

The Pearson logo consists of the word "PEARSON" in a white, sans-serif, all-caps font, centered within a solid black rectangular background. A thin white curved line is positioned below the text, resembling a stylized horizon or a smile.

Copyright © 2009 Pearson Canada Inc., Toronto, Ontario.

All rights reserved. This publication (work) is protected by copyright. You are authorized to print one copy of this publication (work) for your personal, non-commercial use only. See [Terms of Use](#) for more information.

Permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, use on an interactive whiteboard or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. Contact the [Permissions Department](#) for more information.

Except as allowed in the preceding paragraphs, you may not modify, copy, distribute, republish, commercially exploit, or update this publication (work) or any other material on this web site without the prior consent of Pearson Canada. No intellectual property or other rights in and to this publication (work) are transferred to you.

CONTENTS

INTRODUCTION	vi
CHAPTER 1: AN OVERVIEW OF <i>FIRST STEPS</i> IN MATHEMATICS	1
Beliefs about Teaching and Learning	2
Learning Mathematics: Implications for the Classroom	4
Understanding the Elements of <i>First Steps in Mathematics</i>	8
How to Read the Diagnostic Map	12
Planning with <i>First Steps in Mathematics</i>	15
CHAPTER 2: REPRESENT LOCATION	21
Background Notes	22
Represent Location: Key Understandings Overview	24
Key Understanding 1: We describe where things are in relation to other things	26
Sample Learning Activities	28
Case Study 1	37
Key Understanding 2: Some maps or diagrams show the order of things; others also represent distances and directions	40
Sample Learning Activities	42
Key Understanding 3: Plans show placement and relative size of things from a top view	52
Sample Learning Activities	54
Case Study 2	63
CHAPTER 3: REPRESENT SHAPE	67
Background Notes	68
Represent Shape: Key Understandings Overview	70
Key Understanding 1: When we copy and make figures and objects, we need to think about how the whole thing looks	72
Sample Learning Activities	74
Case Study 1	83
Key Understanding 2: The net of an object has to have the same component parts as the object	86
Sample Learning Activities	88
Case Study 2	95

Key Understanding 3: To understand drawings of objects, we need to combine what we can actually see with what we think is there	98
Sample Learning Activities	100

CHAPTER 4: REPRESENT TRANSFORMATION **111**

Background Notes **112**

Represent Transformation: Key Understandings Overview **116**

Key Understanding 1: We can imagine how a thing will look after we move it or change our view of it	118
---	-----

Sample Learning Activities	120
--	-----

Key Understanding 2: We can move things around in space by reflecting, translating, and rotating	130
--	-----

Sample Learning Activities	132
--	-----

Case Study 1	143
------------------------------	-----

Key Understanding 3: Some transformations change size but not shape; others change shape and size	146
---	-----

Sample Learning Activities	148
--	-----

Key Understanding 4: Symmetrical things have component parts which can be matched by rotating, reflecting, or translating	156
---	-----

Sample Learning Activities	158
--	-----

Case Study 2	165
------------------------------	-----

CHAPTER 5: REASON GEOMETRICALLY **169**

Reason Geometrically: Key Understandings Overview **170**

Key Understanding 1: Things can be the same in some ways and different in other ways	172
--	-----

Sample Learning Activities	174
--	-----

Case Study 1	183
------------------------------	-----

Key Understanding 2: Thinking about shape can help us understand the way things work and fit together	186
---	-----

Sample Learning Activities	188
--	-----

Key Understanding 3: Special words, phrases, and symbols help us think about and describe shape and structure	196
---	-----

Sample Learning Activities	198
--	-----

Case Study 2	207
------------------------------	-----

Key Understanding 4: People have developed useful ways to classify shapes	210
---	-----

Sample Learning Activities	212
--	-----

Case Study 3	220
------------------------------	-----

APPENDIX	225
Line Masters	226
Planning Master	238
Diagnostic Map Masters	239
SELECTED BIBLIOGRAPHY	248