Chemistry Cube Game – Exploring Basic Principles of Chemistry by Turning Cubes

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Abstract

The Chemistry Cube Game invites students at secondary school level 1 and 2 to explore basic concepts of chemistry in a playful way, either as individuals or in teams. It consists of 15 different cubes, 9 cubes for different acids, their corresponding bases and precursors, and 6 cubes for different reducing and oxidising agents. The cubes can be rotated in those directions indicated. Each ‘allowed’ vertical or horizontal rotation of 90° stands for a chemical reaction or a physical transition. Two different games and playing modes are presented here: First, redox chemistry is introduced for the formation of salts from elementary metals and non-metals. Second, the speciation of acids and bases at different pH-values is shown. The cubes can be also used for games about environmental chemistry such as the carbon and sulphur cycle, covering the topic of acid rain, or the nitrogen cycle including ammoniac synthesis, nitrification and de-nitrification.

Key words: Acids/bases · Basic chemical principles · Chemistry Cube Game · Collaborative/cooperative learning · Equilibrium · Inquiry-based/discovery learning · Humor/puzzles/games · Oxidation/reduction · Salt formation · Secondary school level 1 and 2 · Speciation

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