

Note to Parents and Teachers:

This book is intended to introduce children age 3–6 to some basic concepts of chemistry. There are a few pages that say “try this experiment”, but honestly, every photo in the book shows an experiment you can do with your child with the everyday items you have at home.

Have fun experimenting together!

If you’d like ideas for more hands-on STE(A)M activities for kids, check out my website, [www.InventorsOfTomorrow.com](http://www.InventorsOfTomorrow.com)

If you’d like a more advanced book on this topic, I would recommend Compounds and Mixtures by Charnan Simon, c. 2010, Cherry Lake Publishing.

This is a book I wrote to use in my own classes. I do not have copyright to all the photos used, so this material can only be used for educational purposes, with no profit taken from their use. C. Janelle Durham, 2016

# Chemistry: Let’s Mix It Up!



**A Family Inventors’ Lab Original**



Some things mix together easily.



Try this experiment at home



1. Fill a clear container with some water and oil.
2. Optional: add food coloring.
3. Drop in an alka-seltzer or some salt.
4. Sit back and watch the bubbles.
5. When the bubbles stop, add more alka-seltzer or salt to make more bubbles.



# Reactions

When you mix some things together, they react. You can tell they're reacting if they change color or smell, or make noise, heat, cold, light, or bubbles.

Some don't...



Let's learn about mixtures.

# Mixtures

We can blend together two types of solids. They get mixed up, but we can un-mix them.



One end of an emulsifier molecule sticks to water, the other sticks to oil, so it connects them in a bridge.



When you need to wash greasy dishes, try to wash with just water—the oil won't come off. Then add soap. Oil sticks to the soap, then they both stick to the water as you rinse it away.

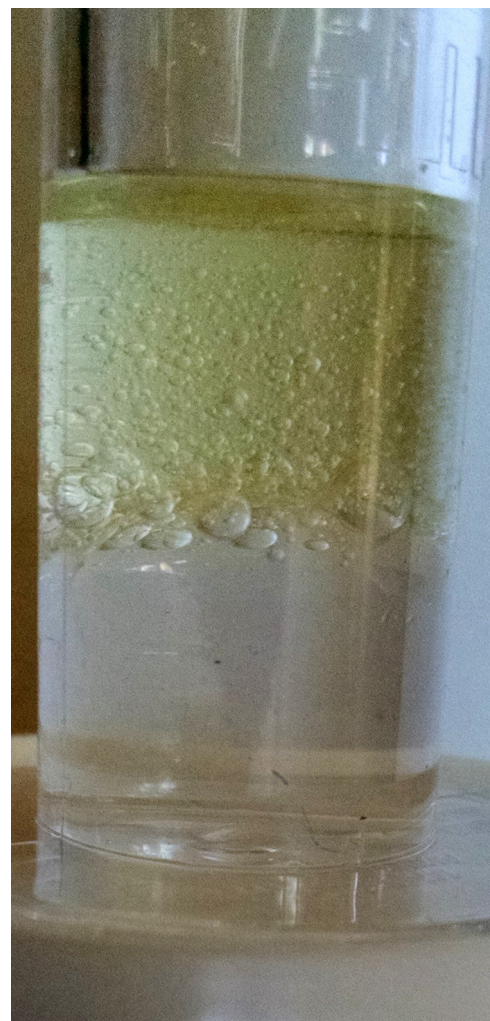


# Emulsifiers

We can use an *emulsifier*, like soap, to help oil & water mix.



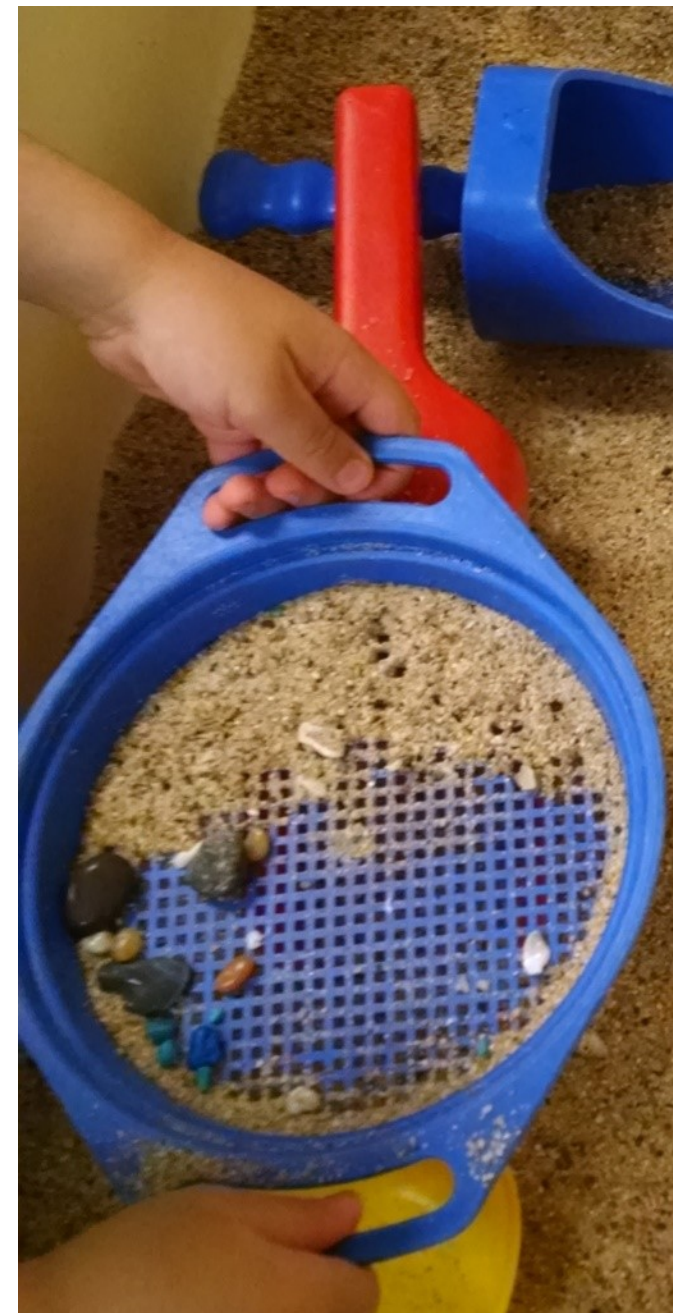
Oil and Water



Oil and Water,  
Shaken Up



Oil, Water, and  
Soap, Shaken Up



Sometimes we put fun mixtures in the sensory bin with strainers to help un-mix them. What have you seen in the sensory table?

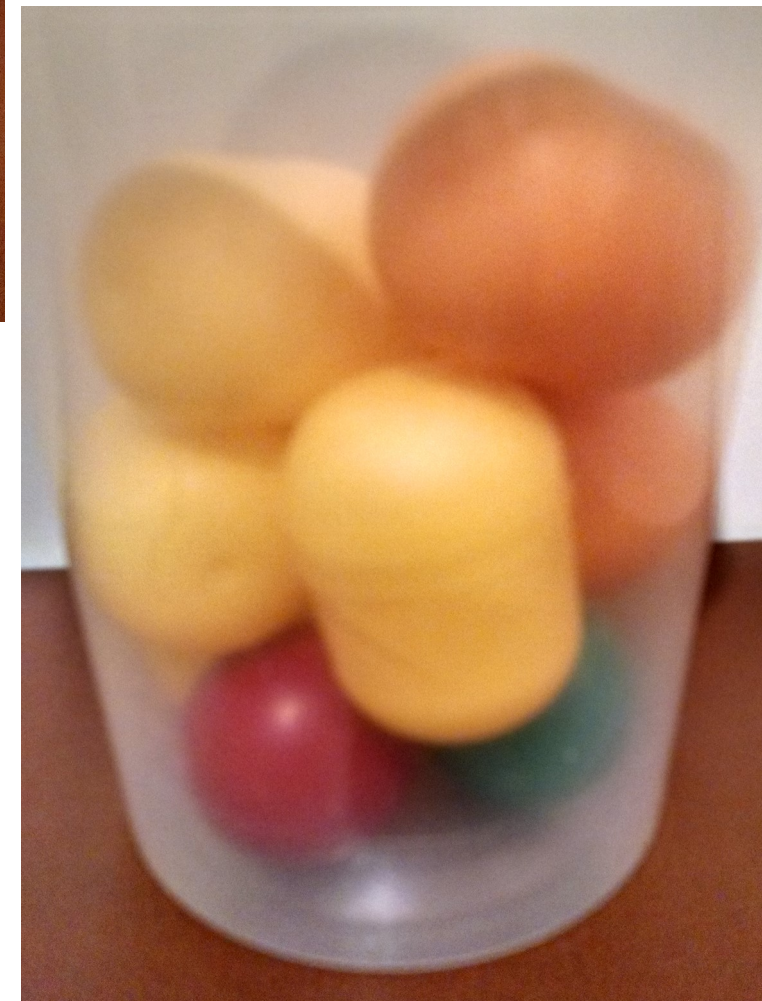
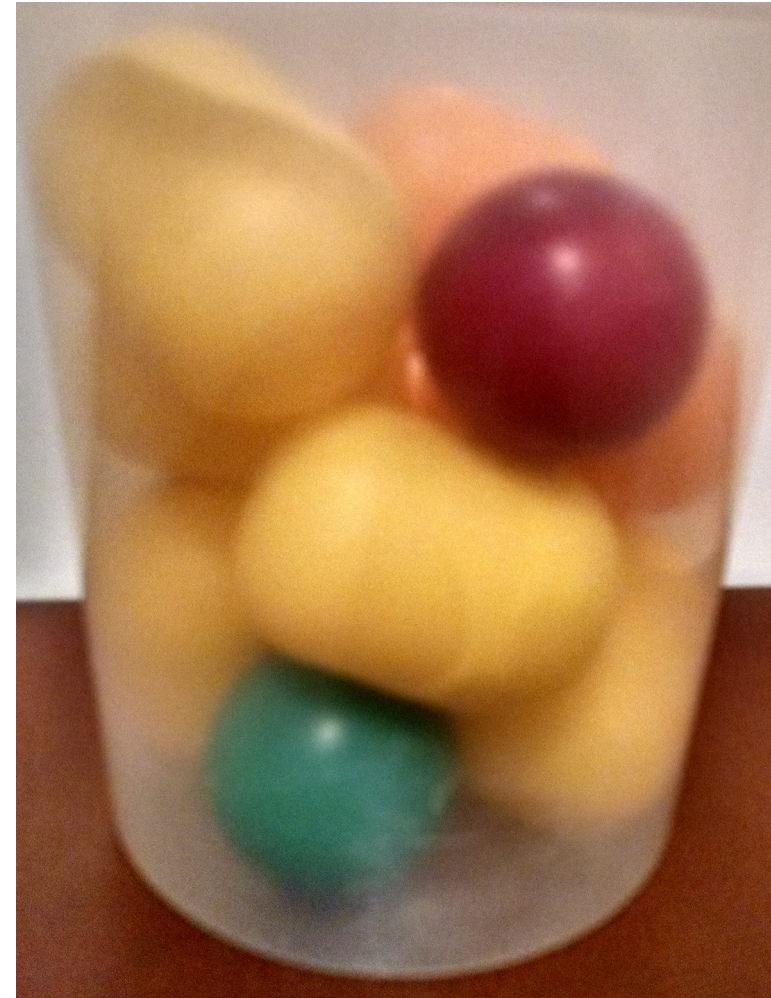
# Suspensions

When you mix some solids and liquids together, they'll look mixed when you shake the jar, but then the solids separate out again.



Test this with a Jar of Dirt and Water

If you mix the oil and water together, then shake it, the water molecules find and connect with the other water molecules, then sink to the bottom.



# Why won't oil and water mix?

Water molecules like to stick to other water molecules, just like these magnet balls like to stick together.



Imagine these yellow plastic eggs are molecules of oil. Oil molecules do not like to stick to water molecules.



# Try this experiment at home

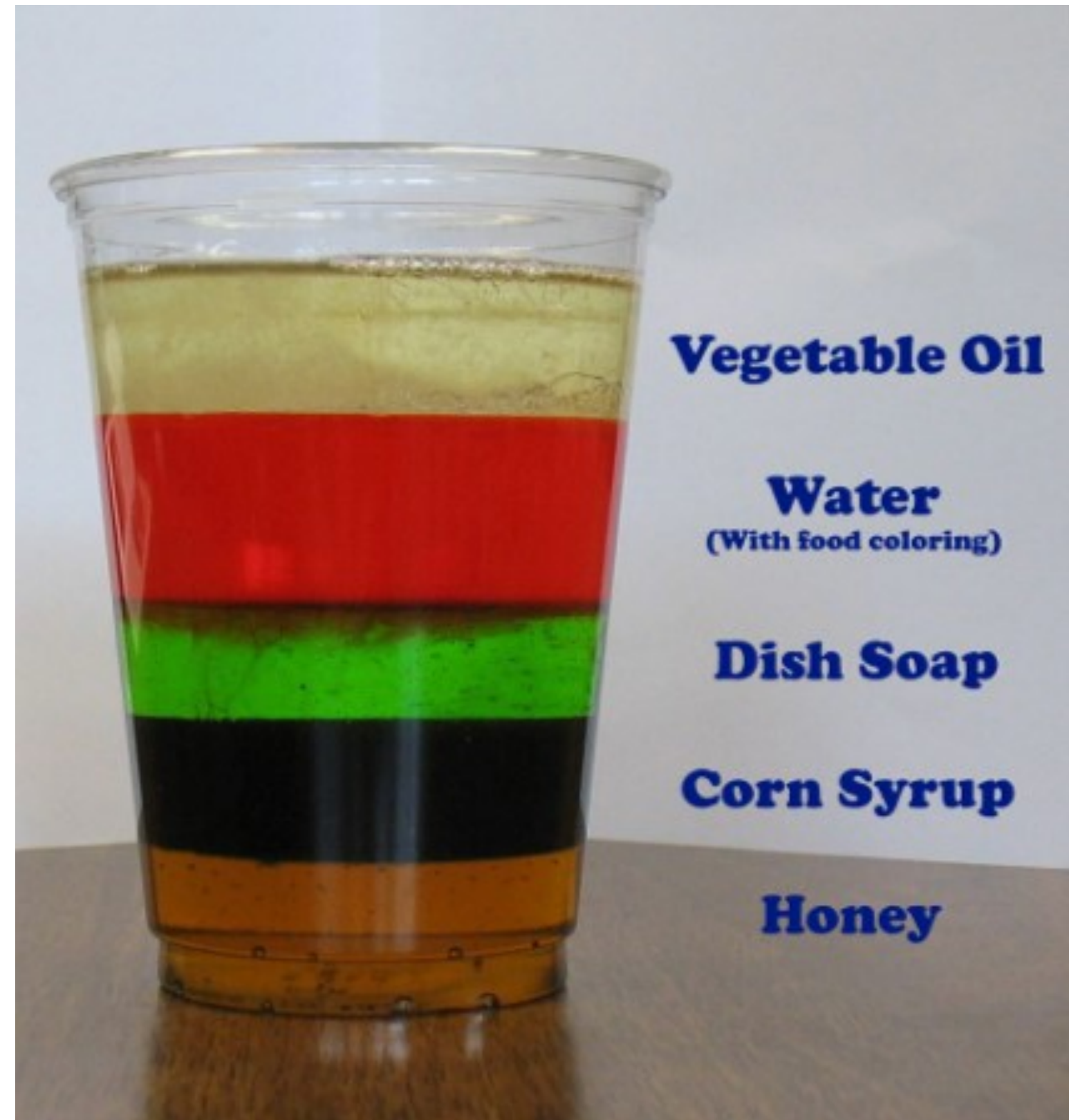
1. Mix water, flour and salt.
2. Shake it to make a solution.
3. Let it rest till all the flour settles to the bottom.
4. Pour it through a coffee filter to separate out the flour.
5. Taste the water. Does it still have salt in it?



If you carefully pour all these liquids into a cup they will stay in separate layers.

# Solutions

When we mix some things together, one *dissolves* into the other.







Sometimes, it's a solid that dissolves into a liquid.  
Sometimes it's liquid that dissolves in another liquid.

# Immiscible Liquids

Some liquids, like oil and water, will not mix with each other.

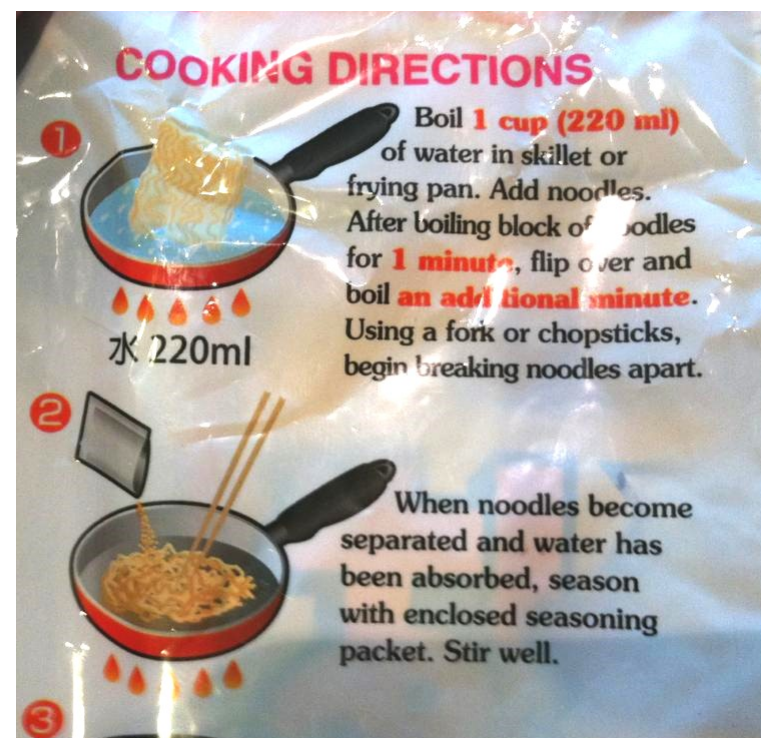


# Have you ever made a solution?



Like hot chocolate?

Or ramen?



When you mix water into solid paints in a palette, you're making a solution of watercolor paint.



If you sprinkle salt and warm water on a piece of ice, they mix with melting ice to make salt water.

