Introduction

The art of origami, or paper folding, is a great tradition in Japan. In its simplest form, the folding is carried out on a square piece of paper to obtain attractive figures of animals, flowers or other familiar figures. The art enjoys great popularity and appeal among both young and old, and it has spread to other countries beyond Japan.

It is easy to see that origami has links with geometry. Creases and edges represent lines, intersecting creases and edges make angles, the intersections themselves represent points. Because of its manipulative and experiential nature, origami could become an effective context for the learning and teaching of geometry.

In this book, origami is used to reinforce the study of geometry, with the hope that the popularity and appeal for the former will stimulate the latter. The activities in this book differ from ordinary origami in that no figures of objects result. Rather, they lead the reader to study the effects of the folding and seek patterns.

The author, Dr. Kazuo Haga, is a retired professor of biology at the University of Tsukuba, Japan. His interest in science has been channeled to the broader field of science education. He mentioned in his book that during his career as a biology professor, while waiting for his experiments to progress, he used to while away the time doing paper folding (or more specifically, mathematics through paper folding).

The experimental approach that characterizes much of science activity (and possibly much of Professor Haga's work as a biologist) can be recognized throughout the book. The manipulative nature of origami allows much experimenting, comparing, visualizing, discovering and

conjecturing. In every topic, the exuberance that the author felt whenever he arrived at mathematical ideas is reflected in his writing style. To paraphrase the author, "more wonders emerge!"

Admittedly proof is a necessary part of mathematical discourse. However, proofs are not emphasized in this book. The author is aware that many students do not appreciate formal proofs. So while some proofs are given after the paper folding, not all mathematical discoveries are proven. The reader is encouraged to fill in all the proofs, for his/her own satisfaction and for the sake of mathematical completeness.

This then is a resource book for mathematics teachers and mathematics teacher educators. It is hoped that going through this book will give them alternative approaches for reinforcing and applying the theorems of high school geometry and for provoking more enthusiasm for mathematics study.

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