

# School Improvement Action Plan

School: Burrows Elementary School

Date: SY 2011-2014

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|---|--|---|
| <p><b>SMART Goal 1: By 2014, all students at Burrows Elementary School will improve problem solving across the curriculum by organizing information from a problem situation and arriving at a reasonable solution as measured by selected system-wide and local assessments.</b></p>   |  |   |
| <p>Support Data (used to select the goal):</p> <ol style="list-style-type: none"> <li>1. TerraNova Math Subtest, 3<sup>rd</sup> edition, 4<sup>th</sup>/5<sup>th</sup> grades, Spring 2009-2011</li> <li>2. TerraNova 3rd edition, Math Subtest, Problem Solving and Reasoning Objective, 4<sup>th</sup>/5<sup>th</sup> grades, Spring 2009-2011</li> <li>3. Teacher Narratives, 2011</li> <li>4. Environmental Scan, 2011</li> </ol> | <p>Standardized Assessment(s):</p> <ol style="list-style-type: none"> <li>1. TerraNova Math Subtest, 3<sup>rd</sup> edition, 4<sup>th</sup>/5<sup>th</sup> grades</li> <li>2. TerraNova 3rd edition, Math Subtest, High Mastery-Problem Solving and Reasoning Objective, 4<sup>th</sup>/5<sup>th</sup> grades</li> </ol> | <p>Local Formative Assessments SY 2011/2012:</p> <p>Problem Solving, common assessment, created from selected items in the test resources found in DoDEA's selected curriculum <i>enVision Math</i> (Scott Foresman-Addison Wesley/Pearson Education), administered as Pre, Mid, and Post Assessments, 4<sup>th</sup>/5<sup>th</sup> grades.</p>  |
|   |  | <p>Research supporting this strategy/intervention:</p> <ol style="list-style-type: none"> <li>1. Research Ideas for the Classroom: Early Childhood Mathematics (Jennings, 1993)</li> <li>2. Hall, T., &amp; Strangman, N. (2002). <i>Graphic organizers</i>. Wakefield, MA: National Center on Accessing the General Curriculum</li> </ol> <p style="text-align: right;">Research abstracts on last page.</p> |

Strategy/Intervention: **Students will use graphic organizers to increase problem solving skills.**

| Activities to implement the intervention   | Person(s) Accountable                | Timeline |         | Resources  |
|--|--------------------------------------|----------|---------|--|
|  |                                      | Begin    | End     |  |
| 1.1 A locally created problem solving common assessment will be administered as a pretest to all students.   | math teachers, SILT, building admin, | Aug. 11  | Aug. 11 | DSO/ISS Math Support Specialist, admin support                         |
| 1.2 Students will be taught how to use graphic organizers to assist in problem solving across the curriculum.  | teachers                             | Oct. 11  | June 11 | DSO training, professional development, curriculum resources           |
| 1.2 Each teacher will use one of the selected diagrams a minimum of twice monthly. Selected diagrams in support of our goal: Fish bone Diagram, Problem and Solution Map, Bar Diagram (math series)  | teachers                             | Oct. 11  | May 12  | research articles and diagram models and templates                     |
| 1.3 Teachers will use a variety of curriculum supplied and locally created graphic organizers when appropriate for problem solving instruction in their classes.   | teachers                             | Oct. 11  | May 12  | curriculum materials, office supplies                                  |
| 1.4 Students will maintain a portfolio of completed diagrams and problem solving activities.   | homeroom teacher                     | Oct. 11  | May 12  | office supplies  |
| 1.5 A locally devised common assessment will be administered midyear to all students and data will be collected to inform instruction.   | SILT, building admin, math teachers  | Jan. 12  | Jan. 12 | office supplies, DSO/ISS Math Support Specialist, admin support        |
| 1.6 Students will participate in the “Problem Solving with Graphic Organizers Activity of the Week” program. Math teachers will reinforce the program in their classes by reviewing solutions and students will record their progress in their Self Assessment folder. | Problem Solving Coordinator          | Nov. 11  | May 12  | problem solving prompts, recognition board and PEA supplied incentives |
| 1.7 A locally devised common assessment will be administered at the end of the year to all students and data will be collected to measure results.   | SILT, building admin, math teachers  | Apr. 12  | May 12  | office supplies, DSO/ISS Math Support Specialist, admin support        |
| 1.8 Students maintain a Data Binder to self assess progress on Goal 1.   | Classroom Teachers                   | Nov. 11  | May 12  | RC points collection, Math Problem of the Week Binder                  |

## Research Abstracts

Jensen, Robert J. (editor). Research Ideas for the Classroom: Early Childhood Mathematics. New York: Macmillan Publishing Company. 1993. p. 161.

*Research Ideas for the Classroom. Early Childhood Mathematics* presents a comprehensive synthesis and interpretation of research findings in mathematics education for elementary grades. A large part of the book is devoted to syntheses of research findings on students' understanding of specific topics in mathematics. The book includes the data driven work of researcher and teacher teams for each section with Robert J. Jensen serving as advisor and study editor.

The discussions within the book point to instructional methods which have been proven to elevate student performance in problem solving skills. Observational findings indicate methods of problem solving instruction which show: elevated performance, neutral conditions, and conditions that depress performance. Suggested classroom activities for problem solving and alternative models of instruction include prototypes or activities that teachers are encouraged to use based on classroom research. Observational findings of the first three of 21 conditions, listed in rank order 1-21, which elevate student performance in problem solving are: 1. Diagram Training, 2. Picture with full problem statement, and 3. Translation training. This data indicates that graphic organizer instruction is an appropriate intervention for increasing our students' problem solving skills.

Hall, T., & Strangman, N. (2002). *Graphic organizers*. Wakefield, MA: National Center on Accessing the General Curriculum. Retrieved May 2011 from [http://aim.cast.org/learn/historyarchive/backgroundpapers/graphic\\_organizers](http://aim.cast.org/learn/historyarchive/backgroundpapers/graphic_organizers)

*Graphic Organizers*, an article by Tracey Hall and Nicole Strangman compile research from many different sources supporting the use of graphic organizers to improve learning outcomes. They define graphic organizers, discuss the research evidence of effectiveness, list referenced research articles and sample different types of graphic organizers and their applications. Graphic organizers have been applied across a range of curriculum subject areas. Although reading is by far the most well studied application, science, social studies, language arts, and math are additional content areas that are represented in the research base on graphic organizers. Operations such as mapping cause and effect, note taking, comparing and contrasting concepts, organizing problems and solutions, and relating information to main ideas or themes can be beneficial to many subject areas. The observed benefits in these subject areas go beyond those known to occur in reading comprehension (Bulgren, Schumaker, & Deshler, 1988; Darch, Carnine, & Kammenui, 1986; Herl, O'Neil, Chung, & Schacter, 1999; Willerman & Mac Harg, 1991). This research led us to the conclusion that graphic organizers benefit all areas of the curriculum in many different skill areas including problem solving.