MATHEMATICS AND PAPUA NEW GUINEA BILUM MAKING
(STRING BAG DESIGNS)

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Papua New Guinea’s 800 Indigenous cultures make various bags for carrying and other purposes. Most use various continuous string bags and these have become not only an important activity for women in a cultural sense but a creative, modern product that can be exchanged or sold in a different economy. Women regularly make up new designs and teach them to other women. Each design, on the poster is intricate and requires considerable mathematical, especially spatial thinking.

Key words: Ethnomathematics  Art and mathematics

Papua New Guinea’s 800 Indigenous cultures, each with its own language, have origins between 10 000 and 40 000 years ago. They make various bags for carrying. Some are made from bark strips or leaf strips. Traditionally women in most of the groups craft bilums from string made from drying and thrashing certain inner barks to separate the “strings” which are then twisted into string by rubbing on the upper leg. However, these bags are made for cultural purposes including sexual, spiritual, and practical purposes (Mackenzie, 1991). They are created by women for women, men, sleeping babies, and young girls. Some bilums are important in relationships such as those presented to husbands and those for containing sacred or special objects. Although there is a common figure-of-eight continuous string “stitch” or weave, there is a wide variety of shapes and sizes depending on purpose. However, other types of “stitches” are also used for different purposes such as fishing nets, and “aprons” and chest covers presented to men. The open weave stretches so that women with the handle over their forehead and well-strengthened neck muscles can carry very heavy loads on their backs. Over the past 40 years, various types of “string” have been used: tulip tree bark, sisal, trade-store string, plastic string, and trade-store wool.

Each cultural group traditionally had special designs and patterns. They now provide women with income. Designs can be quite intricate often requiring up to 20 needles with string of multiple colours. Initial patterns based on “diamonds” or horizontal squares have been modified to create new designs which spread across the country and language groups. Women combine shapes such as two trapezia for a hexagon in the soccer-ball design. They narrow shapes, produce lines, and make concurrent shapes, letters, and pictures. They think and work along oblique lines, count “stitches”, and continually check that they are making a neat, repeated pattern. They visualise the overall product and small shape level.
