# MathLinks™
## Summative Evaluation Report

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Summary and Conclusions

Appendix A

Workshop Evaluation Instrument
Follow up Survey Instrument
Telephone Interview Instrument
Introduction

This report describes the summative evaluation of MathLinks, a supplementary mathematics program designed to promote and support family involvement with activities that connect school and home. Created by Developmental Studies Center (DSC), each three-part lesson cycles from the classroom to home and back to the classroom again. The parent-friendly home activity, central to each of the MathLinks lessons, is provided in Spanish as well as in English. The activities focus on mathematical concepts (e.g., comparing numbers, number combinations, and measuring length) as well as social skills (e.g., listening to a partner, sharing the work, and taking turns).

There are three MathLinks books, one each for Kindergarten, 1st and 2nd grade, each containing 12 activities. All the activities have an At School, an At Home, and a Back at School component. The At School activity involves children in an exploration or game that extends their experience with the mathematical concept in the classroom curriculum, and prepares them for an activity they will do at home. Students then take the activity home and with a partner (a parent, grandparent, or other older person) complete the At Home activity. This activity engages the student and home partner in exploring and discussing the mathematics activity. Students then return their completed At Home activities to school, where teachers facilitate a Back at School discussion. This allows students to share and discuss their experiences with the At Home activity, for example, organizing the data from home activities.

Each book is designed specifically for teachers and children in Kindergarten, 1st or 2nd grade. All teachers participating in this summative evaluation attended MathLinks staff development and were provided one of the three books, depending on the grade they teach.

This report describes the evaluation’s focus areas, the methods used in the study, and findings organized by the evaluation areas. It concludes with a summary of findings.
Evaluation Areas

The summative evaluation of MathLinks was designed to explore four areas:

- Adequacy of program materials and staff development
- Extent of teachers’ implementation
- Extent of family and student involvement
- Staff perceptions of changes in the depth of students' discussions of mathematics as a result of MathLinks.

These evaluation areas were used to guide the design of the evaluation instruments, and to organize the findings provided in this report.

Methods

Four school districts participated in DSC’s summative evaluation of MathLinks. As shown in the table below, 77 teachers, representing at least 23 schools, participated in MathLinks one-day (6-hour) teacher development workshops. The workshops were delivered between September, 2002 and March, 2003. (Because not all teachers provided their school affiliations when they signed in at the workshops, the total number of schools represented is not known.)

<table>
<thead>
<tr>
<th>Location</th>
<th>Teachers</th>
<th>Schools</th>
<th>Workshop Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tehama County, CA</td>
<td>15</td>
<td>5</td>
<td>September, 2002</td>
</tr>
<tr>
<td>Topsfield Schools, Boston MA</td>
<td>15</td>
<td>9 or more</td>
<td>November, 2002</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>24</td>
<td>6 or more</td>
<td>November, 2002</td>
</tr>
<tr>
<td>Vista Unified Schools, CA</td>
<td>23</td>
<td>3 or more</td>
<td>March, 2003</td>
</tr>
<tr>
<td>Totals</td>
<td>77</td>
<td>23 or more</td>
<td></td>
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Three methods of data collection were used:

- Immediately following each staff development workshop, **workshop evaluations** were collected from participants. Seventy-six of 77 teachers (99%) completed the *MathLinks* workshop evaluation. It asked participants to rate the quality of the workshop presentation, to estimate their learning and understanding of *MathLinks*, and the extent to which each workshop component contributed to their learning and understanding. (See Appendix A, pages 27-28.)

The three groups that had the most time (four to six to months) to implement the program (Tehama, Boston and Kansas City) were involved in the two additional stages of data collection. Because there were only several weeks between training and collection of evaluation data, the Vista Unified group did not participate in follow up survey or telephone interviews.

- **Follow up surveys** were sent to participants four to six months after the *MathLinks* workshops. A total of 23 of 64 surveys (36%) were returned after repeated contact. The survey explored teachers' general use of and reactions to the program, and asked teachers to describe the number of *MathLinks* activities used; the elements of the *MathLinks* activities used; the percentage of students who return *MathLinks* activities; their use of modeling, cooperative strategies and social emphasis; and family and student reactions to *MathLinks* activities. (See Appendix A, pages 29-30.)

- **Telephone interviews** were conducted with eight participants, in order to more deeply explore and probe teacher use of and reactions to the *MathLinks* program. Two to three teachers from each group (Tehama, Boston and Kansas City) were selected for the interview strictly on their availability to participate in the interview. The interviews lasted 30-45 minutes each, and covered frequency of use of *MathLinks* activities; successes and challenges with the program; the elements of the *MathLinks* activities used; the percentage of students who return *MathLinks* activities; their use of modeling, cooperative strategies and social emphasis; and family and student reactions to *MathLinks* activities.

Half (four of eight) of the teachers who completed the telephone interviews also returned the follow up survey. This represents 17% of the surveys received.

In addition, half (four of eight) of the teachers (a different combination of teachers than above) who completed the telephone interviews had not yet used *MathLinks* activities in their classrooms. The interviews with these teachers addressed why they had not used the program, and their plans for future use. (See Appendix A, pages 31-33.)
√ **Finding:** Participants' Experience of the Workshops

Immediately following the workshops, participants reported they found the workshop effective and well presented. Participant comments about the workshops were very positive.

Participants indicated on the workshop evaluation forms (n=76, completed immediately following the workshops) that they found the experience **positive and beneficial**. On average, they strongly agreed (using a 1-5 scale, where 1=strongly disagree and 5=strongly agree) that:

- the presenter was responsive to participants (4.96, sd=.20*)
- the time allotted was adequate for the amount of information presented (4.86, sd=.35)
- they had opportunities to voice concerns or questions (4.84, sd=.37)
- the presenter was clear and to the point (4.80, sd=.40).

Approximately one-quarter of comments made by participants on what they liked best about the workshop mentioned presentation and facilitation of the workshop.

Several of the eight participants in the telephone interviews also commented favorably on the workshop:

- (The presenter) was energetic and thorough. I felt confident to do the program.
- It was great. (The presenter) was amazing. I walked out of there thinking that it was definitely worthwhile taking the day to do this, and that it was the best workshop I’d been to in a while. I was engaged the entire time, even when (the presenter) was covering things not in my grade level.
- It was easy to follow, very clear, we went through several activities at the different grade levels. The video was very helpful. Overall it was an enjoyable session, and we were all excited to use the program. We really enjoyed (the presenter) – he had good pacing, and he was relaxed. It was very worthwhile and motivating.
- We came right back from that workshop and got right to using the program. We were ready and excited.
- The training was wonderful, I loved it. The examples of activities were great, and I was excited about the program.

* All numerical rating items provided in this report used the same 1-5 scale, where 1=strongly disagree and 5=strongly agree. The first number presented is the mean, and the second number is the standard deviation.
**Finding: Value of Workshop Components**

Participants reported all components of the workshop to be helpful in their learning about the *MathLinks* program. They particularly found the opportunity to participate directly in the *MathLinks* activities to be a valuable experience.

Workshop participants strongly agreed on the workshop evaluation that the **workshop components were valuable to their learning** about the *MathLinks* program. Teachers particularly favored participating in the activities themselves. They strongly agreed on the value of:

- experiencing and discussing *MathLinks* activities (4.78, sd=.48)
- the overview of the *MathLinks* program (4.65, sd=.59)
- viewing the “Comparing Girths” video (4.60, sd=.62)
- planning ways to introduce the *MathLinks* program to parents (4.54, sd=.68).

When asked what they liked best about the workshop on the evaluation form, the teachers strongly favored the opportunity to have **hand-on experiences**.

- 35 of the 75 comments on what they liked best about the workshop mentioned being able to participate in the *MathLinks* activities.

**Finding: *MathLinks* Preparation**

Workshop participants felt that they gained a clear understanding of the program, and that the workshop effectively prepared them to implement the *MathLinks* program in their classrooms.

Teachers indicated that they gained an **effective understanding** of the program. They strongly agreed that they understood:

- how *MathLinks* combines social and mathematical learning for children (4.82, sd=.42)
- the goals of *MathLinks* (4.74, sd=.53)
- the format (layout) of *MathLinks* (4.71, sd=.51).
Teachers were also asked on the workshop evaluation if they, as a result of the workshop, felt prepared to implement the *MathLinks* program. These ratings were still in strong agreement, but were predictably somewhat lower than ratings about their understanding of the program. Teachers agreed they **felt prepared** to:

- use *MathLinks* (4.58, sd=.59)
- use cooperative strategies to support children’s thinking during *MathLinks* activities (4.53, sd=.64)
- introduce *MathLinks* to parents (4.43, sd=.64).

As might be expected, ratings on how well the workshop prepared participants (n=23) dropped somewhat when asked, four to six months after the workshop, about their preparation level.

- The *MathLinks* workshop prepared me to use *MathLinks* activities in my classroom (4.26, sd=.86).

√ **Finding: Workshop Improvements**

The majority of workshop participants felt the workshop needed no improvements. Suggested changes for the workshop included holding it earlier in the school year, and informing teachers how to order more *MathLinks* books.

Overall, responses to the staff development workshops were very positive. On the workshop evaluation form, just over one-half (17 of 31) of the participants’ responses to a question on improvements needed, indicated that none were necessary.

Some suggestions did emerge from the workshop evaluation, follow up survey and telephone interviews. Two teachers would have liked to have the workshops occur earlier, so they could begin the *MathLinks* program at the start of the school year:

- Should have been scheduled earlier in the school year (Follow Up Survey).
- The best thing would be to have the workshop before the back-to-school night with parents, so we can introduce it to families then (Telephone Interview).
Others would like to hear/see:

- **How to obtain more activity books** (mentioned by 6 teachers on Workshop Evaluation).
- **More emphasis on personal contact with home partners, rather than newsletters** (Follow Up Survey).
- **Examples showing the program being used by teachers experienced with the program** (Follow Up Survey).
- **A follow up workshop** (Follow Up Survey).
Findings on Program Materials

✓ **Finding: Clarity and Appropriateness**

Teachers responded favorably to *MathLinks* materials. They found the activities to be very clear and easy to use. They also found them appropriate and clear for home partners, including good Spanish translations.

Teachers elaborated on the materials in the telephone interviews, reporting that they found the materials to be **very clear and easy to use**:

- Very clear instructions.
- They are great, they couldn’t get much easier. I like that it is all there, the materials you need, etc. You copy it, and that’s it. That’s all you need.
- It is all here in the book. Nice layout, not too wordy, simple pictures.
- The instructions are very clear.
- The book is great. It is the easiest thing I have used for supplemental curriculum. I love it, and am very happy with it. So many manuals are very confusing, with charts here, and references there, and turn to page 37 in the other book, etc. This one has everything right there that you need for an activity – nice set up.
- It was easy enough for those who are ordinarily challenged to do it, and extendable for those who got it right away to make it more interesting.

Teachers in the telephone interviews were also pleased with the **appropriateness of the materials** for use by home partners, including Spanish-speaking families.

- They are very user friendly, and easy to use for the parents. That makes it easier for all of us when the instructions are clear for the parents. They give a lot of variety in suggestions of what to use at home - coins, beans, buttons, etc. Also the kids come home knowing how to do the activity, and kids like being the ones who know how to do it.
- It is easy for parents to read, and very easy for parents to access.
- It has a good Spanish translation.
- My para is a Spanish speaker, and I appreciate having the Spanish translation as well.
Also, teachers reported during these interviews that they found the **design of the activities and materials** to be a factor for success with their students.

- Measurement can be very abstract. Sometimes this can be hard for kids, and it takes an experience like those in *MathLinks* to get the concept. The fact that they measure themselves, measure their own environment is also very tangible for children. *MathLinks* gives them good learning experiences for abstract ideas.

- It was great to ask kids what their thought on the homework was. And reading what they thought was good for me. I saw that some still weren't getting it, that was helpful. But mostly it was just helpful to ask them the question – we so rarely ask the kids about their thoughts on an activity.

Finally, approximately 20% of comments on the workshop evaluation about what participants liked best related to teachers learning about new ways to teach math.

**Finding: Fit with Curriculum**

The activities fit well with classroom mathematics curriculum. Initially teachers predicted the program would fit well, and their reports after using the materials supports this prediction.

Workshop participants strongly agreed that:

- *MathLinks* will fit with and support my current mathematics curriculum (4.64, sd=.53, Workshop Evaluation).

And later, telephone interviewees confirmed the fit:

- It is right on target with what we are teaching, and easy to include. We are using Houghton Mifflin this year, which is new for us.

- I liked that it used the same vocabulary as my math lessons (*Math Trailblazers*), so it expanded what I taught. I didn’t have to teach another lesson for it.

- The number and measurement units were very compatible with our curriculum.

- They enjoyed doing the measurement, and went well with our regular measurement unit.

- Next year I will use it with more units since I can match it to concepts earlier in the year. It gives me more ways to expand those units.
Two other teachers, however, would like to hear more on the fit with curriculum:

- Show how to link it directly to our math curriculum (Follow Up Survey).
- Give a suggested schedule which is tied to curriculum – when in chapter 20 in Harcourt Math, use activity X. This could also be done collaboratively at workshops with grade level teams if they brought the curriculum (Follow Up Survey).

√ Finding: Materials Improvement

Some suggestions for improving the materials were made, specifically, using loose-leaf binding, providing more space for students and home partners to write, and using color in the materials

Teachers were generally very positive about the MathLinks materials. When asked about suggestions to improve the materials on the follow up survey (23 respondents), most often they had no change ideas. Seven of the 13 teachers responding to the question of how to improve the materials said no changes were needed.

Most of the suggestions that were made related to improving the layout and binding:

- The content is great. I only wish it was in a loose leaf notebook, so it is easier to copy and I don't have to tear pages out (Telephone Interview).
- Put materials in a loose leaf, 3-ring binder instead of binding them (Follow Up Survey).
- More writing space for 1st graders, and maybe even more writing space for home partners (Follow Up Survey).
- The area for kids to write only had 4 small lines, and wasn't big enough. That spacing is impossible for 1st grade (Telephone Interview).
- Use color in the materials (Follow Up Survey).

Other suggested improvements from the follow-up survey were:

- More classroom activity in the area of regrouping.
- Tie to curriculum.
Findings on Implementation

√ Finding: Teacher Use of MathLinks

Four to six months after participating in staff development workshops, it is estimated that about half the teachers used the MathLinks program. The most common reason cited for not using the program was lack of time for supplemental mathematics activities. Though, several teachers plan to use MathLinks in the future.

Nearly 80% of teachers in the follow up survey report and 50% of teachers in the telephone interview using MathLinks in their classrooms. Because the return rate for the follow up survey was low (36% of surveys were returned), it might be that those who used the MathLinks program were more likely to return the survey. Thus, an implementation rate of 80% is probably higher than the actual use of the program among the four districts where MathLinks staff development was provided – 50% is likely a more realistic figure.

Among those who used the program, teachers reported using about four activities during the four-six months available between MathLinks training and evaluation follow up:

- Telephone interviewees using MathLinks reported using an average of four activities in four to six months after training.
- Follow up survey respondents using MathLinks reported using an average of four activities, ranging from two to nine activities.

Teachers who did not use MathLinks (50% of telephone interviewees and 22% of survey respondents) most often skipped it because they did not have classroom time for a supplemental program. Others reported the MathLinks program was difficult for children early in the year, difficult to begin mid-year, or was not something they intended to use:

- Couldn’t fit it in this year, too many activities to choose from (mentioned by 2 teachers on the Follow Up Survey).
- Have to finish regular math before state testing, no time for anything extra (Telephone Interview).
- Our current math program is so rigorous I don't have time for anything supplemental (Telephone Interview).
- Busy doing another math program this year (Telephone Interview).
- My kids couldn’t do the activities in November, so I put the book away until March. Now they can do the activities (Follow Up Survey).
- Didn’t plan on using MathLinks, attended workshop to create connections with other teachers (Telephone Interview).
Notably, two teachers who used *MathLinks* in their classrooms also commented about the lack of time:

- The biggest problem I have with the program is pacing. The modeling is really important, but it takes time away from the regular math lessons, and then I get behind the rest of my team who aren't using *MathLinks*. I wonder if you can make it more of a home-based activity, with just a short preview in school, instead of taking so much time. I really have to struggle with do I miss 1 1/2 days of math to do this? The back at school part isn't so hard, because I can use it as filler, for example during snack. But the intro, while really valuable, took a lot of class time (Telephone Interview).

- The only problem is finding the time in class to use the activities (Telephone Interview).

Three of the four telephone interviewees who did not use *MathLinks* this year, **intend to use the program in the future**.

- After state testing, I will go back to it and use it for the last month or two of the year.

- I plan to start it in the 4th quarter this year, and on day 1 next year. I might even experiment with it in summer school.

- I hope to use it at the end of this year, and hope to use it in future years as well.

Two teachers mentioned during the telephone interviews that they shared *MathLinks* materials and some hand-off training with other teachers at their schools. These are both teachers who used *MathLinks* in their own classrooms.

- I photocopied them for my team here at school, and two or three people used them and told me they found them great too.

- I did a mini-workshop with our first grade teachers, giving them a couple of activities and showing them the socks my students made, though we didn't have time to do an activity. I don't know if they have used it or not.
√ Finding: Use of At School, At Home, and Back at School Activities

All teachers who use MathLinks report using the At School introduction for MathLinks activities. Nearly all used the At Home activity, though only about half the teachers report using the Back at School review. Consistent with time challenges reported earlier, issues reported with the back at school review included difficulty finding the classroom time, and difficulty finding the best days for this review.

When asked on the follow up survey, all teachers using the program used the At School activity, and nearly all used the At Home activity. Fewer teachers, however, used the Back at School review.

• all (100%) teachers used the At School activity
• most teachers (83%) used the At Home activity
• less than half (44%) used the Back at School activity.

In the telephone interviews there was a similar pattern of use:

• all four teachers who used MathLinks used the At School activity
• three of the four teachers used the At Home activity
• two of the four teachers used the Back At School review.

Regarding the Back At School review, two telephone interviewees cited difficulties:

• The Back at School part was most challenging for me, since I had to devote a whole math session for it. I let students sit out if they wanted, and about 1/4 of them did.

• Regarding the Back At School activity, I know it is very powerful to come back and discuss what they experienced, but I couldn’t count on all students bringing them back on the same day. Instead I talked to the students personally when they turned in their papers.
Finding: At Home Activity Return Rate

On average, teachers report through the follow up survey and telephone interviews that about 60% of students return completed At Home MathLinks activities, but returns ranged from 0-100%.

On the follow up survey:

- Teachers reported that 55% of students, on average, returned the At Home activities, ranging from 0-100%.

Telephone interview respondents indicated a similar range of returns:

- 100%. That is pretty typical. I stressed that if they didn’t bring this back in two days, they wouldn't be able to participate in the next session on this activity in class.
- About two-thirds of parents have participated and returned the activities. That is really good, we were pleased with that.
- Out of 20 kids, 15 returned it with adult participation. Two or three returned partially done, and the other two are students who don't usually return any type of homework. It was very successful, I was very happy.
- I had no success in getting them to do the activity at home and return it. I have six students, and no one returned the activity. I have only 1 child who occasionally returns things I send home, so this is not unusual, but it is disappointing.
Finding: Use of Modeling

All teachers who use MathLinks report using modeling to introduce the activities in class. Teachers report this is effective in promoting children’s involvement, very helpful for second language learners, and helpful for students in understanding and remembering the activity.

Among the teachers on the follow up survey who said they use MathLinks activities, modeling was consistently and effectively used:

- among teachers using MathLinks, all (100%) report using modeling to introduce MathLinks activities in class
- these teachers rate the modeling as “highly effective” in promoting children’s involvement in the activities (4.56, sd=.62).

All four of the teachers in the telephone interviews who use the MathLinks activities, reported using modeling to introduce the activities:

- With Kindergarten (modeling) is the way to go. Especially for second-language students, they really benefit from seeing it done first.
- We sat in a circle. I asked a student who I knew would have trouble remembering the instructions to work with me. We did it together in front of the class. I role played the mother.
- When we did the activity comparing left and right, I looked at the instructions, discussed with them what we would do, and then showed them the page on the overhead, and did the activity. I made the "X"s, and they counted out a minute for me, and we counted the number of “X”s together. Then each student did a practice, using their own sheet at their desk.
- I always do that (modeling), since many of my students don't understand verbal directions. I showed them how I would stack the pennies. I think I worked with a partner. Then they did it themselves in class.
Finding: Use of Cooperative Strategies

The majority of teachers who used MathLinks activities used the cooperative strategies. They reported that the cooperative strategies were effective in encouraging children to talk about their thinking. Teachers not using cooperative strategies mentioned several issues, including cooperative strategies being inappropriate for special education students, students being unable to talk with others and stay focused on the activity, and the lack of time to use these strategies.

About three-quarters of the teachers using MathLinks activities, used cooperative strategies:

- Among teachers using MathLinks, 72% report using cooperative strategies (such as Turn to Your Partner or Think, Pair, Share) during MathLinks activities in class (Follow Up Survey).
- These teachers using cooperative strategies rate them as “effective” in encouraging all children to talk about their thinking (4.15, sd=.99) (Follow Up Survey).
- Three of the four teachers in the telephone interviews who use the MathLinks activities report using cooperative strategies during the MathLinks activities.
- The cooperative strategies worked well, and students took pride in the fact that they could explain something to their partner (Telephone Interview).
- I already use techniques of this type in their classrooms (mentioned by 2 teachers in Telephone Interviews).

Those who did not use cooperative strategies, reported on the survey that they chose not to use them because:

- The cooperative strategies are not effective with special ed students (mentioned by 2 teachers on the Follow Up Survey).
- Special Ed students are not independent enough to use these strategies (Telephone Interview).
- Groups of two is the largest you can use with this age (Telephone Interview).
- There wasn't time enough to use the cooperative strategies along with the activity (Telephone Interview).
- I just haven't gotten in the habit (Follow Up Survey).
- Their classes work better individually; when working cooperatively students have a hard time staying focused (mentioned by 2 teachers on the Follow Up Survey).
**Finding:** Focus on Social Learning

The majority of teachers who used MathLinks activities helped to focus students on the social skills needed when working with others; for example, helping children learn to make decisions, play responsibly, and work with others. Those who included this focus reported it was effective for students. Most often, those who did not provide this social focus chose instead to focus on the math concepts and procedures involved in the MathLinks activity.

Among the teachers on the follow up survey who said they use MathLinks activities, most discussed with the students the social skills used in working together:

- 78% report focusing on social learning during MathLinks activities in class such as helping children learn to make decisions, play responsibly, and work with others
- these teachers reported that the focus on social learning was effective (4.07, sd=.47).

Three of four teachers during the telephone interviews also agreed that they focused on social learning during the MathLinks activities. They mentioned that:

- That is part of Kindergarten.
- We talk about what to do you if you have a problem, how to solve it; if you have a question, who can you ask.

Those who chose not to focus on social learning explained that they spent their time on the math activity:

- Chose to focus on the math concepts instead (2 mentions, Follow Up Survey).
- Students already get social focus in their reading program. Instead, used the time to make clear what students were to do at home with this activity (Telephone Interview).
Findings on Family Involvement

√ Finding: Introducing MathLinks to Parents/Home Partners

The majority of teachers on the survey and all of teachers in the telephone interviews report introducing the MathLinks program to home partners. Most often this introduction was made through letters and newsletters sent to students’ homes. Those who did not introduce MathLinks to home partners reported it was because they did not have the opportunity to introduce the program at the beginning of the school year.

Among those teachers who used MathLinks in their classrooms, overall about three-quarters report introducing MathLinks to home partners:

- 78% report introducing MathLinks activities to home partners (Follow Up Survey).
- Eleven teachers mentioned using a letter or newsletter to provide this introduction to home partners (Follow Up Survey).
- In addition, two teachers reported using conferences, and three teachers reported using other meetings with parents (math night, parent night, adult ESL class) to introduce MathLinks to parents (Follow Up Survey).
- All four teachers in the telephone interviews using MathLinks introduced the program to home partners.
- All four teachers in the telephone interviews used letters and newsletters to introduce MathLinks to parents. One teacher in this group also talked about it at their back to school night.

The follow up survey revealed that about one-fifth of teachers using MathLinks in their classes did not introduce MathLinks to home partners, generally because they were trained in MathLinks after the start of the school year:

- Among teachers using MathLinks, 22% report not introducing MathLinks activities to home partners.
- Three teachers mentioned that they did not introduce the program to home partners was because they were trained in the MathLinks program too late in the year, and they missed the opportunity to mention it at back to school night or during parent conferences.
- Difficult to introduce to parents in the middle of the year (Follow Up Survey).
√ **Finding: Home Partner Engagement**

In addition to indications of parent involvement based on the rates of return of At Home activities described earlier, there is some evidence that parents who participated in the *MathLinks* activities at home, responded quite favorably.

Three of the four teachers who used *MathLinks* and were interviewed by telephone reported receiving positive feedback about the program from home partners. Home partners enjoyed the activities and liked being involved.

- It is exciting to have the activities in Spanish. It made a big difference to Spanish speaking parents to understand what was going on. Often these parents don’t return anything, and with the Spanish *MathLinks* pages, they did.

- The parents liked that it was very clear what to do, and enjoyed being part of math rather than just skill and drill homework. Parents really want math homework they can understand, and from the instructions they knew just what to do. For five or six of my students, it became more of a cooperative exploration than just getting homework done, since others (parents and siblings) were participating with them.

- A strength is that the teacher makes the activity known to the students, and then the students take it home and teach it to parents. The children guide the parents, because parents won’t take the time to read instructions.
Findings on Student Impact

Finding: Student Reaction to MathLinks

Teachers report that students enjoyed the At School MathLinks activities, particularly because the activities are hands on and experiential. Teachers were less able to comment on student responses to the At Home activities portion of the MathLinks program.

Overall teachers reported on the follow up survey that students enjoy the MathLinks activities in class.

- Teachers agreed that student responses to the classroom activities have been positive (4.24, sd=1.03), though the relatively high standard deviation suggests not all teachers felt equally strong about this.

Teachers comments during the telephone interview supported this overall finding, highlighting student engagement with the hands-on activities both in school and at home.

- They have been very excited. They like it and need to be hands on and manipulative. Also it is very learning appropriate for kindergarten.
- They were excited, motivated, and wanted to do it. The more hands on an activity is, they more excited they get. With this they were able to be loud, talk to their friends, etc.
- Very positive. They enjoyed the activities a lot. They were excited to teach their parents how to do the activities.
- They love hands on activities, and these activities can be simplified for them. They’ve really gained from the activities. They have requested to repeat some activities, and I think they were disappointed not to be able to do them at home with their families.
- They (the children) were excited about it. We gave them the straws, and they liked to have something to take home.
- Got good feedback from parents, and the kids loved it.
- I liked that they are interactive, and this motivated children to find someone to work with - they really wanted to do this with a parent. I loved seeing the comments from students and parents - they were overwhelmingly very good, and wanted to do more.
- It went very well in class.
However, **teachers did not consistently respond that the student responses to MathLinks At Home activities were positive.** This could be that teachers do not feel they can report on what happens with activities they do not see. Because the telephone interviews did not address this topic, there are no additional data to clarify this rating.

- Overall, teachers were only slightly positive (3.38, sd=1.50), when rating student responses to MathLinks home activities. The high standard deviation indicates that some teachers agreed, while others disagreed with the item.

√ **Finding: Student Discussions of Mathematics**

Teachers did not clearly address the topic of the impact of MathLinks on student discussions of mathematics. They report that they did not have enough time and/or experience with the program to estimate its impact on students, nor could they clearly separate the impact of the MathLinks program from the other programs they used during the school year.

On the follow up survey, **teachers did not consistently respond to the issue of MathLinks’ impact on student discussions of mathematics.**

On the follow up survey, overall teachers were only somewhat positive that MathLinks had helped students have deeper discussions of math with each other, with teachers, or with home partners (3.44, sd=.98; 3.50, sd=.86; 3.13, sd=1.13 respectively). These averages in the middle of the 5-point scale are a result of some teachers agreeing, and others disagreeing, with these item. Given the comments from the telephone interviews reported below, the disagreement most likely stems from teachers feeling they could not assess the impact of the MathLinks activities used this year.

None of the teachers in the telephone interviews using MathLinks felt they could answer whether MathLinks had created changes in student discussions with each other, with teachers, or with home partners. These teachers felt that they could not separate the impact of MathLinks from other programs, or that they did not have enough experience with MathLinks throughout the year to make this assessment.

- I can’t say what MathLinks has done alone because we have made a number of additions to our math program. But MathLinks definitely enriches the program.
- Our math program is very language based. These changes have occurred, but not due to MathLinks since I haven't done many activities. I would think that MathLinks would definitely have this impact, but right now it is hard to comment.
- I really can’t say, we only did six lessons.
Summary and Conclusions

The *MathLinks* staff development workshops were, from the participants’ perspective, quite successful. Teachers enjoyed the workshops, and felt motivated by the experience. Teachers report that the workshops were of high quality and very well presented. Because teachers were engaged by participating in the activities, they report leaving the workshops feeling prepared to implement the *MathLinks* program.

The true rate of use is likely to be closer to the rate of those reported through the telephone interviews (50%) than the rate reported in the follow up survey (78%). On average they used four activities in four to six months. Many of those who did not use *MathLinks* activities during this period report that they plan to use *MathLinks* in the future. The majority did not do so this year because of a lack of time for any additional programs.

Among those who used the program, teachers provided very positive feedback regarding the *MathLinks* materials. They found the books to be very clear, and appreciated that the pages were ready to copy and use in class. Teachers reported that students enjoyed the *MathLinks* activities, particularly because they are hands on and experiential. The Spanish translations of the activities were effective at including Spanish-speaking family members, who might not otherwise have been able to participate in the activities. The relatively few suggestions for improving the materials addressed binding and lay-out.

A major strength of the program is that the concepts covered in the *MathLinks* activities fit well with the mathematics curricula teachers use in their classroom lessons. The major challenge teachers report regarding the program was finding the time to use *MathLinks*, particularly the Back at School discussion.

Some teachers also report struggling with how to overcome the low return rates of At Home activities. The average return rate of completed At Home activities was 60%, though this ranged from 0-100% of students across all respondents. There is some evidence that those with lower return rates for the At Home activities find it more difficult to schedule Back at School discussions and reviews.

All teachers used modeling to introduce the activities to students, and reported this to be an effective technique. In addition, approximately three-quarters of teachers used the cooperative strategies and the social focus of the program in addition to the mathematics activities. Those who included these elements found them to be effective learning opportunities for their students. Those who did not use them, however, did so because they believed this type of work is not effective or appropriate for their students, or were using these strategies elsewhere in their teaching.
Most (though not all) teachers who used *MathLinks* this year introduced the program to home partners. Generally, they sent home letters about *MathLinks* or included a description of *MathLinks* into newsletters. With the opportunity to start earlier in the school year next time, teachers report they plan to introduce the program during Back to School visits in the fall of the next school year.

Teachers could not, however, consistently report on the involvement of home partners during the At Home portion of the lessons, most likely because they were not present for that portion of the activity. They were also not in agreement regarding the impact of the *MathLinks* program on their students’ conversations about math. Some teachers felt they had not used enough activities, and/or could not separate the impact of *MathLinks* from the impact of other programs they use during the school year.

In all, the *MathLinks* program appears to have great promise and enjoys the support of most teachers. Teachers are enthusiastic about the program, and report that it has worked well in their classrooms to engage students and demonstrate mathematics concepts relevant to their curricular lessons. Given the positive responses teachers provided regarding the staff development experience, the quality of the *MathLinks* materials, and student experiences in class, it seems reasonable to expect a positive impact on students over time.
Appendix A

Workshop Evaluation Instrument ......................................................... 27
Follow up Survey Instrument ................................................................. 29
Telephone Interview Instrument ............................................................. 31
MathLinks™ Workshop Evaluation
City, State Date

1. Please indicate:
   a) Your School: _____________________________
   b) If applicable, what grade level do you teach? (Circle all that apply.) K 1 2 N/A
   c) If you are not a regular classroom teacher, please describe your role:
       _______________________________________________________________________
       _______________________________________________________________________

For each question below, please circle the number that best corresponds with your answer
where 1 = not at all and 5 = to a great extent
(Circle one number for each item.)

To what extent:

2. Was the presenter responsive to participants? ........ ........ ........ 1.......2 ......3.......4.......5
3. Was the presenter clear and to the point?....... ........ ........ ........ 1.......2 ......3.......4.......5
4. Was the time allotted adequate for the amount of information presented?........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
5. Have you had an opportunity to voice any concerns or questions? ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
6. Do you understand the goals of MathLinks? ... ........ ........ ........ 1.......2 ......3.......4.......5
7. Do you understand the format (layout) of MathLinks? ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
8. Do you understand how MathLinks combines social and mathematical learning for children? ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
9. Do you feel prepared to use MathLinks?........ ........ ........ ........ 1.......2 ......3.......4.......5
10. Do you feel prepared to use cooperative strategies (Tea Party, Turn to Your Partner, Think-Pair-Share, Partner Q&A) to support children’s thinking during MathLinks activities? ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
11. Do you feel prepared to introduce MathLinks to parents? ..... ........ 1.......2 ......3.......4.......5
12. Do you feel MathLinks will fit with and support your mathematics curriculum? ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ ........ 1.......2 ......3.......4.......5
13. Please use the space below to explain your answers to any of items 2 through 12 for which you circled a ‘1’ or a ‘2.’ (Indicate the item number with your comments.)

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
Please rate the extent to which each of the following components of this workshop helped your learning and understanding. (Circle one number for each item.)

<table>
<thead>
<tr>
<th>Component</th>
<th>not at all</th>
<th>to a great extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. The overview of the MathLinks program</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15. Viewing the “Comparing Girths” video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Experiencing and discussing the MathLinks activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Planning ways to introduce the MathLinks program to parents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Please use the space below to explain your answers to any of items 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>through 17 for which you circled a ‘1’ or a ‘2.’ (Indicate the item number with your comments.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. What did you like best about the workshop?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. What areas do you feel you need further information/clarification on?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. How do you feel the workshop could be improved for others in the future?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MathLinks Follow Up Survey

1. What grade level do you teach? (Circle all that apply.) .. .......... ........... ......................K ....... 1 ....... 2

2. How many years of experience do you have teaching elementary grades? ________________

3. If you are not a classroom teacher, please describe your role: ________________________________

4. Have you used MathLinks activities with your class this year?
   - Yes: How many activities? ________________
   - No: Why not? ______________________________________________________________________

   If you answered no to item 4, please skip to item 21.

5. When using MathLinks activities, which elements do you typically use? (Check all that apply.)
   - At School activity   - At Home activity   - Back at School activity

6. For a typical MathLinks activity, what percentage of students bring in completed activities from home? ________ %

7. Have you introduced MathLinks activities to home partners?
   - Yes: How did you introduce it? (For example, sent home a letter, at Back to School Night)
     ________________________________________________________________________________
   - No: Why not? _____________________________________________________________________

8. Have you used modeling to introduce MathLinks activities in class?
   - Yes: How effective has this modeling been to promote children’s involvement in MathLinks activities?
     (Please rate the extent of effectiveness by circling a number.)
     Not at all effective  1  2  3  4  5  Highly effective
   - No: Why not? _____________________________________________________________________

9. Have you used cooperative strategies (such as Turn to Your Partner or Think, Pair, Share) during MathLinks activities?
   - Yes: How effective have these strategies been to encourage all children to talk about their thinking?
     (Please rate the extent of effectiveness by circling a number.)
     Not at all effective  1  2  3  4  5  Highly effective
   - No: Why not? ___________________________________________________________________
10. Have you included a focus on social learning during *MathLinks* activities? (For example, helping children learn to make decisions, play responsibly, and work with others.)

- Yes: How effective has focusing on social learning been for your children?  
  *(Please rate the extent of effectiveness by circling a number.)*  
  Not at all effective 1 2 3 4 5 Highly effective

- No: Why not? ________________________________________________________________

**Please rate the extent to which you agree with each statement.**  
*(Circle one number for each item.)*

<table>
<thead>
<tr>
<th></th>
<th>strongly disagree</th>
<th>strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Home partner responses to <em>MathLinks</em> have been positive</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>OR</td>
<td>I have not received any responses from home partners</td>
<td></td>
</tr>
</tbody>
</table>

12. Home partners have been very involved in the *MathLinks* activities

13. Student responses to *MathLinks* classroom activities have been positive

14. Student responses to *MathLinks* home activities have been positive

15. *MathLinks* has helped deepen students discussions of math with each other

16. *MathLinks* has helped deepen students discussion of math with me and/or other teachers

17. *MathLinks* has helped deepen students discussion of math with home partners

18. *MathLinks* has been easy to link to my mathematics curriculum

19. The *MathLinks* materials are clear and easy to use

20. What changes would you suggest to improve the *MathLinks* materials?

21. The *MathLinks* workshop prepared me to use *MathLinks* activities in my classroom

22. What changes would you suggest to the workshop to better prepare teachers to use *MathLinks*?
Telephone Interview
March, 2003

Interviewee

Length of interview: ______________ Date: ______________

Name: ___________________________ Phone: ______________

City, State: __________________________

School: __________________________

Grade level: __________________________

Introduction

Thank you for helping us in the evaluation of the MathLinks program. My conversation with you today is part of a larger follow up project, where I am working to learn how teachers use and react to the ML staff development and materials. What you tell me will remain confidential, and will only be identified as being from the [Baton Rouge] region. My main focus is to find out how effectively the ML staff development and materials work for you and your students. Do you have any questions before we begin?

Have you used ML this year?

If not, use “No” sheet.

If so, about how many activities?

How often have you used these activities?

What was the last ML activity you used in your class?

What, if anything, was successful?

What issues or concerns arose? (ex: homework return rate, students w/o home partners)

Was your experience with this activity fairly typical of how things have gone for you with MathLinks? If not, how did it differ?

We are interested in how you use the different elements of the ML activities. Among the ML activities you have used in class, how often did you use the:

  in class activity?
  at home activity?
  back in class activity?
When doing the activities in class, how often do you:
  use modeling to introduce the activities in class? How?
  use cooperative strategies, such as Turn To your Partner, or Think Pair Share? Have you included a focus on social learning in any way? How?

How would you describe the student response to ML activities?

How would you describe parent/family responses to ML activities?

What is the typical return rate of the home activities? Why?

Have you introduced ML to parents/families? How?

I’m wondering whether you have noticed any impact of ML on your students. Have you noticed any:
  Changes in children’s discussion of math with each other? Describe.
  Changes in children’s discussion of math with you/other teachers? Describe.

We are interested in the extent of parent/family involvement in ML.
  First, how would you describe their involvement in the mathematical aspect of ML?
  Second, how would you describe their involvement in the social focus of ML?

**Workshop and Materials**

How would you describe the clarity and usefulness of ML materials?

How could the ML materials be improved? Suggestions?

How well would you say the ML workshop prepared you to use ML in your classroom?

What changes would you suggest to improve the workshop?

Do you have any other comments or suggestions regarding MathLinks?

*Thank you very much for your time today. Your answers have been very helpful.*
“No” Sheet
Use if teachers have not used MathLinks program

Why have you not used MathLinks?

Is there anything else that could have been addressed in the workshop that would have better prepared you to use MathLinks?

Are there other types of support or resources (from DSC, your district or your school) that would have made it possible for use to use MathLinks this year?

Do you plan to use MathLinks in the future? Why/why not?

Thank you very much for your time today. Your answers have been very helpful.