Properties and changes of materials

Comparing soluble and insoluble materials

Year 5
Age 9 - 10

For parents

Thank you for supporting your child's learning in science.

Before the session:

- Please read slide 2 so you know what your child is learning and what you need to get ready.
- As an alternative to lined paper, slide 6 may be printed for your child to record on.

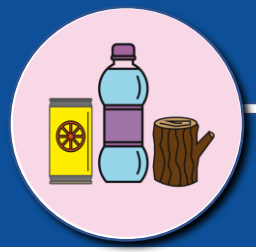
During the session:

- Share the learning intentions on slide 2.
- Support your child with the main activities on slides 3 - 6, as needed.
- Slide 7 is a further, optional activity.
- Slide 8 has a glossary of key terms.

Reviewing with your child:

- Slide 9 gives an idea of what your child may produce.

The Association for Science Education



Properties and changes of materials

Comparing soluble and insoluble materials

Key Learning

- Some materials will **dissolve** in a liquid and form a **solution**. They are **soluble** materials.
- Other materials do not dissolve in a liquid. They form a **sediment**. These materials are **insoluble.**

I can…

- identify and compare soluble and insoluble materials.

Activities (pages 4-6): 30 - 40 mins

Household items to support learning:

- Clear plastic cups (or glass cups).
- Salt, white sugar, brown sugar, flour and rice (or other grain/pulse).
- Teaspoon and water.
- Use lined paper and a pencil for recording. *Alternatively you may wish to print page 6 as a worksheet.*

Taking it further… (page 7): 20 - 30 mins

- You may like to find out more about the properties of salty water.

Explore, review, think, talk...

What happens when you add sugar to a warm drink?
(5 minutes)

- Some people like to add sugar to their tea or coffee.
- What happens to the sugar?

Ask an adult to work with you.

- Half fill a clear plastic cup or glass with lukewarm water.
- Add ½ teaspoon of white sugar.
- Stir slowly and watch what happens.
- Talk about what you see.

- Sugar seems to 'disappear' when you stir it into water but it is still there!
- The sugar has **dissolved** in the water to form a transparent, clear **solution**.
- Sugar is a **soluble** material.

Which other soluble substances can you find in the kitchen?

Watch this clip:
https://www.bbc.co.uk/bitesize/topics/zcvv4wx/articles/zpbdpbk

Soluble and insoluble materials

Comparing soluble and insoluble materials
(pages 4-6: 30 minutes)

- **Soluble substances** like white sugar **dissolve** in water to form a **transparent, clear solution**.

- A **solution** can also be **clear and coloured**, for example when you dissolve honey in water.

- **Insoluble substances** like sand **do not dissolve**. They often sink quickly to the bottom and form a **sediment**.

- Some insoluble substances, like the particles of fine clay soil do not sink quickly. The water looks **cloudy**. The sediment is **suspended** in the water.

Soluble and insoluble materials

Comparing soluble and insoluble materials we use in the kitchen

Ask an adult to work with you. Remember to wash your hands afterwards. You will need:

- A clear plastic cup (or glass).
- A teaspoon.
- Materials to test: a variety of small-grained solids such as:

1. Fill ½ cup or glass with lukewarm water.
2. Add ½ teaspoon of your first material.
3. Stir slowly for a minute and watch carefully what happens.
4. Stop stirring and watch again.

5. Record your observations in a table (see page 6).
6. Classify your substance as ‘soluble’ or ‘insoluble’.
7. Wash out your cup and repeat for other materials.

Ask an adult to work with you.

- Add ½ teaspoon of each material to a separate cup of lukewarm water.
- Stir slowly for a minute and watch carefully.
- Stop stirring and watch again.
- Record your observations. Use the word bank to help you.
- Is the material soluble or insoluble?

Word bank:

soluble	*insoluble*
dissolve	*solution*
transparent	*coloured*
sediment	*cloudy*
suspended	*clear*

I can identify and compare soluble and insoluble materials.

Name of material	Observation - what happened?	Soluble or insoluble?

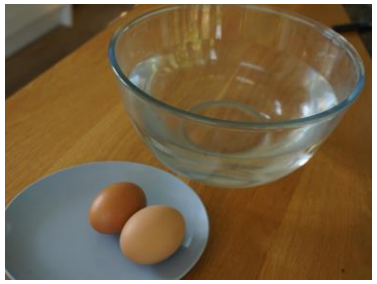
Find out more...

Find out more about the properties of salty water
(20 – 30 minutes)

What is the difference between normal water and salty water?

Use the link to this PSTT 'Science Fun at Home' activity for exploring this question.

https://pstt.org.uk/application/files/6115/8633/7142/3._EGG-CITING_SCIENCE.pdf



- *Take photographs or design a poster to show what you found out!*

Alternatively find out more about our salty seas and oceans:

- Why is the sea salty?
- Do all seas and oceans have the same amount of salt?

Explore these and your own questions using the following links:

https://www.dkfindout.com/uk/earth/oceans-and-seas/

https://www.wildlifetrusts.org/why-sea-salty-and-why-sea-blue

https://www.nhm.ac.uk/discover/quick-questions/why-is-the-sea-salty.html

Glossary of terms

Material: **Material** is the matter from which a thing is or can be made.

Dissolve: Some materials will **dissolve** in a liquid. For example, sugar dissolves in water to form a clear, transparent solution.

Solution: When a material dissolves in a liquid it forms a clear **solution**. A solution can be transparent or coloured. For example, brown sugar forms a clear, coloured solution.

Soluble: A material is **soluble** in a liquid if it dissolves in that liquid.

Insoluble: A material is **insoluble** in a liquid if it does not dissolve in that liquid.

Sediment: Some insoluble materials sink quickly and form a **sediment** at the bottom of a liquid.

Suspended: Some insoluble materials do not sink quickly so the liquid looks cloudy. The sediment is **suspended** in the liquid.

Possible learning outcome for reviewing your work:

I can identify and compare soluble and insoluble materials.

Name of material	Observation - what happened?	soluble or insoluble?
salt	• The salt dissolved slowly as I stirred the water. • The water became clear and transparent.	Salt is soluble
brown sugar	• The sugar crystals got smaller and eventually dissolved. • The water turned a light brown colour. I could see through it.	brown sugar is soluble
flour	• The water went cloudy white when I stirred. • After stirring I could see some flour at the bottom. The water was still cloudy.	flour is insoluble
lentils	• The lentils swirled round and the water went a tiny bit cloudy. • After stirring the lentils sank quickly and the water was almost clear.	lentils are insoluble

Salt and white sugar both dissolve in water to form a clear, transparent solution.

Brown sugar dissolves in water to form a slightly brown coloured solution.
All solutions are clear so you can see through them.

Flour does not dissolve in water. Grains of flour are small, so some will stay suspended in the water, making the water cloudy. The flour grains are called a sediment.

Lentils do not dissolve in water. Lentil grains are quite large so they fall quickly to the bottom as a sediment.
Dust from the lentils may make the water slightly cloudy.