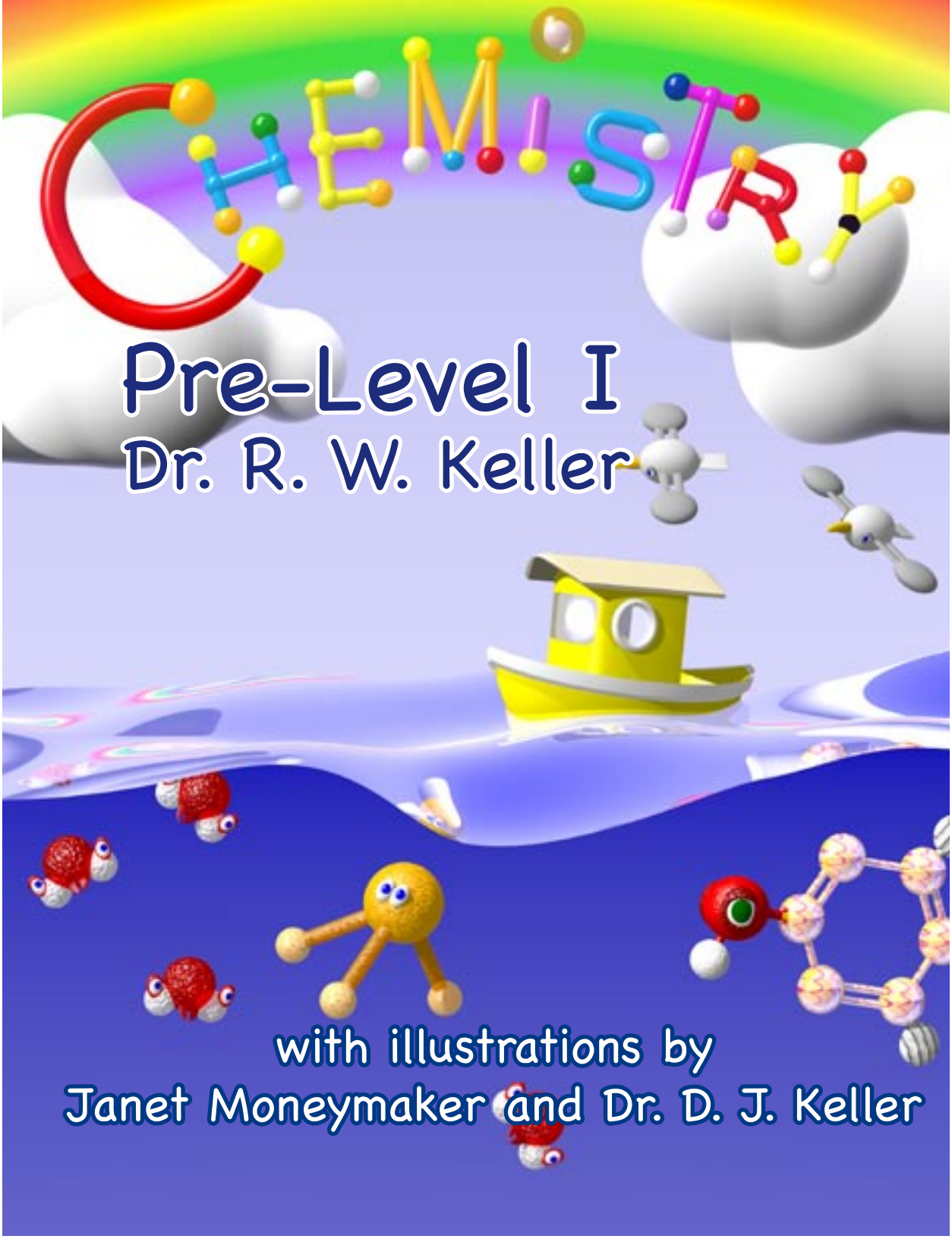
Real Science -4- Kids




# Pre-Level I

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with illustrations by
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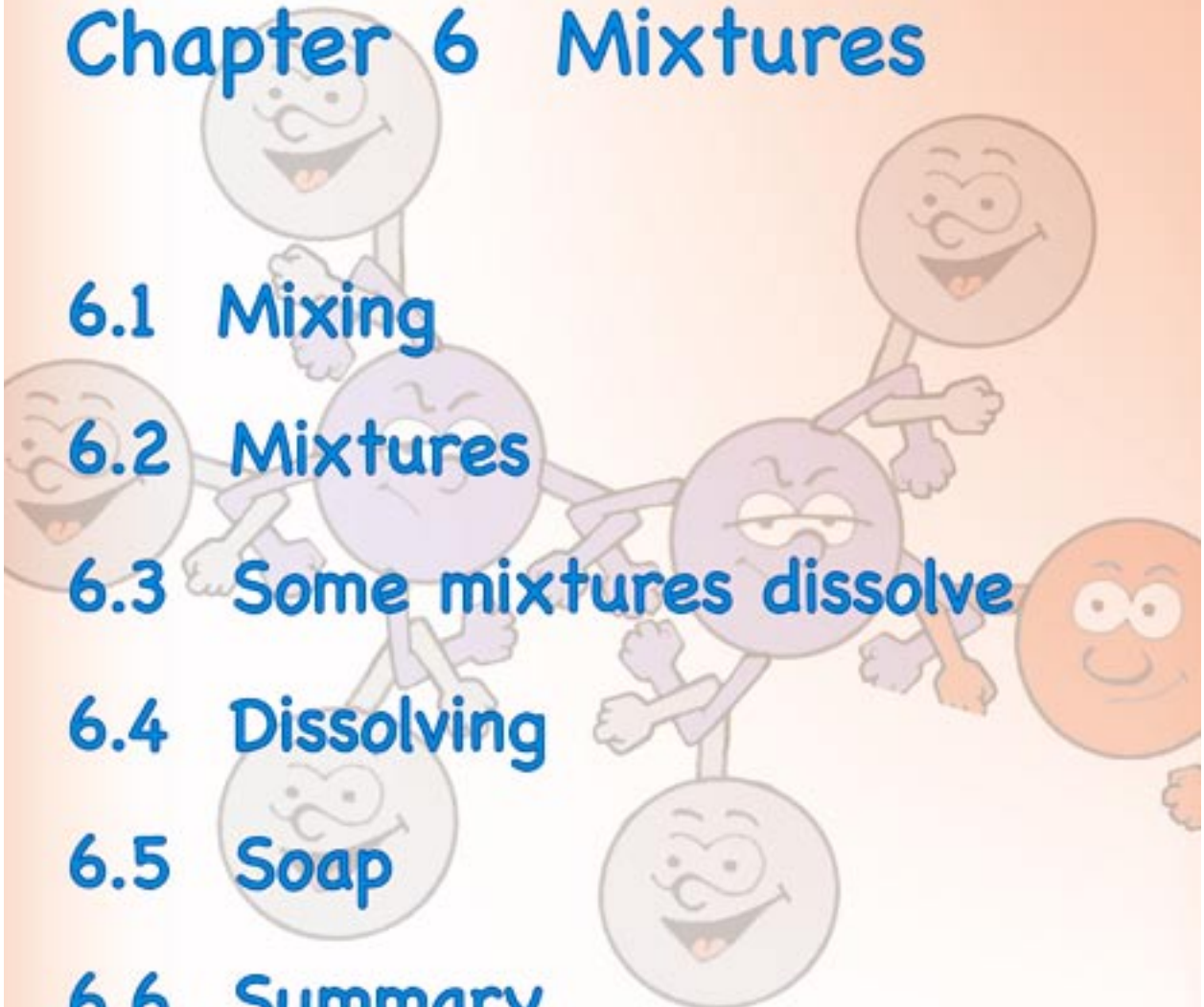
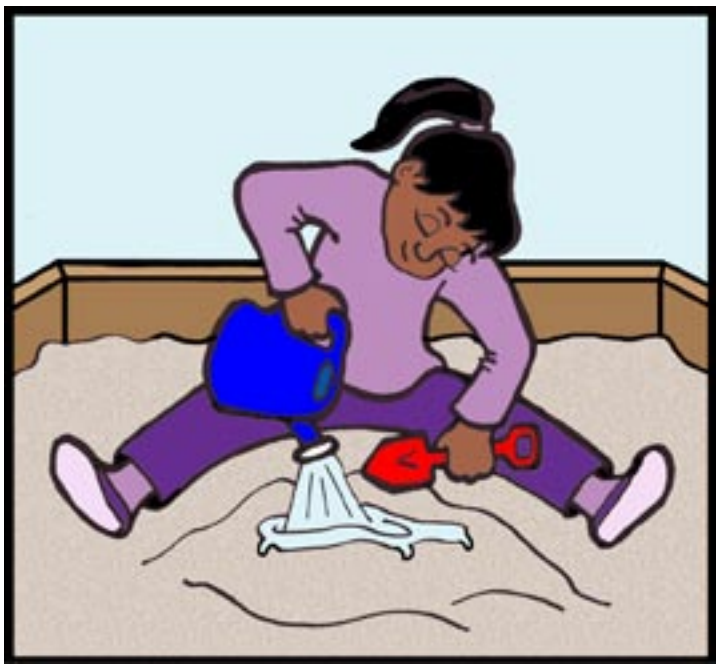
# Chapter 6 Mixtures



# 6.1 Mixing

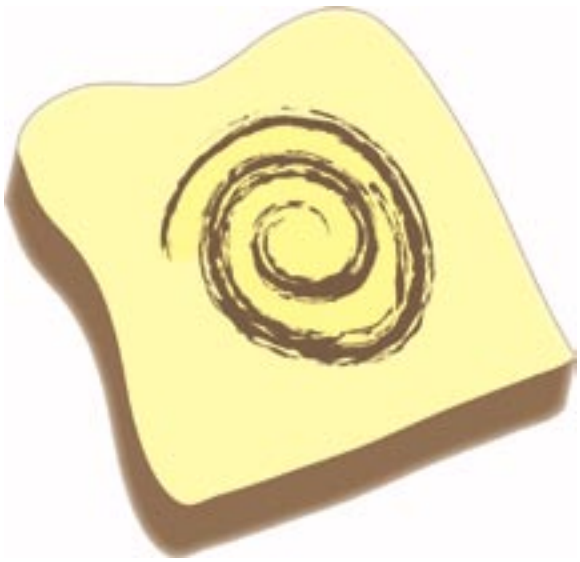


Have you ever put water and sand together in pail? What did you get? A mud pie maybe!

Have you ever made a real pie, like lemon pie? If you have, you probably added eggs and flour, some table salt or oil, and maybe some water. What happened when you added all these things together? You probably mixed them with a spoon or a mixer.

In either case, what you ended up with is a mixture. A mixture of sand and water, or a mixture of eggs, oil, salt, and water. Both mud pies and lemon pies are mixtures.

## 6.2 Mixtures



You can make a mixture of blocks and rocks. You can make a mixture of rocks and sand. You can make a mixture of sugar and cinnamon and put it on your toast! All of these are called mixtures because all of these are made of more than one thing *mixed* together.

## 6.3 Some mixtures dissolve

Have you ever wondered why table salt disappears in water, but sand does not? Have you ever noticed that sugar disappears in

water but not in oil and butter? When table salt or sugar disappear in water, we say they dissolve.


Some things will dissolve in water and some things will not dissolve. What makes some things dissolve and other things not dissolve?

## 6.4 Dissolving

As with everything else, it's the molecules in table salt or sugar that determine whether or not they will dissolve.

Molecules have to follow rules for dissolving or not dissolving, just like they have to follow rules for reacting or not reacting.

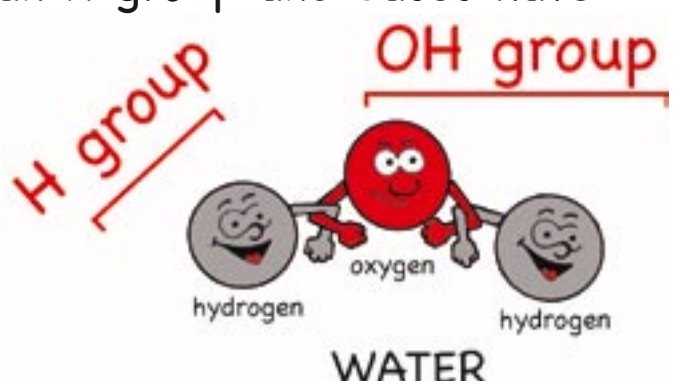
The main "rule" for dissolving is

Like dissolves like.

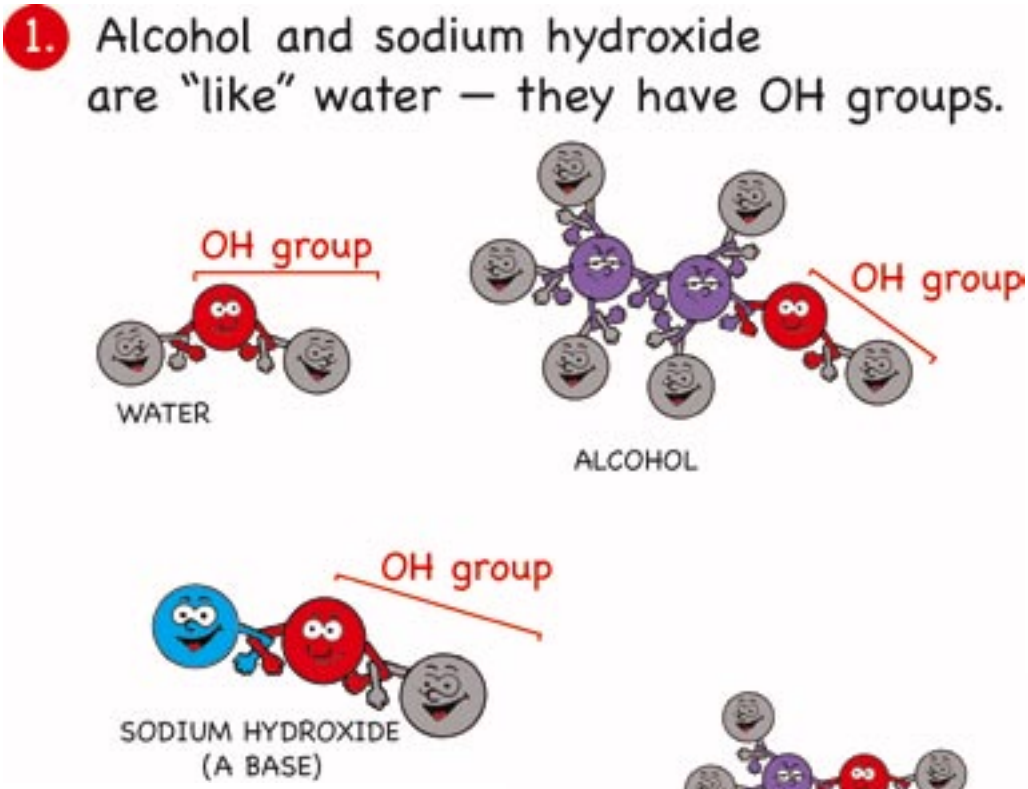
This means, for example, that molecules that are "like" water *will* dissolve in water and molecules that are "not like" water *will not* dissolve in water.

This doesn't mean that the molecules have to be identical or *exactly* alike, they just need to have a few things in common.

For example, what makes some molecules like water? We saw in Chapter 4 that acid molecules have an H group and bases have an OH group. If we look carefully at water, we see that it has BOTH an OH

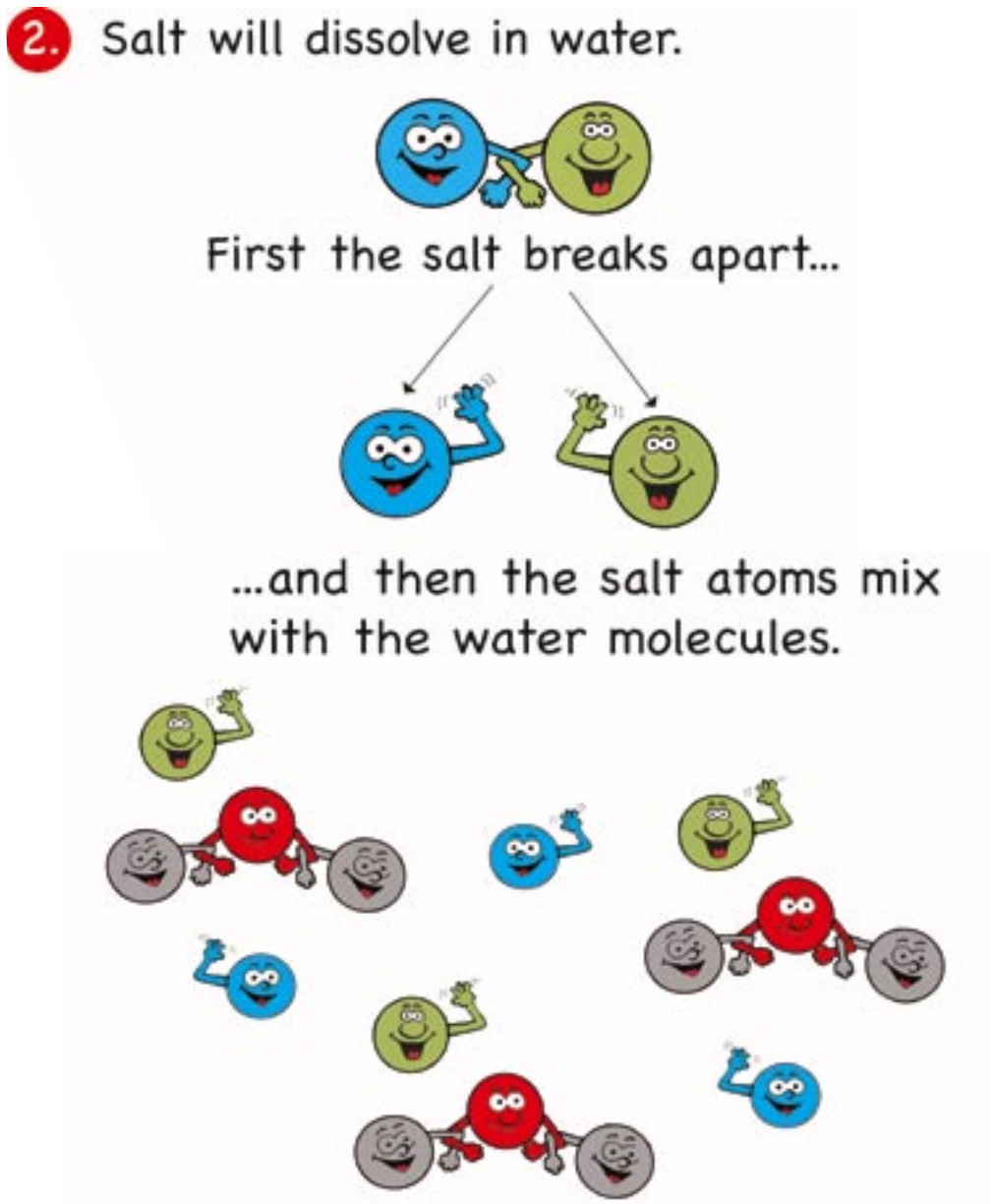


group and an H group! This is one of the things that makes water very special. It is the OH group that makes molecules dissolve in water. Bases that have OH groups are like water and will dissolve in water. Other molecules, like alcohol, which is not a base, but still has an OH group will also dissolve in water.




Sugar is "like" water because sugar also has OH groups. Can you count how many OH groups sugar has?

It's not just OH groups that make some things dissolve in water. For example, salt doesn't have OH groups like sugar, alcohol, and bases but salt dissolves in water. Salt dissolves in water because the water molecules break the



salt molecules into pieces that mix with water. Oil, grease, and butter are not like water, so none of these will dissolve in water. Look carefully at the drawing that illustrates the type of molecule found in oil, grease, and butter. Can you tell why it is not like water?

3. Oil, grease, and butter are not like water.

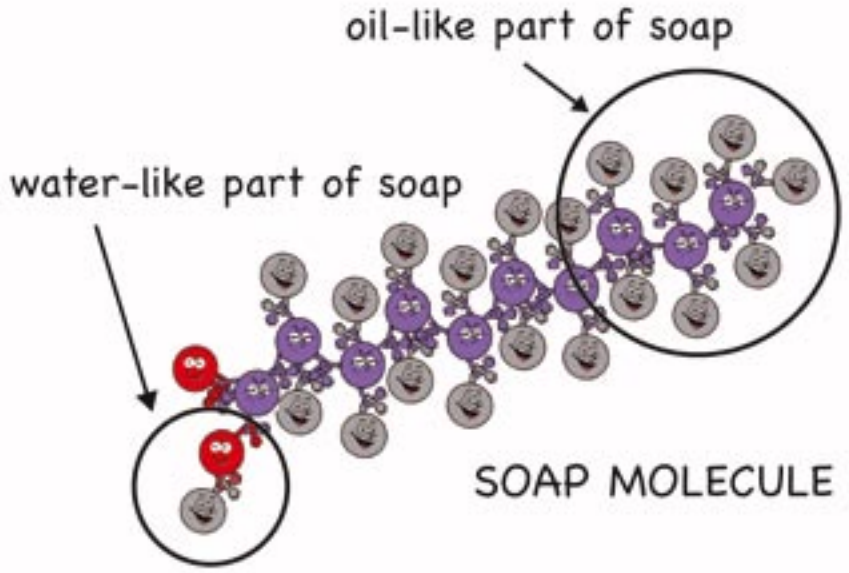
TYPE OF MOLECULE FOUND IN OIL, GREASE, AND BUTTER

## 6.5 Soap

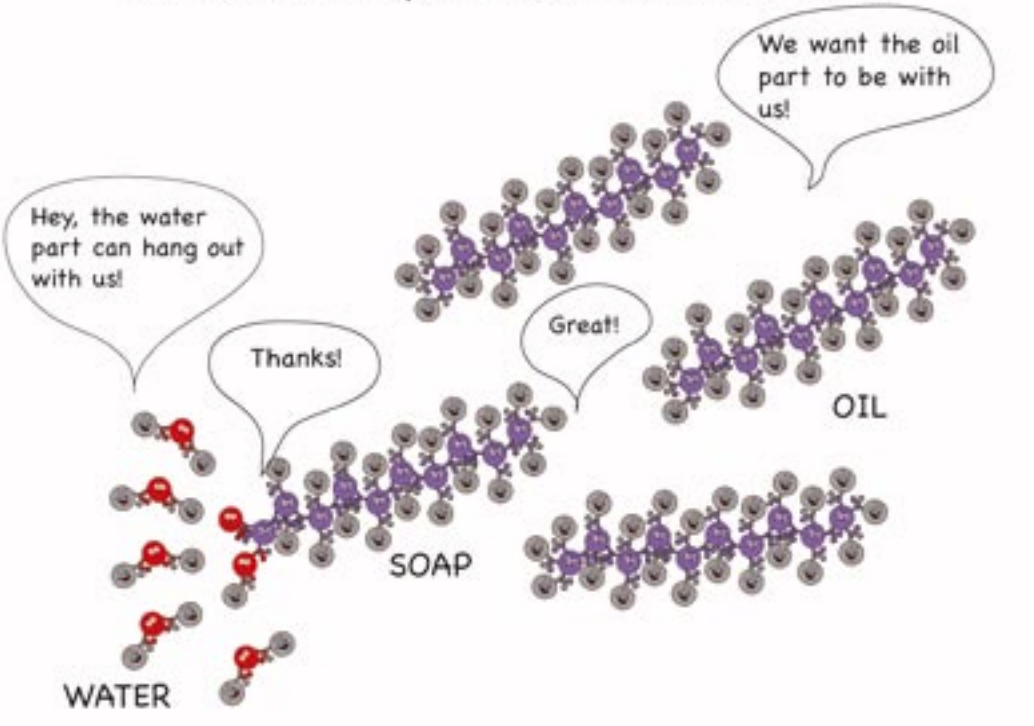
Soap makes things like butter and grease "dissolve" in water. Soap can do this because the molecules that make up soap are a little like water and a little like oil.

In a mixture of oil, soap, and water, the oily part of soap will dissolve in the oil and the watery part of soap will dissolve in the water.

4. Soap has an "oil-like" part and a "water-like" part.



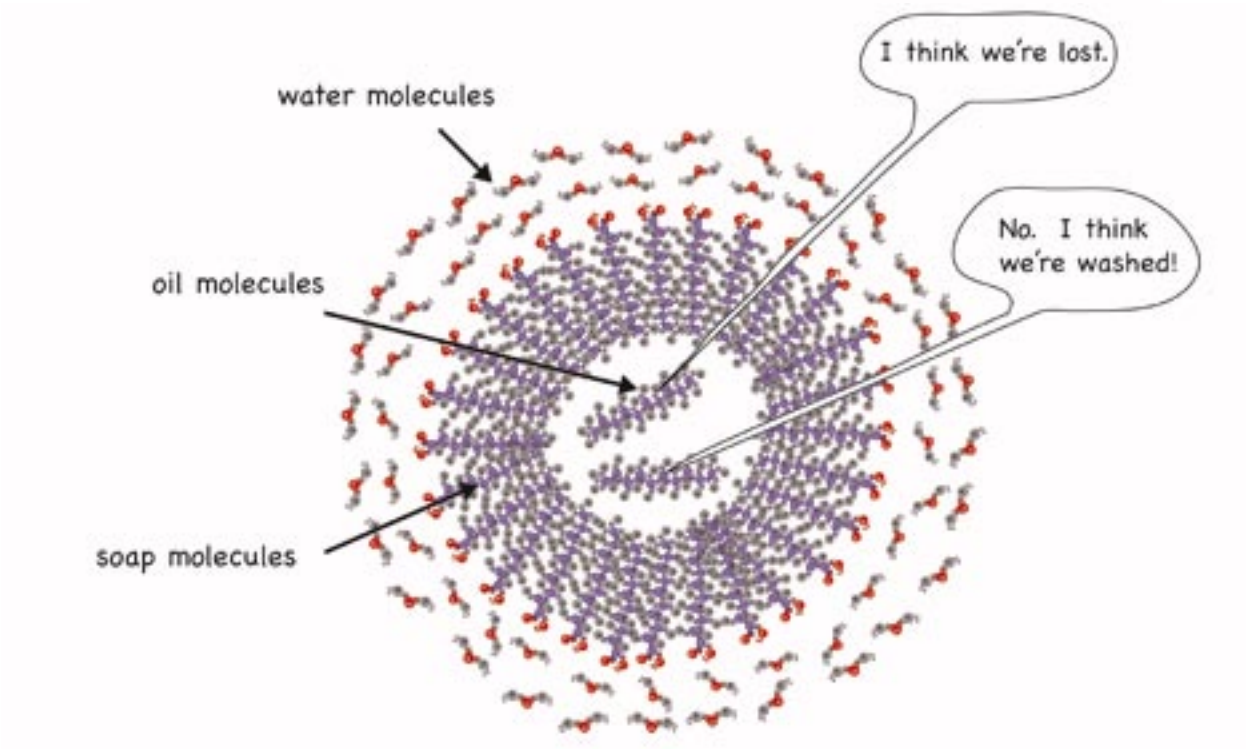

5. The oil-like part of soap dissolves in the oil, and the water-like part dissolves in the water.




WATER, SOAP, AND OIL MIXTURE

Because the oil dissolves in the oily part of soap and the watery part of soap dissolves in the water, a small droplet of oil and soap forms. In this way, the oil is "trapped" by the soap and water inside this little droplet.

**6.** Droplet of oil molecules and soap surrounded by water molecules.




This droplet can then be washed away by the water. This is how soap washes the grease off of your hands!

## 6.6 Summary

- Mud pies and lemon pies are mixtures.
- A mixture is anything that has more than two types of items in it.
- Some mixtures dissolve. Others do not.
- Dissolving depends on the kind of molecules in the mixture. Molecules that are "like" each other dissolve. Molecules that are "not like" each other will not dissolve.
- Soap is like both water and oil. This means that soap can make oil "dissolve" in water.