11–14 years

Simple displacement reactions

ROYAL SOCIETY OF CHEMISTRY

Education
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https://rsc.li/3Gl8Jsh

The problem

How do railway engineers join together 50-metre-long rail tracks so that they can stand up to trains rolling past at over 100 mph?

Hand welding would be time consuming and assessing the quality of these deep welds would also be tricky out on the track.

Instead, engineers turn to some of chemistry's most spectacular reactions for the solution – metal displacement reactions. A mixture of aluminium and iron oxide is ignited, and liquid iron flows into the joint.

Learning objectives

1. Identify the more reactive metal using a reactivity series.
2. State whether a reaction would occur between two substances using the reactivity series.
3. Write word equations for simple displacement reactions.

Displacement reaction snap

Activity 1

How to play

You will need one pack of cards per pair. If you are in a three the third person will be the referee.

1. Shuffle and deal the cards face down.
2. Each player then places a card face up.
3. If the cards don't match:
    - Two metals: shout out the most reactive metal.
    - Two compounds: shout out 'mixture'.
    - Metal and compound: shout out 'reaction' if the metal is more reactive than the metal in the compound. Shout out 'no reaction' if the reverse.
4. The first person to shout the correct answer picks up both cards. The winner is the first person to get all the cards or the person holding the most cards when time is up.

Formative assessment grid

	potassium	magnesium	iron	copper
calcium nitrate				
aluminium nitrate				
tin nitrate				
silver nitrate				

Reactivity series

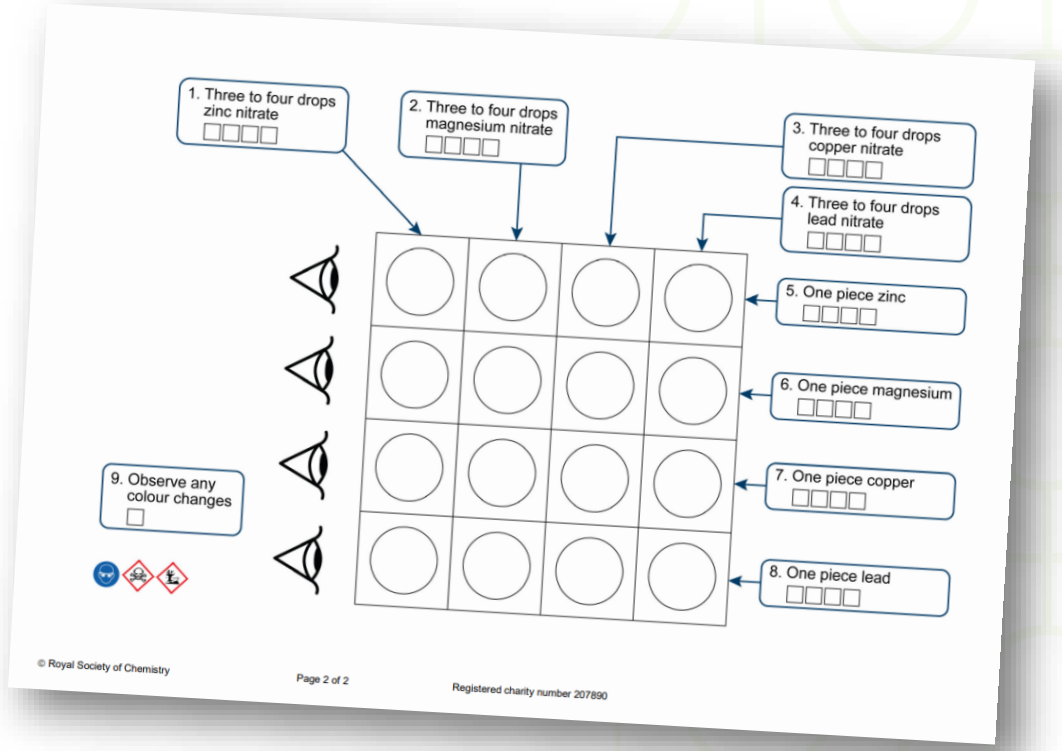
potassium
sodium
calcium
magnesium
aluminium
carbon
zinc
iron
tin
lead
hydrogen
copper
silver
gold
platinum

Activity 2

Microscale displacement reactions

Give learners the opportunity to observe displacement reactions in the microscale with this experiment: rsc.li/3xDBvO4

Or with this alternative version using integrated instructions: rsc.li/2OfpmtQ



More resources