

# What Are Mixtures and Solutions?

Chapter 10 Lesson 4

ByDesign Science, Level 4

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# Putting Matter Together

- ♦ Recall that a compound is a combination of elements that are chemically joined.
- ♦ However, putting matter together does not always create a compound.



COMPOUND (NaCl)



MIXTURE (Jelly beans)

- ♦ In fact, many things you see and use every day are mixtures.



# Putting Matter Together

- ♦ A mixture is two or more substances that are added together but can be separated.
- ♦ The substances in a mixture do not change each other.
- ♦ A fruit salad is an example of a mixture because no new fruits form and each piece of fruit can be separated from the salad.





# Putting Matter Together



- ♦ A fruit salad is a mixture of solids, but there are other kinds of mixtures.
- ♦ Mixing sand and bits of iron in water makes a mixture of two solids and a liquid.
- ♦ You can separate the mixture first removing the iron with a magnet.
- ♦ Then you can separate the sand from the water by filtering it.



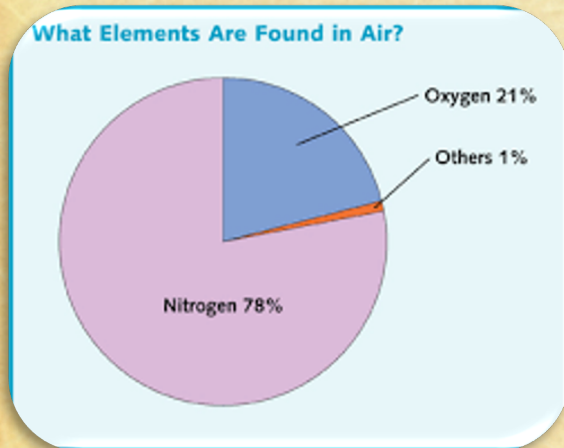
# Putting Matter Together

- ♦ Antifreeze is a mixture of two liquids – water and a type of alcohol.
- ♦ It is added to a car's radiator to keep it from freezing in cold weather.
- ♦ Mixtures of gases and liquids can also be formed.
- ♦ The bubbles of gas in a soft drink show that a gas is mixed with the liquid.





# Putting Matter Together



- ♦ The air around you is a mixture of gases.
- ♦ The air you breathe is about one-fifth oxygen – the gas you need to live.
- ♦ Nitrogen gas makes up about four-fifths of the air.
- ♦ Air has small amounts of other gases, such as argon, carbon dioxide, and water vapor.



# Putting Matter Together

- ♦ Think about what happens when you add sugar to water. When you stir the mixture, the sugar seems to disappear.
- ♦ That is because the sugar molecules spread out evenly in the water. We say it dissolved.
- ♦ When one substance dissolves in another they form a special kind of mixture called a **solution**.





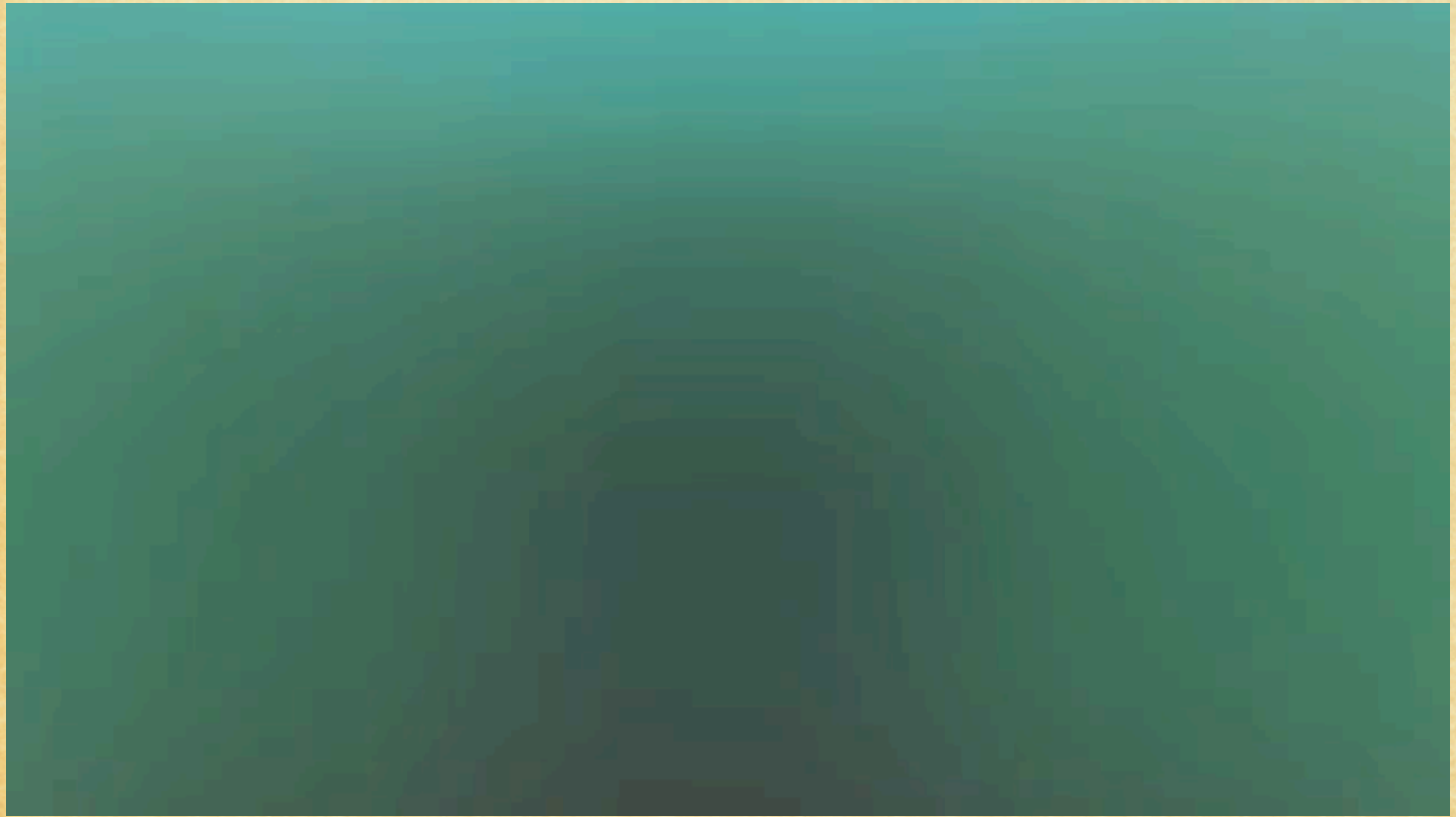
# Putting Matter Together



- ♦ The most common kind of solution is a solid dissolved in a liquid.
- ♦ However, dissolving one solid in another solid can also form solutions.
- ♦ These solutions are usually made of two or more metals and are called *alloys*.
- ♦ Gold jewelry is usually made of silver or copper that was dissolved in gold while it was still liquid.

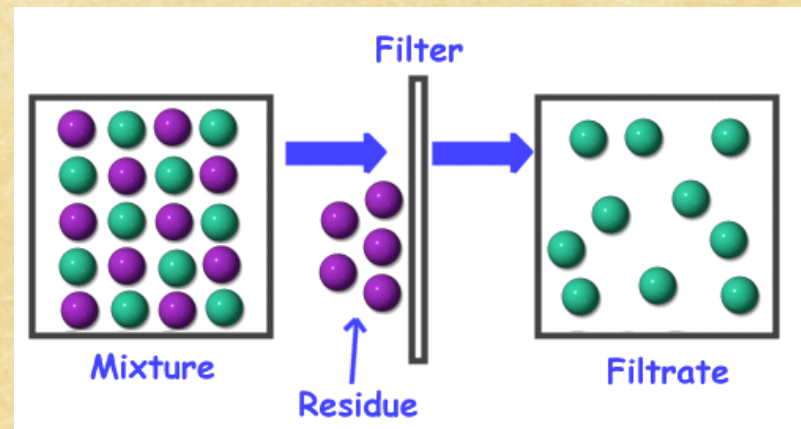


# Putting Matter Together



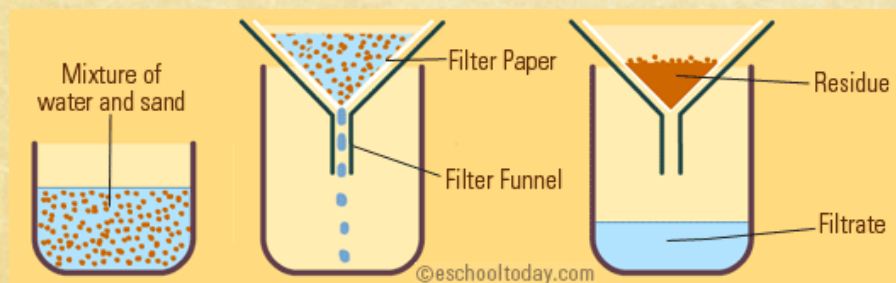
# Separating Mixtures

- ♦ If you do not like something in a salad, you can just pick it out.
- ♦ You often need to use other methods to separate other mixtures.
- ♦ You can use differences in their properties to separate one part of a mixture from other parts.





# Separating Mixtures



- ♦ Magnetic substances can be separated by using a magnet.
- ♦ A solid that does not dissolve in water can be separated from water by filtering.
- ♦ A solid that dissolves in water cannot be separated from water by filtering. The water must be evaporated. This leaves the solid behind.