Mathematician of the week

Evariste Galois
Born: October 25th 1811
Died: May 30th 1832

Evariste Galois was born just outside Paris in 1811. This was the period of history in France when there was much unrest. The monarchy, after the storming of the Bastille on 14 July 1789, was in a perilous position.

Galois' father was mayor and headmaster of a local boarding school. He was educated at home by his mother until he was 12 and then sent to another boarding school in Paris. He was very unhappy at school and known as a trouble maker. One teacher wrote in his report.

It is the passion for mathematics which dominates him, I think it would be best for him if his parents would allow him to study nothing but this, he is wasting his time here and does nothing but torment his teachers and overwhelm himself with punishments.

He failed to get into university and after several years in the National Guard he was arrested and put into prison charged with conspiracy to overthrow the government. The 14th of July was Bastille Day and Galois was arrested again. He was wearing the uniform of the Artillery of the National Guard, which was now illegal. He was also carrying a loaded rifle, several pistols and a dagger.

In March 1832 a cholera epidemic swept Paris and prisoners, including Galois, were transferred to the pension Sieur Faultrier. There he apparently fell in love with Stephanie-Felice du Motel, the daughter of the resident physician. After he was released on 29 April Galois he exchanged letters with Stephanie, and it is clear that she tried to distance herself from the affair.

He was finally released from jail but was challenged to a dual by Stephanie's friends. It is thought that this had political motivations. In the night before the dual he spent his last night writing out all he knew about group theory and sent it to Chevalier who copied his mathematical papers and sent them to Gauss, Jacobi and Liouville and other mathematicians of the time. Liouville published these papers of Galois in his Journal in 1846. The theory that Galois outlined in these papers is now called Galois Theory.

He is mainly famous for his work on group theory and his work on solving equations.

Galois' Group problem

Galois was interested in group theory, solving equations and also geometry.

You can use the six transformations from the trihexaflexagon n to form a "group".

The word trihexaflexagon comes from "tri" - for three faces, "hexa" for its hexagonal form, and "flexagon" for its ability to flex.

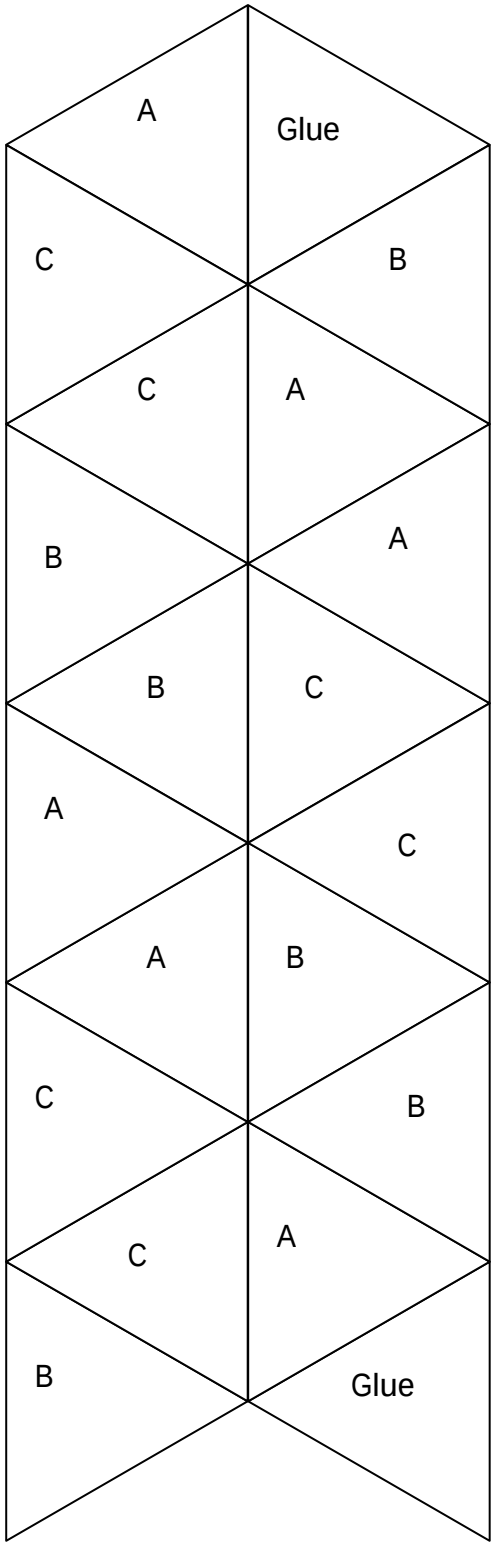
First: colour each letter with a different colour

Second: cut out and fold carefully along centre line and glue together so you have one long thin strip.

Third: Looking at the side without the glue tabs fold the third fold along.

Finally: Now continue folding every third triangle until a hexagon is created.

NOTE: There should be just one colour on each side.



Now you need to start "flexing"

Start with the colour A on top and B on the bottom.

Using the following code fill in the table below.

N = do nothing (A on top, B on bottom)

= flex down (get to C on top, A on bottom)

= flex up (get B on top, C on bottom)

= turn over (B on top, A on bottom)

= flex down, and turn over (A top, C bottom)

= flex up, and turn over (C top, B bottom)

First perform the transformation in the vertical column, then the one in the corresponding horizontal column. Refer to the code and record the symbol for the equivalent transformation. The six transformations in the code box along with the table form a GROUP.

Table for Galois' group of transformations from the trihexaflexagon

	N					
N	N					
						
		N				
						
						
						

Galois' Group Problem - answers

	N					
N	N					
			N			
		N				
				N		
					N	
						N