

Children's Mathematics Achievement: The Role of Parents' Perceptions and Their Involvement in Homework

Kathy Pezdek, Tiffany Berry, and Paul A. Renno
Claremont Graduate University

Two studies examined the accuracy of parents' assessment of their children's mathematics performance and how this relates to the time parents spend on children's homework. Fourth, 5th, and 6th graders completed a mathematics test. Their parents then predicted their child's test performance. Parents overestimated their children's mathematics scores (Study 1: 17.13%; Study 2: 14.40%). The time parents spent helping their children with mathematics homework was unrelated to children's mathematics performance, parents' predictions of their children's mathematics performance, and the accuracy of parents' predictions of their children's mathematics performance. Although increasing parents' knowledge of their children's mathematics competency should remediate poor mathematics performance of U.S. children, neither homework nor traditional report cards effectively inform parents regarding their children's mathematics performance.

How do parental perceptions of their children's mathematics performance and parents' involvement in children's homework affect children's mathematics performance? The interaction of these three variables has not been examined in the research on mathematics performance. The focus here specifically on mathematics ability is important given the relatively poor math ability of U.S. children in the face of the relatively high level of parental satisfaction with children's mathematics achievement in America.

The poor mathematics performance of U.S. children relative to children of other nations is well documented. In a study assessing the mathematical achievement of 13-year-olds in Korea, Spain, the United Kingdom, Canada, Ireland, and the United States, U.S. students had the lowest mean scores of any country in the study (LaPointe, Mead, & Phillips, 1989). Several studies comparing U.S., Japanese, and Chinese students have also reported the relatively poor mathematics performance of U.S. children (Stevenson et al., 1990; Stevenson, Lee, & Stigler, 1986; Stevenson & Stigler, 1992). And even within the United States, Huntsinger, Jose, Larson, Krieg, and Shaligram (2000) recently reported superior mathematics achievement among second-generation Chinese American primary school children than among European American primary school children.

One of the surprising findings in the studies reported by Stevenson and his colleagues (Stevenson et al., 1990; Stevenson et al., 1986; Stevenson & Stigler, 1992) is the fact that despite the poor mathematics performance of U.S. students, parental satisfaction with their children's mathematics performance is relatively high in the United States and significantly higher than that reported by parents of children in Japan and Taiwan (Crystal & Stevenson, 1991). Further, when mothers of the fifth graders in this study were asked whether their child had problems in mathematics, only 37%

of the U.S. mothers responded affirmatively in contrast to 62% of the Asian mothers. Crystal and Stevenson (1991) concluded, "our findings suggest that U.S. parents tend to evaluate their children's mathematics skills uncritically and that their lack of awareness of the frequency or severity of children's problems reduces their effectiveness as a source of help to their children" (p. 375).

In several studies, the ability of parents to predict their child's task performance has been assessed. Although parents' predictions of their child's performance is generally positively correlated with their child's actual task performance, parents consistently overestimate their child's task performance. This fact has been reported using a range of cognitive tasks with second and fifth graders (Miller & Davis, 1992; Miller, Manhal, & Mee, 1991) as well as with first graders on Piagetian tasks and IQ tests (Miller, 1986). In the present study, we specifically assessed the relationship between parents' predictions and children's actual performance on a comprehensive mathematics test and further assessed the role of parents' involvement in children's homework in this relationship.

Although U.S. parents generally agree that parental involvement in children's education is important, few parents are effectively involved (Eccles & Harold, 1996). The major vehicle through which parents help their children with school subjects is homework. Although few studies have examined the effect of homework time specifically on mathematics achievement, several studies have examined the effect of homework time on scholastic achievement generally. In a meta-analysis of nearly 120 empirical studies of the effects of homework on scholastic achievement, Cooper (1989) concluded that increased amount of time spent on homework generally benefited scholastic achievement for high school students but had little effect on scholastic achievement for elementary school students. Similar findings were reported both by Brents-Hill et al. (1988) in their analysis of 7,690 students in third and sixth grades and by Epstein (1988) who surveyed 1,269 parents of first-, third-, and fifth-grade students. More specifically, Cooper, Lindsay, Nye, and Greathouse (1998) reported that for younger students (second and fourth grades), parents' estimates of the amount of time students spent on homework were not signif-

Kathy Pezdek, Tiffany Berry, and Paul A. Renno, Department of Psychology, Claremont Graduate University.

Correspondence concerning this article should be addressed to Kathy Pezdek, Department of Psychology, Claremont Graduate University, Claremont, California 91711. E-mail: kathy.pezdek@cgu.edu

icantly correlated with school achievement ($r = -.06$), as measured by performance on the Tennessee Comprehensive Assessment Program and were significantly negatively correlated with teacher-assigned grades ($r = -.13$). In a recent experimental study, Balli, Wedman, and Demo (1997) introduced an intervention to increase the amount of time that middle-grade students and their families spent on mathematics homework. Although the intervention did increase the amount of homework time, there was no corresponding change in the children's math achievement.

Several cross-cultural studies have examined the relationship between the amount of time spent on homework and school achievement as well. Chen and Stevenson (1989) examined the amount of time spent on homework by children and their parents in Chinese, Japanese, and U.S. schools. There was a great deal of diversity in the amount of time children spent doing homework both within and between the three cultures. However, the relationship between amount of time children spent doing homework and their school achievement (a combined score for reading and mathematics test performance) was consistently negligible. Across four studies including two grade levels (first and fifth grades) and three countries, there were 14 correlation coefficients computed between the amount of time children spent doing homework and their school achievement. Only 4 of these 14 correlations were significant; 2 were positive, and 2 were negative. Similarly, across the same 4 studies, 27 correlation coefficients were computed between the amount of time mothers spent helping their children with homework and their children's school achievement (the same combined score for reading and mathematics test performance). Of these 27 correlations, 10 were significant; each of these was negative.

The present two studies focus on U.S. children's mathematics performance and examine how accurately parents assess their children's mathematics performance and how this in turn relates to the amount of time they spend helping their children with homework. A sample of fourth, fifth and sixth graders completed a mathematics achievement test. A copy of the test was then sent home to their parents who were asked to predict their child's performance on the test. The parents then completed a questionnaire regarding how much time they spent helping their child with mathematics homework and how informed they felt they were about their child's mathematics ability.

Study 1

Method

Participants. Study 1 included the upper-grade students (fourth, fifth and sixth graders) at a public elementary school in the metropolitan Los Angeles area. Twenty-eight percent of the students in the school were not White,¹ and 19.0% qualified for free or reduced-price meals. The sample included approximately equal numbers of boys and girls at each grade level. The distribution by grade included 35.5% fourth graders, 36.8% fifth graders, and 27.6% sixth graders.

Procedure and materials. All 165 of the upper-grade students at the school completed the same mathematics achievement test developed for this study. The 45-item test included 5 each of 9 problem types. The 9 problem types reflected the 9 components of mathematical proficiency specified in the mathematics standards for upper-grade students in the school district. The problems were similar to sample problems provided in the school district's mathematics standards. The Appendix provides a sample of the items used on the math achievement test. For each of the 9

components of the test, the easiest problem and the hardest problem are included in the Appendix. The validity of the mathematics achievement test was tested by computing the correlation between the scores obtained on the math achievement test for all participants in Study 1 and Study 2 for whom Stanford 9 test scores were available ($n = 217$) and the national percentile ranks on the Total Math component of the Stanford 9 Achievement Test that was administered in the schools within 2 months of this study. This correlation was highly significant ($r = .71$).

Shortly after the students took the mathematics achievement test, a copy of the same test was sent home to all parents along with a five-item questionnaire. One parent, self-selected, completed the packet for each child. In the event that one household had more than one upper-grade student at the school, each parent was told the name of the child for whom they were completing the materials. Three waves of mailers were sent home to parents to encourage their participation. Seventy-six parents completed the first part of the materials that included estimating their child's performance on the test. Fifty-two parents completed this first part of the materials as well as the five-item questionnaire. The data for these families are reported in Study 1.

Parents were shown the 45-item math achievement test. Each of the 9 problem types was labeled in a separate section. Parents were instructed to look at the 5 problems in each section and then indicate how many of the 5 problems they thought their child would be able to get correct if he or she was taking the test. We then summed the estimated number correct across all 45 problems and compared this number with the actual number of problems correct for each child.

Parents were asked five additional questions:

1. How many minutes per day does your child spend on homework (not including free reading time)?
2. How many minutes per day does your child spend specifically on *math* homework?
3. How many minutes per day do you or your spouse spend helping your child with his or her homework?
4. How many minutes per day do you or your spouse spend helping your child with his or her *math* homework?

For each of these four questions, the estimated number of minutes was to be indicated next to the name of each day of the week. We then summed the number of minutes per week for each question and used this as the measure. Responses to each of these four questions that were beyond 3 *SDs* from the mean response for each question were not included in the analyses because the validity of such estimates was so improbable.

The fifth question was as follows:

5. How informed do you feel that you are regarding your child's performance in school in *mathematics*?
 - 1) I have no idea how my child is doing.
 - 2) I have little knowledge about how my child is doing.
 - 3) I generally know how my child is doing.
 - 4) I have pretty specific knowledge of how my child is doing.
 - 5) On a week-to-week basis I know how my child is doing.

Results and Discussion

Because the correlation between children's mathematics test scores and grade level was significant in this study ($r = .42$),

¹In the demographic materials provided to us by the schools, the ethnicity of students was reported simply as White or not White.

relationships were tested with partial correlations in which the variance in mathematics test scores due to grade level was controlled. Table 1 presents the intercorrelation matrix with the partial correlation coefficients reported between responses on the six survey items and children's mathematics achievement. Throughout this article, results are considered significant at the $p < .05$ level.

The major issue in this study concerns the relationship between parents' predictions of their children's mathematics performance and their children's actual mathematics performance. Although the correlation between these two variables was significant ($r = .56$), parents significantly overestimated their children's performance. The mean children's score on the mathematics test was 25.16 (out of 45) correct ($SD = 7.70$); the mean score predicted by parents on the same test was 32.87 correct ($SD = 7.55$). This difference was significant, $t(75) = 10.33$.

The next issue concerned the role of parents' involvement in children's homework on children's mathematics performance. Parents indicated that their children spent on average 4.70 hr per week on homework ($SD = 2.59$) and 2.10 hr per week on mathematics homework ($SD = 1.18$). Parents indicated that they helped their children on average 2.17 hr per week on homework ($SD = 2.19$) and 1.14 hr per week on mathematics homework ($SD = 1.06$). The correlation between children's mathematics achievement and the number of hours per week that parents helped their children with homework of all types ($r = -.07$) and the number of hours per week that parents helped their children with mathematics homework ($r = -.14$) were both negative and not significant. Although the correlations between children's mathematics achievement and the number of hours per week that they did homework of all types was significant ($r = .42$), the correlation between children's math-

ematics achievement and the number of hours per week that they did mathematics homework was not significant ($r = .16$).

That is, children's mathematics performance was not related to the amount of time that they spent doing mathematics homework. This finding is consistent with results reported by Chen and Stevenson (1989) with elementary school children in the United States, China, and Japan. Further, children's mathematics achievement was not correlated with the amount of time their parents spent helping them with homework. Although not significant, the fact that these correlations were negative suggests that parents spent more time with children who were not doing well in mathematics and less time with children who were doing well in mathematics.

We next computed for each child the absolute value of the difference between each parent's prediction of the number of problems their child would get correct on the mathematics test and the number of problems that their child actually got correct on the test. This measure, called the *discrepancy score*, assesses the discrepancy in parent's predictions, with a low score indicating more accurate predictions by parents. The mean discrepancy score was 7.71 on the 45-item test ($SD = 6.51$). The discrepancy scores were significantly correlated with children's actual mathematics achievement ($r = .67$): Parents were more accurate predicting the mathematics achievement of lower performing children and were less accurate predicting the mathematics achievement of the higher performing children.

Ironically, parents' discrepancy scores were not significantly correlated with their reports of how informed they felt they were regarding their child's mathematics achievement ($M = 3.44$; $SD = 0.96$; $r = -.24$). The modal response to the question

Table 1
Intercorrelation Matrix for Study 1: Partial Correlations With Grade Level Controlled

Variable	1	2	3	4	5	6	7	8
1. Child's math score ^a								
Partial r	—							
Sig.	—							
2. Parent's predicted math score ^a								
Partial r	.56	—						
Sig.	.00	—						
3. Discrepancy score								
Partial r	.67	.67	—					
Sig.	.00	.00	—					
4. Hours child spent on homework								
Partial r	.42	.56	.76	—				
Sig.	.00	.00	.00	—				
5. Hours child spent on math homework								
Partial r	.16	.40	.13	.22	—			
Sig.	.25	.004	.38	.14	—			
6. Hours parents help with homework								
Partial r	-.07	.02	-.23	-.11	.13	—		
Sig.	.64	.91	.13	.46	.37	—		
7. Hours parents help with math homework								
Partial r	-.14	.01	-.43	-.30	.14	.55	—	
Sig.	.32	.97	.00	.04	.32	.00	—	
8. How informed are parents?								
Partial r	-.08	-.01	-.24	-.23	.02	-.49	.45	—
Sig.	.57	.94	.12	.11	.90	.00	.00	—

Note. All correlations were considered significant (Sig.) at $p < .05$ (two-tailed).

^a Score is out of 45.

regarding how informed parents felt they were regarding their child's mathematics performance in school was Response Number 3, "I generally know how my child is doing."

Although parents had the perception that they were generally informed regarding their children's mathematics performance, in fact, they significantly overestimated their children's mathematics performance on average by 17.13%, and parents' discrepancy scores were unrelated to their reports of how informed they felt they were regarding their child's mathematics achievement in school ($r = -.24$). How does this relate to the amount of help they were likely to give their children with mathematics homework? The number of hours per week that parents estimated that they helped their child with mathematics homework was not significantly correlated with their children's mathematics performance ($r = -.14$) nor with parents' predictions of their children's mathematics performance ($r = .01$).

The school selected for Study 1 was a nontraditional one in which students did not receive regular report cards and letter grades. Parents of the children in this school received qualitative feedback twice a year in general content areas but did not receive quantitative feedback on specific areas of competency. Study 2 was a replication of Study 1 at two public elementary schools that use traditional report cards and are located in neighborhoods adjacent to that sampled in Study 1.

In Study 2 we tested how accurately parents assess their children's mathematics achievement and how this in turn is related to the amount of time they spend helping their children with homework in a larger sample, using two schools that provide parents with traditional report cards. It would be important to know whether providing parents with regular feedback regarding their children's mathematics performance helps enlist the parents to help their children when they are not performing well in mathematics. If so, this would be a reasonable vehicle for beginning to remediate the poor mathematics performance in U.S. schools. Although report cards and grades have been reported to be effective vehicles for communicating students' school performance to parents and teachers (Pilcher, 1994), the effectiveness of report cards has been frequently questioned and varies highly as a function of the format of the report card (Friedman & Frisbie, 1995).

Study 2

Method

Participants. Complete data sets were obtained for a total of 215 upper-grade students (fourth, fifth and sixth graders) at two public elementary schools in the metropolitan Los Angeles area. One parent, self-selected, completed the parents' survey for each child. This sample resulted from a 87.00% return rate on the part of parents. Students were from the same school district as those in Study 1. The two schools selected for Study 2 were traditional schools that used report cards providing quantitative feedback in specific standards-based academic content areas. At one of the two schools, 30.56% of the students were not White¹ and 10.21% qualified for free or reduced-price meals. At the other school, 44.85% of the students were not White, and 37.24% qualified for free or reduced-price meals. The sample included approximately equal numbers of boys and girls at each grade level. The distribution by grade included 24.00% fourth graders, 35.00% fifth graders, and 41.00% sixth graders.

Procedure and materials. The procedure and materials used in Study 2 were identical to those used in Study 1.

Results and Discussion

Because the correlation between children's mathematics test scores and grade level was significant in this study ($r = .57$), relationships were tested with partial correlations in which the variance in mathematics test scores due to grade level was controlled. Table 2 presents the intercorrelation matrix with the partial correlation coefficients reported between responses on the six survey items and children's mathematics achievement.

The major issue in this study was the relationship between parents' predictions of their children's mathematics performance and their children's actual mathematics performance. Although the correlation between these two variables was significant ($r = .63$), parents significantly overestimated their children's performance. The mean children's score on the mathematics test was 28.41 (out of 45) correct ($SD = 7.64$); the mean score predicted by parents on the same test was 34.89 correct ($SD = 6.35$). This difference was significant, $t(214) = 13.25$.

The next issue concerned the role of parental involvement in children's homework on children's mathematics performance. Parents indicated that their children spent on average 5.48 hr per week on homework ($SD = 2.67$) and 2.37 hr per week on mathematics homework ($SD = 1.49$). Parents indicated that they helped their children on average 2.13 hr per week on homework ($SD = 2.13$) and 1.21 hr per week on mathematics homework ($SD = 1.41$). Although the correlation between the number of hours per week that parents helped their children with homework of all types and their children's mathematics achievement was significant ($r = .14$), the correlation between the number of hours per week that parents helped their children with mathematics homework and their children's mathematics achievement was not significant ($r = .06$). There was, however, a modest but significant relationship between children's mathematics achievement and the number of hours per week that they spent doing mathematics homework ($r = .14$).

We next computed for each child the absolute value of the difference between each parent's prediction of the number of problems their child would get correct on the mathematics test and the number of problems that their child actually got correct on the test. If predictions of their children's performance on the mathematics test were perfect, parents' discrepancy scores would be 0. The mean discrepancy score was 6.48 items on the 45-item test ($SD = 7.17$). The discrepancy scores were significantly greater than 0 for fourth graders, $t(50) = 7.25$, fifth graders, $t(73) = 8.61$, and sixth graders, $t(90) = 7.28$. As in Study 1, the discrepancy scores were significantly correlated with children's actual mathematics achievement ($r = .57$). Parents were more accurate predicting the mathematics achievement of lower performing children and were less accurate predicting the mathematics achievement of the higher performing children.

However, as in Study 1, parents' discrepancy scores were not significantly correlated with parents' predictions of how informed they were regarding their child's mathematics achievement in school ($M = 3.60$; $SD = 0.93$; $r = .11$), nor were parents' discrepancy scores significantly correlated with the number of hours per week they spent doing mathematics homework with their child ($r = -.01$). The modal response to the question regarding how informed parents felt they were regarding their child's math-

Table 2
Intercorrelation Matrix for Study 2: Partial Correlations With Grade Level Controlled

Variable	1	2	3	4	5	6	7	8
1. Child's math score ^a								
Partial <i>r</i>	—							
Sig.	—							
2. Parent's predicted math score ^a								
Partial <i>r</i>	.63	—						
Sig.	.00	—						
3. Discrepancy score								
Partial <i>r</i>	.57	.48	—					
Sig.	.00	.00	—					
4. Hours child spent on homework								
Partial <i>r</i>	.48	.66	.73	—				
Sig.	.00	.00	.00	—				
5. Hours child spent on math homework								
Partial <i>r</i>	.14	.10	.07	.05	—			
Sig.	.04	.17	.37	.47	—			
6. Hours parents help with homework								
Partial <i>r</i>	.14	-.06	-.13	-.18	.16	—		
Sig.	.05	.38	.08	.07	.02	—		
7. Hours parents help with math homework								
Partial <i>r</i>	.06	-.08	-.01	-.10	.20	.33	—	
Sig.	.39	.26	.89	.18	.00	.00	—	
8. How informed are parents?								
Partial <i>r</i>	-.08	-.01	.11	.09	.02	-.64	.52	—
Sig.	.27	.91	.17	.22	.75	.00	.00	—

Note. All correlations were considered significant (Sig.) at $p < .05$ (two-tailed).

^a Score is out of 45.

ematics performance in school was Response Number 3, "I generally know how my child is doing."

Although parents had the perception that they were generally informed regarding their children's mathematics performance, in fact, they significantly overestimated their children's mathematics performance on average by 14.40%, and parents' discrepancy scores were unrelated to their reports of how informed they felt they were regarding their child's mathematics achievement in school ($r = .11$). How does this relate to the amount of help they were likely to give their children with mathematics homework? In Study 2, the relationship between the amount of time that parents spent helping their children with mathematics homework was not significantly related to children's mathematics performance ($r = .06$), parents' predictions of their children's mathematics performance ($r = -.08$), or children's discrepancy scores ($r = -.01$).

General Discussion

It is clear that the parents who participated in Study 1 and Study 2 perceived their children as more mathematically competent than they actually were; they overestimated their children's mathematics scores by 17.13% in Study 1 and 14.40% in Study 2. In terms of traditionally conceived letter grades, these overestimates suggest that parents assessed their children's mathematical competency to be about one and a half letter grades higher than it actually was. The two major sources of information for parents regarding their children's mathematics competency are feedback from working with their children on homework and feedback from school. Regarding the first factor, there was mixed support for the conclusion that spending more time working with their children on

mathematics homework increases parents' ability to accurately predict their children's mathematics ability. Although the correlation between discrepancy scores and the number of hours parents worked with their children on mathematics homework was significant in Study 1 ($r = -.43$), in the larger sample included in Study 2, this relationship was not significant ($r = -.01$). Working with their children on the type of mathematics assignments that were sent home as homework was not a reliable vehicle for parents to convey information regarding their children's mathematics competency.

It was surprising as well to learn that for children, spending more time on mathematics homework only modestly improved their mathematics performance (in Study 1, $r = .16$; in Study 2, $r = .14$). This finding is consistent with results reported by a number of researchers who reported a negligible relationship between the amount of time primary school children spend on homework and their scholastic achievement in general (Brents-Hill et al., 1988; Chen & Stevenson, 1989; Cooper, 1989; Cooper et al., 1998; Epstein, 1988). The results of the present study replicate these findings within the specific domain of mathematics and relate these findings to parents' predictions of their children's mathematics performance. Together, these findings suggest that for elementary school students, typical mathematics homework assignments provide little added value beyond the mathematics instruction and practice provided in the classroom. This finding is consistent with findings of Muhlenbruck, Cooper, Nye, and Lindsay (2000) that whereas secondary school teachers more often used homework to prepare for and enrich classroom lessons, primary school teachers used homework to review class material.

Similar patterns of results were obtained in both Study 1, with a nontraditional school that does not use report cards and letter grades, and in Study 2, with two traditional schools that do use report cards and letter grades. The difference between the degree to which parents overestimated their children's math competency in Study 1 (17.13%) and Study 2 (14.40%) was not statistically significant, $t(289) = 1.32$. This suggests that report cards per se probably should not be relied on as an effective vehicle for communicating to parents regarding children's specific mathematics competencies.

These results offer one explanation for why parents of U.S. students are generally satisfied with their children's mathematics competency despite the children's poor mathematics competency relative to children in other countries (Crystal & Stevenson, 1991). This explanation is that the information that U.S. parents have about their children's mathematics competency biases them to perceive their children as more mathematically competent than they are. U.S. parents are not simply poorly informed about their children's mathematics competency. If parents were generally poorly informed regarding their children's mathematical competency, some parents would overestimate and some would underestimate their children's mathematical competency. Across both studies reported here, 84% of the parent's overestimated and 13% underestimated their children's mathematics score. Further, the parents who overestimated their children's mathematics score did so by an average of 8.70 points (out of 45) and those who underestimated their children's mathematics score did so by an average of 3.86 points.

There are several possible explanations for why U.S. parents are biased to perceive their children as more mathematically competent than they are. First, if children's homework is not sufficiently challenging, parents would see their children perform with ease homework that does not reflect their expected level of performance. Second, feedback from school may not be sufficiently detailed or critical to inform parents about their child's mathematical competency in specific domains. Third, perhaps U.S. parents themselves are not competent at math and do not perceive this as a shortcoming (i.e., this is reflected by a parent in the study who said, "I was never very good at math, and my life's been pretty good"). Accordingly, they gloss over their own children's marginal mathematical competency as a way of diminishing the problem in both themselves and their children. Future research is necessary to determine the role of these factors, as well as others, in affecting parents' perceptions of their children's actual mathematical competency.

In the mean time, this research presents a call to action. Parents are not likely to be providing their children with additional help learning mathematics if they inaccurately perceive their children to be more mathematically competent than they actually are. Accordingly, increasing the accuracy of parents' perceptions of their children's mathematical competency may be a reasonable first step toward remediating the poor mathematics performance of children in U.S. schools.

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Appendix

Sample Test Problems: The Easiest and the Hardest Problem From Each Section of the Mathematics Test Used in This Study

Section 1: Addition Concept

1.
$$\begin{array}{r} 27 \\ + 60 \\ \hline \end{array}$$
5. Compare. Write $<$, $>$ or $=$
 4×600 _____ $1,200 + 1,200$

Section 2: Measurement

1. How many inches are in one foot? _____
5. If 1 inch on a map represents 50 miles, then 1.5 inches represents _____ miles.

Section 3: Decimals

1.
$$\begin{array}{r} 7.2 \\ + 1.9 \\ \hline \end{array}$$
5. Write as a decimal: $7/15 =$ _____

Section 4: Problem Solving

1. One morning 2 squirrels were storing acorns for the winter. One squirrel stored 14 acorns and the other stored 11 acorns. **How many total acorns did they store that morning?**
- 3
 - 27
 - 25
 - 30
5. It is Becky's birthday. Becky wants to give 3 cookies to each of her 21 classmates. She also wants to give her teacher 6 cookies. **How many total cookies does she need?**
- 30
 - 51
 - 69
 - 75

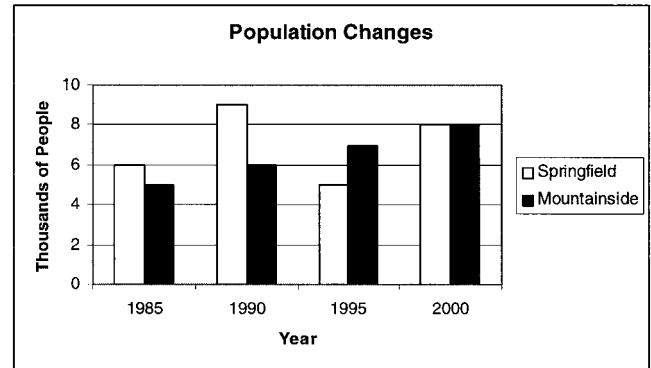
Section 5: Fractions

1. Change the decimal to a fraction: $.70 =$ _____
5. $\frac{1}{2} \div \frac{3}{4} =$ _____

Section 6: Statistics and Graphing



A total of 10 marbles is put into a bag. There are 3 green marbles, 2 red marbles and 5 white marbles.

1. If you reached into the bag to take out one of the marbles, what is the probability of selecting one green marble?
- 10%
 - 20%
 - 30%
 - 50%



5. Using the graph above, determine how many people lived in Springfield in 1990? _____

Section 7: Geometry

1. Write the name of this figure: _____
- 
5. Find the area of this square: _____
- 

Section 8: Multiplication

1.
$$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$$
5.
$$\begin{array}{r} 3264 \\ \times 9142 \\ \hline \end{array}$$

Section 9: Division

1. $64 \div 8 =$ _____
5. $12048 \div 40 =$ _____

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