Colored Drops
Task Information

Grade: 4th Grade

Content:

Physical Science

- **IC1.14** An object composed of two or more different materials that have been mixed may have some properties like each of the original materials and some new properties.
- **IIC1.0** Objects have properties determined by the forms, amounts and properties of the material of which they are made.

Format: Manipulative

Purpose:

- To determine the student's understanding of properties of different liquids
- To determine the student's ability to make inferences based on observations made in an experiment.

Skills:

Primary: observing
Secondary: interpreting data

Time: 15 minutes

Materials:

Teacher

- dropper bottles labeled Y and B
- clear dish detergent
- blue food coloring
- yellow food coloring
- graduated cylinder (at least 50 ml)
- water
- 5 X 8 plain white index cards

Per Student

- 1 test card
- 2 dropper bottles labeled Y and B
- 3 tooth picks
- paper towels
- wax paper
- waste container (16 oz. plastic cup)

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Preparations:

- Use permanent marker to draw 1 blue circle, 1 yellow circle, and 1 circle with both colors on the test card. Make each circle approximately 5 cm in diameter.
- Laminate or cover the test card with clear contact paper.
- Cut wax paper into 5" X 8" pieces to cover test card
- Place 50 mL of water and 2 drops of yellow food coloring in dropper bottle **Y** and stir gently.
- Place 50 mL of water and 3 drops of dish detergent and 2 drops of blue food coloring in dropper bottle **B** and stir gently.
- Advise students to use separate toothpicks when making observations on each solution.
- Pretest solutions to be certain properties observed are similar to those in the scoring rubric. Concentration in soap solution "B" may have to be adjusted.

Safety:

Wear Goggles
Blot water drops with a paper towel before discarding wax test paper

Extensions/Modifications: None

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Colored Drops

Task: At this station, you will be examining the properties of two liquids and their mixture.

Materials

- dropper bottle B
- dropper bottle Y
- test card
- wax paper sheet
- 3 toothpicks
- waste cup
- paper towels

Directions

1. Place a sheet of wax paper over the test card.
2. Place three drops of **B** on the wax paper over the blue circle on the test card.
3. Use a toothpick to examine the properties of **B**. Record your observations below.
4. Besides the color, describe 2 properties of drop **B** that you observed.

_____

_____

_____

5. Put the toothpick in the waste cup.
6. Place three drops of **Y** on the wax paper over the yellow circle on the test card.
7. Use a new toothpick to examine the properties of **Y**. Record your observations below.
8. Besides the color, describe 2 properties of drop **Y** that you observed.

_____

_____

_____

9. Put the toothpick in the waste cup.

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10. Place two drops of **Y** on the wax paper over the yellow and blue circle on the test card. Place two drops of **B** on <u>top</u> of **Y**.
11. Use a new toothpick to gently mix the yellow and blue drops. Examine the properties of this new mixture.
12. Answer questions 13 - 15 below.
13. Describe 2 properties of the combined drops that you observed.

_____

_____

_____

14. Is the new mixture more like drop **Y** or drop **B**? _____
15. Explain your answer to question 4. _____

_____

_____

_____

16. Put the wax paper and toothpick into the waste cup and use a paper towel to dry the test card.

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Colored Drops - Scoring Rubric

Maximum score - 8 points

1. **Standard:** The student appropriately describes 2 properties of the blue drop.

   Criteria:

   - 1 point for each reasonable property

   Sample of acceptable answers:

   - it's a liquid
   - it's "runny"
   - it's wet
   - it's sticky /tacky/ gooey
   - appears flat
   - spreads out
   - it's thin
   - cannot be pushed easily
   - cannot be pulled easily
   - smells like soap
   - it sticks to the toothpick
   - cannot be dragged
   - goes through the wax paper

   *** Blue drop will not exhibit strong properties of cohesion and surface tension since liquid detergent has been added.

2 points total

2. **Standard**: The student correctly describes 2 properties of the yellow drop.

   Criteria:

   - 1 point for each reasonable property

   - it's wet
   - it's a liquid
   - can be pushed
   - clings together
   - it moves
   - can be dragged
   - it stays in a round circle/drop
   - it's sticky /tacky/ gooey
   - can be broken apart
   - can be put back together
   - follows the toothpick
   - makes a "dome"
   - has no smell
   - it's thin
   - sticks together

   *** Yellow drop will exhibit strong properties of water, such as cohesion and surface tension.

2 points total

3. **Standard:** The student appropriately describes 2 properties of the drop mixture.

   Criteria:

   - 1 point for each reasonable property

- Sample of acceptable answers:

   - it's green
   - cannot be dragged
   - appears flat
   - it's sticky
   - it sticks to the toothpick
   - cannot be pushed easily
   - cannot be pulled easily
   - smells like soap
   - it's "runny"

2 points total

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4. **Standard**: The student makes an observation about the combined drops.

   Criteria:

   - 1 point if the student observes that the new drop of liquid acts more like the blue drop

Total 1 point

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5. **Standard:** The student provides a reasonable explanation of choice in question #4.

   Criteria:

   - 1 point for a reasonable explanation

   Sample of acceptable explanations:

   - There must have been something in the blue drop that did something to the yellow drop to change it.
   - Something in blue drop changed/broke the surface tension of yellow drop.
   - When the two drops were mixed together it changed the properties of yellow drop.
   - Blue drop seemed to have soap added which changed the way yellow drop behaved.

*** Credit should be given for a reasonable explanation. Evaluate the students response based on the answer in question #4, even if that observation is incorrect.

Total 1 point

Highest possible score - 8 points

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Student ID _____ **Scoring Form - Colored Drops**

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. Properties of blue drop	0	1	2
2. Properties of yellow drop	0	1	2
3. Properties of the mixed drop	0	1	2
4. Observation of the mixed drop	0	1	
5. Explanation observation in #4	0	1	

Total Score _____

Total possible score - 8 points

Student ID _____ **Scoring Form - Colored Drops**

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. Properties of blue drop	0	1	2
2. Properties of yellow drop	0	1	2
3. Properties of the mixed drop	0	1	2
4. Observation of the mixed drop	0	1	
5. Explanation observation in #4	0	1	

Total Score _____

Total possible score - 8 points

#1

Student ID 3-SM-28 **Scoring Form - Colored Drops**

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. Properties of blue drop	0	(1)	2
2. Properties of yellow drop	(0)	1	2
3. Properties of the mixed drop	0	(1)	2
4. Observation of the mixed drop	(0)	1	
5. Explanation observation in #4	(0)	1	

Total Score 2 pts

Total possible score - 8 points

#2

Student ID 3-SM-21 **Scoring Form - Colored Drops**

(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. Properties of blue drop	0	(1)	2
2. Properties of yellow drop	0	(1)	2
3. Properties of the mixed drop	0	1	(2)
4. Observation of the mixed drop	0	(1)	
5. Explanation observation in #4	0	(1)	

Total Score 6 pts

Total possible score - 8 points

#3 **Student ID** 3-SM-19 **Scoring Form - Colored Drops**

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. Properties of blue drop	0	1	(2)
2. Properties of yellow drop	0	1	(2)
3. Properties of the mixed drop	0	1	(2)
4. Observation of the mixed drop	0	(1)	
5. Explanation observation in #4	0	(1)	

Total Score 8 pts

Total possible score - 8 points

Student ID _____ **Scoring Form - Colored Drops**

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. Properties of blue drop	0	1	2
2. Properties of yellow drop	0	1	2
3. Properties of the mixed drop	0	1	2
4. Observation of the mixed drop	0	1	
5. Explanation observation in #4	0	1	

Total Score _____

Total possible score - 8 points

Colored Drops

Task: At this station, you will be examining the properties of two liquids and their mixture.

3SM-28
F
#1

Materials:

- dropper bottle B
- dropper bottle Y
- test card
- wax paper sheet
- 3 toothpicks
- waste cup
- paper towels

Directions:

1. Place a sheet of wax paper over the test card.
2. Place three drops of B on the wax paper over the blue circle on the test card.
3. Use a toothpick to examine the properties of B. Record your observations below.
4. Besides the color, describe 2 properties of drop B that you observed.

it Stay in one place

it never brak up

5. Throw the toothpick in the waste cup.
6. Place three drops of Y on the wax paper over the yellow circle on the test card.
7. Use a new toothpick to examine the properties of Y. Record your observations below.
8. Besides the color, describe 2 properties of drop Y that you observed.

its thiner then y

it lighter too

9. Throw the toothpick in the waste cup.

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#1

10. Place two drops of Y on the wax paper over the yellow and blue circle on the test card. Place two drops of B on top of Y.
11. Use a new toothpick to gently mix the yellow and blue drops. Examine the properties of this new mixture.
12. Answer questions 13 - 15 below.
13. Describe 2 properties of the combined drops that you observed.

it ture green

and kid tine

14 Is the new mixture more like drop Y or drop B? y

15. Explain your answer to question 4. it eveporat

frome the wax paper

16. Discard the wax paper and toothpick and use a paper towel to clean the test card.

3SM-28

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Task: At this station, you will be examining the properties of two liquids and their mixture.

3SM-21
M
#2

Materials:

- dropper bottle B
- dropper bottle Y
- test card
- wax paper sheet
- 3 toothpicks
- waste cup
- paper towels

Directions:

1. Place a sheet of wax paper over the test card.
2. Place three drops of B on the wax paper over the blue circle on the test card.
3. Use a toothpick to examine the properties of B. Record your observations below.
4. Besides the color, describe 2 properties of drop B that you observed.

Soft sticky

5. Throw the toothpick in the waste cup.
6. Place three drops of Y on the wax paper over the yellow circle on the test card.
7. Use a new toothpick to examine the properties of Y. Record your observations below.
8. Besides the color, describe 2 properties of drop Y that you observed.

it is liquidy it goes threw the paper

9. Throw the toothpick in the waste cup.

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#2

10. Place two drops of Y on the wax paper over the yellow and blue circle on the test card. Place two drops of B on top of Y.
11. Use a new toothpick to gently mix the yellow and blue drops. Examine the properties of this new mixture.
12. Answer questions 13 - 15 below.
13. Describe 2 properties of the combined drops that you observed.

It tarns green and lig widy

14 Is the new mixture more like drop Y or drop B? b

15. Explain your answer to question 4. If you put the tooth pick in the Y it would fall apart

16. Discard the wax paper and toothpick and use a paper towel to clean the test card.

they got wet

3SM-21

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Colored Drops

Task: At this station, you will be examining the properties of two liquids and their mixture.

35M-19
F
#3

Materials:

- dropper bottle B
- dropper bottle Y
- test card
- wax paper sheet
- 3 toothpicks
- waste cup
- paper towels

Directions:

1. Place a sheet of wax paper over the test card.
2. Place three drops of B on the wax paper over the blue circle on the test card.
3. Use a toothpick to examine the properties of B. Record your observations below.
4. Besides the color, describe 2 properties of drop B that you observed.

it falls and Immeditty spreads out very liquidy

5. Throw the toothpick in the waste cup.
6. Place three drops of Y on the wax paper over the yellow circle on the test card.
7. Use a new toothpick to examine the properties of Y. Record your observations below.
8. Besides the color, describe 2 properties of drop Y that you observed.

it is in a dome shape when you stick it it does not fall flat

9. Throw the toothpick in the waste cup.

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#3

10. Place two drops of Y on the wax paper over the yellow and blue circle on the test card. Place two drops of B on top of Y.
11. Use a new toothpick to gently mix the yellow and blue drops. Examine the properties of this new mixture.
12. Answer questions 13 - 15 below.
13. Describe 2 properties of the combined drops that you observed.

it is green it lays flat & spread out

14 Is the new mixture more like drop Y or drop B? B.

15. Explain your answer to question 4. It spread out like the blue did it did not stay up like yellow

16. Discard the wax paper and toothpick and use a paper towel to clean the test card.

3SM-19

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