

West Linn–Wilsonville School District

Mathematics

Guiding Principles

June 2003

Guiding Principle	Bibliography Source
<p><u>A World Class Education</u></p> <p>Excellence in mathematics education requires equity - high expectations and strong support for all students. Equity does not mean that all students are treated exactly the same. It does mean that all students need access each year they are in school to a coherent, challenging mathematics curriculum that is taught by competent and well supported mathematics teachers. School mathematics programs must be founded in the belief that within each student there is a capable and accessible mathematician.</p>	<ul style="list-style-type: none">• American Association for the Advancement of Science. 1990. <i>Project 2061</i>. New York.• NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA.• NSF. 1996. <i>Infusing Equity in Systemic Reform: An Implementation Scheme</i>.• Illinois Mathematics and Science Academy and First in the World Consortium. 2000. <i>Inquiry and Problem Solving: Meaning Making in Mathematics and Science</i>.• National Center for Education Statistics. 1997. <i>Pursuing Excellence: A Study of US Eighth Grade Mathematics and Science Teaching, Learning, Curriculum, and Achievement in International Context</i>. NCES, Washington DC.• National Center for Education Statistics. 1998. <i>Pursuing Excellence: A Study of US Twelfth Grade Mathematics and Science Teaching, Learning, Curriculum, and Achievement in International Context</i>. NCES, Washington DC.
<p><u>Learning</u></p> <p>Students are encouraged to become autonomous learners. Powerful mathematics learning is centered on student constructed understandings of important concepts, intense reflection on their processes and reasoning, and building new knowledge from experience and prior knowledge. Students will gain agility with complex problem solving producing efficient and accurate solutions.</p>	<ul style="list-style-type: none">• NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA.• Carnegie Council. 1990. <i>Turning Points: Preparing American Youth for the 21st Century</i>. House, Peggy A. (Ed.).• National Research Council. 2002. <i>Helping Children Learn Mathematics</i>. Kilpatrick, J and J Swafford, Editors. Washington, DC.
<p><u>Teaching</u></p> <p>Teachers must know and understand deeply the mathematics they are teaching - the concepts on which it is based and the concepts for which it is laying the groundwork. Mathematical content knowledge and skillful pedagogy allows for successful differentiated instruction to assure all students access, engagement and challenge. Effective mathematics teaching requires understanding what students know and need to learn, and then challenging and supporting them to learn it well.</p>	<ul style="list-style-type: none">• NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA.• National Research Council. 2002. <i>Helping Children Learn Mathematics</i>. Kilpatrick, J and J Swafford, Editors. Washington, DC.• Illinois Mathematics and Science Academy and First in the World Consortium. 2000. <i>Inquiry and Problem Solving: Meaning Making in Mathematics and Science</i>.• Carnegie Council on Adolescent Development. 1990. <i>Turning Points: Preparing American Youth for the 21st Century</i>. House, Peggy A. (Ed.). New York.• US Department of Education. 2000. <i>Before It's Too Late: A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century</i>. Washington DC.

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<p><u>The Mathematics Curriculum</u></p> <p>A curriculum is more than a collection of activities - it must be coherent, focused on important mathematics and well articulated across the grades. Mathematics is a highly interconnected and cumulative subject. A well articulated curriculum challenges students to learn increasingly more sophisticated mathematical ideas as they continue their studies.</p>	<ul style="list-style-type: none"> • The Free Press. 1999. <i>The Teaching Gap</i>. Stigler, J. & Hiebert, J. • NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA. • NCREL. June 1999. <i>Policy Issues</i>, "Benchmarking Against the TIMSS: Lessons from First in the World." Slowinski, J., Laine, S., & van der Ploeg, A. Oak Brook, IL. • National Research Council, Mathematical Science Education Board. 1989. <i>Everybody Counts: A Report to the Nation on the Future of Mathematics Education</i>. Washington DC. • Dale Seymour Publications. 1995. <i>Beyond Arithmetic: Changing Mathematics in the Elementary Classroom</i>. Mokros, J., Russell, S.J., & Economopoulos, K. Palo Alto. • Lawrence Erlbaum Associates. 1999. <i>Knowing and Teaching Elementary Mathematics</i>. Liping Ma. University of California, Berkeley.
<p><u>Technology</u></p> <p>Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning. Students can learn more mathematics more deeply with the appropriate and responsible use of technology. They can make and test conjectures. They can work at higher levels of generalization or abstraction. In the mathematics classrooms envisioned by NCTM, every student has access to technology to facilitate his or her mathematics learning.</p>	<ul style="list-style-type: none"> • NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA. • ASCD. October 1990. <i>Educational Leadership</i>, pp. 66-70, "Understanding a Brain-Based Approach to Learning and Teaching." Caine, R.N. & Caine, G. • ASCD. November 1998. <i>Educational Leadership</i>, pp. 52-55, "Teach Me, Teach My Brain: A Call for Differentiated Classrooms." Tomlinson, C.A. & Kalbfleisch, M.L.
<p><u>Assessment</u></p> <p>Assessments should support the learning of important mathematics and furnish useful information to both teachers and students. Assessments will inform instruction and provide a means by which students reflect upon their own learning.</p>	<ul style="list-style-type: none"> • NCTM. 2000. <i>Principles and Standards for School Mathematics</i>. Reston, VA. • Jossey-Bass. 1998. <i>Educative Assessment: Designing Assessments to Inform and Improve Student Performance</i>. Wiggins, G. San Francisco, CA. • Assessment Training Institute. 1997. <i>Student-Centered Classroom Assessment</i>. Stiggins, R.