language descriptors

Language skills for successful subject learning

CEFR-linked descriptors for mathematics and history/civics

Eli Moe
Marita Härmälä
Paula Lee Kristmanson
José Pascoal
Meiluté Ramonienė

EUROPEAN CENTRE FOR MODERN LANGUAGES
CENTRE EUROPEEN POUR LES LANGUES VIVANTES
COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

PROMOTING EXCELLENCE IN LANGUAGE EDUCATION

The European Centre for Modern Languages (ECML) is a Council of Europe institution to which thirty-three countries currently subscribe.

The ECML assists its member states in addressing challenges within their national education systems by:

- promoting innovative approaches to language education;
- advancing the quality of learning and teaching languages;
- supporting the implementation of language education policies;
- fostering dialogue between language education practitioners and decision makers

Within the framework of its 4-year programmes, the Centre works together with ministries, language experts, national institutions and international language organisations. Through its programmes, the ECML provides a platform for gathering and disseminating information, stimulating discussion and training multipliers in matters related to language education. It also maintains Europe-wide networks for teacher trainers, researchers and educational administrators.

The work of the Centre focuses primarily on priority areas in member states such as migration and language education, plurilingual education, mobility and intercultural learning, new media in language education, evaluation and assessment, early language learning, content and language integrated learning, employment and languages. Teacher education is at the core of its work.

ECML activities are complementary to those of the Council of Europe's Language Policy Unit, responsible for the development of policies and planning tools in the field of language education and the Secretariat of the European Charter for Regional or Minority Languages.

***

The present series of publications results from the ECML's 2012-2015 programme, entitled *Learning through languages – Promoting inclusive, plurilingual and intercultural education*. Against the current backdrop of major international political tension and mass migration, they offer timely and much-needed advice, guidance and examples of good practice of inclusive, plurilingual and intercultural approaches to education. The work of the ECML represents a collective effort and determination to enhance the quality in language education at challenging times.

The publications illustrate the dedication and active involvement of all those who participated in a series of 21 international projects and training and consultancy activities. The promotion of the programme outputs and their adaptation to different learning environments is supported through National Contact Points in each of the member states of the Centre: **www.ecml.at/contactpoints.**

All ECML publications and accompanying materials are available for download: **www.ecml.at**.

language descriptors

Language skills for successful subject learning

CEFR-linked descriptors for mathematics and history/civics

EUROPEAN CENTRE FOR MODERN LANGUAGES
CENTRE EUROPEEN POUR LES LANGUES VIVANTES
COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

French edition:
Compétences linguistiques pour des apprentissages disciplinaires réussis
Descripteurs liés au CECR pour les mathématiques et l'histoire/éducation civique
ISBN 978-92-871-8153-4

This publication of the European Centre for Modern Languages of the Council of Europe has been produced within the framework of the Centre's 2012-2015 programme entitled Learning through languages.

Council of Europe Publishing
FR-67075 Strasbourg Cedex
http://book.coe.int

European Centre for Modern Languages of the Council of Europe
Nikolaiplatz 4
AT-8020 Graz
www.ecml.at

ISBN: 978-92-871-8154-1

Cover photo : Shutterstock

Content

Preface

Project title: *Language descriptors for migrant and minority students' success in compulsory education*

This project has been hosted by the European Centre for Modern Languages (ECML). It has been a two-year project that received ECML support in 2012 and 2013 within the ECML 2012–2015 programme.

A team of five people has been responsible for the outcomes of the project:

- Eli Moe, University of Bergen, Norway – coordinator and project lead
- Marita Härmälä, Finnish National Board of Education, Finland – mediation link person
- José Pascoal, University of Lisbon, Portugal – second working language documentalist
- Meiluté Ramonienė, Vilnius University, Lithuania – website correspondent
- Paula Lee Kristmanson, University of New Brunswick, Canada – associate member

We hope the project outcomes will contribute to a greater awareness and understanding of the role language plays in learning and teaching subject matter. Our hope is that teachers can use the descriptors collected and developed in the project as a tool in the subject matter classroom.

We realise that the outcomes of the project are a small step towards providing language support for teachers and second language students in the subject matter classroom. Nothing would please us more than other teachers and researchers building on what we have developed to reveal more knowledge in the field and improve the instrument.

We want to thank everyone who supported our work: the teachers, teacher trainers, researchers, workshop participants, CEFR experts, educational officers and the people who helped us launching the online questionnaires. Without your help this project would not have been possible.

Finally, we want to express our warm gratitude to the ECML staff for their constant support. Without you there would be no project.

Summary

The aim of the project *Language descriptors for migrant and minority students' success in compulsory education* was to indicate one or several levels of language competence that young migrant or minority learners need to have in the language of schooling to do well in mathematics and history/civics.

Since a migrant or minority background may affect young learners' school performance, the project was designed to raise awareness both of the language requirements young migrant and minority learners are met with in an educational setting, and of the close link between a good command of the language of schooling and success in the educational system. A third goal was to develop a tool that could be used by both teachers and students to determine the language needs of the target groups.

The study focused on two school subjects and two age groups. The school subjects studied were history and/or civics, and mathematics, and the age groups were 12/13 and 15/16 year-olds.

The language requirements were put into operation by developing descriptors linked to different levels of the *Common European Framework of Reference for Languages* (CEFR). From the levels A2 to B2, the most relevant descriptors in four sub-skills were chosen and complemented by subject-specific content.

During the project period (2012–2013), 166 language descriptors for history/civics and mathematics were developed. Feedback on them was then collected from language and subject matter specialists.

The results reported are based on:

1. Initial feedback from teachers and teacher trainers
2. Feedback from 31 teachers of maths/history/second language (L2) learning from 21 countries during an international workshop at the ECML in Graz, Austria
3. Data from an online questionnaire in which 79 CEFR experts validated the descriptors by assigning them to CEFR levels
4. Data from a second questionnaire in which 229 teachers (most of them from Finland, Lithuania, Portugal, Norway and Canada) assessed each descriptor by answering whether young learners in the two focus groups and school subjects needed to have the competence expressed in the descriptors in order to do well

Overall, the results indicate that 12/13 year-old students need a level of language proficiency mirroring at least CEFR level B1, while 15/16 year-old students need at least a B2 level of language proficiency.

The outcomes of the project are targeted at policy makers, school administrators, teachers and parents.

1 Motivation and background

CEFR

This project is based on two main pillars: *The Common European Framework of Reference for languages* (CEFR) (Council of Europe, 2001) and research done on the language of schooling (for example, Beacco, 2010; Linneweber-Lammerskitten, 2012; Pieper, 2011; Vollmer, 2010).

In the CEFR, there are 56 scales that describe the development of language competence through six different proficiency levels. The lowest proficiency levels (A1/A2) refer to a basic user, the intermediate levels (B1/B2) to an independent user, and the highest levels (C1/C2) to a proficient user.

Discourse functions

In the works of Vollmer, Beacco, Pieper and Linneweber-Lammerskitten, an attempt was made to identify a number of discourse functions that are necessary for learning and teaching in four school subjects: science, history, literature and mathematics.

By using a large number of the functions identified by these researchers, and by developing CEFR-adapted descriptors from the A2 level to the B2/C1 levels for the two school subjects, we made a tentative attempt to link the two fundamental pillars that the project was based on. Before describing the content and results of the project any further, a brief summary of its background is needed. First, we present the ECML and the way it encourages studies done in connection to language learning and teaching, and, second, we present the CEFR and the way it has been used in the context of our project.

1.1 The Council of Europe and the European Centre for Modern Languages

Language policy unit

The Language Policy Unit of the Council of Europe encourages transparency and reflection in connection with the development of educational standards and decision-making, both in Europe and at the national level within different countries. It addresses the aims, outcomes, content, methods and approaches to evaluation of the language of schooling, taking into account the needs of all students in compulsory education, including disadvantaged learners and migrant children.

In order to support and assist different stakeholders, the Council of Europe has set up a digital platform focusing on the language of schooling (**www.coe.int/t/dg4/linguistic/Schoollang_EN.asp**). The platform includes different kinds of resources: for instance, points of reference and examples of good practices "which the member states are invited to consult and use in support of their policy to promote equal access to quality education according to their needs, resources and educational culture". The platform is gradually being developed, with items continually being added.

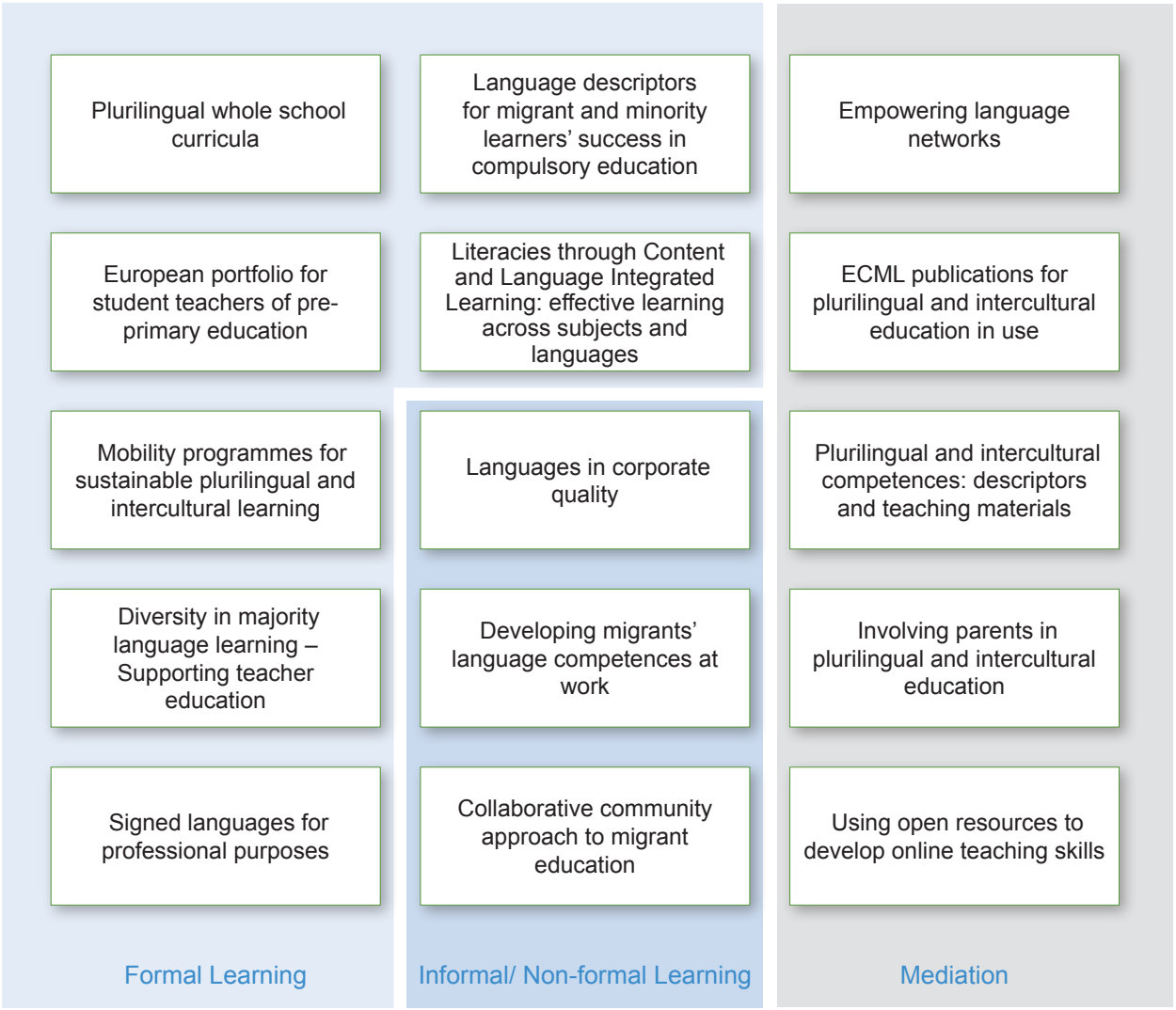
ECML

The ECML is a Council of Europe institution based in Graz, Austria. Its mission is to encourage excellence and innovation in language teaching, and to help Europeans learn languages more effectively. The ECML runs 4-year medium-term programmes. The 2012–2015 programme *Learning through languages – promoting inclusive, plurilingual and intercultural education* supports projects within the following areas:

- Formal learning: learning language(s) in language classes and learning subject matter through the language(s) of instruction
- Non-formal learning, learning out of school
- Mediation

Of the fifteen projects the ECML supports, seven are related to language(s) and learning in school, three to language(s) and learning in other contexts than school and five projects to mediation. The current project is linked to the 2012-2015 programme through the areas of formal learning and the language of schooling.

Table 1. Overview of projects in the 2012-2015 ECML programme (ECML, 2012)



1.2 CEFR levels of language competence

The *Common European Framework of Reference for Languages: learning, teaching, assessment* was published in 2001, approximately 30 years after work on drafting the Threshold level (B1) started. The main aim of the document was "*to overcome the barriers to communication among professionals working in the field of modern languages arising from the different educational systems in Europe. It provides the means for educational administrators, course designers, teacher trainers, examining bodies, etc., to reflect on their current practice, with a view to situating and co-ordinating their efforts and to ensuring that they meet the real needs of the learners for whom they are responsible.*" (CEFR 2001, p1).

Another clearly stated goal for the CEFR is to enhance international co-operation (ibid: 1).

CEFR scales and levels

There are 56 scales of language descriptors in the CEFR, covering several language functions, five different language skills (listening, reading, spoken production, spoken interaction and writing) and six different levels (A1-C2). Equally importantly, the CEFR addresses a number of issues in relation to language and language learning, for instance, communicative competence/ language use, language acquisition, language teaching, language curricula and language assessment in both formal and informal contexts.

Basic users
Independent users
Advanced users

As already mentioned, the CEFR assigns language learners into three groups according to their language competence. Basic users (A1 and A2) focus on learning the most important, everyday language in order to survive in a new language community, while Independent users (B1 and B2) have a language proficiency that enables them to cope independently in educational settings as well as to use the language they are learning as a means to learn more. Advanced users (C1 and C2) are able to use the language effortlessly, coherently and effectively in professional settings (see *The Common Reference Levels*, *global scale*, Appendix I).

Communicative view of language

The CEFR is based on a communicative view of language, as described in Bachman (1990). In other words, language proficiency consists of both linguistic competence and socio-linguistic and pragmatic competence. In the CEFR, there are scales for each of these competences. The scales do not describe knowledge of language, but the ability to use language in different situations. Even though cognitive dimensions of language use are not explicitly mentioned in the CEFR, many descriptors in the B2-C2 area address cognitive dimensions inherently. This view is supported by Little (2010):

"Although the CEFR does not explicitly address the challenge of academic language, the more advanced levels (B2-C2) are defined in terms that imply advanced levels of educational achievement and/or professional involvement" (Little 2010:22).

While the levels A1 and A2, and to some extent B1, focus on basic interpersonal communication skills (BICS), the levels B2-

C2 also address cognitive academic language proficiency (CALP) (Cummins, 1979).

Flexible and descriptive quality

On one hand, the levels of the CEFR should be firmly set. If not, they would lose their function as common reference points. On the other, the CEFR is not meant to be dogmatic, prescriptive or absolute. The flexible and descriptive quality of the CEFR is underlined on the first pages of the document:

If you want to describe a specialised area, you may well need to sub-categorise further than the present classification goes. The examples are suggestive only. You may well wish to keep some, reject others and add some of your own. You should feel quite free to do so, since it must be for you to decide on your objectives and your product (CEFR, 2001: xiii).

CEFR in contexts other than foreign languages

Originally, the descriptors presented in the CEFR were developed with adult foreign language learners in mind, such as tourists and teenage or adult students. Later, the levels and descriptors were adapted and used in L2 contexts (Vox, 2012), for children (Hasselgreen, 2003; 2010) and for other groups of foreign and L2 learners, including deaf learners of a second or foreign sign language (second language learners learning a new language in the same modality as their primary language (L2, M1): for example, both their first and new languages are expressed in the visual-gestural modality) and hearing learners of a sign language as a foreign or second language (typically second language learners learning a second language in a new modality, namely a visual-gestural modality (L2, M2)).

Adapting CEFR descriptors for L2 contexts is also at the core of the present project. By developing language descriptors for two L2 age groups studying history/civics and mathematics, we are moving beyond earlier research connecting the CEFR and the language of schooling. At the same time, the flexibility of the CEFR is explored by using it in a new area: non-language subjects.

1.3 Language of schooling and related studies

The main aim of primary and secondary education is to prepare students for their future lives by empowering them with the relevant skills and knowledge to enable them to live and work as social and independent human beings. In order to reach this goal, students need language skills to acquire knowledge and master the requirements of school and of a variety of different contexts outside school.

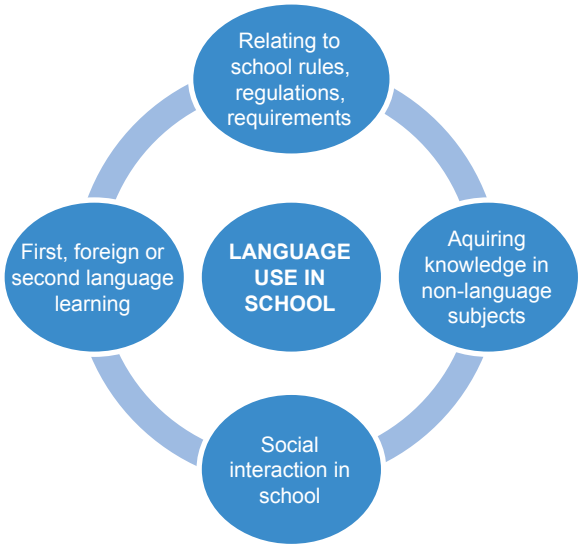
Language in subjects

Traditionally, subjects like history, geography, science and mathematics have been looked upon as “knowledge subjects” or “non-linguistic subjects” for which language is not considered to be an integral part of the learning, except in the case of learning subject-specific terminology. Today, many stakeholders view this differently. “Whatever the subject, all knowledge building in the school context involves working with language.”(Beacco, Coste, van der Ven & Vollmer 2010: 6)

In an educational context, language is used in different situations and for different purposes. Figure 1 gives an overview of different language situations that students have to cope with in school.

The traditional view is that language is important in language lessons. Students learn to communicate and learn about languages in first, foreign or L2 classes. Today, however,

Figure 1. Language situations students need to cope with in school



language is no longer seen as a goal in itself, but also as a tool by which students interact with friends and peers in schools, and by which they learn content matters in subjects like science, geography, history and mathematics. In addition, learners have to be able to relate to more formal language when learning and gathering information, for example, on administrative and legal topics like school rules, examinations, attendance or timetables (Thürmann *et al.* 2010). In order to be successful, students gradually need to learn to master all these language repertoires.

Figure 2 shows what the Council of Europe Language Policy Unit means by language(s) of schooling.

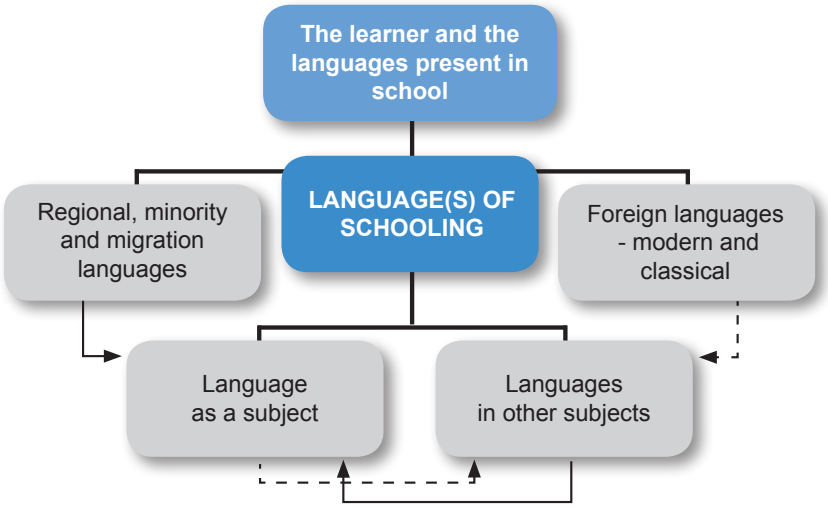
The language of schooling includes the languages taught in language classes and the language used when teaching/studying subjects other than languages. All students need to master the varieties of academic language used in different subject matters, and to be able to interact fluently with peers. Therefore, students need to develop a good command of different language skills in order to learn and be successful in all school subjects. This is often a big challenge for students with a migrant or minority background, and it is important to ensure that these students achieve according to their abilities.

Consequently, language plays an important part in all teaching and learning. Students learn languages and subject matter content through language(s) in school.

Needs of immigrants

Teachers and educational authorities in many countries are developing strategies to cater to the language needs of children and adult immigrants. Significant efforts are made to provide support for the learning of the

Figure 2. Language of schooling overview (Council of Europe, Language Policy Unit, 2009)



language(s) of the host country in order to facilitate access to social, educational and professional life.

Educational success

To succeed in an educational context, students need to master a different type of language than they do in everyday non-academic situations. Consequently, recent research on the language of schooling has, among other things, a pedagogical motivation. It aims to raise an awareness of what students need to be able to do, language-wise, in order to do well at school.

Table 2. Relevant discourse functions in history, science, literature and mathematics

History	Science	Literature	Mathematics
Beacco (2010: 20-21)	Vollmer (2010: 21)	Pieper (2011: 20)	Linneweber-Lammerskitten (2012: 27)
Discourse functions/cognitive operations and their verbal performance			
analyse argue illustrate/exemplify infer interpret classify compare describe/represent deduce define discriminate enumerate explain judge/evaluate/assess correlate/contrast/ match name specify prove recount report (on) a discourse summarise *calculate* *quote*	analyse argue classify compare describe/represent deduce define distinguish enumerate explain illustrate/exemplify infer interpret judge/evaluate/assess correlate/contrast/ match name prove recount report (on) a discourse summarise specify *assess (also mentioned above)* *calculate* *outline/sketch*	analyse argue classify compare describe/represent deduce define distinguish enumerate explain illustrate/exemplify infer interpret judge/evaluate/assess correlate/contrast/ match name prove recount/narrate report (on) a discourse summarise specify *assess (also mentioned above)* *outline/sketch*	analyse argue classify compare describe/represent deduce define distinguish enumerate explain illustrate/exemplify infer interpret judge/evaluate/assess correlate/contrast/ match name prove recount report (on) a discourse summarise specify *assess (also mentioned above)* *calculate* *outline/sketch*

Cummins' theory

In the late 1970s, Cummins (1979) developed a theory that contributed to the definition of the concept of language proficiency. The theory came to life in the wake of Oller's unitary factor hypothesis (Oller 1976), viewing language proficiency as one unitary and indivisible factor. This hypothesis was later challenged by others and rejected by Oller himself (Oller 1984). Cummins argued that even though there are opposing views on what language proficiency is, "the major issue is not which conception of language proficiency is correct but rather which is more useful for different purposes" (Cummins 1980: pp 176). Since much of Cummins' work is concerned with bilingual education and providing equal opportunities for all, he has found it useful to define the two main types of language proficiency needed in a school context: basic interpersonal communication skills (BICS) and cognitive academic language proficiency (CALP). The latter stresses the language required in academic educational contexts.

BICS and CALP

Cummins complements his notion of CALP with what he characterises as social everyday language, namely BICS. BICS are the skills people need in order to communicate in everyday social situations. Such situations are context dependent and are not usually cognitively demanding. These are the primary language skills students and immigrants first develop in a new language. To cope with interactive and social situations, no specialised language is usually required.

CALP, on the other hand, refers to academic language, and Cummins and others underline that such skills are cognitively demanding. It takes time to develop CALP skills in a first and, especially, in an L2. In a school context, students need to be able to focus on content when they listen, read, speak and write. Language functions related to CALP include being able to describe, interpret, and compare. Since such situations have, to a great extent, a reduced context, many students struggle. Of course, when teachers and educators are not aware of the extra language challenge students have in learning academic subjects, problems arise.

Further studies

Beacco (2010), Vollmer (2010), Pieper (2011) and Linneweber-Lammerskitten (2012) have studied the language that young learners at the age of 15/16 need in order to do well in history, science, literature and mathematics respectively. They presented a procedure for supporting curriculum developers and subject matter teachers by directing their attention to the discursive and linguistic dimensions of subject areas. Interestingly, all of these studies conclude by suggesting that very similar discourse functions are necessary in order to be successful in the subjects they focus on, as shown in table 2.

At the bottom of each column, a few discourse functions are mentioned in italics. They are examples of functions that do not directly overlap between the four subjects. These differences may be random, since no explicit argument or explanation is offered in any of the articles.

Discourse functions are not universal

Beacco *et al.* (2010) also stressed that discourse functions are not universal. They take on different forms in different countries as well as in different classrooms.

Classes are also communities employing forms of communication which can be described in terms of texts and discourse genres, irrespective of the subjects taught. There are many different genres of classroom discourse:

teachers' and learners' presentations, teacher-led or learner-led discussions and debates. Discussion may focus on problem exploring or problem solving, presentation may focus on information or persuasion. (ibid: 12)

Project approach

In the current project, an attempt is made to link relevant discourse functions, such as those mentioned in the table above, and levels of the CEFR. Therefore, we have tried to describe in more detail what students performing some of these functions would have to be able to do at different language proficiency levels.

The two age groups (12/13 and 15/16) that we are focusing on represent the final phase of two main educational stages in many European countries: the end of primary school and the end of lower secondary school. Another motivation for choosing 15/16 year-old students is that this was the focal age group of a considerable amount of previous research on the language of schooling. Thus, the results of these studies could be used in our project.

Choice of subjects

As for the choice of subjects, the two subjects, history/civics and mathematics, are taught in most (if not all) grades in primary and lower secondary education in many European countries. History is also a subject that has been addressed in several other Council of Europe initiatives. Another motivation for choosing two quite different school subjects is to see if the language skills required are similar or if there are major differences. Mathematics has a "language" of its own (symbols, formulas, statistics, etc.), yet verbal language is still required for comments, discussion and teaching. On the other hand, history needs verbal language to represent knowledge and as a means for transmitting and creating knowledge.

In the next chapter, we present in detail how we developed the descriptors, who participated in validating them, and what kind of results we obtained in trying to define the language competence that immigrant and migrant pupils need to do well in the two subjects.

2 Language descriptors for migrant and minority learners' success in compulsory education

2.1 Aim of the project

Identifying minimal standards

The overall aim of this project is to indicate one or several levels of language competence that young migrant or minority learners need to have in the language of schooling in order to do well in mathematics and history/civics. In this context, "to do well" refers to minimal standards, i.e. the minimum that students must be able to do in order to learn and make progress in the subject. By doing this, we want to raise awareness of the challenges that young language learners meet when learning subject matter content in a language other than their first language. While they may receive a lot of support from teachers during language lessons, subject matter tasks will often require more precise and sometimes more academic use of language from students than that used during language lessons. Often students receive no additional language support in non-language subjects.

Links between discourse functions and CEFR

A secondary aim of the project is to make a link between some of the discourse functions identified by Beacco (2010) and Linneweber-Lammerskitten (2012) for history and mathematics respectively, as well as between the sets of language descriptors collected/developed and the functions mirroring levels of the CEFR. In this context, we are using the proficiency levels of the CEFR as a yardstick.

Consequently, the study aims to answer the following questions:

- Which CEFR level(s) would the students need do well in history/civics and mathematics at the ages of 12/13 and 15/16?
- Are the language levels required the same for history/civics and mathematics? If not, what differences are there?
- Are the language levels required the same for all skills (listening, reading, speaking and writing)? If not, what kind of differences are there between productive (speaking and writing) and receptive (listening and reading) skills?
- Could some language functions be identified as more or less relevant than others?

The first question is descriptive. The minimum levels are identified by means of the questionnaires that subject matter teachers answered. The second and third questions are comparative as they compare the minimum levels identified by the subject matter experts in both subjects with regard to different sub skills. The last question focuses on comparing the language functions identified and their

relevance according to the subject matter teachers.

Aiming at students' support

Insights gained from this study will increase awareness among teachers, parents and school authorities of the challenges faced by young migrant and minority students, thereby allowing for reflection on how they can be supported.

2.2 Examples of existing practices: Norway, Finland, Lithuania, Portugal and Canada

In this study, migrant and minority students' success in compulsory education has been approached through the educational systems of Canada, Finland, Lithuania, Norway and Portugal. In each country, children attend compulsory education from the age of 6/7 to the age of 15/17 and have mathematics and history/civics as school subjects in all grades.

Context of countries involved

In Lithuania, there are schools for ethnic minorities supported by the state (Polish, Russian and Belarusian schools). In Canada, Finland, Norway and Portugal, students with a migrant background attend mainstream schools and receive varying types of language support.

Language in the curriculum

In Lithuania and Portugal, curriculum goals are expressed as knowledge/ topics students are expected to have/learn about. In Finland, Norway and Canada, most goals refer both to knowledge/topics and language requirements, as indicated in the example below.

Example 1: "Know how to present calculations in writing and orally" (Mathematics, 8th grade, Finland)

Example 2: "Give an outline of how different political parties focus on different values and interests within society, how these views relate to current questions and problems, and argue your own views." (Civics, 10th grade, Norway)

Table 3 summarises the ages at which children attend compulsory education in the five countries, the curriculum goals for mathematics and history teaching and the support migrants receive in the language of schooling.

In Norway, curriculum goals are expressed as what students should be able to do at the end of three main stages: the end of the 4th, 7th and 10th grades. Examples of competence goals with regard to inherent language requirements for 7th (12/13 year-old students) and 10th grade (15/16 year-old students) are indicated in tables 4 and 5.

Next page: Table 3. Compulsory schooling in Canada, Finland, Lithuania, Norway and Portugal - keywords

Country	**Canada**	**Finland**	**Lithuania**	**Norway**	**Portugal**
Compulsory education:	age range: 5-17	age range: 7-15	age range: 7-16	age range: 6-16	age range: 6-17
History/civics: grades when taught and number of lessons/hours	All grades • Grade K-2: 30 minutes per week • Grades 3-5: 1.5 hours per week • Grades 6-10: one 50-minute class every day • Grades 11-12: optional elective	All grades • Grades1-5: 3 weekly lessons (approximately 85.5 hours) • Grades 6-9: 7 weekly lessons (approximately 199.5 hours)	• Grades 5-8: 484 hours • Grades 9-10: 350 hours	All grades • Grades 1-7: 385 hours • Grades 8-10: 257 hours	All grades • Grades1-4: within the area of environment and regional studies for which approximately 430 hours are allocated • Grades 5-6: approximately 160 hours • Grades 7-9: 195 hours (for the area of social sciences which also includes geography) • Grades10-12: 324-445 hours (depending on area of studies)
Mathematics: grades when taught and number of lessons	All grades • Grade K-8: minimum of 1 hour per day • Grades 9-10: one course per semester • Grades 11-12: one course per year (with additional electives available)	All grades • Grades 1-2: 6 weekly lessons (approximately 171 hours) • Grades 3-6: 12 weekly lessons (approximately 343 hours) • Grades 7-9: 14 weekly lessons (approximately 399 hours)	• Grades 1-4: 576 hours • Grades 5-8: 548 hours • Grades 9-10: 245 hours	All grades • Grades 1-4: 560 hours • Grades 5-7: 328 hours • Grades 8-10: 313 hours	All grades • Grades 1-4: approximately 1000 hours (minimum of 7 hours per week) • Grades 5-6: 324 hours Grades 7-9: 360 hours • Grades 10-12: 324-445 hours (depending on area of studies)
Curriculum topics and goals	History/civics and mathematics topics (language requirements implicit in outcomes)	History/civics and mathematics topics, including explicit language requirements	History/civics and mathematics topics (no explicit language requirements)	History/civics and mathematics topics, including explicit language requirements	History/civics and mathematic topics (no explicit language requirements)
Migrant support	Mainstream plus some language support for English language learners in sheltered English classes	Mainstream plus language support for second language learners (Finnish/Swedish)	Mainstream plus language support	Mainstream plus language support for second language learners (Norwegian and mother tongue)	Mainstream plus language support up to B1

Table 4. Examples of competence goals for history/civics for 7th and 10th grade students in Norway

7th grade competence goals
Exploring • Being able to discuss relevant subject-related issues showing respect for other opinions, use relevant terms and distinguish between opinions and facts.
History • Being able to describe geographical discoveries by Europeans, relate cultural encounters and discuss how these may have been experienced.
Civics • Being able to explain the meaning of a society and reflect on why humans congregate into societies. • Being able to present a current conflict between societies and discuss possible solutions.
10th grade competence goals
Exploring • Being able to use statistical sources to compute and describe tendencies and variations in societies, and to assess the quality and reliability of the information. • Being able to reflect on relevant aspects of society using digital and paper-based sources, taking into account the purpose and relevance of the same sources.
History • Being able to present important tendencies in Norwegian history in the 19th and 20th century and discuss how these trends have influenced today's society. • Being able to give an outline of important technological and social trends following the industrial revolution.
Civics • Being able to give an outline of how different political parties focus on different values and interests within society, how these views relate to current questions and problems, and argue your own views. • Being able to describe main trends in the Norwegian economy and how these are connected to the global economy.

Table 5. Examples of competence goals in mathematics for 7th and 10th grade students in Norway

7th grade competence goals
Numbers and algebra • Being able to develop, use and describe methods for mental calculation, approximate results and written calculations, and use digital computational tools. • Being able to find information in texts or practical contexts, set up and explain calculations and procedures, and evaluate, present and discuss results.
Geometry • Being able to analyse properties of two- and three-dimensional figures, and describe physical objects within daily life and technology using geometrical terminology.
Measurement • Being able to explain the construction of measures of length, area and volume, and to calculate the circumference, area and volume of two- and three-dimensional objects.
Statistics and probability • Being able to represent data in tables and diagrams from digital and non-digital sources, and read and interpret the representations and explain their use. • Being able to evaluate and talk about chance in everyday life, games and experiments, and calculate simple probabilities.
10th grade. Some competence goals
Numbers and algebra • Being able to analyse complex problems, identify fixed and variable values, associate problems to known solutions, perform calculations, and present the results in a suitable manner.
Geometry • Being able to perform, explain and prove geometrical constructions with a compass and ruler and a dynamic programme for geometry.
Measurement • Being able to explain the constant π and how it is used to calculate circumference, area, and volume.
Statistics and probability • Being able to perform investigations and use databases to search for and analyse statistical data. • Being able to show a critical attitude towards sources.
Functions • Being able to generate functions describing numerical practical and numerical relationships, with and without digital tools, describe and interpret the functions, and translate the functions into different representations such as graphs, tables and text.

In Finland, the goals for history/civics and mathematics are expressed by means of good performance (corresponding to 8 on the school scale 4-10) at the end of the 5th and 6th grades and as final assessment criteria for the 8th grade. Examples of the criteria used are given in tables 6 and 7.

Table 6. Examples of good performance and assessment criteria in history at the end of the 6th and 8th grades in Finland

HISTORY
Good performance at the end of the 6th grade
Acquiring information • Knowing how to distinguish fact from opinion. • Being able to distinguish a source from an interpretation of that source.
Understanding historical phenomena • Being able to name characteristic features of societies and eras. • Being able to explain why people act in different ways.
Applying historical knowledge • Knowing how to present an account of matters. • Being able to explain an event from the standpoint of some parties involved. • Being able to realise that things can be interpreted in different ways and explain why that happens to be so.
Final assessment criteria for the 8th grade
Acquiring information about the past • Knowing how to distinguish between factors that explain a matter and secondary factors. • Being able to read and interpret various sources.
Understanding historical phenomena • Being able to place the events being studied into their temporal contexts and thus into a chronological order. • Knowing and being able to explain why people once acted differently from how they act now. • Being able to present reasons for and consequences of historical events.
Applying historical knowledge • Being able to answer questions about the past by using the information obtained from different sources, including information acquired by using modern technology. • Being able to formulate own justified opinions about events and evaluate events and phenomena.

Table 7. Examples of good performance and final assessment criteria in mathematics at the end of 5th and 8th grades in Finland

MATHEMATICS
Good performance at the end of 5th grade
Thinking and working skills • Being able to use mathematical concepts by presenting them with instruments, pictures, symbols, words, numbers, diagrams. • Being able to communicate observations and thoughts by acting, speaking, writing and using symbols. • Knowing how to describe groups of things and objects, and positing true and untrue propositions about them. • Knowing how to present mathematical problems in new form. • Being able to interpret a simple text, illustration or event and to make a plan for problem solving.
Numbers, calculations and algebra • Being able to understand the concept of a negative number and fraction, and to present them by different methods. • Knowing how to present calculations in writing and orally.
Geometry • Knowing how to form figures following given instructions.
Data processing, statistics and probability • Knowing how to gather data and organise, classify and present them as statistics. • Know how to read simple tables and diagrams. • Know how to clarify the number of different events and alternatives, and to judge which is an impossible or certain event.
Final assessment criteria for 8th grade
Thinking skills and methods • Knowing how to use logical elements such as “and”, “or”, “if so”, “no”, “exists”, and “does not exist” in speech. • Knowing how to judge the truth of simple propositions. • Knowing how to transform a simple problem in text form to a mathematical form of presentation, make a plan to solve the problem, solve it and check the correctness of the result. • Knowing how to present possible alternative solutions systematically using a table, elm-tree diagram, path diagram or other diagram.
Functions • Knowing how to prepare a table from number pairs according to a given rule. • Being able to verbally describe the general rule for a given number sequence.
Probability and statistics • Being able to read various tables and diagrams, and to determine frequencies, average, median and mode from given material.

In Finland, Norway and Canada (and also some other European countries) language skills are integrated in the curriculum goals of all subjects. In other countries, for instance, in Lithuania and Portugal, this is not the case.

2.3 Language descriptors: targeted CEFR levels

As the descriptors have been developed for young language and subject matter learners at the ages of 12/13 and 15/16, they have been targeted to the CEFR levels A2-B2 for productive skills and A2-C1 for receptive skills. While the team agreed upon descriptors mirroring levels A2-B2 for productive skills, the members were not unanimous as to whether or not to include C1 descriptors for the receptive skills.

The role of C1 descriptors

The main argument for including C1 descriptors was that some would say that some 15/16 year-old students have listening and reading competence mirroring C1. Therefore, it would be useful to include C1 descriptors for listening and reading. The counter argument was that as this project focuses on minimum standards, several team members doubted that C1 competence could be the minimum requirement for listening and reading for 15/16 year-old students.

Nevertheless, the team agreed to include C1 descriptors for listening and reading in the two questionnaires, and to make a final decision after receiving feedback from respondents.

2.4 Participants and the process of developing the descriptors

Many stakeholders contributed to the project results and a number of activities took place in order to set up, develop and complete the project.

2.4.1 Participants

Almost 350 people contributed to the process of gathering data. In the first phase of the project, the researchers, teacher trainers and teachers of history, mathematics and second-language learning participating in an ECML workshop in Graz helped the project team to develop the descriptors by giving feedback on the first version of the descriptors.

Six Finnish and Norwegian subject matter and CEFR experts gave feedback on the first sets of descriptors. These people were contacted individually by the Finnish and Norwegian team members.

31 workshop participants were selected by their national representatives to the ECML after applying to participate in the workshop.

Online questionnaires

Staff members at the ECML in Graz set up two online versions of the first questionnaire. This questionnaire was aimed at validating the CEFR assignments of the descriptors.

78 CEFR experts contributed to the validation of the descriptors by assigning them to CEFR levels. These experts were contacted by team members through national and international networks.

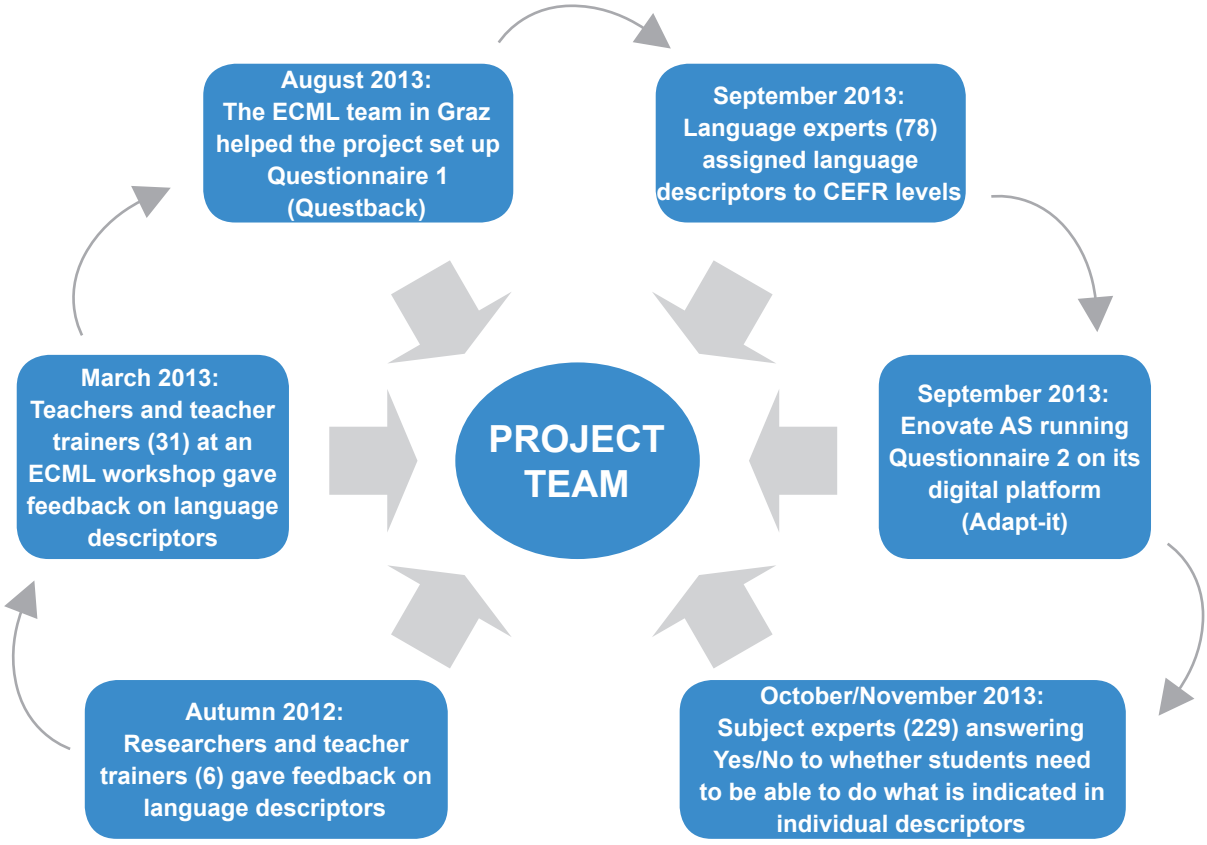
A Norwegian company, Enovate AS, helped with the second online questionnaire. This company has participated in many research projects focusing on information technology and learning. It provides the digital platform for several official tests in Norway. The second questionnaire targeted teachers of history and mathematics and was launched in six languages: English, Finnish, French, Lithuanian, Norwegian and Portuguese.

Teacher feedback

In the last phase, 229 teachers of history/civics and mathematics gave feedback on what CEFR levels students would need to have in order to do well in history/civics and mathematics in the two age groups. The teachers were contacted through national educational networks and international contacts.

It is impossible to say how many teachers were ultimately asked to answer the questionnaire. Links to the questionnaire were posted on the websites of different teachers' associations in Finland and Norway. In addition, teacher trainers of history and mathematics passed on information about the project and the questionnaire to teachers and schools. Some teachers were contacted individually by e-mail and asked to answer the questionnaire. A total of 229 teachers of history/civics and mathematics responded. Most of these were from Finland, Lithuania, Norway and Portugal. Figure 3 gives an overview of the different participants and their role.

Figure 3. Project participants, activity and timeline



Researchers' and teacher trainers' feedback

After agreeing upon a first draft of language descriptors, they were sent for feedback and comments to a few researchers and teacher trainers in Finland and Norway.

Some of the researchers and teacher trainers were language experts who gave feedback on wording and initial level assignment of the descriptors. Other researchers and teacher trainers were consulted as subject matter experts who gave feedback on initial language functions and indicated what kind of language skills were important in history/civics and mathematics. The feedback resulted in revisions of the descriptors.

The version of descriptors presented to the workshop participants two months later was different to the initial one. The input gathered from the researchers and teacher trainers resulted in a few additions to the language functions, some changes to the initial level assignments of some descriptors, and revision of the wording of some of the descriptors.

Workshop participants' feedback

In March 2013, a workshop was hosted by the ECML in Graz, Austria. In total, 31 teachers from 21 different countries participated in the workshop.

The main aim of the workshop was to obtain more feedback on the first version of the descriptors developed by the team members. During the workshop, the participants worked in small groups on the language descriptors for listening, speaking, reading and writing. They gave feedback orally and in writing. In addition, they were asked to comment on preliminary questions for a teacher questionnaire to be included in Questionnaire 2 distributed approximately half a year later.

Ten of the participants were teachers or teacher trainers of history/civics, nine represented mathematics and twelve were language teachers or teacher trainers. They came from Austria, Albania, Armenia, Cyprus, the Czech Republic, Finland, Latvia, France, Iceland, Ireland, Luxembourg, Malta, Montenegro, the Netherlands, Norway, Poland, Romania, the Slovak Republic, Slovenia and Sweden, and were chosen by their national representatives to the ECML.

Preparing Questionnaire 1

The language descriptors were revised on the basis of the feedback and suggestions obtained from the workshop. Then Questionnaire 1 was prepared with the help from the team at the ECML in Graz. The ECML team set up two digital versions of the questionnaire using Questback. More information about these questionnaires can be found in section 2.4.2 "The process of developing language descriptors".

Validating language descriptors

After the workshop, participants' feedback and the second major revision of the descriptors, language experts in different countries were contacted to assign the descriptors CEFR levels. Many of the experts represented the team members' countries. In addition, contacts in other European countries were approached. This was necessary in order to validate the descriptors for history/civics and mathematics and to link them to the CEFR in a reliable way.

Language experts

The language experts were chosen based on team members' contact networks, and included language teachers, teacher trainers, language testers, researchers and persons employed by examination boards or ministries, all of whom knew the CEFR levels thoroughly.

Preparing Questionnaire 2

A Norwegian company, Enovate AS, helped to run Questionnaire 2. Since this questionnaire targeted subject experts mainly in Canada, Finland, Lithuania, Norway and Portugal, it was important to have the descriptors translated into Finnish, Lithuanian, Norwegian, Portuguese and French. The team members translated the descriptors into their own languages. Enovate made it possible to run Questionnaire 2 in six parallel languages and to have all the data in one data file. More information about Questionnaire 2 can be found in section 2.4.2 “The process of developing language descriptors”.

Subject experts

Questionnaire 2 was sent to subject matter specialists such as teachers and teacher trainers and other professionals with personal experience in teaching mathematics and history/civics to students with immigrant or minority backgrounds. This meant that teacher trainers in the team members’ countries sent e-mails (including information about the project and a link to the online questionnaire) to teachers with whom they cooperated. Local school authorities also asked teachers to answer the questionnaire. An association for Norwegian teachers of mathematics posted information about the project and Questionnaire 2 on their website. In addition, the history/civics and mathematics teachers who had participated in the ECML workshop in March 2013, as well as other history/civics and mathematics teachers, were approached and asked to answer the second questionnaire.

2.4.2 The process of developing language descriptors

As stated in Part 1, the starting point for developing descriptors was the CEFR, as well as European language portfolios for young learners and research on language in content area subjects. The finalisation of the descriptors took, however, a lot of effort and was quite time consuming. Figure 4 shows the process the team followed when developing language descriptors.

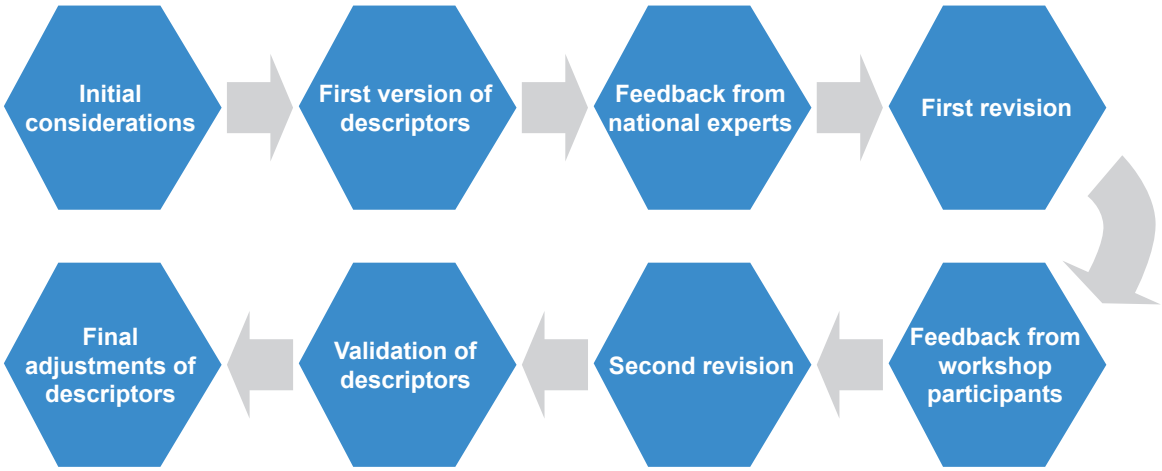
Initial reactions

The first draft of language descriptors included descriptors for listening, reading, speaking, writing and vocabulary, and was sent to language and subject experts in Finland, Lithuania, Norway and Portugal to get initial feedback on the descriptors. According to the feedback, some of the descriptors were considered to be more related to personal and social life than to educational contexts. It was also recommended that the project team closely study Finnish and Norwegian competence goals for history/civics and mathematics in order to get ideas for language functions that might be central in these subjects.

Reactions of ECML workshop participants

Following a major revision of the descriptors, they were presented to the teachers and teacher trainers who participated in the ECML workshop in Graz in March 2013. This version included 129 descriptors: 22 for listening, 24 for reading, 46 for speaking, 26 for writing and 11 for words and phrases. During group work and plenary sessions, participants gave feedback relating to all descriptors. The feedback mainly concerned the following issues:

Figure 4. The process of developing language descriptors



- Consider whether C1 should be omitted for reading and listening
- Consider whether C1 should be added for speaking and writing
- Split one of the suggested functions, *Understand opinions and arguments*, in two: *1. Understand opinions 2. Understand arguments and reasoning*
- Adjust listening and reading functions to each other where it seems logical, as some of the same language functions are relevant for both skills
- Adjust speaking and writing functions
- New language functions were suggested, such as: *listen to audio recorded materials* (listening), *state facts, outline* (speaking and writing), *evaluate, interpret* (speaking and writing), and *express arguments, prove* (speaking and writing)

Review of descriptors

After the workshop, further discussions and revisions took place and, during the summer of 2013, a set of 166 language descriptors were finalised on the basis of the feedback from the workshop (see tables 8 and 9 for overview of descriptors and language functions). As for the feedback concerned with including or leaving out level C1, we decided to include C1 for the receptive skills (listening and reading) in the two questionnaires and to make a final decision following input from teachers of history/civics and mathematics.

In August 2013, while the team members started translating the descriptors to French, Finnish, Lithuanian, Norwegian and Portuguese, ECML staff started preparing a digital version of Questionnaire 1 using Questback.

Tables 8 and 9 give overviews of the descriptors for receptive and productive skills, and the language functions they cover. The number of descriptors in the questionnaires is indicated in parenthesis. The final descriptors can be found in English in Appendix II at the end of the document and online in six language versions.

In total, 25 descriptors for listening and 26 for reading were collected and developed. Some descriptors were similar for listening and reading. In table 9, language functions for productive skills are summarised.

In total, 66 speaking descriptors and 49 writing descriptors were developed. As mentioned above, some of these overlap.

Table 8. Number of language functions and descriptors: receptive skills

Listening	Reading
Understand factual information and explanations (4)	Understand factual information and explanations (6)
Understand instructions and directions (4)	Understand instructions and directions (4)
Understand opinions (4)	Understand opinions (4)
Understand arguments and reasoning (5)	Understand arguments and reasoning (5)
Follow subject-related conversations (4)	Find information (3)
Understand audio-recorded materials (including videos) (4)	Read and analyse information contained in tables, graphs, maps, charts and symbols, as well as in photographs, paintings and drawings (4)

Table 9. Number of language functions and descriptors: productive skills

Speaking (language functions)	Writing (language functions)
Describe (8)	Describe (8)
Explain (4)	Explain (4)
State facts, outline, give an account of something (4)	State facts, outline, give an account of something (4)
Express opinions, discuss (5)	Express opinions, discuss (3)
Express arguments, prove (5)	Express arguments, prove (4)
Summarise (4)	Summarise (4)
Define (4)	Define (4)
Evaluate, interpret (4)	Evaluate, interpret (4)
Compare and contrast (3)	Compare and contrast (3)
Make oneself understood and clear up misunderstandings/misconceptions (5)	Take notes (4)
Talk to teachers and classmates (5)	Work with forms, tables, charts, graphs, etc. (4)
Ask for clarification (4)	Organise (3)
Respond to what people say (3)	
Interact in teamwork (4)	
Give a presentation or talk about subject matter issues in class (4)	

2.4.3 Questionnaire 1: what and why

Questionnaire 1 for language experts

In order to validate the initial CEFR level assignments completed by the team members, two online versions of Questionnaire 1 were constructed. These included all language descriptors, but the order of the descriptors differed in the two versions. Table 10 summarises the sequencing of the skills in the questionnaires.

Since it took some time to complete this questionnaire (166 language descriptors), there was an increased chance that respondents would drop out before having assigned all descriptors to a CEFR level. Having two questionnaires, in which the descriptors were sequenced differently, minimised the chance of having many responses to some descriptors and very few to others.

Within each skill, the sequence of the descriptors was randomised. In other words, the descriptors were not presented in a logical sequence. Different language functions and preliminary CEFR levels were presented to the respondents in a random sequence.

The two versions of Questionnaire 1 were sent to approximately 400 language experts.

2.4.4 Questionnaire 2: what and why

Questionnaire 2 for teachers of history and mathematics

In the second questionnaire, the language descriptors were presented to history/civics and mathematics teachers. This questionnaire was sent out in six different languages: English, Finnish, French, Lithuanian, Norwegian and Portuguese. Questionnaire 2 consisted of the same 166 descriptors.

The teachers did not have to think in terms of CEFR levels, but had to answer "Yes" or "No" to what students in a particular subject and age group (i.e., 12/13 mathematics, 12/13 history/civics, 15/16 mathematics, and 15/16 history/civics) needed to be able to do in order to complete what was indicated by a descriptor. This was considered to be an easier way of approaching the functions from the perspective of a non-language expert.

Example: In order to do well in the subject, should the student be able to understand clearly written, straightforward instructions/ tasks in teaching materials?

In the online questionnaire, the descriptors were presented to the respondents skill by skill, and within each skill, language function by language function. Within each language function, the descriptors mirroring the CEFR levels were presented in a random sequence, as shown in tables 11 and 12.

The reason for presenting the experts with descriptors in a mixed order of difficulty was to encourage them to carefully consider whether the competence presented in each descriptor was actually necessary for a particular subject and age group. It is possible that if they knew which descriptors were considered most easy/ difficult, it could affect their responses.

The teacher questionnaire was sent out to teachers of history/civics and mathematics, teacher trainers, language testers and researchers. The persons approached could choose to answer the questionnaire in one of six languages: English, Finnish, French, Lithuanian, Norwegian or Portuguese. See Appendix II for the English version of the questionnaire.

Table 10. Sequencing of descriptors in expert questionnaires A and B

Sequence	Expert questionnaire A	Expert questionnaire B
1	Listening - 25 descriptors	Reading - 26 descriptors
2	Speaking - 64 descriptors	Writing - 48 descriptors
3	Reading - 26 descriptors	Listening - 25 descriptors
4	Writing - 48 descriptors	Speaking - 64 descriptors

Table 11. Original level assignment for *understanding instructions and tasks in teaching materials* **(reading)**

C1	Can understand in detail lengthy, complex instructions in an area of specialty
B2	Can understand lengthy, complex instructions/tasks in teaching materials, including when they involve several steps
B1	Can understand clearly written straightforward instructions/tasks in teaching materials
A2	Can understand simple routine instructions/tasks in teaching materials

Table 12. The way the language function *understanding instructions and tasks in teaching materials* **(reading) was presented to teachers of history/civics and mathematics.**

In order to do well in the subject, the student should be able to:

1	understand in detail lengthy, complex instructions in an area of specialty
2	understand simple routine instructions/tasks in teaching materials
3	understand lengthy, complex instructions/ tasks in teaching materials, also when it involves several steps
4	understand clearly written straightforward instructions/tasks in teaching materials

2.5 Results

2.5.1 Questionnaire 1

Validation of CEFR descriptors

78 expert answers to Questionnaire 1

The online questionnaire for the language experts was sent to around 400 people. In total, 300 opened the link and viewed the questionnaire. Of those 300, 77 completed the questionnaire and assigned all descriptors to CEFR levels.

One expert assigned only reading descriptors to CEFR levels. Most of the experts came from Finland, Norway and Portugal. In total, experts from 16 countries took part in the survey (see table 13).

Comments from language experts

Questionnaire 1 allowed the language experts to make comments on the descriptors and level assignments. There were no restrictions on what and how they could comment. Only a few experts made comments and three relevant concerns were raised:

1. It is difficult to isolate language from cognition/maturity in the descriptors
2. It is difficult to isolate language from content in the descriptors
3. Some descriptors point to more than one language skill

Such comments are not new and they sum up issues raised in ongoing discussions by researchers and language experts. The CEFR conveys an action-oriented and communicative approach to language learning: people learn language in order to communicate. We will not engage in a discussion here about whether it is possible or not to think of language learning and communication as isolated from cognition and content. The more advanced language a language learner develops, the more difficult it will be to isolate language from cognition and content. The CEFR has descriptors with inherent cognitive aspects. Many, if not all, descriptors from level B2 and above include cognition in some form or another.

Table 13. Overview of CEFR experts answering Questionnaire 1

Country	Number of answers	Country	Number of answers
Canada	3	The Netherlands	3
Czech Republic	2	Norway	28
Denmark	2	Portugal	7
Finland	23	Romania	1
Germany	1	Spain	2
Lithuania	1	Sweden	1
Macao	1	Turkey	1
Malta	1	United Kingdom	1
Total number of respondents			**78**

Examples of B2 decriptors

For instance:

- *Can write clear, detailed texts on a variety of subjects related to his/her field of interest, synthesising and evaluating information and arguments from a number of sources.* (Overall written production, B2, CEFR:61)
- *Can take an active part in informal discussion in familiar contexts, commenting, putting point of view clearly, evaluating alternative proposals and making and responding to hypotheses.* (Informal discussion (with friends), B2, CEFR:77)
- *Can understand specialised articles outside his/her field, provided he/she can use a dictionary occasionally to confirm his/her interpretation of terminology.* (Reading for information and argument, B2, CEFR:70)

The verb "understand" is frequently used in the CEFR descriptors for the receptive skills. It seems difficult to separate language and cognition in relation to understanding.

Issues raised

In connection with the functions *sum up* and *take notes*, a language expert pointed to the fact that some of the descriptors seemed to point to more than one language skill. This is, of course, correct since in order to sum up something (or write notes), learners will also need to listen or read. The CEFR also has a language function called *note-taking* (*during lectures, seminars, etc.*) where the descriptor for B2 is formulated in the following way:

- *Can understand a clearly structured lecture on a familiar subject, and can take notes on points which strike him/her as important, even though he/she tends to concentrate on the words themselves and therefore to miss some information*

Therefore, we end this section by seconding the language experts' concern in these matters. What they have considered inherent in some descriptors probably reflects a correct and relevant observation, and something that concerns the descriptors collected and developed in this project, as well as many of those found in the CEFR.

Assignment of descriptors to CEFR levels

The results of Questionnaire 1 showed a surprisingly high level of agreement between the project team's initial assignment of descriptors to CEFR levels and that done by the language experts. Only six out of 166 descriptors were assigned a different level by the experts (see table 14).

One listening descriptor, four speaking descriptors and one writing descriptor were assigned a different level by the language experts (see Appendix II for final language descriptors and levels).

Table 14. Descriptors about whose CEFR level the project team and language experts disagreed on CEFR level assignment

Descriptor code	Language function	Descriptor	CEFR level – project team	CEFR level – language experts
L224	Understand arguments and reasoning	Can follow complex instructions and directions	C1	B2
S074	Define	Can support a definition with examples	B2	B1
S134	Make oneself understood and clear up misunderstandings	Can make her/himself understood by the teacher and classmates in most situations	B2	B1
S143	Talk to teachers and peers	Can enter unprepared into conversation on subject matter topics	B1	B2
S172	Participate in team work	Can help to solve practical problems that arise, for example, while working on a project, explain her/his opinion and ask for classmates' views. Can suggest alternative ways to proceed with the work	B1	B2
W111	Note taking	Can copy from the blackboard or from other teaching materials	A2	A1

We see that S172 includes two descriptors. In Questionnaire 1 they were presented to the language experts as one. The second part of the descriptor: *Can suggest alternative ways to proceed with the work* appears twice in Questionnaire 1: it is also included in S174 *Can help organise the work, give feedback to team members and suggest how to proceed with the work* which was assigned to B2 by both the project team and the CEFR experts.

When deciding on CEFR levels for the language experts, we used the mode of the language experts' assignments for each descriptor for the CEFR level. The mode is the level to which most language experts have assigned individual descriptors. Table 15 shows how CEFR levels were given numbers in the data.

Table 15. Coding of CEFR levels in the data files

CEFR level	Code
C2	6
C1	5
B2	4
B1	3
A2	2
A1	1

Table 16. Assignment of CEFR levels to the six "problematic" descriptors

Number of expert assignments at different CEFR levels							Missing expert assess-ment	Team	Mode	Mean
Descriptor code	A1/1	A2/2	B1/3	B2/4	C1/5	C2/6				
L224	-	-	3	43	31	-	1	5	4	4.36
S074	1	3	38	34	1		1	4	3	3.40
S134	-	6	35	31	4		2	4	3	3.43
S143	-	-	32	34	7	3	2	3	4	3.75
S172	-	-	31	37	8	1	1	3	4	3.73
W111	52	22	2	1	-	-	1	2	1	1.38

Table 17. Final CEFR assignment of "problematic" descriptors

Descriptor code	CEFR level – project team	CEFR level - language experts	Final CEFR assignment
L224	C1	B2	B2
S074	B2	B1	B2
S134	B2	B1	B1
S143	B1	B2	B2
S172	B1	B2	B1
W111	A2	A1	A1

The mode represents the assignment which most experts chose. Table 16 shows that the level assignment of each of these "problematic" descriptors tends to be centred around two levels: the one most experts chose and the one the team chose.

The mean level assignment of each of these six descriptors is the average of the mode estimate and the project team's level assignment.

The team and the team's consultant discussed the six descriptors shown in Table 13 and decided on a final level assignment for these six descriptors (see table 17).

Table 18. Teachers and teacher trainers answering Questionnaire 2

Number of teachers and teacher trainers	Country
2	Armenia
15	Canada
2	Czech Republic
32	Finland
1	France
1	Iceland
1	Ireland
1	Latvia
30	Lithuania
2	Montenegro
75	Norway
4	Poland
39	Portugal
2	Romania
3	Slovak Republic
4	Slovenia
15	Other

For four of the descriptors (L224, S134, S143 and W111), it was decided to go for the language experts' level assignment. For the last two "problematic" descriptors, S074 and S172, we decided to keep the team's initial level assignment.

Regarding S172, it made sense to assign this descriptor to B1 because we decided to keep only the first part of the descriptor (*can help to solve practical problems that arise, for example, while working on a project, explain her/his opinion and ask for classmates' views*). Descriptor W111 (*can copy from the blackboard or from other teaching materials*) was assigned to A1. As the writing descriptors cover levels A2 to B2, W111 will not be included in the final descriptors.

2.5.2 Questionnaire 2

The results from Questionnaire 2, which focused on the CEFR levels that teachers thought students in the two age groups would need to be successful in history/civics and mathematics, are summarised in tables 21, 22, 24 and 28.

229 teachers answering Questionnaire 2

The link for Questionnaire 2 was sent out to teachers and teacher trainers in Canada, Finland, Lithuania, Norway and Portugal. It was also sent to the teachers and teacher trainers of history/civics and mathematics who participated in the ECML workshop in March 2013. A total of 229 teachers and teacher trainers answered the questionnaire. Table 18 gives an overview of the country of origin of these teachers and teacher trainers.

Most teachers and teacher trainers came from Canada, Finland, Lithuania, Norway and Portugal. There were 15 people who indicated a country other than Canada, Finland, Lithuania, Norway and Portugal.

The educators answering Questionnaire 2 had to state whether they were history/civics or mathematics teachers. In addition, they had to indicate a specific age group (12/13 or 15/16) to function as a background for their answers. Table 19 shows which subjects and age groups the teachers and teacher trainers represented.

A total of 127 history/civics teachers and 102 mathematics teachers answered Questionnaire 2. When setting a CEFR level for a language function and subject/age group, we decided that at least two thirds of the teachers would need to agree. See table 20 for the number of teachers that would have to agree on the same level within each teacher group in order to make decisions on a level.

In general, the mathematics and history teachers agreed that 12/13 year-old students ought to have a language proficiency mirroring B1 in listening, reading, speaking and writing, while students at the age of 15/16 need level B2 in the same skills to succeed as indicated in tables 21, 22, 24 and 28.

When summing up teachers' responses to the language descriptors, we have set a single CEFR level for most functions. In a small number of cases, however, we have marked a level requirement as a transition phase from one level to another, for instance B1–B2. This is done when:

- more than two thirds of the teachers agree on one level, and more than 60% agree on the next
- when there are two or more descriptors describing a function and level, and at least two thirds of the teachers say that the students need the competence that some of these descriptors express, but not all

Table 19. Teachers and teacher trainers by subject and age group

Subject	12/13	15/16	Total
History/civics	53	74	127
Mathematics	46	56	102
Total	**99**	**130**	**229**

Table 20. Number of teachers in agreement necessary to decide a CEFR level

Subject	Age group	Total number of teachers	Number of teachers in agreement necessary to decide a CEFR level
History/civics	12/13	53	35
	15/16	74	49
Mathematics	12/13	46	31
	15/16	56	37

Table 21. CEFR levels required for listening in history/civics and mathematics (both age groups)

	History/civics		Mathematics	
Age groups	**12/13**	**15/16**	**12/13**	**15/16**
Understand factual information and explanations (4)	B1	B2	B1	B2
Understand instructions and directions (4)	B1	B2	B1	B2
Understand opinions (4)	B1	B2	A2 - B1	B1 - B2
Understand arguments and reasoning (5)	B1	B1 - B2	B1	B2
Follow subject-related conversations (4)	B1	B2	B1	B2
Understand audio-recorded materials (including videos) (4)	B1	B2	B1	B2

Listening competence

The overall result, indicated by both teachers of history/civics and mathematics, is that 12/13 year-old students need a listening competence mirroring B1 to do well in the two subjects, while 15/16 year-old student are required to have a B2 competence.

History/civics: The history and civics teachers thought that students at the age of 12/13 need B1 competence to be successful in the subject. With regard to 15/16 year old students, they agreed B2 as a suitable level for five of the six functions. For the function *understand arguments and reasoning*, 46 teachers (62%) said B2.

Mathematics: For all functions but one, the teachers agreed that 12/13 year-old students need a listening competence mirroring B1 and 15/16 year-old students need a B2 level. In connection with the function *understand opinions*, approximately 50% of the teachers said B1 for the younger students and B2 for the older. This may reflect the myth that "there are no opinions in mathematics". Even though few opinions may be expressed in the students' textbooks, they still have to listen to and understand opinions expressed by teachers and classmates in the mathematics classroom.

Reading competence

Teachers of history/civics and mathematics indicated that 12/13 year-old students need a reading competence mirroring B1 to do well in the two subjects. In general, it is felt that 15/16 year-old students should have a B2 reading competence.

Required CEFR levels for reading

Table 22. CEFR levels required for reading in history/civics and mathematics (both age groups)

	History/civics		Mathematics	
Age groups	**12/13**	**15/16**	**12/13**	**15/16**
Understand factual information and explanations (6)	B1	B1	B1	B1
Understand instructions and directions (4)	B1	B2	B1	B2
Understand opinions (4)	B1	B2	-	-
Understand arguments and reasoning (5)	B1	B2	B1	B2
Find and localise information (3)	B1	B2	A2 - B1	B2
Read and analyse graphically represented information in tables, graphs, maps, charts, symbols, as well as photographs, paintings and drawings (4)	B1	B2	B1	C1

History/civics: History and civics teachers show consistency when they assess the level of competence the two student groups need to be successful readers in the subject. They say that B1 is the level the younger students will need, while they agree that B2 is the level required by the older students for all functions but one: the function *Understand factual information and explanations* triggers more varied responses from the teachers. The procedure applied for setting a specific CEFR level as a minimum standard, or marking a transition phase from one level to another as the required level of competence (for instance B1-B2), is explained on page 39 in this document. Between 50 and 60% of the teachers said that students would need a higher level than B1. According to the procedure applied we decided on from the start, this is not enough to mark B1-B2 or B2 as the required level. However, teachers' responses indicate that a higher level of reading than B1 might be necessary for this particular function.

Mathematics: The reading function that showed the most interesting result was *understand opinions*. The teachers answering Questionnaire 2 did not think students need to be able to read and understand opinions in the mathematics classroom. Table 23 shows how the teachers assessed this particular reading function. "Yes" means that they think the students need to be able to understand/do what is expressed in the descriptor, and "No" means they don't think this is important in the mathematics classroom.

Moreover, the teachers thought that 12/13 year-old students need B1 competence in reading to do well in mathematics for all reading functions but one. The teachers

Table 23. Teachers answers to the *understand opinions* reading functions

CEFR level	Descriptor	12/13	15/16
C1	Can understand a wide range of complex and lengthy texts conveying and inferring particular stances and viewpoints	Yes: 7 No: 38 Missing: 1	Yes: 25 No: 30 Missing: 1
B2	Can understand articles and reports concerned with course-related topics in which the writers adopt specific stances or detailed points of view	Yes: 9 No: 36 Missing: 1	Yes: 18 No: 37 Missing: 1
B1	Can identify different views on historical and social issues in straightforward teaching materials	Yes: 7 No: 38 Missing: 1	Yes: 22 No: 32 Missing: 2
A2	Can understand whether an author is for or against something when reading short, simple paragraphs	Yes: 5 No: 40 Missing: 1	Yes: 13 No: 41 Missing: 2

decided on A2 as a suitable level for *find and localise information*. Around 54% of the teachers said they think students at this age would need B1 competence.

Regarding what reading competence students at 15/16 need, the teachers gave more varied feedback, ranging from B1 to C1 (see table 22). It seems a bit strange that they agreed on B1 for *understand factual information and explanations* and on B2 or C1 for the other functions. Around 87.5% of the teachers agreed that students need C1 competence in *read and analyse graphically represented information in tables, graphs, maps, charts, symbols, as well as photographs, paintings and drawings*. Maybe this is a function that intuitively seems closer to mathematics than the other functions, and that this explains their answers to the descriptors of this particular reading function.

Speaking competence

The general picture is that the teachers of both subjects said that B1 is the required level of speaking competence for 12/13 year-old students. Even though teachers pointed to B2 as the required level for most speaking functions in relation to 15/16 year-old students, the number of functions where B2 is required is lower than was the case for listening and reading for this age group.

Speaking descriptors for history/civics

The history teachers indicated that 12/13 year-old students need B1 competence for 13 of the 15 speaking functions included in Questionnaire 2. In addition, they said that 15/16 year-olds need B2 competence in 11 of 15 speaking functions.

For the speaking function *make oneself understood and clear up misunderstandings/ misconceptions*, there are two descriptors mirroring B1 competence. The history teachers thought that students at the age of 12/13 only require what is indicated in one of the descriptors in order to be successful in history/civics (see table 25).

The vast majority (94%) of teachers thought that students at 12/13 need to be able to do what is described in the first descriptor, while less than two thirds of the teachers (60.5%)

Required CEFR levels for speaking

Table 24. CEFR levels required for speaking in history/civics and mathematics (both age groups)

	History / civics		Mathematics	
Age groups	**12/13**	**15/16**	**12/13**	**15/16**
Describe (8)	B1	B2	B1	B2
Explain (4)	B1	B2	B1	B2
State facts, outline, give an account of something (4)	B1	B2	B1	B2
Express opinions, discuss (5)	B1	B2	B1	B2
Express arguments, prove (5)	B1 Relevant?	B1 - B2 Relevant?	B1	B2
Summarise (4)	B1	B2	B1	B2
Define (4)	B1	B2	B1	B2
Evaluate, interpret (4)	B1	B2	B1	B1 - B2
Compare and contrast (3)	B1	B1	B1	B1
Make oneself understood and clear up misunderstandings/misconceptions (4)	A2 - B1	B2	A2 - B1	B2
Talk to teachers and classmates (5)	B1	B1 - B2	B1	B1 - B2
Ask for clarification (4)	A2 - B1	B2	A2 - B1	B2
Respond to what people say (3)	B1	B2	B1	B2
Interact in teamwork (3)	B1	B2	B1	B1- B2
Give a presentation or talk about subject matter issues in class (4)	B1	B1 - B2	B1	B1 - B2

thought they had to be able to do what the second descriptor indicates.

In connection with the function *ask for clarification*, 61% of the mathematics teachers (less than two thirds) thought that 12/13 year-old students need B1 competence.

For the function *compare and contrast*, 59.5% of the teachers thought that they need B2 competence. Since this is less than two thirds of the teachers, the requirement for this function is marked as B1 in table 24.

Express arguments, prove was a function the teachers and teacher trainers of mathematics who participated in the workshop suggested including. Some of the feedback from the history teachers indicated that this is a function they consider quite "mathematical", and they commented that the function *express opinions, discuss* covers what their students have to be able to do. This function is therefore perhaps less relevant for history/civics than for mathematics.

Table 25. History teachers' responses to some B1 speaking descriptors (12/13 year-old students)

Speaking function	Speaking descriptors	Do students need to be able to do this?
Make oneself understood and clear up mis-understandings/ misconceptions	Can make her/himself understood by the teacher and classmates in most situations	Yes
	Can check that the teacher and classmates understand what s/he is saying or that s/ he has understood someone correctly and explain why s/he does not understand	No

Two speaking functions, *talk to classmates* and *give a presentation*, include two descriptors for B2. Table 26 indicates that the mathematics teachers thought that students need to be able to do what is indicated in one of the two.

Table 26. History teachers' responses to some B2 descriptors (15/16 year-old students)

Speaking function	Speaking descriptors	Do students need to be able to do this?
Talk to classmates	Can participate spontaneously in extended discussions on subject matter topics, for example, with a teacher	No
	Can exchange detailed information on topics dealt with in class	Yes
	Can enter unprepared into conversation on subject matter topics	Yes
Give a presentation or talk about subject matter issues in class	Can depart spontaneously from a prepared plan in a presentation and follow up points raised by classmates or the teacher	No
	Can give a clear and systematically developed presentation on a subject topic, for example, present different methods for calculations or historical/current conflicts from different points of view, and highlight and emphasise important points	Yes

Since less than two thirds of the history teachers said "yes" to all B2 descriptors within a function, the required CEFR level is set to B1–B2 for 15/16 year-olds for these three functions. However, the history teachers predict that for some aspects of these language functions, students will need B2 proficiency while for others B1 will suffice.

Speaking descriptors and mathematics

The teachers of mathematics said that 12/13 year-old students needed B1 competence for 13 of the 15 speaking functions included in Questionnaire 2. The two functions that they did not clearly agree on are the same as the ones history teachers could not agree on for the same age group: *make oneself understood and clear up misunderstandings/misconceptions* and *ask for clarification*. According to the mathematics teachers, 15/16 year-olds needed B2 competence in 10 of 15 speaking functions.

The speaking function *ask for clarification* shows the same pattern for mathematics as for history. Less than two thirds of the teachers, 61%, said "yes" to the B1 descriptor. Therefore, the required level is marked as A2–B1.

The speaking functions *make oneself understood and clear up misunderstandings/ misconceptions* include two B1 descriptors that the teachers thought that 12/13 year-old students need to be able to do. Teachers of mathematics responded in the same way to these descriptors as history teachers (see table 25).

According to their responses to Questionnaire 2, mathematics teachers said that students at the age of 15/16 needed a B2 competence in most speaking functions (10 out of 15 functions). For the function *compare and contrast*, 60.7% of the teachers thought students need B2 competence. Therefore, this function is marked as B1-B2 in table 24.

The mathematics teachers responded in the same way as history teachers in connection with the speaking function *talk to teachers and classmates*. They said "yes" to one of two B2 descriptors (see table 26). The same applied for the functions *evaluate and interpret* and *interact in teamwork*. The teachers agreed on one of two B2 descriptors (see table 27). In table 21, the required level for 15/16 year-old students is marked as B1–B2 for these functions.

Table 27. Mathematics teachers' responses to some B2 descriptors (15/16 year-old students)

Speaking function	Speaking descriptors	Do students need to be able to do this?
Evaluate, interpret	Can make hypotheses about causes, consequences and hypothetical situations	No
	Can evaluate different sources or ideas and solutions to a problem	Yes
Interact in teamwork	Can help organise the work, give feedback to team members and suggest how to proceed with the work	Yes
	Can contribute to a project work by reporting and explaining detailed information on topics that he/she finds interesting	No

Required CEFR levels for writing

Table 28. CEFR levels required for writing in history/civics and mathematics (both age groups)

	History / civics		Mathematics	
Age groups	**12/13**	**15/16**	**12/13**	**15/16**
Describe (8)	B1	B2	B1	B2
Explain (4)	B1	B2	B1	B2
State facts, outline, give an account of something (4)	B1	B2	B1	B2
Express opinions, discuss (5)	B1	B2	Relevant?	Relevant?
Express arguments, prove (5)	B1 Relevant?	B1 Relevant?	B1	B2
Summarise (4)	B1	B1	Relevant?	Relevant?
Define (4)	B1	B2	B1	B2
Organise (3)	B1	B1	A2	A2
Evaluate, interpret (4)	A2 Relevant?	B1 - B2 Relevant?	A2	A2 - B1
Compare and contrast (3)	B1	B2	B1	B2
Take notes (4)	A2 - B1 Relevant?	B1 Relevant?	Relevant?	Relevant?
Work with forms, tables, charts, graphs, etc. (4)	B1	B2	B1 - B2	B2

Writing competence

The teachers indicated B1 as the required level for 12/13 year-old students for most writing functions and B2 for 15/16 year-old students. We see the same tendencies for writing as for speaking; the number of functions where B2 is required is lower for writing than was the case for listening and reading.

Writing descriptors for history/civics

The history teachers said that 12/13 year-old students need B1 competence for 10 of the 12 writing functions included in Questionnaire 2. When assessing the level of writing competence that 15/16-yearolds need, the teachers indicated B2 for seven writing functions, B1–B2 for one and B1 for four. On the whole the teachers responded that 15/16 year-old students can succeed in history with a writing proficiency in the transition area between B1 and B2. This

means that they think the level requirements for writing are a bit lower than for the other skills. For the younger students, the CEFR level required for writing is the same as for the other skills.

Evaluate, *interpret* and *take notes* are the functions for which the teachers don't think 12/13 year-old students need a B1 writing competence. We will see later that the same applies for mathematics teachers' assessment of these functions for this age group. It is possible that the teachers think that *evaluate*, *interpret* function seems too academic for 12/13 year-old students and that this function is therefore not as relevant. The data collected for *take notes* may indicate that students can do well in history without demonstrating that they are very good at writing notes. Therefore, we might need to consider whether these two functions are relevant for this age group. The question whether *take notes* is a less relevant writing function also applies to 15/16 year-old students.

As mentioned in connection with the speaking function *express arguments, prove*, we can speculate that this function is less relevant for the teaching and learning of history than of mathematics. The responses to the descriptors for the writing function *express arguments*, prove are quite mixed, especially regarding 15/16 year-old students.

With regard to 15/16 year-old students, the history teachers said that B1 writing competence is required for the *summarise* and *organise* functions.

The history teachers said that 15/16 year-old students need a level of competence approaching B2 for the function *evaluate, interpret*. In Questionnaire 2, this function has two B2 descriptors. The reason why the CEFR level requirement is marked as B1–B2 in table 24 is that less than two thirds of the teachers said that both B2 descriptors are necessary.

- *Can make hypotheses about causes, consequences and hypothetical situations*
- *Can evaluate different sources or ideas and solutions to a problem*

With regard to the first descriptor, 62% of the history teachers said students are required to perform this function in history. Regarding the second descriptor, more than two thirds of the teachers agreed that it is necessary for this age group.

Writing descriptors for mathematics

There is a high correlation between how teachers of history/civics and mathematics responded to many of the writing functions in Questionnaire 2. The most striking result, however, is that some writing functions seem to be less relevant in mathematics than in history (see table 28). Few teachers felt that students should be required to do (in writing) what is indicated in the functions *express opinions, discuss, summarise, organise, evaluate, interpret* and *take notes*. Less than two thirds indicated that any of the descriptors included in *express opinions, discuss, summarise* and *take notes* are required for any of the age groups. Therefore, it seems appropriate to ask whether these functions are relevant for writing in mathematics.

The function *organise* includes the following descriptors:

Table 29. Mathematics teachers' assessment of the descriptors included in the *organise* writing function

	Descriptors	Do 12/13 year-old students need to be able to do this?	Do 15/16 year-old students need to be able to do this?
B2	Can produce continuous writing that is generally intelligible throughout and organise the text in a structured and logical way	No	No
B1	Can organise the text with an introduction, main part and an ending	No	No
A2	Can write a brief text copying a basic pattern	Yes	Yes

For both age groups, the mathematics teachers agreed that what is indicated in the descriptor mirroring A2 is required to do well in the subject. While students have to write coherent texts in many other subjects, this was not considered to be as relevant for mathematics. In fact, according to these data, what they need to do is to learn a pattern for how to submit answers to specific tasks, which is exactly what is described in the A2 descriptor.

The data show that the mathematics teachers said that for the writing function *evaluate, interpret*, 12/13 year-old students need A2 competence, while they set the level at A2-B1 for 15/16 year-old students. This may indicate that this is a function that is not very relevant for writing in mathematics. As we said in connection with the related speaking function, this writing function may be perceived as too academic for 12/13 year-old students. In addition, it may be something none of the age groups have to demonstrate in writing in mathematics contexts.

Apart from these five writing functions, the mathematics teachers agreed that 12/13 year-old students need a writing competence mirroring B1, while the level required by 15/16 year-old students is B2.

2.5.3 Answers to the research questions

Which CEFR level(s) would the students need in order to succeed in history/ civics and mathematics at the ages of 12/13 and 15/16?

Result 1:
12/13 year old students need B1 competence
15/16 year old students need B2 competence

According to the teachers of history/civics and mathematics, 12/13 year-old students need an overall language competence of B1 and 15/16 year-old students a competence of B2 to do well in these subjects. This is the overall result indicated by the data for both subjects. However, the data also illustrates that for some language functions students do not need to be on top of all aspects of a skill. In such cases, the level requirement for the function is specified as a transition from one level to another, for instance, B1-B2. While the level

Table 30. Percentage of relevant functions assigned to the "main" levels

Skill	Relevant language functions	12/13 year-old students: main level B1		15/16 year-old students: main level B2	
		History	Mathematics	History	Mathematics
Listening	6	100	83.3	83.3	83.3
Reading	6	100	80	83.3	80
Speaking	14/15	85.7	86.7	78.6	66.7
Writing	9	100	66.7	77.8	77.8

requirements, with only a few exceptions, are B1 for the youngest student group, there are more transitional level requirements, B1-B2, for 15/16 year-old students, especially for some of the writing functions (see tables 21, 22, 24 and 28).

Students need to be able to read textbooks and teaching materials, and listen to and interact with teachers, classmates and other people in an educational context. They also have to do homework and hand in assignments. In order to do these tasks and learn in different subjects, they have to be independent language users, as described by the CEFR, and have a language which enables them to cope with the multitude of situations they meet in school.

The results confirm the predictions of the CEFR and the conclusions of Vollmer (2010), Beacco (2010), Pieper (2011) and Linneweber-Lammerskitten (2012). The CEFR states that B1 is the threshold for independent language use (for example, students with a B1 language competence are able to use the language to learn more), and that learners at this level should not depend on support from others, as basic users would do. Vollmer, Beacco, Pieper and Linneweber-Lammerskitten studied the language 15/16 year-old students need for science, history, literature and mathematics respectively. They all concluded that at this age students need a language competence mirroring B2.

Are the language levels required the same for history/civics and mathematics? If not, what differences are there?

Result 2:
Language requirements are the same in history and mathematics.

The main results of this study are the same for history/civics and mathematics. Students at the age of 12/13 need a B1 competence to do well in history and mathematics, while 15/16 year-old students need a B2 competence in both subjects. However, it is important to mention that the data indicate four differences between the CEFR level requirements for history/civics and mathematics:

- Three of the writing functions included in the questionnaire seem to be less relevant for mathematics than for history/civics. This concerns the functions *express opinions, discuss; summarise;* and *take notes*.
- The speaking and writing function *express arguments, prove* may be a function more relevant for mathematics than for history and civics.
- The writing function *express opinions, discuss* may be more relevant for history and civics than for mathematics.

- The teachers also indicated by their responses that fewer speaking functions in mathematics require a B2 competence (for 15/16 year-old students) than in history/civics (see table 30).

Are the language levels required the same for all skills?

The overall language proficiency students need to participate in history/civics and mathematics are more or less the same for all skills. As stated earlier, B1 seems to be the level required for 12/13 year-old students and B2 for 15/16 year-olds. Table 30 gives more details related to this overall picture.

Result 3:
12/13 year-old students need a B1 competence in listening, reading, speaking and writing
15/16 year-old students need a B2 competence in listening, reading, speaking and writing

The table shows the percentage of functions, within each skill, where students, according to the teachers, are required to have a B1 competence (12/13 year-olds) and B2 competence (15/16 year-olds). The figures in table 31 are based on the information in tables 21, 22, 24 and 28, with less relevant language functions removed. The general picture is that these "main levels" are required for between 80% and 100% of the language functions within the different skills. The required level for writing, however, differs slightly from this main rule. Apart from writing in history/civics for 12/13 year-old students, there seems to be fewer writing functions for which teachers indicated that the main levels (B1 or B2) are required. In addition, there are also fewer speaking functions in mathematics for 15/16 year-old students where B2 is required (see tables 21, 22, 24 and 28).

Could some language functions be identified as more or less relevant than others?

As mentioned above, the writing function *take notes* seems to be less relevant than other functions included in the questionnaire. Both mixed feedback in the data and teachers' comments indicates this hypothesis.

Result 4:
A few language functions seem to be less relevant.

Two other writing functions seem to be less relevant for mathematics: *express opinions, discuss* and *summarise*.

A third point worth mentioning is that according teachers' comments, the function *express arguments, prove* (both for speaking and writing) seems to be less relevant for history/civics than for mathematics.

3 How can teachers of mathematics and history/ civics (and parents) use these descriptors in classrooms?

As is the case with the general CEFR descriptors, the more specific content-related descriptors, such as those developed in this document, can be used by teachers for a variety of purposes:

- to raise awareness of the language-related aspects of various school subjects;
- to determine language objectives for lessons;
- to use as formative assessment criteria;
- to use as self-assessment criteria for students;
- to help in planning and evaluating the language level that they, as teachers, apply in delivering classroom content in these content subjects.

First of all, these descriptors remind content-area teachers of the fact that all teachers are effectively teachers of language. Without language, we cannot access any particular topic or content area. It is important for content teachers to understand that being able to read, write, listen and speak in the language of instruction is essential for engagement in the learning of the particular content area.

For mathematics teachers, it is not enough to simply be able to use computational skills that focus on numbers and operations. It is also necessary that students understand oral and written instructions, are able to read graphs and tables, communicate their thinking related to problem solving, and so on. In history/ civics classes, teachers not only ask students to listen to lectures and read articles and textbooks, but also to engage in discussions and debates about topics related to historical thinking, civic engagement and cultural awareness.

In addition, students are asked to compose various genres of written texts: informative texts, persuasive texts, biographical texts and narrative texts. All of these tasks take into consideration descriptors related to the five language skills (spoken interaction, spoken production, writing, reading, and listening) as described by in the CEFR and as further specified in this document for content areas.

3.1 Raising awareness of language in content classes

Language awareness of subject teachers

Language descriptors for content areas focus an educator's attention on the linguistic aspects of learning school subjects. By emphasising the language required to participate in content classes, teachers are able to set objectives that relate not only to the acquisition of content-related information, but also to the language functions necessary to negotiate meaning in that content area. According to Sherris (2008) of the Centre for Applied Linguistics, establishing specific content and language objectives is a necessary prerequisite for lesson planning in sheltered content classes.

Language and mathematics

To illustrate the potential role of language in mathematics, let us consider an example from the mathematics classroom. If students are expected to read a graph and communicate the key information included in this graph, teachers need to equip their learners with the linguistic tools necessary to perform this function (for example, "This graph tells me that 60 percent of girls prefer basketball"; "I can see in this graph that 10 percent of boys prefer hockey").

Being cognisant of the language required to express certain ideas reminds content teachers to provide language models for learners to follow. Whether or not they need to rely on these models depends on the language proficiency of the learners, but providing the models can be beneficial both from a mathematical and linguistic perspective. In addition, the provision of linguistic scaffolding through modelling is not only useful for the speakers of other languages, but also for learners who speak the language of instruction but maybe need instructional support as well. It is important to keep in mind that the language models provided in mathematics will be influenced by teaching styles and priorities as well as by the curriculum of the country, which reflects both cultural aspects and content priorities (Beacco *et al*. 2010).

Language and history/civics

To use a civics example, teachers may want students to read primary source documents in order to extract differing points of view of the same historical event. If a teacher keeps in mind that this is not simply a history/civics-related task, but also a linguistic one, history/civics teachers would ensure that examples of ways to express points of view are presented. In addition, they would also provide students with reading strategies to facilitate the extraction of the main ideas from a text.

Moreover, knowing in advance that language functions related to comparing and contrasting would facilitate the achievement of this task would remind teachers to provide examples of ways to communicate comparisons (for example, "From the point of view of the women working in munitions factories, the war provided a meaningful purpose. However, from the perspective of men in the trenches, the reasons for war were less clear."). One can see from this example that certain vocabulary and transitional terms would be useful to learners in order to be able to achieve the curricular outcomes. Being mindful of such linguistic scaffolding gives teachers a way to see themselves not simply as content area teachers, but also as contributors to their language development.

3.2 Language descriptors as guidelines for developing language proficiency in the content classroom

Using the language descriptors provided in this document, teachers might begin to consider the language necessary to be successful in their content classes.

Encourage learning development and content learning

These descriptors can be used not only to develop language objectives for content lessons, but also to monitor individual students' language development. Teachers might choose to develop general checklists for all students or more specific checklists for an individual student who may not be a proficient user of the language of instruction. These descriptors may also prompt teachers to differentiate their instruction and provide small group scaffolding if it is evident that some learners are in need of specific support in order to achieve a language objective that would allow better access to the course content.

3.3 Using descriptors as an instructional tool

In the development of the descriptors described in this document, mathematics and history/civics teachers were asked to identify the language functions that they considered essential to function well in these subject areas. During this development process, it became clear that there is indeed a language component to content classes. In order to illustrate how these descriptors might be used as an instructional tool for teachers, we will consider examples from mathematics and civics classrooms.

The mathematics classroom

The following descriptors for listening were deemed important to teachers of mathematics.

Language function: *understand factual information, and explanations*

Descriptors:

1. *Can grasp the main point of short, clear, simple presentations or explanations by teachers and peers, if people speak slowly and clearly and time is allowed for repetition* (A2)
2. *Can follow straightforward presentations and explanations by teachers and peers on subject related issues* (B1)
3. *Can follow elaborated presentations and explanations by teachers and peers on subject related issues* (B2)

When a mathematics teacher of 12/13 year-olds examines this listening function and these descriptors, he/she might decide that students can function well in his/her mathematics classroom by being able to follow straightforward presentations and explanations by both teachers and peers. In this way, a teacher will be reminded to keep presentations and explanations concise and clear. Also, if many of the students in the class are still not able to function at this level and are still needing very slowly articulated and repetitive explanations, the teacher will modify and scaffold instructions by giving them both in writing and orally and by giving the opportunity for small group and individual support. Also, keeping language proficiency in

mind, teachers may wish to highlight keywords in the instructions and make readily available visual and text-based definitions to support the listening function (*understanding factual information and explanations*).

The history/ civics classroom

To examine another example, this time from a history/civics perspective at the 15/16 year old level, a teacher might want to consider the language necessary to successfully complete a particular writing task (for example, a summary).

Language function: *summarise*

Descriptors:

1. *Can pick out and reproduce keywords and phrases or short sentences from a short text (*A2)
2. *Can collate short pieces of information from several sources and summarise them in writing* (B1)
3. *Can paraphrase short written passages in a simple fashion, using the original text wording and ordering* (B1)
4. *Can summarise a wide range of information and arguments from a number of sources* (B2)

In this case, a teacher may determine that for a student to be successful in their history/civics classes, they should be able to summarise a wide range of information and arguments from a number of sources. However, if there are students in the class who are still only able to "paraphrase short written passages in a simple fashion", they will need to scaffold this much more difficult task by providing examples, templates and models that students can use as a guide.

In addition, they may need to differentiate the task by providing levelled texts that accommodate the reading-related needs of different learners. Although they may have set the higher linguistic-level goal, teachers may need to remind themselves that it is still possible to complete this language function (for example, *summarise*) at a more basic level. In this way students will be able to participate in the history/civics class to the best of their linguistic ability without feeling that they are not able to participate at all. Being aware of the varying levels possible for a specific function will help teachers plan lessons that meet various learner needs.

3.4 Using language descriptors as assessment tools in the content classroom

Although the priority of content teachers is often perceived as the achievement of content-related goals, it is clear that language goals also play a role in the content classroom. Success in content areas requires a certain level of language proficiency. We have discussed briefly how language descriptors can be used as an instructional tool. It is also important to consider how they could complement content outcomes in order to create comprehensive assessment criteria. Content teachers who have language learners in their classrooms may want to create formative and summative assessment tools that consider language goals. For example, in a mathematics classroom, a concept such as probability is not simply a computational concept, but also one with linguistic dimensions. For this reason, a mathematics teacher might want to develop assessment criteria that reflect the mathematical and linguistic aspects.

Learner's self-assessment

In addition to teacher-directed assessments, self-assessment is also a tool that content teachers working with language learners might wish to consider. As evidenced in much of the documentation relating to the CEFR and the language portfolio, developing self-assessment and goal-setting of learners should be a priority for language teachers (for example, Council of Europe, 2004).

Self-assessment helps learners take ownership of their learning and requires teachers to carefully and clearly articulate the objectives of a unit of study. In content classes where there are learners of varying proficiency levels, making both content and language goals accessible to the learners can be one way to help learners understand expectations. In order to create good self-assessment, teachers are required to thoughtfully break down the components of the content-related tasks. By doing so, content teachers will likely discover that some of these components are linguistic in nature. The language descriptors in this document, in combination with curriculum outcomes from content areas such as mathematics and history/civics, can be a starting point for developing assessment criteria that can form the foundation of both teacher-led assessment tools and self-assessment tools.

Two examples of self-assessment forms

To encourage students to set goals and make them aware of what they need to be able to do in the history/civics or mathematics classroom, language descriptors can be used. The teacher and the students can discuss which skills it makes sense to focus on, and the teacher can provide them with relevant language descriptors and CEFR levels. It is probably wise not to focus on too many descriptors at one time.

Students need to know what they are aiming for; therefore the teacher has to "show" them what the relevant descriptors mean and has to provide them with concrete examples. If students are asked to describe something, what will they have to do then? What does an explanation sound or look like? What characterises a discussion and what are students supposed to do?

If the language descriptors are to be used with young students, it may be a good idea to rephrase some of them in a way that makes them accessible to the age and language levels of the students.

Student …… **Age: 15/16** **Subject: History**

My goals for speaking

		I can do this			
My objectives: What I can do What I will work on	I cannot manage this yet	with help from classmates or the teacher	well	very well	I have evidence
	Date	Date	Date	Date	Date
Express opinions, discuss					
B2: I can talk about historical topics and share information, ideas and my attitudes about the topic					
B2: I can give my opinion and explain it					
B1: I can explain why I am for or against something					
Give a presentation or talk in class					
B2: I can give a detailed presentation that includes different points of view and emphasises the most important points related to the topic					
B1: I can give a prepared talk about a topic and answer clear questions from the teacher and my classmates					

Student …… **Age: 12/13** **Subject: Mathematics**

My goals for writing

		I can do this			
My objectives: What I can do What I will work on	I cannot manage this yet	with help from classmates or the teacher	quite well	very well	I have evidence
	Date	Date	Date	Date	Date
Describe					
B1: I can describe how I am thinking when solving a task in a straightforward way					
B1: I can briefly describe a graph, a figure or a table and point out important things					
A2: I can write very short, basic descriptions of something I have worked on in class					
Explain					
B1: I can explain and give reasons for why something related to mathematics is the way it is, and why something is a problem in a straightforward way					
A2: I can explain how to do something or what I have done in simple sentences					

4 Conclusions

4.1 CEFR levels required

The data collected indicate that students at the age of 12/13 are required to have a minimum level of language competence mirroring B1 in all skills in order to succeed in history/civics and mathematics. On the other hand, 15/16 year-old students need a B2 competence in the same skills/subjects. With regard to the older group of students, the teachers indicated in Questionnaire 2 that there may be slightly reduced requirements for some of the speaking and writing functions; in most cases a strong B1 competence or a competence approaching B2 for some of the functions (see tables 21, 22, 24 and 28 marked as B1–B2).

The main focus of this project has been to indicate the minimal level(s) of language competence young migrant and minority students of 12/13 and 15/16 need to succeed in history/civics and mathematics in compulsory education. Even though both the surveys undertaken included listening and reading descriptors for C1, in the end, the team agreed not to include these in the final report. There are two main reasons for this:

- the teachers indicated B1 (12/13 year-old students) and B2 (15/16 year-old students) as minimal language levels;
- in many European countries (and beyond) foreign students applying for university entrance have to document a language competence mirroring B2. Therefore, the team feels it sends the wrong signal to include C1 descriptors when the focus is the required minimal language standards for success.

4.2 Language functions less relevant according to the teachers

The language functions which the data and teachers' responses indicate as less relevant are summed up in table 31.

In the overview of language descriptors in Appendix II, *take notes* does not appear. The functions which are only relevant for one of the subjects are shaded.

Table 31. Less relevant language functions

Subject	Functions
History/civics and mathematics:	*Take notes* (writing)
History/civics	*Express arguments, prove* (speaking and writing)
Mathematics	*Express opinions* (writing), *summarise* (writing)

4.3 Some final reflections

The generic nature of the can-do statements of the CEFR is also found in the descriptors collected and developed in this project. On the one hand, this makes the descriptors more adaptable to different countries and subjects. Thus, the descriptors could be used as a starting point for teachers working with subject matter in different contexts. On the

other, a lot of work is still left for the teachers to handle, since more language specific issues are not covered in this project. For example, we haven't asked questions like "how do we compare or evaluate in English, French, Finnish, Lithuanian, Norwegian and Portuguese?", "Which structures must students be able to express to do this well?" and "What vocabulary would be required to do this well?" This is closely connected to the specific languages and specific genre expectations within different subjects. Genre expectations may even differ from classroom to classroom within the same country.

This means that there is still a lot to discover in relation to the language of schooling. The focus of the project has been on a small area within a vast field.

This project has been conducted by language experts and supported by other language experts, and teachers and teacher trainers of history/civics and mathematics. Other teams could, of course, apply the same methodology when developing language descriptors for other subjects and age groups. Or they could for instance choose to:

- cooperate with subject matter experts from the start in order to make sure that the descriptors represent the most relevant language functions in connection with specific subjects
- observe how students and teachers use the language of schooling in subject matter classes
- study how discourse functions take on different forms in different contexts as well as in different classrooms

4.4 A short guide to developing similar CEFR-linked language descriptors for subjects

1. Select a subject and a relevant age group
2. Select two CEFR levels (or more) that might be relevant for the age group
3. Develop preliminary language descriptors for the subject. Try to a) keep original CEFR levels in mind and b) focus on the skills and language functions that are relevant for learning the subject
4. Collect feedback on the preliminary descriptors from a few (4 – 6) language and subject matter experts
5. Revise the descriptors taking the initial feedback into consideration
6. Collect more feedback on the revised descriptors from a bigger group
7. Revise the descriptors taking into consideration the collected feedback
8. Validate the preliminary level assignments of the descriptors by letting persons who are well acquainted with the CEFR assign these to CEFR levels
9. Collect information from teachers and other subject matter experts on whether students have to know or be able to do what is indicated by individual descriptors
10. Sum up the results of the study

References

Bachman, L. (1990). *Fundamental considerations in language testing*. Oxford: Oxford University Press.

Beacco (2010). Items for a description of linguistic competence in the language of schooling necessary for learning/teaching history (end of compulsory education): an approach with reference points. Language Policy Unit, Directorate of Education, DGII. Strasbourg: Council of Europe, Language Policy Unit. Available at: **www.coe.int/t/dg4/linguistic/Source/.../1_LIS-History2010_en.pdf**

Beacco, J-C, Coste, D., van de Ven, P-H, Vollmer, H. (2010). Language and school subjects. Linguistic dimensions of knowledge building in school curricula. Strasbourg: Council of Europe. Available at: **www.coe.int/t/dg4/linguistic/Source/.../KnowledgeBuilding2010_en.doc**

Council of Europe (2009). A platform of resources and references for plurilingual and intercultural education. Strasbourg: Council of Europe, Language Policy Unit. Available at: **www.coe.int/t/dg4/linguistic/langeduc/le_platformintro_EN.asp**

Council of Europe (2001). *Common European Framework of Reference for languages: Learning, teaching, assessment*. Cambridge University Press. Available at: **www.coe.int/t/dg4/linguistic/source/framework_en.pdf**

Cummins, J. (1981a) Age on arrival and immigrant second language learning in Canada. A reassessment. *Applied Linguistics*, 2, I32-I49.

Cummins, J. (1980). The Cross-Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue. *TESOL Quarterly*, 14/2, 175-187.

Cummins, J. (1979) Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, No. 19, 121-129.

ECML (2014 -1). *ECML 2012–2015 programme*. ECML: Graz. Available at: **www.ecml.at/Programme/Programme20122015/tabid/685/language/en-GB/Default.aspx**

ECML (2014). European Centre for Modern Languages 2012–2015 Programme. Flyer. ECML. Available at: **www.ecml.at/Programme/Programme20122015/tabid/685/language/en-GB/Default.aspx**

European Commission (2008). *Education and Migration. Strategies for integrating migrant children in European schools and Societies*. European Commission, Brussels. Available at: www.nesse.fr/nesse/activities/reports/activities/reports/education-and-migration-pdf

Hasselgreen (2003). *The Bergen Can-do Project*, ECML. Graz. Available at: **archive.ecml.at/cando**

Hasselgreen (2010). *The Ayllit project*, ECML, Graz. Available at: **ayllit.ecml.at**

Linneweber-Lammerskitten, H. (2012). Items for a description of linguistic competence in the language of schooling necessary for learning/teaching mathematics (at the end of compulsory education). An approach with reference points. Language Policy Unit,

Directorate of Education, DGII. Council of Europe, Strasbourg. Available at: **www.coe.int/t/dg4/linguistic/Source/.../4_LIS-Mathematics2012_EN.pdf**

Little, D. (2010). The linguistic and educational integration of children and adolescents from migrant backgrounds. Concept paper. Council of Europe, Strasbourg: Council of Europe, Language Policy Unit. Available at: **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/MigrantChildrenConceptPaper_EN.pdf**

Luciak, M. (2008). The Educational Situation of Migrants and Ethnic Minorities in 15 EU Member States in Comparative Perspective. Available at: **www.ied.edu.hk/fpece_project/EM/The%20Educational%20Situation%20of%20Migrants%20and%20Ethnic%20Minorities%20in%2015%20EU%20Member%20States%20in%20Comparative%20Perspective.htm**

OECD (2010): OECD Reviews of Migrant Education - Closing the Gap for Immigrant Students: Policies, Practice and Performance. Available at: **www.oecd.org/edu/school/oecdreviewsofmigranteducation-closingthegapforimmigrantstudentspoliciespracticeandperformance.htm**

Oller, J. (1984). Communication theory and testing: what and how. Paper presented at the 2nd TOEFL International Conference, October 19-20.

Oller, J. (1976). Evidence for a general language proficiency factor: an expectancy grammar. In Die Neueren Sprachen 2: 165-171.

Pieper, I. (2011). Items for a description of linguistic competence in the language of schooling necessary for learning/teaching literature (end of compulsory education). An approach with reference points. Strasbourg: Council of Europe, Language Policy Unit. Available at: **www.coe.int/t/dg4/linguistic/langeduc/boxd2-othersub_EN.asp#s4**

Thürmann, E., Vollmer, H., Pieper, I. (2010) Language(s) of Schooling: Focusing on vulnerable learners, Document prepared for the Policy Forum 'The right of learners to quality and equity in education – The role of linguistic and intercultural competences', *Geneva, Switzerland, 2-4 November 2010*. Available at: **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/2-VulnerLLearnersThurm_EN.pdf**

Vollmer, H.J. (2010). Items for a description of linguistic competence in the language of schooling necessary for learning/teaching sciences (at the end of compulsory education). An approach with reference points. Strasbourg: Council of Europe, Language Policy Unit. Available at: **www.coe.int/t/dg4/linguistic/langeduc/boxd2-othersub_EN.asp#s3**

Vox – Nasjonalt fagorgan for kompetansepolitikk (2012). *Læreplan i norsk og samfunnskunnskap for voksne innvandrere* (Vox – Norwegian Agency for Lifelong Learning (2012). Curriculum in Norwegian and civics for adult immigrants), Oslo: Vox 2012. Available at: **www.vox.no/Norsk-og-samfunnskunnskap/Lareplan**

Appendix I: Common reference levels, global scale

Advanced user	**C2**	Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.
	C1	Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express him/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.
Inde-pendent user	**B2**	Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
	B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics, which are familiar, or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.
Basic user	**A2**	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
	A1	Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

Appendix II: Language descriptors for history/civics and mathematics

In the following pages, the final language descriptors for history/civics and mathematics are presented. These are the same descriptors with the same wording as in the two questionnaires. As mentioned earlier, the function *take notes* (writing) is omitted from the final descriptors because of mixed feedback in the data and teachers comments regarding the relevance of this function.

The tables showing the language descriptors are sequenced as follows: listening, reading, speaking and writing.

The language descriptors for the following six languages are presented on the website **www.ecml.at/languagedescriptors**:

A. Language descriptors in English
B. Language descriptors in French
C. Language descriptors in Finnish
D. Language descriptors in Lithuanian
E. Language descriptors in Norwegian
F. Language descriptors in Portuguese

Some language functions are shaded in order to show whether they are most relevant for history/civics or mathematics. Blue shading indicates that the function is most relevant for history/civics and a yellow shading shows that the function is most relevant for mathematics.

Language descriptors in English

English listening: descriptors for listening in history/civics and mathematics

	A2	B1	B2
Understand factual information and explanations	Can grasp the main point of short, clear, simple presentations or explanations by teachers and peers, if people speak slowly and clearly and time is allowed for repetition	Can follow straightforward presentations and explanations by teachers and peers on subject related issues	Can follow elaborate presentations and explanations by teachers and peers on subject-related issues
Understand instructions and directions	Can follow simple and clear instructions from teachers and peers on what to do when they are given clearly and slowly	Can follow straightforward instructions and directions from teachers and peers on how to solve a task	Can follow detailed instructions and directions from teachers or peers on how to solve a task. Can follow (lengthy) complex instructions and directions
Understand opinions	Can understand whether a person is for or against something provided what is said is slowly and clearly articulated	Can understand the main points of views expressed in class conversations and clear discussions on historical and social issues	Can understand detailed points of views expressed in class conversations and discussions on historical and social issues
Understand arguments and reasoning	Can understand the main point in simple explanations provided speech is slowly and clearly articulated	Can understand straightforward arguments and reasoning (for example, on historical and social issues or on how to prove something in mathematics)	Can understand detailed lines of argument and reasoning, even when it involves several steps, different perspectives, and both concrete and abstract topics (for example, on historical and social issues or on how to prove something in mathematics)
Follow subject-related conversations and discussions	Can follow simple subject-related routine conversations if people speak slowly and clearly and time is allowed for repetition	Can follow clear, straightforward subject-related conversations	Can follow elaborate conversations on subject-related issues
Understand audio-recorded materials (including videos)	Can understand and isolate the main point from short recorded passages, delivered slowly and clearly, dealing with well-known subject-related issues	Can understand the main points of recordings, in clear, slow standard speech, dealing with subject-related issues	Can understand most recorded audio- and video-recorded materials, in standard speech, dealing with subject-related issues, and identify speaker viewpoints and attitudes

English reading: descriptors for reading in history/civics and mathematics

	A2	B1	B2
Understand factual information and explanations (21)	Can understand the most important information in short, simple factual teaching materials on familiar topics	Can identify main conclusions in clearly written argumentative teaching materials. Can deduce the meaning of words and sentences from a context when the topic is familiar. Can understand the main points in simple factual texts, if they follow a clear structure and the topic is familiar (for example, the Stone Age, French Revolution, mathematical texts)	Can understand in detail factual texts on a wide range of both abstract and concrete topics in teaching materials
Understand written instructions and tasks in teaching materials (22)	Can understand simple routine instructions/tasks in teaching materials	Can understand clearly written straightforward instructions/tasks in teaching materials	Can understand lengthy, complex instructions/ tasks in teaching materials, including when it involves several steps
Understand opinions (23)	Can understand whether an author is for or against something when reading short, simple paragraphs	Can identify different views on historical and social issues in straightforward teaching materials	Can understand articles and reports concerned with course-related topics in which the writers adopt specific stances or detailed points of views
Understand arguments and reasoning (24)	Can understand the main point in simple explanations	Can understand the general line of argument in straightforward teaching materials (for example, in a proof)	Can follow detailed lines of argument and reasoning concerning abstract and concrete topics in teaching materials even when it involves several steps or different perspectives (for example, on historical and social issues or on how to prove something in mathematics)
Find and localise information (27)	Can find and localise specific, predictable information in simple teaching materials and on the internet	Can scan longer, clearly structured texts in order to locate specific, relevant information	Can scan quickly through relatively long, complex texts and decide if closer study is worthwhile

	A2	B1	B2
Read and analyse information represented in tables, graphs, maps, charts, symbols, as well as in photographs, paintings and drawings	Can identify basic information communicated in simple tables, graphs, maps and charts	Can understand specific information and identify facts from tables, graphs, maps and charts	Can analyse tables, graphs, maps and charts and make inferences about the data

English speaking: descriptors for speaking in history/civics and mathematics

Mostly relevant for history/civics Mostly relevant for mathematics

	A2	B1	B2
Describe	Can describe events and activities in a simple list of points	Can pass on information and briefly describe events, observations and processes. Can describe how s/he is thinking when solving a task in a straightforward way. Can briefly describe a visual representation (a graph, a figure, a table, a drawing, etc.), pointing out important features	Can pass on information and briefly describe events, observations and processes. Can describe in detail how s/he is thinking when solving a task. Can give clear, detailed descriptions of events, observations and processes. Can describe a visual representation (a graph, a figure, a table, a drawing etc.) in detail, pointing out both important features and significant details
Explain	Can explain how to do something or what has been done in simple sentences	Can explain and give reasons for why things, related to history/civics or mathematics, are the way they are, and why something is a problem in a straightforward way	Can give the advantages and disadvantages of various solutions and options. Can explain different phenomena, (for instance, historical or mathematical processes), results or views on topical issues clearly
State facts, outline, give an account of something	Can make brief statements about subject-related issues	Can give a short account of plans and actions. Can give a brief outline of an issue or a problem	Can give an account of or outline an issue or a problem clearly
Express opinions, discuss	Can say, in a simple way, what s/he thinks about something, or whether s/he is for or against something	Can explain why s/he is for or against something in a straightforward way	Can argue for her/his points of view and discuss the pros and cons of opposing positions or ways of solving a task in detail. Can discuss and explain her/his attitude towards a topical issue and make hypotheses.Can develop a clear coherent argument, linking ideas logically and expanding and supporting his/her points with appropriate examples

	A2	B1	B2
Express arguments, prove	Can briefly and in a simple and basic way, give some reasons for what s/he has done or will do in a subject-related context	Can talk in a brief way about how to prove something. Can give straightforward arguments for something (for instance, solutions to a mathematical problem, or reasons for different attitudes to current issues)	Can explain, step by step, how to prove something, in a structured and logical way that supports the final conclusion. Can provide evidence for conclusions drawn
Summarise	Can pick out and reproduce keywords, phrases or short sentences from what teachers or peers have said	Can provide a brief explanation of a conclusion drawn. Can briefly summarise a group work	Can summarise quite precisely something that has been said or written
Define	Can reproduce a definition for a mathematical or historical concept in a brief and simple way	Can define a mathematical or historical concept in a straightforward way	Can define mathematical or historical concepts in a detailed way. Can support a definition with examples
Evaluate, interpret	Can state whether something is good or bad, positive or negative in simple sentences	Can give some reasons for why a source is reliable, or why something is an advantage or a problem	Can evaluate different sources or ideas and solutions to a problem. Can make hypotheses about causes, consequences and hypothetical situations
Compare and contrast	Can use simple descriptive language to make brief statements about and compare objects and alternatives	Can compare and contrast different alternatives and solutions in a straightforward way	Can compare and contrast alternatives, solutions, views, sources, etc. in a thorough way
Make oneself understood and clear up misunderstandings / misconceptions	Can make her/himself understood using simple language, if s/he gets some help. Can say s/he does not understand, or that something is not right	Can check that the teacher and classmates understand what s/he is saying or that s/he has understood someone correctly and explain why s/he does not understand. Can make her/himself understood by the teacher and classmates in most situations	Can check that s/he understands, repeats and reformulates

	A2	B1	B2
Talk to teachers and classmates	Can have short, simple routine conversations with classmates if people speak slowly and clearly and time is allowed for repetition	Can participate in most conversations on topics dealt with in class, if the others speak clearly and in standard dialects	Can enter unprepared into conversation on subject matter topics. Can exchange detailed information on topics dealt with in class. Can participate spontaneously in extended discussions on subject matter topics, for example, with a teacher
Ask for clarification	Can say s/he doesn't follow. Can ask for clarification when s/he doesn't understand	Can ask someone to clarify or elaborate what they have just said	Can ask follow-up questions to check s/he has understood, and get clarification of ambiguous points
Respond to what other people say	Can respond to what the teacher and classmates say in a simple way	Can respond to what the teacher and classmates say in a straightforward way	Can react to attitudes, opinions and views in class discussions in an appropriate way
Interact in team work	Can ask and answer simple questions on subject topics that s/he knows well	Can help to solve practical problems that arise, for example, while working on a project, explain her/his opinion and ask for classmates' views	Can contribute to a project work by reporting and explaining detailed information on topics that he/she finds interesting. Can help organise the work, give feedback to team members and suggest how to proceed with the work
Give a presentation or talk about subject matter issues in class	Can give a short, rehearsed and simple presentation on a topic or talk about a topic the class has worked with	Can give a prepared, straightforward presentation on a subject topic or talk about a topic (for example, different types of calculations, a historical period or a current social issue) and answer clear questions if there is time for repetition	Can give a clear and systematically developed presentation on a subject topic (for example, present different methods for calculations or historical/current conflicts from different points of view) and highlight and emphasize important points. Can depart spontaneously from a prepared plan in a presentation and follow up points raised by classmates or the teacher

English writing: descriptors for writing in history/civics and mathematics

Mostly relevant for history/civics Mostly relevant for mathematics

	A2	B1	B2
Describe	Can write very short, basic descriptions of events and activities	Can pass on information and briefly describe events, observations and processes. Can briefly describe a visual representation (a graph, a figure, a table, a drawing, etc.), pointing out important features. Can describe how s/he is thinking when solving a task in a straightforward way	Can pass on detailed information. Can give clear, detailed descriptions of events, observations and processes. Can describe a visual representation (a graph, a figure, a table, a drawing, etc.) in detail, pointing out both important features and significant details. Can describe in detail how s/he is thinking when solving a task
Explain	Can explain how to do something or what has been done in a simple way	Can explain and give reasons for why things, related to history/ civics or mathematics, are the way they are, and why something is a problem in a straightforward way	Can explain different phenomena (for instance, historical or mathematical processes), results or views on topical issues clearly. Can give the advantages and disadvantages of various solutions and options
State facts, outline, give an account of something	Can make brief statements about subject-related issues	Can give a short account of plans and actions. Can give a brief outline of an issue or a problem	Can give an account of or outline an issue or a problem clearly
Express opinions, discuss	Can express in a simple way, what s/he thinks about something, or whether s/he is for or against something	Can explain in writing why s/he is for or against something in a straightforward way	Can discuss subject-related concepts and issues in detail (for instance, democracy, the relationship between love and sexuality (history/civics) or solutions to mathematical problems or different ways of presenting data

	A2	B1	B2
Express arguments, prove	Can briefly and in a simple and basic way, give some reasons for what s/he has done or will do in a subject-related context	Can give straightforward arguments for something (for instance, solutions to a mathematical problem) or reasons for different attitudes to current issues	Can build a proof by stating arguments step by step in a structured and logical way that supports the final conclusion. Can express (in writing) evidence for conclusions drawn
Summarise	Can pick out and reproduce keywords and phrases or short sentences from a short text	Can paraphrase short written passages in a simple fashion, using the original text wording and ordering. Can collate short pieces of information from several sources and summarise them in writing	Can summarise a wide range of information and arguments from a number of sources
Define	Can reproduce a definition for a mathematical or historical concept in a brief and simple way	Can define mathematical or historical concepts in writing in a straightforward way	Can define mathematical or historical concepts in writing in a detailed way. Can support a definition with detailed illustrations and examples
Organise	Can write a brief text copying a basic pattern	Can organise the text with an introduction, main part and an ending	Can produce continuous writing which is generally intelligible throughout and organise the text in a structured and logical way
Evaluate, interpret	Can state whether something is good or bad, positive or negative in simple sentences	Can give some reasons for why a source is reliable, or why something is an advantage or a problem	Can evaluate different sources or ideas and solutions to a problem. Can make hypotheses about causes, consequences and hypothetical situations
Compare and contrast	Can use simple descriptive language to make brief statements about and compare objects and alternatives	Can compare and contrast different alternatives and solutions in a straightforward way	Can compare and contrast alternatives, solutions, views, sources, etc. in a thorough way
Work with forms, tables, charts, graphs	Can put basic information into forms, lists or charts responding to subject tasks	Can fill in forms and charts with relatively detailed information responding to subject tasks. Can create tables, charts, etc. and organise information in a straightforward way	Can create tables, charts, etc. and organise information (for instance, comparing and contrasting information) with recipients in mind

Appendix III: Recommended reading and quotes

Coste, D. (ed.), Cavalli, M., Crispan, A., van de Vem, P-H.(2007): *A European reference document for language of education?* Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/prag07-LPE_DocEurRef_Intro_DCed_EN.doc**

Cambridge ESOL (2011): Using the CEFR: Principles of good practice, Cambridge, Cambridge ESOL. Available at **www.cambridgeenglish.org/images/126011-using-cefr-principles-of-good-practice.pdf**

Beacco, J-C., Byram, M., Cavalli, M., Coste, D., Cuenat, M.E., Goullier, F., Panthier, J. (2010): *Guide for the development and implementation of curricula for plurilingual and intercultural education*, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Schoollang_EN.asp**

Beacco, J-C., Coste, D., van de Hen, P-H., Vollmer, H. (2010): *Language and school subjects. Linguistic dimensions of knowledge building in school curricula*, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Schoollang_EN.asp**

Cummins, J. (2011): *Putting the Evidence Back into Evidence-based Policies for Underachieving Students*, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Schoollang_EN.asp**

Fleming, M. (2009): *Languages of Schooling and the right to plurilingual and intercultural education*, Report on the Intergovernmental Conference, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Schoollang_en.asp#P33_3294**

Shiels, J. (2011): L*anguage competences in "non-linguistic" subjects and success at school*. Available at: **www.coe.int/dg4/linguistic**

Bertucci, M-M (2010): *Migrant pupils and formal mastery of the language of schooling: variations and representations*, List of Studies and resources accompanying the concept paper on The Linguistic and educational integration of children and adolescents from migrant backgrounds, nº 3, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/3_ElevesMigrantsBertucci_en.pdf**

Extramiana, C., Van Avermaet, P. (2011): *Language requirements for adult migrants in Council of Europe member states: report on a survey*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Mig-ReportSurvey2011_EN.doc**

Bainski, C., Kaseric, T., McPake, J., Thompson, A. (2010): *Cooperation, management and networking: effective ways to promote the linguistic and educational integration of children and adolescents from migrant backgrounds*. List of Studies and

resources accompanying the concept paper on The Linguistic and educational integration of children and adolescents from migrant backgrounds, nº 6, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/6_Toolkit-Bainsky_en.pdf**

Beacco, J-C. (2010): *Adult migrant integration policies: principles and implementation,* Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Migr2010_BrochureB_en.doc**

Ongstad, S. (2007): *Disciplinarity versus discursivity? Mathematics and/as semiotic communication*, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Prague07_DisciplinaryOngstad_EN.doc**

Ongstad, S. (ed.), Hudson, B. (in cooperation with Nystrom, P.), Pepin, B., Singer, M. (2007): L*anguage in Mathematics? A comparative study of four national curricula*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Prague07_Maths_EN.doc**

Little, D. (2010): *The linguistic and educational integration of children and adolescents from migrant backgrounds*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/MigrantChildrenConceptPaper_EN.pdf**

Thurmann, E., Vollmer, H. (2010): *A framework of language competences across the curriculum: language(s) in and for inclusive education in Northrhine-Westfalia (Germany)*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Checklist_Nord-Rhein-Westphalia_en.pdf**

Thurmann, E., Vollmer, H., Pieper, I. (2010): *Language(s) of Schooling: Focusing on vulnerable learners*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2010_ForumGeneva/2-VulnerLLearnersThurm_EN.pdf**

Vollmer, H. (2013): *Compétences en langues dans les différentes matières scolaires: l'exemple de la Rhénanie du Nord-Westphalie (Allemagne)*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Cadre_comp%C3%A9tences_intercurriculaire_Nord-Rhein-Westfalia_fr.doc**

Vollmer, H. (2006): *Towards a Common European Instrument for Language(s) of Education*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Vollmer_Beacco_final_EN.doc**

Vollmer, H. (2012): *National Standards for the Natural Sciences in Germany: Focus on "Communication" in Subject literacies and access to quality education*, Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/DG4/linguistic/Source/Prag07_LPE_LangCom_Vollmer_EN.doc**

Vollmer, H. (ed.), Holasová, T. Kolstø, S.D., Lewis, J. (2007): *Language and communication in the learning and teaching of science in secondary schools*. Language Across the Curriculum within Languages of Education. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Prague07_LangCom_VollmerEd_EN.doc**

Thurmann, E. (2012): *Subject literacies and access to quality education*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2012_Sem/semSept/SemScol12_1Thurmann-Aims.docx**

Linneweber-Lammerskitten, H. (2012): *Linguistic competencies entailed by the concept of Mathematical Literacy*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2012_Sem/semSept/SemScol12_10Linneweber.pptx**

Linneweber-Lammerskitten, H. (2013): *Procedure for revealing and defining language aspects in mathematics education*. Strasbourg, Council of Europe, Language Policy Unit. Available at **www.coe.int/t/dg4/linguistic/Source/Source2013_Conf/WG_Linneweber.pdf**

Quotes

> *What [the CEFR] can do is to stand as a central point of reference, itself always open to amendment and further development, in an interactive international system of co-operating institutions ... whose cumulative experience and expertise produces a solid structure of knowledge, understanding and practice shared by all.*

John Trim (Green, A. (2011): L*anguage functions revisited: Theoretical and empirical bases for language construct across the ability range*, English Profile Studies, volume 2, Cambridge: UCLES/Cambridge University Press.).

> *Language plays a crucial role in ensuring cultural diversity, democratic citizenship and social inclusion. It thus has a key role to play in promoting social cohesion. Proficiency in language is essential to ensure access to the school curriculum.*

Introduction to the conference on *Languages of Schooling within a European framework for languages of education: learning, teaching, assessment, organised by the Council of Europe, Language Policy Unit, in Prague, November 2007*.

> *Language education does not stop with language as subject. Language proficiency is equally needed in all other subjects, which are sometimes falsely considered as "non-linguistic" subjects. Communication requirements such as reading and understanding expository texts, listening to explanations, answering questions orally and presenting study results are present in other subjects in close relationship with substantial content. It is often wrongly assumed that the respective competences and skills are developing by themselves, without needing particular attention in the subject classroom, or without specific (re-) training based on what has already been developed within language as subject. This language dimension in teaching and learning other subjects is the second pillar of the language of schooling.*

> *A traditional conception of the relationship between language as subject and other subjects like history, geography and science was to view the role of language as subject as 'servicing' the needs of other subjects. In other words pupils learned language use in one context and applied it in another. There is still some truth in this formulation because language as subject still has special role to play in language development. However the relationship, described in this way, does not sufficiently recognise the contextual nature of language learning nor the links between language development and cognitive growth. Language as subject*

and language in other subjects are both addressed in separate sections of the platform but the need to consider the relationship between these dimensions in order to foster an integrated approach to language development is addressed in both.

In: *Language(s) of Schooling* (2009), Strasbourg, Council of Europe, Language Policy Unit. Available at www.coe.int/t/dg4/.../LE.../LangSchooling_en.doc

Aspects of Language Across the Curriculum: Commonalities, specificities and possible implications for LS and language education policies

Language across the curriculum (LAC) has been a key focus: access to the full curriculum requires proficiency in language which cannot be developed only in the context of language as a subject. Conversely, learning any school subject is in large part a process of developing language. The examples from science, mathematics and history will highlight some of the key considerations. One of the central issues here is how the LAC dimension relates to language as subject and how this should be addressed in an education framework for languages given the target audience(s).

In: L*anguages of Schooling within a European Framework for Languages of Education: Learning, Teaching, Assessment*. Prague, 8-10 November 2007. Introduction to the conference.

This publication is targeted at teachers, teachers' educators, policy makers, language researchers.

The school performance of young learners may be affected if they come from minority or migrant language backgrounds. In order to succeed in an educational context, students need to master language which is different to the language they use in everyday non-academic situations. It is therefore important that policy makers, education authorities and teacher educators develop strategies which cater for the language needs of this group, to ensure that these students have equal opportunities to develop and advance.

In the present study, the competence levels are identified that 12/13 and 15/16 year-old students require in the language of schooling in order to learn and construct knowledge in history and mathematics. In addition, language descriptors with subject-specific content which have been developed during the course of a project of the European Centre for Modern Languages of the Council of Europe are presented. These descriptors can be used by teachers as a starting point for planning and goal-setting in history and mathematics, and for assessing students' progress, in addition to offering students a tool for self-assessment.

www.ecml.at

The European Centre for Modern Languages is a Council of Europe institution promoting excellence in language education in its member states.

ENG

www.coe.int

The Council of Europe is the continent's leading human rights organisation. It includes 47 member states, 28 of which are members of the European Union.

All Council of Europe member states have signed up to the European Convention on Human Rights, a treaty designed to protect human rights, democracy and the rule of law. The European Court of Human Rights oversees the implementation of the Convention in the member states.

9 789287 181541

ISBN 978-92-871-8154-1
http://book.coe.int
€6/US$12

EUROPEAN CENTRE FOR MODERN LANGUAGES
CENTRE EUROPEEN POUR LES LANGUES VIVANTES

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE