Deutsche Gesellschaft für Geographie e. V. (ed.)

# Educational Standards in Geography for the General Higher Education Entrance Qualification

1st edition August 2024

Deutsche Gesellschaft für Geographie | DGfG

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## Imprint

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## Contents

## Foreword

Published in 2006 (and updated and revised in the 10th edition in 2020), the cross-state Educational Standards in Geography for the Intermediate School Certificate have met with a great response in the subject and beyond. They have provided important impetus for school practice, educational administration and research. These Educational Standards in Geography for the General Higher Education Entrance Qualification build cumulatively on this predecessor. With regard to the upper secondary school level, they ensure the transparency of school requirements, promote the further development of competence-oriented teaching, support the interdisciplinary/subject-specific networking of knowledge and, as a supplement to the uniform examination requirements for the Abitur examination (EPA), form a basis for assessing the educational objectives achieved.

The Educational Standards in Geography for the General Higher Education Entrance Qualification draw on the overarching objective formulated in the "Agreement on the Structure of the Upper Secondary School Level and the Abitur Examination" (resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the Federal States in the Federal Republic of Germany on 7 July 1972, as amended). Geography lessons at upper secondary level thus comply with the mandate of providing in-depth general education, a general ability to study and propaedeutic scientific education. They provide an introduction to and examples of research questions, scientific category systems and methods, and impart an education that enables students to develop and strengthen their personalities, to shape their own lives in a socially responsible manner and to participate in a democratic society.
As in the lower secondary level, the Standing Conference of the Ministers of Education and Cultural Affairs (KMK) has also decided to develop educational standards for the upper secondary level for the subjects German, maths, the first foreign language, biology, chemistry and physics. However, qualification-oriented standards are also very important in geography. They help to direct school teaching and learning processes towards the cumulative and systematically interlinked development of competences. In addition, they form a

nationally standardised foundation for the development of curricula and educational plans, position geography in terms of subject policy, and represent an important internal and external assessment of the current understanding of the subject. For this reason, the German Geographical Society (DGfG) decided to independently develop Educational Standards for the General Higher Education Entrance Qualification in geography. This process took around two and a half years and was jointly organised by a multi-perspective working group consisting of eleven representatives from school practice, teacher training, geography education at universities and academic geographers. The work also drew on public discussions and statements from the sub-associations of the DGfG and also the geoscience associations GeoUnion and the DVGeo. The educational standards are the result of an intensive and complex, but always very constructive process of communication and negotiation. They were adopted by the DGfG Executive Committee in June 2024.
The Educational Standards for the General Higher Education Entrance Qualification focus particularly on consolidating and further differentiating the competences of lower secondary level against the backdrop of current educational debates. Emphasis is also placed on in-depth meta-reflective discussion with a stronger focus on conceptual thinking. This includes the introduction of three more subject-related key concepts (understanding space and place, sustainability and power) and the renaming of the competence area “subject-specific knowledge” to “subject-specific concepts”.

The first edition of the educational standards for upper secondary level does not include any examples of exercises. The development of the competence-oriented exercises, which can be used to check whether the specified standards have been achieved, will take place in a second step. They will be added in one of the subsequent editions of the document – analogous to the procedure for the Educational Standards for the Intermediate School Certificate.

In order for the Educational Standards to achieve their intended effectiveness, they must be taken up and implemented by the various stakeholders in the education system (as has largely been the case at lower secondary level). This applies equally to education policy, education administration, didactic research, the three phases of teacher training and school practice.

The Educational Standards for the General Higher Education Entrance Qualification clearly show what a unique subject geography is and the highly relevant competences that young people acquire in geographical education for shaping our future.

We would like to thank the members of the working group for their great commitment and the many colleagues for their constructive and critical support during the creation of this consensual document.

Münster, August 2024

*Ute Wardenga (DGfG), Karl Walter Hoffmann (VDSG) and Rainer Mehren (HGD)*

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# 1 The Contribution of the Subject of Geography to Education

## 1.1 Geographical education

Almost all of today's challenges such as climate change, poverty, loss of biodiversity, resource scarcity, geopolitical conflicts, demographic change, social division, disparities, migration and the spread of epidemic diseases have a strong spatial dimension. This can be seen at different, interlinked scales from local to national to global/planetary. Geographical education is largely based on the fact that human beings are profoundly spatially bound and space-shaping beings. As a person and as part of society, each individual interacts in strongly networked relationships with spatial conditions and developments.

A geographically educated person with a General Higher Education Entrance Qualification has the necessary knowledge, abilities/skills and reflective attitudes to independently explore the world in its spatial dimensionality. This means being able to understand spatial phenomena and processes, in particular the reciprocal relationships between and within society and the environment, as well as their interpretations. The aim of geographical education is to develop spatial competences that enable active participation in society.

Geography as a school subject provides a comprehensive introduction to both social and scientific education in its spatial dimensionality. In geography, space is understood both in its materiality (condition) and in its individual and social construction as place (e.g., individual subjective perception of spaces and places, media coverage of spaces and places; see Section 1.2). The special potential of geographical education lies in the systemic analysis of the diverse interrelationships between people and the environment. This integrative way of thinking is of key importance in the age of the Anthropocene, in which humans have become the dominant geo-factor in the development of planet Earth. The subject of geography is at the centre of the geosciences (e.g., geology, climatology, geoinformatics) in terms of school-relevant content. It thus has a special role to play in promoting knowledge and skills in earth system science, which, for instance, focus on planetary boundaries (see Section 1.3).

The understanding of geography as a space-related human-environment discipline is expressed in its conceptual approaches. At upper secondary level, the central guiding principles of geographical thinking are operationalised in the six key concepts of system, sustainability, scale, spatial patterns (in transition), space/place and power. This helps learners take a complex, holistic and multi-perspective approach to questions relating to the present and future during times of constant change and uncertainty. When considering the major challenges of today, students become beware of and critically question unacceptable simplifications and supposedly straightforward solutions in geography lessons and in their everyday lives (see Section 1.4).

The competence orientation of the Educational Standards in Geography for the General Higher Education Entrance Qualification is divided into six areas of competence: subject-specific concepts, space/place-related orientation, gaining knowledge, communication, judgement and action. The goal here is that the results of geographical learning at school should be personally and socially meaningful, relevant to action and practically applicable (see Section 2).

In competence-oriented geography lessons, both natural and scientific ways of gathering information are introduced as scientific propaedeutics. The spectrum of methods is correspondingly broad and ranges from experimentation and modelling to working with maps and media analyses, for example in the context of spatial constructions. Of particular importance for geographical education is the learning experience and the associated acquisition of knowledge outside the classroom. Genuine encounters with people and the environment in the context of excursions inspires learners and encourages them to recognise and accept responsibility for human actions on small and large scales.

The subject has a special role to play in educational processes related to the digital world, as digital geoinformation (= information with spatial relevance) is one of the most important raw materials of the 21st century (e.g., in questions of logistics, disaster control or geopolitics). A comprehensive approach involves learning with and about digital geoinformation and spatially relevant

media. Geography lessons are not only intended to provide a technology-related introduction to the skills and abilities necessary for dealing with digital media such as geographic information systems (GIS), geo-apps, social media and artificial intelligence (AI). Geographical education takes a comprehensive approach to digital sovereignty by also pursuing participative-transformative activities (e.g., in the collaborative development of OpenStreetMaps, in geo-ecological data collection in the field of citizen science) and critical-reflective approaches (e.g. in relation to the loss of spatial privacy through digital movement profiles or the monitoring of public space in light of the spatial possibilities and limits of big data in the field of seismology).

Geography lessons provide the basis for well-founded factual and value judgements in decision-making processes and support learners in developing their own point of view in a reflective manner. This negotiation takes place with an emphasis on understanding and against the background of cultural diversity and an appreciation of social plurality. In-depth geographical education is of great importance in order to participate in the shaping of society and the environment with autonomy and solidarity. Geographical education makes a significant contribution to political education and the development of responsible individuals in the form of a spatial citizenship approach that enables participation in social negotiation processes about spaces.

As a subject, geography helps students to understand Planet Earth as the basis of life for humankind in its uniqueness, natural and cultural diversity, and vulnerability and encourages them to deal with it responsibly. Through its transformative and critical-emancipatory approach (e.g., in the form of questioning existing thought patterns and types of behaviour) and its strong focus on solutions (e.g., by consciously integrating encouraging case studies and promising approaches), geography lessons actively counter any possible tendencies towards resignation and promote the self-efficacy of the young generation.

Overall, it can be stated that the educational contribution of the subject allows geography to lead the way in Education for Sustainable Development (ESD). Among other things, geography lessons support the introduction of knowledge, skills/abilities and attitudes relevant to the Sustainable Development Goals

(SDGs) through their highly relevant range of topics, strong spatial reference (from local to global/planetary), integrative human-environment perspective, conceptual approach (e.g., the key concepts of system, sustainability and power), central teaching principles (e.g., multi-perspectivity, topicality, solution focus), cultural sensitisation, reflective value formation and a focus on competent action.
Geographical education is therefore of fundamental importance for understanding and shaping the world. The subject helps pupils to tackle the crucial question “How do we want to live?” in an informed and reflective way and to think about alternative futures. Geography is a key future-oriented subject in the school curriculum.

In the following, the contribution of geography to education will be explored in greater depth by further explaining the two unique characteristics of the subject: “Space/Place” (see Section 1.2) and “Human-Environment” (see Section 1.3), and by discussing the basic concepts (see Section 1.4).

## 1.2 Focusing on the perspective of space and place

Like time, space is a fundamental dimension of human existence. Human activity can lead to the preservation of (living) spaces, but also to their destruction. The central challenges of the present day can only be adequately grasped, evaluated and commented on in relation to the future if their spatial dimensionality is taken into account.

Geography uses different perspectives to open up spaces and places:

- Geography is interested in identifying and distinguishing between *material* spaces and *constructed* places (= key concept of “Space/Place”, see Section 1.4):
  Material spaces are regarded as physically existing structures that are understood as objectively tangible conditions. Material spatial understandings focus especially on recording and analysing the location and interrelationships of objects (e.g., the structure of natural spaces, tourist infrastructure, flows of commuters and tourists on the island of Sylt).

The aim is to analyse spatial structures, functions and developments.
The understanding of places as social constructs, on the other hand, is subject to a constructivist paradigm. Places are not seen here as given or existing per se, but as products of attributions of meaning. Constructivist understandings of place focus on analysing different individual and collective perceptions (e.g., Sylt as a recreational place, Sylt as a place with ecosystems worthy of protection), and also interest-driven and social constructions of places, which are often based to some extent on media productions (e.g., Sylt as a dream destination, Sylt as a refuge for wealthy sections of the population). This understanding does not fundamentally assume the possibility of an objectively recognisable space, but rather emphasises the plurality of spaces and places. Both spatial concepts are to be considered not only in isolation, but are particularly effective when viewed in terms of their mutual influence.

- Geographical perspectives focus on spatial *structures*, *functions* and *developments* (= key concept of "Spatial Patterns (in transition)", see Section 1.4).
  This means that learners become able to recognise spatial distributions of phenomena and to derive spatial patterns/structures from them (e.g., the altitudinal grading of vegetation in high mountains), to explain the structures they recognise through the functional interplay of "geofactors" (e.g., interrelationships and dynamics between climate and vegetation) and to discuss the development of spatial structures in the context of natural and social processes (e.g., changes in vegetation stages as a result of anthropogenic climate change). While the first two approaches relate primarily to the present, the development-oriented perspective trains learners to better understand change processes and the consequences of actions. The past (including geological history), present and future are brought into a dynamic context through this perspective. Today's actions are thus always reflected upon against the background of past causes and future consequences for life on earth.

- The spatial perspectives also mean that learners become able to describe, explain, evaluate and comment on spaces as resulting from "trans-scalar" interdependencies and exchange processes on different scales from local

to global (= key concept of “Scale”, see Section 1.4) (e.g., reciprocal relationships between local rainforest deforestation or consumer behaviour in Europe and the planetary climate). This perspective can particularly unfold its potential when it is used to examine the cascade of concrete effects of decisions (made in other places) on the students’ living environment. The basis for applying this perspective is thinking in terms of scale networks, i.e., the ability to carry out a reflective change of scale when considering one’s own actions.

- A geographical understanding of space and place always views space and place as a resource that is generally limited and often contested (= key concept of “Power”, see Section 1.4). Questions of space and place are thus often also questions of power that affect both the interpretation and the design of spaces and places (e.g., the geopolitical disputes in the South China Sea, conflicts over spatial design in the transport transition). In this context, the focus is on disputes about both material spaces and constructed places (e.g., ideologically charged interpretations). Applying this power perspective particularly requires the ability to reveal inequalities in the ability of different people to assert their interests in the interpretation and design of spaces and places.

The clearly defined focus on spatial perspectives is a distinguishing feature of geography as a school subject. By promoting space/place-related orientation skills understood in this way, geography makes a specific, highly relevant contribution to education.

### 1.3 Focusing on the human-environment perspective

A large number of challenges that humanity is currently facing on local and global/planetary levels concern the systemic interplay between humans/society and the environment. Human activity has become a key factor that influences numerous atmospheric and ecosystem processes. In turn, changes to these processes have social, political and economic consequences. In order to fully understand the interactions and the resulting problems and opportunities and to address them appropriately, an integrative and holistic way of thinking is

required. This integrative and holistic way of thinking is a particular strength of geography.

Geography as the leading scientific discipline among school subjects is based on three fields (see Figure 1):
The social science approach is evident in human geography. It analyses the spatial impact of human activity in its diversity and change. The object of interest comprises all human activities that change space or are influenced by spatial conditions and are reflected in structures and developments. Human geography therefore includes areas such as urban geography, economic geography, transport geography, social geography and political geography.

Physical geography adopts a natural science approach and focuses on spatially and temporally dynamic processes in the physical environment that are caused by the systemic interaction of different “geofactors”. Important sub-areas of physical geography are, for example, climate geography, soil geography and geoecology.

Human-environment relations represent the third field. This forms an independent perspective with a dedicated interest in investigating the structure of relationships and impacts between natural and cultural space and makes this the core of analysis. The topics range from resource conflicts (e.g. water, rare earths) and hazard research (e.g., vulnerability and resilience vis-à-vis natural events/hazards) to issues of biodiversity conservation (e.g., industrialised agriculture, overfishing of the oceans).

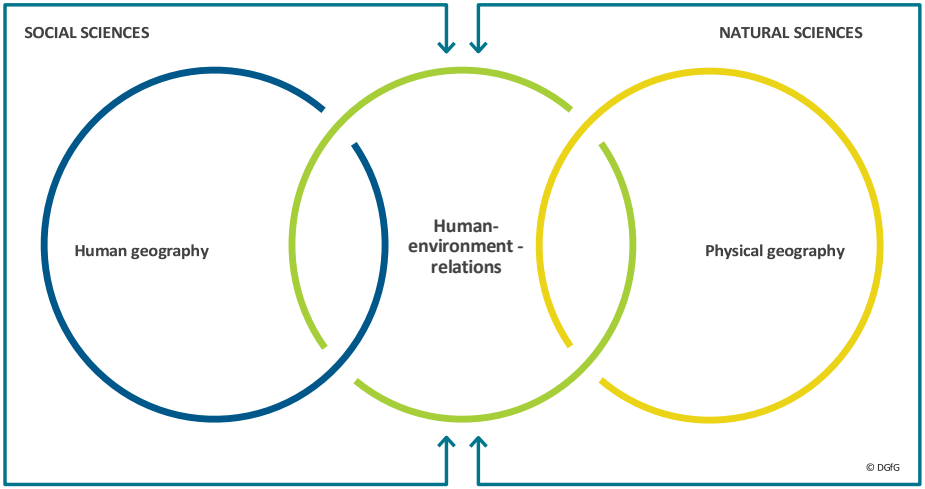



*Figure 1 Geography as a discipline intertwining natural and social sciences*

Geography is a discipline of the geosciences. The other geoscience disciplines include the sciences of the solid earth (such as geology and mineralogy), water (such as hydrology and oceanography), the atmosphere (such as meteorology and climatology), the earth's surface (such as soil science and geomorphology) and the surveying/mapping of the earth (such as geodesy and geoinformatics). The common guiding principle of these earth system sciences is that they convey a fundamental systemic understanding of the interactions and feedbacks between the spheres of the earth which characterise our planet and significantly influence life: the lithosphere (rock), the pedosphere (soil), the atmosphere (air), the hydro-/cryosphere (water/ice), the biosphere (flora and fauna) and the anthroposphere (humans).

The interconnected human-environment relationships are of particular importance in geography lessons. The central theoretical foundation for this approach is a socio-ecological understanding of systems. Here humans and the environment are not understood as independent, autonomous systems that are linked to each other by external relationships (e.g., in the sense of "humankind as a disruptive factor in the ecosystem"). Instead, people and the environment are placed in an overall, inseparable and functional context that includes people with their (sometimes)

competing views and behaviours as an integral part. The system-oriented approach has both a temporal and a spatial perspective. In terms of time, past developments (e.g., geological eras, annual/seasonal time scales), current processes and future (including intergenerational) perspectives are taken into account. With regard to space, the different scales from local to global/planetary are included with their interconnectedness. Geography lessons often link current local events with long-term global developments (e.g., local earthquakes with global tectonic processes).

- In geographic and geoscientific educational processes, the system-oriented human-environment relationships become manifest for learners as they are introduced to skills and abilities:

  - to be able to recognise, explain and model a spatial phenomenon (e.g., a flood in a settlement area) as a (human-environment) system (e.g., as a concept map) and
  - to be able to use this system model a) to make predictions about future developments (e.g. future development of the natural risk of floods), b) to evaluate given strategies for action (e.g., potential of retention areas) and c) to develop their own strategies for action (= key concept "System", see Section 1.4).

- As a key subject of education for sustainable development, geography lessons also focus in particular on the systemic, in-depth penetration of spatial conflicts found in the complex interactions between economy, ecology, social aspects and politics (= key concept of "Sustainability", see Section 1.4).

Secondly, in addition to the spatial perspective explained in Section 1.2, the school subject's uniqueness is seen in its special focus on the dynamic interrelationships between humans and the environment. The integrative nature of geographical thinking overcomes the traditional separation of social and natural science approaches that predominates in schools. The combination of natural and social science interests, explanatory approaches and methods provides learners with appropriately complex and multi-perspective ways of thinking to understand the world. This serves as a basis for reflective judgement and action in an increasingly volatile and uncertain living environment.

### 1.4 Key concepts in geography in upper secondary school

Geography lessons deal with a wide range of topics. However, the subject-specific approach to tackling this thematic diversity provides a common foundation in the form of the key concepts.
The key concepts are selected didactically justified perspectives of the school subject of geography that have proved central to the focus of interest of the discipline of geography. They are fundamental guiding ideas of geographical thinking that can be understood by learners. They explain how the school subject of geography looks at an issue in contrast to biology or history, for example. As systematic patterns of analysis and explanatory approaches, key concepts represent the subject-specific approach of geography to a learning object.
For students, key concepts form the foundations for a systematic and cumulative build-up of knowledge across year groups and for the development of a specialised geographical understanding. They offer teachers orientation in the selection, accentuation and structuring of relevant geographic learning objects and an opportunity for reflection to sharpen their own understanding of the subject.

The three key concepts already introduced in the national Educational Standards for the Intermediate School Certificate are further developed in some points of content and/or conceptually sharpened for the General Higher Education Entrance Qualification *(= italics*):

| | | |
|---|---|---|
| (Human-Environment-) System | ➔ | System: Human, Environment, Human/Environment |
| System components: Structure, Function, Process | ➔ | *Spatial patterns (in transition):* Structure, Function, *Development* |
| Scale levels: local, regional, national, international, global | ➔ | *Scale:* local, regional, national, international, global, *planetary* |

They are supplemented by three other key concepts which – building on the foundations of lower secondary level – broaden and deepen the focus of analysis for learners and teachers in the upper secondary level:

Understanding space and place: material space, constructed place

Sustainability[1]: ecology, economy, social, politics

Power: power to interpret spaces and places, power to design spaces and places

The six key concepts are visualised graphically in Figure 2. At the centre is the object or issue to be investigated (e.g. globalisation, smart city, El Niño), which is symbolised by a globe. The six (randomly arranged) sides of the cube symbolise six selected perspectives ("specialist lenses") on how this issue can be geographically explored in a meaningful way. The six key concepts are not clearly delimited from one another in terms of content but can overlap. However, they each represent a particular focus of analysis. Several key concepts can also be combined with each other in the analysis of an issue (see Table 1).

[1] Education for Sustainable Development (ESD) is an interdisciplinary approach. However, due to the high affinity of the concept of sustainability to geography's view of itself as a human-environment subject (see Section 1.3), it has become particularly important as a differentiator for geography (spatial reference, value orientation, etc.).

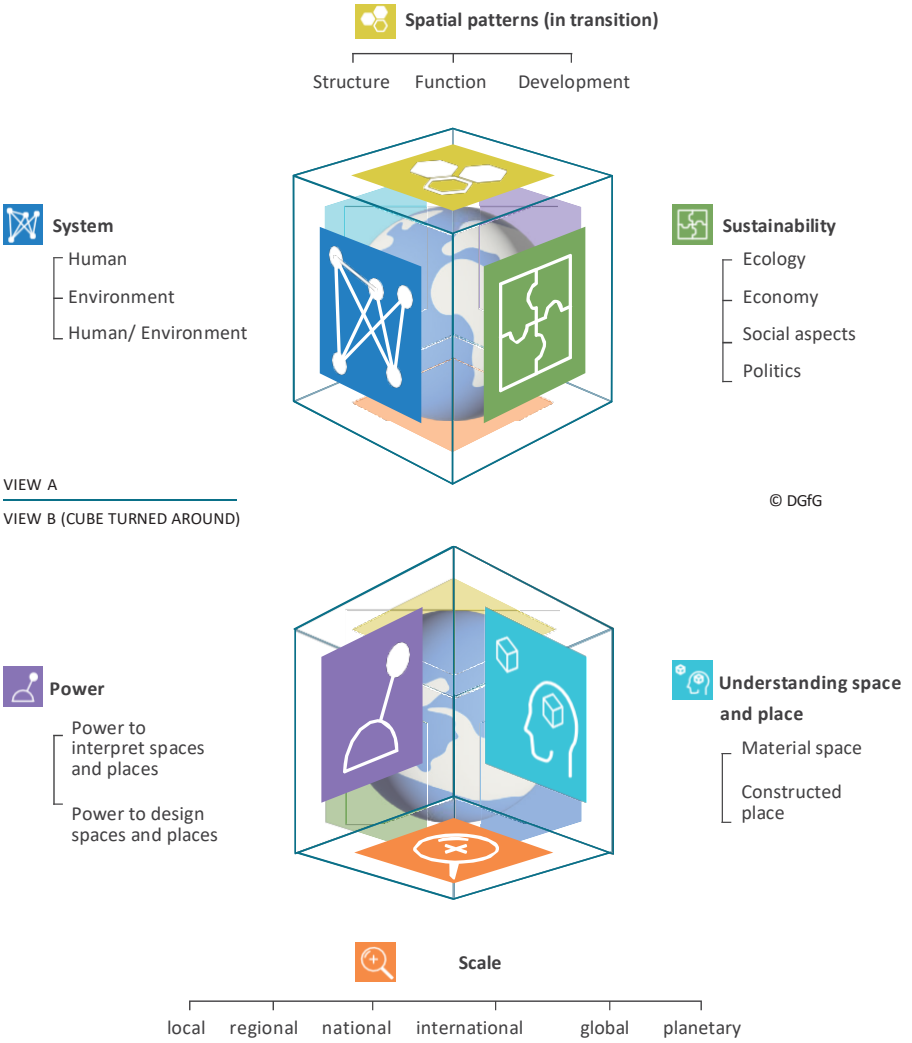
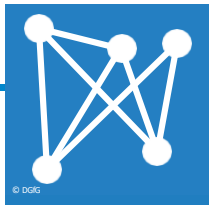



*Figure 2 The six key concepts of geography at the upper secondary level (The illustration is available for download, see QR code)*




## System
### human, environment, human/environment

*The key concept focuses on*

a) the complex and dynamic interactions within and between physical and anthropogenic (sub-)systems and
b) the effects of possible system changes or interventions.

**Selected questions**

a) Which physical and/or anthropogenic elements are (not) part of the system? How are the elements connected? Where are there cycles? Are the feedbacks reinforcing or weakening? To what extent do new developments arise from the interaction of the elements? Are there tipping points?

b) How does the system continue to develop? What is difficult to predict in terms of development? What are the decisive levers/points for change in the system? How can targeted interventions be made in the system? Which different interventions complement each other well? What (also unintended) effects can the system interventions have?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

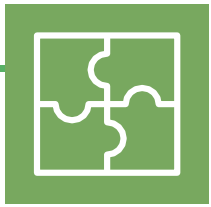
considering the networked interplay of buildings, emissions, air temperature and wind (urban heat island effect) and the corresponding urban planning and design options.

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

considering, with regard to brine evaporation in dry areas for the extraction of the raw material lithium, the interconnected interplay of availability and distribution of water as a resource and, based on this, possible consequences.

## Sustainability
## ecology, economy, social aspects, politics



*The key concept focuses on*

a) the interrelationships between the four dimensions of ecology, economy, social aspects and politics
b) the resulting conflicting objectives and possible strategies for striking a balance, and
c) the (participatory) transformation processes in spatial developments.

**Selected questions**

a) Which dimensions of sustainability affect the topic? What interactions exist between the dimensions?

b) What conflicting objectives arise? What norms and values are behind the arguments of the different people? How can a compromise be found? What can a compromise look like in terms of sustainability? To what extent is there a dominant dimension (e.g. economics) that prevents compromises in favour of sustainability? Can ecological, economic and social resources be balanced against each other? Must limits/guidelines be set for individual developments (e.g. in the area of economics)? Is the compromise sustainable not only locally, but also from a global perspective? Is the compromise also sustainable from an intergenerational perspective?

c) Which changes should be initiated first? At which levels should these changes take place (individual, collective, institutional)? How can the changes be initiated? What opportunities and resistance can arise when initiating change?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

considering competing planning objectives such as the creation of new residential and commercial areas vs. the preservation of existing green and open spaces against the backdrop of the guiding principle of sustainable urban development and the options for action of different groups of actors.

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

considering the conflicting goals between different interests (e.g. groundwater protection, stock market returns, quality of life, energy transition) as well as negotiation processes and strategies for striking a balance against the backdrop of social transformation processes.

## Spatial patterns (in transition) structure, function, development


*The key concept focuses on*

a) recognising spatial structures (e.g., arrangement, regularity, distribution of elements)
b) explaining their functions (purpose/benefit of the structure, relationship between the structural elements) and/or
c) assessing their development (short, medium and long-term changes in the past and future).

**Selected questions**

a) Which elements in the space together form a unit/structure? How are the elements arranged in the space? Are there disparities, zones, patterns, etc.? What (unquestioned) assumptions guide my structuring of space and others' structuring of space? What spatial and social demarcations are made by the people involved?

b) What functions do the elements have? What is the functional relationship between the elements? How does the function explain the spatial structure or the spatial issue?

c) What past developments have led to the current structure of the space or the spatial issue? What are the short-, medium- and long-term causes of the spatial structure or spatial issue? How will the area develop in the short, medium and long term?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

considering areas where cold air and cold air corridors form (= structure) due to their importance for inner-city cooling (= function) against the background of various urban planning options such as the removal or future avoidance of structural obstacles (= development).

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

considering various long-term geodynamic processes (development) to explain the uneven spatial distribution of lithium deposits (structure).


## Scale
## local, regional, national, international, global, planetary

*The key concept focuses on*

a) the choice of scale(s)
b) switching between scales, and
c) the interweaving of scales:
*local (e.g., my neighbourhood), regional (e.g., the Ruhr, Catalonia), national (e.g., Germany, Peru), international (e.g., EU, NAFTA), global (global = places humans at the centre, e.g., UNO) and planetary (places planet Earth or the planets at the centre, e.g., planetary boundaries and tipping points of the ecosystem Earth, the Earth as part the solar system).*

**Selected questions**

a) Which of the various scales am I on? Which scale(s) is/are relevant in this situation or for this issue? To what extent do other people consider other scales to be more decisive?

b) How does the assessment of the issue change when I change the scale? Which causes are found on which scale?

c) How does the scale under consideration (e.g. local) relate to other scales (e.g. global)? To what extent can I clearly distinguish/demarcate scales relevant to the issue? Which measures can be taken at which scale and how do they depend on each other?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

considering the importance of climate protection strategies (emission savings through passive house construction, transport transition, etc.) and adaptation strategies (heat action plans, expansion of green and blue infrastructure, etc.) against the backdrop of advancing global climate change (“think globally – act locally”).

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

considering national deposits of the planetarily limited resource lithium in the context of international economic relations or global climate protection.

## Understanding of space and place
## material space, constructed place

*The key concept focuses on*

a) material space (location and interrelationships of physical and anthropogenic factors) and
b) constructed place (perceptions, media representations, images, utopias, etc. of a space) and
c) the interdependencies between material space and constructed place.

**Selected questions**

a) Where is the material space located? What features characterise the material space and its development? How is the space related to other spaces?

b) Who constructs the place and by what means? What is the intention behind the construction of the place? What positive/negative effect is achieved? What general social developments can be observed in the construction(s) of the place? To what extent are spatial constructions (by other people, in the media, ...) adopted without reflection? Why do people (groups) perceive the space differently? How do different people (groups) justify their perception of the place?

c) Which space/place (material or constructed) is being considered? How does the constructed place influence the material space (and vice versa)? What kind of development measures meaningfully combine the material and constructed understandings of space and place? What are the possible consequences of not taking constructed place into account when designing material space?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

considering equally the limited inner-city open spaces (= material space) and the controversial ideas of different groups related to these open spaces, e.g., as potential spaces of densification (“creating affordable living space”) or as spaces for mitigating climate and ecological developments (“preserving green lungs”) (= constructed place).

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

in the Upper Rhine rift valley, considering, on the one hand, the potential raw materials (e.g., lithium-rich thermal waters of the Upper Rhine rift valley) and, on the other hand, the different perceptions of the region as an economic centre (e.g., Rhine-Neckar metropolitan region) and a tourist destination (e.g., Südliche Weinstraße holiday region), e.g., in information brochures.


## Power
## power to interpret spaces and places
## power to design spaces and places

*The key concept focuses on*

The uncovering of inequalities in the assertion of interests in

a) interpreting and
b) designing spaces and places

**Selected questions**

a) Which interest groups influence the discussion about spaces and places at different scales? What are their strategies, means, communication channels, etc.? Which unquestioned interpretations are powerful, how and why? What power inequalities between different people/groups can be recognised? Which groups are not heard and why not? Which groups do not participate or are excluded? How can disparities in interpretative power be evened out?

b) Who asserts themselves in the designing of spaces and places? At what scale does the power to shape spaces and places lie? Why do certain interest groups (not) prevail? To what extent is the shaping of spaces and places democratically justified? What forms of protest against the power to shape spaces and places are legitimate?

**Example 1**
The climate resilient city

For a geographical understanding of the issue of the “climate-resilient city” this means, for example,

considering the different possibilities of various groups
(e.g., legislative institutions, funding institutions, city administration, citizens' initiatives, young people) in the communication (= power to interpret spaces and places) and implementation (= power to design spaces and places) of urban development models (e.g., green city, child-friendly city, healthy city, social city, city of the future).

**Example 2**
Lithium extraction

For a geographical understanding of the issue of “lithium extraction” this means, for example,

considering the different possibilities of various groups (e.g., international mining companies, governments, local communities) in interpreting (e.g., “white gold”, “climate colonialism”) and shaping lithium extraction (e.g., speculation, expropriation, environmental regulations, public protests).

## 2 The Geography Competence Model at Upper Secondary Level

### 2.1 The six areas of competence

Competences can be seen in the combination of knowledge and skills (and abilities) in the respective areas of competence. They are acquired through actively dealing with specialised geographical content. The subject content thus forms the basis for the development of competences (see Figure 3). Competence-oriented geography lessons expand and deepen subject-related knowledge and skills.

The Educational Standards in Geography for the General Higher Education Entrance Qualification are based on the Educational Standards in Geography for the Intermediate School Certificate in order to promote cumulative learning, the development of structured knowledge and the exploration of new content. The competences and knowledge acquired at lower secondary level form the basis for teaching at upper secondary level. The six established areas of competence in the Educational Standards for the Intermediate School Certificate are further developed and in some cases conceptually adapted: subject-specific concepts, space/place-related orientation, gaining knowledge, communication, judgement and action.

| **Educational standards (Lower Secondary)** | | **Educational standards (Upper Secondary)** |
|---|---|---|
| · subject-specific knowledge | → | subject-specific concepts |
| · spatial orientation | → | space/place-related orientation |
| · gaining knowledge / methods | → | Gaining knowledge |
| · communication | = | communication |
| · evaluation | → | judgement |
| · action | = | action |

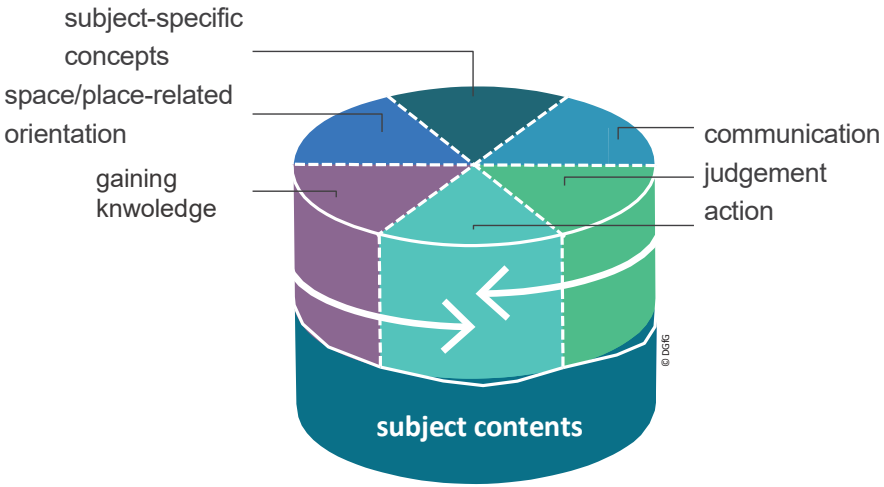



*Figure 3 The Geography Competence Model with the six interdependent/ interpenetrating areas of competence and the subject contents as the basis for developing competence*

Specific competences are identified in each of the six areas of competence. Competences are understood as the cognitive abilities and skills available to individuals or that can be learnt by them in order to solve certain problems, as well as associated motivational, volitional (= will-related) and social readiness and abilities to use the solutions successfully and responsibly in varied situations.

Learners' competences in the area of ...

- **subject-specific concepts** are demonstrated in
  knowledge of the social relevance and epistemological interest of geography, the key concepts derived from this and their functions, and the ability to explain, reflect on and apply these key concepts in order to analyse geographical and everyday issues.

- **space/place-related orientation** is demonstrated in
  knowledge of the difference between material spaces and constructed places, their cartographic and other spatial representations, and the ability to use these in order to provide orientation in space and to grasp space/place-related structures, functions, developments and their interpretations.

- **gaining knowledge** is demonstrated in
  knowledge of geographically relevant ways of thinking and methods, the ability to describe, explain and link these in order to be able to understand or shape knowledge processes and to reflect on their possibilities and limitations.

- **communication** is demonstrated in
  knowledge of geographical language, inter-/disciplinary presentation methods, sources and argumentation structures and in the ability to use these in a variety of contexts in order to evaluate communication about geographically relevant issues, to independently develop communication appropriate to the subject at hand, to the situation and to the addressee(s), and to react appropriately to communication partners.

- **judgement** is demonstrated in
  knowledge about action-relevant guiding principles and strategies and the ability to explicitly formulate, analyse and reflect on these in judgements about facts and values.

- **action** is demonstrated in
  knowledge about action-relevant guiding principles and strategies, and the ability to develop spatial action strategies and to reflect on potential and realised spatial actions and activities.

The six areas of competence are not additively juxtaposed but feed into one another (see Figure 3). For example, learners need subject-specific concepts in order to develop geographically relevant questions in the area of gaining knowledge. The ability to reflect on spatial constructions in the area of space/place-related orientation is a prerequisite for appropriate communication on geographical topics. Reflective judgement is central to competence in spatial action. These are just a few examples that show how the areas of competence are interlinked and together combine to represent the entire sphere of geographical expertise.

## 2.2 The basic and higher requirements in the areas of competence

The Educational Standards for the General Higher Education Entrance Qualification define the competences that learners should acquire by the end of the qualification period. They are specified in *outcome*-oriented standards that are formulated in concrete terms so they can be operationalised in tasks and assessed. The standards are to be understood as norm standards (as opposed to minimum or optimum standards) in that they describe the "average" level of performance that learners should achieve.

The competences are developed in geography lessons in upper secondary school years at both basic and advanced levels (e.g., in the form of basic and advanced courses in some federal states), both of which represent scientific propaedeutic education. The difference between the two levels lies in the scope and depth of the knowledge gained and the knowledge of their links. They also differ in the degree of independence demonstrated when dealing with challenges.

The higher level of requirements is expressed in the areas of competence as follows:

- **subject-specific concepts,**
  in that the key concepts are selected and applied more independently by the learners in the learning process. There is also a greater degree of meta-reflection about subject understanding and the focus of interest in geography.

- **space/place-related orientation,**
  in that there is a stronger focus on the reciprocal interaction of material spaces and constructed places and that learners undertake reflective examination of multifaceted spatial representations.

- **gaining knowledge,**
  in that more complex questions are dealt with more independently, their implementation in concrete ways of thinking and methods is more challenging, and the process of gathering information and the

significance/ claims to validity of the results are reflected upon in greater depth.

- **communication,**
  in that more multi-perspective and controversial content is the subject of communication and that communication processes in speech and writing require more extensive specialised vocabulary, more differentiated and precise specialised forms of expression, and the networked integration of media.

- **judgement,**
  in that students use more and increasingly complex arguments with supporting evidence, substantiate their own points of view in a more factually and ethically differentiated, manner and defend them more comprehensively against objective criticism.

- **action,**
  in that the issues underlying the strategies and options for action are characterised by greater complexity, ambiguity and uncertainties from a factual and an ethical perspective.

## 3 Standards for the Areas of Competence in Geography

The six areas of competence in geography are explained in more detail below and operationalised and specified in the form of (norm) standards.

### 3.1 Standards for the competence area of subject-specific concepts

By taking a specialised view of everyday phenomena, geography makes it possible to explore the world geographically and geoscientifically. In this way, it prepares students to work on issues of central relevance and topicality. The subject is an important part of an educational canon. It is a complex discipline (human geography, physical geography, human-environment relationships). This makes it a central field for dealing with human-environment challenges such as sustainable development.
This complexity requires meta-reflective competences, i.e., the competence to reflect on the subject and in particular on its epistemological interests, in order to be able to formulate relevant questions and deal with them in a differentiated manner and thus gain a deeper understanding. Specialised knowledge should not only be applied but also reflected upon, in terms of its significance, the conditions under which it emerges and the options for gathering this information and applying it. These competences are described in the competence area of subject-specific concepts. In this context, the key concepts are the central access points for the development of a conceptual understanding of the subject.

The key concepts of the human-environment system, system components (structure, function, process) and scales are already comprehensively laid out in the Educational Standards for the Intermediate School Certificate, particularly in the area of competence of subject-specific knowledge. This conceptual approach is expanded through the further development of the aforementioned key concepts and the explicit addition of other key concepts (see Section 1.4). The competence area of subject-specific knowledge found in the Educational Standards for the Intermediate School Certificate has been transferred to the competence area of subject-specific concepts in this

document. In this way, it is emphasised that the subject content cuts across all areas of competence (see Figure 3). The new competence area of subject-specific concepts bundles the standards of spatial analysis required in the competence area of subject-specific knowledge in the explicit application of the key concepts. It also supplements the standards of the lower secondary level with an even stronger conceptual understanding of the subject (= thinking about the subject, e.g., in relation to its epistemological interests on a meta-level).

Each school subject is characterised by certain features related to its objects, interests and methods. In the natural sciences, these subject-specific concepts are summarised under the term Nature of Science. Due to the interconnectedness of natural and social sciences in geography and the universally valid character of Nature of Science, the use of the same term appears appropriate here. Nature of Science generally consists of understanding the scope of scientific knowledge of a subject in relation to the subject, epistemologies, history, society and culture. It involves understanding the investigative methods and the values of the subject. The competence area of subject-specific concepts takes into account the Nature of Science through a) the key concepts specific to geography, b) a meta-level of subject-specific knowledge (e.g., knowledge of the focuses of interest of geography/geosciences and their transformation over time), c) consideration of the relationship of geography to other subjects (interrelationships of geographical/ geoscientific knowledge with, for example, social sciences and biology), and d) the social embedding of specialised knowledge (e.g., the significance of geographical and geoscientific knowledge for sustainability issues).

The competence area is divided into three competences. The first two competences relate to the knowledge and application of key concepts. While competence F1 is aimed at fundamental knowledge of key concepts, competence F2 involves applying the key concepts and thereby utilising their analytical potential.

However, the competence area of subject-specific concepts comprises more

than just knowledge of key concepts and their application. Competence F3 represents a meta-level on the subject of geography. The subject is analysed in terms of its rationale (epistemological interests) and its disciplinary classification (epistemological interests in relation to other subjects). In addition, the aim is to enable students to explain the importance of geographical knowledge in dealing with social challenges in the present and future.

***F1 Ability to characterise key concepts of the subject***

Learners can

- S1 Describe key concepts of the subject.
- S2 Explain the functions of key concepts (e.g., explore geographical issues in a differentiated way; systematically build up knowledge).

***F2 Ability to apply the key concepts of the subject***

Learners can

- S3 justify the selection of a specific key concept for a learning object by reference to the focus of interest (e.g., To what extent is the key concept of systems suitable for the learning object “Conservation of biodiversity”?).
- S4 use key concepts to develop geographically relevant questions (e.g., Who has the power to interpret/shape space in the search for a storage site for radioactive waste? How do spatial structures change due to shifts in function resulting from digitality?).
- S5 use key concepts to geographically analyse an issue/space (e.g., What are the causes of absolute poverty at different scales?).
- S6 use key concepts to change perspectives and draw conclusions (e.g., What are the different economic, ecological, social and political interests in the decarbonisation of industry? How can a compromise be found?).
- S7 use key concepts to apply geographical knowledge as part of a transfer (e.g., recognising similar structures such as earthquake zones or volcanic belts in different parts of the world due to

comparable tectonic processes).

- S8 reflect on the relevance of key concepts for analysing an issue/space (e.g., reflect on the additional knowledge gained by linking material space and constructed place in a spatial analysis).

***F3 Ability to reflect on geography***

Learners can

- S9 describe the focuses of interest in geography (e.g., analysing systemic interrelationships between humans and the environment, developing sustainable strategies for action).
- S10 explain the focuses of interest in geography in relation to other subjects (e.g., differentiating geographical perspectives on a topic from a historical or biological perspective).
- S11 reflect on the significance of geography/geosciences for social challenges in the present and future (e.g., sustainability issues, resource conflicts, hazard research).

## 3.2 Standards for the competence area of space/place-related orientation

Orientation is a fundamental dimension of human existence. Both in everyday spatial terms and in a figurative sense, people need orientation in order to find their way in the world. The ability to orientate oneself spatially is required and promoted in school in geography lessons. This is a fundamental cultural technique that ranges from orientation in the local area to awareness of topographical knowledge and the use of maps and other visualisations of spaces, through to a multi-perspective analysis and evaluation of "glocal" links to living environments. Reflecting on spatial perceptions and constructions of places, which is indispensable in this context, enables a deeper understanding.

This competence area is based on a differentiated concept of "orientation". On the one hand, orientation refers to skills and the ability to use visualisations such as topographical and thematic maps, diagrams, block diagrams and models to gain orientation on the planet. This variant of the term is based on

a more scientific understanding. It works with a concept of reality that assumes that there is a reality that applies equally to all people. It emphasises the technical-instrumental dimension and thus also the (reflective) media competence of spatial orientation. On the other hand, the competence area employs a humanities and social science variant of the term. This emphasises the ability of people to orientate themselves in the world (and environment) on the basis of their respective knowledge and individual experiences. The focus is placed on people's "imagination-based" ideas and images of the world, which always include (changing) power interests and patterns of interpretation. In the Anthropocene in particular, both the technical-instrumental and the socio-cultural orientations are required to make the planetary dimensions of spatial action comprehensible in an epoch in which humans have become a geological factor.

The competency structure model for upper secondary school is compatible with the spatial orientation model for the lower secondary level. In the lower secondary level, spatial orientation requires a knowledge of topographical knowledge and the ability to categorise geographical objects and facts in spatial classification systems. In the upper secondary level, these abilities are demonstrated in the ability to determine a geographical location (O1). In addition, at upper secondary level, map skills (O2), which remain important, are expanded to include the ability to deal appropriately with other visualisations of spaces (O3). The ability to reflect on perceptions of space and place (O5) and constructions of places (O6), already demonstrated at lower secondary level, is upgraded by differentiating between the two perspectives as two competences. The ability to use orientation skills in local settings (O4) underlines the importance of field trips in geography lessons at upper secondary level, as is the case at lower secondary level.

### *O1 Ability to determine geographical location*

Learners can

- S1 localise spaces and places and other geographical/geoscientific objects and issues on the basis of well-founded criteria and other geographical units of reference (e.g., cities, mountains, borders).
- S2 classify the location of a place and other geographical/geoscientific

objects and issues in relation to selected spatial classification grids and orientation systems (e.g., climate and landscape zones, altitudes, so called Global North/Global South).

- S3 evaluate places and other geographical objects and issues in terms of favourable and unfavourable locations (e.g., centre-periphery, location factors).

***O2 Ability to use maps appropriately***

Learners can

- S4 characterise a map as a (double-flattened, scale-bound, generalised, purpose-bound and content-limited) model of spatial information.
- S5 explain the process of producing maps and their use by employing a model of cartographic communication (e.g., world views/intentions of the person producing the map → form of cartographic implementation → different receptions by map readers).
- S6 conduct a targeted and strategy-based analysis of topographical, physical, thematic and other maps (decode, describe, explain and evaluate).
- S7 analyse manipulation and other ways of influencing communication through cartographic representations (e.g., through choice of colour, projections, scales, generalisation).
- S8 independently create analogue and digital maps (e.g., evacuation map, tourist map) from independently collected data or available datasets.

***O3 Ability to deal appropriately with other visualisations of spaces and Places***

Learners can

- S9 research visualisations of geographical/geoscientific phenomena, structures and processes for space/place-related orientation (e.g., images, simulations, travelogues, blogs, causal profiles).
- S10 evaluate visualisations on the basis of a strategy and a target-oriented question.
- S11 compare and evaluate different visualisations and their respective perspectives (e.g., objectives, contexts of origin, applications).

***O4 Ability to use orientation skills in local settings***

Learners can

- S12 use analogue and digital media (e.g., maps, aerial photographs) and other aids (e.g., compass, GPS) to orientate themselves strategically in local settings.
- S13 orientate themselves in local settings using specialist geographical perspectives (e.g., reading spatial structures, recognising changes in function).

***O5 Ability to reflect on perceptions of space and place***

Learners can

- S14 explain the development of their own and others' perceptions of space and place (e.g., from different perspectives, subjective experiences, competing interests, (pre-)judgements).
- S15 reflect on different perceptions of space and place that give rise to different (possibly also one-sided) orientation options (e.g., high mountains as places for recreation, events, sports and nature).

***O6 Ability to reflect on constructions of place***

Learners can

- S16 explain the emergence of their own and others' constructions of place, which are (un)consciously created for different reasons (e.g., regional image campaigns, Eurocentric maps, devaluation of places through the use of language such as "problem neighbourhoods").
- S17 reflect on different constructions of place that produce different (possibly also one-sided) orientation options (e.g., "green washing", social media ratings of locations, communication about geopolitical orders).

### 3.3 Standards for the competence area of gaining knowledge

In order to better understand the challenges of the Anthropocene and develop appropriate strategies for action at different scales, it is important to understand the importance of knowledge and structured knowledge generation and to recognise the responsibility of science, not least against the background of professional controversies and competing truth claims. The fact that geography combines the methods and ways of thinking of natural science and social science can lead to in-depth insights that take into account the various (inter)relationships in the human-environment system. Understanding ways of gaining knowledge at the interface between the natural and social sciences enables students to analyse complex issues and participate in the negotiation of spatial knowledge.

Geography offers a broad spectrum of specific ways of thinking, methods and tools for gaining knowledge, whereby fieldwork is of particular value for geographical education processes. In the digital age, the subject has a prominent position due to the high relevance of digital geoinformation and the proliferation of spatially relevant digital (geo)media (e.g., GPS-based services, GIS, 3D geovisualisation, digital aerial/satellite images).

Being able to understand and design spatial-information-gathering processes from a geographical/geoscientific perspective involves knowing the individual steps of such a process (e.g., in the field), being able to plan and implement them in a typical sequence, and reflecting on their implementation. The competence area is thus based on structural models of scientific information acquisition and divided into competences that focus on formulating geographically relevant questions and hypotheses (E1), use methods and instruments (E2), evaluate primary and/or secondary data and reflect on the path of information gathering (E3). In addition, there is a focus on competences related to reflecting on the characteristics of scientific statements and methods (E4). All four competences focus on spatial effectiveness.

To extend the Educational Standards for the Intermediate School Certificate, the range of methods and instruments is broadened, with a particular focus

on digitalisation. In addition, approaches to gaining knowledge that are planned independently by learners, e.g., in the field or in experiments, are increasingly important. Scientific propaedeutics as a goal of the General Higher Education Entrance Qualification are also more relevant. Among other things, the process of gathering information against the background of different natural and social science ways of thinking and their various potentials is examined from an epistemological perspective. On a meta-level, the focus is also on the responsibility of science, especially in controversial social discourses.

### *K1 Ability to develop geographically/geoscientifically relevant questions and hypotheses on the basis of observations and theories*

Learners can

- S1 characterise phenomena and observations as starting points for geographical/geoscientific investigations (e.g., landslides, urban heat islands).
- S2 independently develop a geographically/geoscientifically relevant question about an issue (e.g., using the various key concepts).
- S3 develop theory-led hypotheses to answer a question (e.g., in an experiment).

### *K2 Ability to use relevant methods and instruments to collect, process and analyse data*

Learners can

- S4 characterise subject-relevant natural and social science methods of data collection, processing and evaluation (e.g., measurement, modelling, surveys, media analysis).
- S5 describe the appropriate use of instruments (e.g., Pürckhauer soundings, drones, GPS).
- S6 independently plan the steps of data collection, processing and analysis to answer the research question (e.g., selection of methods and instruments).
- S7 apply methods and instruments for data acquisition, processing and evaluation (e.g., water analysis, computer simulations).

***K3 Ability to interpret results and reflect on the way in which information is gathered***

Learners can

- S8 interpret the results of data analysis in a theory-based manner.
- S9 appropriately present the entire process of information gathering (e.g., protocol, documentation).
- S10 reflect on the significance, transferability and generalisability of the results against the background of the entire process of information gathering.

***K4 Ability to reflect on the characteristics of scientific statements and methods***

Learners can

- S11 reflect simply on the respective potentials and limitations of natural science ways of thinking and social science ways of thinking and their linkages (e.g., the advantages of examining the topic of aircraft noise by linking data on measurements with resident interviews).
- S12 explain simply the criteria of scientific knowledge production (e.g., evidence vs. opinion, theory vs. ideology).

### 3.4 Standards for the competence area communication

Geography as a future-looking subject explores the ambiguity of key challenges of humanity from a spatial perspective and develops potential approaches to action and solutions. The negotiations that accompany this process require appropriate communication of the subject discourses in the classroom and in social contexts characterised by the conditions of a digitalised world.

Through communication, space becomes the object of negotiation. Space is reconstructed (understood), deconstructed (questioned) and newly constructed (reformulated) through the articulation and exchange of arguments. When discussing spatial issues, this simultaneously leads to the

application and deepening of specialised knowledge. This applies in particular to questions of the relationship between humans and the environment, which affect people in an unprecedented and existential way and require negotiation.

Being able to communicate competently means being able to evaluate, develop and exchange arguments on spatial issues orally, in writing and visually. This communicative three-step process is the prerequisite for responsible social participation. Against this background, it is important to successively expand communication skills (with a particular focus on intercultural situations and social controversies, among other things) and to develop the ability to reflect on the effectiveness of one's own communication. Drawing on the Common European Framework of Reference for Languages (CEFR), a distinction is made between the dimensions C1 Reception (= decoding, understanding and evaluating subject-specific presentations), C2 Production (= creating factually appropriate presentations) and C3 Interaction (= argumentative exchange on subject-specific content) in the competence area of communication. Applied to the specific challenges of space/place-related communication, this means that students should learn to use analogue and digital (geo)media (e.g., travel blogs, journal articles, maps, satellite images) to evaluate information on geographical topics, transfer it into media presentations and enter into exchanges about it.

While the competence area of information gathering is particularly concerned with generating new knowledge on the basis of primary or secondary data, the competence area of communication focuses on researching available information as an argumentative basis.

Aspects of visual communication (e.g., media visualisation of geographical facts) are given greater consideration than in the Educational Standards for the Intermediate School Certificate, and a focus is placed on argumentation. Furthermore, meta-reflective consideration of communication – including non-verbal aspects (e.g., gestures, staging of power) – takes centre stage. In this way, students learn both with and about communication.

### *C1 Ability to decode, understand and evaluate communication on geographical topics (reception)*

Learners can

- S1 research information on geographical/geoscientific issues or questions in a targeted manner in analogue and digital media (e.g., specialist books, online newspapers).
- S2 analyse the origin, quality and trustworthiness of sources used as well as the information, data and forms of presentation contained therein in relation to the author's presumed intention (e.g., internet sources such as social media, explanatory videos, virtual globes).
- S3 evaluate the validity of information and data taken from sources as arguments relating to geographical/geoscientific issues or questions.

### *C2 Ability to develop appropriate communication on geographical topics (production)*

Learners can

- S4 name the research sources they have used (e.g., academic articles, AI-based chatbot).
- S5 present the information and data selected from the sources in a structured and networked way with a focus on findings.
- S6 re-present findings in different language registers (e.g., everyday language, academic language) in spoken and written form and in visual formats (e.g., diagram, concept map, photo).
- S7 develop their own presentations of a geographical/geoscientific topic in a way that is appropriate to the subject.

### *C3 Ability to react appropriately to statements on geographical topics made by communication partners (interaction)*

Learners can

- S8 present their findings to an audience in a way that is appropriate to the subject, addressee and situation using suitable analogue and digital media (e.g., lecture, podcast).

- S9 explain their own point of view in a way that is appropriate to the subject, addressee and situation in dialogue (e.g., in discussions, social media, roleplays).
- S10 develop a compromise in dialogue with communication partners, weighing up arguments (e.g., in the context of participatory spatial planning).

### 3.5 Standards for the competence area of judgement

Many geographical teaching topics relate to current social controversies. Learners are confronted with different judgements about these controversies and at the same time asked to form their own judgements. Judgements are often made quickly and the criteria for forming them are often not disclosed. This is particularly the case in digital discourse environments (e.g., social media). The competence area of judgement thus aims to enable social participation by encouraging reflection on the process of forming judgements. This should allow the criteria on which judgements are based to be explicitly formulated, rendering them accessible in discussion with others and in (self-)reflection.

Judgements result from a process in which specific characteristics are examined on the basis of general criteria and plausible conclusions are derived. A distinction can be made between factual judgements and value judgements:

- Factual judgements are factual statements about how something (probably) was, is or will be. They are based on specialist or technical criteria (e.g., technical models or explanations for assessing soil quality or the socio-economic situation of smallholders). They answer questions such as “How and why is something like this?” or “What can we do?”.
- Value judgements are ethical statements about how something should be or should have been. In addition to factual statements, they are also based on ethical criteria (e.g., values: preservation of nature, prosperity). They answer questions such as “How should it be?” or “What should we do?”

The two operators “evaluate” (= factual judgement) and “comment on” (= value judgement) reflect this distinction.

The five standards represent the steps in the process of forming a judgement: J1 and J2 are prerequisites for making a factual judgement (J3) or a value judgement (J4). These judgements are reflected upon in J5.
Many issues in geography lessons are characterised by double (factual and ethical) complexity. It is therefore important to be able to recognise whether a situation requires only a factual judgement or also a value judgement (J1). The great complexity of geographical/geoscientific issues requires that the different specialist perspectives and, where applicable, the different interests and the full range of relevant ethical issues (“change of perspective”) be identified and analysed (J2).
Competences J3 (factual judgement) and J4 (value judgement) concern the ability to disclose the factual or ethical criteria on which the judgement is based. Factual criteria are, for example, geographical/geoscientific findings, concepts and theories as well as knowledge about their origin and the credibility of the sources of information. Ethical criteria include, for example, certain values, standards and principles. A value judgement is based on factual judgements, but links these with ethical criteria.
The two focal points of geography, “space/place” and “human-environment” (see Sections 1.2 and 1.3), mean that similar general ethical questions are relevant in many topics of geography lessons. Such questions in the “human-environment” focus concern the (intrinsic) value of nature (e.g., animals, species, landscapes) or obligations towards future generations. The “space/place”-focus leads to ethical questions about obligations towards people in other countries, the use of common goods (e.g., oceans, climate) and dealing with spatial disparities (natural, socio-cultural, economic). Sustainability is a particularly important ethical criterion for geographical/geoscientific issues and addresses the obligation we have to all people living today and to future generations when utilising material and immaterial resources.

Geographical/geoscientific case studies, for which factual and value judgements are made, are always characterised by a degree of conflict as to how far they can be justified by specific conditions (e.g., concrete context)

and how far they can be justified by general statements (e.g., theories, concepts). Accordingly, when reflecting on judgements, it is important to question whether and to what extent the criteria used for the specific example are appropriate. In the case of value judgements, attention can be paid to the extent to which certain ethical questions are relevant to the example or only fit the example to a limited extent. With a view to possible social consequences, value judgements should reflect on how political solutions can be initiated despite a pluralism of values (J5).

The competences at upper secondary level go beyond the Educational Standards for the Intermediate School Certificate in that, in addition to students formulating their own judgements, they also focus on analysing the judgements of other people and aim to reflect on these judgements. Furthermore, they emphasise the ability to differentiate between factual and ethical aspects in complex geographical topics and to explain ethical criteria in value judgements, as already introduced at lower secondary level I.

***J1 Ability to characterise a geographical issue as factually and/or ethically controversial***

Learners can

- S1 categorise statements as factual or ethical (e.g., as a factual statement: “according to forecasts, the area of tropical rainforest will continue to decrease in the near future”; as an ethical statement: “The area of tropical rainforest should not decrease in the future”.).
- S2 describe the necessity of a factual or value judgement for a certain situation (e.g., when calling for the abandonment of energy imports from authoritarian states).

***J2 Ability to analyse a geographical issue with a view to judging it***

Learners can

- S3 analyse the different specialist perspectives and, if applicable, the different interests of the persons involved in the situation being judged (e.g., a soil geographical perspective and a technical perspective for a specific agricultural operation).

- S4 analyse the different specific ethical issues pertaining to a situation being judged (e.g., in agriculture: issues of animal welfare, health protection, food security).

***J3 Ability to justify the specialist criteria on which a judgement on a geographical issue is based***

Learners can

- S5 justify the choice of technical criteria and their application to the relevant facts in their own stated judgements (e.g., in a judgement on the vulnerability of a region).
- S6 assess specialist judgements made by others in terms of the appropriateness of criteria used, the relevant facts considered and the plausibility of the judgement in (e.g., in judgements by a citizens' initiative on the expected consequences of the construction of a bypass).

***J4 Ability to explicitly explain the ethical criteria underlying a judgement on a geographical issue***

Learners can

- S7 explain ethical questions typical of geographical issues (e.g., the question of the value of nature or how to deal with global disparities).
- S8 when making their own value judgements, explain the underlying factual judgements and the ethical criteria they selected, and, if applicable, their weighting (e.g., weighting of ecological versus social and economic criteria).
- S9 in value judgements made by other people, analyse the ethical criteria applied, the plausibility of the value judgements and the relevant backgrounds such as the interests, power and socialisation of the author (e.g., in justifications by a citizens' initiative as to why a bypass should be built).

### *J5 Ability to reflect on judgements about geographical issues*

Learners can

- S10 reflect on the suitability of the general criteria used for a factual judgement in light of the specifics of the concrete example (e.g., in a judgement on the development potential of a region).
- S11 reflect on the relevance and suitability of general ethical questions that are typical for geographical issues when making a value judgement on a specific example (e.g., the question of the value of nature in a specific wind power project).
- S12 for a value judgement, reflect on the political consequences in the search for a solution (e.g., for a local land-use conflict, the development of possible compromises based on the various value judgements).

## 3.6 Standards for the competence area of action

Future-oriented geographical education is based on the acquisition of knowledge, skills/abilities and attitudes in order to be able to analyse and evaluate spatial phenomena and processes between people and the environment and, building on this, to develop a responsible, spatial competence for action. Human life is based on various forms of action such as everyday actions (e.g., writing social media posts), informational actions (e.g., conscious consumption of fair-trade products), participatory actions (e.g., active involvement in projects) and volunteering (e.g., organising a school event). Responsible action can only be meaningful and successful if the causes and effects of human-environment interdependencies are taken into account. By developing, analysing and reflecting on action strategies and their implementation at different levels (e.g., individual, collective or institutional such as state, economic, social, cultural institutions), interventions are viewed systemically in geography lessons. The analysis of spatial actions that have caused unsustainable development in different regions of the world shows massive anthropogenic interventions at local and regional levels that lead to scenarios involving global existential threats for the Earth in relation to the planetary boundaries. By negotiating and evaluating/commenting on concrete measures and analysing their

consequences, a contribution is made to reducing and solving problems. This also becomes clear in the concept of Education for Sustainable Development.

The aim of the competence area of action is to encourage learners to generally act in a reflexive and spatially appropriate manner. Planned and executed intentions and strategies for action should be questioned using sound geographical knowledge and reflected judgement. Taking into account multi-perspective challenges and conflicting goals, it is important to critically focus on individual, collective and institutional responsibility. The Earth as a habitat is characterised by constant interest-driven negotiations. The various interests invested in actions are reflected in both material spaces and constructed places.
Geography sees itself as a future-looking subject that contributes to sustainable solutions. The competence area of action gives learners the opportunity to experience social participation and self-efficacy.
This area of competence includes knowledge of action-relevant guiding principles and strategies and the ability to analyse and develop spatial action strategies and options and to reflect on both potential and implemented spatial actions. The content for this is provided by geographical/geoscientific issues, which are often characterised by complexity, controversy, ambiguity and/or uncertainty both factually and ethically and must be dealt with using a systematic approach at various levels (e.g., individual, collective and institutional).

The standards of the competence area of action are characterised by the phases of planned action: motivation to act, action planning (volition), the actual action and evaluation of potential and completed actions (post-action). The competence area of action is divided accordingly into the competences of weighing up (A1), planning (A2), acting (A3) and reflecting (A4) on potential and completed spatial action strategies and actions.
The further development of competences at upper secondary level compared to the Educational Standards for the Intermediate School Certificate is characterised by a stronger systematic focus on spatial action strategies as well as potential and implemented spatial actions at various levels (e.g., individual, collective, institutional).

***A1 Ability to explain and evaluate spatial responsibility and options for action at different levels (e.g., individual, collective, institutional)***

Learners can

- S1 describe the challenges of space/place-related human responsibility (e.g., carrying capacity of the earth, food security).
- S2 explain spatial options **for** action at different levels with regard to sustainable development (e.g., in relation to the Sustainable Development Goals).
- S3 evaluate damage- and risk-preventing/minimising strategy-based measures (e.g., scenario techniques, early warning systems, sustainable planning) at different levels (e.g., local to global/planetary).

***A2 Ability to analyse and evaluate spatial action strategies at different levels in students' own environments***

Learners can

- S4 analyse spatial action strategies and opportunities for social participation at different levels (e.g., legislation, citizen participation processes, civic engagement).
- S5 discuss space/place-related forms, narratives and actions of protest (e.g., civil disobedience).
- S6 evaluate spatial action strategies at different levels with regard to their conditions for success and effectiveness (e.g., using indicators of sustainable development).

***A3 Ability to develop technically sound action strategies and implement concrete spatial actions at different levels in students' own environments***

Learners can

- S7 describe for other people relevant fields of action and the associated conflicting goals (e.g., agriculture and food, sustainable urban development).
- S8 (co-)develop strategies for action using examples in the school/local area (e.g., planning proposals to the local council, fair-trade school kiosk, whole school approach).

- S9 implement strategies for action within the scope of possibilities (e.g., for everyday mobility of the learning group, co-design of sustainable school activities, zero waste school).

***A4 Ability to reflect on potential and implemented spatial strategies and actions at different levels with regard to their causes and effects***

Learners can

- S10 evaluate the effects of actions and alternative courses of action on the human-environment system and the underlying strategies (e.g., nutrition, consumption, mobility, digitality, energy industry).
- S11 discuss potentials and challenges for responsible action (e.g., individual, collective, institutional) in geographically/geoscientifically relevant contexts (e.g., human-environment system at different scales).

## 4 Operators for the Standards in the Upper Secondary Level

Operators are action-initiating verbs that indicate which activities are expected when working on tasks. The operators and their explanations compiled in the Educational Standards in Geography for the Intermediate School Certificate have been adopted for the upper secondary level. They are supplemented by additional operators that are included in the Educational Standards for the General Higher Education Entrance Qualification (see Table 2).

The operators are categorised according to the three performance levels, the explanations of which are also taken from the Educational Standards for the lower secondary level:

- **Performance level I** (**reproduction**) includes the recounting and description of subject-specific contents from a clearly defined area and in a learned context with the reproductive use of work techniques and procedures that have been practised. This calls primarily for reproductive skills.

- **Performance level II** (**reorganisation and transfer**) includes independent explanation, adaptation and ordering of subject-specific contents and the appropriate application of learned contents, methods and procedures to other issues. The main skills required are reorganisation and transfer.

- **Performance level III** (**reflection and problem solving**) calls for independent reflective engagement with new problems, the methods used and procedures and insights gained, in order to produce explanatory statements, interpretations, deductions and options for action. This calls particularly for skills in reflection and problem-solving.

The performance levels are to be understood as interdependent, whereby Performance Level III includes Performance Levels I and II, and Performance Level II includes Performance Level I.

*Table 2 List of operators used in the standards of the Educational Standards in Geography for the General Higher Education Entrance Qualification*
*(* = operators that have been added to the Educational Standards for the General Higher Education Entrance Qualification in comparison to the lower secondary educational standards)*

**Performance Level I – Reproduction**

| | |
|---|---|
| **describe** | Express statements and knowledge (about a given aspect) in the student's own words in a coherent and ordered manner and using geographical terminology |
| **characterise** | Describe facts and processes with their typical characteristics and determine their basic features |
| **implement** | Carry out analyses, experiments, field surveys, questionnaires etc. based on specific instructions |
| **locate** | Identify/mark the location of a place, river etc. on a map or describe it in relation to other spatial features |
| **name/list** | Relate information and facts from given material or knowledge without commentary |
| **record** | Record observations, measurements or experiments performed in detail and in accurate drawings or using appropriate geographical terminology |

**Performance Level II – Reorganisation and Transfer**

| | |
|---|---|
| **analyse** | Analyse and interpret material or facts systematically and purposefully and identify structures |
| **apply*** | Relate a known fact or a known method to a new problem and use it to solve (possible) problems and/or to achieve goals |
| **utilise*** | Obtain information from given materials (continuous and discontinuous texts) and use it in a targeted manner |
| **outline** | Present facts, connections, methods and relations in a structured way and using an appropriate form of communication |
| **classify/collate** | Classify facts in a given context or collate them in a system, giving reasons |
| **explain** | Present information and facts (e.g., phenomena, developments) in such a way that conditions, causes, consequences and universal laws are readily apparent |
| **illustrate** | Describe facts in context and make relationships clear |
| **design/draw** | Present facts in a suitable graphic form and label these diagrams using geographical terminology (e.g., flow chart, diagram, sketch map, mind map) |

| | |
|---|---|
| **orientate*** | Use analogue/digital media and/or a specialist geographical perspective to find the way (in a local setting), based on a strategy |
| **plan** | Draw up a basic concept or procedure for dealing with a problem/question (e.g., as part of a survey, a spatial analysis, an experiment) |
| **present*** | Present prepared information and findings on a topic in a structured and appropriate manner, using media in a manner appropriate to the target audience |
| **compare** | Critically compare similarities and differences and formulate a result/conclusion |

**Performance Level III – Reflection and Problem solving**

| | |
|---|---|
| **derive*** | Draw appropriate/logical conclusions on the basis of key characteristics |
| **reason** | Develop logically argued complex concepts and present them in context |
| **evaluate** | Investigate the validity or suitability of statements, claims, suggestions or measures in their context, citing the criteria used, without expressing a personal opinion |
| **comment on** | Appraise statements, claims, suggestions or measures, making clear and reflecting upon the ethical criteria underlying this appraisal, and expressing a personal opinion |
| **develop** | Link up facts and methods for a specific purpose, e.g., formulate a hypothesis, create a research plan, design a model |
| **discuss** | Make a reasoned judgment/formulate a reasoned opinion on a given issue by weighing up pro and contra arguments |
| **create/draft*** | Work on tasks in a product-oriented manner and shape/produce results independently and creatively (e.g., in text and media products) |

| | |
|---|---|
| **interpret*** | Infer meaning from sources and give a reasoned opinion/overall interpretation based on an analysis, explanation and judgement |
| **research*** | Carry out research into geographical facts with the aim of obtaining valid data or information in a well-founded manner |
| **reflect*** | Examine and weigh up facts and arguments, procedures and positions on the basis of criteria from a meta-perspective |
| **assess** | Analyse the internal coherence and suitability of given statements or claims and forms of presentation in relation to specific issues |

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The Educational Standards in Geography for the General Higher Education Entrance Qualification are available free of charge digitally:

- www.dgfg.org/geographie-und-gesellschaft/schule/

Deutsche Gesellschaft für Geographie (DGfG) is the umbrella organisation for:

- Deutscher Verband für Angewandte Geographie (DVAG)
- Geographische Gesellschaften in Deutschland (GeoGes)
- Hochschulverband für Geographiedidaktik (HGD)
- Verband Deutscher Schulgeographie (VDSG)
- Verband für Geographie an deutschsprachigen Hochschulen und Forschungseinrichtungen (VGDH)
- Vertretung deutschsprachiger Geographiestudierender (GeoDACH)

**Would you like to join us in promoting the subject of geography?**

**Deutsche Gesellschaft für Geographie e.V. (DGfG) –**
**German Geographical Society**

The Deutsche Gesellschaft für Geographie e.V. (DGfG) is the umbrella organisation of geographical associations and societies in Germany with 30,000 members. Geography teachers and geography didactics experts are organised in the Verband Deutscher Schulgeographie and the Hochschulverband für Geographiedidaktik. More information about our services and programmes is found on the DGfG website. We look forward to your commitment!

www.geographie.de

**Hochschulverband für Geographiedidaktik (HGD)**
**Academic Association for Geography Education**

The HGD fosters geography education in research, teaching and educational policy. The aim is the research-based optimisation of the teaching and learning of geographic content, especially in geography lessons. The association represents the interests of geography educators in all phases of teacher education and mediates between the needs of the schools, the universities and education policy. The central organs of exchange are the *Zeitschrift für Geographiedidaktik* (https://zgd-journal.de), the publication series *Geographiedidaktische Forschungen* (www.uni-muenster.de/Geographiedidaktische-Forschungen) and the HGD Symposium, which takes place every two years. Members also regularly receive the HGD newsletter with current information.

www.geographiedidaktik.org

**Verband Deutscher Schulgeographie (VDSG)**
**Association of German School Geography**

The VDSG is one of the oldest and largest associations of specialist teachers in Germany, founded in 1912, with a total of around 5,000 members in 16 federal-state associations. It is the professional and interest group for geographical education in all types of schools and educational areas.

Almost all of the central challenges that humanity is currently facing on a local, global and planetary level have a strong spatial character, concern the systemic interplay between humans/society and the environment and are at the heart of geography lessons. The clearly defined focus on spatial perspectives and the integrative human-environment perspective are two unique features of geography as a school subject.

Geography makes a specific, highly relevant contribution to education by promoting space-related orientation competences and interrelated thinking. In no other school subject is the concept of sustainability so firmly anchored in the curriculum as in geography.

Geography teachers support and encourage the students entrusted to them in their learning process so that they can find their own place in a global society.

The VDSG supports the didactic development of the subject and promotes the further development of geography teachers through training events.

In addition to the largest school competition in Germany, Diercke Wissen, the VDSG is also a partner in the international *iGeo* competition. Support is provided to schools that are particularly committed to the subject of geography and to dedicated young geography teachers in the GeoInnovativ competition and winners of nationwide competitions such as Jugend forscht.

www.vdsg.de