# The New Design Goal

This clock is a variation on my usual design themes. My normal design goals are to make playful, clocks that are great to watch, beautiful, elegant, interesting, mysterious, etc. This clock had the new added goal — to make reading the time an interesting puzzle.

Like a Kaleidoscope

First, always remember, it is much easier to understand something by just watching it than to explain it in words. Here is what it does. First, it displays a empty display of a random selection of one of 7 colors. Then, in another color, it lays the hour on top of the first display, then in lays, again in a new color, the tens-of-minutes on top of that, and finally in a new color, lays the minutes on top. The effect is like watching a kaleidoscope. To make it a lot easier to read, the areas that change first dim and then brighten with the new color for each digit, but of course I cannot show that activity in a static sequence of pictures. Here is an example:

| Beginning | Hour (4, 2 & 1=7) | 4 - Tens of minutes | Minutes (8 & 1=9) |

= 7:49
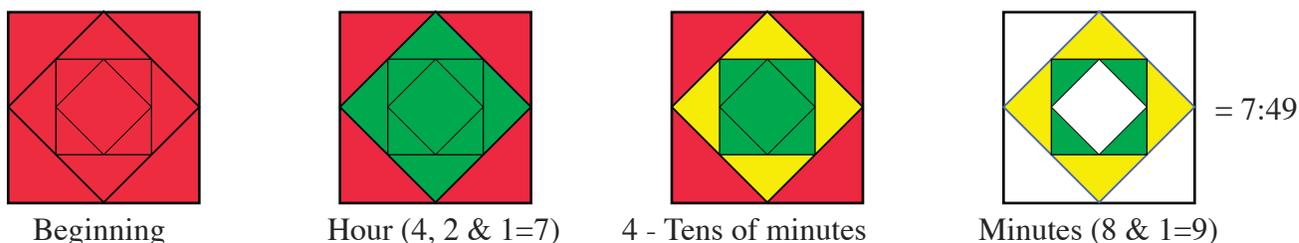
Numbers

There are many number systems. We commonly use decimal in our everyday world. Other systems commonly used by computers are, binary, octal, and hexidecimal. The clock uses binary in a way that is a lot of fun. Just for general interest, this is what it looks like to count in binary.

DECIMAL	BINARY
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010
11	1011
12	1100

In this clock we use squares that are each twice the area of the previous to display the time. The smallest square is worth 1, the next larger is 2, then 4 and finally 8. So here is how you count with this clock:

= 1   1+4=5   1+8=9

= 2   2+4=6   2+8=10

1+2=3   1+2+4=7   1+2+8=11

= 4   = 8   4+8=12
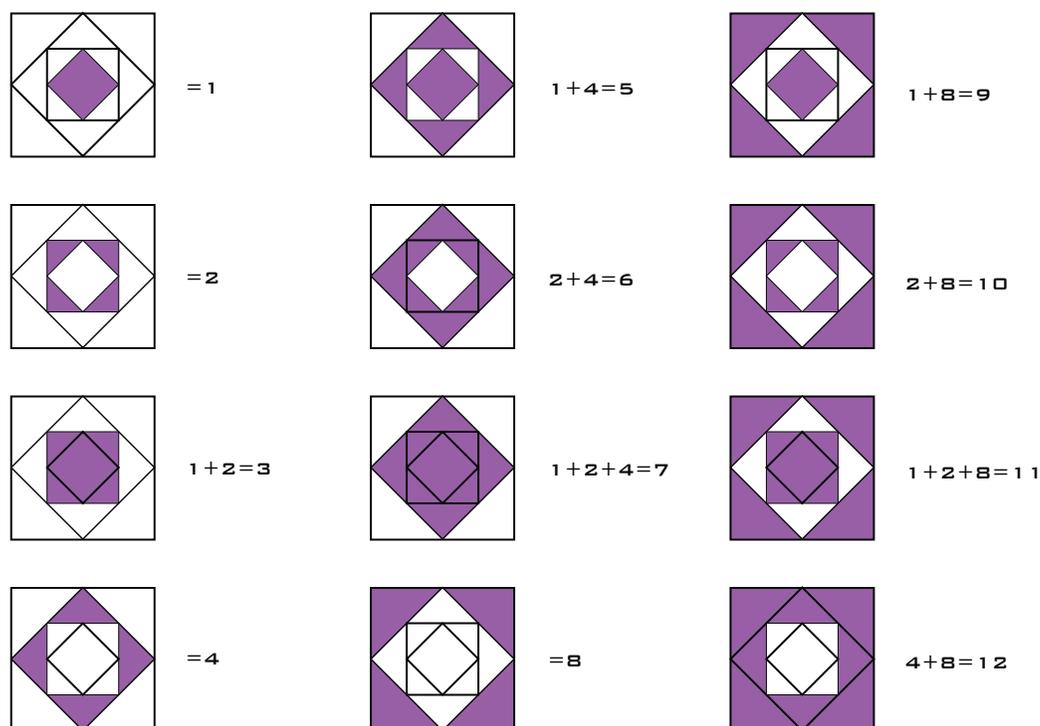
How the clock indicates a ZERO

The above left me with one challenge – how best to show **zero** at times like 7:09 or 7:30 of 7:00. I chose to have the whole display dim and then brighten with no change to show a zero digit. At 7:00 it dims twice, once for each zero.