



# Could you be the next chemistry inventor?



1. Can you compare and group materials on the basis of their properties?
2. Which materials dissolve and why can this sometimes be an important quality in materials?
3. How and why can you separate mixtures?
4. Which materials are the best insulators?
5. What changes are irreversible?
6. How have scientists created new materials that made our lives easier?

## Hook for Learning:

- Feely bag activity with different materials to describe.
- Observe changes when making cakes
- Horrible Science: Chemical Chaos

## Vocabulary:

- Material
- Conductor
- Dissolve
- Insoluble
- Suspension
- Chemical
- Physical
- Thermal
- Conductivity
- Solubility
- Filtering
- Irreversible
- Solution
- Reversible
- Separate
- Mixture
- Evaporation
- Transparency
- Bicarbonate of Soda

## We learn the following scientific knowledge and skills:

- Compare and group together everyday materials on the basis of their properties: hardness, solubility, transparency, conductivity (electrical/thermal) and response to magnets **(1)**
- Explain how some materials dissolve in liquid to form a solution. **(2)**
- Use our knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating. **(3)**
- Give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic. (materials for making blackout curtains) **(4)**
- Demonstrate that dissolving, mixing and changes of state are reversible changes. e.g. evaporating, filtering, sieving, melting, dissolving **(5)**
- Explain that some changes result in the formation of new materials, and that this change is not usually reversible. e.g. acid and bicarbonate of soda **(5)**
- Find out how chemists created new materials e.g. Spencer Silver **(6)**

## As Talkers can we...?

- Organise things well, including resources and others.
- Be prepared to discuss and debate issues until a sensible compromise is reached.
- Break down complex ideas into simpler steps.

## Using Technology can we...?

- Research and explore the work of famous scientists or inventors?

## As Thinkers can we...?

- Use a range of techniques to gather, process and evaluate information in our investigations.
- Recognise risks that may be involved when tackling work.
- Appreciate how learning can happen from mistakes.

## As Writers can we...?

- Write a clear recipe for our fairy cakes using suitable instructional language

## As Mathematicians can we...?

- Plot dates on a timeline to show when chemists created new materials e.g. Spencer Silver

### **Previous knowledge from Year 1: Every day materials**

- I can distinguish between an object and the material from which it is made.
- I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- I can describe the simple physical properties of a variety of everyday materials.
- I can compare and group together a variety of everyday materials on the basis of their simple physical properties.

### **Previous knowledge from Year 2: Every day materials**

- I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

### **Previous knowledge from Year 4: States of Matter**

- I can compare and group materials together, according to whether they are solids, liquids or gases.
- I can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

### **Expected outcomes from this unit**

#### **Exceeding:**

- I can use knowledge of changes in state and separating materials to suggest and implement how dirty/salty water could be made drinkable
- I can explain how particles of a material change as they are mixed, dissolved or altered (chemical reaction)
- I can describe a colloid and explain why it reacts

#### **Secure:**

- I can name two materials that will dissolve to form a solution and know how those materials can be recovered.
- I can demonstrate that dissolving, mixing and changes in state are reversible.
- I can explain that some changes result in the formation of a new material/change in temperature/change in colour and this change is not normally reversible (burning, action of an acid on bicarbonate of soda)
- I can give reasons based on evidence for the particular uses of everyday materials.
- I know that chemists have created useful new materials (Spencer Silver and Ruth Benerito)
- I can choose the correct technique to separate given mixtures.