

Providing Opportunities for Students with Exceptional Mathematical Promise

A Position of the National Council of Teachers of Mathematics

Question

How can teachers and schools identify and support students with exceptional mathematical promise to nurture and sustain their mathematical development and interest in mathematics?

NCTM Position

Students with exceptional mathematical promise must be engaged in enriching learning opportunities during and outside the school day to allow them to pursue their interests, develop their talent, and maintain their passion for mathematics. Such opportunities must be open to a wide range of students who express a higher degree of interest in mathematics, not just to those who are identified through traditional assessment instruments.

We use the term “students with exceptional mathematical promise” to include those who are talented or express higher levels of interest in mathematics as well as students who are identified as “gifted” in mathematics through a battery of standardized assessments. We have deliberately chosen this term over the terms “gifted” and “talented” because historically “gifted” and “talented” students have been identified through a single assessment that often is not mathematics-specific. In this position statement we seek to broaden the range of students identified as “students with exceptional mathematical promise” while acknowledging that each and every student has mathematical promise.

Students with exceptional mathematical promise must be provided with differentiated instruction in an engaging mathematics learning environment that ignites and enhances their mathematical passions and challenges them to make continuing progress throughout their K–16 schooling and beyond. They must have a variety of opportunities inside and outside of school to develop and expand their mathematical talents, creativity, and passions. These experiences may include formal courses; extracurricular experiences such as math clubs, circles, and competitions; and mentoring by and of those with similar interests and talents. These experiences must allow opportunities for individual mathematical development as well as collective, social mathematical engagement. When considering opportunities for acceleration in mathematics, care must be taken to ensure that opportunities are available to each and every prepared student and that no critical concepts are rushed or skipped, that students have multiple opportunities to investigate topics of interest in depth, and that students continue to take mathematics courses while still in high school and beyond.

Although some students may show rapid or early mastery of mathematical skills, such as computation, teachers have a responsibility to identify and nurture students whose exceptional mathematical promise is manifested in other ways. Students with exceptional mathematical promise include those who demonstrate patterns of focused interest; are eager to try more difficult problems or extensions or to solve problems in different, creative ways; are particularly good at explaining complex concepts to others or demonstrate in other ways that they understand mathematical material deeply; and/or are strongly interested in the material. Exceptional

mathematical promise is not a fixed trait; rather it is fluid, dynamic, and can grow and be developed; it also varies by mathematical topic. Exceptional mathematical promise is evenly distributed across geographic, demographic, and economic boundaries. Growing and leveraging such mathematical promise is essential for our field and society to thrive.

Finally, for students with exceptional mathematical promise to have learning environments and opportunities as described here, the preparation and ongoing professional development of teachers of mathematics must address the specific learning needs of these students. Methods of recognizing, nurturing, and challenging students with exceptional mathematical promise must be included in courses and professional development for all preservice and in-service teachers. All teachers must have access to print, electronic, and human resources to support them in meeting the needs of students with exceptional mathematical promise during and outside the school day.

Resources

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