

A Cross-Sectional Examination of Children's Developing Understanding of the Rainbow

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Abstract : Surprisingly little is known from a research perspective about children's understanding of rainbows and rainbow formation, and how this understanding changes with increasing age. Yet this kind of research is useful when conceptualizing pedagogy, lesson plans, or more general curricula. The present study aims to rectify this shortcoming. In a cross-sectional approach, children of three different age groups (4-5, 7-8 and 10-11 years) were asked to draw pictures that included rainbows. The pictures will be evaluated according to their scientific representation of rainbows, such as the order of colors, as well as according to any non-scientific conceptions, such as solidity. In addition to the drawings, the children took part in small focus groups where they had to discuss various questions about rainbows and rainbow formation. Similar to the drawings, these conversations will be evaluated around the degree of scientific accuracy of the children's explanations. Gaining a complete developmental picture of children's understanding of the rainbow may have important implications for pedagogy in early science education. Many other concepts in science, while not explicitly linked to rainbows and rainbow formation, can benefit from the use of rainbows as illustrations - such as understanding light and color, or the use of prisms. Even in non-science domains, such as art and even storytelling, recognizing the differentiation between fact and myth in relation to rainbows could be of value. In addition, research has pointed out that teachers tend to overestimate the proportion of students' correct answers, so clarifying the actual level of conceptual understanding is crucial in this respect.

Keywords : conceptual development, cross-sectional research, primary science education, rainbows

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