

Review from *Mathematics in School*

May 2012 • Vol. 41 – No. 3

www.m-a.org.uk

Knots Unravelled: from string to mathematics

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ISBN: 978 0 9555477 2 3

Arbelos

£12.00 + p&p

The initial introduction to the book sets the scene by discussing a history of knots from their use as buttons to religious connections with various applications. As a taster, after Chapter 1, in one of many interludes, there is a short exercise using the Mobius band to make shorts which involves some cutting tasks. Curious, I'm sure you are and the book will explain further. This really does put you in the mood for Chapter 2 and the journey begins. There are six interludes between the seven chapters with a postlude on varying topics such as Celtic knots, knots to tie ties and the figure-of-eight.

As soon as a mathematical knot is defined, the author states that rope or string is essential, rather than trying to imagine a knot. I was also caught out trying to 'think' about the knot whereas my 11-year-old son preferred his scout ropes to make the knots and was able to see the knots clearly!

Knot projection is explained using examples of good and bad projections. It should be noted that the diagrams throughout the book are of a very high standard and show clearly the knot with crossings. It is useful to attempt the various tasks (ideally with string). The whole theory is centred on two questions: when can a knot be deformed into an unknotted piece of string and how can it be decided whether one knot can be deformed into another? (K)Not easy!

Chapters 3 and 4 discuss the crossing points of knots as well as combining more than one knot and the use of prime knots. Chapters 5 and 6 look at colour properties and links (many tangled knots). The final chapter takes the reader into the realms of knot polynomials and by identifying their polynomials allows to tell whether knots are different—one of the original questions posed at the start of the book. This fascinating mathematics which approaches an application shows how algebra can reveal the secrets of a knot.

The book ends with solutions to the tasks, a full bibliography with many links to websites, a table of knots (showing knot variations), a glossary and an index. Loads of applications for a class even of limited ability—it would be interesting to see some worksheets being developed that could maybe be downloaded from the website to accompany the book. A thoroughly engrossing read and playfully recommended to any person who loves mathematics.

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