ChemWars Teacher notes

Introduction
This activity contains video clips of common test tube displacement reactions for metals and a screen based computer simulation of those reactions. An analogy is drawn between the test tube displacement competition and a Japanese Sumo wrestling bout. Pupils are encouraged to predict the outcomes of the reactions they have chosen by betting on the winner.

The activity provides an introduction, videos of displacement reactions, Sumo bout simulations shown in parallel with the displacement videos, and an interactive white board to arrange the metals in their reactivity series. This activity would be suitable for introducing the reactivity series, or for revisiting the concept.

Running the activity
(You will need to print out the pupil record sheets for the activity.)

Screen one: Introduction and context setting. It shows a Sumo bout between two opponents and explanatory text.

Screen two: Demonstration of the activity. The screen is divided into two main areas, the reaction video area and the Sumo simulation area. The video area shows a video clip of the reaction between copper sulphate solution and an iron nail. A bet is then placed on which metal will win the contest. The same video clip is shown again with a parallel Sumo simulation. The iron wins (pushing the copper Sumo wrestler out of the ring) and the equation for the reaction is shown.

Screen three: Introduction of a whiteboard where iron is placed above copper.

Screen four: Students choose a pair of metals and bet/predict which will win the displacement contest. The video and then the video + animation is run. If their prediction is right they record a personal win. They can change their bet after watching the video clip for the first time. This function encourages pupils to look carefully at the video clip for signs of a chemical reaction. They then update their white board to show the table of reactivity order, and continue by choosing another reaction to view.

Screen five: After sufficient pairs of metals have been seen, pupils can submit their complete table of reactivity order. If they get the table right they can print a record of their table, their score and the results of their bets. Otherwise they return to the game to review their conclusions.

Safety
Not applicable to the screen based simulation.
(See *Technician notes* for safety in the actual displacement reactions.)

More ideas
Allow the pupils to carry out the reactions themselves (see *Technician notes*).
Carry out direct solid-state displacement reactions such as copper oxide + zinc powder and the Thermit reaction (please refer to standard safety publications for information on these reactions.)

Learning outcomes
Develop knowledge and understanding of:
- Reactivity series for metals
- Displacement reactions of metals

Where the activity fits in
QCA Scheme of Work Unit 9E *Reactions of metals and metal compounds*
Year 10 GCSE Double Science Sc3 *Reactions of metals*

Skills
Predictions
Analysis
Knowledge and Understanding

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