

**Project FOCUS  
Best Lessons  
FOURTH GRADE**

**Title of Lesson:** Marker Chromatography

**Theme:** Physical Science

**Unit Number:** 4      **Unit Title:** Sound and Light

**Performance Standard(s) Covered (enter codes):**

S4P1

**Enduring Standards (objectives of activity):**

**Habits of Mind**

- Asks questions
- Uses numbers to quantify
- Works in a group
- Uses tools to measure and view
- Looks at how parts of things are needed
- Describes and compares using physical attributes
- Observes using senses
- Draws and describes observations

**Content (key terms and topics covered):**

Light, Primary Colors, Secondary Colors, Colors of the Rainbow

**Learning Activity (Description in Steps)**

**Abstract (limit 100 characters):** Students will learn the difference between primary and secondary colors

**Details:** This lab is a fun introductory experiment to teach students about the colors in visible light and, in turn, show them everyday applications of colors.

Place a Dixie cup with about 1/2 inch of water on each student's desk. Also, place a marker on each student's desk- each child should get a different color. Make sure the colors you use include red, orange, yellow, green, blue, purple, black, and brown. Cut filter strips so that when one is wrapped around a pencil that is placed horizontally on top of the cup the paper barely reaches the bottom of the cup. Place a small piece of tape and a paper towel (for clean-up) on each child's desk as well. Finally, draw an uncolored/unlabeled rainbow on the board as well.

Instruct the students to draw a line with their marker about 3 cm from the bottom of the filter strip (make sure it is not too close to the bottom or it will be suspended in the water and the experiment will not work). Next, have the student wrap the filter paper around the top of their pencil and place the pencil horizontally over the cup, so that the filter paper is suspended and barely touching the bottom of the cup. Place the cup aside and direct the students' attention to the board; leave the strip to absorb the water for about 5-10 minutes. Then begin the discussion on rainbows. Write ROYGBIV on the board and inform the students that it stands for every color the human eye can see. See if they can guess what each letter stands for and write the color next to each ray of the rainbow. If you so choose, the teacher can have the students copy the drawing in their

notebook. When that is done, let the students look back at their color strip. Have them take the strip out of their cup and place it on the paper towel. Now, divide them into groups of 4 or 5 students and have them take a look at each others' strips. After, go through each marker color and ask the students to raise their hand if they had that color; ask the students to tell what colors that color split into. Write this on the board and see if a trend can be established. Red, yellow, and blue markers should not separate, as they are primary colors. Purple, green, and orange will separate into the primary colors they are made of, as they are secondary colors. Finally, black and brown will vary depending on the brand; nevertheless, they are compound colors and will be made of at least 3 colors. Students may keep their color strip to take home once they are dry. Discussion questions include: What do you think is the definition of a primary color? Which colors are primary colors? What is the definition of a secondary color? Which colors are secondary colors?

**Materials Needed (Type and Quantity):**

Coffee filter strips (approx. 3 inches x 1/2 inch)

Permanent markers (various colors)

Mini Dixie cups (one per student)

Water

Tape

Pencil (one per student)

Paper towels

**Notes and Tips (suggested changes, alternative methods, cautions):**

We are using permanent markers to ensure that the colors separate properly; however, they will stain clothing. Washable markers will work too; however, color definition will not be as apparent and color flooding is more likely to occur. Make sure that the students are careful not to get the marker on any clothing or other objects.

**Sources/References:**

- 1)
- 2)
- 3)