Introduction

Being mathematical has many meanings to many people but some descriptions of what it means to 'be mathematical' might include:

- thinking about and communicating ideas;
- engaging in problem solving activities;
- creating and identifying mathematical problems within given contexts.

Clearly, these descriptions involve some knowledge of mathematics. However, it is not about the regurgitation of facts or the use of a certain skill (for example, being able to do long multiplication) in a particular context. While both of these last aspects of mathematical knowledge are useful, they are only useful when they help us to solve problems.

So, if much of mathematics is not about learning facts and practising skills, how can we support learners in 'being mathematical'? We need to offer learners the opportunity to pose and explore problems, and to do this we need some guidance and structure upon which we can focus if we are to support problem solving effectively.

The purpose of these *Mathematics Trails* is to help give some meaning to problem solving and be explicit about the skills learners need to develop. In an ideal world perhaps we would incorporate the development of these skills into our 'normal lessons', but first we do need to know what they are and the sorts of situations that open up the opportunities to learn and use them.

All the questions in this book can be used in an appropriate curriculum content context rather than taught in isolation, but the important thing is that there is a journey to make and problem solving skills with which we need to become familiar. We hope that, after tackling some of these problems, learners will recognise appropriate opportunities to 'generalise' and talk about 'generalising' when those occasions arise in the future. The book will not necessarily make those who use it expert problem solvers, but will help them unravel some of the mysteries we encounter on problem solving journeys.