IES Institute of Education Sciences

What Works Clearinghouse Educators Practice Guide: ***Preparing Young Children for School***

Recommendation 3: Provide intentional instruction to build children's understanding of mathematical ideas and skills

TIER 1 STRONG

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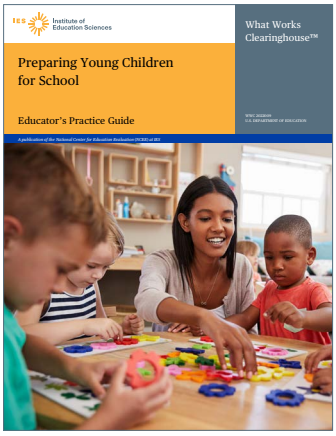
Children's natural curiosity may help them develop some informal intuitions about mathematics. However, children also benefit from more intentional activities and conversations designed to help them actively make sense of mathematics and develop a deeper understanding of mathematical ideas and skills. Children who develop deep understanding of mathematical ideas and skills in preschool are better prepared to learn from the more formal mathematics instruction that they will encounter in kindergarten and beyond. The panel recommends intentionally planning lessons that will help children develop understandings of mathematical ideas and skills in numeracy, geometry, measurement, and patterning.



The steps in this recommendation from the What Works Clearinghouse Practice Guide ***Preparing Young Children for School*** guide teachers on how to provide small-group mathematics instruction, extend instruction beyond basic mathematical skills, and provide instruction on mathematical topics in an incremental and sequential manner.

How to carry out the recommendation

1. **Provide small-group instruction to build children's foundational understanding of mathematics.** The panel recommends working with a small group of children to provide intentional mathematics instruction, while the other children are engaged in activities at other centers or with a co-teacher or aide. Dedicate at least 15–20 minutes nearly every day to small-group mathematics instruction. When teaching small groups, teachers can hear from all children multiple times. Teachers can engage children in multi-turn conversations and tailor instruction to meet children's needs. The panel also recommends planning lessons that will intentionally help children learn a foundational mathematical idea or skill, rather than waiting for mathematical topics to occur naturally during the day.
2. **Extend mathematics instruction beyond basic skills to include more advanced mathematical ideas.** Most preschools focus on verbal counting, shape naming, and numeral identification. However, mathematics instruction at this age should extend beyond these basic topics to include more advanced mathematical ideas. Some advanced mathematical ideas that children in preschool would benefit from learning include:
    - characteristics of shapes such as sides, curves, and angles
    - measurement activities such as measuring classroom objects
    - subitizing, or the ability to see a small number of objects and instantly know how many are in the group without counting
    - number relationships such as thinking of the quantity of 4 as sets of 3 and 1 or as 2 sets of 2, help children represent a quantity in multiple ways
3. **Build children's mathematical knowledge and skills in an incremental and sequential manner.** Children's knowledge of mathematical ideas and skills builds incrementally over time, following typical natural developmental progressions. The panel recommends using a curriculum that develops skills in an incremental way aligned to these progressions. To figure out where children are in their developmental progression, observe children during mathematics lessons and during conversations about mathematics.

Recommendation from: Burchinal, M., Krowka, S., Newman-Gonchar, R., Jayanthi, M., Gersten, R., Wavell, S., Lyskawa, J., Haymond, K., Bierman, K., Gonzalez, J. E., McClelland, M. M., Nelson, K., Pentimonti, J., Purpura, D. J., Sachs, J., Sarama, J., Schlesinger-Devlin, E., Washington, J., & Rosen, E. (2022). *Preparing Young Children for School* (WWC 2022009). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/30