

## **“Freedom Quilts”: An Ethnomathematical Way of Communication Towards Liberation**

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### **Introduction**

Throughout time, quilts have been created as a vehicle for sharing family history, a moral message, or as a reflection of historical and cultural events. The focus of this paper is on one important form of communication as used on the *Underground Railroad* by African-Americans escaping slavery before the United States Civil War. The term “Underground Railroad” has come to us from a story of a farmer chasing a runaway who testified that the slave vanished on some kind of “Underground Railroad” (Burns & Bouchard, 2003). Underground Railroad “was used to describe the network of abolitionists and safe houses that helped slaves escape to Ohio and Canada. Safe houses along the way were known as “stations”, those who guided the escapees were called “conductors” and the runaways themselves were called “passengers” (Burns & Bouchard, 2003, pp. 32).

The *Underground Railroad* was organized by former slaves, freed blacks, and sympathetic whites for the slaves to find shelter, food, drinking water, safe hiding places, and safe paths to follow as they moved to the free states of the north and Canada. The quilts are referred to as *Freedom Quilts* and they were often hung over a clothes line, porch, or balcony to symbolize what to do or where to go by using different designs that indicate safety, danger, clues, and landmarks to guide the slaves to freedom. The quilts were sewn to serve as a coded map for runaway slaves to memorize. In this perspective, slaves followed symbols on *Freedom Quilts* that were hung out during the day to give guidance, directions or dangers that lay ahead. This method of communication was very effective, because bounty hunters never caught onto the quilts and their messages.

### **Definition**

According to *The Random House Dictionary of the English Language* (1973), quilt is defined as "a coverlet for a bed, made of two layers of fabric with some soft substance, as wool or down, between them and stitched in patterns or tufted through all thicknesses in order to prevent the filling from shifting" (pp.1180). The word quilt probably originates from the Latin *culcita* or *culcitra*, which means a stuffed sack or cushion. However, quilt word only came into the English language from the old French word *cuilte* that was developed around

the 13<sup>th</sup> century, which means mattress (The Random House Dictionary of the English Language, 1973).

### **A Short Quilt History**

The earliest known quilted garment is on the carved ivory figure of a Pharaoh of the Egyptian First Dynasty about 3400 B.C. that features the king wearing a mantle that appears to be quilted (Colby, 1971).

Crusaders brought quilting to Europe from the Middle East in the late 11<sup>th</sup> century and in accordance to Colby (1971), in medieval Europe, around 13<sup>th</sup> century, quilted cloth was part of a soldier's armor. Quilted garments were also very popular in the Middle Ages and at that time knights wore quilted garments under their armor for comfort and to protect the metal armor from the rain, snow, and the sun.

The earliest bed quilts were made in the 17<sup>th</sup> century in Holland and England and were subsequently brought to America by European immigrants. In the 18<sup>th</sup> century, quilted clothing was fashionable in Europe. The art of quilting flourished during the 19<sup>th</sup> century and by the beginning of the 20<sup>th</sup> century American textile manufacturing had grown to the point that a wide variety of quality fabrics were readily available to the homemaker.

Today, quilting is a form of self-expression that provides occasion for socializing because women often get together to work on a quilt projects. Seen in this context, quilting is and has always been a social event. Currently, there is a renewed interest in quilts and quilt-making with a combination of traditional methods and designs and innovative ways of quilting.

### **Quilt and Ethnomathematics**

Studies involving quilts provide a concrete links for students between contemporary life and history because they serve as artifacts acting as tools that help to retell family stories and past events.

At this time, quilts are passed down from one generation to another. The original material often comes from scraps of clothing and articles from the home. There is a sense of personal heritage and history evident in the quilt that comes through when they are shared by the owner.

The study of quilts values the history of ordinary people and every day experiences. It allowed this researcher to understand the practice of quilting as an art form that is both historically and currently done by many women, in many countries. Women have also used

quilts in order to have a voice; to express their political, social, and religious beliefs. This is a very important aspect of an ethnomathematics program because the validation of the mathematical practices of this cultural group that is often deemphasized or left out of history of people (D'Ambrosio, 1990).

The focus on the origin of the fabric, that is, where it comes from, is also another important ethnomathematical perspective. For example, during the colonial period, in the United States, fabric stores were not well established and they were not accessible to people from all socio-economic levels. Fabrics were very expensive because fibers from plants and animals used in quilting had to be gathered, cleaned, spun, and woven. Seen in this environment, by looking at these processes allows for a deeper understanding and comprehension about the roles people had in colonial times, also it allows for an appreciation for the ease with which people obtain manufactured fabric products today. Besides their use as warm blankets, quilts reminded immigrants as well, of their family, friends and those who remained behind. From an ethnomathematical perspective, the study of quilts provides historical connections between the everyday lives of ordinary people to events that were important at that time in history.

Another perspective to be considered is that the secret codes in quilts are part of a longstanding tradition that goes back to Africa and the encoding of textiles there. The African precedent is that in these textiles, all of the designs have a meaning. During the time of slavery in the United States, everything that was African was forbidden. In so doing, "enslaved Africans were prohibited from drumming, speaking in their native languages, or learning to read and write in English" (Wilson, 2002, pp. 5). They were also not allowed to place an African design in a quilt. Instead, what was shrewdly done by those who wanted to communicate was to take American quilt patterns and give these patterns meaning.

Quilts, on another level could be used to transcend the problems of one's immediate environment because they can warm the body and the spirit by using colors "that had special meanings, represented the heavens, their ancestors, the spirits, the land, the people and/or secret societies from different tribes" (Wilson, 2002, pp. 6). This was one way of bringing a new form of life into slave cabins or into the lives of those who were enslaved. The quilt patterns, and especially those that we called improvisational, are composed of fragments, remnants of cloth; so fractured cloth comes together and creates something new. This is like a metaphor, which certainly addresses what happened during the time of slavery because in spite of the difficulty, in spite of families being torn apart, there was always a coming together to lead to liberation.

### The Ethnomathematics of the *Freedom Quilts*

Quilts were used both as a means of signaling and providing travel instructions on the Underground Railroad. Quilts were made by enslaved women who used different symbols or pictures to communicate with runaway slaves. They were often displayed in window-sills to convey messages.



Figure 1: *Freedom Quilt Displayed on Window-sill*

Seen in this context, one may picture a slave hanging a quilt on the fence on a farm of 18<sup>th</sup> century Southern plantation. The quilt was hung with other items to be aired out so most people believed that quilts were just a kind of bed-covering that needed to be aired. However, to those people who knew how to identify the secret codes in the quilt pattern, this meant the difference between life and death. Since slaves were not taught to read or write in English, they developed an intricate system of secret codes, signs, and signals to communicate with one another along the routes of the *Underground Railroad*. In so doing, in order to memorize the whole code, a sampler quilt was used. The sampler quilt included all necessary patterns that were arranged in the order of the code. Freed slaves traveled from one plantation to another to teach to other slaves the translation of the codes of the sampler quilt patterns (Wilson, 2002).

*Freedom Quilts* contained ties with knots that were often used to indicate the date the slaves were ran away from their working plantation. For example, five knots in the cord meant that they should escape on the 5<sup>th</sup> day of the 5<sup>th</sup> month (Wilson, 2002). The ethnomathematical perspective of this context is to study the mathematical practices of this specific cultural group in the course of dealing with their environmental problems (D'Ambrosio, 1990). For example, if a quilt showed a house with smoke coming out of the chimney, it meant that the house was safe. Thus, according to Rosa & Orey (2006), the quilt codes may be considered as mathematical techniques (*tics*) used by the slaves (*ethno*) who were trying to manage problems and activities that arose in their own social-political environments (*mathema*).

In the light of these facts, quilts present us with an ingenious, indeed highly creative and complex way in which to communicate between slaves and safe houses because they did not show any connection to slavery. The *Freedom Quilt* codes of the Underground Railroad were transmitted to the members of the slave's families, by their ancestors, through generations. In this context, it is necessary to emphasize the importance of Ozella McDaniel Williams, an African-American woman who made and sold quilts in South Carolina. She told about the quilt codes to tourists who visited Charleston. She also affirmed that there were ten patterns used in the quilt code and each quilt signaled a specific action for slaves to take at a particular time. She also mentioned a number of secondary patterns (Burns & Bouchard, 2003). Usually, the code had two meanings:

1. Signal to slaves to prepare to escape, and to
2. Give clues to indicate safe directions on the journey.

In this context, *Freedom Quilts* are presented as a link between mathematics, ethnomathematics, and the very tactile craft and art of quilting, in order to stimulate student's creativity and interest, because quilts may be considered as cultural and mathematical expressions of student's daily life.

### Ozella's Underground Railroad Quilt

In the early 1990, Ozella revealed most of the *Freedom Quilt* codes to the authors Tobin and Dobard who wrote part of Ozella's story in the book *Hidden in Plain View*, in 1999.

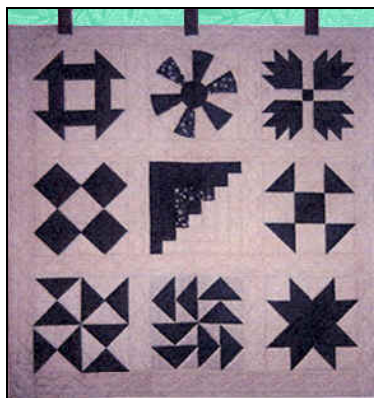













Figure 2 - Ozella's Underground Railroad Quilt

Unfortunately, Ozella died in 1998, before the publication of the book (Wilson, 2002). The message in the Ozella's Underground Railroad Quilt (Tobin & Dobard, 1999) below may be interpreted as:

	<p><b><i>The monkey wrench...</i></b></p> <p>Slaves knew it was time to gather and pack away whatever tools they needed for the long journey to freedom. They also had to be prepared and hone their mental and spiritual tools, because they needed to be deceptive.</p>
	<p><b><i>...turns the wagon wheel...</i></b></p> <p>Slaves knew that they should pack enough provisions to fit in a wagon and to be used in their long journeys. It was time to move on because the situation was getting dangerous.</p>
	<p><b><i>...towards Canada on a bears paw...</i></b></p> <p>Slaves knew that they had to follow the bear tracks through the woods, in order to remain safe, which would also lead them to water and food.</p>
	<p><b><i>...trail to the crossroads.</i></b></p> <p>Slaves knew that they had to meet at the crossroads of Cleveland, Ohio because it was a destination that offered several routes to freedom. They also knew that they had to wait there to receive further instructions.</p>
	<p><b><i>Once you get to the crossroads, dig a log cabin on the ground.</i></b></p> <p>Slaves knew that this symbol drawn on the ground indicated that a person was safe for them to get instructions. It also advised that slaves were seeking for shelter. According to Brackman (2006), this symbol also indicated that slaves should “establish a permanent residency in a “free” area” (pp.84).</p>
	<p><b><i>Shoofly told them to dress up in cotton...</i></b></p> <p>Slaves knew that Shoofly was someone to be trusted or was someone among friends or a friendly guide who is nearby and could help them.</p>
	<p><b><i>...and satin bow tie.</i></b></p> <p>Slaves knew that they had to dress up in different clothing to resemble free blacks.</p>
	<p><b><i>Flying geese stay...</i></b></p> <p>Slaves knew that gluing geese were cardinal directional code because they had to follow the geese northward in the spring or the directions in which pattern indicated.</p>
	<p><b><i>...on the drunkard's path...</i></b></p> <p>Slaves knew that they had to walk in an unusual manner. They should follow a zigzag trail in order to make their tracks difficult for slave hunters to follow.</p>

	<p><i>...and follow the stars.</i></p> <p>Slaves knew that this symbol directed them to look for the constellation drinking gourd (Big Dipper) which pointed to the North Star, which lead them to the north and Canada (Brackman, 2006)</p>
	<p><i>The Tumbling Blocks</i> was the tenth quilt pattern. It was the code for Niagara Falls, the final landmark before crossing into Canada and freedom. This code was also associated with “packing up and moving on”.</p>

### Mathematical and Geometrical Quilts

A mathematical quilt may be considered as a marriage between the most abstract of the sciences and the very tactile art of quilting. All quilts are mathematical in nature, but some quilts present more mathematical concepts than others. In so doing, imagine that a quilt as a plane. In geometry, when a shape is moved in a plane it is called a *transformation*. Some special types of transformations are called *isometries*. The following are three common *isometries*:

1. **Translation:** It "slides" an object a fixed distance in a given direction. The original object and its translation have the same shape and size, and they face in the same direction. The word "translate" in Latin means "carried across". Translations are also called slides.
2. **Reflection:** It can be seen in water, in a mirror, in glass, or in a shiny surface. An object and its reflection have the same shape and size, but the figures face in opposite directions. A reflection can be thought of as a "flipping" of an object over the line of reflection or line of symmetry.
  - **Line symmetry:** It occurs when two halves of a figure mirrors each other across a line. The line of symmetry is the line that divides the figure into two mirror images. Another name for the concept of line symmetry is line of reflection.
3. **Rotation:** It is a transformation that turns a figure about a fixed point called the center of rotation. An object and its rotation are the same shape and size, but the figures may be turned in different directions. Rotations are also called turns.

### Conclusion

Slaves followed symbols on the quilts that were put out during the day to give guidance on the directions or dangers that lay ahead of them. Both mathematics and design

elements were used in creating these directional quilts. In the light of these facts, *Freedom Quilts* do not only teach students about people and places of the past, but also provide a positive link between school, academic mathematics, ethnomathematics, and history. By sharing these quilts teachers and students are also recognizing and appreciating the diversity of the backgrounds within the class. In general, quilts also provide "real world" examples of geometry concepts because they often use translations, reflections, rotations, and lines of symmetry. In order to study and make a quilt students have to measure, plan of the layout by using spatial relation, and recognize shapes and patterns.

Geometry concepts, when standing alone, can be seen as abstract concepts for students, but by analyzing actual *Freedom Quilt* patterns and by being surrounded by examples, students are able to see their relevance to the study of history and geometry. They will also be focusing on the content areas of mathematics (especially geometry), language arts, science, and design by connecting history and ethnomathematics perspective into the mathematics curriculum in order to value this very important aspect of this specific cultural group.

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