## Key idea: Materials

### Yr 6

When two or more substances are mixed and are remain present the mixture can be separated. **Y6**

Sometimes mixed substances react to make a new substance. These changes are usually irreversible. **Y6**

All matter (including gases) has mass **Y6**

Heating can sometimes cause materials to change permanently. When this happens, a **new** substance is made. These changes are not reversible. **Y6**

Heating causes solids to melt into liquids and liquids to evaporate to gases. Cooling causes gases to condense to liquids and liquids to freeze to solids – **Linked to Water Cycle in Geography** **Y5**

### Yr 4

Solids, liquids and gases are described by observable properties **Y4**

Materials can be divided into solids, liquids and gases **Y3**

Heating causes solids to melt into liquids and liquids to evaporate to gases **Y4**

Cooling causes gases to condense to liquids and liquids to freeze to solids

The temperatures at which given substances change state are always the same.

Some changes can be reversed and some can't **Y3**

Materials change state by heating and cooling. **Y3**

### Yr 2

Materials have describable properties **Y1**

There are different materials **Y1**

Different materials have different properties **Y2**

Materials can be changed by physical force (twisting, bending, squashing and stretching) **Y1**

**Describing materials**

**Changing materials**

## Applications and activities related to new NC – BOLD ITEMS MUST BE TAUGHT

Reversible changes that should be investigated are dissolving (years 5 and 6). Not just for water. Temperatures of state changes should be investigated and compared.

- Where does the puddle go? (Testing to see if it soaks away in order to explore evaporation).

Y6 - Provide lots of opportunities to explore changes that require children to describe the properties of materials before and after and gather evidence to decide if new substances have been made (this would involve trying to get back the original materials to prove no new substances had formed). Examples are: making jelly, cooking biscuits, glues (wall paper paste versus araldite for example), drying clay and firing clay, concrete, plaster or Paris, dissolving simple solutes, dissolving fizzy soluble tablets, reacting real chalk dust with vinegar or lemon juice.

**Y6 - Separating mixtures applies the *Key Idea* that materials have properties. To separate mixtures, first identify the differences in the properties of the mixture's components, and then decide what would affect one material and not the other, to separate them. It is important that children have explored the relevant property before they are expected to apply an understanding of it to separate materials.**

**Y5 - Using the model of the water cycle to explain why there is little rain in deserts or more rain near the coast.**

Reversible changes that should be investigated are melting, freezing, evaporation and condensation (years 3 and 4). **Not just for water.** Temperatures of state changes should be investigated and compared.

- Where does the puddle go? (Testing to see if it soaks away in order to explore evaporation).

**Y3 - Investigating questions that relate to the properties of rocks and grouping them according to their properties. Explore how fossils form when once living things become trapped within sand and clay that hardens into rock over millions of years**

**Y 3 - Investigate composition of different soils to answer questions e.g. about how they formed.**

Investigate the properties (see above notes) of a wide range of materials including metals, plastics, wood, rocks and liquids. Investigations should always be purposeful. Examples of questions that encourage this:

- Which toys would be safe to pit in a baby's playpen?
- What is the best material to make a mop?
- Which chocolate melts the quickest?
- Which elastic band would make the best catapult?