

NCTM Position Statement: Early Childhood Mathematics Education

The National Council of Teachers of Mathematics believes that early childhood mathematics education, for young children aged 3–8, should be developmentally appropriate. Developmentally appropriate instructional practices are those in which the mathematics learning environment takes into account the social, emotional, physical and intellectual needs of young children. Because young children actively construct knowledge, instruction should concentrate on facilitating learning through exploration and interaction with materials and people. In early childhood mathematics, how and when the curriculum is taught is as important as what is taught. Thus, endorsing a developmental philosophy for early childhood mathematics education suggests reorganizing classroom practices around the total child rather than allowing materials and rigid timelines to dictate instruction. Furthermore, early childhood mathematics instruction should foster a positive environment, provide equal access for all children and account for cultural and ethnic diversity.

Therefore, the National Council of Teachers of Mathematics recommends developmentally appropriate mathematics instruction that has the following aims:

- Acknowledge and build on the children's accumulated knowledge by including children's experiences, languages and relevant, real-world contexts.
- Incorporate active and interactive learning. Children's understandings develop as they explore, investigate and discuss mathematical concepts. Physical and mental interactions with the environment, materials and other individuals give children opportunities to construct, modify and integrate ideas.
- Offer opportunities for children to develop and expand language acquisition, while structuring, restructuring and connecting mathematical understandings. Concepts should be repeatedly experienced through concrete, visual, verbal and pictorial formats. Gradually children should be encouraged to translate and record their experiences in more abstract representations.
- Be concept and problem-solving oriented. The classroom environment should provide for the regular study of mathematics, focusing on the

development and integration of mathematical thinking, reasoning, understandings and relationships through concrete problem-solving experiences. Mathematical concepts should be integrated with other subject areas, making use of natural connections wherever they occur.

- Develop children's confidence in their mathematical abilities. Varied instructional strategies, meaningful child-related contexts and opportunities for active participation in the learning process encourage children to become capable mathematical thinkers and to believe in themselves as such.
- Include ongoing assessment. Teachers should make instructional decisions that are based on the progress of the children in their classroom. Children's progress is determined through the information obtained from the formal and informal assessment of each child's individual pattern of growth. Evaluation strategies such as observations, interviews and portfolios give evidence of children's thinking processes and their understanding of concepts.

The National Council of Teachers of Mathematics recommends that those who produce, select and purchase young children's mathematics curriculum materials support developmentally appropriate early childhood mathematics programs. Guidelines for early childhood mathematics encourage a child-centred approach to instruction. Preference should be given to mathematical learning environments that support active participation through observation, exploration, verbalization and hands-on experiences. The focus of instruction should be on the continuous development of mathematical processes and language through activities that gradually increase in difficulty, complexity and challenge as the children develop understanding and skills. Developmentally appropriate early childhood mathematics instruction should meet the needs of individual learners at different stages of readiness, by considering the influences of cultural backgrounds, prior experiences, learning styles and cognitive abilities.

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