Colored Dots 3
Task Information

Grade: 4th Grade

Content: Physical Science
(Level 1) **IC - 1.4** - Mixtures - objects, events, properties

Format: Manipulative

Purpose:
The student will observe procedures used to separate colors using a paper chromatography process.

Skills:
Primary: observation
Secondary: generalizing, inferring

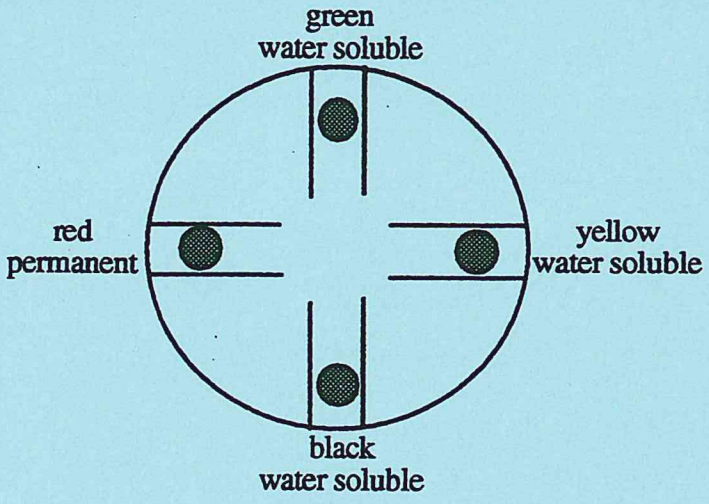
Time: 10 Minutes

Materials:

Teacher
- 1 yellow water soluble marker
- 1 green water soluble marker
- 1 black water soluble marker
- 1 red permanent marker
- scissors
- 1 thin line black permanent marker
- extra paper towel
- extra prepared filter papers (9 cm)

Per Student
- 1 - 5 oz. clear plastic cup of water
- 1 - filter paper with colored dots
- paper towel

Preparation:
1. Cut the filter paper with four (4) tabs (about 1 cm x 3 cm) as shown in the diagram below. Place a different dot on each of the four tabs about 1 cm from the end.



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2. On the clear plastic cup, draw a thin line with a black permanent marker all the way around the cup about 4 cm from the bottom of the cup.
3. The line will serve as a fill line for the water. The tabs from the filter paper should **just** reach the top of the water line.
4. You may have to adjust the tab cuts on the filter paper or the fill line on the clear glass.

Safety: N/A

Extensions and Modifications:
Colored Dots 1 and Colored Dots 2

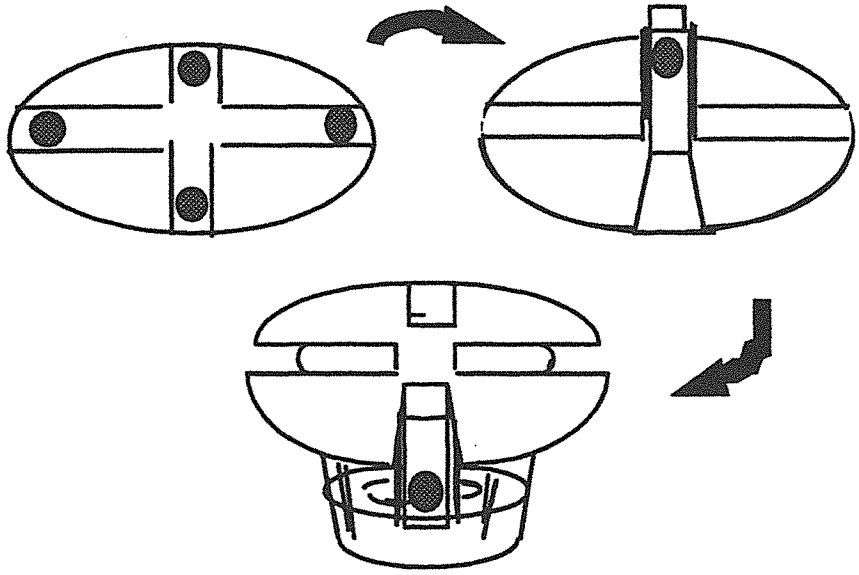
Credit/ Source:
Elementary Science Syllabus level I Supplement - p. 80

Colored Dots 3

Task: At this station you will be observing the effects of water on dots of different colors.

Materials:

- 1 filter paper with colored tabs
- 1 cup with water
- paper towels



Directions:

A. Before you are a small cup of water and a piece of cut filter paper.

B. Bend the tabs with colored dots upward as shown in the diagram.

C. Next, turn the paper upside-down and place the four tabs into the small cup. Be sure the colored dots are **above** the water surface, but be sure that each of the tabs is **touching** the surface of the water.

DO NOT LIFT THE CUP!

D. After about 1 minute, when the first color reaches the top of the tab, remove the paper and flatten it out on a paper towel.

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Colored Dots
Answer Sheet

1. Describe what you observed about each of the dots.

Yellow Dot

Green Dot

Red Dot

Black Dot

2. Explain why the red dot acted differently than the other dots.

3. Explain why the black dot acted the way it did.

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Colored Dots 3 - Scoring Rubric

Maximum score - 6 points

1. Observations of dots — 4 points total

Standard; The student describes what happens when water reaches each dot.

Criteria: Yellow dot, Green dot, and Black dot

- 1 point for each reasonable description of movement **or** change in color.

Acceptable descriptors for movement:

- climbed up
- moved
- smudged
- touched the top
- color went up
- absorbed to the top
- spread out
- ran
- raised
- reached the top
- smeared
- moved upward
- got bigger
- blurred
- moved off the circle

Acceptable descriptors for color change:

- changed color
- fades
- list of colors formed
- gets lighter
- color thins out

*** No credit is given if the student only states the dot changed. ***

Criteria: Red dot

- 1 point for each reasonable description.

Acceptable descriptors:

- didn't move
- didn't blur
- stayed as a dot
- nothing
- stayed the same
- didn't wear out
- didn't come out
- it got wet
- didn't come off
- didn't spread out
- it got soaked
- it didn't change

2. Reason why red dot acted differently — 1 point total

Standard: The student explains why the red dot acted differently.

Criteria

- 1 point for a reasonable comparison of the red dot and the other dots on the paper.

Acceptable descriptors of comparison:

- one dot used permanent ink and the other didn't.
- They were different solutions.
- One dot is water color and the other isn't.
- They were different markers or inks.
- They are made of different stuff.
- One is washable and the other isn't.

UNacceptable answers:

- They were different.
- One moved and one didn't.

*** No credit is given if the student only restates the observations made in question 1. ***

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3. Reason why black dot acted the way it did **1 point total**

Standard: The student explains why the black dot acted the way it did.

Criteria:

- 1 point if the student explains that black is a mixture of many colors **or** water will separate them.

  Acceptable answers:

  - Black is a mixture (made up) of many colors.
  - The black marker was washable (water soluble).
  - All colors are part of black.
  - Water separates the colors in black
  - Water makes the colors in black run

*** No credit is given if the student only restates the observations made in question 1. ***

Highest possible score - 6 points

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Student ID _____ **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	0	1
B. Green dot	0	1
C. Red dot	0	1
D. Black dot	0	1
2. Reason why red dot acted differently	0	1
3. Reason why the black dot acted the way it did	0	1

Total Score _____

Total possible score - 6 points

Student ID _____ **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	0	1
B. Green dot	0	1
C. Red dot	0	1
D. Black dot	0	1
2. Reason why red dot acted differently	0	1
3. Reason why the black dot acted the way it did	0	1

Total Score _____

Total possible score - 6 points

#1 **Student ID** 4A - CN - 15 **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	(0)	1
B. Green dot	0	(1)
C. Red dot	(0)	1
D. Black dot	0	(1)
2. Reason why red dot acted differently	(0)	1
3. Reason why the black dot acted the way it did	(0)	1

Total Score 2pts

Total possible score - 6 points

#2 **Student ID** 4A - CN - 11 **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	0	(1)
B. Green dot	0	(1)
C. Red dot	0	(1)
D. Black dot	0	(1)
2. Reason why red dot acted differently	(0)	1
3. Reason why the black dot acted the way it did	(0)	1

Total Score 4pts

Total possible score - 6 points

#3 **Student ID** 4A - DE - 7 **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	0	(1)
B. Green dot	0	(1)
C. Red dot	0	(1)
D. Black dot	0	(1)
2. Reason why red dot acted differently	0	(1)
3. Reason why the black dot acted the way it did	0	(1)

Total Score 6 pts.

Total possible score - 6 points

Student ID _____ **Scoring Form - Colored Dots 3**

Male / Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

1, Observations of dots

A. Yellow dot	0	1
B. Green dot	0	1
C. Red dot	0	1
D. Black dot	0	1
2. Reason why red dot acted differently	0	1
3. Reason why the black dot acted the way it did	0	1

Total Score _____

Total possible score - 6 points

M

Colored Dots
Answer Sheet

#1

1. Describe what you observed about each of the dots.

Yellow Dot

green

Green Dot

Yellow

Red Dot

ask

Black Dot

red

2. Write an explanation for why the red dot acted differently than the other dots.

Nothings wrong

3. Write an explanation for why the black dot acted the way it did.

it almost turned Brown

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M

#2

Colored Dots
Answer Sheet

1. Describe what you observed about each of the dots.

Yellow Dot

The ink moved out of the dot.

Green Dot

It made a yellow and green.

Red Dot

It stayed the same

Black Dot

It made a blue and brown

2. Write an explanation for why the red dot acted differently than the other dots.

Both sides are red

3. Write an explanation for why the black dot acted the way it did.

one side was brown the other side was black

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Colored Dots
Answer Sheet

4A-DE-7
#3

1. Describe what you observed about each of the dots.

Yellow Dot

It turned to a orangeish-yellow and spred

Green Dot

It turned into blue and green and spred.

Red Dot

It stayed the same and didn't spred.

Black Dot

turned into purple and brown. and spred the most

2. Write an explanation for why the red dot acted differently than the other dots.

Mabey the water wouldn't effect that kind of marker.

3. Write an explanation for why the black dot acted the way it did.

Mabey that's the color's It's made of.

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