
Sequence games

Posted by MariaD - 2008/07/16 15:00

About twenty people attended the Club. I would like to thank everybody for their excellent math ideas that make the Club possible, and for helping each other, be it with figuring out where the curve goes next or with cleaning flour from the floor. WE ROCK!

I am reading a book about optimal experience called "Flow," by Mihaly Csikszentmihalyi. And you thought my name was hard to pronounce! Flow is a metaphor used for a complex feeling of "joy, creativity, the process of total involvement with life." Based on studying hundreds of thousands of people over decades, Mihaly C. created, among other things, a list describing what it feels like when an experience is meaningfully enjoyable. I think I will re-type it here, because we see many examples of Flow in what children do:

- A challenging activity that requires skill
- The merging of action and awareness; you stop being aware of yourself as separate from the experience
- Clear goals and feedback
- Concentration on the task at hand
- The feeling of control
- The loss of self-consciousness and self-scrutiny, the feeling of union with the environment
- The transformation of time: it flies, stretches, compresses dictated by the rhythms of the activity

Sometimes I design activities that happen to be more or less duds: they don't produce this total engagement of Flow. Maybe they don't give participants enough feeling of control, or somehow break their concentration, or unnecessarily introduce external "tests" that produce self-consciousness. For example, if you ask a kid to perform a computation that came up in a problem she is solving, and it takes her too long to compute, her concentration will break, she will become self-conscious of her poor computation skills, and she will probably lose the feeling of control over the problem. This model helps me analyze and improve activities. It also helps me the joy and concentration - parts of the experience of Flow - when they spontaneously occurs in kneading the dough, doodling in bright markers on a smooth surface, or clapping a pattern, all together, in a perfect rhythm, many times over.

This Monday, the math focused on sequences. The name starting activity was about coding our names, letter by letter, with a sequence of numbers. Most modern codes are like that, from PGP (pretty good privacy) to the ones used by various intelligence and anti-intelligence agencies (spies!) My very own dear grandma used to work for a Russian intelligence agency, receiving and deciphering coded signals from the famous Zorge spying in fascist Germany, and Japan. Her husband-to-be and my future grandfather was an officer in the front lines taking notes for himself in a little hidden diary using a code of his own invention. Taking notes was prohibited for fear of German or Japanese spies finding the notes if they capture you, and also for fear that the notes will counter the official propaganda on how the war was going. We still have the notes in the family, though, and my mother is working on decoding them. Eyewitness accounts are invaluable for history.

Anyway, the Club members used the counting numbers to code our names, first, which isn't very secret at all because everybody knows this particular sequence (1, 2, 3, 4, 5...) very well! Just like everybody tends to know the ABCs, another sequence example. So I asked people if they knew the Fibonacci sequence, and only four of us did. The Fibonacci sequence is easy to make: you start with 1, 1 and then add the previous two numbers to get the next one: 1, 1, 2, 3, 5, 8, 13... We programmed Excel to produce enough sequence members to cover the whole alphabet, and coded our names with it. That's pretty safe, as casual codes go. Not safe enough to use in professional intelligence work, but safe enough for everyday needs, like passwords for sites, because very few people actually know the sequence. To give an example, our Gabe's name was coded 7-1-2-5 using the counting numbers, and 13-1-1-5 using Fibonacci - which actually shows a coding/decoding problem with A and B being the same number. Sometimes people use tricks of that sort on purpose, though, to make decoding harder.

The bestselling book "The Da Vinci Code" used Fibonacci-based cipher as one of the main plot devices."13-3-2-21-1-1-8-5 O, Draconian devil! Oh, lame saint!" read the cipher. The heroine, a cryptographer's daughter, instantly recognized the significance of numbers, deciphered the poem, and later used the clue to open a Switzerland bank vault. The book was criticized by geeks everywhere for making the key secret quite obvious.

The main significance of the sequence, though, is the fact that comes up in nature all the time. From pine cones to shells, it is everywhere. We made nautilus shell drawings based on the sequence, while looking up some facts about Fibonacci, a twelfth-century Italian mathematician. What math tools did he use? When was pencil invented, again? I love questions children ask! Here is a page on Fibonacci himself - and a page on his sequence. See if you can find the sequence somewhere in your grocery bag, or in the nearby woods.

Then we went to play outside, and arranged ourselves in another famous sequence. Caitlin, at the zero level, put her two outstretched hands on the shoulders of two people. They, in turn, put their four hands on the shoulders of four people in front of them. The four people had eight hands, of course, and they put their hands on the shoulders of eight people, and that was the last level we could make. So, the sequence goes 1, 2, 4, 8... Club members were very creative with naming this sequence. Some examples: "tree, double, powers, ocean, human knots, times two, pyramid." Note that some

examples describe what you do to make the structure (double, times two) and some how it looks like as a result - tree, pyramid, human knots, ocean. We made some waves! Here is a page I made in some ancient times about structures like that. The tree in the picture is called Aloe Dichotoma, native to South America and growing in a San Diego nature park. There are several more plants that keep splitting in two at each branching, for example, the amazing carnivorous Drosera Binata! Note the prefixes of the names, "di-" in "Dichotoma" and "bi-" in "Binata" - they mean "two." It reminded me of the infamous "dihydrogen monoxide" hoax.

<http://www.naturalmath.com/images/blog/aloedichotoma.jpg>
Aloe Dichotoma, by allloe

We proceeded to make some pies, and to try and figure out how many combinations we could make out of all the fillings on the table (dates, three sorts of apples, coconut, rhubarb and so on). I used dinner roll frozen dough, because it is very easy to handle and it feels quite nice and soft, being sourdough. The task of counting all the possibilities was complicated. Some suggestions on how to go about it included sorting by the number of fillings and making a tree. In fact, I was hoping to connect the tree to the previous activity, but it turned out this way of doing things did not quite make sense to kids. I probably should have followed up on the idea that did make sense to them - sorting by the number of fillings. We explored some combinations using plates as models, and then baked our pies. I attempted to show the tree structure again, drawing it on the floor for space, but the possibility of drawing on the floor mesmerized people more than binary trees did. They definitely had a very good Flow experience with drawing, and I knew better than to break their concentration, so I just took some pictures. Then our pies were ready.

Next time, I plan to work more with sequences, and to make a bridge from sequences to fractals. We will create our own sequences for secret codes, draw extremely funky fractal pictures, and use the fractal structure of a secret substance you can find in a grocery store to create a twenty-foot geyser. Stay tuned!

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Re:Sequence games

Posted by FriendlyAnil - 2010/02/15 07:35

I've been tinkering with this idea for months. Granted, most of it has been at the back of my head and I have very little exposure to miniatures games, but I just love the idea of a tabletop wargame! But, simply rolling dice and marking kills is extremely boring.

What kind of story would you be wanting to tell? I think that will greatly impact what you can do with a minis game.

I have a start for a minis game that I've injected some story into, using the green and tan plastic army men. Each one comes with a stat card with a personality detailed on it. The soldier also gains some type of experience for each "battle" he survives. I've also made about half the card with blank space to note cool stuff he's done, "bragging rights" I guess you'd call it. That way, each soldier has a story attached to him. A story that is specific to him and that likely will never be duplicated. That's very basic story injection.

I'm curious as to how deep of a story you're looking to tell in a minis game. From the way I understand it, they're all more oriented to a battlefield view rather than a soldier view, so that would limit, somewhat, the options for storytelling you have. Of course, that's just how I see it at the moment. Someone else may come up with something that blows my opinion out of the water, and I'd love to see it!

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