deepening intercultural awareness. (Coyle et al., 2010, p. 41-42)

4.2. The Language triptych

The analysis of the CLIL vehicular language is mentioned in Coyle’s et al. work. The analysis supports learners in using language from three interrelated perspectives: language of learning, language for learning and language through learning.

Relating to **Language of learning**, it is an analyses of language needed for learners to access basic concepts and skills relating to the subject theme or topic. As example there is presented the use of the past tense in a science lesson, learners need to be supported in understanding the concept of “pastness” and past “markers”. This can be achieved through using certain phrases rather than having to learn for example verbs in past tense. These selected verbs will depend on the content. The use of the past tense in a CLIL class enables learners to use language appropriate to the content in a meaningful way, which can be further explored for grammatical cohesion in the language class.

Second perspective presented by Coyle et al. is **Language for learning**. It focuses on the kind of language needed to operate in a foreign language environment. It is emphasized that unless learners are able to understand and use language which enables them to learn, to support each other and to be supported, quality learning will not take place. Strategies for enabling learners to discuss and use the CLIL language independently will have to be transparent in both the teaching and the learning process.

Furthermore, **Language through learning** is presented. The language is based on the principle that effective learning cannot take place without active involvement of language and thinking. The CLIL lesson demands a lot of talk, interaction and dialogic activity that is different from traditional language or content lesson. Learners need language to support and advance their thinking process while acquiring new knowledge, as well as their language learning. (Coyle et al., 2010, p. 36-38)

5. Methodology of CLIL

5.1. Planning a CLIL lesson

According to Deller and Price in teaching a subject through a foreign language the methodology differs from conventional foreign language teaching. As the subject dictates the language demands, teachers have to analyze the language demands of a given lesson and give the learners the language support which they need. At the lower grades teachers should put the emphasis more on receptive than productive skills. At this level the writing component could just be copy writing and labeling objects, or writing one-word answers to questions. (Deller & Price, 2007, p. 9)

Deller and Price also state that CLIL teachers have to include more strategies to support understanding and learning. Teachers should use as much visuals as possible such as pictures, charts or diagrams. There should be a lot of repetition and consolidation. Concerning writing activity, it needs to be done twice because second time the students have the opportunity to focus more on the language. (Deller & Price, 2007, p. 9)

According to Mehisto et al. a typical lesson plan could include the following:

- holding a warm-up discussion or playing a game that somehow connects with the topic (five minutes)
- discussing language, content and learning skills outcomes with students (three to five minutes)
- finding out what the students already know, guiding them in organizing that information and helping them articulate what else they want to learn about the topic (eight to ten minutes)
- having students individually read a short text looking for specific information (five minutes)
- doing peer co-operative work to compare results from the reading, and using information to create something new such as a plan or a list of recommendations (fifteen minutes)
- asking two or three questions of the entire class that encourage students to think critically/constructively about how they could improve the end result of their group work (content and language) (five minutes)
- presenting one group's outcome and having other groups contest or add to the information presented, and agreeing on one class outcome (ten minutes)
- reviewing the lesson's learning outcomes, deciding the extent to which outcomes were achieved and deciding on the next steps (three to five minutes)

(Mehisto et al., 2008, p. 33)

According to Coyle et. al. teachers usually create individual lesson plans in relation to their imagination. However, several sample lesson plans and materials are available on the Internet or in literature that focus on CLIL method. Teachers can adjust the lesson plans to their needs according to covered topic. (Coyle et al., 2010, p. 80)

Mehisto et al. emphasize that preparation for a CLIL lesson takes much more time than an ordinary lesson because teachers have to set content, language and learning skills goals for every lesson. The authors also claim that since off-the-shelf CLIL materials are in short supply, teachers often spend considerable time developing and adapting existing learning resources. Many teachers are not willing to invest the time required for preparation and follow-up. However, co-

operation between CLIL teachers can relieve stress and save time. (Mehisto et al., 2008, p. 22)

Moreover, Coyle et al. present that in contrast to the vast English language teaching course book and resource market, there are very few ready-made CLIL materials available so CLIL teachers have to create learning materials on their own. Coyle et al. present that in a CLIL classroom and planning for a CLIL lesson teachers need to focus equally on how the students *meet* content subject (the input) and *what they do* while learning (how they *process* the input). (Coyle et al., 2010, p. 96)

According to Coyle et al. when a CLIL teacher finds useful material e.g. on the Internet he or she has to make choices about *what* to select, *how* to combine it, which *order* to use it in, and how to target different ability levels with different elements. The teacher has to modify some sections of the text which may be too advanced for learners. However, there is no need to create completely different material. Coyle et al. also emphasize that CLIL lessons are not about re-teaching already-learned material in another language. (Coyle et al., 2010, p. 96)

Concerning assessment in CLIL lessons, in *Teaching science through English – A CLIL approach* is said that teachers observe and assess learners' performance using specific criteria. Individual, pair or group work could be involved in performance assessment. It is stated that performance assessment can also be used to evaluate development of communicative and cognitive skills as well as attitude towards learning e.g. teachers can ask students to explain the effects of microorganisms on the human body (communication), reflect on the reliability of their findings (cognitive skills) and share information with other group members (attitude). It is emphasized that teachers should keep ongoing records of continuous, formative assessment done through observation of learning experiences in the classroom, in the science lab or outside. Further, over a period of several weeks, evidence of students' progress to achieve the learning outcomes needs to be recorded. There is a range of appropriate task types that can be used in CLIL lessons. Moreover, there is a big need of using variety of tasks to stimulate output of content and language. Some of them are time-consuming to set up and create and to be completed. Some examples of task types for science are presented

in the part entitled Attachments. The sample lesson plan about human skeleton is presented there. (*Teaching science through English*, p. 15-23, online)

5.2. Experience with the CLIL method in the Czech Republic

CLIL has become the firm part of the Czech language politics on the basis of document of the European Union entitled *Podpora jazykového vzdělávání a lingvistické rozmanitosti: Akční plán 2004-2006*. The document assumes that a pupil could immediately verify newly acquired language skills and thanks to this fact a pupil's self-confidence for another study of a language will be strengthened.

Furthermore, according to Vojtková and Hanušová who are authors of the project entitled *CLIL v české školní praxi* state that according to the research realized in 2008 the CLIL method was used by around 6% of Czech schools. English was used the most often from all foreign languages. Maths, ICT, art and music appeared to be the most often used integrated subjects. According to information of NIDV (Národní institut pro další vzdělávání) the CLIL method was used in the first grade at primary school the most, after that at secondary schools and partly at second grade of primary school. Systematic further education of teachers in using the CLIL method started in 2010 within the projects of ESF (European social fund). The education of teachers within the project entitled *Obsahově a jazykově integrované vyučování na 2. stupni základních škol a nižším stupni víceletých gymnázií – CLIL* was realized from May 2010 in all the regions of the Czech Republic. The project focused on teaching non-language subjects in English, German and French. Approximately five hundred teachers from primary and grammar schools joined the project. The CLIL method also became a part of the education of future teachers. The Pedagogical faculty of Charles University has had the longest experience with training teachers in using the CLIL method. The courses of subject entitled *Integrovaná výuka matematiky a angličtiny* that last two semesters and course of CLIL which lasts two semesters as well are offered to students. A course called *Integrace jazykové a odborné výuky* that lasts one semester is taught at the Department of Mathematics at the Charles University. (Vojtková & Hanušová, 2011, p. 26-27)

5.3. Experience with teaching biology through the CLIL method in the Czech Republic

The Department of English literature of Pedagogical faculty at Masaryk University started the project entitled *CLIL do škol* in November 2009. The project focused on creating methodical materials for teaching English through CLIL method to be implemented to subjects at second grade of primary school and grammar school. There were chosen seven partner schools to participate in the project e.g. primary school in Březová, Slavkov u Brna Komenského and Malinovského, further grammar school in Cheb, Brno Křenová etc. The main aim of the project was the implementation of the CLIL method with using English as a foreign language to chosen subjects. (*CLIL do škol*, 2012, p. 1, online)

The project also focused on first experience of chosen schools with teaching biology through the CLIL method. Jana Nešporová one of the teachers from partner schools described the process of implementation of the CLIL method in biology. She cooperated with teachers from partner schools and colleagues from the Pedagogical faculty of Masaryk University. Nešporová said that she had written down the terms (usually nouns, adjectives and verbs) that had been used during the lesson. She put new terms to the database on LMS Moodle once or twice a month. The author emphasizes that it is really difficult not only to keep time plan to accomplish thematic plan of the subject but also compulsory reflection of the language at the end of the lesson. Nešporová said that the CLIL method helped students to extend their knowledge of vocabulary and strengthened their ability to react to instructions in English. She appreciated cooperation with her colleagues that provided her an opportunity to check correctness of used vocabulary. Nešporová also gives a piece of advice to involved students in searching new terms. Another piece of advice is that a teacher should create a notice board for placing discussed terms to be visible any time by pupils. She emphasizes that teachers should plan their CLIL lessons well in advance and they also should focus on their English. (*CLIL do škol*, 2012, p. 30-33, online)

5.4. Experience with the CLIL method in Europe

Relating to the theoretical part the fifth chapter focuses on the CLIL method in the Czech Republic both in general and experience of Czech teachers with teaching biology through the method. I supposed I would find some information about experience with teaching biology through CLIL in other European countries. Unfortunately, there has not been found any useful information about teaching biology or Science in Europe. I have read a lot of articles and texts about the CLIL method. Nevertheless, I could not find appropriate information that could be used in the theoretical part of the thesis. I have decided to state experience of three Europe countries with the CLIL method in general.

As Carrió-Pastor mentions CLIL has become a key issue within the EU policies. She presents a research survey on the situation of CLIL throughout Europe that was published by Eurydice (the information network on education in Europe) in 2006. The survey covered pre-primary, primary and secondary education. The author states most European countries have some involvement into CLIL provision in different situations: as part of mainstream school education, within pilot studies or experimental projects, or both. Only six countries e.g. Portugal, Cyprus, Denmark or Greece have no CLIL experience at all. (Carrió-Pastor, 2009, p. 52-53)

Carrió-Pastor says there are some countries that have established some criteria applied to students e.g. different types of test that try to identify the pupils' good general knowledge of curricular subject matter (Czech Republic, Slovakia and Bulgaria) or their level of the target language to be used for CLIL (France and Romania), or both methods at the same level of importance (Hungary, The Netherlands and Poland). (Carrió-Pastor, 2009, p. 54-55)

Concerning experience with the CLIL method in different subjects, only three European countries – Slovakia, Germany and Hungary will be described in more detail.

Further, Pokrivčáková states that CLIL methodology has been known and applied in Slovak schools for nearly fifteen years. The author mentions that most schools integrate teaching in Slovak as a mother language and English as a foreign language. The second most frequent foreign language used within CLIL is

German. There is also said that only a few schools apply CLIL in Spanish and French. (Pokrivčáková et al., 2015, p. 17)

According to Pokrivčáková at bilingual and non-bilingual CLIL schools, CLIL lessons are usually timetabled as content subject lessons. The most common CLIL subjects are e.g. mathematics, biology, geography, arts etc. that are taught by teachers qualified to teach content subjects. (Pokrivčáková et al., 2015, p. 20)

As Pokrivčáková presents CLIL teacher training courses in Slovakia, accredited by the Slovak Ministry of Education and organised as part of continual teacher education, have been currently provided by the National Institute of Education, Methodical and pedagogical centres, and other educational institutions. Moreover, she points out some pedagogical faculties have incorporated CLIL courses into the pre-service teacher training (e.g. CPU in Nitra, Žilina University and Prešov University). (Pokrivčáková et al., 2015, p. 23)

Relating to situation in Germany Maljers states CLIL has had a long history in the school system. As early as in the first half of the 20th century private schools existed which made use of the main principle of CLIL, i.e. using another language to teach content subjects. Maljers also writes that for more than ten years French used to be the only CLIL language in this type of school. The author presents that in the eighties more and more grammar schools founded bilingual branches in which English was the language of instruction. (Maljers, 2015, p. 93)

Furthermore, Maljers presents three types of CLIL – general, modular and context-specific CLIL. General CLIL is the most common type of CLIL. Foreign language teaching starts at the age of five. The author states in these preparatory courses, children are taught more than the usual four to five hours a week. CLIL programmes are available to students from year five (beginning of the preparatory course) to year thirteen (end of secondary education).

Traditional CLIL is practised in Germany in the following contexts:

- Schools: mainly grammar schools
- Languages: mostly English and French, but also Italian, Spanish, Dutch, Russian (these last four in very few schools).
- Subjects which are taught in bilingual education: in most cases Geography, History, and Politics, but also Social Science, Biology, Physical Education, Art, Music, Physics and Mathematics. (Maljers, 2007, p. 94-95)

Referring to teachers' qualification, Maljers says that in Germany secondary school teachers have a so-called dual qualification. They study two subjects at university, and degrees comprising a language and a content subject are frequent. A student who has a teaching degree in French and History is qualified to teach both subjects in school. This means that there are qualified teachers for bilingual instruction. The author also writes that despite this qualification, German school authorities insist on an additional qualification for these teachers which they can obtain in initial training courses at university, in pre-service training before taking up a teaching post, or in in-service training at the different national teaching centres. (Maljers, 2007, p. 97)

Relating to experience with CLIL in comparison with Slovakia and Germany, Hungary has much longer tradition. As it is evident from the Chart 1 where the number of CLIL programmes in Hungarian public education in past years is stated (Maljers, 2007, p. 101), first CLIL programmes started in 1996. (Maljers, 2007, p. 101)

Concerning subjects used to be taught by the CLIL method Maljers states that at primary level (from first to the fourth grade), subjects such as P.E., Music, Art and Craft, etc. are mostly involved in CLIL-type teaching. According to Maljers Science represents a smooth link to upper primary grades due to its visualise and descriptive character. Besides Science, upper primary curricula include subjects such as History, History of Art, British and American Civilisation, and Information Technology. The author emphasizes that Biology and History is supposed to be a great challenge. Maljers presents in most programmes the target language is English, German or French. (Maljers, 2007, p. 102)

Relating to teacher training in Hungary Maljers points out CLIL teachers are expected to have an above-average command of the target language. It is presented that some schools have access to grants for their teachers in order to send them to the target countries. (Maljers, 2007, p. 106)

To sum up Slovakia and Germany are less experienced in teaching through the CLIL method than Hungary. Concerning a foreign language used in a CLIL lesson English is the most common target language in all of the three countries. German and French seem to be other two most common languages used in a CLIL lesson. Furthermore, the most common CLIL subjects in Slovakia and

Germany are mathematics, biology, geography and arts. However, P.E., Music, Art and Craft are subjects used for a CLIL lesson at primary level and Science at the secondary level in Hungarian schools. Upper primary Hungarian schools include subjects such as History, History of Art, British and American Civilisation, and Information Technology. Contrary to Slovakia and Germany, biology and history are supposed to be a great challenge for learners in Hungary. Relating to qualification of CLIL teachers the situation in all three countries is very similar. There are some teacher training courses in pre-service training before starting a job as a teacher, or in in-service training. Teachers usually participate in CLIL training during their university studies in all three countries. Slovakia and Germany insists on qualification in a target language and a CLIL subject. Further, Hungarian teachers are expected to have an above-average knowledge of the target language but there cannot be found any information about required knowledge of a CLIL content subject. Unfortunately, there has not been found any information about experience of these countries with teaching biology through the CLIL method.

6. Questionnaire survey

In February 2016 I piloted a small-scale questionnaire-based survey focused on experience with teaching biology through the CLIL method. The questionnaire (see Appendix 1) was sent to approximately twenty-three primary schools and seven grammar schools situated in the Highlands - Žďár nad Sázavou, Příbyslav, Losenice, Nížkov, Nové Veselí, Nové Město na Moravě, Jihlava, and Hradec Králové. Only 3% of teachers from chosen primary and grammar schools were willing to fill in the questionnaire. I have decided to ask only one subject teacher from each school to fill in the questionnaire for better evaluation of the results. I have also sent the e-mail to the headmasters of all schools to inform them about my intention to ask biology teachers from their school to fill the questionnaire.

The main aim of the survey lay in finding out if the respondent biology teachers were aware of the CLIL method and if they have any experience with teaching biology through the method. Another aim was based on getting to know if the schools plan to implement the CLIL method. I also wanted to discover if the teachers from different primary and grammar schools find the method beneficial.

The main goal of the survey lay in gaining a general overview so closed set of options for the answers were preferred to be used. The questionnaire consisted of sixteen questions in total. Fifteen of them were closed and there was possibility of adding comments or filling in an open-ended statement to the last question.

The first part of the questionnaire inquires basic information about respondent teachers. The questionnaire was filled by eight primary school teachers and four teachers of biology from grammar school. Most of them are female teachers (66.7%). Majority of the teachers (66.7%) are employed at primary schools.

Furthermore, the teachers were asked to fill the number of students who attended their school. My intention lay in making out the schools' largeness because I supposed that bigger town schools could be well equipped contrary to smaller village schools concerning the successful implementation of the CLIL method. The question could be ambiguous because two of ten teachers wrote the number of students in their class instead of the number in total. As the research shows the average number of students is 387 both from primary and grammar schools.

The questionnaire was sent to primary town schools rather than to village schools. I supposed that it would be most likely possibility that primary schools situated in towns could have some experiences with the CLIL method rather than smaller village schools. According to the results of the survey these presumptions were confirmed. All of the respondent teachers working bigger town schools. Relating to grammar schools there were few of them in the explorative area. However, four from seven addressed grammar school teachers were willing to fill the questionnaire. Most of the respondent teachers (42%) work at schools in Hradec Králové, three of twelve biology teachers are employed at schools situated in Žďár nad Sázavou. Other two teachers work in Jihlava. Only one person works as a teacher at school in Velká Losenice and another one teaches in Nové Město na Moravě.

Furthermore, respondent biology teachers were supposed to mention the length of their teaching practice. An average teaching practice lasts twelve years. One male primary teacher from Žďár nad Sázavou has been teaching for thirty-four years and the shortest period of teaching practice lasts only one year.

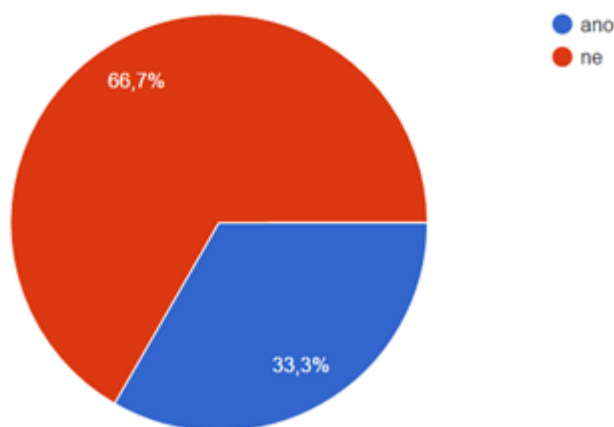
Referring to teaching specialization the results of the survey show that three people teach only biology. Two teachers state that their subjects are both biology and chemistry. Maths, PE, geography, physics, German, civics and ICT represent the other subjects that are taught together with biology. Respondent teachers were supposed to state the level of their language knowledge.

According to teachers' responses eight of twelve in total (66.7%) achieve intermediate level and two people (16.7%) accomplish elementary level. Only one teacher achieves advanced level and one person cannot speak English.

Furthermore, the answers of the respondent teachers to individual questions will be discussed and analysed. Questions in the questionnaire given to respondent teachers were written in Czech. However, they have been freely translated into English for the purpose of the diploma thesis.

1. Have you ever encountered a term CLIL?

Concerning first question my aim was to learn if the respondent teachers had ever heard the abbreviation of the method's name. It means Content and language integrated learning. The research shows that most of teachers (66.7%) are not aware of the meaning of the term CLIL as it is apparent from the diagram below. The negative teachers' responses to the question surprised me a lot. I supposed that it would be vice versa. There could be many factors that might have influenced the teachers' responses to the question. Age and teaching experience of the respondent teachers, the lack of information about meaning and using the method could be some of the factors that could influence the teachers' view on the CLIL method.



2. Are you familiar with the abbreviation only or are you more interested in the CLIL method? If you are not, answer questions from 6 to 11.

The aim of the second question lay in finding how many teachers had ever used the CLIL method in their lessons.

If the teachers were not aware of the meaning of the method they were asked to reply to questions from sixth to eleventh that focused on using foreign languages in biology lesson. Concerning the results four teachers from seven in total have

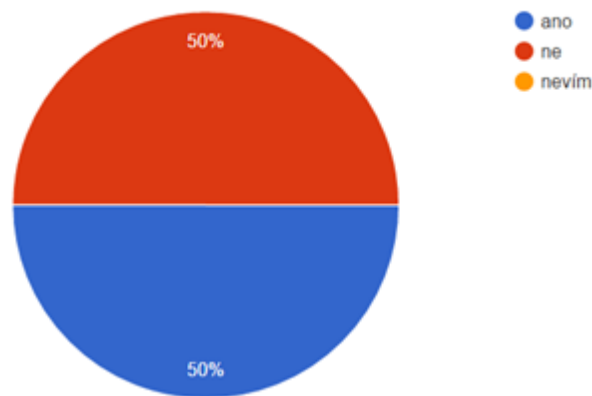
never heard the abbreviation. As it is evident from the diagram below only one teacher is aware of the meaning of CLIL. Another teacher has some knowledge of using the method. One male primary teacher working in Velká Losenice has already applied the method in geography and history.

It was surprising that there was only one teacher who has already applied the method. I supposed that most of the teachers would not have any experience with using the CLIL method in their lessons. As it is evident from the chart below my presmptions were confirmed.

ne
ne
Znám zkratku.
metodu znám, zkoušel jsem použití v Z a D
Ne
neznám
mám povědomí

3. Has your school ever participated in any project/course related to the CLIL method?

The goal of the question was to find out the name of an appropriate agency that arranges CLIL courses. The question was answered by four respondents. As it is visible from the following diagram only two teachers have already attended some course. One of them stated the name of the CLIL course entitled Channel Crossings. The rest of teachers have never attended any course focused on the method. The fact that only two teachers have participated in a CLIL course was very surprising. I assumed that more than half of the chosen schools would be interested in attending some CLIL course. There are some schools situated in bigger towns that have participated in the projects focused on the CLIL method e.g. the project entitled *CLIL v české školní praxi* or *CLIL do škol* that have been mentioned in the previous chapter.

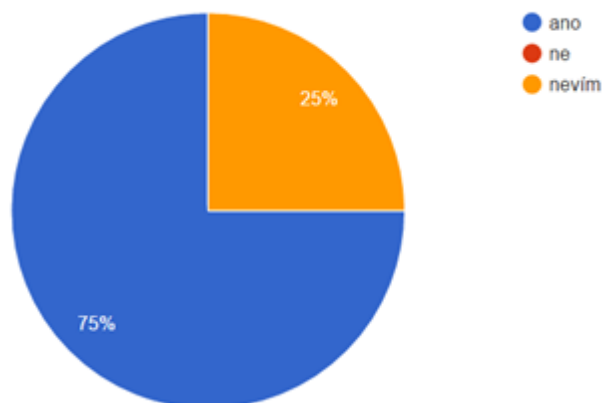


4. Do you think biology is appropriate for teaching through the CLIL method?

Concerning responses to the question one male primary teacher mentioned the name of a CLIL course that had been arranged by language agency entitled Channel Crossings. I was curious about the CLIL courses provided by this agency so I have sent an e-mail to gain more information. Jana Mrkvičková who is the coordinator of educational activities was very obliging and she sent me the e-mail with a lot of useful information about workshops concentrated on the CLIL method. Jana Mrkvičková also informed me about a new edition of exercise book focused on teaching biology through the CLIL method entitled *Labyrinth* that is intended for lower secondary students. The exercise book was created due to the project called *Škola bez hranic*. The student's book has been checked out by more than eighty teachers from thirty-seven schools. The teachers and students who had an opportunity to work with the exercise book were very excited and impressed. They would like to go on using the book in future. I browsed on the website of the project and took a look at the student's book of biology. I suppose it is definitely worth trying. I especially love the design of the student's book and an interesting adaptation of discussed topics. I also wanted to participate in some CLIL workshop. However, I could not afford to finance the course.

Furthermore, I wanted to find out if the teachers shared my opinion that biology was the most appropriate subject to be taught through the CLIL method. As it is evident from the diagram below three respondents (75%) agree with the subject's appropriateness. One teacher does not know if the biology is appropriate subject for teaching through the CLIL method. There was also a complementary question. If the respondents thought that biology was an appropriate subject for teaching through the CLIL method, they were supposed to state the reason and express their opinion on the question if biology was more likely to be used at primary or grammar school. One of two teachers assumes that biology is appropriate subject due to technical terms for concrete subject in English. The second one agrees with the teacher's opinion and adds that biology terms are similar to Latin words.

As it can be seen from the diagram below most of the teachers who answered the question agree with my opinion on biology's appropriateness for teaching through the CLIL method. From my point of view many Czech biological terms were borrowed and adopted from Latin. Moreover, due to the fact that many biological terms in English are very similar to Latin terminology, teaching biology through the CLIL method would not be as difficult as in other subjects.



Proč ano/proč ne? A spíše na ZŠ nebo gymnáziích? (2 odpovědi)

odborné termíny pro daný předmět v AJ

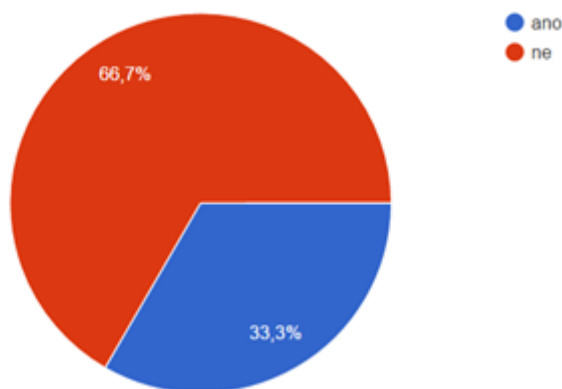
větší posobnost názvů s latinou

**5. Have you ever applied the CLIL method in biology lessons?
If your answer is positive answer the following question:
What way did you use for assessment of a CLIL lesson?**

Furthermore, I was wondering how the teachers who have already used the method assessed the CLIL lesson.

As it is apparent from the following diagram two of three respondents have never used the CLIL method in biology lesson. The third person has some experience with using the method in his lessons. The teacher also answers the complementary question where he states that oral evaluation is used with students' cooperation. The responses to the question were not surprising for me because as it had been already mentioned there was only one male teacher who has applied the method in geography, history and also in biology.

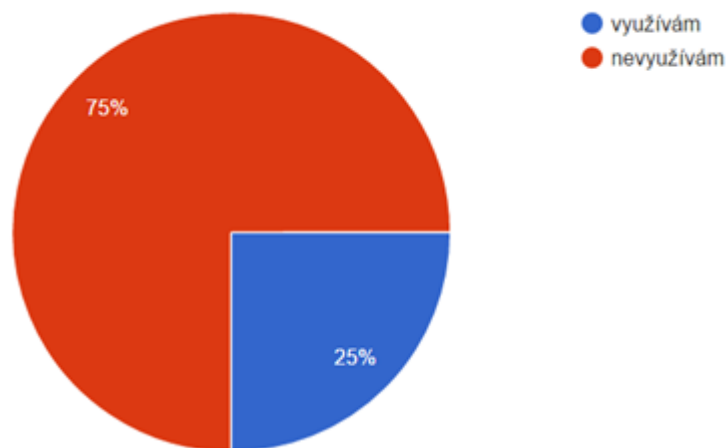
From my point of view the assessment of the CLIL lesson is much more difficult than e. g. creating a lesson plan. I assumed that the teachers' responses could provide some useful information to assess students' work. However, the results were vice versa.



If the teachers have never used the CLIL method they were asked to reply to questions from sixth to eleventh focused on using foreign languages in a biology lesson.

6. Do you use foreign languages in teaching biology?

Concerning sixth question I was wondering what was the attitude of teachers who have never applied the CLIL method to using English in a biology lesson. The research shows that nine teachers (75%) do not use foreign languages in their biology lessons. However, as it is evident from the following diagram there are three respondents (25%) who use foreign languages in their lessons. The responses were surprising for me because I supposed that there would be more young teachers whose knowledge of English would be at least on the intermediate level. As it had been already mentioned eight from twelve teachers who have filled in the questionnaire achieve intermediate level of English. Nevertheless, it is incomprehensible why they do not use foreign languages in biology lessons. It is possible that the respondent teachers are afraid of using foreign languages due to the lack of confidence or time-consuming preparation for other lessons.

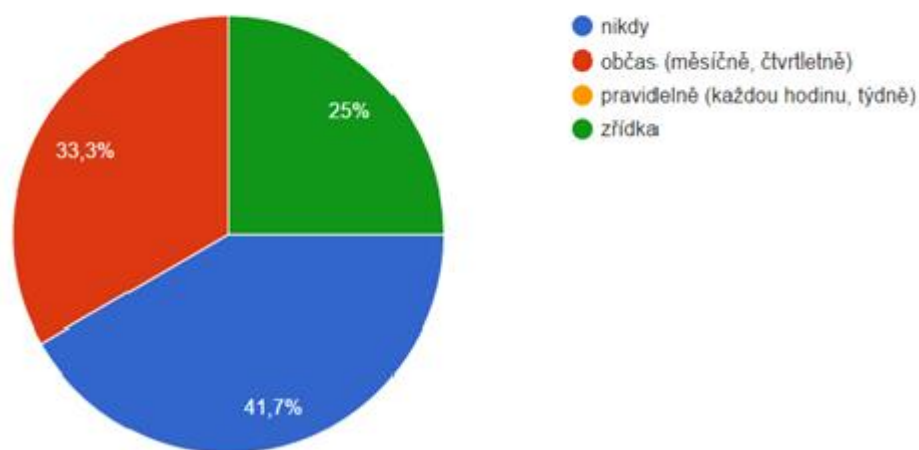


7. How often do you apply foreign materials in biology lessons?

Moreover, I wanted to find out if the teachers used foreign materials in a biology lesson. I supposed if they used the materials sometimes or rarely they might have been interested in using the CLIL method. As it is evident from the diagram below five teachers (41.7%) have never used foreign materials in their biology lessons. Four teachers (33.3%) from twelve respondents state that they use foreign materials from time to time (monthly/quarterly). Three people (25%) use the materials rarely. There is nobody who uses foreign materials regularly (each lesson or weekly).

Concerning the results, I assume that some of the teachers who sometimes use foreign materials could change their opinion and try to apply the CLIL method in their lesson. However, it will depend on their motivation and willingness to invest a lot of time and energy to implement the method. From my point of view despite the fact that the implementation is a long-lasting and demanding process it is worth trying.

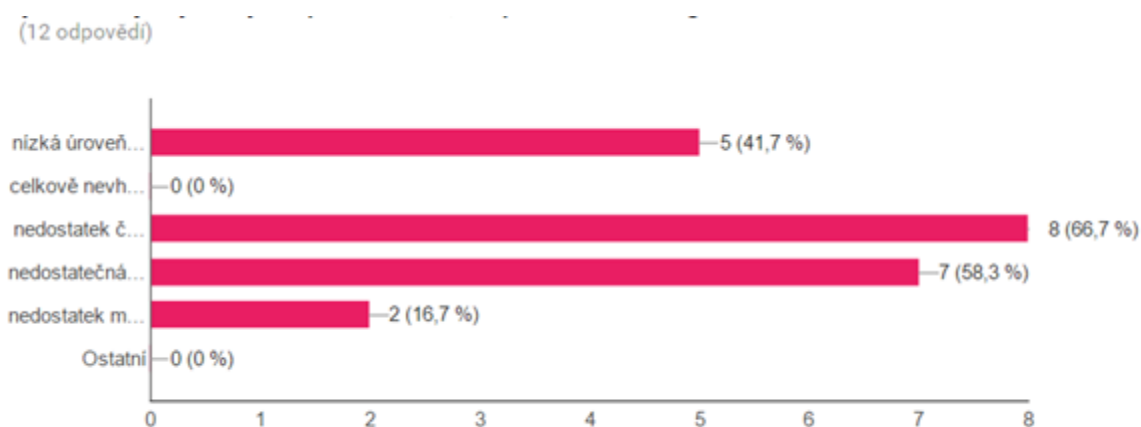
(12 odpovědi)



8. What are the most common reasons why teachers do not use a foreign language in teaching science subjects e.g. biology?

Furthermore, my aim lay in learning the most common reason why the teachers did not use a foreign language in biology. I assumed that the insufficient teacher's knowledge of foreign languages would be the most frequent reason and the second one would be a low level of students' knowledge of a foreign language. As you can see from the diagram below, eight teachers (66.7%) suppose that the lack of time for integration of a foreign language into a lesson is the most frequent reason. Seven respondents (58.3%) assume that the reason lies in the insufficient teacher's knowledge of foreign languages. About 42% of respondents find the low level of students' knowledge of a foreign language as the most frequent reason. Two of the twelve teachers (16.7%) think that the lack of students' motivation to be actively involved in a lesson is another reason. Nobody supposes that the reason lies in unsuitable school conditions in general.

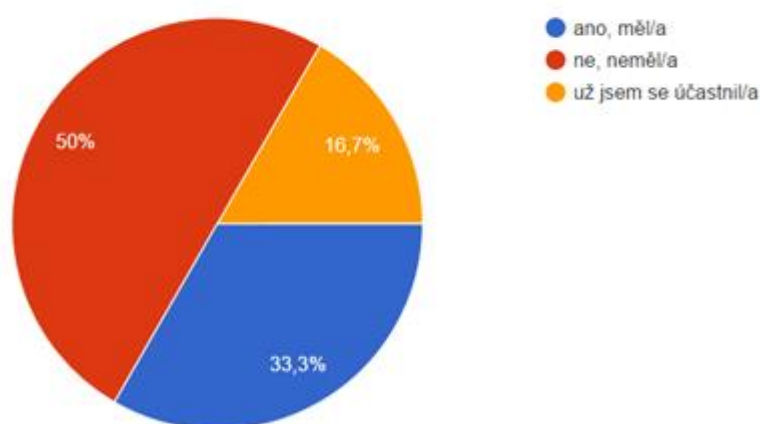
Concerning the teachers' responses my presumptions were confirmed. From my point of view if there were more young teachers the process of implementation of the CLIL method would be more successful.



9. Would you like to try any course focused on usage of the CLIL method at schools?

I also wanted to find out information if there was some chance that the CLIL method would be used more often in future. As it is apparent from the diagram below six teachers (50%) are not interested in attending any course. However, four teachers (33.3%) would like to attend some CLIL course. Only two respondents have already participated in some course. The fact that the question was answered by all the respondent teachers was pleasing because the question was found one of the most important that could cause influence on final results in a great extent. I supposed that more than 50% of the respondent teachers would be interested in attending a CLIL course. Nevertheless, according to results my presumptions were totally wrong. I hope four teachers mentioned above will participate in a CLIL course and they will apply the method in a biology lesson.

(12 odpovědí)

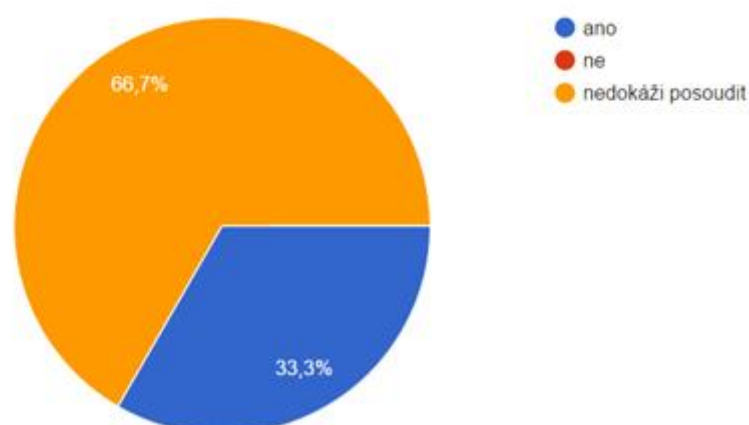


10. Do you agree your school would be able to provide necessary conditions for implementation the CLIL method?

Another aim lay in finding out if the teachers got on well with their headmasters and if they were informed enough about the school's issues. As it is evident from the following diagram most of the teachers (66.7%) are not able to consider if their school would be able to provide necessary conditions for the implementation. However, four respondents (33.3%) are sure about their school's inability to provide necessary conditions for the implementation.

From my point of view the implementation of the CLIL method is not as simple as it appears to be. There are many viewpoints that should be taken into consideration e.g. the sufficient amount of money and qualified teachers who are able to apply new methods in their lessons. Another viewpoint could be students' interest and motivation to improve their language skills. The key of successful implementation of the CLIL method into Czech schools could lie in positive attitude of headmasters to invest money and energy in order to provide students a possibility to find employment.

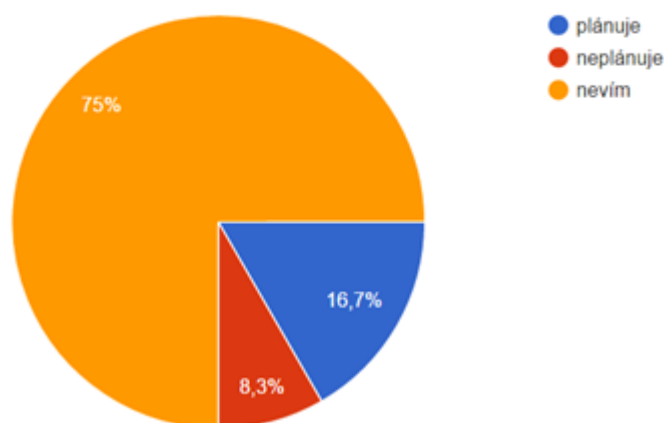
(12 odpovědi)



11. Are your school planning the implementation of the CLIL method in teaching biology?

I wanted to learn if the teachers had a good labour relationship with their headmasters and if they were informed enough about the school's matters. Concerning the results nine respondents (75%) do not have any information about the intention of their school to implement the CLIL method into teaching biology as it is apparent from the diagram below. Two teachers (16.7%) are sure about the positive attitude of their school to the implementation. The only one male primary teacher from Žďár nad Sázavou is informed that his school does not plan to implement the CLIL method. The lack of teachers' interest or insufficient communication between teachers and headmasters could influence the answers of respondents. I suppose that the question should have been intended for headmasters because a decision making about important issues is rather in their competence. However, I assume that most of the teachers are not able to consider the situation because they probably do not get on with their headmasters.

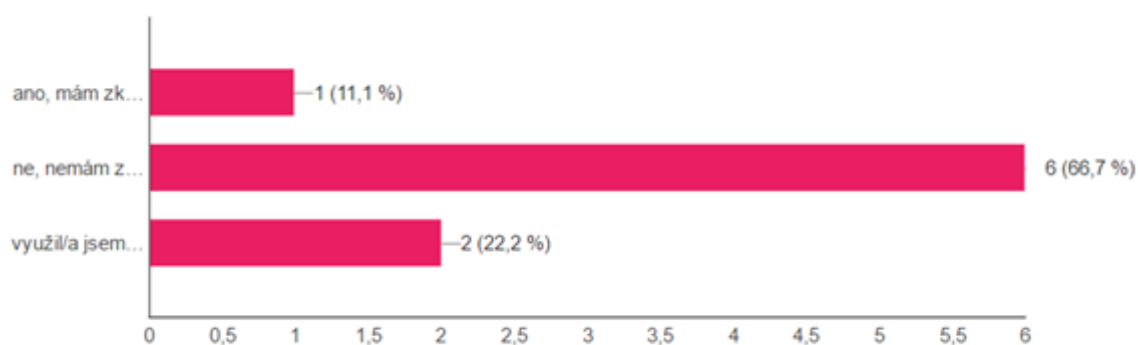
(12 odpovědi)



12. Have you had any experience with CLIL materials' production in biology lessons or have you preferred usage of ready-made materials?

Furthermore, I was interested in number of the respondent teachers who had already applied the CLIL method in a biology lesson and tried to create the materials on their own. As it is evident from the following diagram most of the teachers (66.7%) have no experience with production of CLIL materials. Only two from nine teachers have used some ready-made materials. The results show that only one person has tried to create his own materials for teaching geography and history through the CLIL method. The results might/could be unreliable because the question was answered by the teachers who have never applied the CLIL method in biology so they should have not responded to the question. My presumptions that most of the teachers would have hardly any experience with creating materials for a CLIL lesson were confirmed. The results were not surprising for me because as it had been already mentioned creating CLIL materials is demanding and time-consuming process. However, many ready-made materials exist in these days e.g. student's book entitled *Labyrinth* that has been mentioned so teachers do not have to create their own materials for teaching a CLIL lesson.

(9 odpovědi)

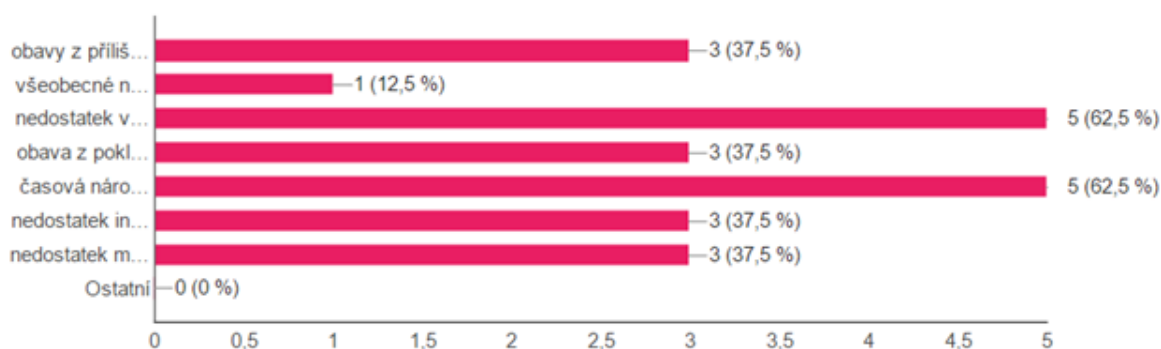


13. What do you find the most problematic situation in the process of implementation of the CLIL method?

Concerning thirteenth question I was interested what difficulties could make the implementation of the CLIL method impossible. Research shows that most of the teachers (62.5%) suppose that the lack of qualified teachers and time-consuming preparation for a CLIL lesson would be the most problematic during the implementation of the method. As it is evident from the diagram below most of the respondents (62.5%) find the lack of information about the way of using the CLIL method and shortage of materials and didactic sources also problematic. The teachers place the worries about excessive difficulty for students and decrease of the level of teaching in technical subjects as another big problem connected with the implementation of the CLIL. Only one teacher finds the general misunderstanding of approach by parents and students as the biggest problem during the implementation.

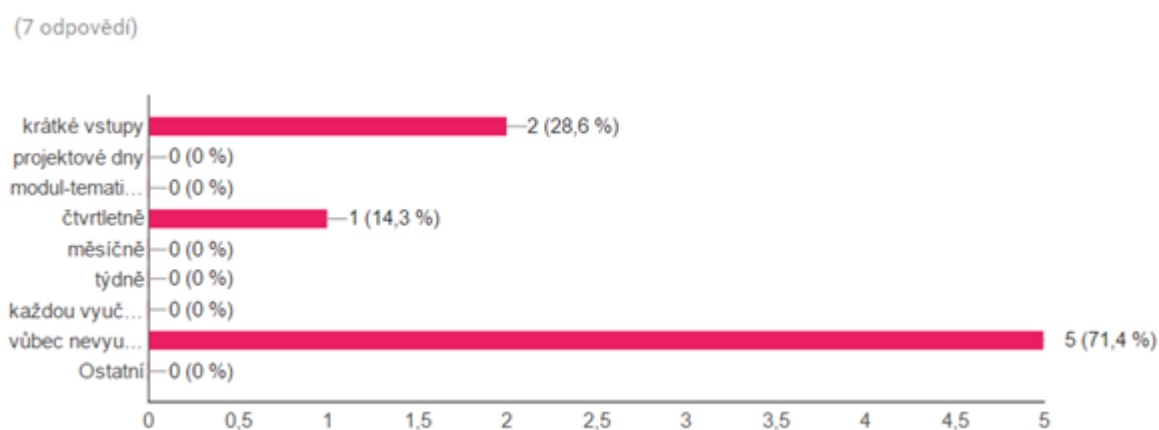
As I supposed most of the teachers came to an agreement that the lack of qualified teachers and time-consuming preparation for a CLIL lesson would be the most problematic during the implementation. Nevertheless, the teachers' opinion probably is caused by the lack of information about using the method or unwillingness to try some new teaching method that requires adequate knowledge of English.

(8 odpovědí)



14. What form of the CLIL method do you use in biology lessons and what is frequency of its usage?

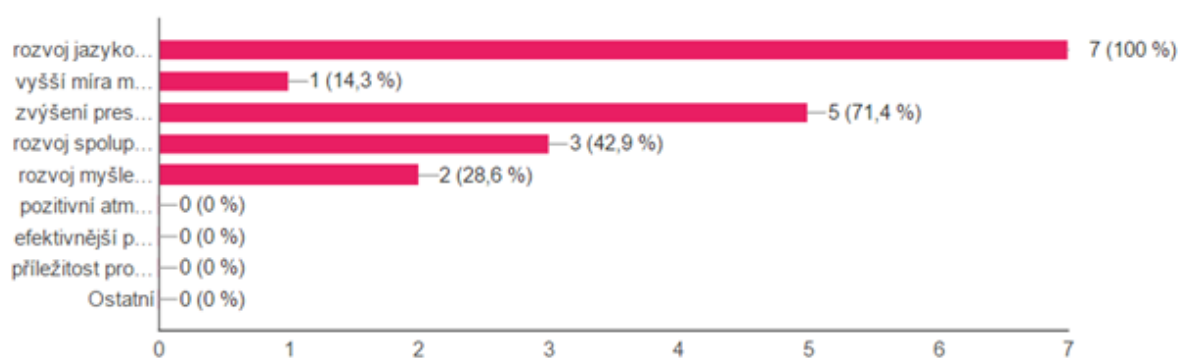
Furthermore, another aim lay in finding out if the teachers planned the whole CLIL lesson or if they preferred to integrate a few CLIL activities into an ordinary biology lesson. Most of the teachers (71.4%) reply that they do not use the method at all. Some of the respondents (28.6%) use a short input as a form of CLIL method in biology lessons and only one teacher uses the CLIL method quarterly. Concerning the teachers' responses the results could be unreliable again because as we have already learnt only one teacher has some experience with teaching through the CLIL method. The teachers' responses could be influenced by the lack of respondents' attention and interest. From my point of view the option *I do not use the method at all* should have not been offered because it could be confusing.



15. What is benefit of using the CLIL method in education?

I was wandering if the respondent teachers found the CLIL method useful or useless and if they supposed that the method would be beneficial primarily for students or for school's prestige.

Concerning the benefit of the CLIL method seven respondents (100%) come to an agreement that using the CLIL method is beneficial for the development of students' language skills. As it is apparent from the diagram below the rise of school's prestige and competitiveness is found as a second biggest benefit by five teachers (71.4%). About 43% of respondents find the development of teachers' cooperation and the progress of students' critical thinking as third important benefit of the CLIL method. Higher extent of students' motivation and active involvement in education is pointed by almost 30% of teachers as the other important benefit from using the CLIL method. The fact that nobody chooses the options such as positive atmosphere in a class or an opportunity for student's self-evaluation as the benefit of the CLIL method surprised me a lot. I supposed that these options would be at the top of the scale. From my point of view the fact that the teachers find the rise of school's prestige and competitiveness more important than e.g. higher extent of students' motivation or the progress of pupils' thinking is startling and it is worth noticing.



16. Do you find the CLIL method beneficial? Do you agree with implementation of the CLIL method to schools? You have got an opportunity to express your thoughts and opinions relating to the CLIL method.

Regarding the last point of the questionnaire, the possibility of adding comments or filling in an open-ended statement was offered to teachers. I wanted to gain more complex information about the teachers' view on benefits from the implementation of the CLIL method. Only one female teacher from grammar school situated in Žďár nad Sázavou expresses her opinion that each extra form of education is beneficial for student's general range of knowledge. Other respondent teachers were probably not willing to fill the last question. Time-consuming of filling in the questionnaire or absence of experience with the CLIL method could cause that the respondents did not mention their opinions. The only one answer did not provide me any useful information.

To sum up the main aim of the survey lay in learning if the CLIL method was known in the research area. Another goal of the survey was to gain a piece of information if the teachers consider the CLIL method beneficial.

I presupposed that respondent teachers would have been more aware of the CLIL method's existence. I also expected that at least half of the teachers had already applied the method in a biology lesson. However, the survey shows that the majority of the respondents have never heard about the method except one teacher who has already applied it in other subjects. As it follows from this fact almost all of the teachers have never participated in a CLIL course except one respondent. To summarize the results of the survey an average teaching practice of the respondent teachers lasts twelve years. The longest teaching practice lasts thirty-four years and the shortest period of teaching practice is only one year. I intended to find out the length of teachers' practice because in my opinion teachers with longer practice would not be willing to try new teaching methods and their level of English would be lower in comparison with younger teachers.

Furthermore, I was interested in the teachers' view on appropriateness of teaching biology through the CLIL method. The survey proves that three quarters of the teachers come to an agreement that biology is an appropriate subject to be taught through the CLIL method. Moreover, seventy-five percentages of the

respondents do not use foreign languages and materials in biology lessons. Most common reasons why foreign languages are not used in non-language subjects are the lack of time for integration of foreign languages and insufficient teachers' knowledge of the languages.

Concerning the implementation of the CLIL method almost of all of the teachers are not able to consider if their school could provide necessary conditions to implement the method. I supposed that teachers would be informed about headmasters' intention to implement the method to their schools. Nevertheless, as it is evident from the survey's results respondent teachers have not got any information about the headmasters' intention to innovate the method. The survey shows that the majority of respondents have not any experience with the production of CLIL materials except one teacher who has already tried to create his own worksheets. According to the teachers' opinion the lack of qualified teachers and time-consuming preparation for a CLIL lesson would be the most problematic during the implementation. Regarding frequency of using the method in a biology lesson more than seventy percentages of the respondents do not use the CLIL method at all. All teachers come to an agreement that using the CLIL method encourages the development of students' language skills. They find the rise of school's prestige and competitiveness as the second important CLIL method's benefit. The survey proves that the CLIL method is not used by the respondent teachers. In my opinion teachers should apply the method in biology lessons because there are many biological materials in English available either on the Internet or in scientific books that could be used by teachers during the planning of a CLIL lesson. Students who would like to study biology at university could benefit from the CLIL lessons and used gained knowledge during their studies.

7. Production of sample materials

The questionnaire survey represents one volume of the diploma thesis' practical part. Sample materials comprise second volume. The materials have been made for pupils attending lower secondary school. Worksheets for pupils, teacher's notes and glossaries are embodied in sample materials, which are listed below these paragraphs. All of these activities lie in practising reading comprehension, speaking, writing and listening skills.

Regarding to worksheets for pupils they have been made according to RVP and ŠVP concerning school subject - biology at the lower secondary school. There are picture resources that are placed as an index at the bottom of the page in each worksheet to not disturb. They are also found in the Teacher's notes. On account of inexperience in creating materials for a CLIL biology lesson sample materials have been made on the basis of ready-made materials available on the internet e.g. *One-stop English* or *CLIL Jazykový pedagogický park* etc. Approximately 90% of exercises in the materials have been borrowed from the internet and adapted for the purpose of production sample materials that represent practical part of the diploma thesis.

Concerning teacher's notes main aim of the lesson, needful materials and duration of the activities are mentioned there. Teacher's notes provide the description of particular activities and right answers. A glossary constitutes another part of teacher's notes. It consists of key words that occur in a particular worksheet. The definitions of particular words intended for pupils from the sixth to the eighth grade are written in Czech language. English definitions can be found in the glossary in the worksheet that is intended for the ninth graders due to their higher level of English in comparison with younger students.

Originally the sample materials have been created only for the purpose of the diploma thesis. However, they have been tested at a lower secondary school Leandra Čecha in Nové Město na Moravě. Only two sample materials meant for pupils from the sixth and seventh grade have been put to the test.

The topic of the CLIL lesson, tested in the sixth grade, dealt with Insects. From the beginning of the lesson pupils were annoyed so I tried to motivate them by explaining the importance of the topic through which they would learn new useful

vocabulary in English. Nevertheless, it did not obtain a positive response from the students. Concerning the first and the second activity pupils were not able to understand English definitions of insects so it was necessary to provide Czech translation. However, they managed to guess right answer. I decided to skip the third activity due to the lack of time and the difficulty of the text. The fourth activity lay in labelling the stages of butterfly's life cycle. The activity proved to be the easiest and the most engaging. In the last activity pupils should have matched four stages of butterfly's life cycle and put them into correct order. However, they did not do the exercise due to lack of time and pupils' unwillingness to finish the last part of the worksheet. I had thought we would manage to fulfil all activities during the lesson, nevertheless, it proved to be impossible. I supposed that the reason lay in pupils' unwillingness to cooperate and in their insufficient knowledge of both biology and English. From my point of view this worksheet would be more appropriate for students at grammar school because they possess better knowledge of the subject and the language. They are also more willing to learn new information. If I test the sample materials in the future, I will definitely simplify them and leave out some of the more difficult which were problematic for students.

The CLIL lesson in the seventh grade dealt with Photosynthesis. Pupils' cooperation was not satisfying. However, their knowledge of biology and English seemed to be much better in comparison with the sixth graders. However, the class did not manage to accomplish all activities e.g. pupils were supposed to read a text about photosynthesis and answer given questions at home. They found the activity too difficult. I provided right answers to two pupils who did it at home. Concerning the fourth activity they were told to fill in photosynthesis' vocabulary into the crossword. Nevertheless, due to lack of time the students finished it at home. Only few pupils solved it for the next lesson. The most enjoyable activity for students was represented by a song about Photosynthesis. They were able to catch most of the words during the first listening. Relating to the third activity they did not manage to fill the missing words in the equation of photosynthesis so I provided them a piece of advice.

To sum up I am a little bit disappointed. I supposed that the worksheets have been made appropriately for the students from the sixth and seventh grade. I did not presuppose pupils' inability to manage all exercises and their unwillingness to cooperate. Despite this fact, I am satisfied that I had been given an opportunity to test the sample materials in teaching practice. From my point of view, the materials have not been created in a wrong way. I was satisfied with pupils' positive response to the design of the worksheets.

Created sample materials for learners from the sixth to ninth grade are listed below these paragraphs.

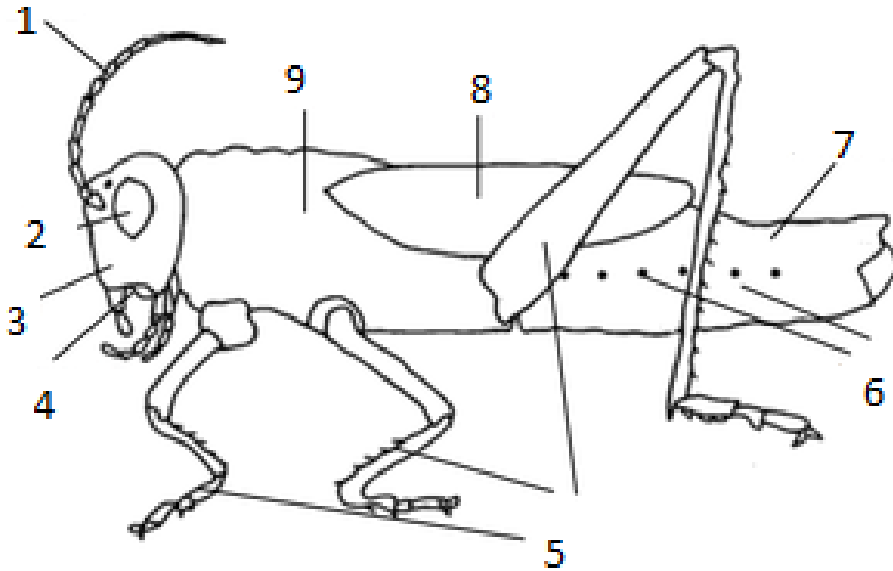
SUBJECT: SCIENCE / TOPIC: INSECTS / GRADE: 6TH

1. Complete words from the box.

NAT	EBE	TTBUERFLY
UBG YDAL		
CELI	TISMAN	GRSASPPERHO
DONFLYRAG	LFY	

- A. I am a social animal and I live in the wood. I search for food in the kitchen and I can bite you! Who am I?
- B. I am a very pretty and colourful insect. I pollinate flowers and I can fly. Who am I?
- C. I am red and I have eight dots. I am a beetle that can fly. Who am I?
- D. I have wings and I buzz. I eat garbage and I spread diseases. Who am I?
- E. I can fly and I pollinate flowers. I can make honey and I can sting you. Who am I?
- F. I eat plants and I have long legs to jump in the grass. Who am I?
- G. I have a long thin body and I have four wings. I live near water. Who am I?
- H. I am very small insect without wings. I can live in your hair. Who am I?
- I. I am green and I have big eyes. I am a predator and I eat my husband. Who am I?

2. Label the body parts of the insect.¹



1.
2.
3.
4.
5.
6.
7.
8.
9.

Complete:

- a) Insects have got three body parts -, and
- b) Insects have got a to see many images.
- c) Insect have got twoon the top of their head.
- d) Insects have got pairs of legs.
- e) Some insects have got one or two pairs of..... to fly.

¹ Picture 1 is available at: <http://caitand.weebly.com/insects.html>

3. Read the text and answer the questions below.²

Insects belong to a group called Arthropods. But not all Arthropods are insects. Spiders and centipedes are Arthropods but they are not insects. It is because insects only have six legs. Spiders have eight legs and centipedes have many more. Worms are not insects (they do not have an exoskeleton or any legs). Insects do not have bones or a skeleton. They have a “skin” called an exoskeleton. Insects have body parts just like you. There are three basic body parts – head, thorax and abdomen. Let’s look more closely at the head. Insects can detect smells, vibrations or sound with their antennae. They use their antennae to find each other. Most insects have two compound eyes so they can see many images but insects cannot see long distances. Insects eat many different things. Many insects eat plants. Some eat other insects and spiders. Mosquitoes and fleas suck blood when they bite humans or other animals. Many bees and butterflies drink nectar from flowers. Most insects have four wings like dragonflies but flies have only two wings. Insects don’t have noses. They breathe through openings in the sides of their abdomens. These are called spiracles. Insects go through the process of metamorphosis. All insects change as they grow from eggs into adults. Most insects like butterfly undergo complete metamorphosis, in which they completely change their form as they grow from juveniles to adults. Complete metamorphosis involves four stages – egg, larva, pupa and adult. But some insects like grasshopper undergo an incomplete metamorphosis that has only three stages – egg, nymph and adult.

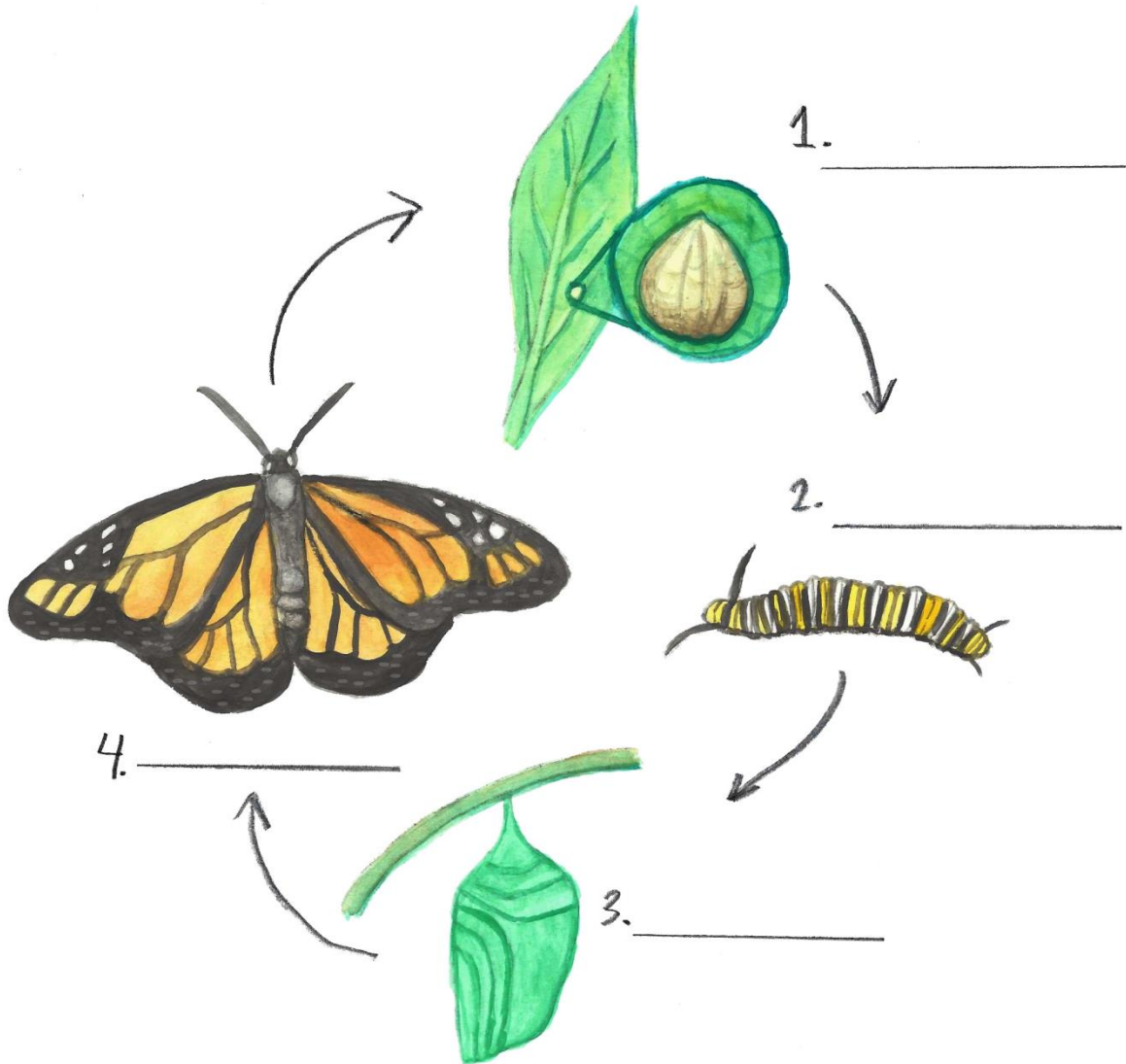
Is it true or false?

- a) Spiders and centipedes belong to Arthropods but they are not insects.
- b) Insects have four pairs of legs.
- c) Antennae, thorax and abdomen are basic insects’ body parts.
- d) Insects don’t have bones like humans but they have an endoskeleton.
- e) Insects can see many images because they have one pair of compound eyes.
- f) All insects have two pairs of wings.
- g) Insects use their nose to detect smells.
- h) Insects can breathe by lungs.
- i) All insects eat plants.

² The text is available at: <http://www.watchknowlearn.org/Video.aspx?VideoID=39306&CategoryID=1473>

- j) A grasshopper undergoes a complete metamorphosis.
- k) In insects with complete metamorphosis the larva hatches from eggs and change into nymph.

4. Label the stages of the butterfly life cycle.³



³ Picture 2 is available at:
https://www.google.cz/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjN6_6s5v3PAhVGvBoKHe3IBdsQjRwIBw&url=https%3A%2F%2Fwww.tes.com%2Flessons%2Fof5bMLkDyBmWg%2Flife-cycles&bvm=bv.136811127,d.d24&psig=AFQjCNFPZkQ-t7PoVTuG7hfex3DFykfEBg&ust=1477754285649995

5. Butterfly life cycle.⁴

STAGE 1	ADULT BUTTERFLY	LAYS AN EGG
STAGE 2	THE EGG	HATCHES INTO CATERPILLAR
STAGE 3	THE CATERPILLAR	MAKES A COCOON
STAGE 4	ADULT BUTTERFLY	STARTS TO EMERGE FROM THE COCOON

6. Write the stages of the life cycle of butterfly.

Stage 1:

Stage 2:

Stage 3:

Stage 4:

⁴ Inspiration for this activity was taken from the website: <http://www.thebutterflysite.com/life-cycle.shtml>

SUBJECT: SCIENCE / TOPIC: INSECTS / GRADE: 6TH

TEACHER'S NOTES

AIMS:

- To teach basic vocabulary connected with the topic insects.
- To study the main characteristics of insects.
- To introduce the life cycle of butterfly.

MATERIALS

- Worksheet

DURATION

- 45 minutes

LANGUAGE FOCUS

- Present simple including *have got* and *can*.

WARM-UP

- Write the topic on the board. Ask students to tell you what they already know about insects.
- Ask students to write their ideas on the board to create a mind map.
- If they do not know a word in English they can write it in Czech.
- Tell students that you will learn about basic characteristics of insects and their reproduction.

ACTIVITY 1

- Tell pupils to fill in the names of different insects.
- Ask students to write their answers. (10 minutes)
- Check pupils' answers. Ask them randomly to read their answers.
- Tell students to repeat the words after you to practice pronunciation.
- The activity has been thought up by the author of the thesis.

Answers: A. ant, B. butterfly, C. ladybug, D. fly, E. bee, F. grasshopper, G. dragonfly, H. louse, I. mantis

ACTIVITY 2

- Ask children what they already know about the structure of insects' body.⁵
- Ask pupils to label the body parts of the insect. (5 minutes)
- Check answers.
- Tell students to fill in the sentences below the picture. Emphasize that we can use the quantifier – a pair of (e.g. two pairs of wings). (5 -7 minutes)
- The activity has been thought up by the author of the thesis.

Answers: 1. antennae, 2. compound eye, 3. head, 4. mouthparts, 5. legs, 6. spiracles, 7. abdomen, 8. wings, 9. thorax

a) head, thorax, abdomen, b) compound eye, c) antennae, d) three, e) wings

ACTIVITY 3

- Ask pupils to read the text about insects' basic characteristics, their body structure and reproduction to practice reading comprehension.⁶ (5 minutes)
- Ask them if they understand the text. Explain the words if it is necessary.
- Tell pupils to answer the questions below the text (write if it is true or false). (10 minutes)
- Check answers. If someone does not know the answer, do not tell the right answer immediately but ask the rest of the class.
- Ask students to sum up what they have learnt about insects.
- Inspiration for the activity has been taken from different websites – e.g. <http://www.onestopenglish.com/clil>

Answers: a) T, b) F, c) F, d) F, e) T, f) F, g) F, h) T, i) F, j) F, k) F

ACTIVITY 4

- Tell pupils to look at the picture about the life cycle of a butterfly.⁷
- Ask them to label four the stages of the cycle. (2 minutes)
- Check answers.
- Inspiration for the activity has been taken from the website: <https://www.tes.com/lessons/fOf5bMLkDyBmWg/life-cycles>

⁵ Picture 1 is available at: <http://caitand.weebly.com/insects.html>

⁶ The text is available at: <http://www.watchknowlearn.org/Video.aspx?VideoID=39306&CategoryID=1473>

⁷ Picture 2 is available at: https://www.google.cz/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjN6_6s5v3PAhVGvBoKHe3IBdsQjRwIBw&url=https%3A%2F%2Fwww.tes.com%2Flessons%2FfOf5bMLkDyBmWg%2Flife-cycles&bvm=bv.136811127,d.d24&psig=AFQjCNFPZkQ-t7PoVTuG7hfex3DFykfEBg&ust=1477754285649995

Answers: 1. egg, 2. larva (caterpillar), 3. pupa (chrysalis), 4. adult butterfly

ACTIVITY 5

- Tell pupils to make a group of four people.
- Give one pack of words about the life of a butterfly that were cut to pieces to each group.⁸
- Ask pupils to put the words into correct order. (5 minutes)
- Check answers. Ask students to read the sentences aloud to practice pronunciation.
- Tell students to write all the stages to the worksheet.
- Inspiration for this activity was taken from the website:
<http://www.thebutterflysite.com/life-cycle.shtml>

Answers:

Stage 1: Adult butterfly lays an egg.

Stage 2: The egg hatches into caterpillar.

Stage 3: The caterpillar makes a cocoon.

Stage 4: Adult butterfly starts to emerge from the cocoon.

GLOSSARY:

ant	mravenec
bee	včela
butterfly	motýl
dragonfly	vážka
grasshopper	kobylka
fly	moucha
mantis	kudlanka
louse	veš

⁸ Inspiration for this activity was taken from the website: <http://www.thebutterflysite.com/life-cycle.shtml>

ladybug	slunéčko sedmítečné
thorax	hrud'
abdomen	zadeček
antennae	tykadla
wings	křídla
compound eye	složené oko
Arthropods	členovci
centipede	stonožka
worm	červ
skin	pokožka
exoskeleton	exoskeleton
spiracles	trachea, vzdušnice
metamorphosis	metamorfóza, proměna
complete	dokonalá
incomplete	nedokonalá
larva (caterpillar)	larva (housenka)
pupa (chrysalis)	kukla
adult	dospělec
juvenil	mládě
lay	snášet
hatch into	vylíhnout se
emerge	vyvinout se, dostat se
cocoon	kokon, zámotek

SUBJECT: SCIENCE / TOPIC: PHOTOSYNTHESIS / GRADE: 7TH

1. Listen to the song about photosynthesis and fill in the text.⁹

If you want to know how a plant grows,
It takes water, (1), and sunlight and makes (2).....

Every (3)..... can do this fundamental process,
and we call this (4).....

Unlike me and you, plants need (5).....
and they make (6) that stops us turning blue.

Every plant can do this fundamental process,
and we call this Photosynthesis.
It's a miracle how all the (7)
catches (8) in the leaves
of the plants and the trees.

A plant of any size, can do it if it tries
We're not (9)..... so we can't Photosynthesize.

Every plant can do this fundamental process,
and we call this Photosynthesis.
It's a miracle how all the chlorophyll
catches sunlight in the leaves
of the plants and the trees.

Every plant can do this fundamental process,
and we call this Photosynthesis.
Every plant can do this fundamental process,
and we call this Photosynthesis.

⁹ The song is available at: https://www.youtube.com/watch?v=C1_uez5WX1o, the text of the song at: <http://andrewsscienceclass.weebly.com/song-lyrics---photosynthesis.html>

2. Read the text about Photosynthesis and answer the questions below.¹⁰

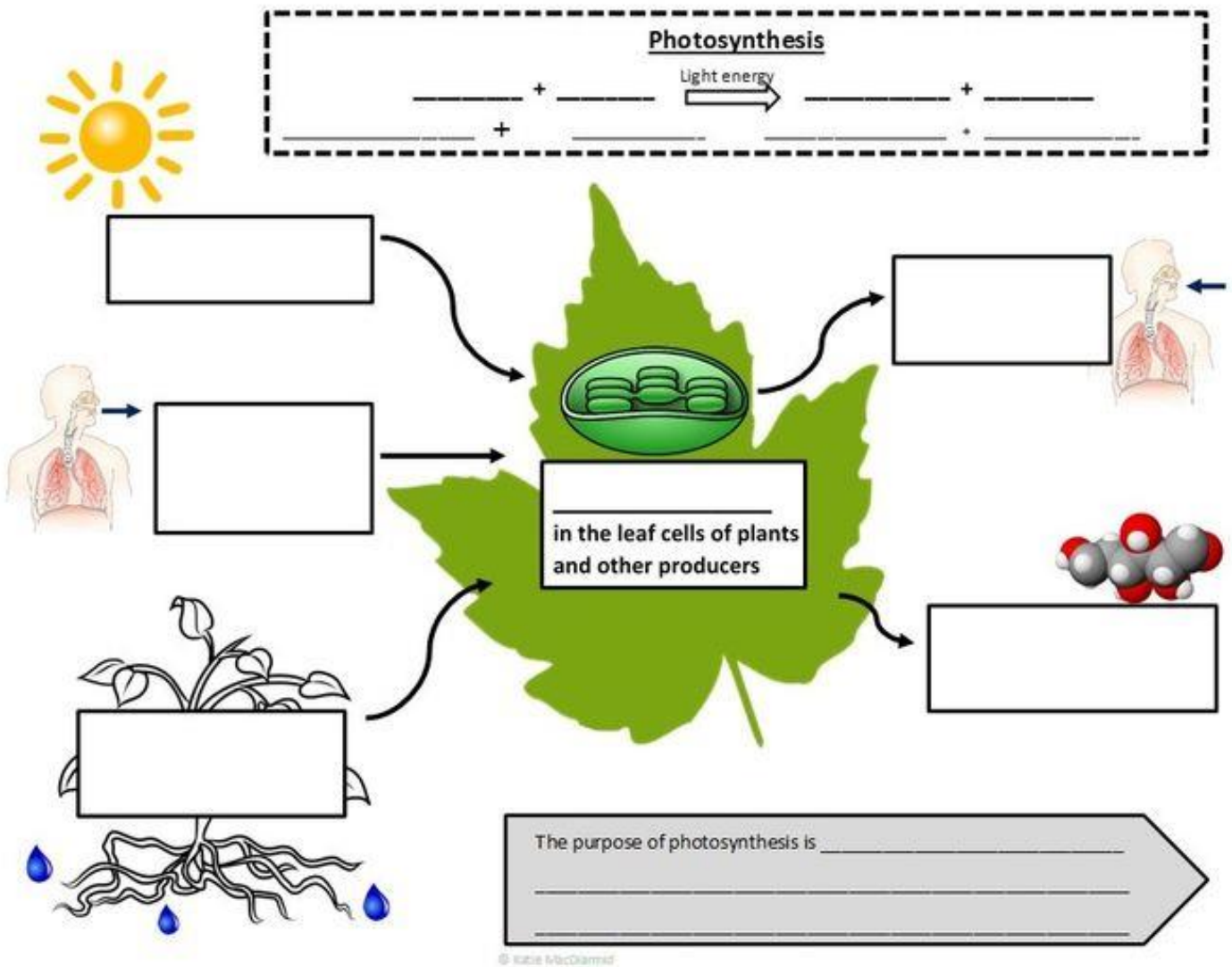
Photosynthesis is an important process because plants make their own food by the process and it provides oxygen. Plants need carbon dioxide, water and sunlight to make food (glucose). Carbon dioxide from the air passes through small pores (**stomata**) in the **leaves**. **Roots** absorb water that passes to the leaves. Photosynthesis takes place in the leaves of plants. There are small **cells** in the leaves called **chloroplasts**. Each chloroplast **contains** green chemical **chlorophyll** that gives leaves their green colour. Chlorophyll **absorbs** sunlight that plants need for the process. **Hydrogen**, that is in water, and carbon dioxide form glucose. Products of photosynthesis are glucose and **oxygen**. Plants absorb carbon dioxide from the air and **release** oxygen during the process of photosynthesis. People **breathe in** oxygen and **breathe out** carbon dioxide. We cannot **survive** without plants because they **produce** oxygen that we need to live. Plants can live without us because there is **enough** carbon dioxide in the atmosphere.

Is it true or false? Tick (✓) or cross (✗).

- a) Plants need only water and carbon dioxide to make food and oxygen.
- b) Photosynthesis takes place in the roots of plants.
- c) Leaves are green because they contain chlorophyll.
- d) Glucose and hydrogen are products of photosynthesis.
- e) People breathe out oxygen.
- f) People can survive without plants.

¹⁰ The text is available at: <http://photosynthesiseducation.com/photosynthesis-for-kids/>

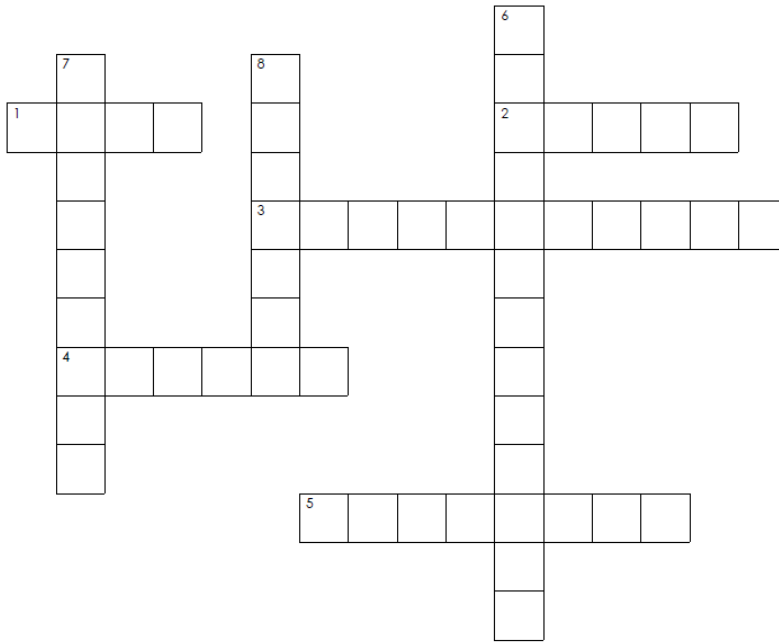
3. Label each component of Photosynthesis and complete the equation.¹¹



¹¹ The worksheet about photosynthesis is available at: <http://sheet.malotine.com/cell-respiration-and-photosynthesis-worksheet/>

4. Fill in words into the crossword.¹²

Photosynthesis



Across: →

1. place where photosynthesis takes place
2. each plant absorbs water by its ..
3. green chemical that gives leaves colour
4. one of the products of photosynthesis
5. light that comes from the sun

Down: ↓

6. people breathe out
7. substance that creates the cell wall
8. second product of the photosynthesis

¹² The crossword maker is available at: <https://www.superteacherworksheets.com/generator-word-search.html>

SUBJECT: SCIENCE / TOPIC: PHOTOSYNTHESIS / GRADE: 7TH

TEACHER'S NOTES

AIMS:

- To study the process of photosynthesis.
- To teach basic vocabulary connected with the topic photosynthesis.

MATERIALS

- Worksheet, PC (to play the song about photosynthesis)

DURATION

- 45 minutes

LANGUAGE FOCUS

- Present simple and making a plural form (e.g. leaf x leaves)

ACTIVITY 1

- Tell pupils they are going to listen to the song about photosynthesis¹³. (15 minutes)
- At first advise them to listen. After that tell pupils to fill in the words.
- Play the song twice.
- Check answers. Write the answers on the board or project it on the screen to check spelling.
- Ask students to repeat the words after you at first chorally and after that individually to practice pronunciation.
- The activity has been thought up by the author of the thesis.

Answers: 1. air, 2. cellulose, 3. plant, 4. Photosynthesis, 5. CO₂, 6. oxygen, 7. chlorophyll, 8. sunlight, 9. green

¹³ The song is available at: https://www.youtube.com/watch?v=C1_uez5WX1o, the text of the song at: <http://andrewscienceclass.weebly.com/song-lyrics---photosynthesis.html>

ACTIVITY 2

- Tell pupils to look at the text about photosynthesis.¹⁴
- Ask them if they understand words in bold. If not explain the words to them.
- Ask students to read the text. (5 minutes)
- Ask pupils if they understand it.
- Tell students to answer the questions below the text. (5 minutes)
- Check answers.
- Ask pupils to describe the process of photosynthesis.

Answers: a) F, b) F, c) T, d) F, e) F, f) F

ACTIVITY 3

- Ask pupils to label each component of photosynthesis and complete the equation.¹⁵
- Explain students they should write numbers (numeral equation) to the first line and words to the second line. (5-7 minutes)
- Check answers. Write the answers on the board or project them on the screen.
- Ask one volunteer to describe the photosynthesis according to the picture. If he/she makes a mistake, let him/her to correct it. If he/she does not know, ask another volunteer to help him/her.
- Discuss the purpose of the photosynthesis in Czech and try it also in English.

Answers: $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$,
carbon dioxide + water → glucose (sugar) + oxygen

On the left side: sunlight, carbon dioxide, water and chloroplast

On the right side: oxygen and glucose (sugar)

ACTIVITY 4

- Tell students to fill in the crossword about photosynthesis¹⁶. (10 minutes)
- Check answers. Project the answers on the screen.
- Give plus points to the pupil who finished the task first. Praise all of the pupils for solving the crossword successfully.
- The activity has been thought up by the author of the thesis.

¹⁴ The text is available at: <http://photosynthesiseducation.com/photosynthesis-for-kids/>

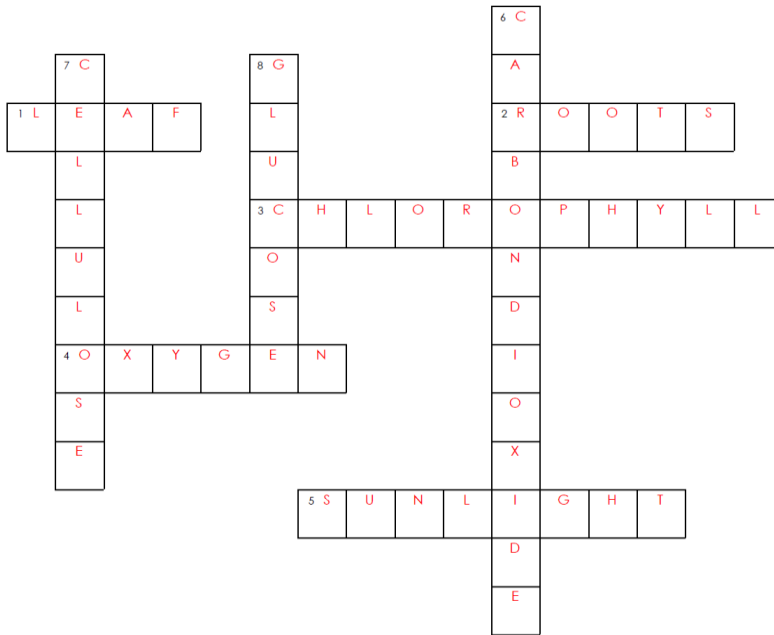
¹⁵ The worksheet about photosynthesis is available at: <http://sheet.malotine.com/cell-respiration-and-photosynthesis-worksheet/>

¹⁶ The crossword maker is available at: <https://www.superteacherworksheets.com/generator-word-search.html>

Answers:

SOLUTION

Photosynthesis



Across: →

1. place where photosynthesis takes place
2. each plant absorbs water by its ..
3. green chemical that gives leaves colour
4. one of the products of photosynthesis
5. light that comes from the sun

Down: ↓

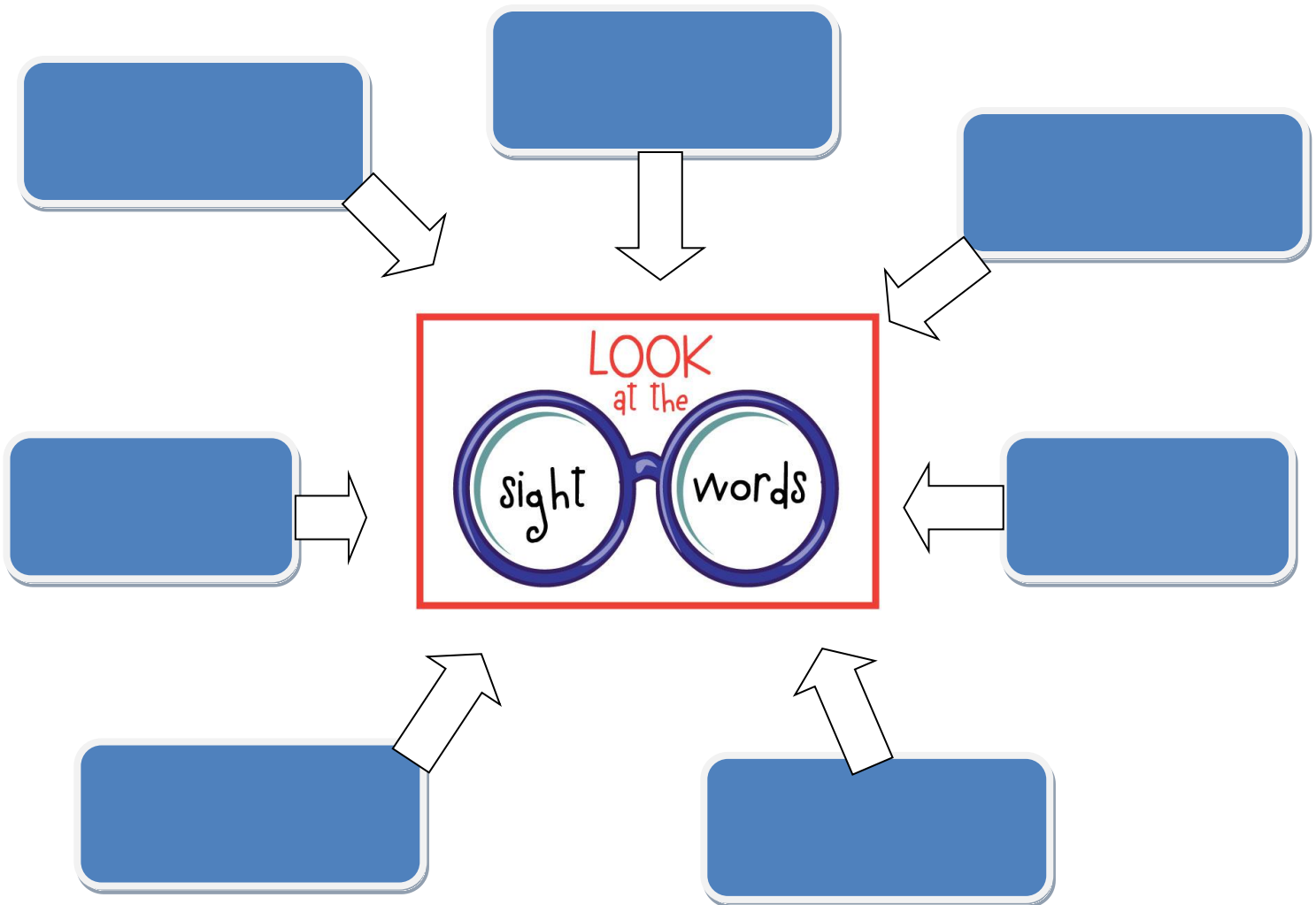
6. people breathe out
7. substance that creates the cell wall
8. second product of the photosynthesis

GLOSSARY:

CO₂ (carbon dioxide)	oxid uhličitý
cellulose	celulóza
photosynthesis	fotosyntéza
oxygen	kyslík
chlorophyll	chlorofyl
sunlight	sluneční záření
leaf, leaves	list, listy
cell	buňka
chloroplast	chloroplast
breath in, out	vdechnout, vydechnout
equation	rovnice
producer	producent
roots	kořeny
glucose	glukóza (cukr)

SUBJECT: SCIENCE / TOPIC: SIGHT / GRADE: 8TH

1. Complete the mind map.¹⁷



¹⁷ Picture 3 is available at: <http://www.clipartkid.com/sight-word-school-cliparts/>

2. Ask your partner and fill in the gaps.¹⁸

Student A

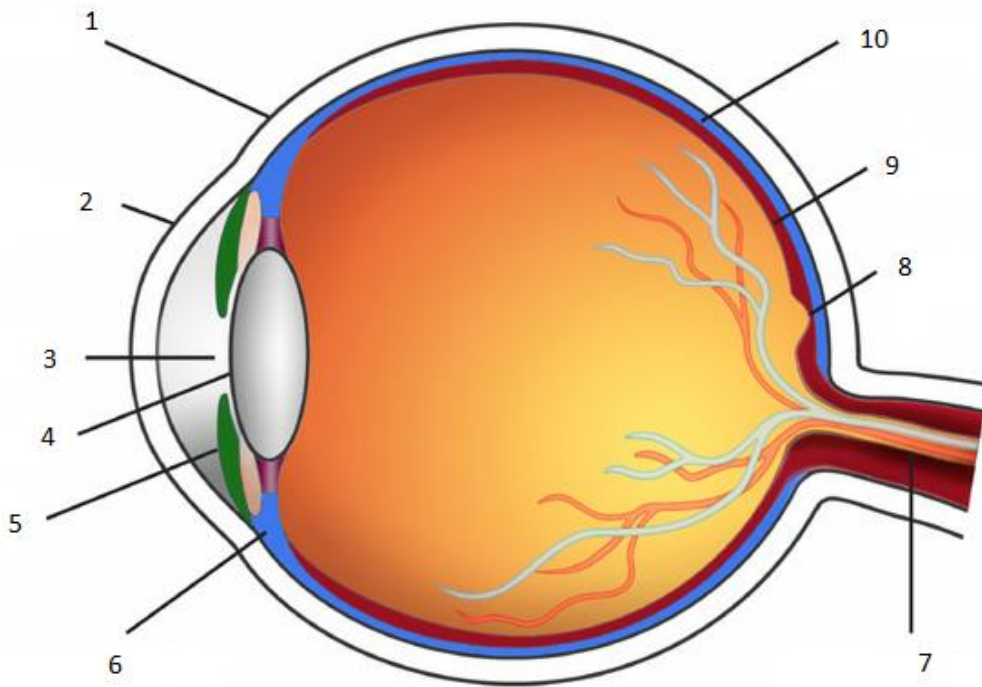
There are many parts to your eye, and each one of them helps you to see. The light goes in through an opening called the **pupil**. That's the black dot in the centre of your eye. The **(1)**, or coloured part around the pupil, can change the size of the opening, letting in more or less light. The lens focuses the light rays on the **retina**; the **(2)**..... protects the lens. When you look at your eyes in the mirror, you're only seeing a part of them. The whole eye is shaped like a round ball, most of it is inside your head and protected by your **skull**. Your **(3)**..... and **eyelashes** protect your eyes too. Your eyelids make it possible for you to close your eyes, shutting out the light when you are tired. Closing your eyes makes it easier for you to go to sleep. As the light enters the eye, it passes through the **(4)**.....The lens helps to take out the **fuzzy** look of the thing you are looking at, focusing the image. As the light goes through the lens, it turns upside down! When the upside down image shines on the back of your eye, it strikes the **(5)**..... The **retina** contains the **optic nerve** that sends the message of what you are looking at to the brain. The **(6)**..... and **cones** help us see shapes and colours and are a part of the **(7)**..... The **optic nerve** carries the message to your brain.

Student B

There are many parts to your eye, and each one of them helps you to see. The light goes in through an opening called the **(1)** That's the black dot in the centre of your eye. The **iris**, or coloured part around the pupil, can change the size of the opening, letting in more or less light. The lens focuses the light rays on the **(2)**.....; the **cornea** protects the lens. When you look at your eyes in the mirror, you're only seeing a part of them. The whole eye is shaped like a round ball, most of it is inside your head and protected by your **(3)**..... Your **eyelids** and **(4)**..... protect your eyes too. Your eyelids make it possible for you to close your eyes, shutting out the light when you are tired. Closing your eyes makes it easier for you to go to sleep. As the light enters the eye, it passes through the **lens**. The lens helps to take out the **(5)**..... look of the thing you are looking at, focusing the image. As the light goes through the lens, it turns upside down! When the upside down image shines on the back of your eye, it strikes the **retina**. The **retina** contains the **(6)**..... that sends the message of what you are looking at to the brain. The **rods** and **(7)**..... help us see shapes and colours and are a part of the retina. The **optic nerve** carries the message to your brain.

¹⁸ The text is available at: <http://www.sedl.org/scimath/pasopartners/senses/lesson2.html>

3. Label the parts of the eye.¹⁹



1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

EYE VOCABULARY:	
řasnaté těleso	sítnice
optic nerve	lens
duhovka	rohovka
pupil	sclera
fovea	choroid

¹⁹ Picture 4 is available at: http://www.proprofs.com/quiz-school/story.php?title=parts--eye_2

4. There are nine common eye disorders hidden in the word search. Can you find all of them? ²⁰

S D H X L F H X V E H D O J S
H S N J B H X O V J E R P L S
Y W E I Y T X Q A T K K T T E
Y D B N L X P B H U L A O X N
A M Z F D B U G F U V A M E D
T L P B S N I V O A S M E Z N
P K F A R S I G H T E D T H I
E S L N T Y I L I B H U R N L
N B E R N H M G B X J T I M B
C K O B P A M J J R L K S N T
C H T B E A T H L J U O T F H
S W R V T R R T H R V O J R G
A M L I Q W F V W A F P L Q I
B T S K D C A G R M E L R O N
A M S U M S I B A R T S J U C

šilhavost	barvoslepost
šeroslepost	krátkozrakost
dalekozrakost	slepota
astigmatismus	oční lékař

²⁰ The word search creator is available at: <https://www.superteacherworksheets.com/generator-word-search.html>

5. Find someone who..

Ask your classmates:

- *Are you near-sighted / farsighted?*
- *Do you have an astigmatism?*
- *Do you need / wear glasses or contact lenses?*
- *Are you blind?*
- *Do you have any eye disorder?*

Tick (✓) or cross (✗).

NAME	NEARSIGHTED	FARSIGHTED	ASTIGMATISM	GLASSES	CONTACT LENSES	BLIND

6. Answer the questions:

- a) How many classmates are near-sighted / farsighted?
.....
- b) Does anybody have an astigmatism?
.....
- c) How many classmates wear glasses /contact lenses?
.....
- d) How many blind people do you know?
.....
- e) Do you have bad eyesight?
.....
- f) Do you go to an optometrist?
.....

SUBJECT: SCIENCE / TOPIC: SIGHT / GRADE: 8TH

TEACHER'S NOTES

AIMS:

- To teach basic vocabulary connected with the topic Sight.
- To practice using the vocabulary during speaking.
- To practice reading comprehension.

MATERIALS

- Worksheet

DURATION

- 45 minutes

LANGUAGE FOCUS

Present simple

Warm-up – The importance of sight (10 minutes)

Blind Man's Bluff:

1. The students go on a "sighted" (eyes open) walk and a "non-sighted" (blindfolded) walk. The students choose partners and take turns being blindfolded. When taking the walk, the students take care to observe the colours in the environment. They also note if they saw things moving, and if they saw things that were far and close. On returning they contribute to a list of objects observed and objects' colours. Teacher writes the responses on a chart.
2. The students compare the two walks, stressing the important role the eyes play in our everyday lives. They discuss how difficult it was for them to go on "non-sighted" (blindfolded) walk. A teacher can ask students: *How do we recognize each other by sight? What things do we look for?* Students discuss how they rely on hearing and feeling to move around when they can't see. *How is this feeling the same as when you walk around in the dark? Which way is easier - with your eyes open or closed? Why? What part of your body do you use to see?*²¹

²¹ These activities are available at: <http://www.sedl.org/scimath/pasopartners/senses/lesson2.html>

ACTIVITY 1

- Ask students to complete the mind map. Tell them to write the words both in Czech and in English. ²² (5 minutes)
- Check their answers. Write the answers on the board and discuss pupils' ideas.
- The activity has been thought up by the author of the thesis.

ACTIVITY 2

- Tell students to work in pairs.
- Give them the text – Student A and Student B. ²³
- Explain the activity.
- Ask pupils to read the text silently. (2 minutes)
- Then tell students to work with a partner to find out the missing words. (10 minutes)
- Students also can use Czech for asking each other.
- Check answers.
- Ask pupils if it was difficult or easy for them to fill in the gaps and communicate in English.
- Inspiration has been taken from the website:
<http://www.sedl.org/scimath/pasopartners/senses/lesson2.html>

Answers:

Student A: 1. iris, 2. cornea, 3. eyelids, 4. lens, 5. retina, 6. rods, 7. retina

Student B: 1. pupil, 2. retina, 3. skull, 4. eyelashes, 5. fuzzy, 6. optic nerve, 7. cones

ACTIVITY 3

- Ask students to label the parts of the eye. ²⁴ (5-7 minutes)
- Emphasize that some words from the box are written in Czech so they have to translate them and match them with the right number.
- Give pupils and advice if it is necessary.
- Check answers.
- Inspiration has been taken from the website: http://www.proprofs.com/quiz-school/story.php?title=parts--eye_2

Answers: 1. sclera, 2. cornea, 3. pupil, 4. lens, 5. iris, 6. ciliary body, 7. optic nerve, 8. fovea, 9. retina, 10. choroid

²² Picture 3 is available at: <http://www.clipartkid.com/sight-word-school-cliparts/>

²³ The text is available at: <http://www.sedl.org/scimath/pasopartners/senses/lesson2.html>

²⁴ Picture 4 is available at: http://www.proprofs.com/quiz-school/story.php?title=parts--eye_2

ACTIVITY 4

- Ask pupils to tell you what common disorders they know. (5 minutes)
- Ask pupils to solve the word search.²⁵
- Point out that words in the box are in Czech but words in word search are in English.
- Check answers.
- The activity has been thought up by the author of the thesis.

Answers:

Solution

```
S D + + + + + + + + + D O + S
+ S N + + + + + + + E + P + S
+ + E I + + + + + T + + T + E
+ + + N L + + + H + + + O + N
+ + + + D B + G + + + A M + D
+ + + + + N I + + + S + E + N
+ + F A R S I G H T E D T + I
+ + + + T + + L I + + + R + L
+ + + R + + + G B + + + I + B
+ + O + + + M + + R + + S + T
+ H + + + A + + + + U + T + H
S + + + T + + + + + + O + + G
+ + + I + + + + + + + + L + I
+ + S + + + + + + + + + O N
+ M S U M S I B A R T S + + C
```

ACTIVITY 5

- Ask pupils to fill the chart to find out information about their classmates' sight.
- Tell them to ask their classmates questions e.g. if they are near-sighted / far-sighted etc. (5 minutes)
- Tell students to write down the answers to the chart.
- Discuss the results with students.
- Tell them to talk to their partner and answer the questions below the chart.
- The activity has been thought up by the author of the thesis.

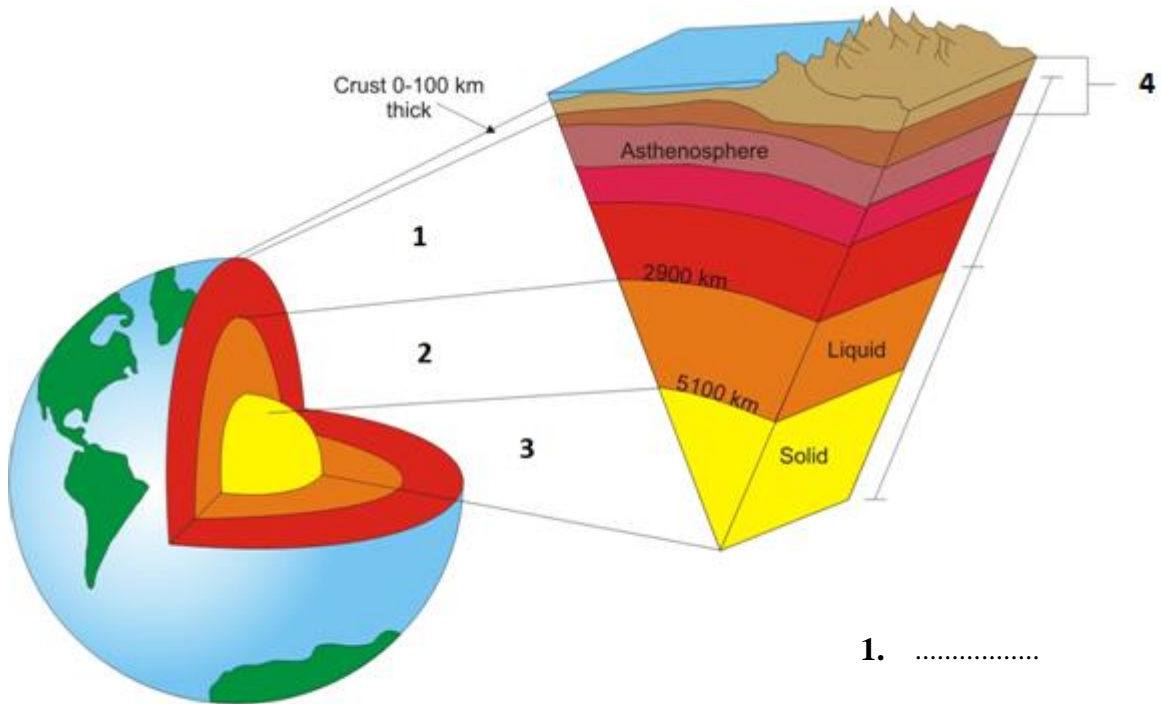
²⁵ The word search maker is available at: <https://www.superteacherworksheets.com/generator-word-search.html>

GLOSSARY:

pupil	zornice
retina	sítnice
skull	lebka
cornea	rohovka
eyelid	oční víčko
eyelashes	řasy
fuzzy	rozmazaný, neostrý
optic nerve	optický nerv
rods	tyčinky
cones	čípky
lens	čočka
fovea	žlutá skvrna
sclera	oční bělmo
ciliary body	řasnaté těleso
strabismus	šilhavost
nearsighted/short-sighted	krátkozraký
colour-blindness	barvoslepý
night-blindness	šeroslepost
optometrist	oční lékař
astigmatism	astigmatismus
farsighted	dalekozraký
blindness	slepota
contact lenses	kontaktní čočky

**SUBJECT: SCIENCE / TOPIC: THE HISTORY OF THE EARTH /
GRADE: 9TH**

1. Label the main parts of the Earth.²⁶



- 1.
- 2.
- 3.
- 4.

²⁶ Picture 5 is available at: <http://osca.nvrdns.com/earth-structure/>

2. Read the planet riddles and try to guess what planet it is.²⁷

Earth	Jupiter
Mars	Neptune
Mercury	Venus
Saturn	Uranus

A. I'm named after a Roman God
I'm the fourth planet from the sun
I am known as the red planet
And have two moons rather than one
What am I?

B. When looking at all of the planets
This is the second largest one
It has rings made of ice, dust and
rocks
And is the sixth one from the sun
What am I?

C. 71% is water
And the rest of it is land
Some of that is made up of soil
And some of it's made of sand
What am I?

D. I'm yellow and cloudy and super hot.
Look low in the sky, I'm easy to spot.
People call me the "Evening Star"
From planet Earth, I'm not very far.
What am I?

²⁷ The text about planets is available at: <http://riddles-for-kids.org/planet-riddles/>

3. Do you believe that aliens exist? Would you like to meet an alien? If so what would you like to ask him? Write at least five sentences.²⁸

.....

.....

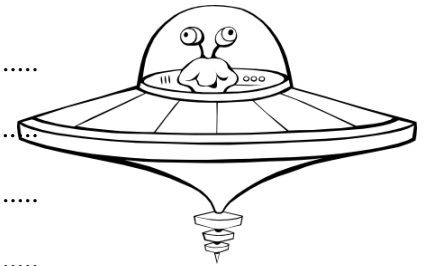
.....

.....

.....

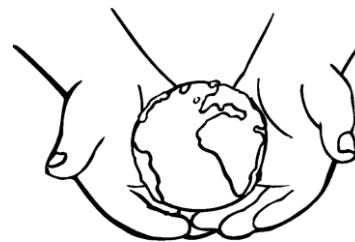
.....

.....



4. Label the definitions of the Earth's spheres.²⁹

lithosphere	biosphere
asthenosphere	hydrosphere
pedosphere	atmosphere



Take Care of the Earth

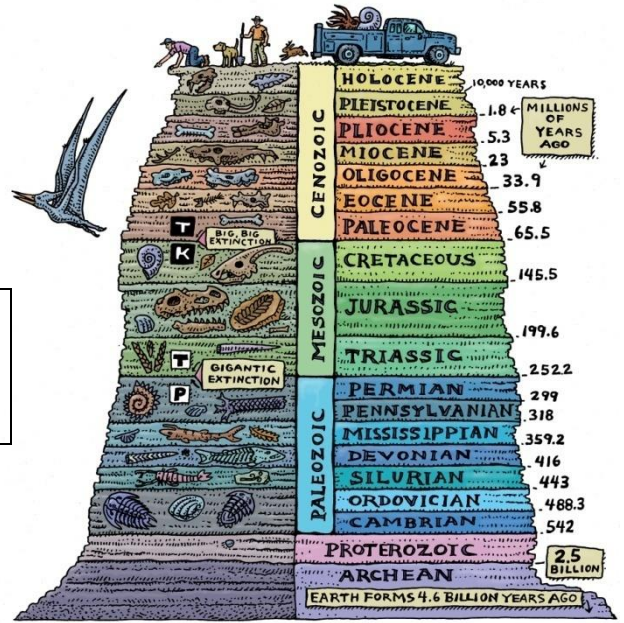
- a) The watery layer of the Earth's surface.
- b) A part of the Earth' surface that contains the soil layer.
- c) It is a sphere or area around the planet Earth where life exists.
- d) It is the solid part of the earth consisting of the crust and outer mantle.
- e) It is the layer of our planet that lies beneath the lithosphere.
- f) It is a thin layer of gases that surrounds the Earth. It protects us from electromagnetic radiation from the Sun

²⁸ Picture 6 is available at: https://www.google.cz/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=0ahUKEwjJh_3B7v3PAhWGPRQKHdaxDKsQjRwIBw&url=http%3A%2F%2Fclipartist.net%2Fsvg%2Falien-svg%2F&bvm=bv.136811127,d.d24&psig=AFQjCNGFJAumbGOH6Fjzq-7_S7WWFxFgwow&ust=1477756611389999

²⁹ Picture 7 is available at: <http://www.batchcoloring.com/take-care-of-the-earth-on-earth-day-coloring-sheet/>

5. The history of the Earth. ³⁰

GEOLOGICAL ERA ³¹



CENOZOIC (TERTIARY, QUATERNARY)	PALEOZOIC	MESOZOIC
--	------------------	-----------------

PERIOD

PERMIAN	PLEISTOCENE	EOCENE	HOLOCENE	DEVONIAN	ORDOVICIAN	PALEOCENE
----------------	--------------------	---------------	-----------------	-----------------	-------------------	------------------

CARBONIFEROUS	SILURIAN	TRIASSIC	CAMBRIAN	JURASSIC	CRETACEOUS
----------------------	-----------------	-----------------	-----------------	-----------------	-------------------

MILLIONS YEARS AGO

65	570	2600
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FAUNA AND FLORA

DINOSAURS	MAMMALS	AMPHIBIANS (FROGS)	FIRST BIRDS	FLOWERING PLANTS
------------------	----------------	-------------------------------	--------------------	-----------------------------

FISH, CEPHALOPODS, MOLLUSCS	TRILOBITES	SEAWEED	FIRST REPTILES	FIRST VASCULAR PLANTS
--	-------------------	----------------	---------------------------	--------------------------------------

³⁰ Picture 8 is available at: <http://prehistoricoregon.com/following-the-geological-timeline>

³¹ The text about geological eras is available at: <http://www.enchantedlearning.com/subjects/Geologictime.html>

FIRST HUMANS (HOMO SAPIENS)	MAMMOTHS	
PRIMITIVE PRIMATES	GRASSES	FIRST HOMINIDS (ASUTRALOPITHECINES)

Look at the picture of the geological periods of the Earth and try to fill the chart. Use the words from the boxes.³²

GEOLOGICAL ERA	PERIOD	MILLIONS OF YEARS AGO	FLORA	FAUNA

³² Inspiration for this activity was taken from the website available at:
http://www.zsmarianske.cz/sablony/vy_32/babickova/vy_32_inovace_166.pdf

**SUBJECT: SCIENCE / TOPIC: THE HISTORY OF THE EARTH /
GRADE: 9TH**

TEACHER'S NOTES

AIMS:

- To practice using vocabulary connected with the topic.
- To practice writing skills and using present simple and conditional mood.
- To learn how to work in a group and to practice speaking.

MATERIALS

- Worksheet, a pack of cards with vocabulary concerning with the topic, a sheet of paper, glue

DURATION

- 45 minutes

LANGUAGE FOCUS

Present simple, cardinal numbers

ACTIVITY 1

- Ask pupils to look at the picture of the Earth's structure.³³
- Ask students to label the main parts of the Earth. (3 – 5 minutes)
- Check answers.
- Inspiration has been taken from the website: <http://osca.nvrDNS.com/earth-structure/>

Answers: 1. mantle, 2. outer core, 3. inner core, 4. lithosphere

ACTIVITY 2

- Ask pupils to read the planet riddles.³⁴ (2 minutes)
- Ask them if they understand the riddles.
- Tell them to fill in the names of planets. (5 minutes)

³³ Picture 5 is available at: <http://osca.nvrDNS.com/earth-structure/>

³⁴ The text about planets is available at: <http://riddles-for-kids.org/planet-riddles/>

- Ask students to read each riddle aloud and answer what planet it is. Give a a piece of advice if it is necessary.
- Check answers.
- The activity has been thought up by the author of the thesis.

Answers: A. Mars, B. Saturn, C. Earth, D. Venus

ACTIVITY 3

- Discuss the existence of aliens.³⁵
- Ask pupils to write at least five sentences to answer the questions e.g. *Would you like to meet an alien? If so what would you like to ask him?* (5 minutes)
- Discuss pupils' ideas. Emphasize the use of conditional mood.
- The activity has been thought up by the author of the thesis.

ACTIVITY 4

- Tell students to look at the picture. Ask them to guess what the sentence *Take care of the Earth* means.³⁶
- Emphasize the importance of taking care of the Earth.
Ask pupils to label the definitions of the Earth's spheres.³⁷ (5 minutes)
- Check answers.
- The activity has been thought up by the author of the thesis.

Answers: a) hydrosphere, b) pedosphere, c) biosphere, d) lithosphere, e) asthenosphere, f) atmosphere

ACTIVITY 5

- Ask students to make a group of four people.
- Give a sheet of paper and one pack of cards to each group.³⁸

³⁵ Picture 6 is available at:

https://www.google.cz/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=0ahUKEwjJh_3B7v3PAhWGP RQKHdaxDKsQjRwIBw&url=http%3A%2F%2Fclipartist.net%2Fsvg%2Falien-svg%2F&bvm=bv.136811127,d.d24&psig=AFQjCNGFJAumbGOH6Fjzq-7_S7WWFxFgwow&ust=1477756611389999

³⁶ Picture 7 is available at: <http://www.batchcoloring.com/take-care-of-the-earth-on-earth-day-coloring-sheet/>

³⁷ The definitions of these spheres are available at: <http://www.dictionary.com/>

³⁸ Picture 8 is available at: <http://prehistoricoregon.com/following-the-geological-timeline>

- Explain the procedure. Students' task is to put the cards into correct order to each column to make a sense and glue the cards on the sheet of paper. (15 minutes)
- Check answers. Project the right answers on the screen.
- Inspiration for the activity is available at:
<http://www.enchantedlearning.com/subjects/Geologictime.html> and

Answers:

GEOLOGICAL ERA	PERIOD	MILLIONS OF YEARS AGO	FLORA	FAUNA
PALEOZOIC	CAMBRIAN	570	SEAWEED	FISH
	ORDOVICIAN			CEPHALOPODS, MOLLUSCS
	SILURIAN			
	DEVONIAN			
	CARBONIFEROUS			TRILOBITES
	PERMIAN			FIRST REPTILES
MESOZOIC	TRIASSIC	2600	FLOWERING PLANTS	DINOSAURS
	JURASSIC			MAMMALS
	CRETACEOUS	65		AMPHIBIANS (FROGS)
				FIRST BIRDS
CENOZOIC - TERTIARY			PRIMITIVE PRIMATES	
			FIRST HOMINIDS(ASUTRA LOPITHECINES)	
QUATERNARY			GRASSES	MAMMOTHS
				FIRST HUMANS (HOMO SAPIENS)

GLOSSARY:

mantle	the zone of the earth between the crust and the core
inner core	a solid sphere in the middle of the fluid core
outer core	the part of the Earth between the mantle and inner core
Mars	the planet that is fourth in order from the sun, it has red colour
Saturn	the planet that is sixth in order from the sun and that is surrounded by large rings
Earth	the planet on which we live
Venus	the planet that is second in order from the sun, it is yellow, cloudy and super-hot
lithosphere	the solid part of the earth consisting of the crust and outer mantle
hydrosphere	the watery layer of the Earth's surface
pedosphere	a part of the Earth' surface that contains the soil layer
biosphere	a sphere or area around the planet Earth where life exists
asthenosphere	the layer of our planet that lies beneath the lithosphere
atmosphere	a thin layer of gases that surrounds the Earth
Mercury	the planet that is closest to the sun
Uranus	the planet that is seventh in order from the sun
Jupiter	the largest of the planets and fifth in order from the sun
Neptune	the planet that is eighth in order from the sun
Paleozoic	the era of geologic time from about 540 to 245 million years ago, it is characterized by the appearance of primitive fish, reptiles, trilobites and first vascular plants
Mezozoic	the geological era between the Paleozoic and Cenozoic eras: 248 to 65 million years ago. It is sometimes called the "Age of Dinosaurs."

Cenozoic	the most recent era of geologic time, from about 65 million years ago to the present. the Cenozoic Era is characterized by the formation of modern continents and the diversification of mammals and plants
Cambrian	the first part of the Paleozoic era: 590 to 505 million years ago.
Ordovician	the second period in the Paleozoic era: 505 to 438 million years ago.
Silurian	the third period of the Paleozoic era: 438 to 408 million years ago.
Devonian	the fourth period of the Paleozoic era: 408 to 360 million years ago.
Carboniferous	the penultimate period of the Paleozoic era: 360 to 249 million years ago.
Permian	the last period of the Paleozoic era: 286 to 248 million years ago.
Triassic	the earliest period of the Mesozoic Era, from about 245 to 208 million years ago, age of dinosaurs and earliest mammals
Jurassic	the second and middle period of the Mesozoic Era, from about 208 to 144 million years ago, during which dinosaurs were the dominant form of land life and the earliest birds appeared
Cretaceous	the third and last period of the Mesozoic Era, from about 144 to 65 million years ago, characterized by the development of flowering plants
Tertiary	the first period of the Cenozoic era,
Quaternary	the second and last period of the Cenozoic Era, from about 2 million years ago to the present, characterized by the appearance of humans
seaweed	a plant growing in the sea
vascular plants	a plant having a specialized conducting system that includes xylem and phloem
flowering plant	a plant that produces flowers, fruit, and seeds; angiosperm
Cephalopods	a class of molluscs, e.g. octopus, move by expelling water from a tubular siphon

under the head, they have muscular arms and highly developed eyes

molluscs

animals that have a soft body, no spine, and is often covered with a shell, many molluscs live in water

trilobite

an extinct arthropod that has segmented body and that lived and extinct in Paleozoic

reptile

an animal (such as a snake, lizard, turtle, or alligator) that has cold blood, that lays eggs, and that has a body covered with scales or hard parts

dinosaurs

reptiles that lived on Earth millions of years ago

mammal

a type of animal that feeds milk to its young and that usually has hair or fur

amphibians

cold-blooded animals that can live both on land and in water

mammoth

a type of large, hairy elephant that lived in ancient times

7.1. Testing created sample materials in practice

Originally the sample materials have been created only for the purpose of the diploma thesis. Finally they have been tested at a lower secondary school Leandra Čecha in Nové Město na Moravě. Only two sample materials have been put to the test. Basic information about model CLIL lessons in the sixth and seventh grade are mentioned in the four charts below. The first two charts with the title Model lesson 1 focus on experience with teaching biology through a CLIL method in the sixth grade.

MODEL LESSON 1	
Grade Level	6th class, young learners, 12 years old
Subject	Natural Science and English Language
Thematic Unit	Biology of animals
Topic	Insects
Pupils	15
Lesson (in timetable):	4th
Type of Lesson	Lesson of fixation of knowledge and developing skills.
Objectives	Learners will know the structure of insects' body and stages of their life cycle (e.g. butterfly) Learners will name the parts of insects's body, Learners will learn the behavior of different kinds of insects, their life strategy and evolution (metamorphosis) Learners review speaking in a target language (English)
Vocabulary	thorax, abdomen, wings, compound eye, Arthropods, spiracles, larva (caterpillar), pupa (chrysalis), adult, juvenil etc.
Language	I have got...wings, I have got ...thin body, I have got ...three body parts, two pairs of legs. I can/can't fly, I can pollinate flowers, I can make honey,

	<p>I can sting you</p> <p>I can suck blood.</p> <p>I am a social animal,</p> <p>I am a beetle,</p> <p>I am a predator.</p> <p>I live.. in the wood, near water, in people's hair</p>
Teaching Aids	Worksheet, pictures or flashcards of insects, scissors, biology textbook

MODEL LESSON 1 - PROCEDURE		
Time	Part of the lesson	Activity
5'	Warm up	Exercise 1: Learners label basic species' definitions with terms in a jumbled order. Teacher provides pupils language support both in a target language and a mother tongue (Czech).
10'	Fixation	Exercise 2: Learners describe nine parts of the insect's body. They fill right words (body parts) in sentences. At first learners repeat new vocabulary after the teacher individually and afterwards in chorus to fix right pronunciation.
10'	Developing skills	Exercise 2: Pupils work in pairs, one student hides the terms and the second tries to guess right words. Afterwards they swap the roles. The activity provides learners information about amount of acquired vocabulary.
15'	Guided practice	Exercise 4: Learners are supposed to label the stages of the butterfly's life cycle as fast as possible. They use a glossary to find new terms describing each stage of the cycle. Learners should know the cycle's stages in the right order from biology lessons.
5'	Conclusion	Review activity and feedback of learners' performance. Teacher praises all pupils for their effort

Furthermore, Chart 3 and 4 concentrate on the lesson in the seventh grade. Particular activities and their duration are described in the charts called Procedure. Inspiration for processing of gained data has been taken from book called *CLIL in Foreign Language Education* written by Silvia Pokrivčáková et al.

MODEL LESSON 2	
Grade Level	7th class, young learners, 13 years old
Subject	Natural Science and English Language
Thematic Unit	Biology of plants
Topic	Photosynthesis
Pupils:	13
Lesson (in timetable):	2nd
Type of Lesson	Lesson of fixation of knowledge and developing skills
Objectives	Learners will learn meaning and importance of photosynthesis. Learners will revise equation and products of photosynthesis. Learners will learn basic terms connected with photosynthesis. Learners review speaking in a target language (English)
Vocabulary	CO ₂ (carbon dioxide), cellulose, oxygen, sunlight, chloroplast, glucose, chlorophyll
Language	Present simple, e.g. Each chloroplast contains green chemical chlorophyll that gives leaves their green colour. Chlorophyll absorbs sunlight that plants need for the process etc.
Teaching Aids	Worksheet, pictures or flashcards of insects, scissors, biology textbook

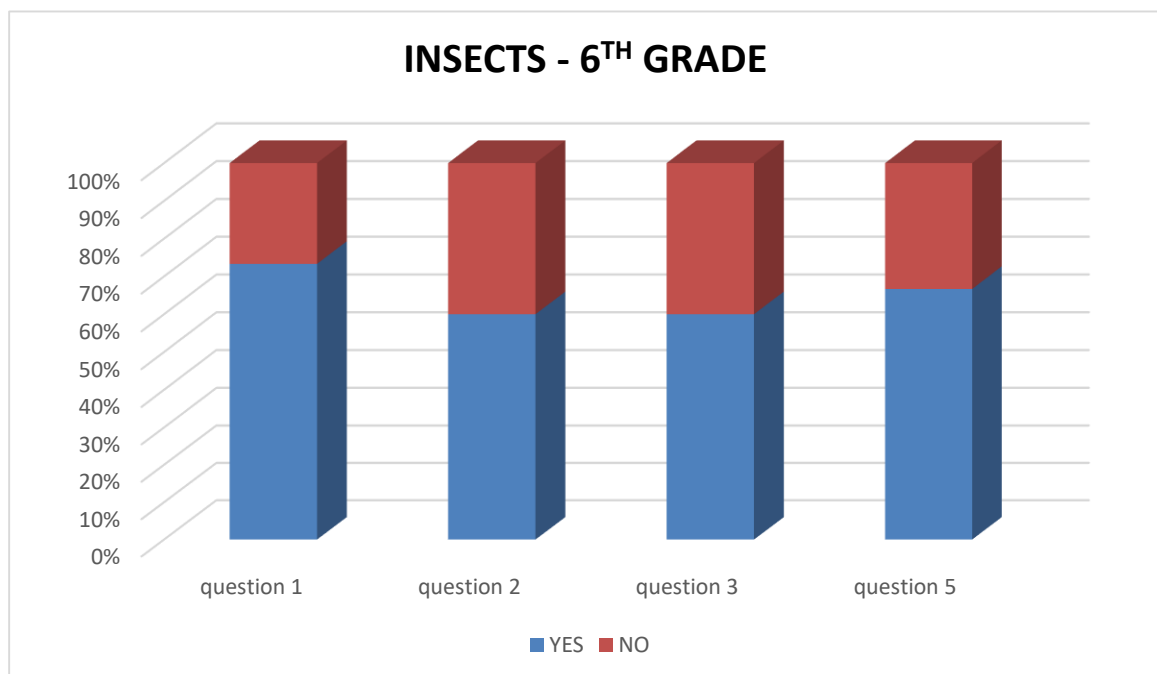
(Pokrivčáková et al., 2015, p. 51)

MODEL LESSON 2 - PROCEDURE		
Time	Part of the lesson	Activity
5'	Warm up	Exercise 1: Learners listen to a song dealing with photosynthesis. They are supposed to fill missing words. Learners hear the song twice to catch the terms. Teacher asks them to summarize information they learn from the song.
10'	Fixation	Exercise 3: Learners complete the photosynthesis' equation. They should know the equation from previous biology lessons. After filling it learners complete the missing terms – e.g. factors having influence on the process of photosynthesis or place where it takes place.
10'	Developing skills	Exercise 4: Learners work individually or in pairs and they try to fill basic vocabulary in the crossword. They look up the words in a glossary. Teacher provides pupils language support both in a target language and a mother tongue (Czech).
15'	Guided practice	Exercise 4: Learners work in pairs and try to say filled definitions from the crossword and write the sentences in exercise books. Teacher asks each pair to tell right answers and checks their pronunciation.
5'	Conclusion	Review activity and feedback of learners' performance.

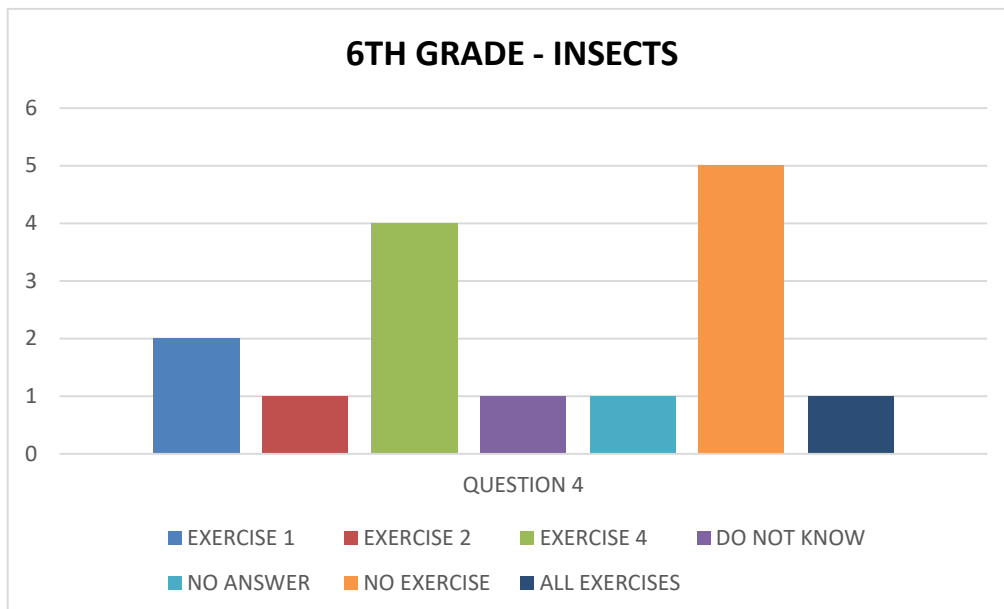
Moreover, after teaching model CLIL biology lessons pupils from the sixth and seventh grade have been asked to fill a short questionnaire (see Appendix 2) to evaluate the lessons. Learners answer the following questions:

1. ***DID YOU LIKE THE ENGLISH LESSON ABOUT INSECTS/PHOTOSYNTHESIS?***
2. ***DID YOU LIKE THE WORKSHEET?***
3. ***DID YOU FIND THESE EXERCISES DIFFICULT?***
4. ***WHAT EXERCISE DID YOU LIKE THE MOST?***
5. ***WOULD YOU BE INTERESTED IN OTHER BIOLOGY LESSON TAUGHT IN ENGLISH?***

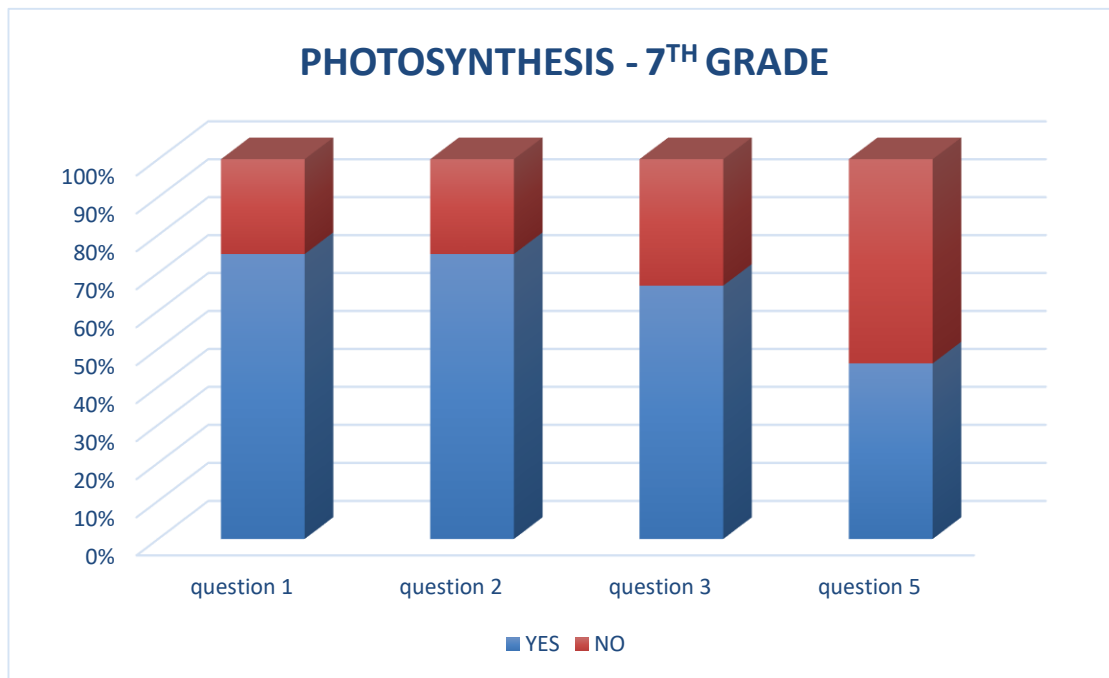
From first to fifth question learners were supposed to circle an option yes or no. Their answers have been evaluated and recorded in the diagrams below. Normally there are nineteen students in the sixth grade but only fifteen pupils participated in the lesson. As it is evident from the diagram below the majority of pupils (70%) has positive opinion on the model CLIL lesson. Accurately 50% of students from the sixth grade like the worksheet focused on the topic Insects. The half of pupils suppose exercises from the worksheet are too difficult. Relating to fifth question 60% of learners are interested in other CLIL biology lesson.



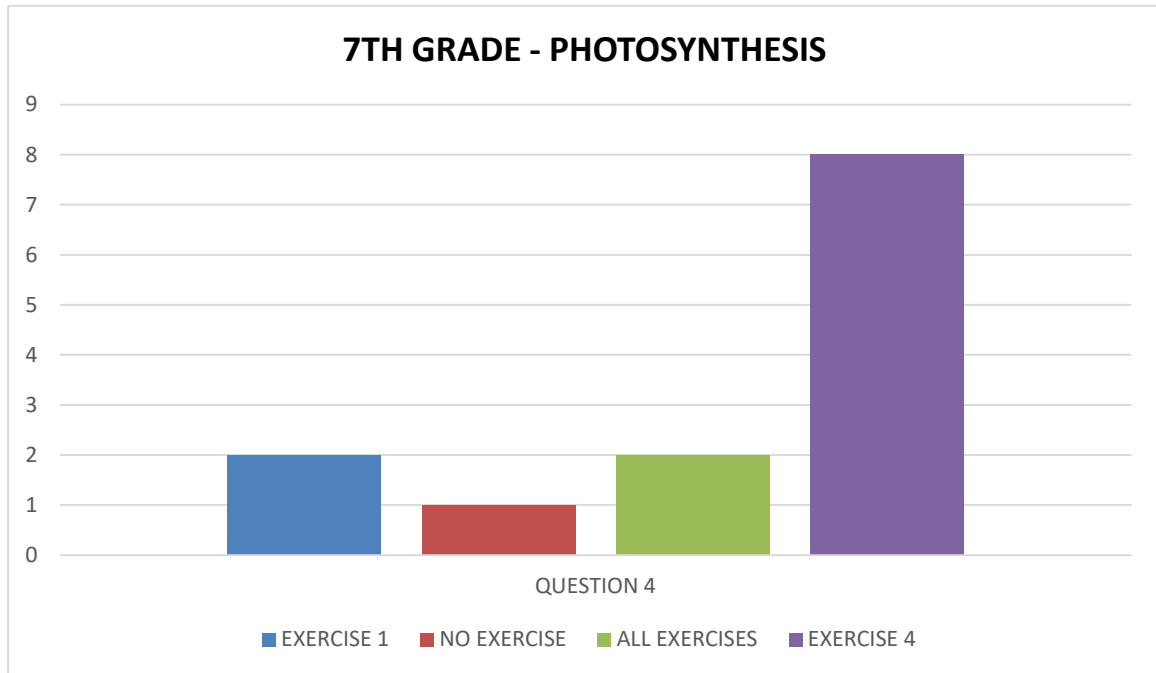
Relating to the fourth question both students from the sixth and seventh grade were asked to state any of the exercise in the model CLIL lesson that they liked the most. All answers have been evaluated and recorded into a diagram. As it is visible from the diagram below two pupils like first exercise that focuses on labelling basic species' definitions with terms in a jumbled order. Only one student likes second exercise that lies in describing parts of the insect's body. Four pupils like the fourth exercise where they are supposed to label the stages of the butterfly's life cycle. Five from fifteen students do not like any exercise from the worksheet. All exercises are interesting for one pupil. Other student does not know what exercise is the best. The other one does not answer the fourth question.



Further, the model CLIL lesson in the seventh grade will be discussed. There are fourteen pupils in the seventh grade, however, thirteen students answer the questionnaire. Most of the pupils (70%) like the lesson about photosynthesis. Concerning second question majority of students (70%) likes the design of the worksheet. About 60 % of pupils states exercises from the worksheet are too difficult for them. Only 40 % of learners would like to experience other biology lesson taught in English.



Answers of the students from the seventh grade to the fourth question are recorded in the diagram below. Two pupils state the first exercise that lies in filling terms about photosynthesis in a song is the best. Other two students suppose all exercises are interesting for them. Only one pupil does not like any exercise. Eight from thirteen learners find the fourth exercise that lies in filling a crossword the most interesting.



To sum up I am a little bit disappointed. I supposed that the worksheets have been made appropriately for the students from the sixth and seventh grade. I did not presuppose pupils' inability to manage all exercises and their unwillingness to cooperate. Despite this fact, I am satisfied that I have been given an opportunity to test the sample materials in teaching practice. From my point of view the materials have not been created in a wrong way. Moreover, I am satisfied with pupils' positive response to the design of the worksheets.

Conclusion

Relating to the theoretical part, the fifth chapter focuses on the CLIL method in the Czech Republic both in general and experience of Czech teachers with teaching biology through the method. I supposed I would find some information about experience with teaching biology through CLIL in other European countries. Unfortunately, there has not been found any useful information about teaching biology or Science in Europe. I have read a lot of articles and texts about the CLIL method e.g. *International CLIL Research Journal* (online). Nevertheless, I could not find appropriate information that could be used in the theoretical part of the thesis. For the reason I have decided to state experience of three European countries with the CLIL method in general.

The practical part of the diploma thesis presented a small-scale questionnaire-based survey. Creation of the questionnaire represented a very difficult task because a questionnaire should follow set criteria to be valid and reliable. The survey provided important data that have been analysed.

The main aim of the survey lay in finding out if the respondent biology teachers were aware of the CLIL method and if they had any experience with teaching biology through the method. I presupposed that respondent teachers would have been more aware of the CLIL method's existence. However, the survey showed that the majority of the respondents have never heard about the method except one teacher who has already applied it in other subjects. Furthermore, the results of the survey proved that none of the teachers had never made an effort to apply the CLIL method in biology lessons. One of the respondent teachers has already applied the method, however, he has chosen other subjects (history and geography). Moreover, all of the teachers except two of them answered that their school did not plan to implement the CLIL method. The survey showed that the teachers found the CLIL method beneficial. All teachers came to an agreement that using the CLIL method encouraged the development of students' language skills. They found the rise of school's prestige and competitiveness as the second important CLIL method's benefit.

Concerning appropriateness of teaching biology through the CLIL method the survey proved that three quarters of the teachers came to an agreement biology was an appropriate subject. Respondents stated that biology terms in English were similar to Latin words.

Sample materials comprised second volume of the practical part. The materials are intended for pupils who attend lower secondary school, from sixth to ninth grade. During creation of the sample materials I found inspiration in various sources such as ready-made CLIL materials that are available on the Internet and in literature that focuses on CLIL.

Originally the sample materials have been created only for the purpose of the diploma thesis. However, they have been tested at a lower secondary school Leandra Čecha in Nové Město na Moravě. Only two sample materials meant for pupils from the sixth and seventh grade have been put to the test. The reason lies in insufficient knowledge of English and particular subject matter in the eighth and ninth grade. I supposed that the worksheets have been made appropriately for the students from the sixth and seventh grade. Nevertheless, I did not presuppose pupils' inability to manage all exercises and their unwillingness to cooperate. Despite this fact, I am satisfied that I had been given an opportunity to test the sample materials in teaching practice. From my point of view the materials have not been created in a wrong way. However, I was satisfied with pupils' positive response to the design of the worksheets. If I test the sample materials in the future I will definitely simplify them and leave out some of the more difficult which were problematic for students.

Due to the fact that the majority of respondent teachers are not aware of the CLIL biology teachers including myself should create some other ready-made materials and try to inform other teachers about the advantages of the method. From my point of view possibility of using the materials and learning more information about the method could be the impulse for many schools to implement the CLIL.

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Appendix 1

DOTAZNÍK PRO UČITELE BIOLOGIE NA ZŠ/GYMNÁZIUM

Vážená paní učitelko, vážený pane učiteli,

dovolte mi Vás požádat o vyplnění tohoto dotazníku. Vámi vyplněné informace poslouží pro zpracování mé diplomové práce na téma „Výuka biologie metodou CLIL“. Dotazník je anonymní a zjištěné údaje budou použity pouze pro účely mé diplomové práce.

Děkuji Vám za Váš čas a ochotu.

Bc. Petra Benešová

CLIL (Content and Language Integrated Learning) znamená obsahově a jazykově integrované vyučování. Jedná se o výuku neязыkového (odborného) předmětu v cizím jazyce, který slouží jako prostředek komunikace a pro sdílení vzdělávacího obsahu. Tento typ integrované výuky si stanovuje dva základní cíle, a to cíl obsahový a jazykový. Žáci tedy rozvíjí nejen znalosti z daného předmětu, ale ve stejné míře zvyšují úroveň cizího jazyka.

Pohlaví:

muž

žena

Typ školy:

ZŠ

gymnázium

Počet žáků:

Vaše odpověď

Město:

Vaše odpověď

Délka praxe:

Vaše odpověď

Aprobace:

Vaše odpověď

Jazyková úroveň učitele:

základní úroveň (A1-A2) - znalosti základní školy

středně pokročilá (B1) - znalosti střední školy

pokročilá (B2)

jazyk neovládá

1. Setkali jste se již s pojmem CLIL?

ano

ne

2. Znáte pouze tuto zkratku nebo máte o této metodě hlubší povědomí?

Pokud nemáte, odpovězte prosím na otázku č. 6 až 11

Vaše odpověď

3. Účastnila se Vaše škola někdy nějakého projektu/semináře spojeného s metodou CLIL?

ano

ne

nevím

Pokud jste odpověděl/a ano, tak o jaký projekt/seminář se jednalo, kdy se konal a kdo ho pořádal?

4. Myslíte si, že předmět biologie je vhodný pro vyučování metodou CLIL?

ano

ne

nevím

Proč ano/proč ne? A spíše na ZŠ nebo gymnáziích?

Vaše odpověď

5. Využil/a jste někdy metodu CLIL v hodinách biologie?

ano

ne

Pokud jste zaškrtl/a ano, tak odpovězte prosím na následující otázku:

Jakým způsobem jste hodnotil/a hodiny s metodou CLIL?

6. Využíváte cizí jazyky ve výuce biologie?

využívám

nevyužívám

7. Jak často využíváte ve svých hodinách biologie cizojazyčné materiály?

nikdy

občas (měsíčně, čtvrtletně)

pravidelně (každou hodinu, týdně)

zřídka

8. Jaké jsou podle Vás nejčastější důvody pro nevyužívání cizího jazyka ve výuce nejazykových předmětů, například biologii?

nízká úroveň cizího jazyka žáků

celkově nevhodné podmínky na škole

nedostatek časového prostoru v hodinách pro začlenění cizího jazyka

nedostatečná znalost cizího jazyka u pedagogů

nedostatek motivace žáků k aktivnímu zapojení do výuky

Jiné:

9. Měl/a byste zájem o seminář zaměřený na využívání metody CLIL na školách?

ano, měl/a

ne, neměl/a

už jsem se účastnil/a

10. Domníváte se, že je Vaše škola schopna zajistit nezbytné podmínky pro zavedení metody CLIL?

ano

ne

nedokáži posoudit

11. Plánuje Vaše škola v budoucnu implementovat metodu CLIL do výuky biologie?

plánuje

neplánuje

nevím

12. Máte zkušenosti s tvorbou nových (vlastních) materiálů v hodinách biologie s využitím metody CLIL, nebo jste raději využil/a již vytvořené materiály?

ano, mám zkušenosti

ne, nemám zkušenosti

využil/a jsem již vytvořené materiály

13. Jaké jsou podle Vás největší problémy se zavedením metody CLIL?

obavy z přílišné obtížnosti pro žáky

všeobecné nepochopení přístupu rodiči i žáky

nedostatek vhodných pedagogů

obava z poklesu úrovně výuky odborného předmětu

časová náročnost na přípravu vyučování

nedostatek informací, jak používat tuto metodu ve výuce

nedostatek materiálních a didaktických zdrojů

Jiné:

14. Jakou formou a jak často metodu CLIL v hodinách biologie používáte?

krátké vstupy

projektové dny

modul-tematický celek

čtvrtletně

měsíčně

týdně

každou vyučovací hodinu

vůbec nevyužívám

Jiné:

15. Jaký přínos má podle Vás používání metody CLIL ve výuce?

rozvoj jazykových dovedností žáků

vyšší míra motivace a aktivního zapojení žáků do výuky

zvýšení prestiže školy a konkurenceschopnosti

rozvoj spolupráce mezi učiteli napříč pedagogickým sborem

rozvoj myšlenkových operací vedoucí ke kritickému myšlení žáků

pozitivní atmosféra ve třídách mezi žáky vyučovanými metodou CLIL

efektivnější plánování a třídění vzdělávacího obsahu učiva

příležitost pro žákovo sebehodnocení

Jiné:

16. Zdá se Vám metoda CLIL přínosná? Proč by podle Vás měla být tato metoda implementována do škol? Zde můžete vyjádřit Vaše další myšlenky a názory týkající se metody CLIL.

Appendix 2

DOTAZNÍK – hodina anglického jazyka CLIL – téma: Hmyz (6. roč.)/ Fotosyntéza (7.roč.)

1. Líbila se ti hodina anglického jazyka o hmyzu/fotosyntéze?
ANO NE
2. Líbil se ti tento pracovní list?
ANO NE
3. Zdála se ti cvičení v tomto pracovním listu obtížná?
ANO NE
4. Které cvičení se ti líbilo nejvíce a proč?
.....
5. Měl/a bys zájem o další hodinu biologie vyučovanou v anglickém jazyce?
ANO NE