

# Mixtures

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## *Connecting to Your World*

–Panning is one way to separate gold from a mixture of gold and materials such as sand or gravel. A pan containing the mixture is placed underwater and shaken vigorously from left to right. You will learn how to classify and separate mixtures.



# Classifying Mixtures

–How can mixtures be classified?



A **mixture** is a physical blend of two or more components.

A salad bar provides a range of items. Customers choose how much of each item to use in their salads. Each salad has a different composition.





**–Based on the distribution of their components, mixtures can be classified as heterogeneous mixtures or as homogeneous mixtures.**

## –Heterogeneous Mixtures

A mixture in which the composition is not uniform throughout is a **heterogeneous mixture**.

## –Homogeneous Mixtures

A mixture in which the composition is uniform throughout is a **homogeneous mixture**.

Another name for a homogeneous mixture is a **solution**.

The term **phase** is used to describe any part of a sample with uniform composition and properties.

- A homogenous mixture consists of a single phase.
- A heterogeneous mixture consists of two or more phases.



When oil and vinegar are mixed they form layers, or phases. The oil phase floats on the water phase.



## Separating a Heterogeneous Mixture

Sometimes plastic signs are used to mark trails used by hikers or vehicles. The sign in the photo is used to mark locations along a trail where an all terrain vehicle (ATV) is permitted. Aluminum nails are used to attach signs at eye level to trees or posts. How could a mixture of aluminum nails and iron nails be separated?



**Analyze** *Identify the relevant concepts.*

List properties of aluminum and iron.

Aluminum:

- metal
- gray color
- doesn't dissolve in water
- not attracted to magnet

Iron:

- metal
- gray color
- doesn't dissolve in water
- attracted to magnet

**Solve** *Apply concepts to this situation.*

Identify a property that can be used to separate iron and aluminum objects. The ability to be attracted by a magnet is a property that iron and aluminum do not share. You could use a magnet to remove the iron nails from a mixture of iron and aluminum nails.

10. Air is mainly a mixture of nitrogen and oxygen, with small amounts of other gases such as argon and carbon dioxide. What property could you use to separate the gases in air?



**Problem Solving 2.10** Solve Problem 10 with the help of an interactive guided tutorial.

# Separating Mixtures

–How can mixtures be separated?





**–Differences in physical properties can be used to separate mixtures.**

## –Filtration

The process that separates a solid from the liquid in a heterogeneous mixture is called **filtration**.

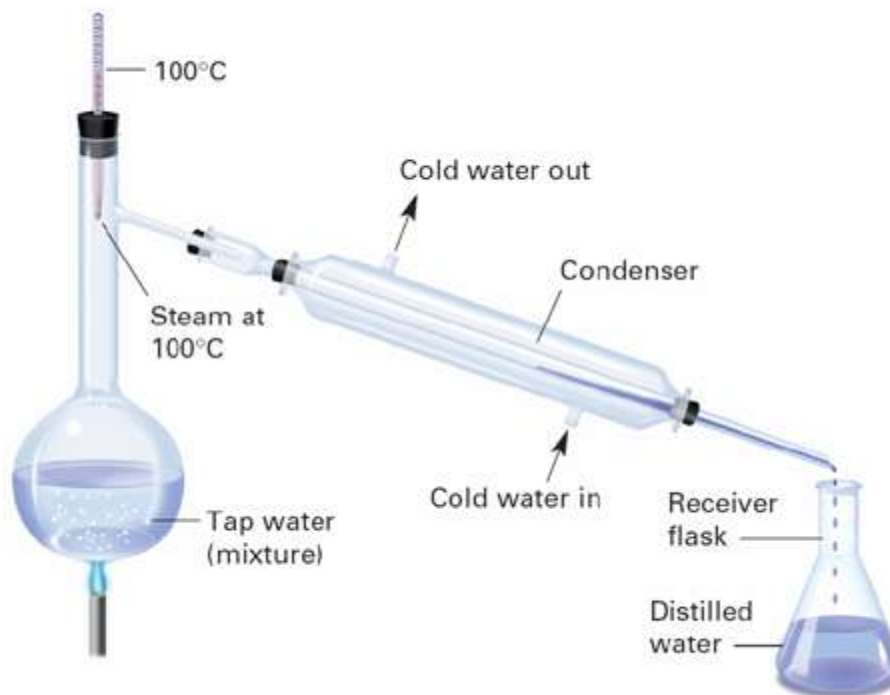
A colander is used to separate pasta from the water in which it was cooked. This process is a type of filtration.





## –Distillation

During a **distillation**, a liquid is boiled to produce a vapor that is then condensed into a liquid.



## 2.2 Section Quiz.

Assess students' understanding of  
the concepts in Section 2.2.

Continue to:

[Section Quiz](#)

-or-

Launch:



## 2.2 Section Quiz.

1. Which of the following phrases describes a mixture?
- i composition varies
  - i composition may vary
  - i components cannot be separated

## 2.2 Section Quiz.

2. Which of the following is a homogeneous mixture?
- i vinegar
  - i iron filings in sand
  - i chicken noodle soup
  - i muddy water

## 2.2 Section Quiz.

3. Which technique is used to separate homogeneous mixtures?
- i filtration
  - i distillation
  - i magnetism
  - i dissolving

**END OF SHOW**