Rainbow Milk

Pillar: Healthy Eating
Division: I
Grade Level: 1
Core Curriculum Connections: Science and Language Arts

I. Rationale: This activity explores color creation and incorporates a nutritional focus on the importance of milk and dairy in our diets. Students will experiment with combining the three primary colors to produce all the colors of the rainbow. Using food coloring, liquid dish soap, and milk, students create bowls full of beautiful rainbows. Students will predict, observe, describe, and record their findings about changes in colour that result from mixing the primary colours.

II. Pillar Focus (Healthy Eating):

Students will be able to:

- explain the importance of milk and dairy products as part of a healthy diet.
- describe the necessary nutrients that milk and dairy products provide for our bodies.

III. Curriculum Outcomes: Science

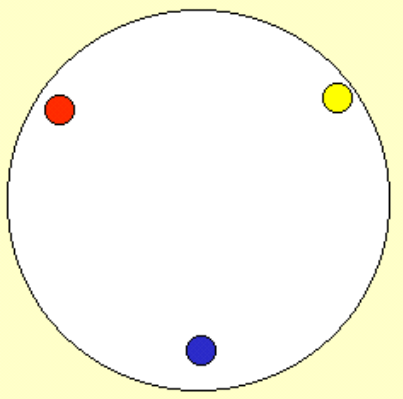
Grade 1 Topic A: Creating Colour
Specific Learner Expectations
Students will: 1. Identify colours in a variety of natural and manufactured objects.
2. Compare and contrast colours, using terms such as lighter than, darker than, more blue, brighter than.
4. Predict and describe changes in colour that result from the mixing of primary colours and from mixing a primary colour with white or with black.
6. Distinguish colours that are transparent from those that are not. Students should recognize that some coloured liquids and gels can be seen through and are thus transparent and that other colours are opaque.

IV. Materials:

- food coloring (red, blue, yellow)
- liquid dish detergent
- 4 Litre jug of skim milk (or enough to cover the groups of students doing the activity. Note: whole milk does not produce the desired result)
- shallow bowls (one for every group that will be performing the experiment)
- paper, or pre-made observation sheets (some included with this lesson)
- markers, crayons, or coloured pencils
- bones (such as those from a model skeleton) can be used to demonstrate the importance of calcium.
- safety goggles (there is a chance some of the materials may splash up from the bowl).
- observation sheet (Here, students will record their hypotheses, and record observations before and after food coloring and liquid dish detergent is added to the milk.)

- Canada Food Guide
- Optional: Catch a Rainbow Printable Activity Sheet (attached)
- Optional: The Color Wheel (attached) - copy onto a transparency to use as an overhead.

V. Procedure:



***Safety Note**: Before you begin, make it clear to the students that they cannot drink the rainbow milk due to the dish liquid detergent used in the activity. It is a good idea to supply students with eye goggles in case any detergent or food coloring splashes up from the bowl.*

i. Activating:

1. Ask students to think about the colors that make up a rainbow and discuss their answers.
2. List the colours that were volunteered on the board and then discuss the order that the colours appear in. Provide students with the R.O.Y. G. B.I.V. acronym to help them remember the correct sequence.
3. Tell students that you have an important document that uses some of the colors of the rainbow to represent different food groups.
4. Show students a copy of The Canada Food Guide and use the following questions to guide discussions:

- Does anyone know the name of this very important document?
- What is the Canada Food Guide used for? (talk about its purpose).
- How many colours/food groups do you see? What are they?
- What colour shows the milk and milk products?
- Be sure to mention that blue is a very important colour (primary/ main colour) just as milk is a very important food group.
- Why are milk and dairy products so important for your body? Discuss how milk and dairy contain calcium which helps promote the growth of strong bones and teeth. Now, explain that the activity they are about to complete will involve milk, and the colors of the rainbow.

ii. Acquiring:

a. Give each small group of students a bowl containing milk.
b. Next have the students add several drops of blue food coloring, yellow food coloring, and red food coloring equally spaced around the bowl. The colors should be as close as possible to equal distances from each other, so each color should be placed about 1/3 of the way around the outer rim of the milk. Ask students to make predictions about what they think will happen when the dish soap comes into contact with the food coloring; have them write their hypotheses down on their observation sheets.
c. Add a little bit of dish soap to the center of the milk.
d. Remind students to watch the colors carefully.
e. Allow the mixture time to settle (approximately 5 minutes), and then have students make observations about what has happened to the milk and colors by drawing and recording what they see on their observation sheets.

f. Next, have students blow softly into the bowls in order to swirl the colors together and create beautiful rainbow patterns.

Photographs of the experiment in progress

Figure 1: Students generating hypotheses

Figure 2: Milk after the food coloring has been added

Figure 3: Adding the dish liquid detergent to the milk and food

Figure 4: Rainbow milk

Figure 5: More Rainbow milk!

iii. Applying:

6. Display the color wheel on the smart board or an overhead transparency and refer to it when discussing the results with the students. Reinforce that the primary colours are the basis for creating the secondary colors and all other colors.

7. After viewing and discussing the color wheel, have students recreate their own colour wheels by drawing, labelling, and experimenting with mixing and adding the appropriate colours of paint.

VI. Extensions and Variations:

1. **Eating Under the Rainbow:** Refer to this ***Health in Action*** lesson, which focuses on balance and moderation as part of a healthy diet, teaching children how to make healthy choices based on the recommendations in the Canada Food Guide. Students track, record and graph their food intake over time, trying to incorporate a variety of foods from each food group corresponding to the colors of the rainbow. They celebrate this learning in a positive way by gathering together to *'Eat Under the Rainbow'* in their classroom.

2. Plan healthy snack days to correspond to each of the primary colours. For example, students may bring in apples, strawberries etc. for Red Snack day and bananas for Yellow Snack day. You could plan a smoothie day and experiment with what happens when all of the colours are mixed together.

3. **Math Connections:**

- Students could count the number of food coloring drops that they used for each color and then calculate the total number of drops of food coloring used in their experiment.

4. **Literature connections:**

- A Rainbow All Around Me by Sandra L. Pinkney
- The Food Pyramid by Janine Scott

- From the Rookie Read About Science series:
- "All the Colors of the Rainbow" by Allan Fowler

VII. Assessment Ideas:

- Have students hand in their observation sheets to check for individual comprehension.
- Collect the colour wheels to assess for correct labels and color combinations.

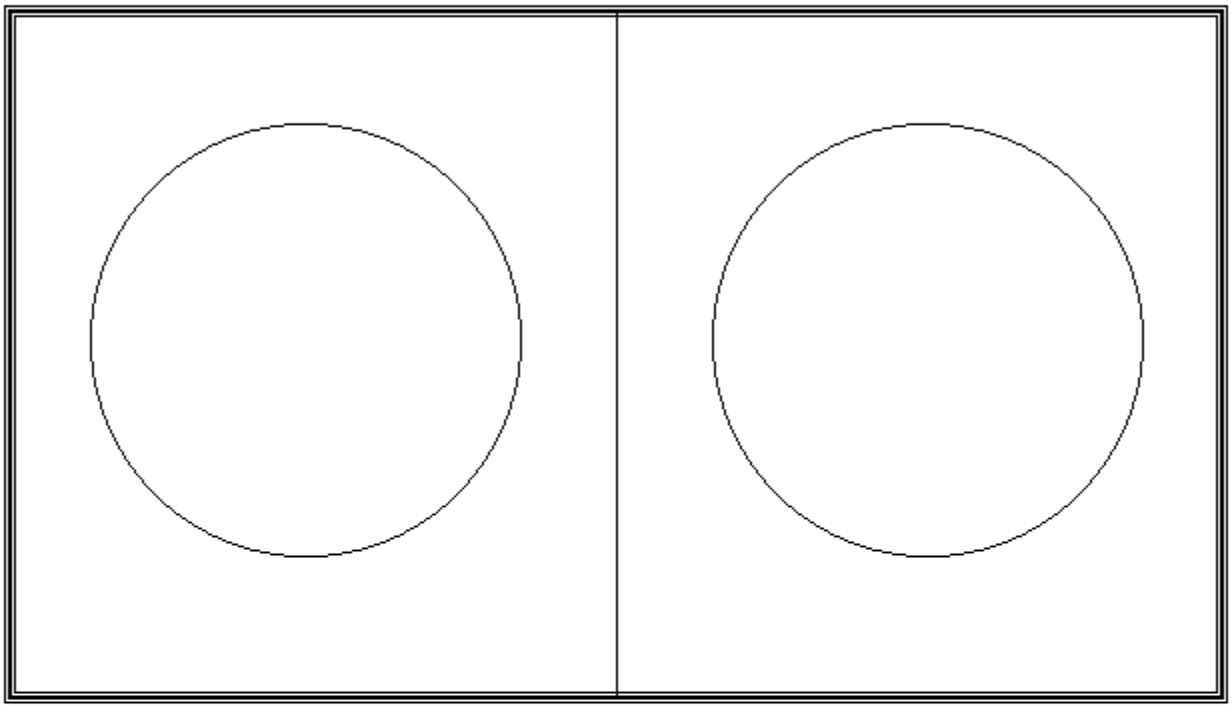
VIII. Source:

- Source of Idea: Kidzone

Name: _____

Date: _____

Catch a Rainbow



Draw a picture of your observations.

What did I do? _____

_____

_____

What did I see? _____

_____

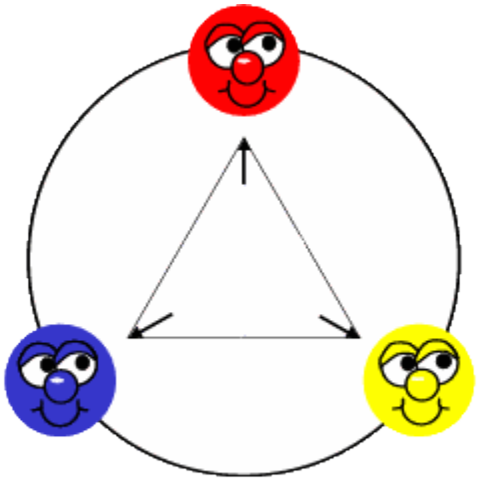
_____

The Color Wheel

Color wheels show us how colors are related. They remind artists how to mix and think about colors.

The primary colors are:

- red
- blue
- yellow



Primary colors cannot be made from other colors. Artists create all the other colors of the rainbow by mixing together the primary colors.

The secondary colors are:

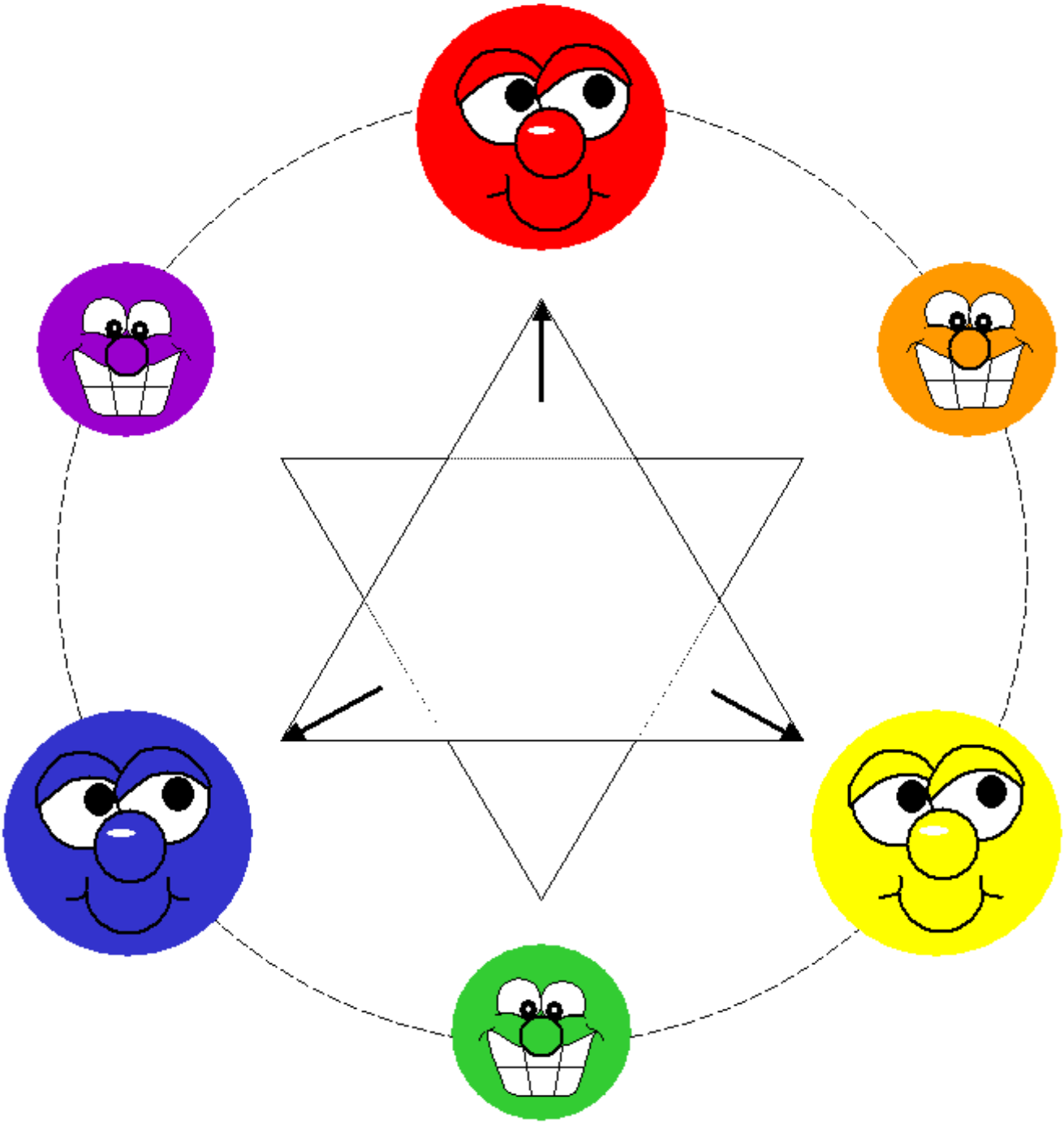
green
orange
violet (purple)

Secondary colors are made by mixing two primary colors. Each secondary color is made from the two primary colors closest to it on the color wheel

Just by mixing these colors, you can get all the colors of the rainbow:

The Color Wheel

Primary and Secondary Colors



Red, yellow and blue are the three primary colors. They cannot be made by mixing any other colors.

Orange, green and violet are the three secondary colors. They are each made by mixing the two primary colors closest to them.