Contents Vaw out built or square guist 180

UNIVERZITA PALACKÉHO
Přírodovědecká fakulta
tel. 585 634 513, 585 634 516 ①

	List of colour plates	viii
	List of figures	ix
	Acknowledgements	xi
1	Introduction	1
	Research in cartography and children 2	
DAT	Reading and understanding text on small scule maps 61	
	derstanding maps	5
2	Cartography and geo-information science	7
	The 'cartographic revolution' 8	
	How maps work 9	
3	How children learn with maps	12
	Is map learning innate? 12	
	Map learning as the personal construction of knowledge 13 Map learning as the social construction of knowledge 20 Perspectives from an information processing approach 22	
4	Models, aerial photographs and large scale plans	26
	A A A A A A A A A A A A A A A A A A A	
	Onaerstanding that models can represent space 20	
	Understanding that aerial photographs can represent space 27	
	Understanding that maps can represent space 29	
	Using maps to find a location 30	
	Understanding the map's alignment and viewing angle 33 Understanding scale 34	
	Using coordinates 36	
	Understanding symbols and text on large scale maps 37	

A life skill we don't teach 39 Using maps to identify a route 40 Navigating small spaces 41 Navigating in the real world 42 6 Children's neighbourhood maps Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97 Maps and special users 98	5	Using maps to find the way		3
Using maps to identify a route 40 Navigating small spaces 41 Navigating in the real world 42 6 Children's neighbourhood maps Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		A life skill we don't teach 39		
Navigating small spaces 41 Navigating in the real world 42 6 Children's neighbourhood maps Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Navigating in the real world 42 6 Children's neighbourhood maps Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
6 Children's neighbourhood maps Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Recreating the view from above 45 Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		THE SAS BAN STA SEE SALLY		
Children's maps of their home area 45 Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97	6	Children's neighbourhood maps		4
Assessing children's maps 46 Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Recreating the view from above 45		
Using mapping software 50 7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Children's maps of their home area 45		
7 Understanding topographic and thematic maps Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Assessing children's maps 46		
Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Using mapping software 50		
Some learning difficulties with scale 51 Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97	7	Understanding topographic and thematic		5
Generalisation 53 Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Some learning difficulties with scale 51		
Understanding conventional symbols on topographic maps 53 Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Visualising relief 55 Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97			raphic maps 53	
Contours 59 Reading and understanding text on small scale maps 61 Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Understanding picture maps 62 Understanding thematic maps 63 8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Reading and understanding text on small sci	ale maps 61	
8 World maps, globes and atlases Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		18 기술 (18 학생 / 18 학급)는 18 전 기업에 가능하면 18 전 전 전 전 전 18 전 기업 전 18 전 1	Marin, alles	
Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Understanding thematic maps 63		
Understanding the Earth 67 Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Development of world place knowledge 69 Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97	8	World maps, globes and atlases		6
Children's maps of the world 69 Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Understanding the Earth 67		
Map projections 74 Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Development of world place knowledge 69		
Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Children's maps of the world 69		
Understanding the spherical Earth 77 Children's maps of their own country 79 Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Map projections 74		
Understanding nested spatial hierarchies 80 School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Understanding the spherical Earth 77		
School atlases 83 Electronic atlases 85 PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Children's maps of their own country 79	Is map learning innate? 12	
PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		· · · · · · · · · · · · · · · · · · ·		
PART 2 Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		Electronic atlases 85		
Better teaching with maps 9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97	PAI	RT 2		
9 Planning a map and GIScience curriculum Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		ter teaching with mans		8
Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97		AN PRINT BUSINESS		
Map skills 91 Progression 92 Evaluating map teaching strategies 96 Gender differences 97	9	Planning a map and GIScience curriculus	n	9
Progression 92 Evaluating map teaching strategies 96 Gender differences 97				
Evaluating map teaching strategies 96 Gender differences 97 DE USTANIA TORS DE USTANIA		-		
Gender differences 97				
Muys and special users 90				

10	Practical map activities: up to age 7	100
	Direct and indirect environmental experience 100	
	Learning with models, photographs and large scale plans 102	
	Learning with atlases and globes 104	
	Learning with aimses and gibbes 104	
11	Practical map activities: age 7 to 11	106
	Developing map numeracy 106	
	Developing map literacy 109	
	Learning with large scale maps 110	
	Map making 112	
	Learning with atlases and globes 114	
12	Practical map activities: age 11 to 14	116
	Map numeracy 116	
	Map literacy 118	
	Developing map and atlas skills 119	
	Learning to use GISystems 121	
	Beyond age 14 122	
	topographic contents or showever a surround has not related	
13	Making better maps for children	124
	Visual variables used in map symbology for the or see as a see of the contract of	Plate 4
	Putting maps on the page 124	
	Graticules and grids 127	
	Showing scale information 128	
	How much detail to show? 128	
	Symbology and legends 128 Supporting map reading through the 120	
	The ting map reading through type 130	
	Labelling geographical names 133	
	Project on regionabe animone and the Miller A anna a anna a	
14	Conclusion world of childhood from	136
		76
	Appendix	
		139
	Bibliography Index	141
	- mich	152