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Making the Conceptual Tangible: The Role of Art in Understanding Mathematics and Physics

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This research considers the educational role of art in finding pathways towards accessing mathematics and science, particularly those abstract concepts usually only accessible to people with an advanced algebraic vocabulary.

In the light of the narrowing of the school curriculum in recent decades, and particularly the reduction in timetabling of art and music in English schools, this research actively explores the use of topic overlap between sciences and art to investigate how abstract concepts can be made tangible through visual and aural stimulation.

Kinetic sculpture is employed that visibly and audibly demonstrates particular phenomena, e.g. wavelike behaviour, harmonic ratios or resonance. The sculpture encompasses two or more tangible aspects such as shape, pattern, scale, sound, resonant frequencies, motion, recorded film that illuminates differences in different latitudes, and reversed or translated perspectives.

Feedback is sought through exhibitions of the sculpture. Through observation, survey and interview, key metrics are captured and analysed. These include the degree to which interest has been captured, curiosity aroused, and particularly comprehension aided by the art designed to maximise observation, questioning, critical thinking and learning.

The longer term goal of the research is to initiate a conversation in the wider public domain as to the value of art in accessing abstract concepts. It will bring to the broadest forum the value of art in its uniqueness, breadth of language, immediacy and power of communication by visibly and audibly shedding light on physical phenomena and enabling people the potential for greater success and enjoyment in learning.