

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.

An alternative activity would be to give the pupils the test tube reactions to do as well, which would involve the following safety precautions.

Safety

- Eye protection must be worn at all times
- Solutions of lead salts and copper salts are particularly poisonous.
- Solutions of silver salts are oxidizing solutions and normally have a low pH.

Requirements

Per group:

Strips of cleaned metal approx. 5mm x 50 mm:

- Copper
- Silver
- Iron (a cut nail is best)
- Magnesium
- Lead
- Zinc

Emery paper to clean metal strips

50cm³ (or less see notes below) portions of the following solutions, all approx. 0.1 M:

- copper sulphate solution
- zinc chloride solution
- magnesium nitrate
- iron (II) sulphate (freshly prepared)
- lead (II) nitrate
- silver nitrate

Care should be taken with silver nitrate, which is corrosive as a solid and stains skin and clothing when dry. Allow a maximum of 10 cm³ per group.

Care should be taken with lead (II) nitrate, which is harmful as a solid. Allow a maximum of 20cm³ per group.