MORDA CE PRIMARY SCHOOL

National Curriculum Objectives (Substantive and disciplinary knowledge)	Key enquiry questions and steps for sequence of learning
N/C Year 5 objectives • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda **Year 5 Subject Progression** Demonstrate that dissolving, mixing and changes of state are reversible changes. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of vinegar (acid) on bicarbonate of soda. Describe in detail the properties of liquids, solids and gases. **Year 6 Progression** Use developing knowledge of solids, liquids and gases to describe how mixtures might be separated, including through filtering, sieving and evaporating.	Step 1 – Does the size of particles affect the rate they dissolve at? - Planning and carrying out a fair test investigation Step 2 – Separating solutions - Can all solutions be separated in the same way? Why? Why not? Step 3 – Does the shape and size of a container affect the speed of evaporation? - Planning and carrying out a fair test investigation Step 4 – Reversible and irreversible changes - Which changes are reversible and irreversible? Explain why. - Reversible changes will be demonstrated through dissolving, mixing and changes of state. - Irreversible changes will be demonstrated by showing how some substances can make new ones through burning, chemical reactions Cross curricular investigation – which material is best for a WW2 blackout blind?

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COMMON MISCONCEPTIONS

- Gases are not matter because most are invisible.
- Gases do not have mass.
- A "thick" liquid has a higher density than water.
- Air and oxygen are the same gas.
- Helium and hot air are the same gas.
- Particles of solids have no movement.
- Materials can only exhibit properties of one state of matter.
- Melting/freezing and boiling/condensation are often understood only in terms of water.
- The temperature of an object drops when it freezes.
- Steam is visible water gas molecules.
- Solids dissolved in liquids have vanished and so you cannot get them back
- Lit candles only melt, which is a reversible change.