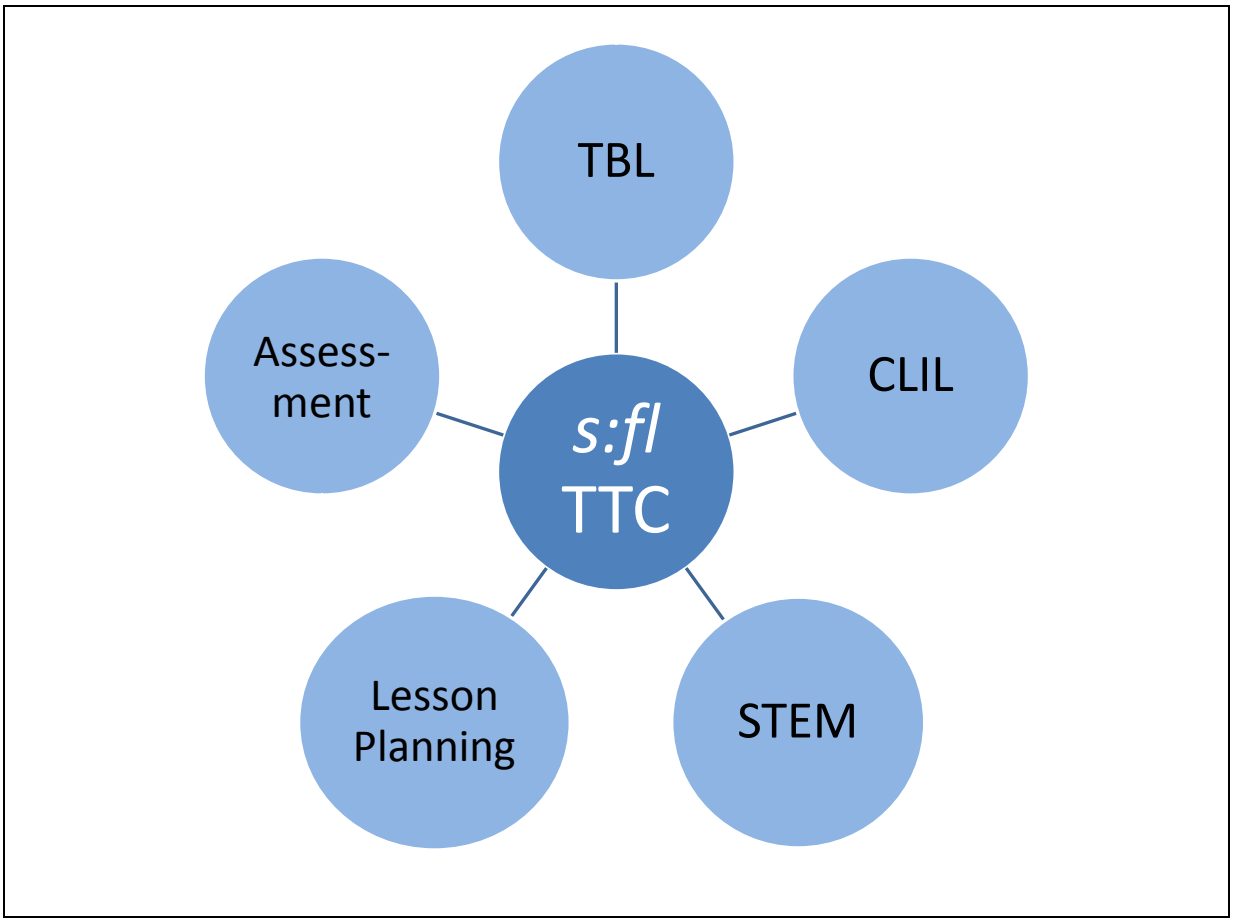
s:fl
Schools: Future Labs
TEACHER TRAINING COURSE

HANDBOOK



"Knowing is not enough; we must apply.
Willing is not enough; we must do."
Johann Wolfgang von Goethe

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Authors

The Teacher Training Course (TTC) based on the draft of the Teacher Training Institute Mazowieckie Samorzadowe Centrum Doskonalenia Nauczycieli (MSCDN) was designed by Gerhard Bach (CLIL consultant to *s:fl*), in cooperation with the *s:fl* project team at Goethe Institut Athens (Sulochana Giesler, Iliana Kikidou, Anna Slavi, Penelope Sotiropulou), as well as all project participants sharing their knowledge and expertise. In particular, we wish to thank the teachers and trainers involved in the project for sharing not only their professionally tested ideas and materials, but also for their input and feedback. For further information and updates please go to http://www.sflabs.eu/ , where you can also find more information about the TTC in the ***s:fl TTC Repository.***

Schools: Future Labs is an Erasmus+ project (KA2) and has been funded with the support of the European Commission. It aims to unite creativity in Science (Physics, Biology, and Chemistry) and language in years of primary education. It implements a new approach wherein language learning (German / Spanish) and STEM subjects are combined, by applying the STEM/CLIL methodology in the 5th and 6th grade.
Duration**:** Three years (01.09.2014- 31.08.2017)

There are thirteen partners involved in Bulgaria, Greece, Poland and Romania. The partners are:

- Goethe Institut Athen, Greece
- Instituto Cervantes, Athens, Greece
- National and Kapodistrian University of Athens, Greece
- University of Shumen (Department for Information, Qualification and Lifelong Learning), Varna BG
- Mazowieckie Samorzadowe Centrum Doskonalenia Nauczycieli (MSCDN), Poland
- Ministerio de Educacion, Cultura y Deporte, Spain
- Ministerul Educației și Cercetării Științifice, Romania
- Uwekind International School, Bulgaria
- 49th Primary School "Benito Juarez“, Bulgaria
- Colegiul National Ion Maiorescu, Romania
- Liceul Teoretic Bilingv Miguel de Cervantes, Romania
- Społeczna Szkoła Podstawowa nr 4 STO, Poland
- Ellinogermaniki Agogi S.A., Greece

The aims of the project are:

- Get the students interested in STEM subjects and in the habit of using a foreign language.
- Make a successful transition to employment in areas vital that ensure competitiveness of the European economies
- Possess transversal skills adaptive to any employment situation
- Encourage student engagement
- Ensure a social and collaborative way of learning and change classroom practice
- Train the trainers and the teachers

Contents

TTC : Purpose, Objectives, Outputs, Activators

Schools: Future Labs (*s:fl*)

This Teacher-Training Course (TTC) is part of the *Schools: Future Labs* (*s:fl*) project conducted between 2014 and 2017 funded by Erasmus+. The main purpose of this project was to get learners interested in STEM subjects (Science, Technology, Engineering, Mathematics) and to get them into the habit of using a foreign language to master STEM content. Using language to learn subject matter lies at the heart of CLIL (Content and Language Integrated Learning). Thus, the networking of STEM and CLIL can be turned into an explicit methodology, further enriched by task-based learning approaches (TBL) which teachers can employ so as to put students' interest, curiosity and sense of initiative at the centre of the learning process.

Objectives

To reach its purpose and aims, *s:fl* has developed a teaching methodology based on Action Research, involving task-based exploration of STEM subjects in combination with CLIL. This methodology is learner-centered and includes planning and implementation skills geared to the developmental level of the learners ("entrepreneurial pedagogy"). It does not intend to modify or fundamentally change the national STEM- and language-curricula in the target countries, but rather to encourage their implementation in schools, by proposing and evaluating an innovative, bottom-up methodology that is engaging and motivating both for teachers and their students.

Outputs

One of the central outputs of *s:fl* is the Teacher Training Course (TTC) presented here. It brings together the fundamentals of the project approach, namely the methodologies of task-based (language) learning (TBL) and Content and Language Integrated Learning (CLIL), and interconnects these with subject matter generated from STEM-subjects based on STEM methodology developed specifically for *s:fl*. In this way, *s:fl* emphasizes the critical role that STEM subjects play in today's educational world. Since the project has been tested in primary schools (grades 5 and 6), where learning outcomes were measured and evaluated, the results of these evaluations now can be transported directly into a hands-on training course for student-teachers and in-service teachers. In this respect, the TTC addresses the needs expressed by the European Council that "Teacher education programs should be of high quality, evidence-based and relevant to [learners'] needs." (Council Conclusions, 2009/C 302/04).

In compliance with these demands, the TTC integrates the two other central outputs of the project, namely

(a) the series of "plug-and-play" STEM-CLIL teaching modules, applied to a variety of STEM subjects and applicable to any foreign language; and

(b) a virtual student learning portfolio which documents each student's learning outcomes.

Both of these as well as other materials can be accessed as a supplement to this training course handbook in the annexes available online in the ***s:fl* TTC Repository**.

The *s:fl* project was piloted in schools in each of these four countries: Bulgaria, Greece, Poland and Romania. The lessons were taught in either German or Spanish. Annex 3 provides samples of good practice meant to serve as tools for teachers encouraging them to try out this approach in their own teaching.

However, the training provided here is not limited to the languages of German and Spanish. Securely anchored in the CLIL approach, any foreign or second language can serve to implement the *s:fl*-goals in different STEM subjects and related areas in science such as biology or environmental studies. Also, the training course can be adapted to serve younger or older learners than those represented here, and thus enrich the curriculum in elementary and in secondary schools alike.

Added value (content and language)

The effectiveness of this approach has been comprehensively evaluated in the *s:fl*- project, revealing

(1) that students learning with this method reach knowledge and competence levels comparable to those students learning STEM conventionally in monolingual settings, and

(2) that students generate a high level of interest in STEM subject matter and in learning STEM through the lens of another language than their mother tongue.

Similarly, teachers have expressed

(1) a higher sense of fulfillment and satisfaction from teaching STEM using the CLIL approach, and

(2) an appreciation of the added value of STEM-teaching in their professional profile.

Trainees' profile

The teacher-training course addresses the needs of practitioners wishing to expand their professional portfolio by adding new methodological dimensions to their teaching of STEM subject matter. It also addresses the interests of teacher trainees or novices wishing to become STEM and/or CLIL teachers. The TTC handbook applies the term ***trainee*** to all these participants.

Trainers' profile

Geared explicitly to the training aspect, the teacher training course provides guidelines for teacher training institutes and their trainers. Therefore, in order to fulfill its purpose, it is considered as a prerequisite that trainers have experience in either STEM or CLIL or both, and that they have a command of the language in which STEM subjects are to be taught. The TTC handbook applies the term ***trainer*** to all teaching professionals involved in the implementation of the training.

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TTC: Structure, Format

TTC Structure

The TTC is composed of 5 modules (= components to be taught). In addition, TTC provides 3 annexes containing materials for teachers to use as required (= supplementary components). The course is designed to fit into a 5-day program comprising 7-8 hours each day, thus fitting itself into a one-week training period. However, the modular structure of the TTC permits a segmentation of the program, for instance into 2 or 3 segments to be conducted in 2 or 3 weekend sessions. Furthermore, each module can be taught as a stand-alone element. If, in case of time constraints, the training needs to begin in the afternoon, the Day 1 program can be adjusted by condensing the morning and afternoon sessions into a single unit of a minimum of 5 hours. In case the final day program needs to terminate at noon, the afternoon program can be incorporated into the morning session.

This overall flexibility allows trainers to set preferences and accommodate the program to a pre-defined time-frame and other local constraints. However, to ensure optimal information processing and learning results, trainers are advised to follow the time frame and the module sequence suggested. The annexes are not required elements of the training course as such; they serve as toolboxes and collections of materials to be used where necessary or so desired.

The 5 modules comprise these methodologies and areas of implementation:

1. Task-based learning (TBL): method and application
2. Content and Language Integrated Learning (CLIL): method and application
3. STEM through CLIL and with “mobile labs”: guidelines, method, application
4. Lesson planning and execution: guidelines, checklists, templates
5. Observing and assessing teaching (planning, processes and outcomes)

The annexes, located in the ***s:fl* TTC Repository**, contain materials on:

Annex 1: STEM-CLIL – Documents
Annex 3: STEM-CLIL – Powerpoint presentations
Annex 4: STEM-CLIL- Worksheets

Each module contains a description of the course procedure, its content areas, objectives, and expected outcomes. Where applicable, it provides activities for the trainees to gain hands-on experience. Furthermore, the plug-and-play mode of the TTC course offers links to additional resources and materials; these are either internal, i.e. direct outcomes of the *s:fl* project, such as lesson modules and samples of good practice, or external, such as web-based resources, suggestions for further reading, and more.

In the program structure of each module, the following categories and time-frames are used:

Day/Time:	morning sessions	–	approximately 4 hours
	afternoon sessions	–	approximately 3-4 hours
Topic:	specification of the module and the content areas to be covered. “Review & Reflect” is the closing slot of each workday; participants use this slot to provide feedback, and re-formulate their expectations-portfolio prepared at the beginning of the workshop.		

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In addition, and when deemed necessary, this slot may also be used for individual trainer-trainee consultations.

Materials: materials suggested for use during the training itself; can be supplemented or substituted by other materials (trainer's choice). **Note**: materials provided are mostly in English, some also in German, or Spanish. Power Point Presentations (PPP) provided are mostly in English, some in German. All materials have been tested in *s:fl* training contexts. They are provided in the ***s:fl* TTC Repository**.

Mode: defines the interactional approach(es) predominant in the session; can be supplemented or substituted by other approaches (trainer's choice).

TTC Format

Each module is presented below in the following format:

1. Module overview (sessions: morning – afternoon)
2. Module objectives
3. Description of the module's general content and individual topics covered, including mode of presentation where necessary.
4. TTC-specific materials and resources provided online in the ***s:fl* TTC Repository**
5. Additional resources, supplementary readings

s:fl Teacher Training Course – Overview 5 Modules

Module	Day / Time	Topic
M 1: TBL	Day 1 morning	Introduction / Meet & Greet
		Pre-framing: personal expectations portfolio; personal teaching philosophy
		Course overview
	Day 1 afternoon	TBL: Task-based learning 1: the fundamentals (developmental psychology)
		TBL: Task-based learning 2: the methodology
		TBL: Principles
		Review & Reflect
M 2: CLIL	Day 2 morning	CLIL-Principles: Content and Language Integrated Learning Definitions – Objectives - Implementation
		CLIL-Domains: The 4 Domains (4 Cs): C1: Content – C2: Communication C3: Cognition – C4: Culture (Community)
	Day 2 afternoon	Focus C2: BICS & CALP
		Focus C3: LOTS & HOTS
		From CLIL to STEM: the rationale
		Review & Reflect
M 3: STEM	Day 3 morning	The TBL-CLIL-STEM Paradigm
		The CLIL-STEM Repertoire 2: Lesson Plan Analysis
	Day 3 afternoon	STEM-Focus1: the experimental phase
		STEM-Focus 2: implementing the mobile lab
		Review & Reflect
M 4: Lesson Planning	Day 4 morning	Planning an integrated STEM lesson 1: Closing in on a topic
		Planning an integrated STEM lesson 2: Using the STEM lesson planning template
	Day 4 afternoon	Lesson plan presentations and peer-feedback
		Review & Reflect
M 5: Assessment	Day 5 morning	Self-assessment and Peer-assessment: Principles and Guidelines
		Self-assessment: The CLIL-STEM teacher's competences grid
		STEM-CLIL (Peer) Observation
	Day 5 afternoon	Surveying the *s:fl* –TTC Repository: the annexes
		Summary: My next steps in STEM-CLIL
		Trainees' Feedback & Networking
		Conclusion

Module M1: Task-Based Learning (TBL)
Overview
Morning session: Pre-framing
Afternoon session: TBL

	Session	Topic	Materials	Mode
M1: TBL	Morning	Introduction / Meet & Greet		Trainer /Organizer presentation
		Pre-framing: personal expectations profile; personal teaching philosophy	Handouts: "Personal Expectations" "Teaching Philosophy"	Brainstorming; Group Discussion; Team building; Plenary
		Course overview	Handouts (trainer)	Trainer presentation Plenary
	Afternoon	Task-based learning 1: the fundamentals (learner)	PPP1 Worksheet 1	Presentation Activity
		Task-based learning 2: the methodology (teacher)	PPP1 Worksheet 2	Presentation Activity
		TBL Principles in action: planning a TBL activity	Worksheet 3	Activity
		Review & Reflect		Plenary Discussion

Module objectives

1. Trainees will gain insight into their personal involvement motivation by reflecting on their expectations from the TTC in conjunction with their personal teaching philosophy.
2. Trainees will gain insight into the principles of TBL as an interconnected concept of learner-centred instruction.
3. Trainees will test their awareness of TBL by analyzing learner profiles.
4. Trainees will test the applicability of TBL by planning a task-based learning scenario.

Session overview – morning

Pre-Framing. *Framing* is a technique that helps the meaning-making process in learning situations. To meet the demands of TTC purposes, it consists of two interrelated parts.
Personal expectations profile: This *pre-framing* activity at the outset of the workshop allows participants to locate themselves in the center of the training situation by defining their expectations and hoped-for outcomes of the training course, both in terms of their personal involvement and in terms of the course content. The exchange of personal expectations with the other trainees allows trainers to review their focus on upcoming workshop activities. It also allows trainees to review their initial expectations as the training progresses from day to day.
Personal teaching philosophy: This *pre-framing* activity challenges the trainees to reflect on their professional self-perception. Teachers, novices in the profession as much as experienced professionals, harbor beliefs about "what works" in the classroom and what

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not. In a game-like activity participants can be asked to align their personal teaching "philosophy" to a range of pre-defined teacher profiles, and explain their choice(s). Lewis (1993: 30) offers these categories for language teachers:

instructor	editor	language partner
educator	counselor	cheerful steamroller
motivator	confessor	instant reference book
dictator	fount of all truth	sympathetic interlocutor
assessor	social organizer	representative of authority
time keeper	genial host	language advisor

(Source: Bach 2013: 317)

Session overview – afternoon

TBL fundamentals and methodology

Task-based language learning (TBL) focuses on the use of authentic language in authentic learning contexts. Students are involved in meaningful tasks using the target language. Such tasks can include real-life activities in the classroom or simulation activities (preparing for an interview, or making a phone call). The outcome of the learning activity is assessed equally on the task process and the task results, both relying on communicative processes involved in getting the task completed. Language accuracy is deemed important but has no effect on the outcome assessment, as long as the flow of information is not endangered (principle of "message before accuracy"). The learner is positioned in the center of the task activity, not the subject matter or the teacher. This is where the teacher redefines his function as a planner, provider, and monitor of the learning activity. Tasks developed for TBL are reflective of the learners' cognitive age and their language competence levels. TBL focuses on assisting students to develop target language fluency and confidence in using the language in concrete situations. The core of the lesson or project is, as the name suggests, the task.

Task-based learning is:

1. *experiential, contextual and authentic* (learning activities)
2. *interactive and autonomous* (communicative processes)
3. *learner and learning oriented (*task processing)
4. *product oriented* (results of classroom based learning activities)
5. *emancipatory* (development of social competences)
6. *holistic* (the learner's personality and individuality)

Source: Bach/Timm (2013): 17-18 – see PPP1

Why do we focus on TBL in the *s:fl*-project? In terms of method (approach), TBL overlaps with STEM; both follow an identical procedure in which the task (TBL) or experiment (STEM) forms the central activity of a given lesson. The major difference is: While in TBL the task is an activity mostly planned and generated by the learners themselves, in STEM the experiment follows a pre-defined 5-step routine (STEM inquiry method – see M3). Both approaches locate the learner at the center of the process, with the teacher acting as learning facilitator and moderator of the learning process.

TBL	STEM
Pre-Task Activities	Trigger
	Hypothesis
Task Cycle 1: Planning & Execution	Experiment: Planning & Execution
Task Cycle 2: Review & Report	Verification & Conclusion: Review & Report
Transfer	Generalization / Transfer

Note to trainers: It is important to clarify in this TTC session that tasks are more than simple activities learners are encouraged to engage in. Since STEM tasks (experiments) are highly outcome-oriented, teachers need to make sure that the activities they plan to involve their students in are as task-like as possible. According to Dave & Jane Willis (*Doing Task-based Teaching.* OUP. 2007:12-14) the following criteria describe task-characteristics applicable to the experimentation phase in STEM:

1. Will the activity engage learners' interest?
2. Is there a primary focus on meaning?
3. Is there a goal or an outcome?
4. Is success judged in terms of outcome?
5. Is completion a priority?
6. Does the activity relate to real world activities?

Source: https://www.teachingenglish.org.uk/article/criteria-identifying-tasks-tbl

The more confidently the teacher can answer "yes" to each of these questions, the more task-like the activity. Teachers are encouraged to use these six questions as a reference tool in their planning (see M4). To test their understanding of these principles, trainees will be asked to prepare and present a task-based learning scenario.

TTC-specific materials, activities, and resources provided in the *s:fl* TTC Repository

Materials

PPP1, Handouts, Worksheets 1, 2, and 3

Activities

1. Trainees analyze and categorize "Learner profile 'Lisa'" / Worksheet 1
2. Trainees analyze and categorize "Learner profile 'Richard'" / Worksheet 2
3. Trainees plan a task-based scenario / Worksheet 3

Resources

https://www.teachingenglish.org.uk/article/criteria-identifying-tasks-tbl

Willis, Dave & Jane. *Doing Task-based Teaching.* OUP. 2007.

Bach, Gerhard & Johannes-Peter Timm (eds.) *Englischunterricht: Grundlagen und Methoden einer handlungsorientierten Unterrichtspraxis* [*Task-based Teaching Methodology*]. 5th rev. edition. Tübingen: Francke. 2013

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Module M2: Content and Language Integrated Learning (CLIL)
Overview
Morning session: **CLIL: Principles & Domains (4Cs)**
Afternoon session: **Focus on C2 & C3**

	Session	Topic	Materials	Mode
M2: CLIL	Morning	CLIL: Content and Language Integrated Learning Definitions – Objectives – Implementation	PPP2	Presentation Activity
		CLIL: The 4 Cs Content – Communication – Cognition – Culture Focus C1: Content	PPP3 Worksheet 4	Presentation Activity
	Afternoon	Focus C2: BICS & CALP	PPP4 Worksheet 5	Presentation Activity
		Focus C3: LOTS & HOTS	PPP5 Worksheet 6	Presentation Activity
		From CLIL to STEM: the rationale	Worksheet 7 (STEM lesson)	Activity
		Review & Reflect		Plenary Discussion

Module objectives

1. Trainees will gain insight into what CLIL is and how it is distinct from other related methodologies or pedagogies.
2. Trainees will gain insight into the complexity of CLIL, namely the interrelation of the 4 CLIL domains ("4Cs") and how this relates to their teaching.
3. Trainees will gain insight into the communication concept of BICS and CALP and be able to apply these in a given task.
4. Trainees will gain insight into the cognition concept of LOTS and HOTS and be able to apply these in a given task.
5. Trainees will be able to apply C2- (communication) and C3- (cognition) concepts in an analysis of a STEM lesson.

Session overview – morning

CLIL Pedagogy

CLIL is a pedagogical approach for learning content matter through an additional language; both the subject matter and the language are focused on in this approach. Developed in the 1990s, CLIL has gained importance and impact in schools worldwide, and the European Commission prioritizes CLIL as the major pedagogical approach in the 21st century: "It can provide effective opportunities for pupils to use their new language skills now, rather than learn them now for use later. ... It provides exposure to the language without requiring extra time in the curriculum, which can be of particular interest in vocational settings."

Very briefly defined, CLIL is "a dual-focused educational approach in which an additional language is used for the learning and teaching of content and language with the objective of promoting both content and language mastery to pre-defined levels" (Frigols-Martín et al. 2011). – While this defines "what" CLIL is, a broader definition is needed to show "how" CLIL is made operational as a teaching method: "CLIL is an instructional concept in which specific subject-matter, such as Art, Music, Physics, History, or Physical Education, is taught in a language different from the mother tongue. Language and content are learned in an integrative manner. In working with authentic learning materials, the learners expand their language competence and, at the same time, gain a deeper understanding of the subject matter in question. The added value resulting from this dual approach can be found in different areas inside and outside of the school environment. In addition, content and language integrated learning in real-life and context-specific situations promotes the development of intercultural competence." (Bach 2013) – It is also important to clarify what CLIL is *not*. It is not "immersion pedagogy", not "bilingual education", not "content-based instruction" (check online resources for definitions of these approaches.).

The dual focus of CLIL has been promoted by the European Commission as providing "added value" for learners, schools, and communities at large. The major added-value-elements highlighted are: CLIL ...

1. builds intercultural knowledge and understanding as well as intercultural communication skills
2. develops multilingual interests and attitudes
3. provides opportunities to study content through different perspectives
4. allows learners more contact with the target language
5. does not require extra teaching hours
6. complements other subjects rather than competes with them
7. diversifies methods and forms of classroom practice
8. increases learners' motivation and confidence in both the language and the subject being taught

(Source: http://ec.europa.eu/education/languages/language-teaching/doc236_en.htm)

The CLIL Framework – the 4 Cs (Do Coyle)

The basic principle of CLIL – language is used to learn subject matter which in turn determines the language needed to communicate in such a context – provides the framework for subsequent methodological decisions. Following Do Coyle, these are the **4 domains of CLIL**:

1. Content (C1): progression in knowledge, skills and understanding related to specific elements of a defined curriculum
2. Communication (C2): using language to learn whilst learning to use language
3. Cognition (C3): developing thinking skills which connect concept formation to understanding and language
4. Culture (C4): exposure to alternative perspectives and shared understandings, which deepen awareness of others and self.

Source: Coyle, D. (2008). CLIL – a pedagogical approach. In N. Van Deusen-Scholl, & N. Hornberger, *Encyclopedia of Language and Education, 2nd edition* (pp. 97-111). Springer.
See: https://clilingmesoftly.wordpress.com/clil-models-3/the-4-cs-model-docoyle/

This indicates that, in several ways, a CLIL-based lesson overlaps with the principles of a TBL-based lesson. Both integrate identical skills, focus on real-life tasks, and use materials directly related to a content-based school subject. Furthermore, with respect to language as communication, both focus on language *processing* and on language *production* at the same time. And with respect to cognitive processing, both CLIL and TBL focus on the thinking processes of learners and how teachers assist learners in expressing their thoughts appropriately. At the methodological level of CLIL planning, this involves a clear understanding of BICS & CALP and LOTS & HOTS.

Session overview – afternoon

BICS & CALP and LOTS & HOTS

The concepts hidden behind these acronyms describe basic components of CLIL in two domains: BICS & CALP = C2-domain "communication"; LOTS & HOTS = C3-domain "cognition". The 2015 *TKT-CLIL-Glossary* (see"Resources" below) describes these as follows.

BICS: Basic Interpersonal Communicative Skills
Those skills needed for everyday conversational talk. Examples are: greetings, stating likes and dislikes, describing the weather. ... Tasks associated with BICS are usually less demanding. Cognitive processes linked to BICS include: identifying specific information, naming objects, matching and sorting objects into sets.

CALP: Cognitive Academic Language Proficiency
This is the language competence required for studying curricular subjects in a non-native language. CALP refers to the language of academic learning. The language learned is cognitively demanding and often impersonal, e.g. listening to lectures on abstract topics, writing essays. ... Cognitive processes linked to CALP include: justifying opinions, forming hypotheses and evaluating evidence.

LOTS: Lower order Thinking Skills
Skills such as remembering, understanding and applying new subject knowledge. Learners develop LOTS for example when they recognize new vocabulary, classify, give examples and compare objects. Lower-order thinking can involve the use of basic or advanced vocabulary

HOTS: Higher Order Thinking Skills
Skills such as analyzing, evaluating and creative thinking. These develop reasoning skills, critical judgment and producing new ideas, e.g. How can we change the design of the building to make it more energy efficient? Higher-order thinking involves the use of advanced language.

Both, BICS/CALP as well as LOTS/HOTS, are attempts to classify languaging processes and thinking processes in a hierarchical fashion, on scales ranking from lower order skills to higher order skills. They serve as orientation guidelines and are meant to be used by CLIL teachers as aids in the planning phase of lesson building. It takes practice to use these as tools, and not as prescriptions. It is important to stress that they are dynamic in nature, and that overlaps from one level or stage to the next (higher or lower) must be considered normal. When these scales are used carefully as tools, they not only assist teachers in planning CLIL lessons, but also in assessing and evaluating lesson outcomes in terms of learner competences.

TTC-specific materials, activities, and resources provided in the *s:fl* TTC Repository

Materials
PPP2, PPP3, PPP4, PPP5
Worksheets 4, 5, 6, 7

Activities

1. Trainees compare the narrow and broad definition of CLIL by identifying the major components in each / Worksheet 4
2. Trainees check online definitions for "immersion pedagogy", "bilingual education", "content-based instruction", and determine their difference from CLIL.
3. Trainees discuss the validity of the "added value" of CLIL with respect to their personal educational settings.
4. Trainees analyze learner tasks using BICS/CALP reference tools. / Worksheet 5
5. Trainees develop learner tasks using LOTS/HOTS reference tools. / Worksheet 6
6. Trainees analyze a STEM lesson plan based on C2 and C3 domain characteristics. (German sample: "Schmetterling") / Worksheet 7

Resources

Frigols Martín, Marsh, Mehisto, Wolff. *European Framework for CLIL Teacher Education*. http://www.ecml.at/tabid/277/PublicationID/62/Default.aspx
(available in English, German, French, Serbian)

Bentley, Kay (2010). The TKT Course CLIL Module. Cambridge: CUP.

(Bentley, Kay) (2015: tkt-clil-glossary. (pdf-document provided online): http://www.onestopenglish.com/clil/

https://www.teachingenglish.org.uk/article/clil-a-lesson-framework

Module M3: STEM
Overview
Morning session: **TBL-CLIL-STEM Paradigm & Repertoire**
Afternoon session: **STEM-Focus Experiment & Mobile Lab**

	Session	Topic	Materials	Mode
M3: STEM	Morning	The TBL-CLIL-STEM Paradigm	Handout	Trainer Presentation Team-work (design)
		The TBL-CLIL-STEM Repertoire: Lesson Plan Analysis	Handout	Trainer Presentation Individual & Team Work (Analysis)
	Afternoon	STEM-Focus 1: the experimental phase	Worksheet 8	Trainer Presentation Team Work
		STEM-Focus 2: implementing the mobile lab		Trainer Presentation Team Work
		Review & Reflect		Plenary Discussion

Module objectives

1. Trainees will gain insight into what STEM in the *s:fl* project is and how it is distinct from other STEM concepts and methodologies.
2. Trainees will gain insight into the complexity of the inter-relationship between TBL, CLIL and STEM, and be able to show this complexity (construction of a model) and describe it (preparation of a chart / diagram).
3. Trainees will be familiarized with the 5-step“methodology by inquiry” (trigger, hypothesis, experimentation, conclusion, generalization).
4. Trainees will be able to apply the 5-step *s:fl* CLIL-STEM cycle in a given task (lesson model analysis or similar).
5. Trainees will be able to analyze a CLIL-STEM lesson plan for its STEM Potential.

Session overview – morning

The TBL-CLIL-STEM Paradigm

STEM is a curriculum based in four specific disciplines — science, technology, engineering and mathematics (German: MINT – Mathematik, Informatik, Naturwissenschaften, Technik); (Spanish: ciencia, tecnología, ingeniería, matemáticas). STEM considers these disciplines as interconnected, not as separate school subjects. Therefore, its approach is interdisciplinary and applied. STEM integrates the four subject matter areas into a cohesive unit, where learning can take place in the environment of real-world applications. Context-embedded and task-based learning activities, real world applications, and problem solving are the signature of STEM. These features already signify the close connectivity to the principles of CLIL.

What makes STEM special in the **CLIL** context is its primary objective: to allow learners to realize how scientific methods can be applied to everyday life. In this respect, STEM is not “reserved” for older learners. Combined with CLIL, STEM activities begin in the elementary school sector, showcasing the possibilities of “cross-over” effects of scientific explorations on real life questions. The objective is a double one: to generate students'

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interest in exploring a scientific question, and to enable them to communicate their findings in a language other than their L1.

In this way, what is activated in the protected context of school, can successfully be transferred beyond school boundaries. This is where STEM and CLIL connect to TBL: bridging in-school STEM activities and out-of-school STEM applications (for more detail consult http://www.livescience.com/43296-what-is-stem-education.html).

STEM fields are closely related and build on each other. At the primary level, the learners' curiosity about natural and scientific phenomena in the world around them can be channeled into appropriate STEM-focused curricular designs (see worksheet 7 from previous session). Such learning in the communicative and cognitive domain – C2 and C3 of the 4 CLIL-domains) – build stepping stones for STEM-activities in the higher grades of elementary education (*s:fl* = grades 5 and 6), since the students will be familiar with some of the basic approaches of exploratory learning and experimental designs based on the inquiry method.

The demand on teachers should not be underestimated. Teachers working within the TBL-CLIL-STEM network, do not apply the "infusion"-approach; they do not provide students with the "right" answers. Instead, they help them to research and identify the right questions and find appropriate answers themselves. Creativity and risk-taking are encouraged, and errors and mistakes – in the execution of experiments (= content) as much as in the communicative attempts to describe the processes involved in experimenting (= language) – are valued as learning opportunities.

The TBL-CLIL-STEM Repertoire

Generally, the STEM repertoire is defined in this way (for details consult http://www.edweek.org/tm/articles/2014/06/17/ctq_jolly_stem.html):

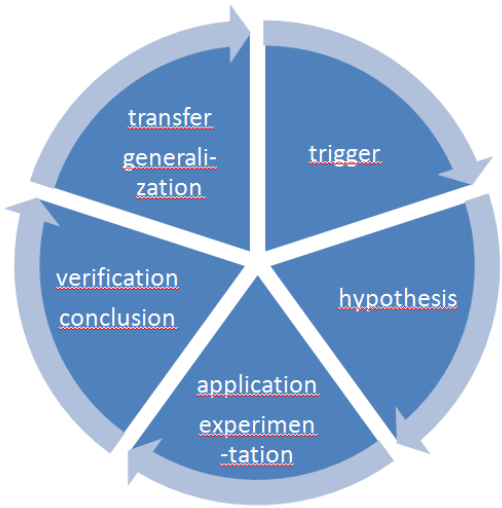
Science = the study of the natural world
Technology = any product made by humans to meet a want or need
Engineering = the design process students use to solve problems
Mathematics = the language of numbers, shapes, and quantities

As a teaching approach founded on TBL and CLIL, STEM incorporates six features:

1. STEM focuses on real-world issues and problems. Students explore real social, economic, and environmental problems and develop solutions
2. STEM clearly defines the task students will engage in, as well as its range, and its limitations.
3. STEM is built around the "exploratory design cycle". This includes identifying a problem, conducting background research, developing ideas for solutions, creating or testing a prototype, verifying the results, and transferring them to new contexts. (see illustration below)
4. STEM immerses students in hands-on inquiry and open-ended exploration. Students collaborate in each phase of the task and its solution(s). In this process, students communicate with fellow students and with the teacher in the L2.
5. STEM involves students in teamwork. Teamwork is process-oriented as well as product-oriented and incorporates the L2 in a natural fashion. Student-teams decide on how to communicate their findings.

6. STEM is interdisciplinary; it applies the same exploratory design process across the different subject matter areas and forces students to think "outside of the box." STEM allows for multiple right answers and views failure as a necessary part of learning.
   (Source: Anne Jolly 2017)

The transformation of these features or principles into a well designed CLIL-STEM teaching model needs careful planning. Traditionally, STEM in L1 learning contexts builds on the 7-step method called the "exploratory design cycle" developed in the United States in the 1990s. STEM in Europe has comprised these 7 steps into a 5-step-method without giving up on the complexity of the approach. This scientific/educational "methodology by inquiry" is a pedagogical approach based on historically established scientific research methods. The inquiry method has contributed significantly to the recognition and success of science and technology in educational environments. What appears to be top-heavy in the original design, with four steps to complete before experimentation begins, is more balanced in the 5-step model, with a clear focus on experimentation in the middle of the cycle. The advantages of the 5-step cycle for teachers and students are: comprehensiveness and clear framing of individual steps, planning economy (teacher), steps of progression (students).

7-step STEM „exploratory design cycle"	**5-step *s:fl* CLIL-STEM cycle**
	
Source: http://www.middleweb.com/4328/12-steps-to-great-stem-lessons/	Source: *s.fl* lesson planning template

Following the approach of the 5-step *s:fl* CLIL-STEM cycle, the teacher

- seeks triggers to attract the attention of students
- urges students to formulate hypotheses
- urges and helps students to conduct experiments and to record their observations
- causes discussion of the observations and helps students form conclusions
- ensures the consolidation leading students gradually to generalization, transfer and application of knowledge to the phenomena of everyday life

The 5 steps in detail (based on Kalkanis 2010)

1. Trigger of Interest ("I observe", "I am interested in"): used to challenge the student's interest. Triggers can refer to topical or unusual natural phenomena of our local or wider world, to scientific predictions, presentations of new technological applications and products, to current events, or to artistic creations. Apart from our natural environment, another source for research and for the selection of different types of information (texts, images, audio) that may trigger the educational process is the internet.

2. Hypothesis Formulation ("I assume", "I discuss", "I hypothesize"): reflections on the topical issue, as has emerged from the trigger of interest and discussion leading to hypotheses; causes, principles and the parameters that affect it or are affected by it, are involved here. Any existing information on the subject and questions generated by such information should be recorded; it can lead the discussion to a hypothesis focusing on the phenomena and requiring further study.

3. Experimentation ("I research", "I experiment", "I investigate"): the formulation of questions and hypotheses highlights the necessity of further research; its complexity may make it necessary to divide the students into groups, each concentrating on a different aspect. The *coordination of groups* during experimentation, the *schedule compliance* and the *information feedback* are essential components of a successful cooperative effort.

4. Theory Formation / Conclusion ("I conclude"): conclusions are formulated based on the processing, evaluation, selection and composition of the material collected, the experimental observations, the measurements taken and the data collected.

5. Generalization / Application / Transfer ("I consolidate", "I generalize"): conclusions are transferred to applications in other similar processes and phenomena of our physical world. These can be correlated with other observations / events / conclusions to supply further proof of the validity of the theory.

Session overview – afternoon

STEM-Focus 1: the experimentation phase and its larger context

In the 5-step *s:fl* CLIL-STEM cycle the experimentation phase demands central attention. It builds on hypotheses generated by the students and feeds into the verification of the hypotheses and into conclusions concerning the validity of the experiment in different new scenarios.

How do we know a CLIL-STEM lesson is what it claims to be and not simply another science experiment taught in a different language? How can we assess the quality of STEM lesson plans available on the internet? Can they be easily adapted to our specific learning environment and the demands of the TBL-CLIL-STEM paradigm?

The first guideline to use in assessing the experimentation potential in STEM lessons or lesson plans for task-based learning scenarios in a CLIL environment are the six features listed in the TBL-CLIL-STEM Repertoire above. The second is the inventory of 10 observation items provided below. The questions to keep in mind when designing or reviewing a STEM lesson (plan) and the experiment involved in the lesson are:

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1. Does the task / experiment present a real and compelling task challenge?
2. How will students relate to the task?
3. Does it allow for multiple acceptable and creative solutions?
4. Does it integrate important STEM content in an age-appropriate manner?
5. Is the design cycle used as an approach to solve the task?
6. Does the approach reflect a student-centered, hands-on teaching and learning experience?
7. Do the results lead to the design and creation of a technique, technology, or prototype?
8. Does it engage students in purposeful teamwork?
9. Is there a clear focus on problem solving (testing a hypothesis, its solution, and the evaluation of its results)?
10. How does it involve students in communicating their design, experiment, and results in oral and written form, appropriate to their L2 competence level?

(Source: Anne Jolly. Adapted for *s:fl* from: http://www.stem-by-design.com/how-to-analyze-a-lesson-for-stem-potential/)

Reviewing available STEM lesson plans is the first step towards successful lesson planning in the teacher's own STEM discipline. In particular, language teachers preparing to teach STEM subject matter are advised to practice planning an experiment-based STEM lesson in a "dry run" and submit their plans to qualified peers for assessment. The second step is the implementation of the mobile lab as a major tool in the execution of an experiment.

STEM-Focus 2: implementing the mobile lab

Obviously, STEM teaching does not require mobile labs. Nevertheless, they are a great asset in planning and conducting lessons due to their economy and ease of integration. Mobile labs enable students to develop and implement their own experiments. The methodology is student-led, self-directed and includes project planning and implementation skills: all essential to the development of transversal skills. Mobile labs are modular and can be shared among schools. They allow teachers to provide their students with:

1. hands-on activities to engage students in meaningful lab activities
2. access to innovative equipment and technology
3. safe learning and experimentation environments
4. learning activities covering a variety of STEM topics

Note to trainers: The use of mobile labs in the teaching of STEM topics has been an integral part of the *s:fl*-project. To what extent mobile labs will be utilized in other contexts depends on decisions made at the local or regional level and in the schools implementing STEM. Where it is clear that mobile labs will not be utilized, this session can be eliminated from the TTC program. Instead, the previous session on "The CLIL-STEM Repertoire" and "STEM-focus 1" can then be expanded.

TTC-specific materials, activities, and resources provided in the *s:fl* TTC Repository

Materials

Worksheets 8, 9

Document: CLIL-STEM lesson plan: Polygons and Polyhedra

Activities

1. Trainees construct a two- or three-dimensional model displaying the complexity of the TBL-CLIL-STEM relationship.
2. Trainees present their model in 5-minute oral presentations.
3. Trainees apply the 5-step *s:fl* CLIL-STEM cycle in a given task (lesson model analysis or similar) / Handout / Worksheet 8.
4. Trainees analyze a CLIL-STEM lesson plan for its STEM Potential, using Anne Jolly's checklist on features and questions / Worksheet 9.

Resources

Anne Jolly (2017). *STEM by Design*. Routledge.
See also:
http://www.stem-by-design.com/how-to-analyze-a-lesson-for-stem-potential/

Anne Jolly (2012). 12 Steps to Great STEM Lessons.
http://www.middleweb.com/4328/12-steps-to-great-stem-lessons/

STEM Activities
Handbook. http://www2.ivcc.edu/mimic/nsf/Middle%20School%20Activities/STEM%20Activities%20Handbook.pdf

European Commission, (2007), Directorate-General for Research, Directorate L - Science, Economy and Society Unit L4 - Scientific Culture and Gender, "Science Education NOW: A Renewed Pedagogy for the Future of Europe", http://ec.europa.eu/research/science-society/document_library/pdf_06/report-rocard-on-science-education_en.pdf

Kalkanis G., (2010), "Scientific Educational Method by Inquiry".
http://micro-kosmos.uoa.gr (→ educational proposals)

Module M4: Lesson Planning
Overview
Morning session: **Planning an integrated STEM lesson**
Afternoon session: **Lesson plan presentations and peer-feedback**

	Session	Topic	Materials	Mode
M4: Lesson Planning	Morning	Planning an Integrated STEM lesson 1: Closing in on a topic	Handouts	Presentations Individual & Team Work
		Planning an Integrated STEM lesson 2: Using the lesson planning template	Lesson planning template Assessment checklist	Presentations Individual & Team Work
	Afternoon	Lesson plan presentations and Peer-Feedback	Trainee lesson plans	Trainee presentations Discussion
		Review & Reflect		Plenary Discussion

Module objectives

1. Trainees will gain insight into the sequential process of CLIL-STEM lesson planning
2. Trainees will be able to plan a STEM lesson using the STEM lesson planning template and other tools (Assessment Criteria Inventory)
3. Trainees will be able to gauge improvement potential in lesson plans through peer assessment processes

Session overview - morning:

Planning an integrated STEM lesson

Planning a STEM lesson is a cognitively demanding task even for experienced teaching professional. It means tying together all elements of TBL, CLIL, and STEM into a coherent design. It also implies testing it in a dry run by submitting it to peer assessment for constructive feedback. In many cases, STEM practices in individual schools are nourished by team work and peer support, since STEM teachers and language teachers work hand in hand. This added advantage can be fully utilized when teachers use appropriate tools for planning STEM lessons, for observing peers in implementing CLIL-STEM in their classes, and for assessing the outcomes of STEM learning activities. The tools necessary for each of these elements are provided in the ***s:fl*-TTC Repository**. In this session of the training course, they can be explored and experimented with. These tools are meant to be used flexibly: they provide strategies for planning, execution and assessment within specific CLIL-STEM boundaries. These boundaries, however, are not static; they have wide margins for modification and adaptation which should be utilized extensively.

Note to trainers: To provide greater flexibility in strategic planning, a large number of materials are provided below in the **Resources** section; they need to be adapted for local conditions. Among other constraints, this is due to the fact that most planning tools available (in printed form as well as online) are in English. Since CLIL and STEM are

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quickly expanding “markets”, trainers are advised to check the internet for new products, materials, and assets before implementing the training.

Planning an *integrated* STEM lesson implies using TBL and CLIL components in a strategic fashion. Teachers need to be clear about the context and the content of a lesson and the learning objectives towards which the 5 steps of a typical lesson need to be geared. Teachers need to be clear about content knowledge and the cognitive skills and the communicative skills needed to obtain such knowledge. Teachers need to be clear about how a lesson is orchestrated around the 5 steps design and how it is linked to previous and subsequent learning. And teachers need to be clear about how they can optimize their students’ potential for independent task-based activities, and how to handle foreseeable as well as unforeseen difficulties including failure. It is important to remember that in TBL-CLIL-STEM *failure is a definite learning paradigm*. In STEM experiments, failure is to be considered normal; teachers can use it strategically as a motivator to incite further learning, particularly in the cognitive domain.

In the planning process, teachers can use as a general guideline the **Planning Inventory** provided in the *TKT Course CLIL Module* (Bentley 2010: 31) and expanded here to fit STEM concerns. There are 13 questions to consider:

1. What are my teaching aims? (= objectives)
2. What will learners know and be able to do at the end of the lesson which they didn’t know or couldn’t do before the lesson? (= outcomes)
3. What subject content will the learners revisit and what will be new?
4. What communication will take place? (BICS / CALP)
5. Which thinking and learning skills will be developed? (LOTS / HOTS)
6. Which tasks / experiments will learners be involved in?
7. What scaffolding is provided to make learning more effective?
8. Which classroom management activities are planned?
9. What language support will be needed for communication of content, thinking and learning? (4Cs dynamic model)
10. Which materials and resources will be provided to support the task / experiments?
11. Which generalization / transfer possibilities are made available?
12. How will learning processes and outcomes be assessed?
13. How will teaching processes and outcomes be assessed?

All of these questions (and more) have been integrated into the lesson plan and the assessment criteria available in the ***s:fl* TTC Repository**. Since the *s:fl*-project is clearly output-oriented as well as competence-oriented, the objectives specified in the lesson plan are competence-based. They are formulated as “can-do”-statements. “can-do”-statements are formulated in two areas – knowledge and skills: “The students will know ...”, “The students will be able to ... “. Language-teachers having worked with the CEFR (Common European Framework of Reference for Languages: Learning, Teaching, Assessment) will be familiar with formulating “can-do”-statements. STEM teachers can easily adopt these to their field.

All lesson planning begins with content, namely defining a topic (C1 – the content domain in the 4Cs-model), according to the motto “First choose, then plan!”. In most cases, topics are generated in accordance with national curricula required for implementation at the local level. Still, teachers may have a range of options. When

choosing content, questions 1 and 2 from the Planning Inventory need to considered side by side. Once this has been cleared, the questions concerning language and communication come into play (C2), alongside with questions concerning thinking skills (C3 – the cognitive domain). All of these need to be planned with appropriate scaffolding provided for the learners to activate their knowledge and skills, and to motivate their incentives for learning new content. Finally, questions concerning the generalization and transfer of newly acquired knowledge and skills need to be considered (C4 – the culture domain). This may not always be possible or necessary; but teachers should attend to this domain so as to make learning meaningful beyond immediate school contexts.

Session overview – afternoon:

Lesson plan presentations and peer-feedback

Lesson plans produced in a training session are far from perfect, they reflect the dynamics of work-in-progress. The downside to such results is that they cannot be put to the test in a classroom immediately. The upside is they can be presented to peers and trainers for review and feedback before they are implemented in the classroom. This provides a setting in which the exchange of ideas and suggestions bears great improvement potential. To allow all trainees to receive feedback on their own work as well as to provide feedback to other lesson plan proposals, this session is open-ended. Trainees should be encouraged throughout the feedback process to utilize the three inventories provided (see below), and to infuse their feedback with knowledge and insight gathered from the previous modules and sessions. This will build a bridge to the final Module on self-assessment and peer-assessment.

TTC-specific materials, activities, and resources provided in the *s:fl* TTC Repository

Materials

Worksheet 10: “13 Questions on Planning”
Document: “Lesson planning template”
Document: “Assessment Criteria Lesson Planning and Delivery”

Activities

1. Trainees will develop a STEM lesson plan integrating TBL, CLIL and STEM principles, using available templates and documents.
2. Trainees will present their lesson plans in front of a peer audience, and receive feedback on improvement potential.
3. Trainees will provide feedback on improvement potential to other lesson plan proposals.

Resources

Bentley, Kay (2010). *The TKT Course CLIL Module.* Cambridge: CUP.

Coyle, Do (2005). *CLIL Planing Tools for Teachers*. http://www.unifg.it/sites/default/files/allegatiparagrafo/20-01-2014/coyle_clil_planningtool_kit.pdf

Chapters on CLIL lesson planning can be found in these books:

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Bell, Phil; Kelly, Keith; Clegg, John (2016): *Putting CLIL into Practice*. Oxford: OUP.

CLIL Guidebook (2016). (Sandra Attard Montalto, Lindsay Walter, Maria Theodorou, Kleoniki Chrysanthou). http://www.languages.dk/clil4u/index.html#Guidebook

Coyle, Do; Hood, Philip; Marsh, David (2010): *CLIL*. Cambridge: CUP.

Dale, Liz; Tanner, Rosie (2012). *CLIL Activities: a Resource for Subject and Language Teachers.* Cambridge: CUP.

Mehisto, Peeter; Frigols, Maria J.; Marsh, David (2008). *Uncovering CLIL: Content and Language Integrated Learning and Multilingual Education*. London: Macmillan.

A review outlining the contents of these books can be found here (available in German only): https://www.goethe.de/de/spr/unt/kum/clg/20782495.html

Module M5: Assessment
Overview
Morning session: **Self-assessment and Peer-assessment**
Afternoon session: **the *s:fl* toolbox: annexes; feedback**

	Session	Topic	Materials	Mode
M5: Assessment	Morning	Teacher Self-assessment and Peer-assessment: Principles and Guidelines	CLIL matrix PPP6	Trainer presentation self-guided instruction
		Self-assessment: The CLIL-STEM Teacher's Competences Grid	CLIL matrix	self-guided instruction; peer discussion
		(Peer) Observation Guidelines & Inventory	Observation Checklist	
	Afternoon	Surveying the *s:fl* TTC Repository: the annexes	Annexes 1-4	Trainer presentation discussion
		Summary: My next steps in STEM-CLIL		Trainees' reflection and feedback
		Trainees' Feedback & Networking		Trainees' feedback on TTC
		Conclusion		

Module objectives

1. Trainees will gain insight into their own CLIL-STEM competences by applying the CLIL matrix.
2. Trainees will be able to gauge improvement potential in lesson plans presented for review through peer assessment processes.
3. Trainees will be able to gauge improvement potential in their own lesson planning through self-assessment.
4. Trainees will gain insight into the advantages of supportive (peer) observation of CLIL-STEM classroom processes.

Session overview - morning:

Teacher Self-assessment and Peer-assessment: Principles and Guidelines

This training section addresses assessment as part of a teacher's professional profile. It does *not* deal with the assessment of *students'* competences. Since the assessment and/or evaluation of learning outcomes is largely governed by national or local provisions, it cannot be dealt with here. For those interested in *learner assessment*, the handbooks listed under "Resources" in Module 4 contain chapters on this matter. Particularly useful also is Bentley's chapter on students' learning outcomes assessment in the *TKT Course CLIL Module* (pp. 84-99).

Teachers have a strong impact on the performance of learners and thus on learning outcomes. Therefore, reflecting one's own practice is part and parcel of a teacher's

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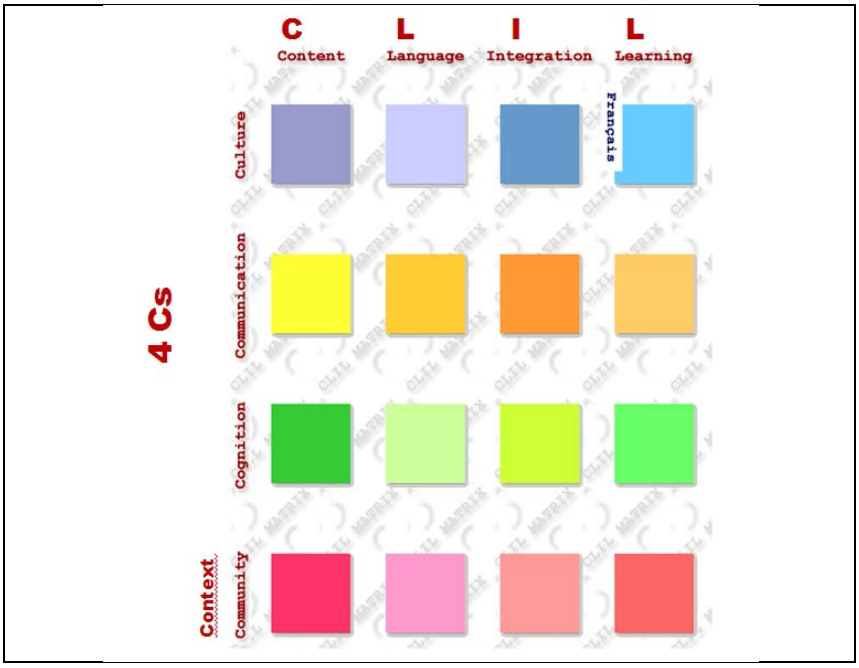
professionalism. Teachers are encouraged to review their practice and adjust it in the light of desired learning outcomes and of the individual needs of students. Where experiential learning, experimentation, and learning management are at the front of pedagogical practice, teachers make sure *not* to provide students with the answers, but help them to search for the right questions and find answers on their own initiative. To do this adequately, teachers need appropriate competences. To fine-tune their practice, teachers can resort to best-practice samples, assess their own samples of STEM practice with a critical view, and submit them to others experienced in providing constructive feedback. This is the nature of self-assessment and peer-assessment in general, and it applies in full range to CLIL-STEM practices as well.

Self-assessment: The final module of the TTC focuses on this issue and encourages trainees to self-assess their insight into the TBL-CLIL-STEM paradigm in general, and into the details of lesson planning in particular, in order to measure how their teaching skills and competences have been strengthened and developed by the TTC. A self-assessment matrix developed particularly for CLIL teaching professionals and CLIL trainees is provided to fill that demand. Developed by an international team of CLIL experts, the CLIL Matrix "is an awareness-raising and training tool for teachers who wish to consider the skills and knowledge necessary for achieving quality CLIL [and who wish] to examine the extent to which they are prepared for teaching through CLIL" (ECML homepage). The matrix is built around the 4 core elements of CLIL: Content, Language, Integration and Learning. These four elements are aligned with the 4 core elements of the "4 Cs": Culture, Communication, Cognition and Context. This alignment results in a matrix array of 16 indicators. To self-assess one's competence as a CLIL teacher, you follow the procedure outlined in the guidelines: "Each indicator is shown as a coloured box. Clicking on the box leads to four navigation elements. The first is an introduction to the quality indicator. The second provides an example of how the indicator is applied in the classroom. The third invites the user to answer a set of questions so that they can position themselves with respect to CLIL expertise. The fourth provides extra information in a brief text which is accessed by passing the cursor over the respective box answered." http://archive.ecml.at/mtp2/CLILmatrix/EN/qMain.html



Note to trainers: The matrix specifies "community" as one of the 4 Cs. This may be confusing since, in Module 2, "content" was specified as the first "C". Content, however, is already one element in the CLIL sector, and therefore cannot be used again in the 4Cs-sector. To solve this problem, the designers of the matrix use "community" instead. The *s:fl* designers consider "context" a better term to describe the components in this element. The functionality of the matrix as a self-assessment tool does not suffer from this change.

Peer assessment: When teachers invite colleagues into their classrooms to observe their teaching, they utilize a special "tool" to improve their practice – peer-assessment. For peer assessment, *s:fl* provides a checklist that has been used and tested by observers of CLIL practices. It is closely linked to the other components available to practitioners in the CLIL Inventory, namely the assessment criteria on lesson planning and lesson delivery (see Materials below). In fact, the observation checklist is the fourth component in the CLIL-STEM Inventory. It focuses on 4 observable areas:

1. Lesson structure, design, and outcomes
2. Teaching & Learning Strategies
3. Content, Language & Communication
4. Learning Processes Management / Mobile Labs

Peers concentrate on what they observe and comment only in this way: "observed; observed partly; not observed; no answer / does not apply". In other words, no judgment or evaluation is involved in the assessment. The list is flexible – items can be added, and comments on certain items can help to clarify observations. Even though the TTC does not involve any actual classroom teaching and observation, trainees can sharpen their perception and gain deeper insight into what defines sound CLIL-STEM practice.

Session overview - afternoon:

Surveying the *s:fl* Repository: the annexes

The annexes provide materials, resources and information on CLIL, STEM, and the *s:fl* project results and outcomes. Trainers will guide trainees through the materials. Particular attention should be paid to the lesson plans collected here, since they demonstrate samples of good practice. It is important to survey these beforehand, and pre-select those most suitable for the training at hand. They can be included in the presentation phases and trainee activities in individual modules, particularly M2, M3, and M4.

Note: Some annex materials may not be available to trainees, since these are restricted for use only by project partners. Special permission may have to be obtained.

Trainees' feedback

Trainers interested in trainees' feedback over and beyond the general review and feed-back session at the end of Module 5, should consider developing a feedback document trainees can fill out and return to the TTC organizers. To ensure reliable results, feedback should be provided anonymously. A sample feedback checklist is available in the *s:fl* Repository. It has been tested in German TTC contexts. It can easily be adapted to Spanish or to the language (mother tongue) used in the training.

TTC-specific materials, activities, and resources provided in the *s:fl* TTC Repository

Materials

PPP6

Document: "Assessment Criteria Lesson Planning and Delivery"
Document: "Observation Checklist"
Documents: Lesson plans and Assessment Checklists from module 4
CLIL Competences matrix: http://archive.ecml.at/mtp2/CLILmatrix/EN/qMain.html

Note to trainers: check internet connection! Trainees need to bring notebooks.

Activities

1. Trainees will apply the CLIL matrix and discuss results with partners / peers.
2. Trainees will study the observation checklist / Worksheet 11 and discuss its potential for professional improvement with partners / peers.

Resources

Teacher self-assessment:
ECML CLIL Matrix: http://archive.ecml.at/mtp2/CLILmatrix/EN/qMain.html

Student assessment:
Quartapelle, Franca (2012). *Assessment and Evaluation in CLIL*. (available in all *s:fl* project languages):
http://aeclil.altervista.org/Sito/en
alternatively:
http://aeclil.altervista.org/Sito/book-pdf-version-2/

Annex Materials: Overview

Annexe 1- Documents:

- A2 Arbeitsblatt CLIL Example / Beispiel „Schmetterling“
- TTC Assessment Criteria Checklist for CLIL-STEM Lessons Planning and Delivery
- TTC CLIL-STEM Lesson Planning Template
- TTC CLIL-STEM Observation Checklist
- TTC STEM lesson plan: Geometry – Polygons and Polyhedra

Annexe 2 - Power Point Presentations:

- PPP1: Task-based (language) learning
- PPP2: CLIL Principles
- PPP3: CLIL 4Cs: Focus C1 Content
- PPP4: CLIL 4Cs: Focus C2 Communication
- PPP5: CLIL 4Cs: Focus C3 Cognition
- PPP6:CLIL Assessment

Annexe 3- Worksheets:

- TTC Worksheet 1: Learner profile “Lisa”
- TTC Worksheet 2: Learner profile “Richard
- TTC Worksheet 3: Designing a task-based scenario
- TTC Worksheet 4: Comparison brief and broad definitions of CLIL
- TTC Worksheet 5: BICS & CALP; LOTS & HOTS
- TTC Worksheet 6: LOTS & HOTS Activity
- TTC Worksheet 7: Analyzing a STEM lesson plan
- TTC Worksheet 8: CLIL-STEM methodology: the lesson design cycle
- TTC Worksheet 9: CLIL-STEM example: “Polygons and Polyhedra”
- TTC Worksheet 10: Planning a CLIL-STEM lesson
- TTC Worksheet 11: Analyzing the CLIL-STEM observation checklist

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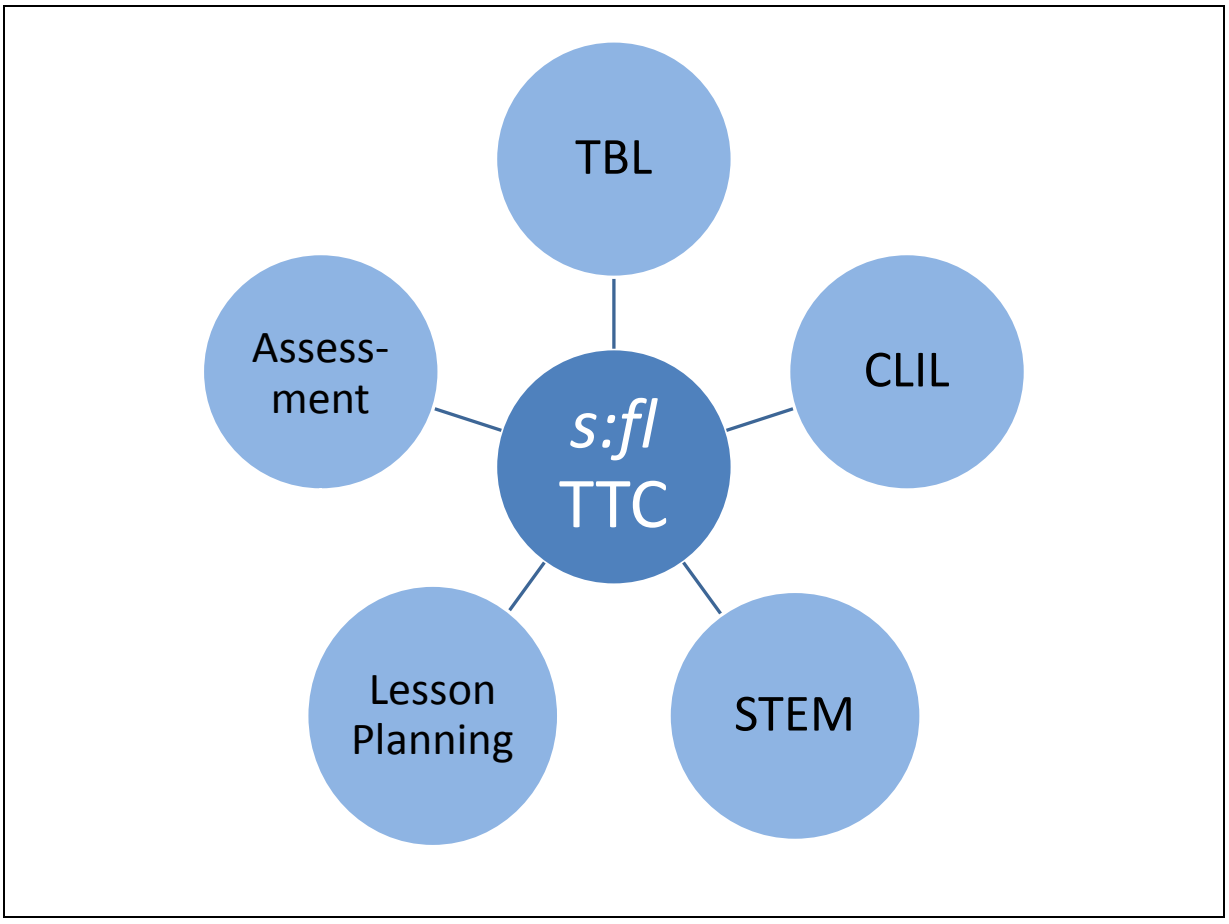
schools: future labs
TEACHER TRAINING COURSE

HANDBOOK



"You can analyze the past,
but you need to design the future.
That is the difference between
suffering the future and enjoying it."

Edward de Bono

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Documents

Document 1: Arbeitsblatt A2 CLIL Beispiel: Modul: Umwandlugsprozesse in der Natur der Schmetterling

Document 2: Assessment criteria for CLIL- STEM lessons: planning

Document 3: CLIL- STEM Lesson planning template

Document 4: CLIL – STEM Observation checklist

Document 5: Geometry: Polygons and Polyhedra

MODUL: UMWANDLUNGSPROZESSE IN DER NATUR

DER SCHMETTERLING

Die Aktivitäten

Erste Sequenz: Entdecken des Entwicklungszyklus des Schmetterlings

Es ist zunächst erforderlich, das thematische Vokabular, das für jede Einheit und während der ganzen Sequenz gebraucht wird, einzuführen oder zu wiederholen.

Einführung: Einführung in die Sequenz anhand der Geschichte *Die kleine Raupe Nimmersatt* von Eric Carle (s. Bibliografie). Bevor die Geschichte vorgelesen wird, fragt der Lehrer die Schüler, was auf der Titelseite des Buches zu sehen ist. *„Mit der Raupe passiert etwas ganz Besonderes. Was denkst du/was denkt ihr, was passieren wird?"* Die Schüler sagen, was ihrer Ansicht nach mit der Raupe passieren wird.

**Dieser Teil der Sequenz kann zu einer Einführungseinheit zum Vokabular rund um die Umwandlung der Raupe erweitert werden. Vorlesen der Geschichte, gefolgt von Frage-Antwort-Gesprächen darüber, was mit der Raupe passiert ist, danach Vertiefung des Vokabulars mit Hilfe einer Aktivität/ eines Spiels.

Vertiefung: Diskussion über die Geschichte. Wie hat sich die Raupe zu einem Schmetterling entwickelt? Den Schülern die Möglichkeit geben, die Stadien, die sie beobachtet haben, zu beschreiben. Diese Entwicklungsstadien aufzählen und an der Tafel notieren. Verwenden von *Dokument* 1 - Lebenszyklus, um zu erklären, dass die Raupe vier Entwicklungsstadien durchläuft, um ein Schmetterling zu werden.

Aktivitäten

- Die Lehrkraft teilt das Arbeitsblatt *Material 1 – Schmetterling1* aus und erklärt die Aufgabe. Sie fasst den Entwicklungszyklus des Schmetterlings zusammen, die Schüler nummerieren die Bilder und kleben anschließend die entsprechenden Wörter auf.
  Der Schmetterling (das Weibchen) legt das Ei/die Eier auf einem Blatt ab. Die Raupe schlüpft aus dem Ei. Sie frisst sehr viel und wächst.
  Dann wird aus der Raupe eine Puppe. In der Puppe entwickelt sich der Schmetterling.
  Der Schmetterling schlüpft aus der Puppe. Er trocknet seine Flügel und fliegt fort.
  Die Schüler sollen anhand der Zeichnung verstehen, dass es sich um einen Zyklus handelt, der sich wiederholt. Zur Wiederholung kann später das *Material 2* von den Schülern bearbeitet werden.
- *Material 3 - Lückentext* (abhängig vom Schülerniveau). Es können nun auch die Fotos in Dokument 3, die die Entwicklung des Monarchfalters zeigen angeschaut werden. Die Schüler können kommentieren, was sie sehen.
- Die Schüler können die Metamorphose des Schmetterlings mit Bewegungen darstellen. *Das Ei*: auf dem Boden hocken, die Knie sind an die Brust herangezogen und werden von den Armen umschlungen; *Die Raupe*: auf dem Boden liegen und sich schlängelnd wie ein Wurm vorwärts bewegen; *Die Puppe*:

aufrecht stehen ohne sich zu bewegen, die Arme sind vor der Brust verschränkt, der Kopf ist nach unten gerichtet, das Kinn liegt auf der Brust; *Der Schmetterling*: die Kinder ‚entfalten ihre Flügel' und fliegen durch die Klasse.

- Gruppenarbeit: jede Gruppe illustriert den Lebenszyklus des Schmetterlings, indem sie unterschiedliche Techniken und Hilfsmittel verwendet: Malerei, Buntstift, Collage..., auf Tonkarton, Zeichenkarton, Holztafel, normales Papier, Pappteller... Die Arbeiten jeder Gruppe werden im Klassenraum ausgestellt. Abhängig vom Schülerniveau können die Schüler ihren Bildern kurze Beschreibungen hinzufügen.

- Raupen-/ Schmetterlingsspiel: jedes Kind hat einen Schal oder ein Stück Stoff. Die Schüler legen sich auf den Schal und winden sich wie eine Raupe, indem sie den Schal unter ihrem Körper behalten. Sie hören dem Lied zu, das der Lehrer singt und führen die zugehörigen Bewegungen aus. Der Lehrer singt nach der Melodie von *Bruder Jakob/Frère Jacques*:
  Die Raupen kriechen, die Raupen kriechen, überall herum, überall herum.
  Sie kriechen in dem Garten, sie fressen alle Blätter, schmatz, schmatz, schmatz.
  Schmatz, schmatz, schmatz!
  Die Raupe wird zur Puppe, die Raupe wird zur Puppe, überall, überall.
  Überall im Garten, überall im Garten, spinn, spinn, spinn. Spinn, spinn, spinn. (Die Schüler rollen sich zu einer Kugel zusammen und bedecken ihren Kopf mit dem Schal.)
  Die Schmetterlinge fliegen, die Schmetterlinge fliegen, überall herum, überall herum.
  Sie fliegen in dem Garten. Sie flattern mit den Flügeln. Flatter, flatter, flatt. Flatter, flatter, flatt. (Die Schüler fliegen mit dem Schal als Flügel.)

Inhalt des Moduls

Dokument 1 – Lebenszyklus

Dokument 2 – Gedicht

Dokument 3 – Fotos Monarchfalter

Material für Schüler

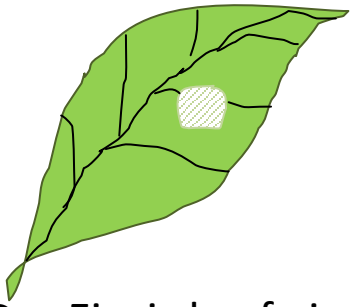
Material 1 – Schmetterling1

Material 2 – Schmetterling2

Material 3 – Lückentext

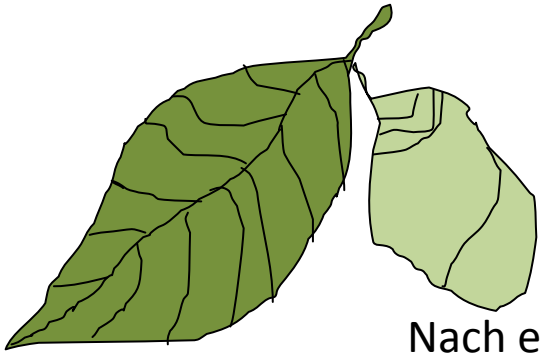
Material 4 – Beobachtungsprotokoll

Material 5 – Steckbriefe



Das Ei wird auf einem Blatt abgelegt.

Nach etwa 5 Tagen schlüpft die Raupe. Sie frisst und wächst.



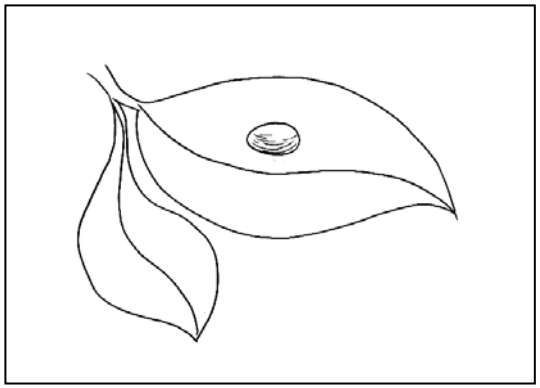
Nach einigen Wochen wird aus der Raupe eine Puppe.

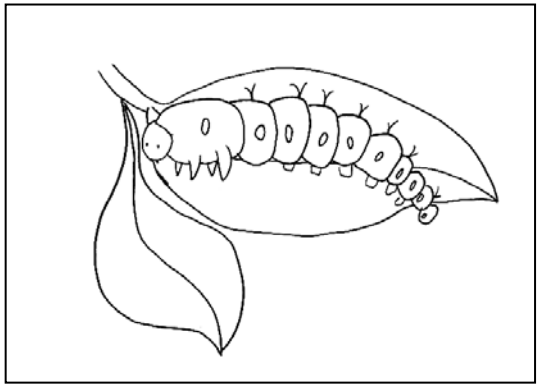
Nach einigen Wochen öffnet sich die Puppe und der erwachsene Schmetterling schlüpft und fliegt weg.

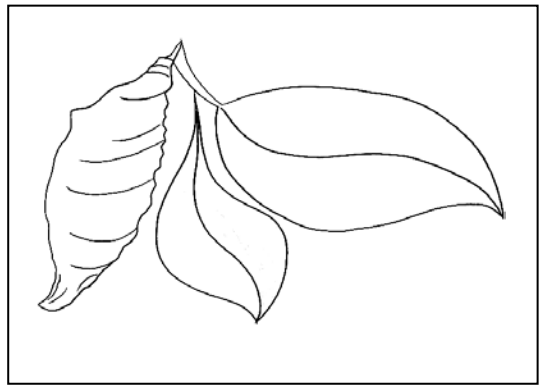
die Puppe	das Ei	die Raupe	der Schmetterling

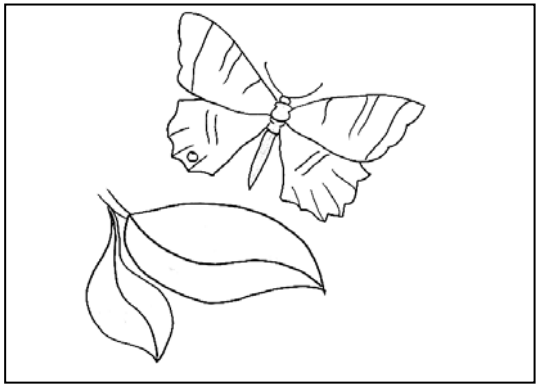
Nom: _____

Entwicklung des Schmetterlings









Hör zu, was dein/-e Lehrer/-in über den Zyklus des Schmetterlings erzählt. Nummeriere die Bilder in der richtigen Reihenfolge. Schneide die Wörter ab und klebe sie an das entsprechende Bild.

DER SCHMETTERLING

Name_____

Male ein Bild zu jedem Stadium im Lebenszyklus des Schmetterlings.

1. Der weibliche Schmetterling legt **Eier** auf einem Blatt ab. Die Eier bleiben solange auf dem Blatt liegen, bis die Larven schlüpfen.

2. Aus den Eiern schlüfen **Larven** oder **Raupen**.

3. Die Raupe verpuppt sich in einem Kokon und schläft ein. Sie wird eine **Puppe**.

4. Die **Puppe** öffnet sich und der **Schmetterling** kommt heraus.

5. Der weibliche **Schmetterling** findet ein Männchen und legt Eier ab.

DER SCHMETTERLING

Name_____

Vervollständige die Sätze über den Entwicklungszyklus des Schmetterlings.

1. Der Schmetterling hat _____ Entwicklungsstadien.
2. Der weibliche Schmetterling legt _____ auf ein Blatt.
3. Aus dem Ei schlüpft eine _____.
4. Nach ein paar Wochen verpuppt sich die _____

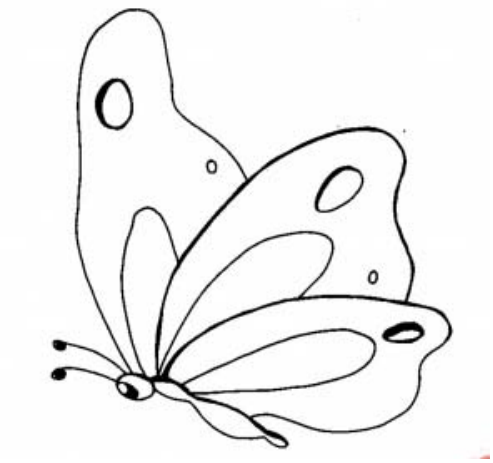
   und schläft ein.
5. Einige Wochen später öffnet sich die _____ und ein

   wunderschöner _____ schlüpft heraus und

   _____ fort.

Name:

Beobachtungsprotokoll



Ich habe einen Schmetterling gesehen:

am (Datum) _____ .

Wo : _____

Farbe : _____

Name : _____

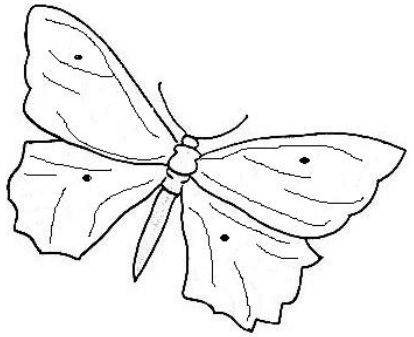
Wie war das Wetter zu der Zeit: (kreuze an)

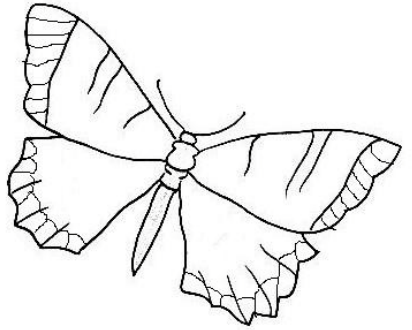
 ☐  ☐  ☐

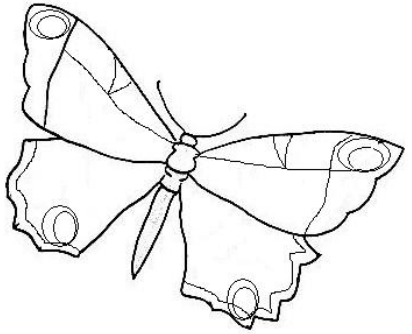
Mal deinen Schmetterling oder kleb ein Foto auf!

Schmetterlinge bei uns

<table>
<tr><th>Name</th><th>Lebensweise</th><th>Aussehen</th></tr>
<tr><td>Der Zitronenfalter</td><td>die Nahrung:
Der Schmetterling frisst Blütennektar. (z. B. Flieder)
Die Raupe frisst Blätter von Sträuchern. (z. B. Faulbaum)

Schmetterling zu beobachten[1]:
<table><tr><td>J</td><td>F</td><td>M</td><td>A</td><td>M</td><td>J</td><td>J</td><td>A</td><td>S</td><td>O</td><td>N</td><td>D</td></tr><tr><td></td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td></td><td></td></tr></table>
die Farben:
zitronengelb, vier Punkte: orange</td><td>  </td></tr>
<tr><td>Der kleine Fuchs</td><td>die Nahrung:
Der Schmetterling frisst Blütennektar.
Die Raupe frisst Blätter von Brennnesseln.

Schmetterling zu beobachten:
<table><tr><td>J</td><td>F</td><td>M</td><td>A</td><td>M</td><td>J</td><td>J</td><td>A</td><td>S</td><td>O</td><td>N</td><td>D</td></tr><tr><td></td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td></td><td></td><td></td></tr></table>
die Farben:
orange, Rand : schwarz, weiß, blau</td><td>  </td></tr>
<tr><td>Das Tagpfauenauge</td><td>La nourriture (Nahrung):
Der Schmetterling frisst Blütennektar (z. B. Veilchen, Klee, Disteln) und saugt auch Saft von reifem Obst.
Die Raupe frisst Blätter von Brennnesseln und auch Obst.

Schmetterling zu beobachten:
<table><tr><td>J</td><td>F</td><td>M</td><td>A</td><td>M</td><td>J</td><td>J</td><td>A</td><td>S</td><td>O</td><td>N</td><td>D</td></tr><tr><td></td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td></td><td></td></tr></table>
Les couleurs (Farben):
rot-braun, Augenflecken unten: blau / oben: blau, weiß, rot</td><td>  </td></tr>
</table>

[1] Bitte beachten: Das Vorkommen der Schmetterlinge ist auch vom Wetter abhängig!

Dokument 2: Gedicht zum Schmetterling

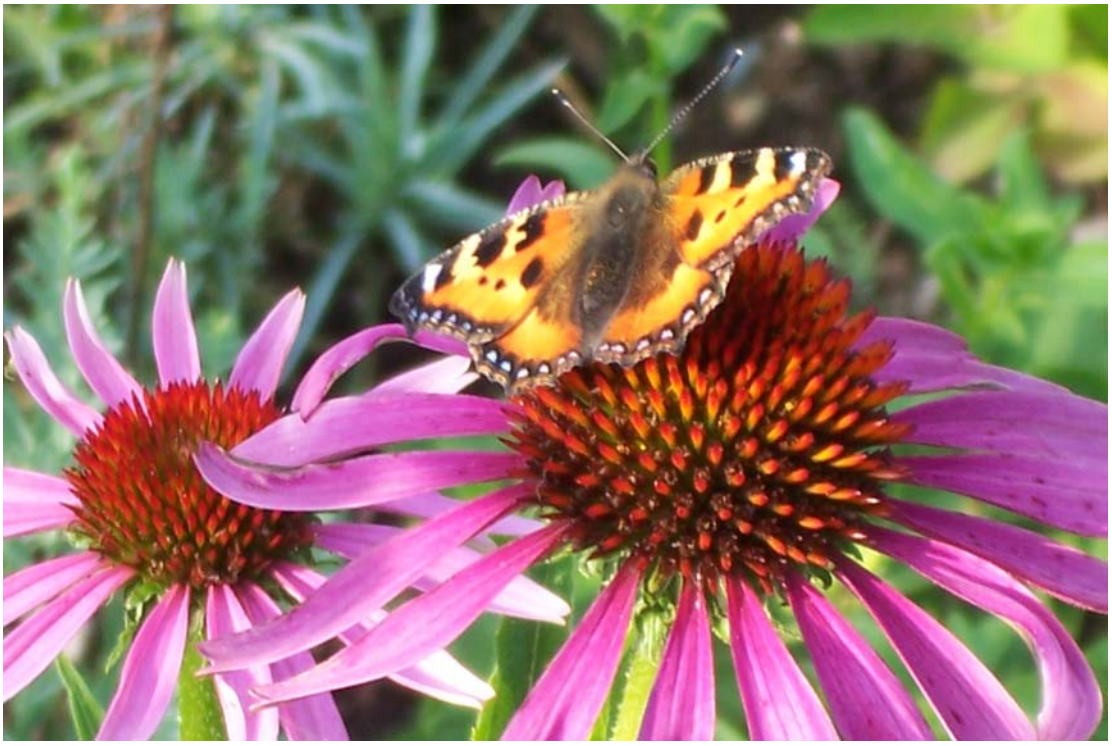
Schmetterling - Flatterding

Schmetterling – Flatterding,
flattert still – wie er will,
fliegt ganz hoch – höher noch,
schwebt im Kreis – keiner weiß.

Fliegt er weg – ins Versteck?
Bleibt er da – mir ganz nah?
Dreht er sich – sieht er mich?
Kommt er bald – macht er halt?

Schmetterling – Flatterding!
Jetzt, hurra – bleibt er da,
setzt sich her – freut mich sehr,
schüttelt sich – kitzelt mich,
bleibt dann still – wie ich will.
Schmetterling – schönes Ding.

(in: http://www.lehrerweb.at/gs/projekte/be/proj1/gedicht.htm)



Kleiner Fuchs (Foto: Renate Krüger)

Assessment criteria for CLIL-STEM Lessons: Planning schools: future Labs Erasmus+

CLIL-module

I Lesson Planning

General aims/goals
□ Are the teaching aims clear?
□ Are the learning outcomes defined?
□ Is the function of the mobile lab clarified?

Content
□ Is the module content linked to past learning?
□ Is the presentation of new content clear?
□ Is the content accessible?
□ Is content distributed in different, progressive *steps*?
□ Is a progression from simpler to more complex content elements provided?
□ What impact does the use of the mobile lab have on making the content accessible?
□ none □ some □ extensive

Cognition (thinking skills)
□ Which thinking skills are involved in the steps of the different modules:
□ *Lower-order thinking skills*: defining, identifying, classifying .?
□ *Higher-order thinking skills*: explaining, applying, comparing, hypothesizing ?
□ Are appropriate *strategies* provided to develop thinking skills? Which ones?
□.....
□ What impact does the use of the mobile lab have on cognitive processing?
□ none □ some □ extensive

Communication (language)
□ Which language activities are involved?
□ listening
□ reading
□ speaking
□ interacting (student ⟷ teacher)
□ interacting (student ⟷ teacher)
□ writing

□ Are language functions (grammar/structures and vocabulary) defined in detail?
□ Are interactional functions (agreeing, disputing, questioning) defined in detail?

□ Are the students involved in *using the* language? To which degree (%)?
□ Are the students involved in *learning the* language? To which degree (%)?

Communication (interaction)
□ To what extent do the students use code-switching / code-mixing: □ occasionally □ extensively
□ To what extent does the teacher use code-switching / code-mixing: □ occasionally □ extensively

□ Which CALP functions are involved? (CALP: Cognitive Academic Language Proficiency)
□.....

□ Which socio-communicative functions (BICS: Basic Interpersonal Communicative Skills) are involved?
□.....

□ What impact does the use of the mobile lab have on communication:
□ (student – teacher): □ none □ some □ extensive
□ (student – student): □ none □ some □ extensive

Culture / Community
□ Does the content offer opportunities to develop/expand social/cultural perspectives?
□ Which curriculum links to other subjects can the content encourage?

Based on: F. Quartapelle (ed.) 2012: *Assessment and evaluation in CLIL.* 160-162. www.aeclil.net.
Adapted for *Schools: Future Labs* with focus on 4Cs model (Doyle) by Gerhard Bach. Internal project use only.

CLIL-module

II Lesson Delivery & Outcomes

Lesson planning review
- □ Does each step provide a balanced quantity of materials and tasks?
- □ Are the planning details appropriate (time, level and complexity of activities)?

Teaching & learning strategies
- □ Which *strategies* are used to link new information *to previous learning*?
  - □ brainstorming
  - □ questions
  - □ key words
  - □ guessing
  - □ games (e.g.riddles), contests

  - □ other: .....

- □ Which *strategies* are used in order to *make input comprehensible*? (List items!)
  - □ oral scaffolding - questioning, paraphrasing, thinking aloud
  - □ visual scaffolding / visual aids
  - □ key vocabulary emphasizing
  - □ language input appropriate for students' proficiency level
  - □ graphic organizers, mind maps
  - □ mobile lab activities

  - □ other: .....

- □ Which *thinking strategies* are used to *support learning* (comprehension & production)
  - □ oral scaffolding – questioning
  - □ framing
  - □ mind mapping (unstructured, free-flowing)
  - □ concept mapping (structured mind map)
  - □ cubes (**c**ircle, **u**nderline, **b**ox, **e**valuate, **s**olve)
  - □ summarizing
  - □ reviewing

  - □ other: .....

Classroom Management (instructional organizers)
- □ Which *classroom management* activities are planned and executed?
  - □ teacher's speech
  - □ group work
  - □ pair work
  - □ individual activities
  - □ warm up
  - □ exercises or tasks integrating language improvement and content learning
  - □ tasks focusing content and real world connections
  - □ mobile lab activities managed by students

  - □ other: .....

Teaching resources
- □ Which teaching materials are provided?
- □ Are the materials authentic or adapted for classroom use?
- □ Which of these are provided by the mobile lab?
- □ Which of these are generated for the use of the mobile lab?
- □ Does the use of the mobile lab clearly support the learning of content?
- □ Does the use of the mobile lab clearly support the learning of language?
- □ Does the use of the mobile lab clearly support student interaction?
- □ Does the use of the mobile lab clearly support students' management skills?
- □ other: .....

Based on: F. Quartapelle (ed.) 2012: *Assessment and evaluation in CLIL.* 160-162. www.aeclil.net.
Adapted for *Schools: Future Labs* with focus on 4Cs model (Doyle) by Gerhard Bach. Internal project use only.

Lesson (title)	**Subject/Topic:**
Language competence level A1 □ A2 □+ B1 □ B2 □ C1 □	Prerequisites / requirements: (e. g.: language or content revision or preparation; use of L1 in specified teaching segments)
Class/grade: Number of students in class:	Age of learners: : Duration of lesson(s):
Content of lesson:	
Teaching aims/objectives Content: Communication: Cognition: Culture/ community/ citizenship:	

FL/STEM lesson planning template based on 4Cs (see next page) (content, communication, cognition, culture)

phase / time	Content	Objective/Competence („can-do“ statements)	Student activity	Social form/ setting	Material, media, mobile lab	Language: subject specific terminology	Language: communication & interaction	Teacher activity	Notes, comments on processes & outcomes = including affective outcomes, (self-) evaluation
trigger									
hypothesis									
experimen-tation, (processes, results) verification of hypothesis									
conclusion									
transfer generalization application									

FL/STEM and the domains of the 4Cs

C1	Content / Learning outcomes	"know" (content): "be able to" (content, communication): "be aware" (content, cognition):
C2	Communication: Language learning & Interaction	Vocabulary (revisited) Vocabulary (new): subject matter specific (CALP) Vocabulary (new): general (BICS) Structures (focus on grammar) Language functions (information, argumentation, questioning, reasoning)
C3	Cognition / cognitive processing: LOTS & HOTS	Remembering / Identifying Comparing Classifying Predicting Reasoning Synthesizing / creating
C4	Culture / Community	Awareness (of scientific topic as relevant for the culture / community) Involvement (project continuation outside of classroom) Communication (proliferation of scientific results in community)

CLIL/STEM Observation Checklist

Grade Level: Number of Students: Date: Lesson Observed: (1) (2) (3) Duration of Lesson (minutes):

The following categories identify criteria for CLIL-STEM lessons (delivery and outcomes) - see details in (1) lesson planning template and (2) assessment checklists. **This checklist serves as the third component: observation**. Note: Not all features may be observable in any one lesson; there may be others not listed here; use space provided at bottom of page to add further categories. Also, observers are advised to use the lesson plans as an additional reference tool.

Indicators / observed features of achievement	observed observed partly not observed no answer / does not apply	1 2 3 0	Comments
1. Lesson structure, design, and outcomes			
Planned objectives / learning outcomes are clearly formulated and recognisable in all phases and activities of the lesson.			
The quantity of materials and tasks reflect a balance of individual learning phases.			
Content is designed / modified to correspond with learner cognitive level.			
Language is designed / modified to correspond with learner comprehension level.			
Learning outcomes reflect knowledge (content).			
Learning outcomes reflect skills & abilities (communication).			
Learning outcomes reflect awareness (cognition, transfer).			
Lesson reflects 5 methodological steps of STEM inquiry approach (trigger – hypothesis - experimentation – verification/conclusion – generalisation/transfer).			
2. Teaching & Learning Strategies			
Specific strategies are used to link new information to previous learning (e.g. brainstorming, eliciting keywords, guessing/hypothesizing).			
Routine activities are used to quickly engage students in learning, experimenting and communicating.			
Specific strategies are used to make input comprehensible (e.g. scaffolding, graphic organizers, body language).			
Specific thinking strategies are used to support learning in the cognitive domain (e.g. framing, mind-mapping, cubing, summarizing).			
3. Content, Language & Communication			
Language activities are varied and balanced (listening, reading, speaking, interacting).			
Language functions (grammar, structures, vocabulary) are explained and practiced when necessary (= focus on form).			
Interactional functions (agreement, disagreement, questioning) are freely used by learners (= focus on communication).			
Teacher encourages code-switching in order to keep communicative flow alive.			
Learners also make use of code-switching without teacher encouragement.			
Content stimulates students' use of BICS in exchanging their ideas with each other.			
Content stimulates students' use of CALP in exchanging their ideas with each other.			
The use of the mobile lab has a clear impact on communication.			
The use of the mobile lab has a clear impact on cognitive processing.			
4. Classroom and Learning Processes Management / Mobile Labs			
Classroom management activities observed include: □ teacher's speech; □ group work; □ pair work; □ individual activities; □ other (please specify)			
Learning processes management activities observed include: □ warm up activities; □ tasks integrating language and content; □ tasks focusing on transfer of content to other contexts; □ tasks generated by students spontaneously; □ other (please specify)			
Materials used in lesson have been generated/modified for use in mobile lab activities.			
The use of the mobile lab supports the learning of STEM content.			
The use of the mobile lab supports the learning of language.			
The use of the mobile lab supports the use of language in interaction.			
The use of the mobile lab supports students' management skills.			
5. Other			

Geometry: Polygons and Polyhedra

Overview
Participants will explore and discuss polygons and polyhedra.

Category: Math, Science, Engineering

Learning Goals
- Discuss and use polygon, polyhedral, and solids terminology
- Experiment using the scientific method
- Construct and test space figure models

Participants
The activity can be conducted with almost any number of participants and one session leader.

Materials

Construction Materials • Pieces: Toothpicks, straws, or some other material for constructing • Connectors: Mini marshmallows, raisins, gum drops, modeling clay, or some other connector material Activity Sheet, one per participant	Scissors Solids (e.g. die, rectangular box, can of food, ball, pyramid, etc.) Supplemental Shapes and Solids Sheet Pencil/ Pen

Activity
Suggested time: 90 minutes

Setup
Have various solids and/or pictures of shapes and solids placed around the tables or work areas for participants to see as they arrive.

Polygons

What is a polygon? (a 2-dimensional shape made up of straight lines)

Have each participant match the name of the shape with the picture of the shape.

How many sides does a “googolgon” have? (10^100 sides)

What shapes are on the surface of a soccer ball? (black pentagon and white hexagon)
Have participants make a square out of pieces and connectors. Stand it upright.

Is it sturdy? (no)

Have participants make a triangle out of pieces and connectors. Stand it upright.

Is it sturdy? (yes)

Polyhedra

What is a polyhedron? (a 3-dimensional space figure made up of flat faces; there are no curved surfaces)

List some space figures (solids) that are polyhedra. (Polyhedra: Cube,

Rectangular Space Figur, Pyramid with Square or Triangular Base)

List some space figures (solids) that are not polyhedra. (Cylinder, Cone, Sphere)

Have participants construct a tetrahedron (pyramid with a triangular base).

Have participants hypothesize about the number of tetrahedral it will take to support a book. Then, put them in small groups to test their hypothesis.

Discuss the results of their experimentation with using tetrahedra to support a book.

What shape is common to both the triangular pyramid and the square pyramid?

Where else do you see this shape? Take a walking tour, if feasible. (The triangle is a “strong” shape. It can be found in roof construction, supports under tables, wheelchair ramps, etc.)

Credits

Activity packet developed by Dawn Wiggins

The Shape of Things
Participant Activity Sheet

Polygon:
List the number of sides for each shape; then, match the name of the shape with the shape.

Triangle

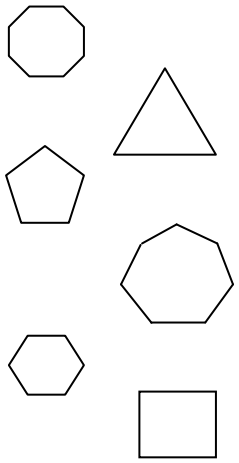
Quadrilateral

Pentagon

Hexagon

Heptagon

Octagon



How many sides does a “googolgon” have?

What shapes are on the surface of a soccer ball?

Make a square out of pieces and connectors. Stand it upright. Is it sturdy?

Make a triangle out of pieces and connectors. Stand it upright. Is it sturdy?

Polyhedron:

List some space figures (solids), polyhedra or otherwise.

Construct a tetrahedron (pyramid with a triangular base).

Supporting a book with tetrahedra.

Hypothesis: A book can be supported with _____ tetrahedra.

Form small groups and experiment to see how many tetrahedra it takes to support a book.

It takes _____ tetrahedra to support a book.

What shape is common to both the triangular pyramid and the square pyramid?

Where else do you see this shape?

Supplemental Shapes and Solids

Presentations

Presentation 1: Task based language learning and teaching

Presentation 2: CLIL-Principles

Presentation 3: CLIL- the 4 Cs- C1 – Content

Presentation 4: CLIL – the 4 Cs- C2 BICS & CALP

Presentation 5: CLIL – the 4 Cs- C3 –Cognition - LOTS & HOTS

Presentation 6: CLIL – Assessment

schools: future Labs

Task-based language learning and teaching / Handlungsorientiert Lernen und Lehren

Gerhard Bach, Universität Bremen

Lisas Eintrag im Lerntagebuch / Lisa‘s entry in her learning diary

- “Lisa”
  - Alter: 8 Jahre, 3. Klasse Grundschule (Deutschland)
  - 1. Lernjahr Englisch als Fremdsprache
  - Eintrag in ihr Lerntagebuch am Ende des Schuljahres
- Ich mag Englisch, weil wir da raus dürfen und englische Spiele spielen und englische Lieder singen. Am liebsten mag ich im Buch die Geschichten lesen. Wenn ich lese, schau ich die Bilder an und dann kann ich die Wörter besser sagen. Wenn ich schreibe, denke ich auch an die Bilder. Ich finde es lustig, wenn ich “how are you” zu meiner Lehrerin sage auf dem Pausenhof und sie macht große Augen. Manchmal spreche ich lustige Wörter nur so für mich. Blöd find’ ich Rechnen auf Englisch, die Zahlen hören sich so komisch an: “four*teen*”, “fif*teen*” und so weiter.
- Haben Sie ähnliche Erfahrungen?

- “Lisa”
  - age 8, third grader in German primary school,
  - first year EFL learner
  - entry in her personal language portfolio (ELP) (transl. from German):
- I love English because we get to go outside and play “English” games and sing songs. I like reading the stories in our book best. When I read I look at the pictures and this helps me say the words better. When we write I also think of the pictures. I think it’s funny when I say “hello, how are you” in English to my teacher in the hallway and she looks at me in surprise. I sometimes say funny words to myself. I hate doing math in English, the numbers sound crazy: “four*teen*”, “fif*teen*” and so on.
- Do you have similar experiences?

Lisas Eintrag – pädagogisch betrachtet
Lisa‘s entry – the educator‘s view

- Ich mag Englisch, weil wir da raus dürfen und englische Spiele spielen und englische Lieder singen. Am liebsten mag ich im Buch die Geschichten lesen. Wenn ich lese, schau ich die Bilder an und dann kann ich die Wörter besser sagen. Wenn ich schreibe, denke ich auch an die Bilder. Ich finde es lustig, wenn ich “how are you” zu meiner Lehrerin sage auf dem Pausenhof und sie macht große Augen. Manchmal spreche ich lustige Wörter nur so für mich. Blöd find’ ich Rechnen auf Englisch, die Zahlen hören sich so komisch an: “four*teen*”, “fif*teen*” und so weiter.

- I love English because we get to go outside and play “English” games and sing songs. I like reading the stories in our book best. When I read I look at the pictures and this helps me say the words better. When we write I also think of the pictures. I think it’s funny when I say “hello, how are you” in English to my teacher in the hallway and she looks at me in surprise.
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Lisas Eintrag – pädagogisch betrachtet
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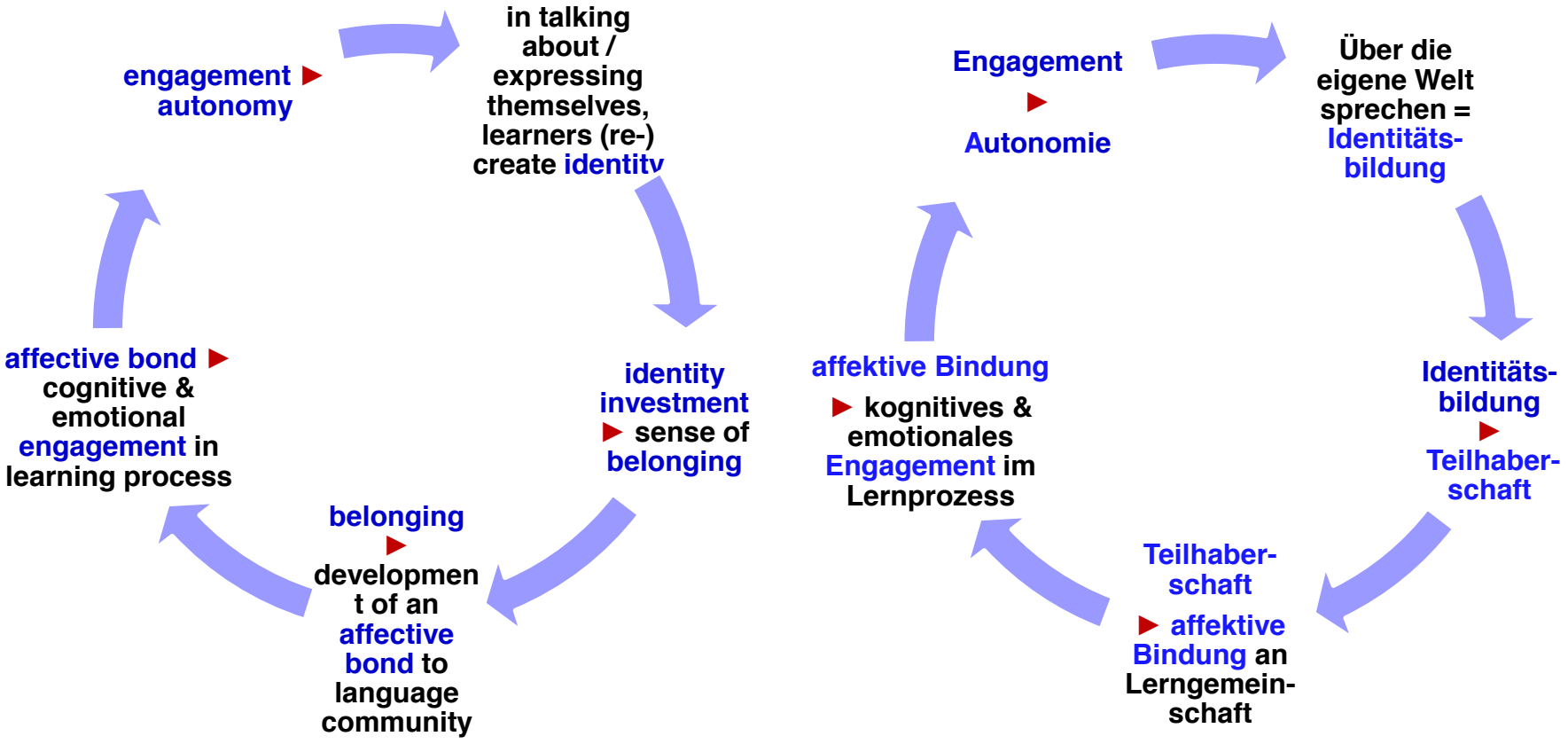
- 1 Kulturelle Dimension; Lernen als „Spiel“; kreative Interaktion
  cultural dimension of language learning and language learning as „playful“ / creative interaction
- 2 Vernetzung sprachlicher und visueller Impulse
  networking reading with visual and aural/oral signals
- 3 Vernetzung schriftsprachlicher und visueller Impulse
  networking writing with visual signals
- 4 soziale Dimension des Lernens und Aktivierung („empowerment“) von Sprachhandlungen
  social dimension of communication and empowerment through languaging
- 5 emotionale Dimension: Sprache und Klang
  sense of language as emotion

The learning cycle in the activity-designed approach
Der Lernzyklus im handlungsorientierten Lehr-/Lernansatz



Teaching and Agency / Autonomie
(learner centered / activity-designed approach)

- **Aspects of the activity-designed approach are:**
  - decision-making in the classroom;
  - relationships between structure of language and the learning process;
  - relationship between perception, action and understanding;
  - learner's relationship to the world inside/outside classroom;
  - learner's empowerment to monitor and control learning processes.

- Source: van Lier, Leo. "Action-based Teaching, Autonomy and Identity." *Innovation in Language Learning and Teaching,* vol. 1, no.1 (2007): 46-65.

- **Handlungsorientierung bedeutet für die Lerner:**
  - Entscheidungen treffen beim Lernen;
  - Beziehungen herstellen zwischen Sprache und Lernprozess;
  - Beziehungen herstellen zwischen Wahrnehmen, Verstehen und Handeln;
  - Beziehungen herstellen zwischen dem Unterricht und der außerschulischen Welt
  - Den eigenen Lernprozess beobachten und kontrollieren können.

- Quelle: van Lier, Leo. "Action-based Teaching, Autonomy and Identity." *Innovation in Language Learning and Teaching,* vol. 1, no.1 (2007): 46-65. Deutsche Übersetzung: Gerhard Bach

Communicating in activity-designed learning contexts
Kommunikation in handlungsorientierten Lernkontexten

T: *Richard, where is your homework?*
S: *I couldn't do it. I was by my uncle and I come late at home.*
T: What time was it when you came home? When did you come home from your uncle's?
S: *At eight or so. At half past eight.*
T: *And what did you do at your uncle's?*
S: *We repaired the car.*
T: *Your uncle's car?*
S: *Yes. We had – hmm –* Probleme *– hmm – problems. We did not find a –* 'n Engländer, *an Englishman* (laughs) – so'n (mumbles, class laughs)
T: *Well, what you mean is a tool,* ein Werkzeug*,, for turning nuts ...* (makes gesture*). I think it's called a spanner. Did you find a spanner in the end?*
S: *No.*
T: *So you couldn't repair the car after all?*
S: *No, we couldn't. But we – hmm – tried long, till late in the night.*
T: *I see. And therefore you couldn't do your homework. Well, do it for tomorrow then, will you?*

Action-designed (language) learning is

- *experiential, contextual and authentic*
  erfahrungsbasiert, unmittelbar und authentisch
  ⇒ learning activities
- *interactive and autonomous*
  engagiert, interaktiv und autonom
  ⇒ communicative processes
- *learner and learning oriented*
  prozess-, lerner- und lernorientiert
  ⇒ task processing
- *product oriented / ergebnisorientiert*
  ⇒ results of classroom based learning activities
- *emancipatory / emanzipatorisch*
  ⇒ development of social competences
- *holistic / ganzheitlich*
  ⇒ the learner's personality and individuality

Source: Bach/Timm (2013): 17-18

Questions / comments / feedback?

CLIL – Principles

Gerhard Bach
CLIL Consultant
Universität Bremen

You can analyse the past, but you need to design the future. That is the difference between suffering the future and enjoying it.

Wir können die Vergangenheit analysieren, aber die Zukunft müssen wir entwerfen. Der Unterschied zwischen beiden ist, die Zukunft ertragen zu müssen oder sich ihrer erfreuen zu dürfen.

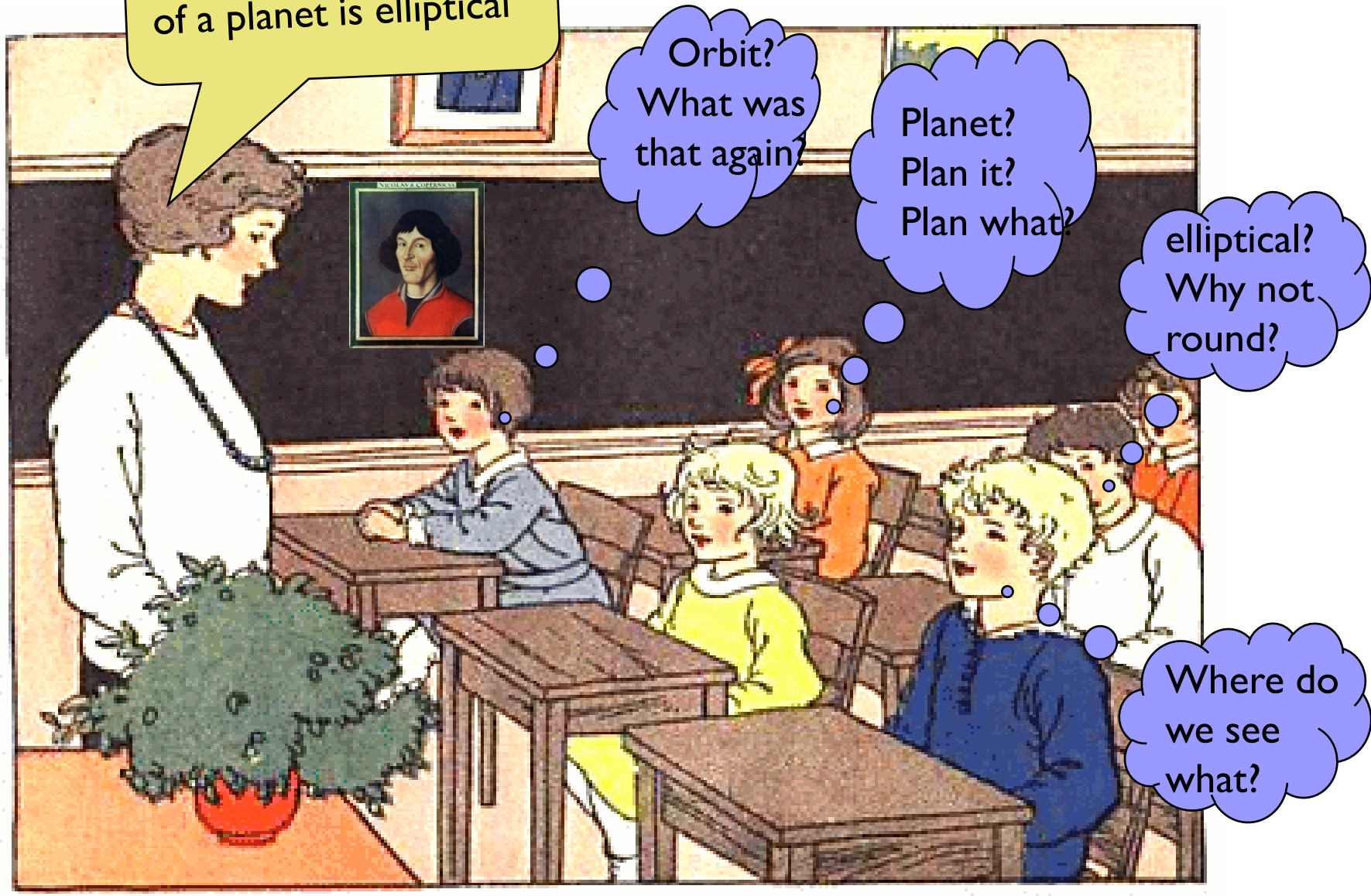
Edward de Bono

CLIL „very simply“ is / „Einfach gesagt“ ist CLIL

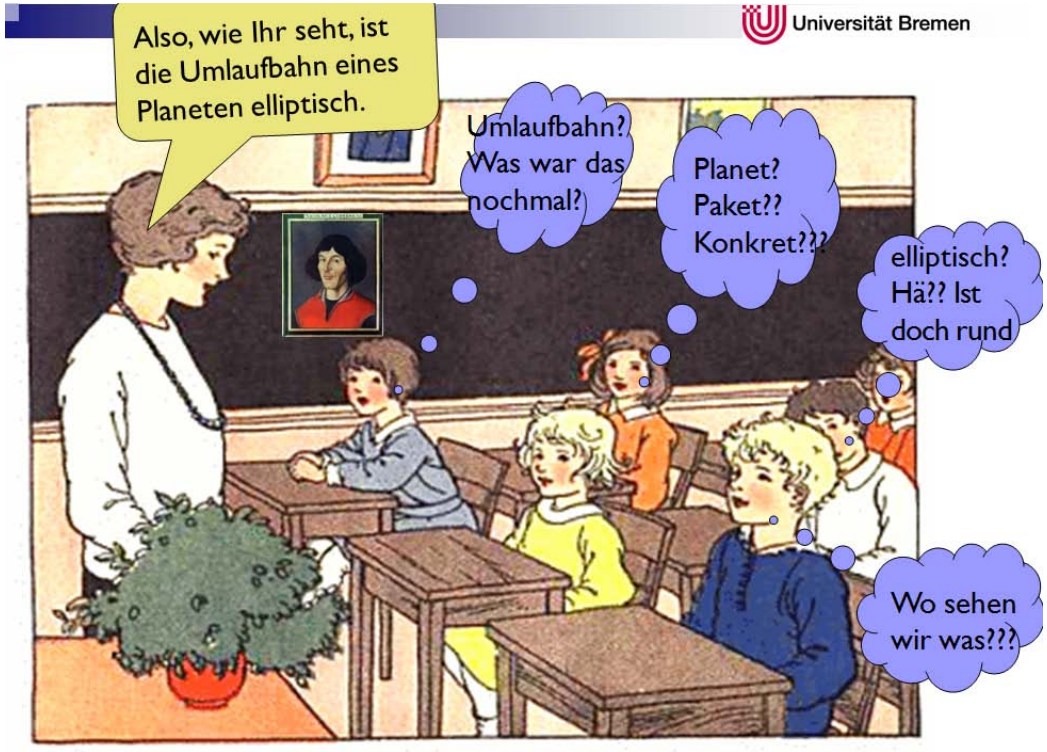
... ein Lehr- und Lernansatz mit doppeltem Fokus, bei dem die L1 und eine weitere Sprache in kommunikativen Settings eingesetzt werden, um Wissen und Kompetenzen sowohl im Inhaltsbereich als auch im sprachlichen Bereich zu fördern, mit Bezug zu vordefinierten Kompetenzstufen.

a dual-focused teaching and learning approach in which the L1 and an additional language are used in communicative settings for promoting both content mastery and language acquisition to predefined levels.

Quelle / Source: CCN – CLIL Cascade Network – 2009



CLIL – Curriculum: 4 Cs (broadly speaking)



- **C**ontent (c**o**ntext): topic / theme Inhalt / Thema
- **C**ommunication: language & interaction / Sprache & Interaktion
- **C**ognition: mental processing / mentale Verarbeitungsprozesse
- **C**ulture (c**o**mmunity): social environment Schule und Umwelt als soziale Lernorte

CLIL – komplexes Netzwerk / complex network

CLIL (= *Content and Language Integrated Learning*)
ist ein didaktisches Konzept, bei dem ein Sachfach, z.B. Kunst, Musik, Physik, Geschichte oder Sport, in einer Fremdsprache unterrichtet wird. Sprache und Inhalt werden integrativ gelernt. In der Auseinandersetzung mit authentischen Lernaufgaben, in denen Materialien und Inhalte der realen Welt bearbeitet werden, können die Lerner sowohl ihre fremdsprachliche Kompetenz erweitern als auch ein tiefer gehendes Verständnis der jeweiligen Inhalte erlangen. Der daraus resultierende **Mehrwert** ist in verschiedenen schulischen und außerschulischen Bereichen festzustellen. Sprachlich und inhaltlich integriertes Lernen in wirklichkeitsnahen Kontexten fördert darüber hinaus die interkulturelle Kompetenz.

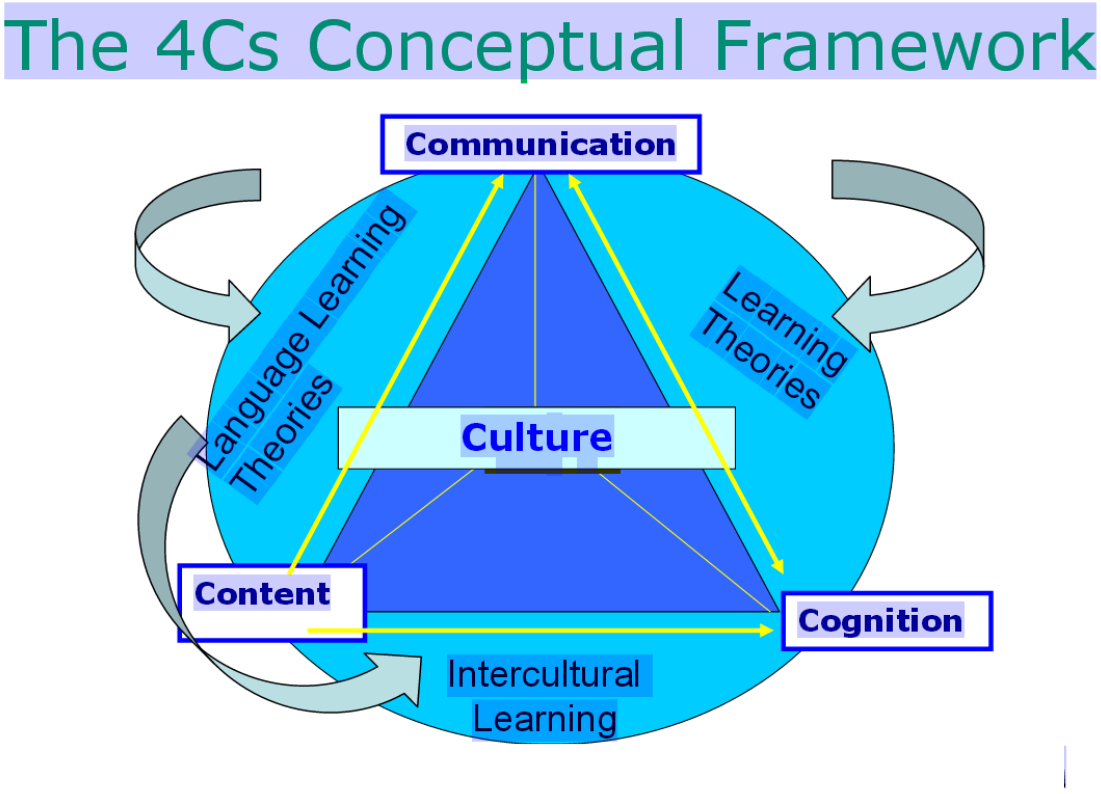
CLIL (= *Content and Language Integrated Learning*)
is an instructional concept in which specific subject-matter, such as Art, Music, Physics, History, or Physical Education, is taught in a language different from the mother tongue. Language and content are learned in an integrative manner. In working with authentic learning materials, the learners expand their language competence and, at the same time, gain a deeper understanding of the subject matter in question. The **added value** resulting from this dual approach can be found in different areas inside and outside of the school environment. In addition, content and language integrated learning in real-life and context-specific situations promotes the development of intercultural competence.

Quelle / Source: Gerhard Bach: „Bilingualer Unterricht: lernen – lehren – forschen." In: Bach/Niemeier (Hg.) *Bilingualer Unterricht: Grundlagen, Methoden, Praxis, Perspektiven*. 5. Auflage. Frankfurt: Lang (2010), pp. 5-22.

CLIL – komplexes Netzwerk / complex network
6 basic features / 6 grundlegende Elemente

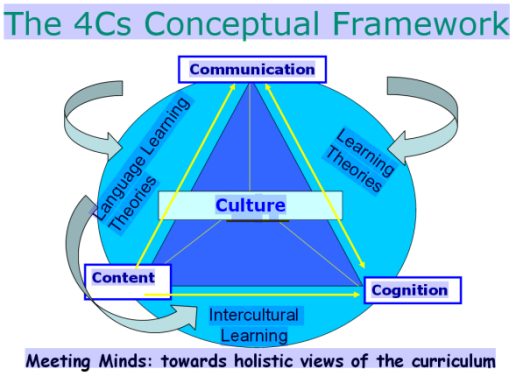
- *language learning =language use /*
  Sprache lernen = Sprache benutzen, um zu lernen
  using language to learn (not learning to use language)
- *contextualized language use / Sprache in realen Kontexten anwenden*
  focus on function of language (not focus on form)
- *situated language use / Sprache in konkreten Situationen anwenden*
  learner‘s locality (the „here and now“)
- *knowledge and concept formation / Wissenszuwachs und Konzeptbildung*
  general concepts („rain“) / scientific concepts („precipitation“)
- *communication and interaction /* Kommunikation und Interaktion
  inter-personal, culture-specific & cross-cultural
- *management of learning / selbstregulierendes Lernen*
  instructional environment, task/activity orientation, interdisciplinarity, self-access, language awareness

4 Cs – complex network (Coyle 2011)



Networking the 4 Cs – what is „learning“ in CLIL?

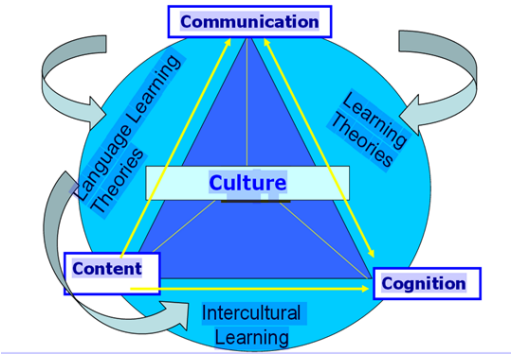
- A CLIL lesson
  - is not a language lesson
  - neither is it a subject lesson simply transmitted in a foreign language
- Instead, a CLIL lesson
  - combines elements of the 4 Cs in a dynamic manner
  - helps the learner to



- ... make progress in knowledge, skills and understanding related to specific topics in the curriculum [content]
- ... to use language to learn whilst learning to use language [communication]
- ... develop thinking skills and link concept formation, understanding and language [cognition]
- ... become familiar with alternative perspectives and values, which deepen awareness of otherness and self. [culture]

4 Cs – Netzwerk: „Was ist „Lernen“ in CLIL?

- CLIL-Unterricht ...
  - ist weder ein reiner Sprachunterricht,
  - noch ist er ein Fachunterricht, der nur in einer anderen Sprache stattfindet.
- CLIL-Unterricht ...
  - vernetzt die einzelnen Faktoren der 4 Cs und
  - unterstützt so den Lerner



- ... sein Wissen, seine Kompetenzen und sein Verständnis über konkrete Themen zu erweitern; (C1 content; auch context)
- dabei wendet er die fremde Sprache an, um Sachverhalte zu erlernen und sich mit anderen darüber auszutauschen; (C2 communication)
- so entwickelt er kognitive und sprachliche Fähigkeiten, mit denen er Konzepte bilden und erproben kann; (C3 cognition)
- zugleich macht er sich vertraut mit alternativen Sichtweisen und Werten, sowohl von sich selbst als auch von anderen. (C4 culture; auch community)

Networking the 4 Cs : promoting learning as activity

- A CLIL lesson
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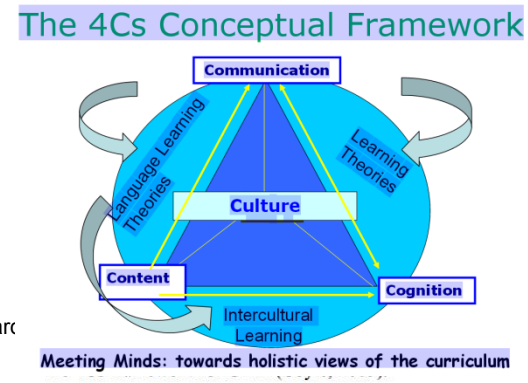
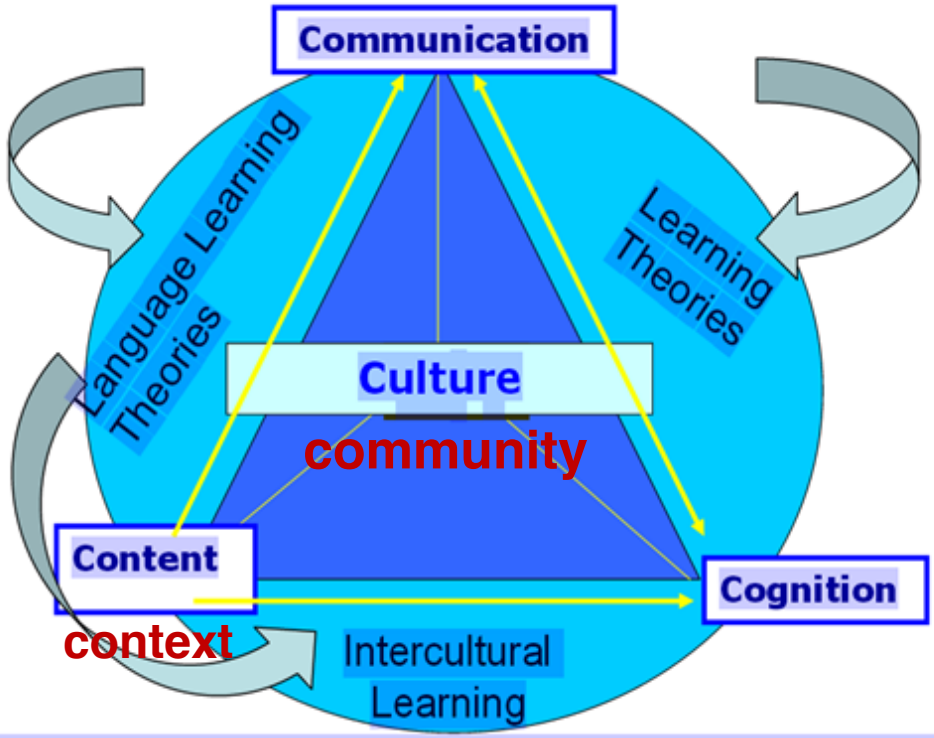


- ... make progress in knowledge, skills and understanding related to specific topics in the curriculum [content]
- ... use language to learn whilst learning to use language [communication]
- ... develop thinking skills and link concept formation, understanding and language [cognition]
- ... become familiar with alternative perspectives and values, which deepen awareness of otherness and self. [culture]

4 Cs – das dynamische Modell



Culture is the foundation for content, communication and cognition to build on

„Culture“ ist das Fundament, auf dem Inhalt, Kommunikation und Kognition aufbauen

CLIL – added value / Mehrwert

- fördert interkulturelle & kommunikative Kompetenz
- fördert multilingualen Interessen und Einstellungen
- eröffnet die Möglichkeit differenzierter Konzeptbildung
- intensiviert Kontakt zur Zielsprache
- erfordert keine zusätzlichen Unterrichtsstunden
- kooperiert mit anderen Fächer, ("fächerübergreifender„ Unterricht)
- bietet vielfältige Unterrichtsmethoden und Arbeitsformen (Mehrdimensionalität)
- erhöht die Motivation und das Selbst-vertrauen der Lerner, sowohl sprachlich als auch fachlich

Quelle: http://ec.europa.eu/education/languages/language-teaching/doc236_de.htm)

- builds intercultural knowledge and understanding as well as intercultural communication skills
- develops multilingual interests and attitudes
- provides opportunities to study content through different perspectives
- allows learners more contact with the target language
- does not require extra teaching hours
- complements other subjects rather than competes with them
- diversifies methods and forms of classroom practice
- increases learners' motivation and confidence in both the language and the subject being taught

Source: http://ec.europa.eu/education/languages/language-teaching/doc236_en.htm

Need more information on CLIL and the 4Cs?
Wo finde ich mehr über CLIL und die 4 Cs?

CLIL – Literatur/e
Fok/cus: 4 Cs – Methoden / teaching methods

- http://www.goethe.de/ins/it/de/lp/lhr/mat/clil/7578029.html

http://www.playingclil.eu/this-is-the-playingclil-ebook/

CLIL – Literatur/e
Fok/cus: Einführung & Beispiele / Introduction and examples ελληνιστί

ΕΓΧΕΙΡΙΔΙΟ CLIL

1. Einführung in CLIL
2. Warum / wozu CLIL?
3. Die 5 Cs
4. Der CLIL-Ansatz
5. Unterrichtsbeispiele
6. CLIL – Evaluierung
7. Videos

http://www.languages.dk/clil4u/index.html#Guidebook

ΕΓΧΕΙΡΙΔΙΟ CLIL

It‘s time to talk CLIL

CLIL – Principles

Gerhard Bach
CLIL Consultant
Universität Bremen

schools: future labs

CLIL – the 4 Cs:
C1 - Content

content /communication /cognition / culture

Gerhard Bach
CLIL Consultant
(University of Bremen, Germany)

4 Cs – review: inter-connections

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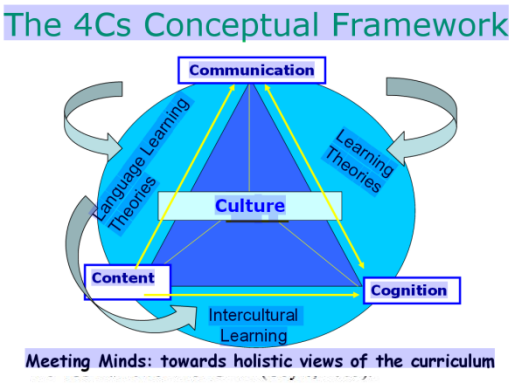

- ... make progress in knowledge, skills and understanding related to specific topics in the curriculum [content]
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- ... develop thinking skills which link concept formation, understanding and language [cognition]
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C1 - content

- Are all subjects taught in school equally useful for CLIL?
- Which are the advantages of learning content matter in another language?
- Is all content equally suitable for learning?
- What are the special requirements concerning MINT subjects?
- How can input become comprehensible when the focus needs to be on content and language at the same time?

- What's your opinion on this?
  Take notes on one of these questions for a 3 minute presentation.

CLIL – C1 – Content

Guiding principle: Using language to learn

- It is content which determines the learning route.
- If it were language, imagine how limiting this would be. Example: learners have not yet been introduced to the past tense. Try to have a conversation with someone using only the present tense in authentic settings - it is almost impossible.
- If the content requires use of the past tense and learners have not studied this, then CLIL lessons will enable learners to access the language needed in the defined context in different ways. This may initially be in the form of using key phrases in the past tense without studying the whole tense formation at this stage.
- The emphasis is always on accessibility of language in order to learn.

Source: Coyle (2011)

CLIL – C1 – Content

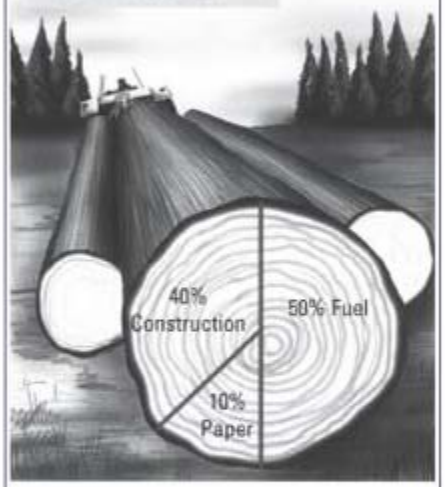
Guiding principle: Using language to learn content.

Language lesson or CLIL lesson?

3

Source 3

World wood usage



Activity 1

Look at Source 3. Draw bar graphs or a divided bar graph to show world wood usage.

4

3 ***Read this paragraph about the economy of Sweden, and put all the verbs in the passive.***

In the south of Sweden farmers grow cereals, potatoes and sugar beet, and rear cattle and pigs. The Swedes exploit the northern forests for their timber. They can export timber products indefinitely because they have managed the forests well and not destroyed them with uncontrolled cutting. They mine iron inside the Arctic Circle. They established the first mines in the 1890s, and the high salaries attracted workers to move to this inhospitable region. But they have recently had to close many mines because of a fall in demand. Competition from developing countries has damaged the once prosperous steel and shipbuilding industries, but industrialists manufacture a variety of profitable goods, including aircraft, cars, domestic equipment and textiles.

Source: Bentley (2010): 9

CLIL – C1 – Content

Guiding principle: Using language to learn subject matter.

- Examples:
- Language teachers developing a content type approach to a theme – for example “House and Home”, and carrying out a comparative study between house and home in an African country and in one’s own country & culture.
- Tandem project which involves both language teachers and subject teachers planning together. Example: a study on “Glocalization – the global world and local concerns” (language and geo-politics / social studies).
- Cross-curricular project on “Peace” in a foreign language, involving different approaches such as scientific, geographical, historical, political, economic, literary and artistic.
- → We will investigate a concrete example later.

CLIL – C1 – Content

Guiding principle: Using language to learn subject matter.
Lesson planning

Defining the topic

- What will I teach?
- What will my students learn?
- What are my teaching aims/objectives?
- What are the learning outcomes?
- What are the assessment criteria?

→ Step 1: All of these in terms of content, communication and cognition

→ Step 2: Focus on content

→ Step 3: concretization – see lesson planning template

schools: future labs

CLIL – the 4 Cs:
C1 - Content

content /communication /cognition / culture

Gerhard Bach
CLIL Consultant
(University of Bremen, Germany)

schools: future labs

CLIL – the 4 Cs:
C2 - BICS & CALP

content /**communication** /cognition / culture

Gerhard Bach
CLIL Consultant
(University of Bremen, Germany)

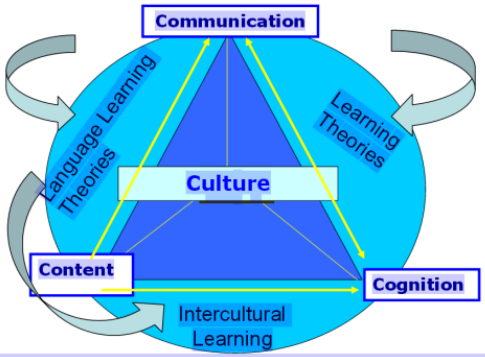
„Sprache im Unterricht ist wie ein Werkzeug, das man gebraucht, während man es noch schmiedet.“
(W. Butzkamm)

„Language in the classroom is like a tool that you use while you are still forging it.“

CLIL – C2

- **C**ontent / subject matter / theme / topic
- **C**ommunication /interaction
- **C**ognition / thinking
- **C**ulture / citizenship

The 4Cs Conceptual Framework



Meeting Minds: towards holistic views of the curriculum

C2 – communication / interaction: typical questions / typische Fragen

How can we ensure high output of communication between the learners and their instructor and among learners themselves, even when the foreign language is still “foreign” to some?
Wie können wir ein hohes Maß an Kommunikation zwischen Schülern und Lehrern und zwischen Schülern untereinander erreichen, selbst dann, wenn die Fremdsprache für die Schüler noch “fremd” ist?

- What are the specific communicative tools learners need in CLIL? How do we help them attain these?
  Welche besonderen sprachlichen Hilfsmittel benötigen die CLIL-Schüler? Wie helfen wir ihnen, sich diese anzueignen?
- CLIL – the double focus of language-as-interaction:
  „learning to use language“ (focus on form / „accuracy“)
  „using language to learn“ (focus on content / „meaning“)
  CLIL – der doppelte Fokus von „Sprache als Interaktion“:
  „die Sprache lernen (Fokus auf sprachlicher Form / Korrektheit)
  „die Sprache benutzen, um zu lernen“ (Fokus auf Inhalt und Bedeutung)

focus on form (as part of language instruction) or focus on meaning (as part of CLIL)

- **Focus on form**

- Learners consciously memorize language rules and functions, and (re-)produce them in a learning environment.
- Schüler erlernen bewusst sprachliche Regeln und (re-)produzieren sie in einem Lernkontext

- **Focus on meaning (Bedeutung)**

- Learners are exposed to meaningful language input and use language spontaneously in meaning-focused interaction.
- Schüler erhalten sprachlichen Input in bedeutsamen Situationen und interagieren sprachlich spontan in entsprechenden Kontexten.

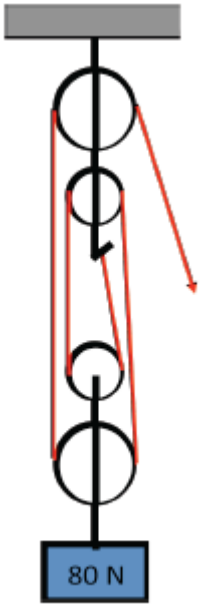
C2 – communication / interaction
doppelter Fokus

- CLIL – the double focus of language-as-interaction:
  „learning to use language“ (focus on form / „accuracy“)
  „using language to learn“ (focus on content / „meaning“)

  CLIL – der doppelte Fokus von „Sprache als Interaktion“:
  „die Sprache lernen (Fokus auf sprachlicher Form / Korrektheit)
  „die Sprache benutzen, um zu lernen“ (Fokus auf Inhalt und Bedeutung)

- Brainstorm on „double focus“: an example from the subject you teach
  Brainstorm über den „doppelten Fokus: ein Beispiel aus Ihrem Fachunterricht

C2 – BICS & CALP: Welche Sprache braucht das Lernen? Beispiel Physik: Flaschenzug / Pulley



- Schüler:

  „Am Flaschenzug mach‘ ich es so: Ich zähle die Seilstücke rechts und links von der losen Rolle und teile das Gewicht durch diese Zahl. Das ist dann die Zugkraft am Flaschenzug.“

- Fachbuch:

  „Hängt beim Flaschenzug die Last an *n* tragenden Seilabschnitten, so ist die am Seilende erforderliche Zugkraft F gleich dem *n*-ten Teil der Gewichtskraft der Last“

Quelle: adaptiert aus Josef Leisen: „Wie wird Sprache im Fachunterricht gelernt?“
http://sprachsensiblerfachunterricht.de/

The complexity of learner language: BICS & CALP

- BICS
  Basic interpersonal communicative skills
  "Alltagssprache"
- BICS typically refers to concrete, observable things, people, and actions, and is typically supported by a considerable amount of contextual information.
- BICS = grundlegende Kommunikationsfähigkeiten, also Sprachkompetenz in der Alltagskommunikation und im zwischenmenschlichen Bereich

- CALP
  Cognitive academic language proficiency
  „Fachsprache"
- CALP refers to cognitively demanding language (e.g. abstract nouns and complex syntax) as a tool for critical thinking.
- CALP = unterrichtsbezogene kognitive Sprachkenntnisse und Sprachkompetenz in der Fachsprache

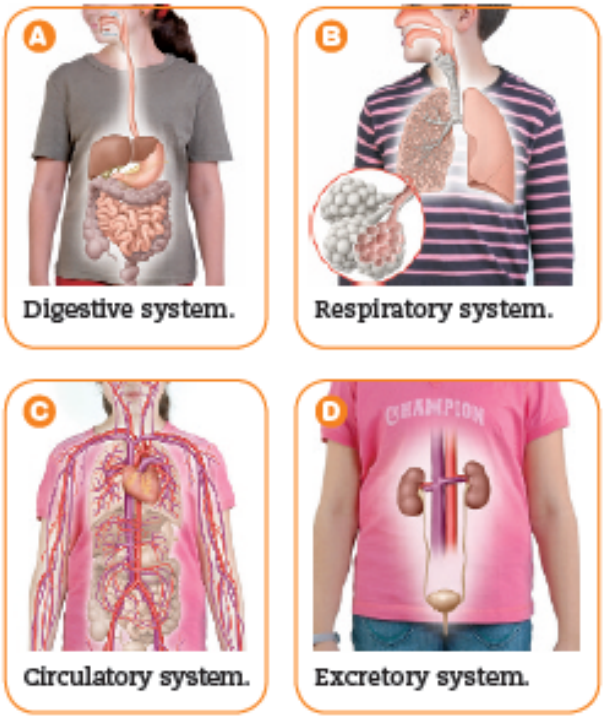
The complexity of CALP in CLIL

- academic language typically includes an increased variety in the vocabulary, such as the use of rare and/or abstract nouns;
- Syntactic and lexical variety which is cognitively demanding.
- In addition, the specific content forces the user/learner to be very precise in describing what they are learning / doing.

Nutrition

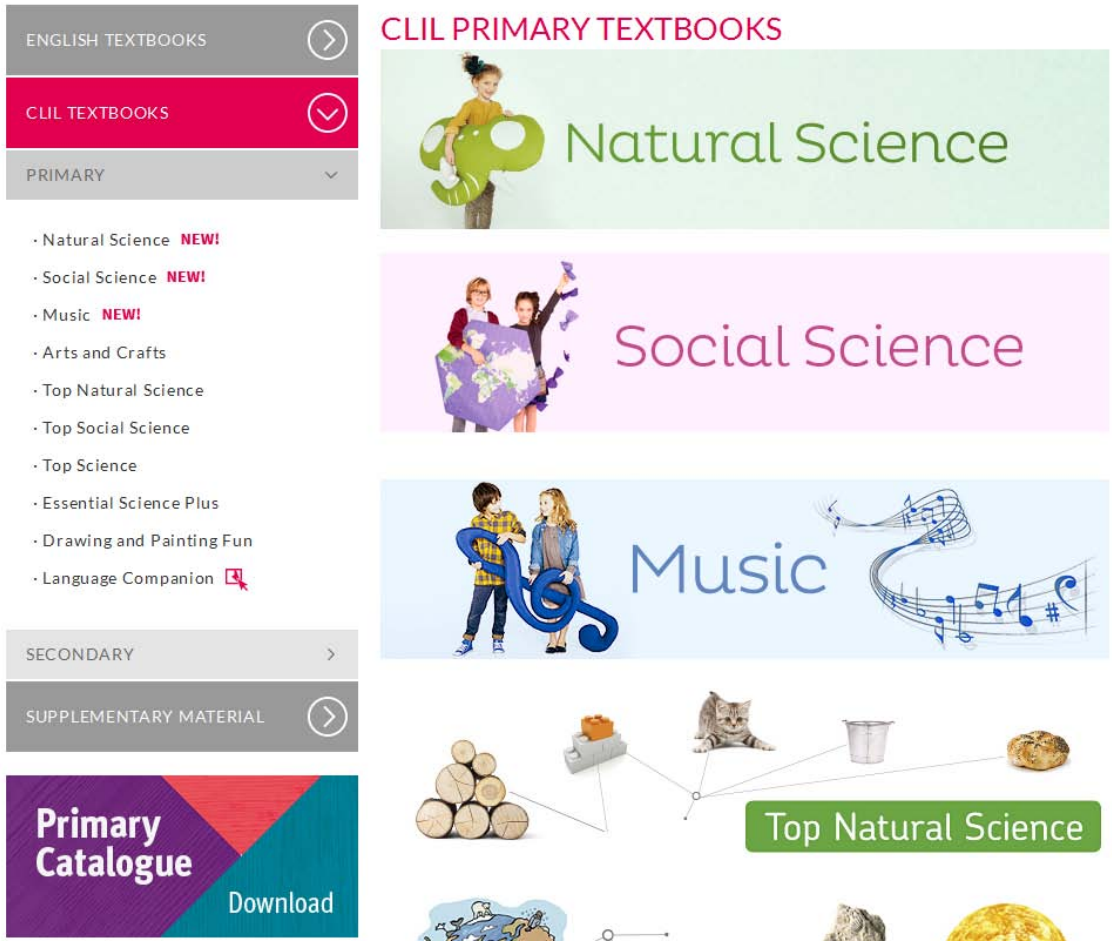
Nutrition is a combination of processes which supply our body with the substances and the energy we need to live. There are four processes involved in nutrition:

- **Digestion**. This involves obtaining **nutrients** from food for our body to use. Digestion takes place in the **digestive system**.
- **Respiration**. This involves obtaining the **oxygen** we need to live, and releasing **carbon dioxide**. Respiration takes place in the **respiratory system**.
- **Circulation**. This involves transporting **nutrients**, **oxygen** and **waste products** throughout the body. Circulation takes place in the **circulatory system**.
- **Excretion**. This involves **eliminating waste** produced in our body. Excretion takes place in the **excretory system**.



Source: Essential Science Plus. Level 6 Primary
http://www.richmondelt.es/w/catalogue/clil-textbooks/primary-1/

CLIL-English: Resource for Teachers



Source: http://www.richmondelt.es/w/catalogue/clil-textbooks/primary-1/

BICS & CALP in CLIL
general and subject-specific vocabluary

turbine generator renewable transmission	heat light sound	some tall use many	magnetic field conducting wires power plant
subject-specific voc. for talking about electricity production CALP	general voc. used in science and used in everyday situations CALP & BICS	often used words in general language and used in subject-specific language BICS & CALP	*compounds* used when when we talk about certain concepts CALP

Some of these words are easier to understand and use than others, but CLIL learners have to know all of them to follow instructions, to work on science questions, to prepare presentations, etc.

BICS & CALP in CLIL
handlungsbezogenes und fachbezogenes Vokabular

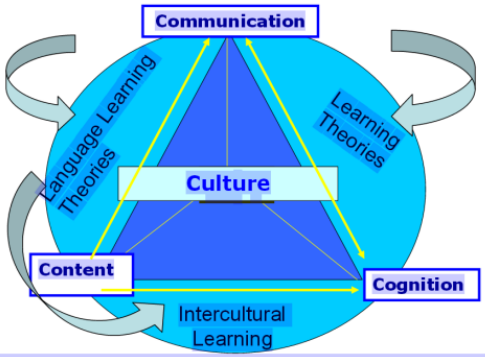
Zirkel Umfang Durchmesser	Mittelpunkt Zahl Größe	ungefähr drum herum viele	steiler Anstieg plötzlicher Abfall Gesamtergebnis
Fachspezifischer Wortschatz zur Beschreibung der Teile eines Kreises. CALP	Handlungssprachlicher Wortschatz, Anwendung sowohl im Alltag als auch im Fachdiskurs CALP & BICS	Häufig verwendete Wörter, primär alltagssprachlich, aber auch im Fachdiskurs BICS (& CALP)	*Kollokationen*, zur Beschreibung spezifischer Konzepte oder Prozesse CALP

Manche dieser Wörter sind einfacher zu verstehen und zu lernen als andere. CLIL-Lerner müssen sie alle anwenden können, um Aufgaben im naturwissenschaftlichen Bereich lösen zu können.

CLIL – C2

- **C**ontent / subject matter / theme / topic
- **C**ommunication /interaction
- **C**ognition / thinking
- **C**ulture / citizenship

The 4Cs Conceptual Framework



Meeting Minds: towards holistic views of the curriculum

Activating CLIL: C2 - Communication

- When second-language learners are involved in communication activities in the classroom
- that focus on the authentic exchange of information,
- and invite the expression of critical thinking skills,
- four areas of communicative competence are stimulated:
  - accuracy
  - coherence
  - appropriateness
  - effectiveness

- Thus the role of the teacher in CLIL is to
  - create contexts which enhance both content knowledge and language growth
  - provide communicative settings integrating content and language

- Wenn L2-Schüler im Unterricht in kommunikative Aktivitäten eingebunden werden,
- deren Fokus auf dem authentischen Informationsaustausch liegt
- und kritisches Denken anregt,
- werden vier Bereiche von kommunikativer Kompetenz stimuliert:
  - Genauigkeit
  - Stimmigkeit (Kohärenz)
  - Angemessenheit
  - Wirksamkeit

- Aufgabe der Lehrkraft ist es also,
  - Lernkontexte zu schaffen, die Wissenszuwachs ebenso fördern wie sprachlichen Zuwachs,
  - Kommunikationsanlässe zu schaffen, die Inhalt und Sprache miteinander vernetzen.

Questions? Comments? Fragen? Kommentare?

schools: future labs

CLIL – the 4 Cs:
C2 - BICS & CALP

content /**communication** /cognition / culture

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schools: future labs

CLIL – C3 – cognition
LOTS & HOTS

content / communication / **cognition** / culture

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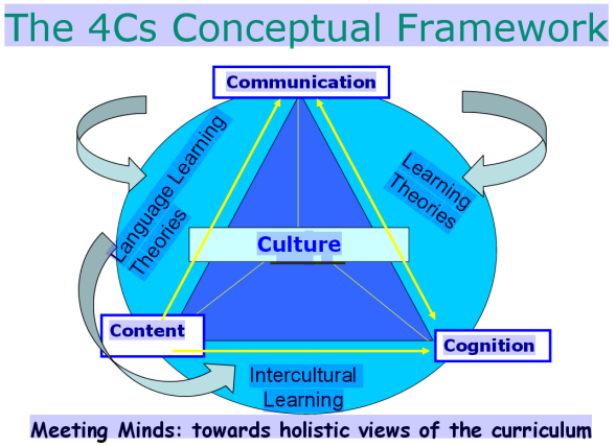
CLIL – C3

- **C**ontent / subject matter / theme / topic
- **C**ommunication /interaction
- **C**ognition / thinking
- **C**ulture / citizenship



C3 – cognition : typical questions / typische Fragen

- Welche Bedeutung hat eine hohe bzw. niedrige Komplexität bei Denkprozessen?
- Sind kognitive Prozesse in verschiedenen Fächern unterschiedlich ausgeprägt (z. B. naturwiss. / sozialwiss. Fächer)?
- Welche Hilfsmittel können wir nutzen, um Denkprozesse auf den verschiedenen Kompetenzstufen anzuregen und sprachlich zu verarbeiten?
- Welche Art von Aufgaben müssen wir entwerfen, um komplexere Denkprozesse zu fördern – und welche Konsequenzen hat das für C1 (content) und C2 (communication)?

- How does CLIL account for lower and higher thinking skills?
- Are cognitive processes subject specific and thus differrent in individual subject matter areas (science, social science, art, music)?
- In which way do subject-specific materials need to be structured so as to ensure the development or promotion of cognitive thinking skills? Are there tools we can use for this?
- What kind of activities do we need to generate in order to support complex thinking processes?

C3 – kognitive Kompetenzen entwickeln

Aufgabe: ordnen Sie den Fragen „kognitive Anforderungen“ zu

1. Benenne 6 Früchte auf dem Bild.
2. Finde etwas, das nicht rund ist und auch nicht eckig.
3. Gruppiere die Nahrungsmittel in „Obst“ und „Gemüse“
4. Kann man diese Sachen auch in Deinem Land anbauen. Warum? Warum nicht?
5. Schreibe ein Rezept für eine Gemüsesuppe oder einen Obstsalat

Kognitive Anforderung:

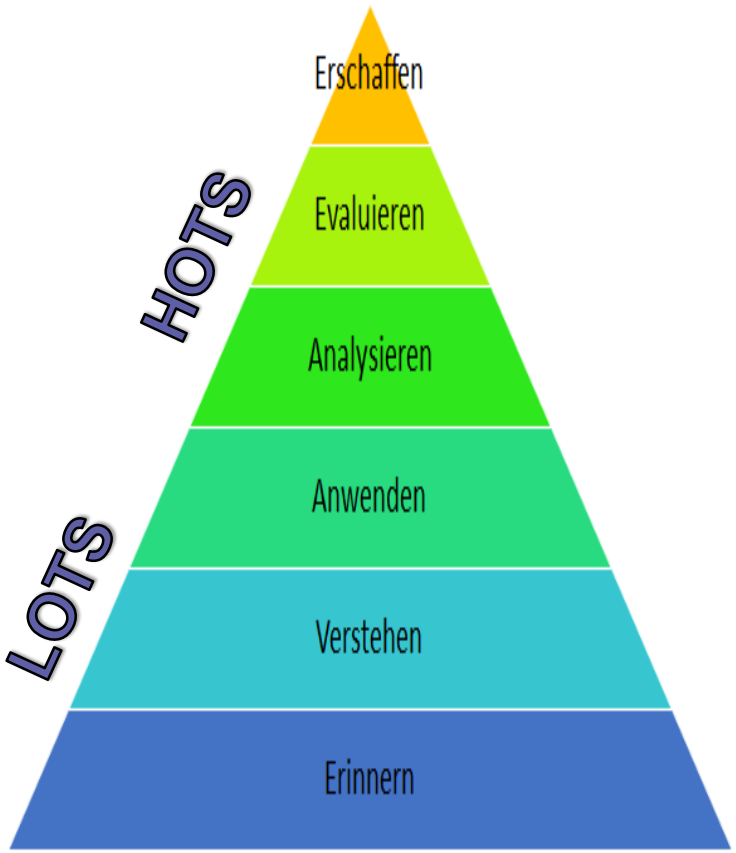
klassifizieren
vergleichen
kontrastieren
erschaffen
definieren
benennen
unterscheiden
evaluieren
hypothetisieren
identifizieren
ordnen
voraussagen
argumentieren
erinnern
synthetisieren

C3 – kognitive Kompetenzen entwickeln

Aufgabe: ordnen Sie den Fragen „kognitive Anforderungen“ zu

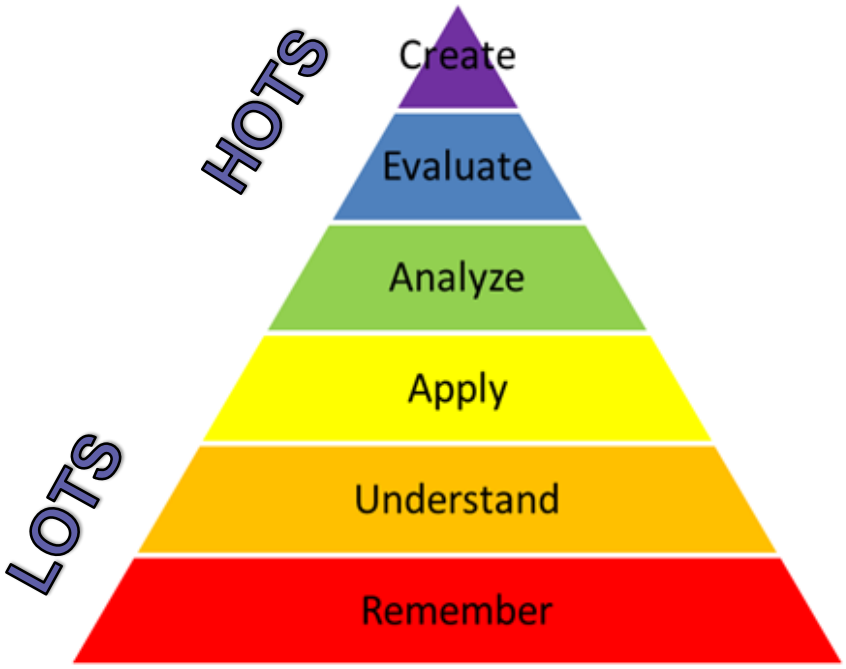
1.	Benenne 6 Früchte auf dem Bild.	1.	benennen, erinnern, identifizieren
2.	Finde etwas, das nicht rund ist und auch nicht eckig.	2.	vergleichen, kontrastieren, identifizieren
3.	Gruppiere die Nahrungsmittel in „Obst“ und „Gemüse“	3.	unterscheiden, klassifizieren
4.	Kann man diese Sachen auch in Deinem Land anbauen. Warum? Warum nicht?	4.	voraussagen, argumentieren
5.	Schreibe ein Rezept für eine Gemüsesuppe oder einen Obstsalat	5.	synthetisieren, erschaffen

Kognitive Prozesse - Blooms Taxonomie (1974)
6 Stufen von LOTS zu HOTS (lower / higher order thinking skills)



- Wie kann man die Auswirkung von Zeit auf Raum in einem Modell sichtbar machen?
- Wie hat die Erforschung des Weltraums unser Weltbild verändert?
- Welche Verbindung besteht zwischen Zeit und Raum?
- Wie lange braucht die Raumfähre, um die Raumstation zu erreichen?
- Warum können Enten fliegen? Warum können Raumkapseln fliegen?
- Wann begann das Zeitalter der Raumfahrt?

Ordering cognition: Bloom‘s taxonomy from lower to higher order thinking skills



Bloom‘s Taxonomy (revised)

- How would you illustrate the impact of time on space?
- How has the exploration of space impacted our world?
- What links are there between time and space?
- How long will it take the space capsule to reach the docking station?
- Why can ducks fly? Why can space capsules fly?
- When did the space age begin?

C3 – kognitive Kompetenzen & Beispiele

Kognitive Kompetenz	Kognitionsfördernde Aktivitäten	Lernaufgaben – Beispiele
erinnern	wiederholen, auswendig lernen	Wiederhole die Regel „Wärme entsteht, wenn “ „Ein Dreieck ist gleichschenklig, wenn
identifizieren	bezeichnen, lokalisieren	Benenne drei Arten der Herstellung von Elektrizität.
ordnen	organisieren, Reihenfolge bilden	Erstelle eine Zeitschiene über die Entwicklung des Autos.
hierarchisieren	anordnen, zuordnen, Rangfolge erstellen	Erstelle eine Rangordnung für die 6 Arten von Mobilität.
definieren	erklären, darstellen,	Erkläre „Kapillaraktivität“, definiere „Geschwindigkeit“.
klassifizieren	nummerieren, gruppieren, zuordnen	gruppiere Fischsorten nach Häufigkeit des Vorkommens im Mittelmeer.
voraussagen	Erwartungen äußern, Ergebnisse antizipieren	Was passiert, wenn wir Substanz (a) mit Substanz (b) mischen?
Hypothesen bilden	Theorie erstellen	Wenn wir ein Blatt Papier flach auf eine mit Wasser gefüllte Wanne legen, dann kann folgendes passieren: (1.) (2.) usw.
Begründungen entwickeln	argumentieren, schlussfolgern	Der Benzinverbauch wird sinken, wenn
evaluieren	bewerten, beurteilen	Kommentiere die Argumente für / gegen den Einsatz von Atomenergie

CLIL – C3 – cognitive skills terms & examples

cognitive skill	classroom activity	example
remembering	recall, recognize, relate	reciting a verse from a poem
identifying	label, locate, match	name three types of electricity production
ordering	organize, sequence	Make a timeline for the development of atomic energy
ranking	order, put, place	Put the statements about atomic energy in order of their historical development
defining	explain, outline, show	Explain „capillary“, define „velocity“
classifying	number, group, order	group „sour“ items (acidity)
predicting	anticipate, expect	What will happen when we mix substances (a) (b)
hypothesizing	formulate a theory	If we , the consequence may be
reasoning	argue, conclude	The efficiency of fuel comsumption can be improved when
evaluating / creating	assess, comment on, judge, rate	Read a text on the defense of atomic energy and comment on the logic of its arguments

C3 – Kognitive Prozesse - Blooms Taxonomie (1974)
6 Stufen von LOTS zu HOTS (lower / higher order thinking skills)
Verben zur Formulierung von Aufgaben nach Ruth Meyer: www.arbowis.ch

erinnern	verstehen	anwenden	analysieren	evaluieren	erschaffen
nennen aufzählen anführen aussagen ausführen benennen bezeichnen erzählen berichten beschreiben zeichnen skizzieren darstellen schreiben schildern	interpretieren erklären erläutern formulieren übertragen übersetzen deuten bestimmen identifizieren definieren darlegen ableiten demonstrieren zusammen- fassen herausstellen	anwenden erstellen ermitteln herausfinden lösen durchführen berechnen ausfüllen eintragen drucken planen erarbeiten verwenden bearbeiten speichern sichern formatieren	isolieren auswählen entnehmen sortieren vergleichen einteilen einordnen bestimmen herausstellen analysieren vergleichen gegenüber- stellen unter- scheiden untersuchen testen	entscheiden beurteilen bewerten sortieren klassifizieren bestimmen begründen auswählen prüfen entscheiden Stellung nehmen evaluieren	entwerfen zuordnen verbinden tabellieren konzipieren zusammen- stellen in Beziehung setzen entwerfen entwickeln ableiten ordnen beziehen koordinieren

Bloom's Taxonomy Verbs

When developing curriculum for your class, keep this list nearby. This will help you determine the level of response you are anticipating from your students.

Knowledge	Count, Define, Describe, Draw, Find, Identify, Label, List, Match, Name, Quote, Recall, Recite, Sequence, Tell, Write
Comprehension	Conclude, Demonstrate, Discuss, Explain, Generalize, Identify, Illustrate, Interpret, Paraphrase, Predict, Report, Restate, Review, Summarize, Tell
Application	Apply, Change, Choose, Compute, Dramatize, Interview, Prepare, Produce, Role-play, Select, Show, Transfer, Use
Analysis	Analyze, Characterize, Classify, Compare, Contrast, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Outline, Relate, Research, Separate,
Synthesis	Compose, Construct, Create, Design, Develop, Integrate, Invent, Make, Organize, Perform, Plan, Produce, Propose, Rewrite
Evaluation	Appraise, Argue, Assess, Choose, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritize, Prove, Rank, Rate, Select,

www.teach-nology.com/worksheets/time-savers/bloom/

C3 – kognitive Kompetenzen

Aufgabe: Erstelle je 3 Fragen zu LOTS and HOTS

Task: Write three questions for LOTS and HOTS

LOTS:
1

2

3

HOTS:
1

2

3

Erinnern – Verstehen – Anwenden –
Analysieren – Evaluieren – Erschaffen

C3 – kognitive Kompetenzen
Erstelle je 3 Fragen/Aufgaben zu LOTS and HOTS

Erinnern – Verstehen – Anwenden –
Analysieren – Evaluieren – Erschaffen

LOTS:

1. Welche Landschaftsformen sind hier zu erkennen? (Erinnern)
2. Erkläre das Klima, das hier vorherrscht (Verstehen)
3. Finde heraus, welchen Einfluss der Park auf die Luftqualität hat? (anwenden)

HOTS:

1. Warum sind hier wohl so viele hohe Gebäude um den Park herum? (analysieren)
2. Inwieweit ist dieser Ort anders als der, wo Du wohnst? (evaluieren)
3. Wenn Du ein Stadtplaner wärest, was würdest Du verändern, aus welchen Gründen und mit welchen Mitteln? (erschaffen)

CLIL – C3 – cognitive skills

Task: Write three questions for LOTS and HOTS

Lower order questions:

1. What landscape features can you see? 8remember)
2. What kind of climate does this area have? (understand)
3. What is the impact of the park on the air quality? (apply)

Higher order questions:

1. Why do you think are there so many tall building here? (analyze)
2. In what ways is this place different from where you live? (analyze, evaluate)
3. If you were a town planner, what would you change and why? (create)

Blooms Taxonomie = Strategiehilfe für Unterrichtsplanung
= strategic aid for lesson planning

- Stufen = hierarchische Ordnung der Aufgaben = Schwierigkeitsgrad der zu vermittelnden Inhalte reflektieren
- Stufen = helfen zur Beschreibung der Kompetenzen (auch Einzelstunden übergreifend)
- Stufen = Unterrichtssequenzen und ihre Vernetzung optimieren.

- levels = hierarchical ordering of tasks/activities = reflext on level of difficulty of conten to be taught
- levels = helps description of competences (individual lesson and larger modules)
- levels = help optimize networking of lesson sequences.

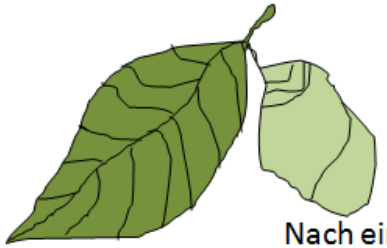
CLIL – C3 – kognitive Kompetenzen

Beispiel Grundschule: Erinnern, Verstehen

http://eplc.ecml.at/Modules/4Transformationdelanature/Lepapillon/tabid/2386/language/de-DE/Default.aspx

Das Ei wird auf einem Blatt abgelegt.

Nach etwa 5 Tagen schlüpft die Raupe. Sie frisst und wächst.



Nach einigen Wochen wird aus der Raupe eine Puppe.

Nach einigen Wochen öffnet sich die Puppe und der erwachsene Schmetterling schlüpft und fliegt weg.

CLIL – C3 – kognitive Kompetenzen

Beispiel Grundschule: Verstehen Analysieren

http://eplc.ecml.at/Modules/4Transformationdelanature/Lepapillon/tabid/2386/language/de-DE/Default.aspx

DER SCHMETTERLING

Name_____

Male ein Bild zu jedem Stadium im Lebenszyklus des Schmetterlings.

1. Der weibliche Schmetterling legt **Eier** auf einem Blatt ab. Die Eier bleiben solange auf dem Blatt liegen, bis die Larven schlüpfen.

2. Aus den Eiern schlüpfen **Larven** oder **Raupen**.

3. Die Raupe verpuppt sich in einem Kokon und schläft ein. Sie wird eine **Puppe**.

4. Die **Puppe** öffnet sich und der **Schmetterling** kommt heraus.

5. Der weibliche **Schmetterling** findet ein Männchen und legt Eier ab.

CLIL – C3 – kognitive Kompetenzen

Beispiel Grundschule: Verstehen , analysieren und reproduzieren

http://eplc.ecml.at/Modules/4Transformationdelanature/Lepapillon/tabid/2386/language/de-DE/Default.aspx

DER SCHMETTERLING

Name_____

Vervollständige die Sätze über den Entwicklungszyklus des Schmetterlings.

1. Der Schmetterling hat _____ Entwicklungsstadien.
2. Der weibliche Schmetterling legt _____ auf ein Blatt.
3. Aus dem Ei schlüpft eine _____.
4. Nach ein paar Wochen verpuppt sich die _____ und schläft ein.
5. Einige Wochen später öffnet sich die _____ und ein wunderschöner _____ schlüpft heraus und _____ fort.

CLIL – C3 – kognitive Kompetenzen

Beispiel Grundschule: Anwenden, Analysieren

http://eplc.ecml.at/Modules/4Transformationdelanature/Lepapillon/tabid/2386/language/de-DE/Default.aspx

Beobachtungsprotokoll

Ich habe einen Schmetterling gesehen:
am (Datum) _____.
Wo : _____
Farbe: _____
Name des Schmetterlings: _____

Wie war das Wetter zu der Zeit: (kreuze an)

 ☐ ☐  ☐

Mal deinen Schmetterling oder kleb ein Foto auf!

CLIL – C3 – kognitive Kompetenzen

Beispiel Grundschule: Evaluieren, (Erschaffen)

http://eplc.ecml.at/Modules/4Transformationdelanature/Lepapillon/tabid/2386/language/de-DE/Default.aspx

Schmetterling - Flatterding

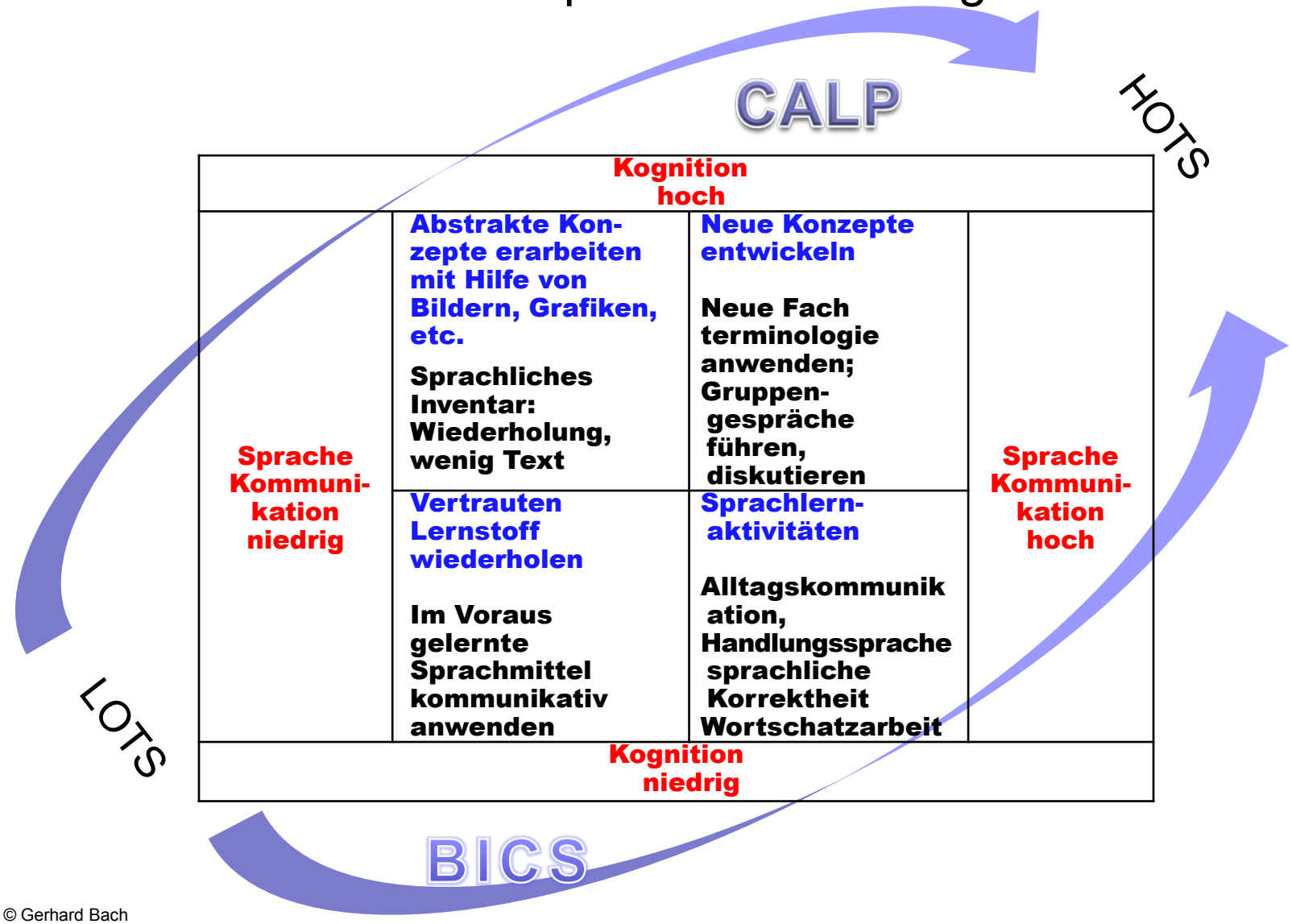
Schmetterling – Flatterding,
flattert still – wie er will,
fliegt ganz hoch – höher noch,
schwebt im Kreis – keiner weiß.

Fliegt er weg – ins Versteck?
Bleibt er da – mir ganz nah?
Dreht er sich – sieht er mich?
Kommt er bald – macht er halt?

Schmetterling – Flatterding!
Jetzt, hurra – bleibt er da,
setzt sich her – freut mich sehr,
schüttelt sich – kitzelt mich,
bleibt dann still – wie ich will.
Schmetterling – schönes Ding.

http://www.lehrerweb.at/gs/projekte/be/proj1/gedicht.htm

C2 → C3 – Kompetenzentwicklung Lerner



CLIL – C3 – Cognition

schools: future labs

CLIL – C3 – cognition
LOTS & HOTS

content / communication / **cognition** / culture

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schools: future labs

CLIL – Assessment

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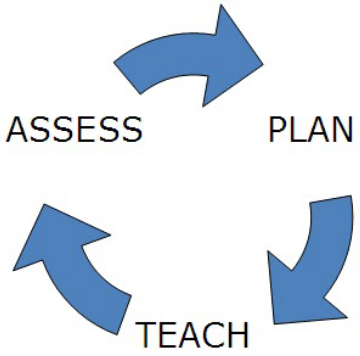
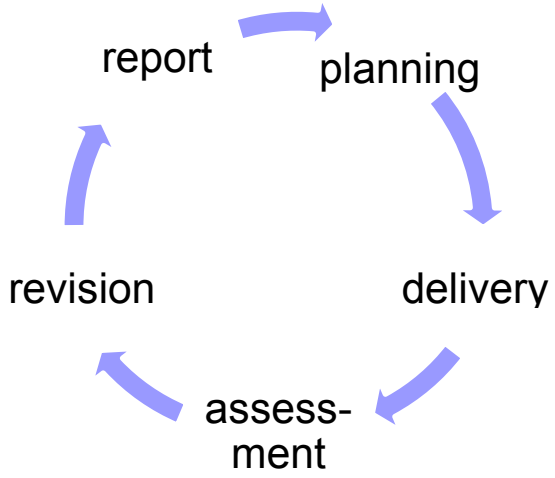
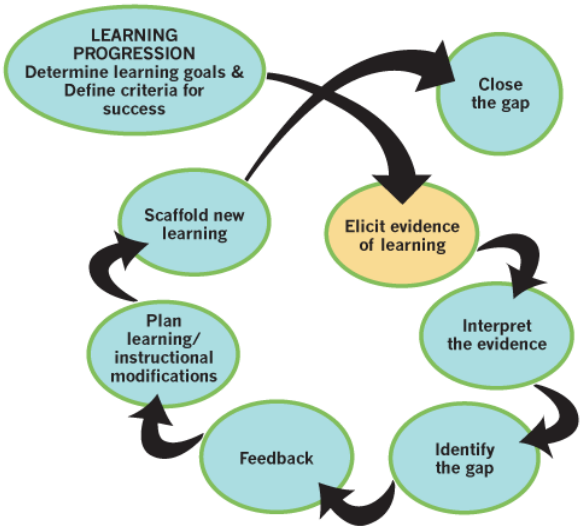
Assessment cycle: models & complexity







CLIL Assessment: criteria / context

Overall agreement among assessment experts:

- we assess learning / growth / increase of knowledge based on pre-defined criteria
  ►formative assessment: undertaken continuously during an educational process
- we evaluate results based on specific pre-defined criteria
  ►summative assessment: undertaken at specific points during an educational process

Formative Assessment: 4 types

Type	Purpose
Performance assessment • criteria-based • formal or informal • individual or collaborative	• Find out what has been learned • Observe and record stages of learners' progress • Collect data / samples of work done
Peer assessment • criteria-based • learning outcomes defined	• Learners assess each other • Learners give each other feedback • Learners reflect on standards set by themselves and others
Self-assessment • criteria-based • learning outcomes defined)	• Learners assess their own work („can-do" statements) • Learners reflect on standards set by themselves
Portfolio assessment • criteria-based • defined at beginning of course	• Find out what overall has been learned • Select samples of good practice to record achievement

„A combination of self-centred learning for portfolio work, accompanied by formative assessment by the teacher and peer tutoring has proved highly efficient in the CLIL classroom."
www.univie.ac.at/Anglistik/Views_0703.pdf

Performance Assessment: example 1 (CLIL4U Guide Book)

CONTENT

Criteria	4 - excellent	3 - good	2 - satisfactory	1 - not satisfactory
Use of topic-specific vocabulary in written work	All new words used appropriately in simple sentences	15 new words used appropriately in simple sentences	10 new words used appropriately in simple sentences	Fewer than 5 new words used appropriately in simple sentences
Identification of relevant information from different websites	Relevant information identified from at least three different websites	Relevant information identified from at least two different websites	Relevant information identified from at least one website	More than one website accessed but no relevant information identified

Performance Assessment: example 2 (CLIL4U Guide Book)

COOPERATION

Criteria	4 - excellent	3 - good	2 - satisfactory	1 - not satisfactory
Ability to cooperate in a group task	Student consistently performs well as a group member, showing initiative, organising task completion, and supporting all other group members	Student often performs well as a group member, showing initiative, organising task ompletion, and supporting all other group members	Student performs well as a group member at times, showing initiative, organising task completion, and supporting all other group members	Student acknowledges membership of the group but does little to help achieve group success

Performance Assessment: example 3 (CLIL4U Guide Book)

CREATIVITY

Criteria	4 - excellent	3 - good	2 - satisfactory	1 - not satisfactory
Originality in preparation and execution of diagrams and other visual materials	Student has at least three original design ideas and is able to prepare the resulting visuals	Student has at least two original design ideas and is able to prepare the resulting visuals	Student has at least one original design ideas and is able to prepare the resulting visual	Student makes some contribution to designing and preparing visuals

CLIL matrix

- CLIL Matrix

- The CLIL matrix:
  - Developing teacher competences
  - Self-assessment tool for teachers and trainers

CLIL – Matrix: 16 contact zones

http://archive.ecml.at/mtp2/CLILmatrix/EN/qMain.html

CLIL Indicators:

- Content - Culture
- Language - Culture
- Integration - Culture
- Learning - Culture

- Content - Communication
- Language - Communication
- Integration - Communication
- Learning - Communication

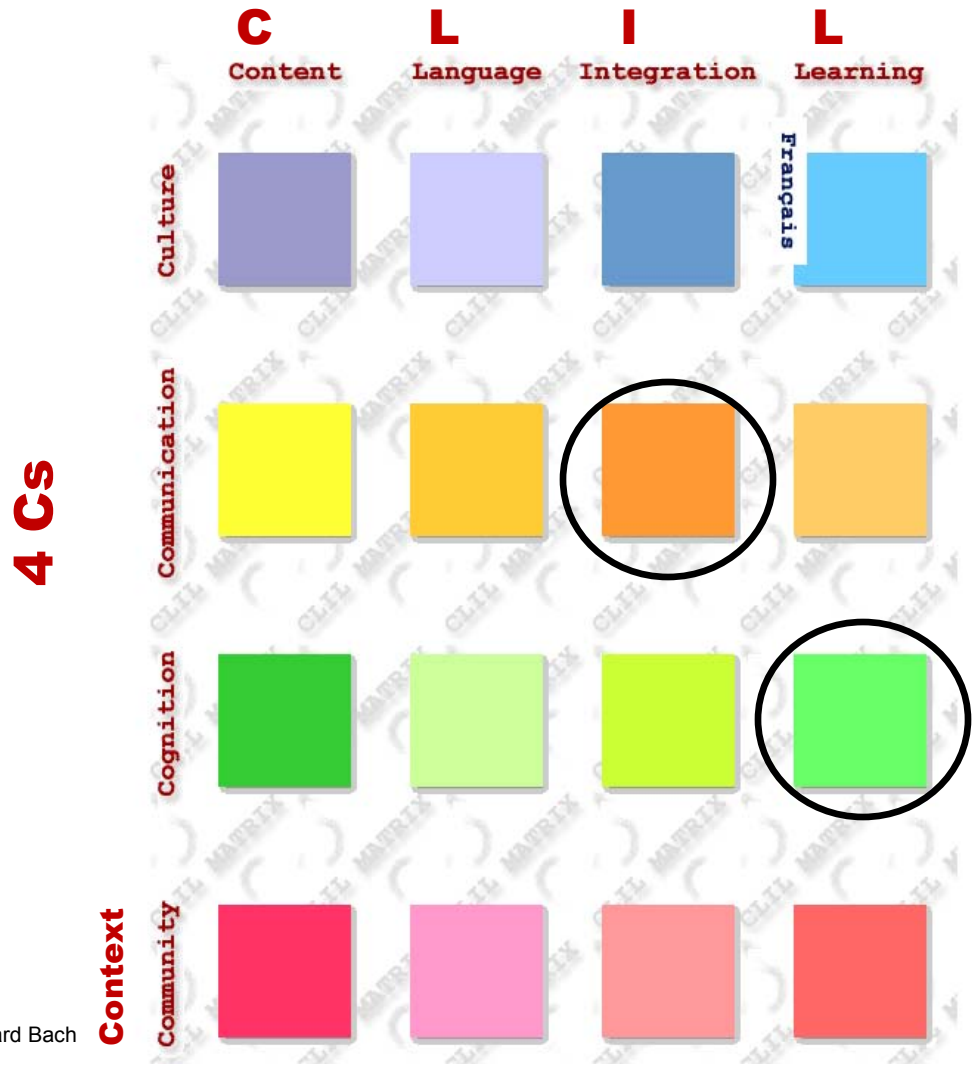
- Content - Cognition
- Language - Cognition
- Integration - Cognition
- Learning - Cognition

- Content - Community
- Language - Community
- Integration - Community
- Learning - Community

Mehrwert / Added value

CLIL – Assessing teacher competences

http://archive.ecml.at/mtp2/CLILmatrix/EN/qMain.html



- The **CLIL-Matrix** consists of 16 areas of competence of CLIL teachers.
- Each field lists specific competences by combining „CLIL“ and the „4Cs“.
- All competences necessary for planning and conducting authentic CLIL lessons are included in the matrix.
- CLIL-Matrix = Self-assessment instrument

CLIL–Matrix – Teacher Competences Example 1

Integration - Communication

1. The tasks that I use with my students lead to interactional communication

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

2. In my classroom, students interact with each other and the teacher

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

3. As a teacher, I use project work

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

4. In my classroom, I also encourage students to use transactional communication in order to promote skills they need in their professional life

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

CLIL –Matrix – Teacher Competences – example 2

Learning - Cognition

1. In my CLIL teaching the focus on language and on content are equally important

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

2. I provide sufficient language support to help students fulfil their tasks

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

3. I support different student learning styles in my CLIL classroom

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

4. I pay attention to how vocabulary and concepts are acquired

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

5. In my CLIL teaching, I have developed specific strategies in terms of learning content and language in order to support the cognitive needs of individual students

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

6. I help learners to create activities that will help them to understand the content

○ very much ○ much ○ somewhat ○ not much ○ hardly at all

It‘s time to talk CLIL

Worksheets

schools: future labs

CLIL – Assessment

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Module M1: Task-based Learning

Worksheet 1: Lernerprofil “Lisa”
German version

Beispiel: Lisas Eintrag im Lerntagebuch – pädagogisch betrachtet:
Was sagen die Einträge über Lisa aus?

- **Ich mag Englisch, weil wir da raus dürfen und englische Spiele spielen und englische Lieder singen. Am liebsten mag ich im Buch die Geschichten lesen. Wenn ich lese, schau ich die Bilder an und dann kann ich die Wörter besser sagen. Wenn ich schreibe, denke ich auch an die Bilder. Ich finde es lustig, wenn ich “how are you” zu meiner Lehrerin sage auf dem Pausenhof und sie macht große Augen. Manchmal spreche ich lustige Wörter nur so für mich. Blöd find’ ich Rechnen auf Englisch, die Zahlen hören sich so komisch an: “four*teen*”, “fif*teen*” und so weiter.**

- 1
- 2
- 3
- 4
- 5

11

Module M1: Task-based Learning

Worksheet 1: Learner Profile “Lisa”
English version

Lisa‘s entry – the educator‘s view
What do these statements say about Lisa as a learner?

- I love English because we get to go outside and play “English” games and sing songs. I like reading the stories in our book best. When I read I look at the pictures and this helps me say the words better. When we write I also think of the pictures. I think it’s funny when I say “hello, how are you” in English to my teacher in the hallway and she looks at me in surprise. I sometimes say funny words to myself. I hate doing math in English, the numbers sound crazy: “four*teen*”, “fif*teen*” and so on.

- 1
- 2
- 3
- 4
- 5

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Module M1: Task-based Learning

Worksheet 2: Learner profile "Richard"

Example: Richard and the „Englisman " (EFL)
Strategies employed in activity-designed Learning Contexts

T:	Richard, where is your homework?	**Activity-designed (language) learning is …**
S:	*I couldn't do it. I was by my uncle and I come late at home.*	1
T:	What time was it when you came home? When did you come home from your uncle's?	
S:	*At eight or so. At half past eight.*	2
T:	And what did you do at your uncle's?	
S:	*We repaired the car.*	
T:	Your uncle's car?	
S:	*Yes. We had – hmm – Probleme – hmm – problems. We did not find a – 'n Engländer, an Englishman* (lacht) – *so'n* (class laughs)	3
T:	Well, what you mean is a tool, "ein Werkzeug", for turning nuts … (makes gesture with hands). I think it's called a spanner. Did you find a spanner in the end?	4
S:	*No.*	
T:	So you couldn't repair the car after all?	
S:	*No, we couldn't. But we – hmm – tried long, till late in the night.*	5
T:	I see. And therefore you couldn't do your homework. Well, do it for tomorrow then, will you? 	6

Module M1: Task-based Learning

Worksheet 3

Task:
Design a task-based scenario. Subject-matter area: your choice. Learner age: 10
The scenario needs to reflect the characteristics listed below.
Be prepared to explain your scenario by providing concrete answers to these questions:
Source: https://www.teachingenglish.org.uk/article/criteria-identifying-tasks-tbl

1. How does the activity engage learners' interest?

2. Is there a primary focus on meaning?

3. Is there a goal or an outcome?

4. Is success judged in terms of outcome?

5. Is completion a priority?

6. Does the activity relate to real world activities?

Module M2: CLIL

Worksheet 4

Compare the brief (narrow) and the broad (extensive) definition of CLIL.
What is the advantage of a brief definition over a broad one?
What is the advantage of a broad definition over a brief one?
To what extent are the 4 Cs recognizable in each?

Definition	Comments
CLIL is "a dual-focused educational approach in which an additional language is used for the learning and teaching of content and language with the objective of promoting both content and language mastery to pre-defined levels" (Frigols-Martín et al. 2011)	
"CLIL is an instructional concept in which specific subject-matter, such as Art, Music, Physics, History, or Physical Education, is taught in a language different from the mother tongue. Language and content are learned in an integrative manner. In working with authentic learning materials, the learners expand their language competence and, at the same time, gain a deeper understanding of the subject matter in question. The added value resulting from this dual approach can be found in different areas inside and outside of the school environment. In addition, content and language integrated learning in real-life and context-specific situations promotes the development of intercultural competence." (Bach 2013)	

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Module M2: CLIL – Worksheet 5 and Handout
Handout BICS / CALP / LOTS / HOTS
BICS: Basic Interpersonal Communicative Skills
Those skills needed for everyday conversational talk. Examples are: greetings, stating likes and dislikes, describing the weather. ... Tasks associated with BICS are usually less demanding. Cognitive processes linked to BICS include: identifying specific information, naming objects, matching and sorting objects into sets.
CALP: Cognitive Academic Language Proficiency
This is the language competence required for studying curricular subjects in a non-native language. CALP refers to the language of academic learning. The language learned is cognitively demanding and often impersonal, e.g. listening to lectures on abstract topics, writing essays. ... Cognitive processes linked to CALP include: justifying opinions, forming hypotheses and evaluating evidence.
LOTS: Lower order Thinking Skills
Skills such as remembering, understanding and applying new subject knowledge. Learners develop LOTS for example when they recognize new vocabulary, classify, give examples and compare objects. Lower-order thinking can involve the use of basic or advanced vocabulary
HOTS: Higher Order Thinking Skills
Skills such as analyzing, evaluating and creative thinking. These develop reasoning skills, critical judgment and producing new ideas, e.g. How can we change the design of the building to make it more energy efficient? Higher-order thinking involves the use of advanced language.

Bloom's Taxonomy Verbs

When developing curriculum for your class, keep this list nearby. This will help you determine the level of response you are anticipating from your students.

Knowledge	Count, Define, Describe, Draw, Find, Identify, Label, List, Match, Name, Quote, Recall, Recite, Sequence, Tell, Write
Comprehension	Conclude, Demonstrate, Discuss, Explain, Generalize, Identify, Illustrate, Interpret, Paraphrase, Predict, Report, Restate, Review, Summarize, Tell
Application	Apply, Change, Choose, Compute, Dramatize, Interview, Prepare, Produce, Role-play, Select, Show, Transfer, Use
Analysis	Analyze, Characterize, Classify, Compare, Contrast, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Outline, Relate, Research, Separate,
Synthesis	Compose, Construct, Create, Design, Develop, Integrate, Invent, Make, Organize, Perform, Plan, Produce, Propose, Rewrite
Evaluation	Appraise, Argue, Assess, Choose, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritize, Prove, Rank, Rate, Select,

Powered by: The Online Teacher Resource (www.teach-nology.com)

Module 2: CLIL

Worksheet 5:
Communicative and cognitive processing
(Use Handout above as a reference tool)

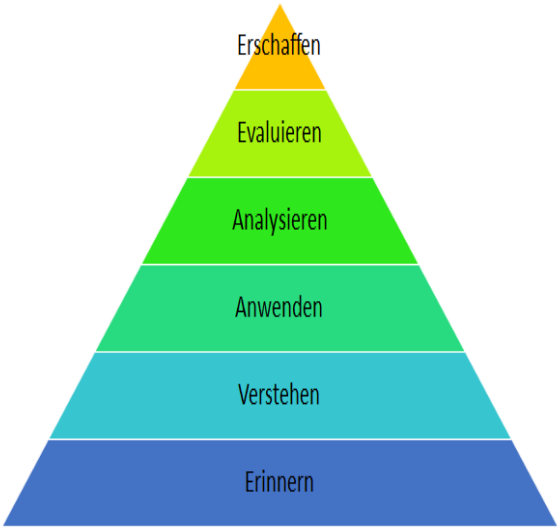
Basic questions:

- How do we structure specific content, so that communicative & cognitive competences can develop?
- In what way does high or low complexity impact thinking processes?
- What tools can we use to encourage learners to engage in thinking processes at different levels of competence and process these in appropriate language?

Example Topic „Food“. Elementary grade level. Age approx. 10 years.

Task for learners: (do this first!)

1. Name six fruits in the picture.
2. Find something that is not round and not square.
3. Group these food items into „fruits“ and „vegetables“.
4. Do you know other kinds of fruit or vegetable?
5. Can any of these be grown in your area, too? Why? If not, why not?
6. Write a recipe for a vegetable soup or a fruit salad.



Teacher task: (now do this!)

Assign each of the above tasks to one category on the Bloom taxonomy and give reasons for your choice; your choice needs to reflect the complexity of the task in question

Remember – understand – apply – analyze – evaluate – create
(bottom to top)

Module 2: CLIL
Worksheet 6

Example: advanced CLIL, secondary level. Year 4 in foreign language. Subject matter area Geography – Urban space as living space.

Teacher task: Develop questions for a worksheet based on this picture:
(Use Handout above as a reference tool)

LOTS (lower order thinking skills) :

1 Remember:

2 Understand:

3 Apply:

HOTS (higher order thinking skills):

1 Analyze:

2 Evaluate:

3 Create:

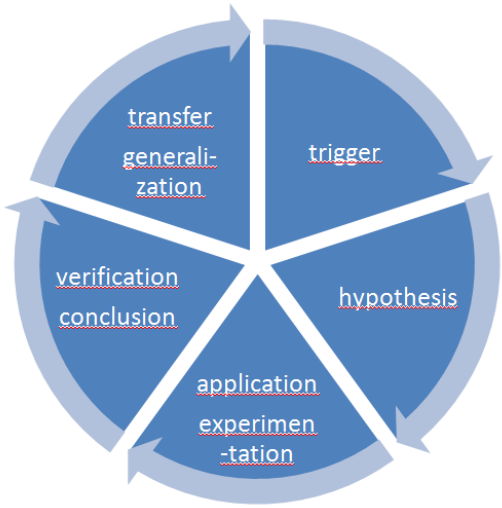
Module 2: CLIL
Worksheet 7

Task:
Trainees analyze a STEM lesson plan based on C2 and C3 domain characteristics.
The lesson plan is provided as a separate pdf-document.
It is available only in German.

Spanish Trainers:
The topic is widely used in CLIL, and should be available in Spanish, too.

Module 3: STEM
Worksheet 8

The design cycle

7-step STEM „exploratory design cycle"	5-step *s:fl* CLIL-STEM cycle
	
Source: http://www.middleweb.com/4328/12-steps-to-great-stem-lessons/	Source: *s.fl* lesson planning template

Task 1:
Trainers propose a topic.
Trainees design a task using the 5-step *s:fl* CLIL-STEM cycle.

Task 2 (alternative or additional):
Trainers select a model lesson plan.
Trainees analyze the plan using the 5-step *s:fl* CLIL-STEM cycle

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Module 3: STEM
Worksheet 9

Trainers provide the CLIL-STEM lesson plan: “Polygons and Polyhedra”
(provided as a separate pdf-document)

Trainees analyze it for its STEM potential answering the questions listed below.
Trainees will be able to pinpoint items in the lesson plan to underscore their analysis.

1. Does the task / experiment present a real and compelling task challenge?
2. How will students relate to the task?
3. Does it allow for multiple acceptable and creative solutions?
4. Does it integrate important STEM content in an age-appropriate manner?
5. Is the design cycle used as an approach to solve the task?
6. Does the approach reflect a student-centered, hands-on teaching and learning experience?
7. Do the results lead to the design and creation of a technique, technology, or prototype?
8. Does it engage students in purposeful teamwork?
9. Is there a clear focus on problem solving (testing a hypothesis, its solution, and the evaluation of its results)?
10. How does it involve students in communicating their design, experiment, and results in oral and written form, appropriate to their L2 competence level?

(Source: Anne Jolly. Adapted for *s:fl* from:
http://www.stem-by-design.com/how-to-analyze-a-lesson-for-stem-potential/)

Module 4: Lesson Planning
Worksheet 10

Task: Plan a CLIL-STEM lesson

In the planning process, you can use as a general guideline the **Planning Inventory** provided below (Source: adapted from *TKT Course CLIL Module, p.* 31).

What are my teaching aims? (= objectives)

1. What will learners know and be able to do at the end of the lesson which they didn't know or couldn't do before the lesson? (= outcomes)
2. What subject content will the learners revisit and what will be new?
3. What communication will take place? (BICS / CALP)
4. Which thinking and learning skills will be developed? (LOTS / HOTS)
5. Which tasks / experiments will learners be involved in?
6. What scaffolding is provided to make learning more effective?
7. Which classroom management activities are planned?
8. What language support will be needed for communication of content, thinking and learning? (4Cs dynamic model)
9. Which materials and resources will be provided to support the task / experiments?
10. Which generalization / transfer possibilities are made available?
11. How will learning processes and outcomes be assessed?
12. How will teaching processes and outcomes be assessed?

Since STEM is clearly output-oriented as well as competence-oriented, the objectives specified in the lesson plan are competence-based. They are formulated as "can-do"-statements. "Can-do"-statements are formulated in two areas – knowledge and skills: "The students will know ...", "The students will be able to ... ".

Note:
The "Lesson planning template" and "Assessment Criteria Checklist" are provided as separate documents.

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Module 5: Assessment
Worksheet 11

Task: Trainees will study the observation checklist and discuss its potential for professional improvements with peers (plenary). Cross-referencing to the “Assessment Checklist” is encouraged.

Note: The Observation Checklist is provided as a separate document.