Properties of Matter

The Action
Oil, water and dish soap are used to illustrate differences in density.

Grade Level
Grade 3 - Properties of Matter

Materials
- Small jar 3/4 full of cold water
- Medicine dropper or straws
- Cooking oil (1 Tbsp)
- Liquid soap (1Tbsp)
- A spoon

Instructions
- Take the jar of cold water and using the dropper, add 3 drops of oil. Move the jar gently in a small circle and note the changes.
- Add 3 drops of liquid soap to the water and oil. Stir with the spoon and note the changes.
- Empty the jar and fill it 3/4 full of warm water. Add 3 drops of oil to the warm water. Move the jar gently in a circle and note the changes.
- Add 3 drops of liquid soap to the warm water and oil and stir with a spoon. Note changes.

Safety
No safety concerns. Be careful not to spill oil or water on the floor, as it may be slippery.

Science Principle
All three liquids have different densities, therefore the oil sits on top of the water and the liquid soap sinks. When the oil is added and mixed gently, it sits on top of the water in 3 or 4 circle-like shapes covering a small surface area. When liquid soap is added and stirred, the oil appears to dissipate. Repeating this process using warm water, the oil breaks apart into tiny circles and covers the majority of the surface. When the liquid soap is added, the oil again appears to dissipate.
The changes occurring depending on the temperature of the water means that the oil is thinner in the warmer water and thicker in cooler water.