

Educational Standards in Geography for the Intermediate School Certificate

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Editor:

Deutsche Gesellschaft für Geographie (DGfG)

German Association for Geography

As the umbrella organization for the

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Foreword

The establishment of Educational Standards for every discipline is of major significance with regard to quality assurance and the development of the discipline's content. The Permanent Conference of the Ministers for Education and the Arts of the federal states of Germany (Kultusministerkonferenz, KMK) has taken on this task for some subjects, but not for geography. Academics, lecturers in geography education and geography teachers, however, recognize that there is a need to develop such standards for the subject of geography in order to secure and improve the quality of the educational process for the subject in schools. These standards present a common nationwide foundation for the curriculum, and will position geography in terms of the politics of the discipline. The German Association for Geography (DGfG) has taken the initiative to establish these standards for geographic education. This brochure presents the results of its consultations, and all of the subsidiary geographical associations have agreed to these standards.

In response to international comparative studies, the KMK has placed a special emphasis on the development and implementation of national Educational Standards. These Educational Standards define the competencies that students should possess upon completion of a specific phase of their education; thus they are a crucial element of quality assurance. They are general standards and not minimum standards.

Up to now the KMK has supervised the development of standards for German, mathematics and the first foreign language learned as well as biology, chemistry and physics. While it was initially planned to develop standards for all subjects, in the autumn of 2004 it became apparent that the KMK would not commission standards for any further subjects in the foreseeable future because of the high costs involved. As a result the DGfG decided to develop standards for geography on its own initiative and to present these to the KMK and the cultural authorities in the federal states.

The Association for Geographical Education (HGD) set up a working group early in 2005 to develop a draft version. It used the so-called Klieme-Expertise as well as existing geographical documents (International Charter of Geographical Education, Curriculum 2000+, Basic Curriculum) and made use of insights from the debate among lecturers in teaching methods, geography teachers and academic geographers. The interim results were presented and discussed at two conferences.

At the same time talks were held with the KMK. By mid-November 2005 the first draft version was ready and was approved in its basic structures by the committee of the HGD and on the 3rd of December by the committee of the DGfG. It was then presented for further discussion. A number of committed geography teachers and lecturers in teaching methods as well as academic geographers made significant contributions. This version was revised several times. In February 2006 a summit meeting of the HGD and the VDSG (Association of German School Geographers) took place, where most of the final editing was carried out. The executive committee of the VDSG confirmed the final version on 18th March 2006, followed by the general committee of the VDSG on 14th May 2006. The final version was sent to the KMK, the 16 Ministries of Education and the Arts and a number of influential educational scientists. Geography was thus the first subject to develop national standards for the Intermediate School Certificate on its own initiative in co-operation with teachers, lecturers in teaching methods and academics.

The implementation of the standards involves several steps: curricula and exam questions should be adapted to the Educational Standards. Furthermore, the standards will be included in teacher training and further education as well as in the development of schools and teaching. A new element of the system is the empirical testing of the extent to which competences are actually attained at the intended point in time. Because of the high costs and the limited capacities of the Institute for the Development of Quality in the Educational System (IQB) at the Humboldt University in Berlin, the development of comparative exercises and actual testing are only planned for the core subjects in the foreseeable future. The IQB will validate the standards presented by the KMK, make them more precise and standardise them. Thus, the Educational Standards remain open for the further development of discourse between educators involved in academic geography, geographical teaching methods and geography in the schools.

The following must be considered with regard to adapting curricula to the standards: Educational standards describe the target level to be achieved by a specific school certificate. They focus attention on cumulative learning, i.e., learning achievements built up over the long term (output). Curricula describe and structure the way to attain this objective (input). In Germany, curricula and outline plans that describe learning goals and the material to be learned systematically and in the order in which they should be achieved, will continue to exist alongside the standards. The compatibility of the curricula with the Educational Standards must be examined in each federal state and relevant timetables must be taken into account.

The next steps for geography consist of the formulation of sample exercises to make the standards more specific. Furthermore, competence models must be designed that will clarify in what age group and under what circumstances the individual competences are to be developed.

We are very pleased with the high level of consensus and the positive reception of these Educational Standards for Geography in all aspects of our subject, and also with the positive response from the Ministries for Education in all the federal states.

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The national Educational Standards can be downloaded as PDF files from the websites of the geography associations (e.g., www.geographie.de/hgd).

1 Geography's contribution to education

Geographically and geoscientifically relevant phenomena and processes such as globalisation, climatic change, earthquakes, flooding and storms, as well as population change, migration, disparities and conflicts over resources, shape many aspects of our lives and our societies on planet Earth.

Dealing with these complex developments calls for adaptation of previous behaviour and strategies on the basis of sound knowledge, judgement and problem-solving competence, e.g., in the areas of environmental protection, risk assessment, urban and regional planning, water supply issues, economic development and developmental policy co-operation. Because the dynamics of these processes stem from the interactions between natural, physical geographical conditions and human activities, these qualifications can be developed especially through the combination of natural science and social science education. It is in this very area that geography's special potential lies.

Education in the natural sciences furthers the perception and understanding of natural phenomena; at the same time it examines the specific methods used in the natural sciences, their applications and their limitations. Education in the social sciences furthers an understanding of social, political and economic events, structures and processes; it also includes knowledge of social sciences methodologies. The special contribution of the subject **Geography** to an understanding of the world lies in its examination of the interrelations between nature and society in different sizes and types of space. Thus it is a school subject which first, has a central concern with the topic of spatial aspects and secondly, links knowledge from natural science and social science. Thus, geography is a bridging subject between these areas of science and education.

The main goals of geography lessons are therefore to provide insights into the connections between natural conditions and social activities in different parts of the world, and to teach an associated spatially-oriented competence that can be applied. These main goals are in accordance with the International Geographical Union's "International Charta of Geographical Education", the "Curriculum 2000+" of the German Association for Geography as well as the "Basic Curriculum" of the Association of German School Geographers.

In accordance with these aims, students of geography have the opportunity to recognise interactions between nature and society (economy, politics, social aspects) based on selected regional examples. They can also learn to understand the resulting structures, processes and problems involved with these interactions and to consider solutions for these problems. To this end an understanding of the Earth as a system is necessary, i. e. of the various natural systems and subsystems of the geosphere. Thus geography is a centralising subject for all aspects of geosciences relevant to schools (see Leipzig Declaration of the German Association of Geography/Alfred Wegener Foundation). It also furthers an understanding of social systems in their main spatially relevant basic structures.

With this **general geographical approach**, geography lessons make a special contribution to the encouragement of multi-perspective, systematic and problem-solving thinking.

Space, as well as time, is an existential aspect of our lives and it is therefore urgently necessary to consider it in detail. The ability to orient oneself spatially in different ways is therefore an important geographical competence, going well beyond the possession of basic topographic knowledge and serving as the foundation for the development of further geographical competences. However, students do not only acquire spatial orientation competence, but also analyse regions of the Earth at different scales, e.g., their homeland Germany, Europe and selected non-European regions, from different perspectives and with regard to various problems. In this way they acquire **fundamental regional geographical knowledge** about regions, nations and groups of nations as well as the potential to develop a considered awareness of their home country, awareness as Europeans and cosmopolitan attitudes between the global and the local. In geography, spaces are examined from various perspectives: as concrete, material spaces, as thematically/systematically ordered spaces, as individually perceived spaces or as socially constructed spaces.

Geography as a subject is traditionally strongly oriented towards methods and media; (visual) clarity and topicality play a major role. Students have an opportunity to become familiar with numerous traditional and computerised media. They thereby acquire the ability to use media effectively and in an informed and considered way; in particular the use of all types of maps is learned. Students also acquire a methodological competence that is essential for self-determined learning and action.

Field trips and projects make possible the inclusion of reality outside of school and students' own active experiences.

Geography as a school subject makes a significant contribution to **interdisciplinary and co-operative tasks in education**. The following will highlight those aspects that are of particular significance to the subject. Together with biology, geography is a central subject in environmental education. Students learn from examples of many environmental themes, both close to home and far away, that natural science and social science have to be interconnected. Education in development policy and intercultural learning are also particularly important aspects of geography teaching in schools. By considering natural, economic, political and social interrelations, students acquire important competences in these areas. Because of its contents and function, geography is particularly committed to education for sustainable development (see UN Decade 2005–2014) as well as to Global Learning.

The aims, contents and methods of basic geographical education are a major element of general education and also create the foundations for connectible vocational learning in many professional areas, e. g., in planning, environmental protection, tourism and public and private economic development.

2 Areas of competence of the subject geography

On completion of the Intermediate School Certificate, students will have acquired general competences in natural and social sciences as well as specific geographical/geosciences competences.

Competences are "... the cognitive abilities and skills available to individuals or learnable by them to solve specific problems, as well as the associated motivational, volitional and social readiness and abilities to apply these problem solutions successfully and responsibly in variable situations" (Weinert 2001, p. 27 f.). The individual expression of these competences is determined by the following factors: ability, knowledge, understanding, skill, action, experience and motivation (see Klieme 2003, p. 73). Educational standards specify competences that students should have in order to be considered as having attained certain important educational goals. Competences and standards describe learning outcomes for students up to the completion of the Intermediate School Certificate.

Geography is an integrating subject between the natural sciences and social sciences, which has consequences for its competence structure. Parallel to the purely natural science subjects of biology, chemistry and physics, geography includes the competence areas of knowledge specific to the subject, methodology, communication, evaluation. Furthermore, building on these four areas of competence, geography includes action as a separate area of competence. This area can also be found in other social science subjects. A unique characteristic of geography is the area of competence in "spatial orientation".

The competences from these areas lead not only to understanding natural and social interrelations in various parts of the world, in the context of the main aims of the subject, but also to a considered, ethically-grounded and responsible ability to act spatially. These areas of competence overlap. The desired overall geographical competence ensues not from the addition but from the interconnection of the individual areas of competence. The competences and standards of the various areas are not acquired in isolation but within the framework of specific problems and in a geographical context.

Thus geography includes the areas of competence described in the following *table*. These areas of competence work together and complement each other to create

an overall geographical competence within the framework of general education. Each area of competence is subdivided on the basis of a sound theoretical foundation.

Areas of competence	central competences
Knowledge specific to the subject	Ability to understand spaces at different scales as physical and human geographical systems and to analyse the interrelations between man and environment.
Spatial orientation	Ability to orientate oneself in space (topographical orientation skills, map-reading competence, orientation in real spaces and reflection upon spatial perceptions).
Gathering information/ methods	Ability to collect and evaluate geographically/geoscientifically relevant information in real space and in media, as well as to describe the steps in the gathering of information in geography.
Communication	Ability to understand geographical information, to express and present it and to discuss it appropriately with others.
Evaluation	Ability to evaluate spatial information and problems, information in the media and geographical insights in terms of specific criteria and in the context of existing values.
Action	Ability and willingness to act in accordance with natural and social conditions in various fields of action.

3 Standards for the areas of competence in geography

In the following, general standards will be formulated for the six areas of competence, which are to be acquired by the students on completion of the Intermediate School Certificate. Sample exercises will relate these to specific content areas.

3.1 Standards for the area of competence "Subject-specific Knowledge"

Geography sees the Earth as a human-environment or human-Earth system from a spatial perspective. The central objects of study are the interrelations between the system Earth¹ or its physical geographical subsystems, and humankind or the human geographical subsystems (Fig. 1). Significant contributions are made to the analysis of the system Earth by knowledge from other geosciences and natural sciences, e.g., geology, geophysics, climatology. The analysis of human geographical systems is augmented by insights from other social sciences, in a spatial context, e.g., urban development, economics and ethnology.

Geography is interested in identifying geographical patterns and relationships in the physical and human geographical subsystems. To this end it explains the spatial expression of the components of these systems at different scales, i.e., regional geographical conditions in particular areas (e.g., countries and regions). Spaces are thereby always considered as systems.

The breadth and complexity of geographical information calls for a reduction to the core of geographical/geoscientific knowledge for geography as a school subject, and the use of examples for teaching. This can take place using **basic concepts** that structure the content of the subject. As geography considers itself as a systems science, the fundamental concept of the subject is the **systems concept**.

¹ The object of study of geography is the geosphere, which is understood as the interconnected system consisting of the subsystems lithosphere, pedosphere, hydrosphere, biosphere and atmosphere as well as the anthroposphere. The anthroposphere includes further subsystems such as settlement, transport and agricultural systems etc. This is the human-Earth system in the broadest sense, which is influenced by processes/energy flows from outer space and the centre of the Earth. In geography and other geosciences, "system Earth" is generally accepted to be roughly the same as the "geosphere", whereby the anthroposphere is an additional aspect of the "system Earth", not as an object but as an external human activity.

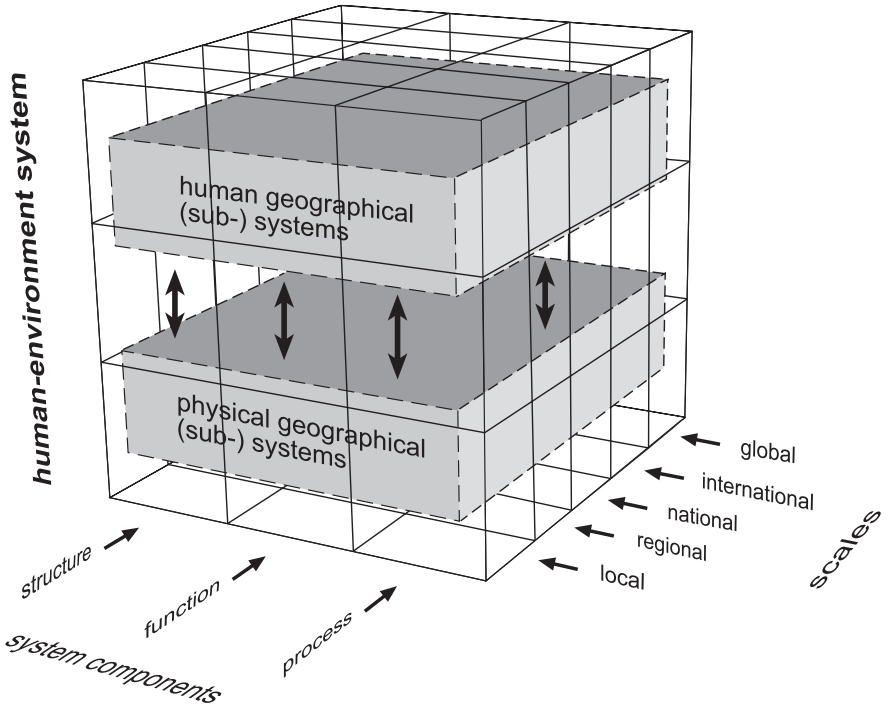


Diagram: Claudia Pietsch 2007

Fig. 1 Basic concepts in the analysis of space in geography

Subordinate to this main concept are the system components of structure, function and process as basic subconcepts.

Geographic factors such as relief, climate, settlement and economy in their spatial organisation and distribution form the **structure** of a system. These elements are interrelated and therefore each has **functions** (e.g., the function of climate for vegetation, roadways for settlements, relief for roadways). The spatial systems themselves can also have functions as subsystems for other systems (e.g., city – hinterland). Each individual element of a system, and systems as a whole, change through the interactions among continuous **processes**. These processes can extend over different periods of time and have different spatial extents (e.g., global

climatic change, formation of the Alps, vulcanicity in Asia, metropolisation in the world, structural change in the Ruhr region).

The basic concepts of geography apply to human, physical and regional geography as well as to the overall human-Earth system at all scales (Fig. 1).

For students of geography, the fundamental concepts form the foundation of a systematic accumulation of knowledge from a subject and a life-world perspective. They serve to further the vertical integration of the knowledge acquired, e.g., the students can discover similar structures and processes in different areas or contexts in consecutive classes. These concepts are also a basis for the horizontal expansion of knowledge, in that they make connections to other situations and subjects apparent to the students. Thus, for example, similar fundamental concepts are to be found in the natural science subjects.

The subject-specific knowledge (F) for geography as a school subject is structured according to competences (F1 to F5), to which the physical and human geographical systems, the different scales, and the system components contribute (Fig. 1). Competence F1 involves the ability to characterise the whole Earth as a part of the superordinate solar system. Competences F2 and F3 concern the ability to comprehend spaces as physical or human geographical systems (e.g., oceanic systems, the city as a system). The main goal of geography teaching is, however, to develop and establish the competence F4; here students learn to analyse developments and problems in space, examining **physical and human geographical factors and their interactions** (e.g., land-use in various regions, provision of drinking water, urban climates, the regulation of rivers and flooding). The development of this competence is a keystone of education for sustainable development. The analysis of physical and human geographical subsystems is an important precondition for understanding interrelations in this context.

Parallel to the development of competences F1 to F4, with competence F5, students acquire the ability to carry out an independent analysis of individual spaces in the framework of a problem-oriented **regional geography**. The students learn to study selected areas from a geographical/geoscientific point of view and to analyse structures, functions and processes in accordance with this goal. By learning such methods using specific examples, they learn to transfer this knowledge to other areas and recognise similarities and individual differences. This knowledge of the interaction of factors and the processes taking place within and between regions also enables them to predict the future development of regions. It contrib-

utes to an ability to evaluate the expected consequences of human intervention in the environment and to act accordingly. This becomes evident in the competence areas "Evaluation" and "Action".

Topographical orientation and knowledge of spatial ordering systems, which have an integral significance for all of the competences listed here, form a separate area of competence – "Spatial Orientation".

These competencies relate primarily to physical areas, or regions, or spatial systems of the locational relationships among physical objects. In geography, space and place are, however, not considered to be simply inherently obvious. They are delimited according to specific perspectives (e.g., the delimitation of Europe from a geological, cultural, political point of view) or are created for different human purposes (e.g., planning regions such as the Euroregions) and are therefore human constructs; spaces are also perceived in quite different ways by individuals and groups (e.g., mental maps of one's own country or of Africa). It is an important task of geography in schools to make students aware of these aspects of spatial understanding. These latter perspectives are chiefly anchored in the competence area "Spatial Orientation".

F 1 Ability to describe the Earth as a planet

Students can

- S 1² describe the Earth's fundamental planetary characteristics (e.g., size, shape, structure, inclination of the Earth's axis, gravitational pull),
- S 2 explain the position and movement of the Earth in the solar system and the consequences thereof (day and night, seasons).

F 2 Ability to comprehend different types and sizes of spaces as physical geographical systems

Students can

- S 3 name the natural spheres of the Earth system (e.g., atmosphere, pedosphere, lithosphere, biosphere, hydrosphere) and describe specific interactions,

² The abbreviation „S“ denotes the individual standards. In order not to break the flow when reading, the term „geographical“ is used in the standards instead of the frequently used „geographical/geoscientific“.

- S 4 describe and explain current spatial aspects of physical geographical phenomena and structures (e.g., volcanoes, earthquakes, drainage systems, karst landforms),
- S 5 explain past and projected physical geographical spatial structures (e.g., movement of geotectonic plates, glaciation),
- S 6 describe and explain the functioning of spatial physical geographical factors (e.g., significance of climate for vegetation, of bedrock for soils),
- S 7 describe the operation of spatial physical geographical processes (e.g., weathering, weather events, mountain formation),
- S 8 describe the interaction of geographic factors and simple cycles (e.g., altitudinal zones of vegetation, ocean currents and climate, the ecosystem of tropical rainforests, the water cycle) as systems,
- S 9 apply the knowledge acquired on the basis of examples to other spaces and places.

F 3 Ability to comprehend different types and sizes of space as human geographical systems

Students can

- S 10 describe and explain past and current human geographical spatial structures; they are familiar with predictions of future structures (e.g., political organisation, spatial economic structures, population distributions),
- S 11 describe and explain the functions of human geographical spatial factors (e.g., the opening up of settlement areas by transport networks),
- S 12 describe and explain the operation of spatial human geographical processes (e.g., structural change, urbanisation, economic globalisation),
- S 13 explain the interaction of factors in human geographical systems (e.g., population policy, world trade, megacities),
- S 14 explain the consequences of social and political spatial constructs (e.g., wars, migration, tourism),
- S 15 explain human geographical interactions between spaces (e.g., town – country, developing countries – industrialised countries),
- S 16 apply the geographical knowledge acquired on the basis of examples to other spaces and places.

F 4 Ability to analyse human-environment relations in different types and sizes of spatial divisions

Students can

- S 17 describe and analyse the functional and systemic interactions among physical and anthropogenic factors in the use and shaping of spaces (e.g., choice of company location, agriculture, mining, energy production, tourism, transport networks, urban ecology),
- S 18 explain the consequences of the use and shaping of spaces (e.g., forest clearance, water pollution, soil erosion, natural catastrophes, climatic change, water shortages, soil salinization),
- S 19 explain systemically the consequences of the use and shaping of spaces using selected examples (e.g., desertification, migration, resource conflicts, ocean pollution),
- S 20 explain possible ecologically, socially and/or economically appropriate measures for the development and protection of spaces (e.g., development of tourism, reforestation, linking-up of biotopes, protection of geotopes),
- S 21 transfer knowledge to other spaces at the same or different scale and describe similarities and differences (e.g., global environmental problems, regionalisation, and globalisation, capacity of the Earth and sustainable development).

F 5 Ability to analyse different types and sizes of space with regard to specific issues

Students can

- S 22 formulate geographical questions (e.g., favourable/unfavourable location, equality of living conditions in towns/cities and in the country) for a specific area (e.g., home area, federal state, agglomeration, Germany, Europe, USA, Russia),
- S 23 analyse structures and processes in the selected areas (e.g., economic structures in the EU, globalisation of industry in Germany, deforestation in the Amazon Basin, Siberia) in order to answer these questions,
- S 24 compare areas according to selected topics (e.g., population policy in India and China, the climate of the USA, Germany, Russia, natural resources in the Arctic and Antarctic),

- S 25 label spaces according to specific characteristics and delimit them from one another on a comparative basis (e.g., developing countries – industrialised countries, agglomerations and peripheries in Germany and Europe).

3.2 Standards for the competence area "Spatial Orientation"

Skills in spatial orientation are developed strongly in geography in schools. Students acquire fundamental topographic knowledge and skills in geography classes. One element of orientation competence is a basic knowledge of topographic orientation at different spatial scales (e.g., such as knowing the names and locations of the continents and oceans, the European states and important cities, rivers and mountain ranges in Germany) and knowledge of various spatial grids for orientations and systems of organisation (O1), e.g., such as latitude and longitude, climatic and vegetation zones or the classification of the Earth according to economic, political and cultural characteristics. Orientation competence also includes the ability to fit geographical facts into spatial systems (O2), i.e. the recognition of locational relations, as well as a series of topographic skills relevant to everyday life (O3), e.g., the competences to read maps and produce simple maps of one's own. It is also a part of geographical education to train orientation skills in towns or the countryside using maps, compass directions and other tools, such as a compass (O4). Awareness of the subjectivity of spatial perceptions (e.g., the Eurocentric orientation of maps) and of the social constructedness of space and depictions of space provide additional key elements of spatial orientation competence (O5).

Map competence is not only highly relevant to everyday life but is also a basic qualification for other subjects taught in schools.

Although there are some overlaps with aspects of the knowledge, methods and evaluation of other competence areas, spatial orientation competence is considered a separate area of competence because of its geographical foundations and its high degree of social relevance.

O 1 Possession of basic topographic knowledge

Students

- S 1 have basic orientation knowledge at different scales (e.g., names and location of continents and oceans, major mountain ranges of the Earth, the German federal states, major European cities and rivers),
- S 2 are familiar with basic rasters and orientation systems (e.g., latitude and longitude, climatic and landscape zones of the Earth, regions at different stages of development).

O 2 Ability to place geographical objects and information in spatial systems

Students can

- S 3 describe the location of a place (and other geographical objects and facts) in relation to other geographical units of reference (e.g., rivers, mountains),
- S 4 describe in detail the location of geographical objects in relation to selected frameworks and spatial orientation systems (e.g., latitude and longitude).

O 3 Ability to use maps appropriately (map competence)

Students can

- S 5 list the basic elements of a map (e.g., projections, generalisation, double flattening of the spherical Earth and relief) and describe how a map is created,
- S 6 read topographic, physical, thematic and other everyday types of maps and evaluate them in the context of guiding questions,
- S 7 describe the ways in which cartographic information can be manipulated (e.g., through choice of colour, accentuation),
- S 8 prepare topographic sketches and simple maps,
- S 9 carry out simple mapping in the context of school exercises,
- S 10 describe the applications of GIS (= Geographical Information Systems).

O 4 Orientation skills in real space

Students can

- S 11 determine their location in real space with the aid of a map and other aids to orientation (e.g., landmarks, street names, compass directions, GPS--the Global Positioning System),
- S 12 describe a route in real space with reference to a map,

- S 13 move in real space with the aid of maps and other aids to orientation (e. g., landmarks, pictograms, compass),
- S 14 use schematic diagrams of transport networks.

O 5 Ability to reflect upon spatial perceptions and constructions

Students can

- S 15 explain, using cognitive/mental maps, that space is always perceived selectively and subjectively (e. g., comparison of German and Japanese students' mental maps of the world),
- S 16 explain, using various types of maps, that representations of space are always constructed (e. g., two different designs for map grids; two different maps of developing and industrialised countries).

3.3 Standards for the competence area "Acquisition of Knowledge/ Methodology"

Methodological competence is increasing in significance for students in order to enable life-long learning. A wide range of methods and media are used in geography teaching to answer geographical/geoscientific questions. There are many sources and forms of information available to students in their lessons for the acquisition of geographically/geoscientifically relevant information.

Methodological competence to deal with geographically/geoscientifically relevant information includes three subsidiary skills: Knowledge of sources and forms of information, and information strategies (M1), the ability to gather information (M2) and the ability to analyse information (M3). The evaluation of information is placed in the competence area "Evaluation" in the model of competence structures used here, communication of/about information as well as the presentation of information is placed in the competence area "Communication". Maps are a media, which is particularly important in geography, and they play a major role in the competence area "Spatial Orientation". It also becomes apparent here that subsidiary competences are not acquired sequentially but in association with each other.

Students of geography learn that geographical information can be found in a wide range of sources (e.g., information books, atlases, in the field, the press, CDs/ DVDs) and in numerous information forms/media (maps, photographs, aerial photographs and satellite images, diagrams, statistics, graphic representations, texts).

Maps as specifically geographical media play a prominent role. Modern, high-tech sources of information are growing in importance because of their topicality. In geography today it is not sufficient to teach about sources and forms, it is also necessary to teach strategies for gathering and evaluating information. Students acquire this knowledge, can apply it routinely and process geographical/geoscientific information critically and purposefully.

Students use two main ways of gathering information. Firstly, they gather information from the above-mentioned new and traditional media and sources of information. Secondly, the students can gather their own data during field trips in geographical reality or in simple experiments (e. g., observation, mapping, counting and measuring).

In geography lessons students learn how to process information systematically by structuring their information, identifying the most significant information, linking it with other information and transforming it into other forms. With these qualifications they attain reading competence with regard to so-called non-continuous texts after PISA.

Furthermore, students of geography learn how geographers/geoscientists carry out their research, and begin to develop the ability (M4) to complete, in principle, the same steps in their own search for evidence and solutions. It must be emphasised that this ability is only beginning to be developed by the time the students do the Intermediate School Certificate. Using selected examples, analogous to research procedures, students start with geographically/geoscientifically relevant questions and formulate new hypotheses on causes, interrelationships and solutions. To test these hypotheses they use information from the above-mentioned sources and process it in view of the questions and their hypotheses.

M 1 Knowledge of geographically/geoscientifically relevant sources and forms of information and information strategies

Students can

- S 1 list geographically relevant sources of information, both traditional (e. g., books, the field) and technical (e. g., Internet, DVDs),
- S 2 name geographically relevant forms of information/media (e. g., maps, photographs, aerial photographs, figures, texts, diagrams, globe),

- S 3 describe fundamental strategies for gathering information from traditional and high-tech sources and forms as well as information processing strategies.

M 2 Ability to gather information to answer geographical/geoscientific questions

Students can

- S 4 select information from maps, texts, images, statistics, diagrams etc. in accordance with specific problems, issues and goals,
- S 5 in accordance with specific problems, issues and goals, gather information in the field (e.g., observation, mapping, measuring, counting, taking samples, questionnaire survey) or by means of simple experiments.

M 3 Ability to process information in order to answer geographical/geoscientific questions

Students can

- S 6 structure geographically relevant information from traditional and high-tech sources and from their own research and extract significant insights,
- S 7 purposefully associate the information thus acquired with other geographical information,
- S 8 transform the information thus acquired into other forms of representation (e.g., figures into maps or diagrams).

M 4 Ability to describe simply the methodological steps for acquiring geographical/geoscientific information and reflect upon this

Students can

- S 9 independently pose simple geographical questions and formulate hypotheses to answer these questions,
- S 10 describe and apply simple ways of testing hypotheses,
- S 11 describe simply ways to acquire information/insights.

3.4 Standards for the competence area „Communication“

Communication competence has a dual function: Communication in the classroom and communication in a social context.

Students learn to understand geographical/geoscientific facts, to express themselves appropriately using geographical terms and thus to make themselves understood to others. This includes the presentation of such facts and interrelations/connections in front of others. These various subsidiary communication competences are summarised here as one competence (K1). Students also have the opportunity to exchange ideas in geography classes (K2). These skills should be developed and practiced in the long-term as part of an overall geographical competence.

Geography classes provide a special opportunity in this context, as they usually involve highly relevant themes that are also very important outside of school in society at large (e.g., environmental themes, planning, urban development, migration, natural hazards, cultures, regional geography etc.). This has very much to do with "putting knowledge into life" (Alexander von Humboldt). Geography lessons are not limited to unequivocal or unambiguous information, but also include a variety of trains of thought and arguments (e.g., when assessing interests and dealing with conflicts in planning, in the explanation and evaluation of natural hazards, justifying predictions etc.). Communication competence is of elementary significance for all of these activities.

Students realise that the geographical/geoscientific contents of schoolwork also depend on communication appropriate to the facts, the audience, and the communicator's aims, and that form and content work together. Thus communication does not take place only "after" the acquisition of specialised knowledge but is simultaneously its prerequisite.

K 1 Ability to understand and express geographically/geoscientifically relevant statements

Students can

- S 1 understand written and verbal geographically relevant statements in everyday and subject-specific language,
- S 2 express geographically relevant information (in text, images, graphics etc.) ordered according to the logic of the subject and using specialist terminology,
- S 3 differentiate between observations of information and evaluations in geographically relevant statements,
- S 4 organise and present geographically relevant statements in a way appropriate to the subject, the situation and the audience/target group.

K 2 Ability to speak about geographically/geoscientifically relevant facts, to discuss them and develop a well-founded opinion

Students can

- S 5 identify the logical, argumentative and geographical quality of their own and other people's statements in the context of geographical issues, and react appropriately,
- S 6 weigh geographical statements and evaluations based on selected examples and develop their own, well-founded opinion in a discussion and/or develop an appropriate compromise (e. g., role-playing, scenarios).

3.5 Standards for the competence area "Evaluation"

On the basis of fundamental, integrated geographical knowledge and the skills acquired in the areas of orientation, methodology/acquisition of knowledge and the communication, students can evaluate spatial situations, facts and problems using specialised geographical knowledge (B1) in geography lessons. For this evaluation they take geographical criteria into account, consider physical geographical / ecological and economic and social geographical aspects (especially their mutual influence), take different scales and locations into account and begin to reflect upon the emergence and development potential of natural and cultural landscapes. They also make use of general criteria when discussing advantages and disadvantages, identify the interests of different actors, look at a situation from the point of view of different people affected by it and thereby practice the skill of changing perspectives. In geography classes, students frequently have the opportunity to develop this ability to evaluate using different examples, e.g., by evaluating the construction of a hotel complex, the designation of a conservation area or intervention in an ecosystem according to given criteria. It should be emphasised that this skill is just beginning to be developed when students sit the Intermediate School Certificate.

Geography lessons also teach students the skill to evaluate geographically relevant information gained from various sources and media in terms of their significance and explanatory value (B2). They learn, for example, about the different value of maps, aerial photographs and satellite images or they discover that different emphases can be placed when they transform data into maps or diagrams.

The students examine the social significance of geographical/geoscientific knowledge (B3), in that examples help them to recognise, for instance, the effects that

exploration had on the areas travelled and on the explorers' countries of origin. They also learn about the consequences and relevance of geographical/geoscientific research findings **using selected examples**, e. g., the prediction of a volcanic eruption or the environmental acceptability of a construction project.

Students are trained to link their evaluation of evidence with geographically relevant values and norms and thus to produce well-founded evaluations (B4). Criteria for evaluations are provided, for example, according to general human rights and the protection of nature and the environment. This leads to the **model of sustainability** (sustainable development). Geography helps students to develop the ability to evaluate humankind's interventions in nature and the environment (e. g., planning and construction of new housing/a dam) according to their ecological, social/political and economic acceptability. This includes subjective preferences; that may be unavoidable but must be identified and justified.

B 1 Ability to evaluate selected spatial situations/facts using geographical/geoscientific knowledge

Students can

- S 1 name general and subject-specific criteria for evaluation (e. g., ecological/economic suitability, significance now and in the future, perspective),
- S 2 apply geographical knowledge and the above-mentioned criteria to evaluate selected geographically relevant facts, events, problems and risks (e. g., migration, flooding, development aid, land-use conflicts, cultural conflicts, civil wars, resource conflicts).

B 2 Ability to evaluate selected geographically/geoscientifically relevant information from the media in accordance with given criteria (media competence)

Students can

- S 3 evaluate information acquired from traditional and modern sources (e. g., school textbooks, newspapers, atlases, Internet) and their own field work in terms of their general explanatory value and their significance for the specific question/issue,

- S 4 give a critical opinion on the role of special interests in the presentation of geographically relevant information (e. g., tourist complexes in travel brochures, town plans for children).

B 3 Ability to evaluate appropriately selected geographical/geoscientific insights and perspectives in terms of their significance and consequences for society

Students can

- S 5 express a critical opinion on the consequences of selected geographical insights in historical and social contexts (e. g., consequences of different conceptions of the world/explorers' reports),
- S 6 express an opinion on selected geographical statements with regard to their social significance (e. g., predictions of natural hazards and environmental risks).

B 4 Ability to evaluate selected geographically/geoscientifically relevant facts/processes having regard to geographical and interdisciplinary values and norms

Students can

- S 7 list geographically relevant values and norms (e. g., human rights, environmental protection, sustainability),
- S 8 evaluate geographically relevant facts and processes (e. g., watercourse regulation, tourism, development aid/economic co-operation, use of resources) in terms of these values and norms.

3.6 Standards for the competence area "Action"

On the basis of the competences acquired in all of the areas described here, students acquire the ability to potentially become appropriately active in specific situations and contribute to solving problems. This should/could lead to willingness to act.

Responsible action can only take place when basic subject-specific knowledge is augmented by the teaching of action-relevant knowledge (e. g., knowledge of potential solutions, spatial problems, environmentally friendly measures) (H1) is taught and when the students are also motivated/interested (H2). Numerous factors can hinder their willingness to act and take real action, even when knowledge and inter-

est are present. Nonetheless, together with other school subjects, geography aims to develop a willingness to take appropriate action (H3). It should be borne in mind that the influence of school lessons is limited and that factors external to school, especially the students' parents and friends, play a large role. Students should not be manipulated in school or forced to take action, but should decide to take action after serious thought and for good reasons. A distinction can be made between informative action, political action and everyday action. Geography lessons should enable and encourage students to think about the consequences of action planned or carried out and possible alternatives (H4).

Numerous fields of action are discussed in geography classes. Firstly, the wide range of everyday activities whereby aspects of the environment are used, shaped, and "geography is made". A special role is played by the value-oriented fields of action for environmental protection and intercultural and international understanding in One World, all of which come together in the overall model of "sustainable development".

Students gain a basic understanding of natural systems and the consequences of intervention in these systems. This can lead to a high regard for a near-natural environment and willingness to become active in environmental protection. The inclusion of anthropogenic aspects can help the students to develop an awareness of man's threat to natural habitats as well as risks to humans from natural hazards. In this way geography can make a significant contribution to encouraging students to participate actively in the avoidance and reduction of environmental damage.

On the basis of their geographical knowledge of regions and social systems as well as the development/acquisition of a corresponding value system, the students can be encouraged to develop the ability and willingness to work for peaceful coexistence on Earth, to co-operate in planning projects for the promotion of intercultural understanding in their own country and to support development aid measures.

Their understanding of the interactions among physical and human geographical factors, i. e. ecological, economic and social/political factors, gives the students insight into the need for sustainable development, from the local to the global level, and also gives them the ability and willingness to act accordingly.

H 1 Knowledge of information and strategies relevant to action

Students are familiar with

- S 1 environmentally and socially acceptable lifestyles, economic activities and products as well as solutions (e.g., use of public transport, organic farming, renewable energy sources),
- S 2 measures to prevent/reduce damage and risks (e.g., tsunami warning systems, unsealing surfaces, land reclamation),
- S 3 ways to identify prejudices (e.g., with regard to people from other cultures) and to mitigate them.

H 2 Motivation and interest in geographical/geoscientific fields of action

Students are interested in

- S 4 the variety of nature and culture in their home area and in other regions,
- S 5 geographically relevant problems at a local, regional, national and global levels (e.g., ocean pollution, flooding, poverty in developing countries),
- S 6 orientation towards geographically relevant values.

H 3 Willingness to take specific action in geographically/geoscientifically relevant situations (informative action, political action, everyday action)

Students are willing to

- S 7 provide other people with geographical information about relevant fields of action (e.g., environmental and social acceptability of a by-pass, the necessity to construct a dyke or to provide areas for flooding, sustainable urban development, sustainable agriculture),
- S 8 understand geographically based decision-making processes in planning policy and to participate in these (e.g., planning suggestion to local authorities, participation in the local agenda of their home place),
- S 9 work on an everyday basis for better environmental quality, sustainable development, intercultural understanding and peaceful co-existence in One World (e.g., purchase of fair trade and/or organic products, sponsorship, choice of means of transport, avoiding creating rubbish).

H 4 Ability to reflect upon actions with regard to their effects on natural and social spaces

Students can

- S 10 explain individual potential or actual actions in a geographical context,
- S 11 assess the natural and social spatial consequences of selected individual actions and think of alternatives.

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