Activities
The Magic School Bus Meets Molly Cube

Grades: 3–5

Overview
Children learn about mixtures and solutions using vegetable oil, soap and detergent.

Field Trip Notes
When Wanda's favorite singer, Molly Cule, comes to town, she chooses Ms. Frizzle's class to wash her famous car. The kids clean the car top to bottom, but Molly insists they missed a spot. Only when they shrink small enough to see molecules can they clean the car down to the very last bit - but time is running out, and
they need a molecular miracle to get the job done before Molly’s concert begins.

**Matchmaker, Matchmaker**

**Time**: 50 minutes  **Group**

**Size**: 4

Ralphie discovers that soap and water slip grease and grime away because of the special characteristics of soap molecules. Your kids investigate some characteristics of oil, water, and soap.

**What You Need**

- Dishpan of water
- Paper towels
- Liquid detergent
- Copies of MATCHMAKER, MATCHMAKER page
  
  For each group:

- 2 tumblers of water
- 2 tablespoons cooking oil
- 1 tablespoon liquid detergent

**Talk About It**

Pass around samples of oil, water, and liquid soap.

**Ask**: What are some characteristics of water? Oil? Soap? List responses.

**Ask**: Do the teeniest-tiniest bits (molecules) of these things determine these properties? (yes)

**What To Do**

1. Let kids touch the substances. Ask: How do they feel? Is how they feel a characteristic? (yes)
2. Have kids dip a finger in oil and then try to rinse it off with water alone. Ask: Does the oil come off? How could we remove it?
3. During the activity, students will discover that soap and water mix, while oil floats on top of water. Challenge kids: Can you mix oil and water? Record kids’ ideas. If possible, let them experiment with some of their ideas.

4. After kids add soap to the oil and water, ask: What did the soap do to the oil and water? (Soap mixes oil and water because on end of the soap molecule is water-loving, while the other clings to oil. Stirring in soap creates a cloudy suspension of tiny oil droplets surrounded by soap molecules - an emulsion.)

5. Ask: Why do soap and water clean oil and grime? (The oil-loving end of the soap molecule surrounds and lifts the oil; water rinses it away.)

Subjects:

Science, Mixtures and Solutions, Atoms and Molecules, Matter and Elements, Observation
MATCHMAKER, MATCHMAKER

Everything is made of super-tiny molecules. Oil and water molecules don’t like to mix. What match-maker will bring them together?

What to Do

1. Put a few drops of SOAP in a glass of WATER. Stir well. What happens?
   Can you see the soap?
   Do the oil and water mix?

2. Put 2 tablespoons of OIL in a glass of WATER. Stir well. What happens?

3. Add 1 tablespoon of SOAP to the WATER and OIL. Stir well. What happens?

Think About It

What did the soap do to the oil and water?

Take-Home Challenge:

Remove oil and grime the matchmaker way. Rub baby oil onto greasy, grmy hands. Then wash under running water with soap. Baby oil lifts the grime; soap and water wash it away.