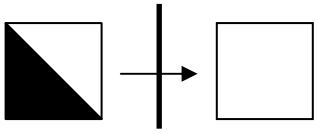
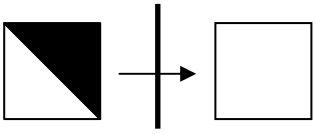
MAKE A CLOCK ART POSTER: 4 O'CLOCK CLOCK REFLECTION

1. First: Practice drawing vertically or horizontally reflected patterns

a. Draw these reflected patterns across the vertical lines:



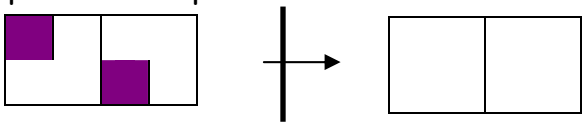
Reflect over this line



Reflect over this line

Each side should be a "mirror image" If you fold your paper on the vertical line, the colored triangle part of the images should match (touch) exactly.

b. Draw this reflected set of two patterns across the vertical line, reflect both the pattern and position



Reflect the patterns

Reflect the positions

Positions 1 2 2 1

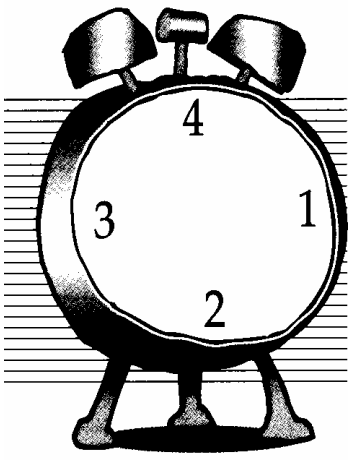
c. Draw these reflected patterns across the horizontal lines:

Now the mirror images should match when folded across the horizontal lines

Reflect patterns and positions

2. CLOCK ARITHMETIC

Use this 4 o'clock clock to fill out the 4 o'clock clock addition table.



Clock by Joe Spooner

+	1	2	3	4
1				
2				
3				
4				

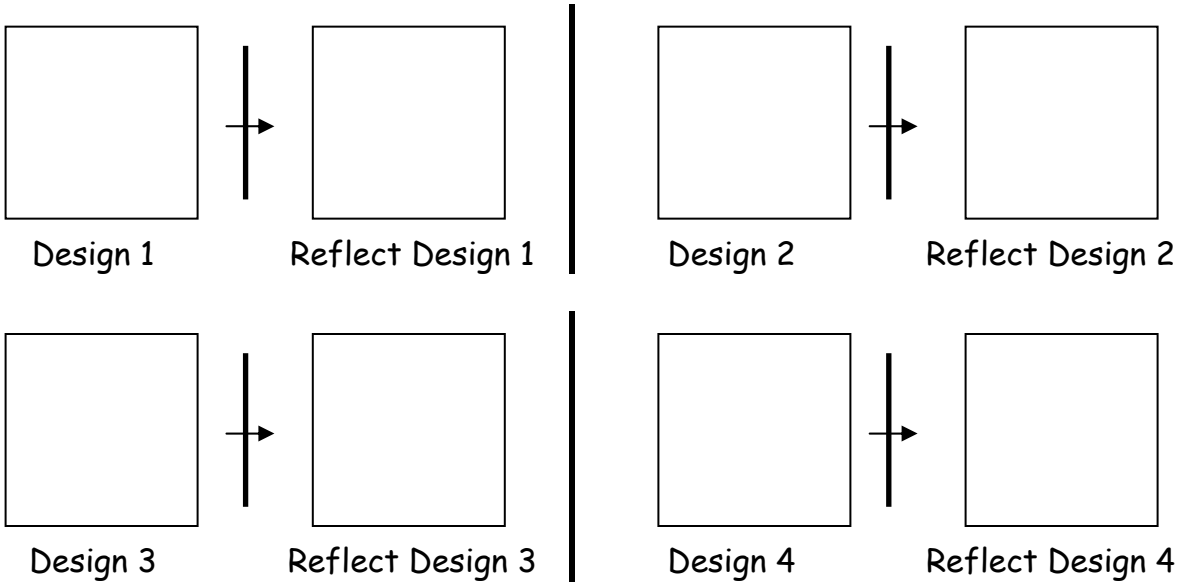
Table 1

3. COLOR-CODE Create a simple design for each hour {1, 2, 3, 4} on the 4 hour clock. Bright, bold designs work best.

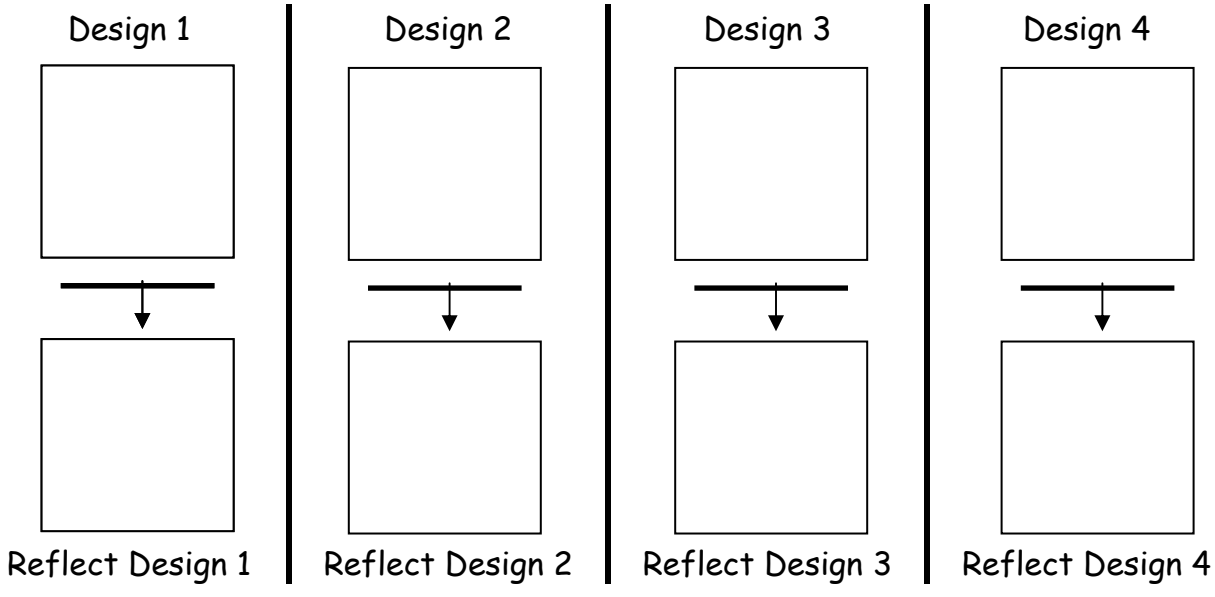
1	2	3	4

4. PRACTICE vertically and horizontally reflecting each of your designs:
Just sketch how your design reflects, don't worry about coloring here.

HORIZONTAL REFLECTIONS ACROSS VERTICAL LINES



VERTICAL REFLECTIONS ACROSS HORIZONTAL LINES



4. TRANSFER DESIGNS

Use your designs to color in the four 4 x 4 grids (Cut & Paste page).

GRID 1: THE ORIGINAL

- Match the numerical entries in the shaded portion of table 1 with their same positions on GRID 1 and color in your coded patterns.

GRID 2: REFLECT GRID 1 ACROSS A VERTICAL LINE

- REFLECT all of the design entries (patterns & positions) in GRID 1 across the right vertical edge of GRID 1 onto GRID 2.

Reflect patterns and positions

1	**2**	**3**	**4**	→	**4**	**3**	**2**	**1**

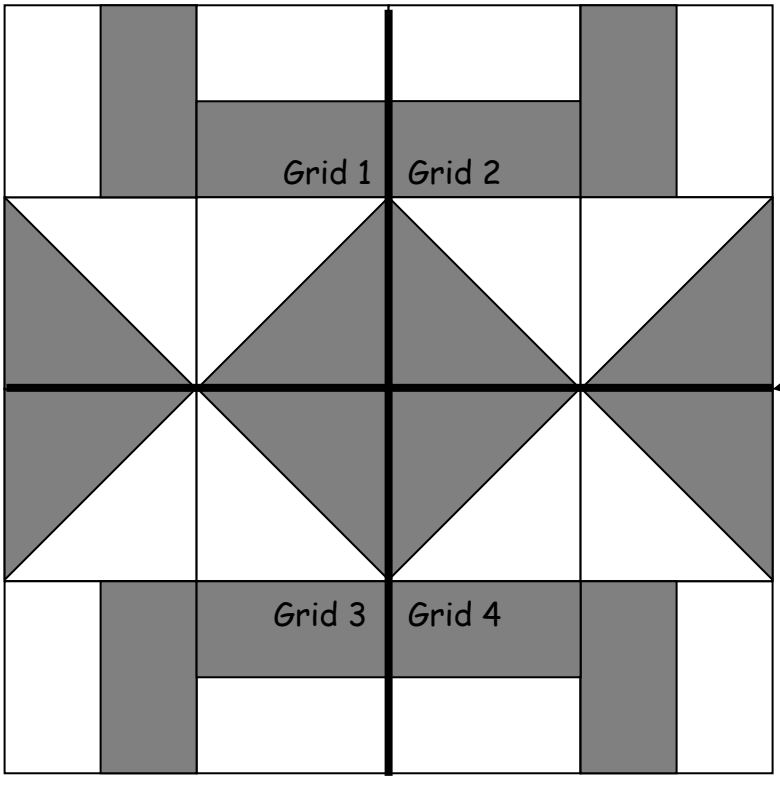
This illustrates the reflection of the entry positions

GRIDS 3 & 4: REFLECT GRIDS 1 & 2 ACROSS A HORIZONTAL LINE

- REFLECT all of the design entries in GRID 1 (GRID 2) across the bottom horizontal edge of GRID 1 (GRID 2) onto GRID 3 (GRID 4).

REFLECTION LAYOUT EXAMPLE: REFLECT PATTERNS AND POSITIONS

Original Table	**Vertical Reflect**
Horizontal Reflect	**Horizontal Reflect**



MAKE A CLOCK ART POSTER: 4 O'CLOCK CLOCK REFLECTION

- Draw your designs on these four 4 x 4 grids (see the Grid 1 - 4 directions on the worksheet)
- After you draw your designs, cut out each grid and paste them onto a colored paper background to make your poster.

Grid 1

Reflect all of Grid 1 across vertical →

Reflect the patterns AND the positions

Grid 2

Reflect all of Grid 1 across horizontal ↓ Reflect the patterns AND the positions

Reflect all of Grid 2 across horizontal ↓ Reflect the patterns AND the positions

Grid 3

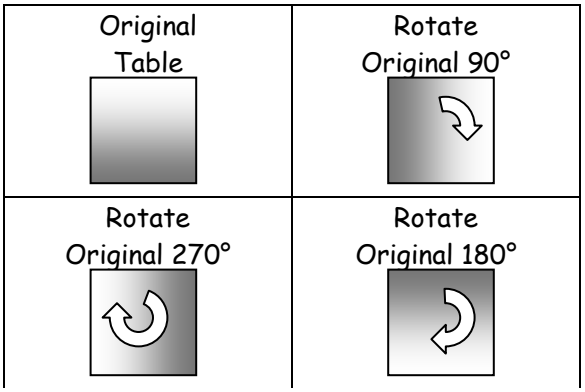
Grid 4

COLOR-CODING CLOCK ARITHMETIC TABLES

A few beginning ideas: Most ideas work for any o'clock clock.

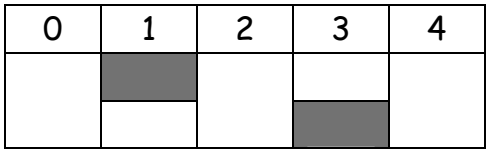
- *The only limit is your imagination!*

1. Color all four grids exactly the same and then ROTATE them when you cut and paste them onto a decorative background. Here is one rotation format:



2. Color in REFLECTIONS and then what happens when you ROTATE the REFLECTIONS?
3. Color all four grids exactly the same ON a "see through" medium (overhead, wax paper?) and then ROTATE or REFLECT them when you cut and paste them onto a decorative background or show them in class. (or ROTATE & REFLECT or ... ?)
4. Color closed subsets (for example, on the 12 o'clock clock, {2, 4, 6, 8, 10, 12}) with one design and all of the other numbers with different design(s). This, for example, would show the pattern of even numbers on the 12 o'clock clock.
5. Color all of the additive inverse pairs with opposite designs.

For example, on the 4 o'clock clock: 1 o'clock + 3 hours = 4 o'clock, 1 and 3 are additive inverses on the 4 o'clock clock.



These two basic designs are "opposite," just like 1 and 3 are opposite (add to 4) on the 4 o'clock clock.

6. Use _____ o'clock clocks. Your take home files have 4, 9 and 12 o'clock clock clocks and grids. All the clocks work! The 24 o'clock clock is very fun.
7. Use different shaped & sized grids. See your take home files for decreasing 4, 9 and 12 o'clock clock grids. These are just a sample, what ideas do you have?
8. Have teams of four students each design their own grid and make a team poster.
9. See the Java Applet to practice making posters before you color.

http://www.wou.edu/las/natsci_math/math/burton/ca.html