

# Mixtures and Solutions

**Grade:** 5 **Subject:** Science **Time:** ~45 min + ~15 min extra **Work mode:** By yourself · pencil only Science

## Start Here

This is a **paper science activity**. You will read a little, look at a picture and a chart, and answer questions with a pencil. You do **not** need a computer or any lab supplies. Work by yourself and do your best. If a question is hard, skip it and come back. You may read the words out loud to yourself.

## Start Notice & Wonder 5 min

Think about foods and drinks you have seen mixed together.

1 **Trail mix** has peanuts, raisins, and pretzels all tossed together. Write **one thing you notice** and **one thing you wonder** about trail mix.

2 You stir a spoon of salt into a cup of water and keep stirring. The salt seems to **disappear**. Where do you think the salt went? Write your best idea.

## Build Read the Science 5–10 min

### Mixtures and solutions

A **mixture** is two or more things put together that are **not** joined into a new material. In many mixtures, like trail mix, you can still **see the different parts**.

A **solution** is a special kind of mixture. In a solution one thing **dissolves** into another and it looks **the same all the way through**. Salt water is a solution. The salt did not disappear — it broke into tiny bits too small to see, spread out in the water. You can taste it, and you can get it back.

The parts of a mixture keep their own properties, so you can **separate** them using those properties:

- **Sift** — shake through a screen to split big pieces from small ones.
- **Magnet** — pull out a part that is magnetic (like iron).
- **Filter** — pour through a coffee filter or paper to catch bits that will not fit through, while liquid passes.
- **Evaporate** — let the water dry into the air. The dissolved solid, like salt, stays behind.

### Word Bank

mixture

two or more things put together that keep their own properties.

solution

a mixture that looks the same throughout because one part dissolved.

dissolve

to break into bits too small to see and spread out evenly.

property

something you can observe, like size, color, or being magnetic.  
separate  
to take a mixture apart into its pieces.

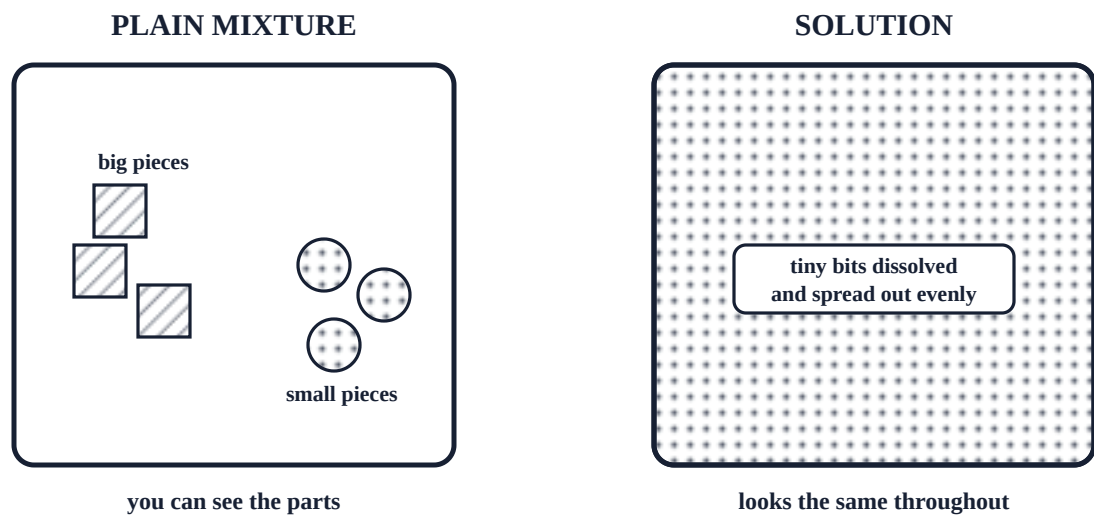


Figure 1. A particle picture. In a **plain mixture** (left) the parts stay in clumps you can see and pick apart. In a **solution** (right) the dissolved bits are spread out evenly, so it looks the same everywhere. The fills are patterns (hatching and dots), not colors, so the picture is clear in black and white.

3Look at Figure 1. In **one sentence**, tell how the solution jar looks **different** from the plain mixture jar.

## Apply Use the Data 20 min

A class made some mixtures and wrote down what they observed. Read Table 1, then answer.

Table 1. Four mixtures and what the class observed (original class data).

| Mixture                      | Can you see the parts?          | Does it dissolve in water? | Is a part magnetic? |
|------------------------------|---------------------------------|----------------------------|---------------------|
| A. Sand + iron filings       | Yes                             | No                         | Yes (iron)          |
| B. Sugar stirred in water    | No — looks the same all through | Yes                        | No                  |
| C. Sand + water (muddy)      | Yes — bits float and settle     | No                         | No                  |
| D. Small beads + big buttons | Yes                             | No                         | No                  |

4Classify each mixture. Write **S** if it is a **solution** (looks the same all through, dissolved) or **P** if it is a **plain mixture you can pick apart**.

- \_\_\_\_ A. Sand + iron filings
- \_\_\_\_ B. Sugar in water
- \_\_\_\_ C. Sand + water
- \_\_\_\_ D. Beads + buttons

5Choose the best way to separate each mixture. Use the evidence in Table 1. Write **sift**, **magnet**, **filter**, or **evaporate** on the line, then tell which clue helped you choose.

5a. Mixture A (sand + iron filings): \_\_\_\_\_  
Clue I used:

5b. Mixture B (sugar in water): \_\_\_\_\_

Clue I used:

5c. Mixture C (sand + water): \_\_\_\_\_

Clue I used:

5d. Mixture D (beads + buttons): \_\_\_\_\_

Clue I used:

**6Observation or inference?** An **observation** is something you see or measure. An **inference** is an idea you figure out. Write **O** or **I** for each.

\_\_\_\_ a) The sugar water looks clear all the way through.

\_\_\_\_ b) The sugar is still in the water even though you cannot see it.

\_\_\_\_ c) The iron filings jumped to the magnet.

## Explain Claim–Evidence–Reasoning 5–10 min

**Question 7.** Pick **Mixture A** (sand + iron filings) or **Mixture B** (sugar in water). Explain how you would **separate** it. Use one clue from Table 1 as your evidence.

**Sentence starters you may use:** "I would separate Mixture \_\_\_\_ by..." · "My evidence from Table 1 is..." · "This works because..."

Claim (how you would separate it)

Evidence (a clue from Table 1)

Reasoning (why that works)

## Close ACE Wrap-Up 5 min

Articulate

In your own words, what is the difference between a plain mixture and a solution?

Connect

Point to one row of Table 1 that is a solution. Write its letter and how you know.

Extend

Name one **new** mixture from home and tell how you would separate it.

## Continue Early Finisher optional · ~15 min

If you finish early (no new supplies needed):

**Make a separation plan.** Imagine a new mixture: **salt + sand + iron filings**, all dry in one cup. On the back of this page, write the **steps in order** to get all three parts by themselves. Tell which tool you use for each step (magnet, water, filter, or evaporate) and why.

Turn in: Hand in this whole packet with your name, class, and date filled in. Make sure questions 1–7 and the ACE box are answered. The early-finisher plan is optional — turn it in too if you did it.

G05\_SCI\_MixturesSolutions\_01 — Mixtures and Solutions Student Packet