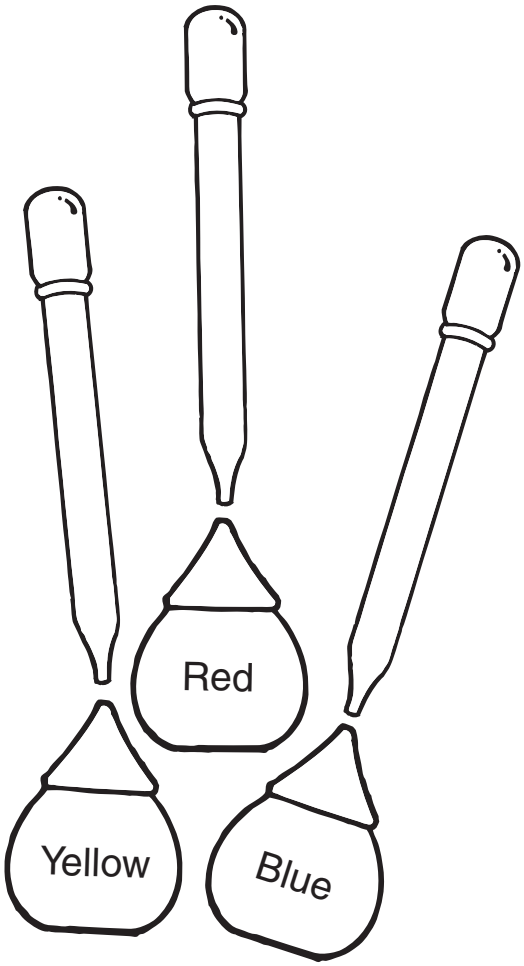
Rainbow Ice

Demonstration Materials

- clear, shoebox-size plastic container
- food coloring (red, blue, and yellow)
- water
- 3 clear, plastic cups (9–12 oz)
- 3 pipettes or eye droppers
- various types of salt (table salt, Epsom salt, rock salt)
- block of ice (Freeze water inside of a container that fits inside the clear container for the experiment.)

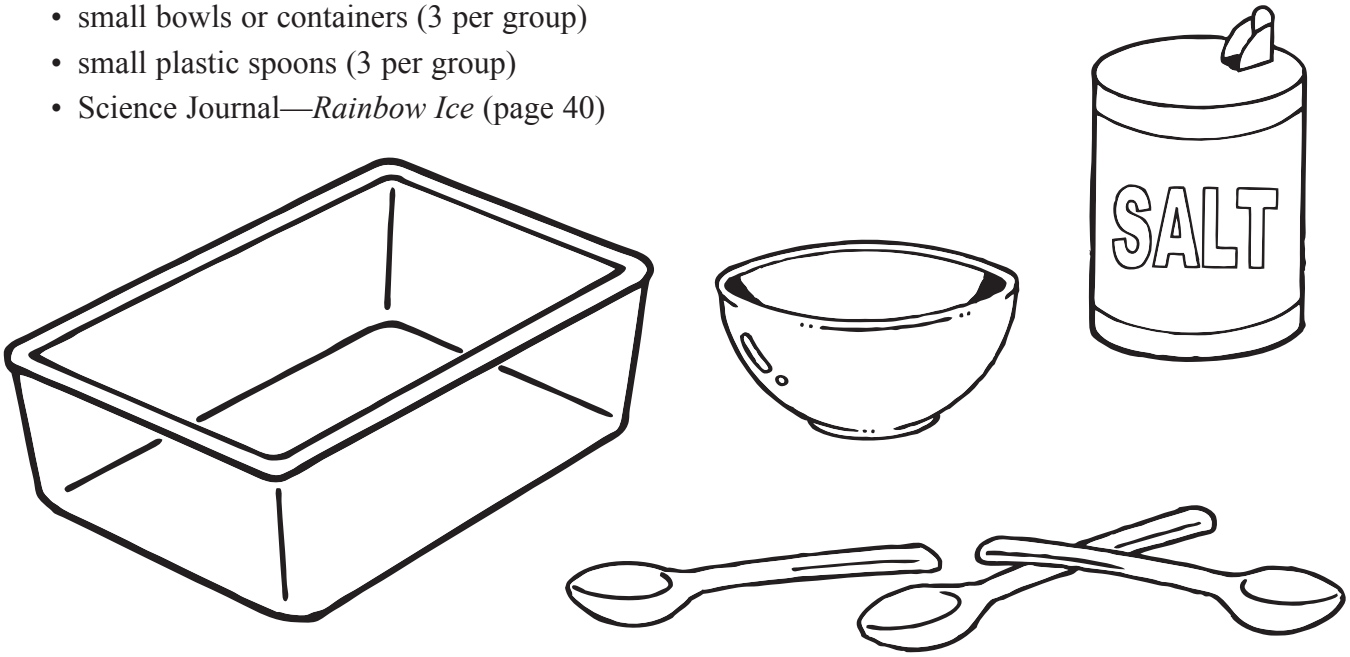
  Note: Ice cubes will work, but they tend to melt quickly.

- 3 small bowls or containers
- 3 small plastic spoons
- Science Journal—*Rainbow Ice* (page 40)
- Word Cards—*Rainbow Ice* (page 41)



Student Materials

- clear, shoebox-size plastic containers (1 per group)
- colored water (red, yellow, and blue) in clear cups (1 set per group)
- pipettes or eye droppers (3 per group)
- various types of salt (table salt, Epsom salts, rock salt)
- blocks of ice (1 per group)
- small bowls or containers (3 per group)
- small plastic spoons (3 per group)
- Science Journal—*Rainbow Ice* (page 40)



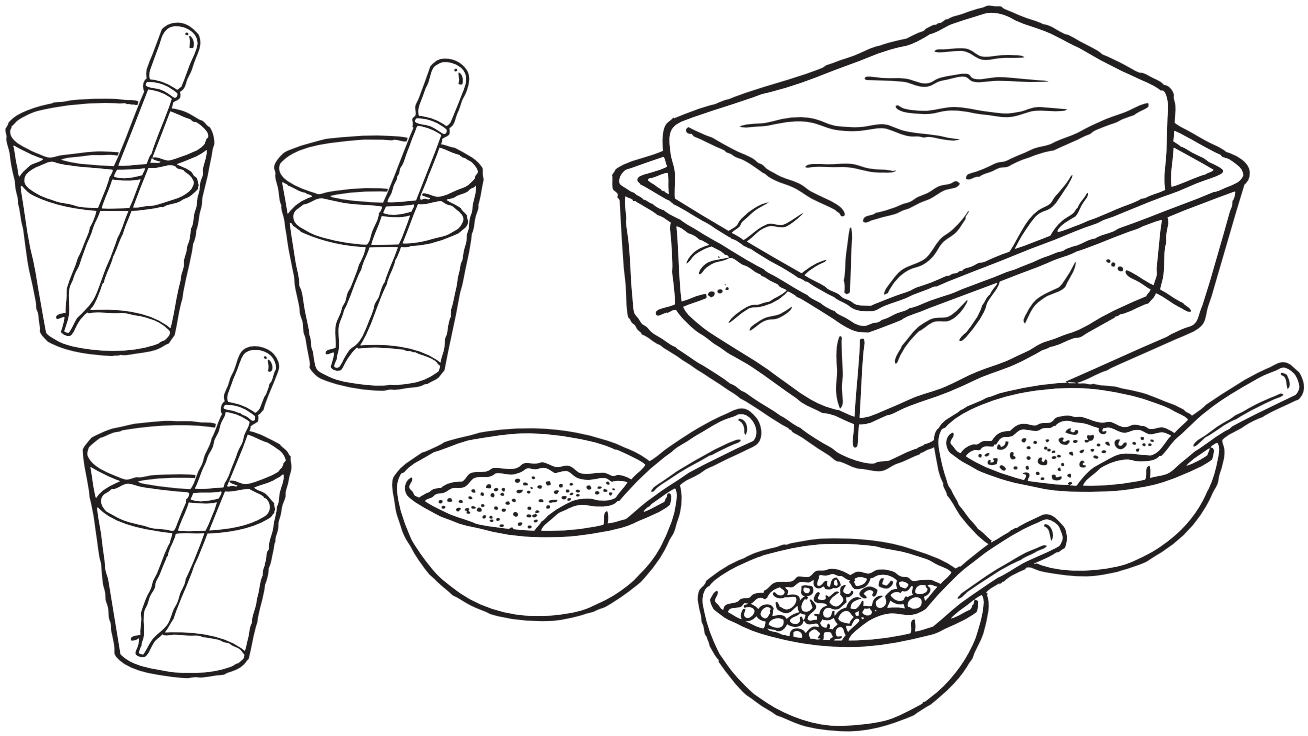
Rainbow Ice *(cont.)*

Getting Ready for the Activity

1. Make copies of the Science Journal page. Give one copy to each student.
2. Reproduce word cards on cardstock (or heavy paper), laminate, and display.
3. Pour salt into the small containers (one type of salt per container). Add one spoon to each container of salt. Place one set of containers of salt at each workstation.
4. Fill the clear, plastic cups 3/4 full with water. Add sufficient food coloring to produce vibrant primary colored water. Create four sets of the primary colored water (red, blue, and, yellow). Do NOT mix the colors to make secondary colors.
5. Place one pipette into each cup of colored water. Place one set of the colored water and pipettes at each workstation.
6. Remove the ice blocks from the freezer and place one into each of the clear, plastic containers. Place one at each workstation. (**Note:** The ice may be left out and observed throughout the day. Or, it may be rinsed off and put back in the freezer to be used again the next day.)
7. Divide the class into groups of 4–5 students.
8. Allow students to practice using the pipettes prior to the activity.
(See page 23 for Pipette Warm-up Activities.)

Introduce the Activity

1. Read a book of your choice that reinforces the theme of color.
(**Suggestions:** *Little Blue and Little Yellow* by Leo Lionni; *Color Dance* by Ann Jonas)
2. Introduce the word cards for the unit. Discuss the meaning of new words and concepts.
3. Demonstrate this experiment to the entire class. Follow the steps outlined on the following page.



Rainbow Ice *(cont.)*

Procedure

1. Use a pipette to transfer several drops of colored water onto the block of ice. Count the number of drops applied to the ice. Observe what happens.
2. Add a different color to the block of ice. Observe closely. What secondary color begins to appear?
3. Choose one type of salt. Pour a spoonful onto the ice. Observe the physical reaction that takes place. Listen carefully. What do you hear?
4. Continue to experiment with the colored water and salt.
5. Draw a picture of your observations on the Science Journal page.

Fun Science Questions and Facts

What is a physical reaction?

It is when two or more chemicals are mixed, and the by-product is a mixture of the two original chemicals. For example, if you mix salt (NaCl) and water (H_20), you will get saltwater, which is a mixture of the original chemicals, not a new chemical.

What is a chemical reaction?

It is when two or more chemicals are mixed, and the by-product is a different chemical than either of the original chemicals. For example, if you mix baking soda (sodium bicarbonate) and vinegar (acetic acid), a chemical reaction takes place and a different chemical (a carbon dioxide) is created.

What makes the Rainbow Ice experiment a physical reaction and not a chemical reaction?

The salt (NaCl) is added to the water (H_20), and it causes the ice to melt and form salt water. To be a chemical reaction, there would need to be created a by-product of the reaction that is different from the original chemicals.

Why does the ice make cracking noises?

When ice thaws and refreezes, it makes cracking noises as it expands and contracts.

Have you ever seen someone use salt to melt ice?

Salt is commonly used in parts of the country where it snows to keep the ice from forming on the roads and sidewalks. When salt is added to ice, some of the salt actually dissolves by pulling water away from the ice crystals. The melted ice-salt mixture is colder than 0 degrees Celsius or 32 degrees Fahrenheit. The salt lowers the freezing point of water.

Why not just let the students use all six colors of the rainbow?

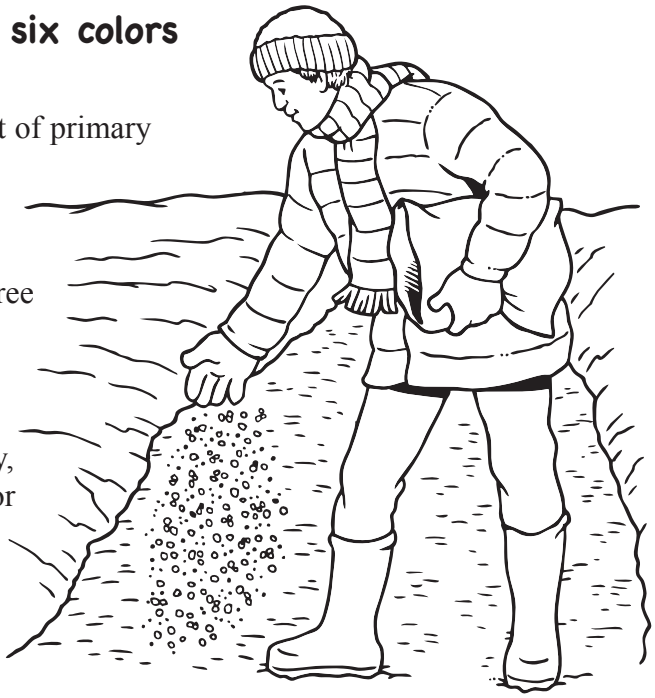
Producing the secondary colors reinforces the concept of primary and secondary colors.

What type of color is brown?

It is called a *tertiary* color—the combination of all three primary colors.

What are the colors of the rainbow?

Red, orange, yellow, green, blue, and purple (Actually, it's indigo and violet, but using purple makes sense for young children.)



Name_____

Rainbow Ice

Draw a picture of the rainbow ice.

ice

melt

salt

mix

freeze

water