## Contents

## Introduction

Everyone can start Specializing	1
WAREHOUSE PAPER STRIP PALINDROMES	1 1 5
Generalizing Writing yourself notes	9
PATCHWORK CHESSBOARD SQUARES	2  20
Review and preview	24
Phases of work Three phases The entry phase	29 30 32
TETHERED GOAT	
ENTRY-1: What do I KNOW?	33
LADIES LUNCHEON	· · · · · · · · · · · · · · · · · · ·
ENTRY-2: What do I WANT?	36
FRACTIOUS SNVBLOPES	
ENTRY-3: What can I INTRODUCE?	39
CUBES CUBED ODICK AND TOASTY	- 40 - F
ENTRY summarized The attack phase	42 42
The review phase REVIEW-1: CHECK the resolution REVIEW-2: REFLECT on the key ideas	43 44
and key moments REVIEW-3: EXTEND to a wider context	45 46
	•
Practising REVIEW	48

vill Ininking mathematically	
CHORPY CHAVLES	
REVIEW summarized	51
The three phases summarized	51
•	
Responses to being STUCK	55
Being stuck	55
THREADED PINS LEAPPROGS	58 63
Summary	68
•	00
ATTACK: Conjecturing	71
What is conjecturing?	71
GOLDBACH'S CONJECTURE	
PAINTED TYRES FURNITURE	<u> </u>
Conjecture: Backbone of a resolution	
CONSECUTIVE SUMS	75
How do conjectures arise?	76
SQUARE DIFFERENCES	85
PIFTEEN TIPTEMENTS	97 88
Discovering pattern	88
CIRCLE AND SPOTS	
Summary	91
•	
SATTACK: Justifying and convincing	95
Structure	95
LTERATES	95
MATCHES 1 MATCHES 2	96 97
Seeking structural links	100
BEE GENEOLOGY	
SQUARE DISSECTION	
When has a conjecture been justified?	105
Developing an internal enemy	109
BUREKA SEQUENCES	- 11
HIDDEN ASSUMPTIONS	
Summary 2	115
Still STUCK?	119
Distilling and mulling	119
COT-DUAL	

	Contents	ix
Specializing and generalizing Hidden assumptions		123 126
NINE DOTS TRUE OR FALSE MULTI-PACETS		
Summary	The second secon	129
Developing an internal monitor Roles of a monitor Emotional snapshot Getting started Getting involved Mulling Keeping going Insight Being sceptical Contemplating Summary		131 132 134 136 138 140 141 143 147
On becoming your own questioner A spectrum of questions Some 'questionable' circumstances		151 152 154
SKESAW NUMBER SPIRALS PAPER BANDS		
Noticing Obstacles to a questioning attitude Summary		160 162 165
Developing mathematical thinking Improving mathematical thinking Provoking mathematical thinking Supporting mathematical thinking Sustaining mathematical thinking Conclusion		169 170 174 176 178 183
Something to think about		187
Bibliography		222
Index		223

Index of questions

228