

# West Linn–Wilsonville School District

## Mathematics

### Classroom Indicators of Excellence

June 2003

What Teachers Do	What Students Do	The Learning Environment for Mathematics
<ul style="list-style-type: none"> <li>• Be relentless in their efforts to lead each child to high achievement.</li> <li>• Pose questions and tasks that provoke students to consider relevant ideas.</li> <li>• Pose questions that encourage investigation designed to enhance conceptual understanding.</li> <li>• Ask genuine questions centered on student thinking.</li> <li>• Require students to think and engage in learning.</li> <li>• Design differentiated lessons to challenge all learners.</li> <li>• Design instruction to create multiple entry points - challenging aspects of every problem for every learner.</li> <li>• Select and sequence coordinated comprehensive activities that build on prior knowledge.</li> <li>• Design instruction to lead child from concrete to abstract understanding in each lesson.</li> <li>• Honor and encourage "think time."</li> <li>• Guide student development of mathematical ideas with established understandings.</li> <li>• Expect students to devise one or more approaches/methods.</li> <li>• Expect mathematical justifications for both correct and incorrect answers.</li> <li>• Model mathematical thinking and risk taking.</li> <li>• View incorrect answers as worthwhile - leading to new learning.</li> <li>• Provide a variety of opportunities for students to demonstrate their knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>• Be engaged with the learning and diligent in their efforts to achieve skill and understanding.</li> <li>• Demonstrate a willingness to accept and engage in challenging problems, take risks, make mistakes, and apply a strong work ethic.</li> <li>• Look for more than one approach to solve a problem.</li> <li>• Experiment with, adapt, and apply a variety of appropriate strategies to solve problems.</li> <li>• View difficulties and errors as learning opportunities.</li> <li>• Honor the mathematical processes that work for others.</li> <li>• Use mathematical tools to solve problems.</li> <li>• Master "the basics" to increase procedural ability.</li> <li>• Extend problems and explore personal "what if" questions.</li> <li>• Make and test conjectures, searching for generalizations in ideas and methods.</li> <li>• Investigate mathematical conjectures to develop mathematical arguments and justifications.</li> <li>• Actively build new knowledge from experiences and problem solving, integrate prior knowledge with new learning, and apply new understandings to different situations and contexts (including ones outside of mathematics).</li> <li>• Build metacognitive skills by examining one's own thought</li> </ul>	<ul style="list-style-type: none"> <li>• Is a place where all learners engage in thinking and learning.</li> <li>• Is a community of learners with support for the learning of each person.</li> <li>• Encourages use of multiple representations of mathematical ideas to support student understanding.</li> <li>• Is rich in discussion to encourage questioning, logical reasoning and clear communication of ideas.</li> <li>• Supports non-routine problem activities to strengthen transfer and application of concepts.</li> <li>• Is safe for learners, accepting trial and revision as hallmarks of active learning.</li> <li>• Presents opportunities for group problem solving and teach the skills of intellectually rigorous collaborative work.</li> <li>• Provides the freedom for students to share their creativity.</li> <li>• Engages students in a variety of grouping techniques - individuals, pairs, small groups, class groups, ability groups and gender.</li> <li>• Embodies the courage to challenge and question ourselves, each other, and our curriculum.</li> </ul>

What Teachers Do	What Students Do	The Learning Environment for Mathematics
<ul style="list-style-type: none"> <li>• Balance inductive and deductive approaches to learning.</li> <li>• Provide mathematical tools (manipulatives and models) to support sense-making.</li> <li>• Embed factual/procedural skill practice within complex tasks.</li> <li>• Create mathematically worthwhile tasks that allow for authentic problem solving.</li> <li>• Create a classroom culture that honors inquiry, collaboration and personal challenge.</li> <li>• Allow for critical reflection time.</li> <li>• Continue to grow, to be life long learners themselves.</li> </ul>	<p>processes, learning style and strengths.</p> <ul style="list-style-type: none"> <li>• Actively participate in reflective opportunities and self-assessments.</li> <li>• Discuss, collaborate, and communicate mathematical thinking coherently and clearly with peers, teachers and others.</li> </ul>	