

1	Life on Earth	6			
1.1	Life on Earth	8			
	MODEL The geospheres model of the Earth	9			
1.2	Life on Earth – sustainability	10			
1.3	Life on Earth – globally connected	12			
2	Geofactors	14			
2.1	Plate tectonics	16			
	Seafloor spreading – the seabed tears apart	16			
	Plate tectonics – a comprehensive model	18			
	Dynamics and mobility of the Earth's plates	20			
	MODEL Wilson cycle	20			
	Origin of the Alps	22			
	Formation of ore deposits	23			
	Volcanism	24			
	Earthquakes	26			
	CASE STUDY California	28			
2.2	Climate	30			
	Signs of change	30			
	MODEL The climate system	31			
	The Earth's radiation and heat budget	32			
	Air pressure and warming	33			
	Natural climate changes	34			
	Anthropogenic influences	35			
	Global temperature differences	38			
	From temperature to pressure differences	40			
	The origin of the jet stream	41			
	MODEL The Earth's air pressure and wind belts	43			
	Air currents in the tropics	44			
	The influence of the oceans	46			
	The water in the air	47			
	Central Europe – different weather patterns	50			
	Climate classifications – climate zones	51			
	Climate change and possible results	52			
	CASE STUDY Our local area	56			
2.3	Water	58			
	Water – scarce and precious	58			
	Water – a special substance	58			
	MODEL The water cycle	60			
	Water - integrated into a cycle	61			
	Standing and flowing water – freshwater ecosystems	61			
	The world's oceans – the largest aquatic system	62			
	Water – managing a precious commodity	64			
	Virtual water and water trading	66			
	Privatisation of the water industry	67			
	Sustainable use of water	68			
	The EU Water Framework Directive	69			
	CASE STUDY The Middle East	70			
	CASE STUDY The Aral Sea	72			
2.4	Surface forms	74			
	Endogenous and exogenous processes	74			
	MODEL The rock cycle	75			
	Rocks are formed ...	75			
	... Rocks decay: Weathering	76			
	Karst – weathering in equilibrium	77			
	Resistance forms: cuestras	78			
	The effect of flowing water	79			
	Valley forms	81			
	The effects of the wind	82			
	The Earth – an “ice age planet”	83			
2.5	Soil	86			
	MODEL Soil evolution	86			
	Soil – more than just dirt	86			
	Soil – overused and degraded	88			
	CASE STUDY Ukraine	90			
2.6	Geofactors	92			
	MODEL Geoecosystems and geoecological model	93			
	CASE STUDY The Upper Rhine Plain	94			
	CASE STUDY The Upper Rhine	96			
	CASE STUDY Tectonics and geothermal energy	98			
3	Ecozones	101			
3.1	From the ecosystem to the geoecozones	102			
	Zoning of the Earth	102			
	Ecozones – zonal division of the Earth's surface based on specific ecosystems	103			
	Altitudinal zones in mountains – a counterpart of the global zones	104			
	Utilising the ecozones	108			
	Climate change – impacts on the ecozonal classification of the Earth	109			
3.2	Biodiversity on poor soils	110			
	The tropics – more than just moist heat on the equator	110			
	The tropical rainforest ecosystem	112			
	Sustainable agriculture in the permanently humid tropics – a challenge	114			
	Commercial logging – often the beginning of the end of the rainforest	117			
	Tropical rainforest – a unique ecosystem and global resource under acute threat	117			
	CASE STUDY Amazonia	118			
3.3	Between rainforest and desert	120			
	The savannahs – interplay of tropical warm and humidity	120			
	Summer humid tropics – the most extensively used zone within the tropics	123			
	Summer humid tropics – a fragile ecosystem	126			
	CASE STUDY The Sahel	128			
3.4	Where the sun reigns	130			
	Desert forms and weathering	131			
	Deserts – empty and useless?	133			
	CASE STUDY Southwest-USA	134			

3.5 Rich soils, scant vegetation	136	5.4 Traditional industrial locations	200
Steppes – hot summers, cold winters	136	Manufacturing industry	200
Steppes – intensively used grasslands	138	The early evolution of industry	201
Steppes – highly vulnerable grasslands	139	Former industrial regions in transition – the example of coal and steel regions	202
CASE STUDY The Great Plains	140	Location factors and location decisions	206
3.6 Darkness for months and nearly deserted	142	MODEL Weber's Industrial location theory	207
The high latitudes	142	MODEL The product life cycle model	209
Life and work at the periphery of the ecumene	144	CASE STUDY The Ruhr area	210
CASE STUDY Siberia	146	5.5 Industrial regions	212
4 Agriculture	148	Development through innovation	212
4.1 Agriculture and food	150	MODEL Theory of long waves	213
Food systems	150	Industrial production concepts	214
The basis of agriculture	150	MODEL The cluster model	217
The structure of agriculture in Germany	152	Local and global industrial locations	218
Intensification of agriculture – successful, but not without consequences	153	CASE STUDY Silicon Valley	222
CASE STUDY Oldenburger Münsterland	156	5.6 Tertiary sector	224
4.2 Agricultural products	158	Tertiarisation of the economy	224
Agricultural market and agricultural trade	159	The digitalisation of services	226
Bioenergy and agrofuels	160	Locations of person-related service providers	228
Betting on food prices	161	Locations of business-oriented service providers	230
The struggle for fertile land – land grabbing	162	CASE STUDY The United Kingdom	232
CASE STUDY Indonesia	164	5.7 Tertiary sector– specialised service locations	234
4.3 Agriculture	166	Retail locations	234
Alternative paths	167	Global services	236
CASE STUDY Tanzania	172	MODEL Global Cities	237
5 Industry and services in a globalised World	174	CASE STUDY Frankfurt am Main	238
5.1 Economic sectors	176	5.8 Tourism	240
Sectoral structure of the economy	176	Types and forms of tourism	240
MODEL The Fourastié sectoral model	177	History of tourism	241
Structural change in the economy	177	Tourism – changed market situation	242
The informal economy	179	Tourism as an economic factor	243
5.2 Raw materials	180	The impact of tourism	244
Raw materials – resources – reserves	180	MODELS Life cycle of a tourism	245
MODEL Hubbert curve	181	CASE STUDY Canary Islands	246
Global commodity trading	181	5.9 Globalisation	248
The formation of coal	182	Rapid growth in trade and capital movements	248
The formation of crude oil and natural gas	183	The concept of globalisation	249
New extraction technologies	184	Technical preconditions for globalisation	249
Metallic raw materials	186	Political preconditions for globalisation	250
MODEL The syndrome concept	187	Globally networked – but not all participate equally	251
CASE STUDY Australia	188	MODEL International trade	253
5.3 Energy	190	Terms of trade – a measure of exchange relations	254
Forms of energy	190	Multinational and transnational enterprises	254
The global energy industry	190	Commodity chains and their problems	255
The use of renewable energies	192	CASE STUDY Bangladesh	256
Towards a sustainable energy economy	194		
CASE STUDY The North Sea	196		
CASE STUDY Germany	198		

6	Population and migration	258	8	One World?	316
6.1	Development of the world population	260	8.1	Differences in development	318
	The growth of the world population	260		Economic indicators	319
	Causes of population development	260		Social indicators	320
	MODELL The demographic transition model	263		Developing Countries –	
	Changes in the age structure	264		Third World – First World – One World	322
	How many people can our planet support?	266		Poverty – the central problem	324
	Carrying capacity – global vs. regional	269		Nutrition and health	324
	CASE STUDY Africa	270		Gender inequality –	
	CASE STUDY The population of Germany	272		women are disadvantaged	326
6.2	Migration	274		CASE STUDY One World	328
	Migration is normal	274	8.2	Developing countries in the world economy	330
	MODELL Push-pull model	275		The colonial era – with consequences	330
	Causes of migration	275		Integration into world trade	332
	Migration movements	276		Increasing foreign debt	333
	Impacts in the countries of origin	277		The changing structure of foreign trade	334
	Impacts in countries of inward migration	278		Globalisation – an opportunity?	334
	CASE STUDY USA	280		MODEL Theory of global fragmentation	335
7	Town and Country	282		Capital and know-how	337
7.1	Urbanisation	284		CASE STUDY Brazil	338
	The growth of towns and cities	284	8.3	Economy, society, geography	340
	Growth and town size	285		The changing economic structure	340
	Metropolisation and polarisation	286		The informal economy –	
	Risks and opportunities of megacities	288		workplace of the poor	341
	CASE STUDY São Paulo	290		Structures of inequality	342
7.2	Urban development and urban structures	292		Power – distributed unequally	344
	Town origins and development	292		Cities – with a clear locational advantage	344
	MODEL Development and structure of a German town	295		MODEL Polarised development	345
	MODEL North American City	297		Cities – overstretched	346
	CASE STUDY Bremen	298		Primate cities – dominant cities	346
7.3	Urban subspaces	300		MODEL Local Fragmentation	347
	The city centre – the pulse of the city	300		Bad governance	348
	Inner city residential districts –			Rural areas – left behind	348
	once home to tens of thousands of people	302		CASE STUDY Brazil	350
	Spatial differentiation processes –		8.4	Development	352
	Rising and declining urban districts	302		Theories of low and high economic development	352
	MODEL Fragmented city	305		MODEL Development model of the tourism industry	353
	MODEL Gentrification	305		Development of individual economic sectors	353
	Living in the outskirts – quiet and cheap!?	306		Improvements in world trade	354
	CASE STUDY Chicago	308		MODEL polarisation reversal theory	355
7.4	Urban ecology and sustainable urban development	310		Sustainable Development – Agenda 2030	357
	Urban ecosystem	310		Global governance and good governance	358
	Urban climate	311		Improving living conditions	358
	Sustainable urban development	312		Germany's development cooperation	359
	CASE STUDY Air pollution in Stuttgart	314		CASE STUDY South Korea	360
A	Appendix	362			
	Registry	362			
	Picture sources	368			