

Lesson 3: Material World



- I can use scientific language and ideas to explain dissolving and separation.




Quiz Time!

Last week, we looked at dissolving and separating mixtures through evaporation. How could you separate those mixtures? Match them up. One has been done for you.



paper clips in uncooked rice



paper filter




gravel and sand



sieve



cooked pasta in hot water




magnet



oil and water



funnel



sand and water



separatory funnel



Mixtures, solutions and suspensions



A **mixture** contains more than one **substance**. These are not chemically joined, which means they are easy to separate. A **substance** may dissolve in one liquid but not in another. For instance, nail varnish dissolves in acetone, but not in water.

A **solution** is usually **transparent**, even if it is coloured. Things like instant coffee do not really **dissolve** – instead, small particles remain in **suspension** and the liquid is murky. Focus on the “disappearance” of the solid granules as evidence of dissolving.



Salt dissolves in water.
It is a **solution**.



Coffee doesn't dissolve completely in water.
It is a **suspension**.

When a solid is added to water, the water particles surround the solid edges. If the attraction between the water and the solid particles is greater than that between the solid particles, then it will dissolve. This process is affected by things like **temperature** and the amount of solid. There is always a limit as to how much solid can dissolve in a given amount of liquid.



Investigation 1

We will investigate whether soil and water make a solution or a suspension, by recording our careful observations.

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| <p>You will need:</p> <ul style="list-style-type: none"> - a transparent glass - soil - some water - a spoon | <p>First, put some soil in your glass and add some water until it is $\frac{3}{4}$ full. Stir well with a spoon for one minute.</p> <p style="text-align: center;">What can you see?</p> | <p>Then, leave the mixture to rest for 6 hours.</p> <p style="text-align: center;">What has changed?</p> |
|---|---|--|



Solution?



Suspension?

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Investigation 2

What happens to an uncooked egg when it is left in white vinegar?

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| <p>You will need:</p> <ul style="list-style-type: none"> - a transparent glass - an egg (uncooked) - white vinegar - a spoonful of patience | <p>Method</p> <ol style="list-style-type: none"> 1. Gently place your egg inside the glass 2. Pour the vinegar until the egg is completely submerged. 3. Observe what happens over a week. | <p><u>Glossary</u></p> <p>Solution – mixture of solid and liquid (you might not be able to see the solid)</p> <p>Solute – the material that dissolves</p> <p>Solvent – liquid (usually) that does the dissolving</p> <p>Dissolve – when a solid mixes with liquid to make solution</p> <p>Evaporate – heat liquid until it turns into gas</p> <p>Mixture – two or more substances that can be separated</p> <p>Soluble – when something can dissolve</p> <p>Insoluble – when something can't dissolve</p> <p>Filter – use porous material to separate solid and liquid</p> |
|--|--|--|

Before you start, have a think about what could happen to your egg over a week. Write your prediction below, using *because* to explain your thoughts.

I predict that _____

because _____

Record your careful observations in the table below every other day, using scientific language from the glossary.

| DATES | OBSERVATIONS |
|----------------|--------------|
| Day 1 | |
| Day 3 | |
| Day 5 | |
| Day 7 | |



Your Conclusion

Is it day 7? Then it's time for you to take your egg in your hands. What has happened? Was your prediction correct? Write your conclusion below, using scientific language.

A large rounded rectangular box with a black border, containing ten horizontal lines for writing a conclusion.

Do you have an eggcellent picture you'd like to stick here?

