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## ABSTRACT

This paper reports on a nationwide, random telephone survey conducted with parents and teachers of children in kindergarten through fifth grade. The survey measured parents' and teachers': (1) interest in and attitudes toward science; (2) comfort level teaching and talking about science; (3) use of hands-on science activities and teaching methods; (4) perceived support for science reform in school systems; and (5) overall assessments of the current and future status of science education. While parents and teachers view science as a very important subject for children in grades K-5, teachers do not feel highly qualified to teach science. Most teachers also feel that the current emphasis on science education in the schools should increase, and most feel that there should be an increase in the use of the hands-on approach to science instruction. Providing teachers and parents with training, support, and materials may be the first step to achieving true science education reform. (AA)

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**THE BAYER FACTS OF SCIENCE EDUCATION:  
AN ASSESSMENT OF ELEMENTARY SCHOOL  
PARENT AND TEACHER  
ATTITUDES TOWARD SCIENCE EDUCATION**

*Executive Summary*

**APRIL 1995**

**PREPARED FOR:**

**Bayer Corporation  
1 Mellon Center  
500 Grant Street  
Pittsburgh, PA 15219-2507**

**IN COOPERATION WITH:**

**The National Science Foundation's  
National Science and Technology Week**

**PREPARED BY:**

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**THE BAYER FACTS OF SCIENCE EDUCATION:  
AN ASSESSMENT OF ELEMENTARY SCHOOL  
PARENT AND TEACHER  
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***Goals of the Research***

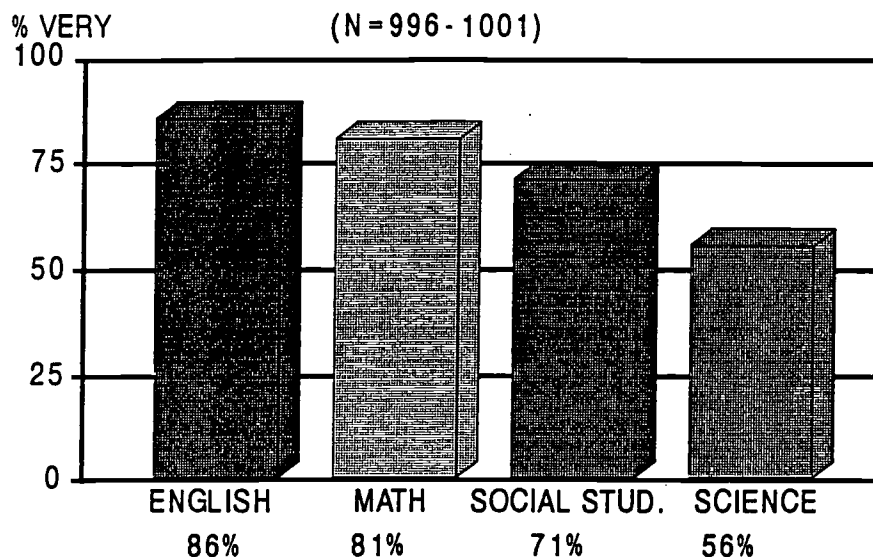
A nationwide, random telephone survey was conducted with parents of children in kindergarten through fifth grade and teachers of kindergarten through fifth grade to measure:

1. interest in and attitudes toward science;
2. comfort level teaching and talking about science;
3. use of hands-on science activities and teaching methods;
4. perceived support for science reform in the school systems; and
5. overall assessments of the current and future status of science education.

***Methodology***

In the spring of 1995, a telephone survey was conducted with 1000 parents and 1004 teachers of children in grades K-5. The calls were nationwide and were completely random. Each survey took approximately 12-14 minutes to complete, and all calls were supervised and monitored. Parents and teachers responded to qualitative items designed to measure their attitudes toward science and science education. All responses were processed using the statistical package SPSS. This Executive Summary presents the highlights of the research findings.

### TEACHER RATINGS OF QUALIFICATIONS



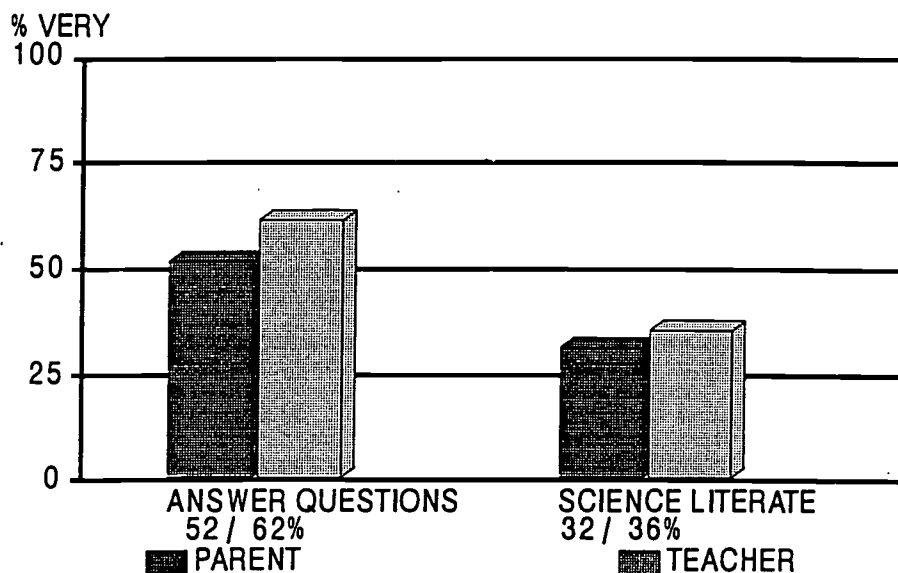
	English	Mathematics	Social Studies	Science
4 = Very	86%	81%	71%	56%
3 = Somewhat	12	16	25	40
2 = A little	1	2	3	4
1 = Not at all	1	1	1	1

\* Teachers consider themselves well qualified to teach all major subjects, but less qualified to teach science. When teachers rated themselves in terms of how well-qualified they were to teach various subjects, they reported being most qualified to teach English and Mathematics and less qualified to teach Social Studies and, especially, Science.

- over eight in ten felt very qualified to teach English and/ or mathematics;
- seven in ten felt very qualified to teach social studies; and
- over half felt very qualified to teach science.

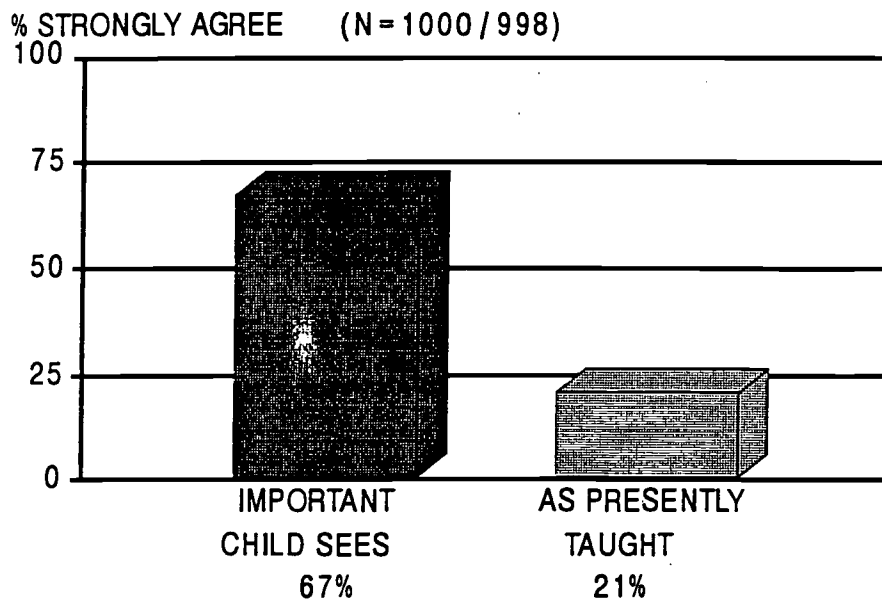
### PARENT AND TEACHER COMFORT LEVEL

(N = 982 - 1000)

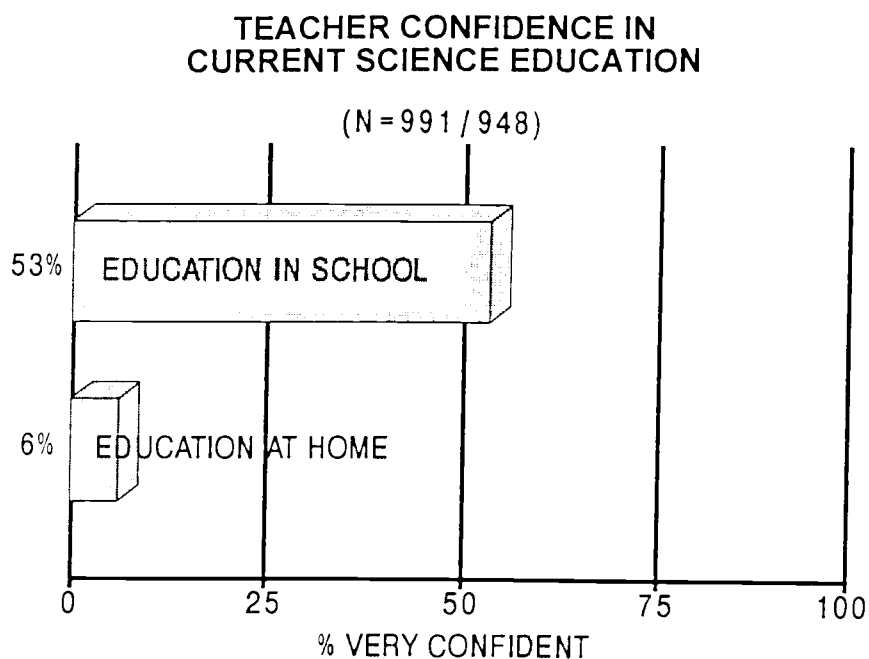


- \* The graph above shows that while half of the parents of children in grades K-5 and six in ten teachers said that they felt very comfortable answering their students'/ child's questions about science, only about one-third considered themselves very "science literate" -- defined as being a person who can understand stories about science on TV, in newspapers, or in magazines.

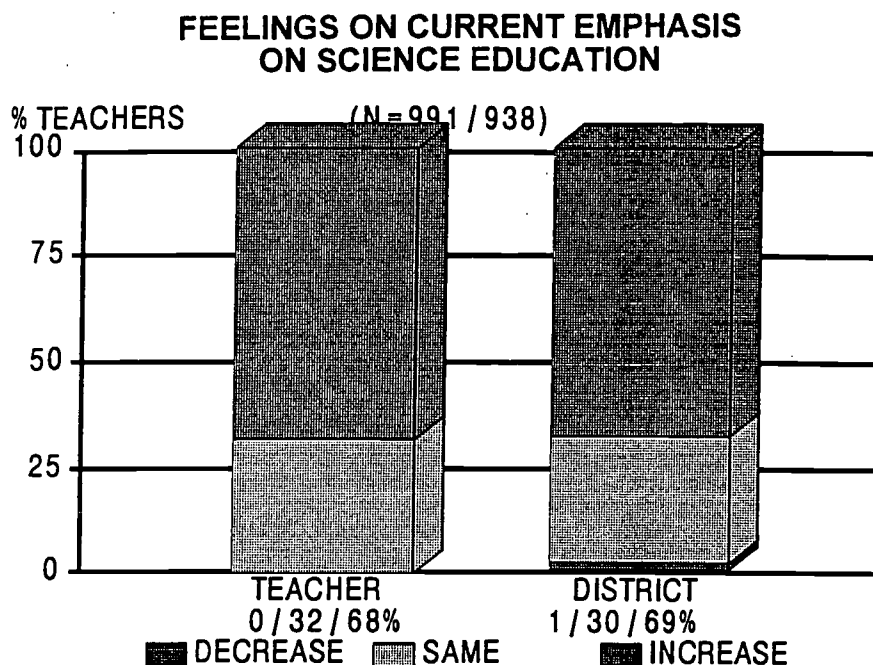
# SCIENCE AS EXCITING, CREATIVE. AND INTERESTING



- \* There are strong feelings among parents that science is important for their children. A majority strongly agreed that they want science to be exciting, creative, and interesting for their child.
- \* However, only two in ten parents strongly agree that as it is presently taught, science is an exciting, creative and interesting subject.



- \* Over half of the teachers said that they are very confident that their students are getting a good science education **in their school**.
- \* Yet, teachers are less confident that their students are getting a good science education **at home**, with fewer than one in ten saying they are very confident.

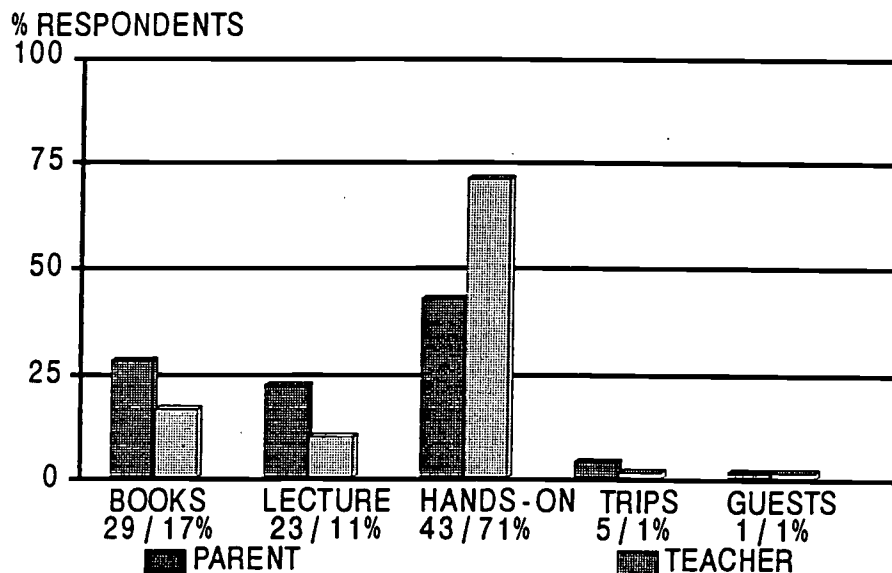


- \* A majority of teachers felt that the current emphasis on science education in their school should increase.
- \* A majority of teachers also reported that their school and district administrators feel that this emphasis should increase.
- \* About one-third of the teachers said that they and/ or their administrators were satisfied with the current level of emphasis on science education.



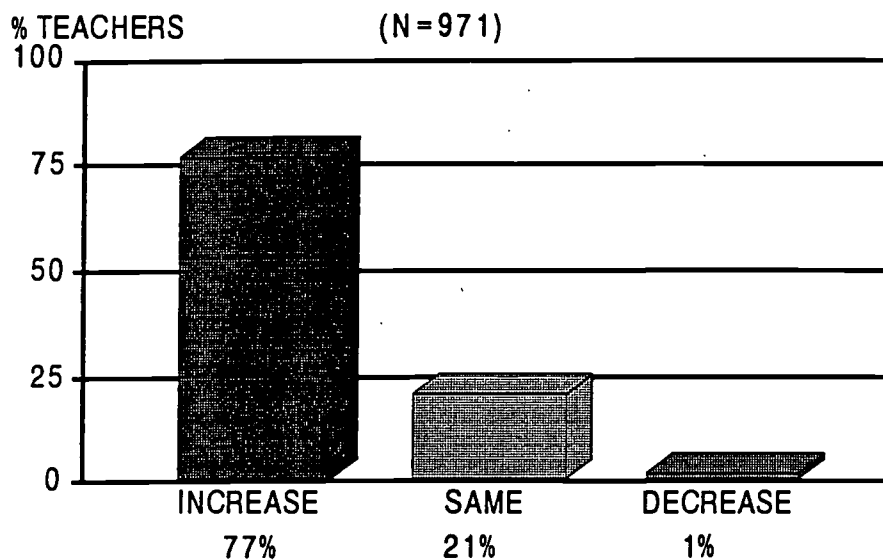
## SCIENCE TEACHING METHOD

(N = 970 / 898)



- \* Parents and teachers differ in their perceptions of what was happening with science instruction in the classroom.
  - Over half of the parents see more traditional methods of teaching being used as the main method of teaching their child science -- textbooks and teacher led discussions or lectures. Four in ten mention hands-on science as the method most often used.
  - However, seven in ten teachers say that the most frequent method they use to teach science is the hands-on approach.

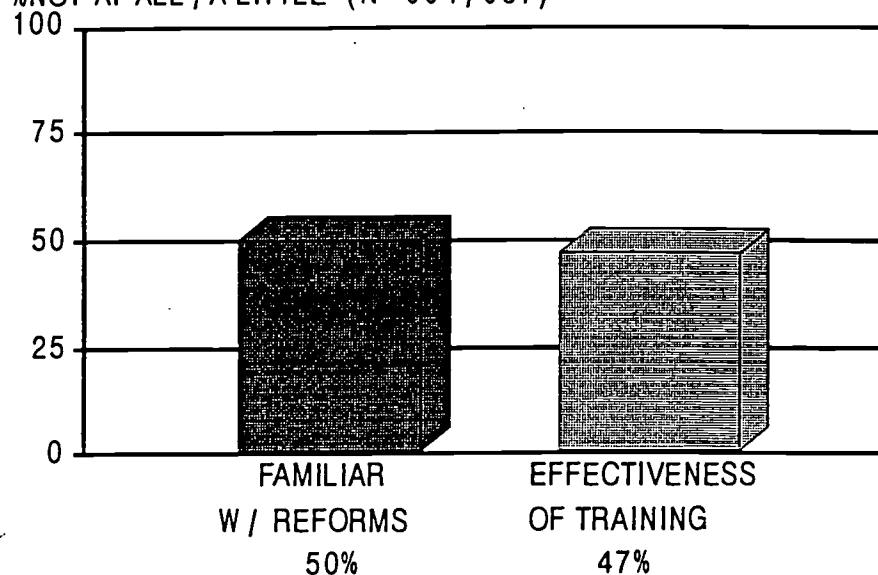
### LEVEL OF HANDS-ON ACTIVITY INSTRUCTION



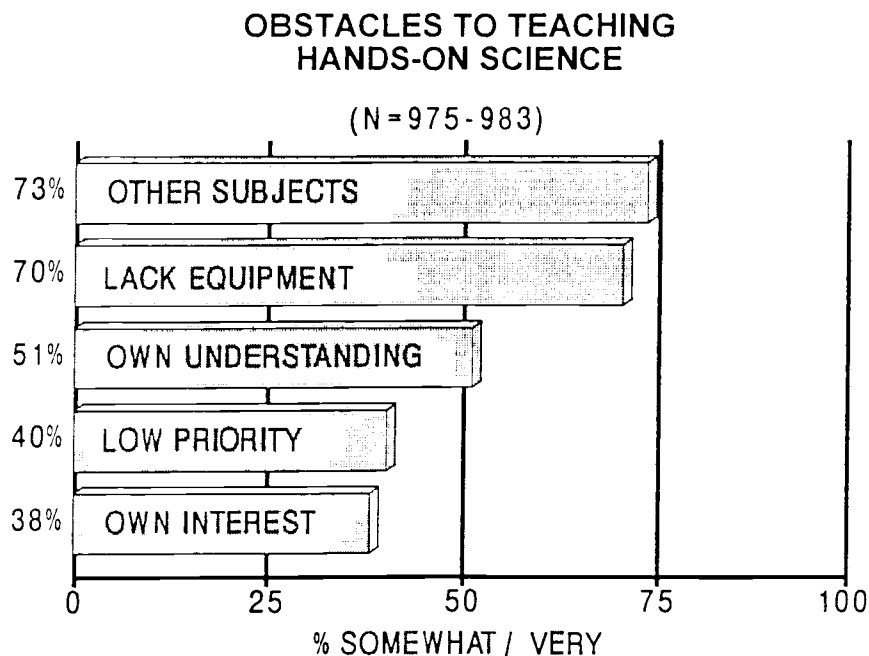
- \* Most teachers (over three-quarters) believe that the level of hands-on science instruction and experimentation used should increase.
- \* Less than one-quarter of the teachers said that the level of hands-on science instruction and experimentation used should stay at the current level.
- \* Few teachers felt that the level of hands-on science instruction and experimentation used should decrease.

## TEACHER SUPPORT FOR HANDS-ON EMPHASIS

%NOT AT ALL / A LITTLE (N = 994 / 987)

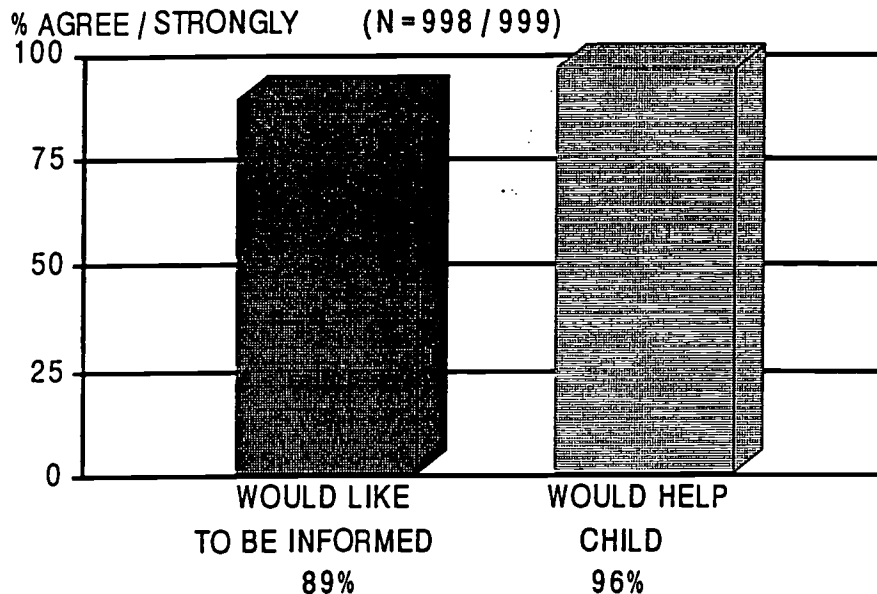


- \* Overall, half of the teachers said that they are not at all or a little familiar with recent recommendations for science education reform that may change K-grade 5 instruction, including national recommendations, benchmarks, and new national standards:
- \* In terms of being prepared to move ahead with hands-on science instruction, many teachers may lack effective training. Almost half said that that their course work or training to become a teacher or to teach science was not at all or a little effective.



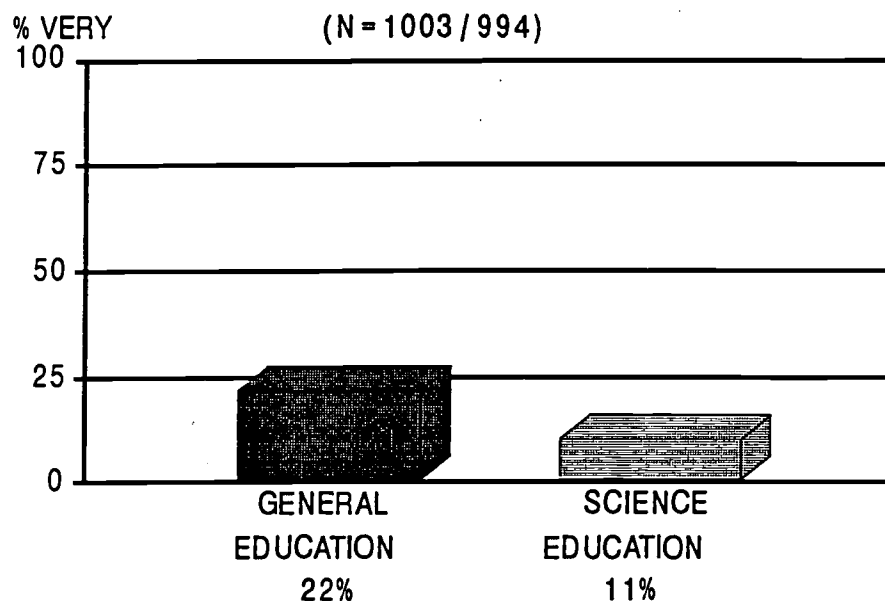
- \* The most important obstacles, as rated by teachers, to their teaching of hands-on science were:
  - other subjects requiring their teaching time (39% somewhat; 34% very); and
  - lack of equipment (35% somewhat; 35% very).
- \* Less important to teachers was their own lack of understanding enough science (29% somewhat; 22% very).
- \* Even less important obstacles were seen to be:
  - a low priority among administrators for hands-on science (24% somewhat; 16% very); and
  - teacher's own lack of interest in more hands-on instruction (18% somewhat; 20% very).
- \* Half of the teachers either agree (36%) or strongly agree (14%) that their are no real obstacles to their teaching hands-on science to their students. However, three in ten disagreed (32%) and one in ten (11%) strongly disagreed that they did not face any obstacles.

## PARENT INVOLVEMENT IN SCIENCE EDUCATION



- \* Almost all parents agreed (62% agreed, 27% strongly) that they would like to become better informed about how proposed changes for science education will affect their child.
- \* Almost all parents agreed (55%) or strongly agreed (41%) that they would spend some time each week at home helping their child with science if the school asked and provided suggestions.
- \* Most parents want to be somewhat (47%) or very (44%) involved in responding to changes in science education in their child's school, if they were to occur.
- \* Not surprisingly, almost all parents (86%) think it is very important to keep their child interested and enthusiastic about science, considering the fact that many children lose their enthusiasm for science at about the sixth grade level.

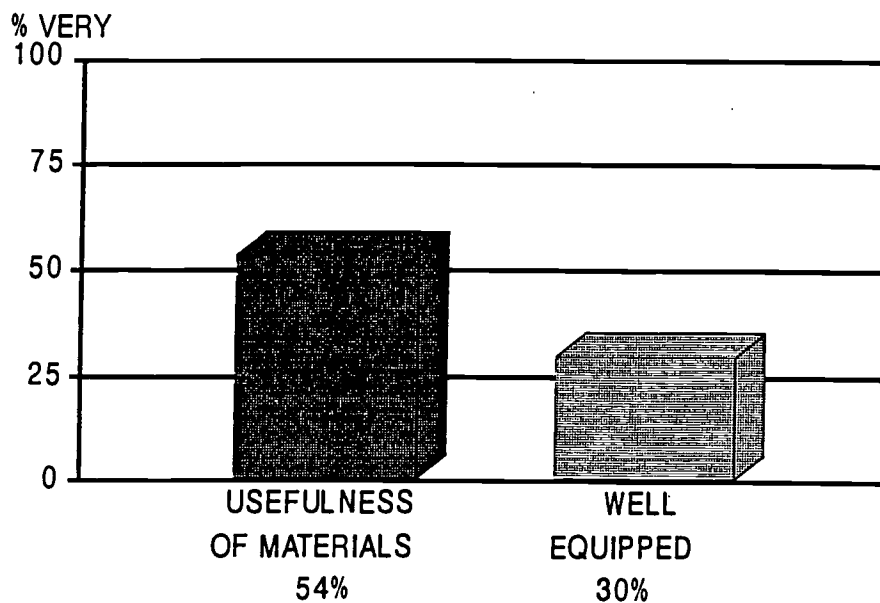
### TEACHER FEELINGS ON PARENT INVOLVEMENT IN EDUCATION



- \* While parents have good intentions, teachers, overall, do not sense a strong parent involvement in helping children with science education -- even less so than in education in general.
- 22% said parents are very involved in their child's general education; while
- 11% said that parents are very involved in their child's science education.

### PARENT RESOURCES

(N = 978 / 993)



- \* Over half of the parents said that information and materials that could help them work with their child at home learning science would be very useful.
- \* Only three in ten parents feel very well equipped to teach their child science.

## CONCLUSIONS

1. While parents and teachers view science as a very important subject for children in grades K-5, teachers do not feel highly qualified to teach science. Importantly, only about one-third of the parents and teachers consider themselves very science literate and only half feel very comfortable answering their child's or students' science questions. Very few parents are involved in their child's science education.
2. Most teachers feel the current emphasis on science education in their school should increase, and most feel that there should be an increase in the use of the hands-on approach to science instruction. Yet, there are some obstacles to teachers moving forward with hands-on science -- mainly the fact that other subjects require their class time, and they lack classroom equipment to teach hands-on science.
3. Importantly, teachers also appear to lack the training and background in science instruction to effectively utilize hands-on instruction. Half of the teachers were not at all or a little familiar with recent recommendations for science education reform, and almost as many rated their own course work and training in science or science instruction as being not at all or a little effective. This suggests that the success of science education reform will likely require a great deal of elementary school teacher training.
4. Another element for successful science education lies with parent involvement. Teachers reported little involvement on the part of parents in their students' science education, and few were confident that their students were receiving a good science education at home. Most parents expressed a willingness to become more involved in their child's science education and said that they would help their child with science activities at home, given some guidance. Half of the parents said that they would find materials to help them with this very useful.
5. Clearly, there appears to be a strong opportunity to enhance elementary school science education, both within the schools and within the home. Providing teachers and parents with training, support, and materials may be the first step to achieving true science education reform.



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