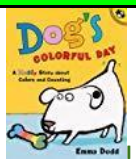
Unit 4  Week 2	***Small Groups: Math Color Mixing*** Low to Medium Support	**Math** **SG2**	**Standards:** MELDS.M.OAT.PS.3 MELDS.M.MD.PS.4 MELDS.M.MD.PS.11



Guiding Math Ideas:

- Math Enthusiasm
- Measurable Attributes and Measuring Tools

Math Concepts from Unit Learning Progressions:

- Science and math concepts help us understand color.
- Mixing and creating colors using measurement tools.
- Using measurable attributes to organize materials.

Materials:

- eye droppers
- diluted liquid water color or food coloring in gradations from dark to light
- small clear containers for paint (e.g., plastic cups or baby food jars)
- white paper towels, cut in 3 inch strips
- large tray
- absorbent paper such as newspaper for table
- color equations (formulas) on paper strips- use color swatch and color name- (See example in Teacher Materials)
- blank strips

Math Vocabulary:

- dilution- adding water to something to change the concentration (make it appear lighter)
- formula- a plan for trying out new things. Sometimes scientists write down their plans (formulas).
- equation- a way of writing down math relationships
- + means add
- = means all together

Preparation:

This small group should follow the reading of *Dog's Colorful Day*.

Decide whether the colors will be pre-mixed or if the children will mix the gradations of colors as a part of combining a science concept (dilution).

Gather all materials. Cut paper towel strips and distribute about 7 or 8 per child. Put jars of paint and droppers in a tray in the center of the table, so that 4 or more children can participate at a time. Cover the table with newspaper. Place the paper towel strips horizontally in front of the children to encourage left to right color mixing. Make a few simple color equations ahead of time.

Procedure:

Introduce the activity by recalling the book *Dog's Colorful Day* and the many different colors of paint that dog discovered during his day.

Demonstrate how to put the same dropper back into the same jar.

We are mixing colors on our paper instead of in the water.

Start out with free play allowing children to drop and mix colors onto their paper towel strips.

Introduce the idea of dark to light:

What do you notice about these colors? Children may say that some are darker than others, etc. *When we add color to paint, we say we* ***dilute*** *the color- make it less concentrated, or lighter in appearance. If we have a dark color, we could add water to it to make it light.*

Introduce the color formulas [equations]:

I wonder if we can make some new colors by using different colors and dropping them onto our paper. Scientists sometimes use ***formulas*** *when they experiment in their labs. These are plans for trying out new ideas, and writing them down. When you use math numbers and symbols, these can be called* ***equations****.*

Read some of your simple color equation strips to the children:

1 drop of red + 2 drops of blue = purple

Reflect the combinations that children make. If they are interested, write their color equations or support them in writing them.

Strategies to Provoke Math Thinking:

- Left to right orientation: Take all opportunities to reinforce left to right "reading" of the equations, as well as the ordering of the paints from dark to light- darkest on the left, lightest on the right. This concept of left to right in reading equations is also applicable to early reading skills, as well as a forerunner to writing math equations.
- Children typically start to represent math operations using their fingers or manipulatives. They have already been doing these types of representations through finger plays, use of counting materials and "people" math. While it is not developmentally appropriate to expect preschool children to write math equations, this art activity can begin to show how symbols are used to represent math operations. This activity introduces the + and the = symbol, which will be used in context during Units 5 and 6.

Adaptations for Additional Challenge:

- Observe whether or not children are "counting on. This skill involves "holding" a number in one's mind, and then adding onto the number mentally without having to recount the entire groups. Provide lots of opportunities in the course of the school day to count on- as children plan playgroups, decide if there is room at the table for another, etc.
- At this point in the year, some of the children are starting to write numerals. They may have begun to represent their work with simple equations. Have materials such as markers, chubby pencils and blank paper strips for children to use as they invent their own color equations. Add

these materials to other centers and encourage children to use them during play, such as counting the number of blocks in a tower, or sorting small cars into color groups.

- Use the correct mathematical terms for operations, such as addition and subtraction. Provide numeral cards and cards with operations symbols of + - = for children to use as the construct equations, in addition to writing materials.

Documentation: Take photos of the color combinations that children create. Show photos during lunch or center time and discuss with children.
Provocation: Refresh the color jars and place them in a tray at the science center, or put inside the water table for experimentation. Place a color wheel and/or gradations of color from paint sample chips in the science or art center to foster additional experimentations with color mixing.

* This activity is adapted from the article *Mathematical Masterpieces: Exploring Math through Art by D. McLennan. Teaching Young children 12(1). 26-31.* Entire article is available to NAEYC members.