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BLOCK Fest

Math and Science learning for Young Children and their Parents

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Block play provides a natural environment for children to experiment with early concepts of math and science. Block Fest was developed as a hands-on learning lab for young children and their parents. Survey responses showed that Block Fest taught parents about emergent math and science learning for children, and offered children a rich environment for developing those concepts.

Two decades of research show that children build number and math skills from a very early age, and that those who are strong in early math skills excel in math in the later years. Play is a natural learning lab for young children, where they develop math and science ideas such as counting, equality, addition and subtraction, planning, patterns, classification, volume, area, and measurement. Informal concepts such as these provide the foundation for formal math and science learning (O'Hara, Demarest & Shaklee, 2006)

Parents and Teachers can help young children learn by offering materials to promote construction of concepts of math. In fact, research shows that children's block play is related to later math competence. Early block play predicts math interest and competence in junior high and high school, when the concepts start to get more complex and difficult to master (Wolfgang, Stannard & Jones, 2001).

Block play also provides a natural context for exploring the physical world. Like little scientists, children can experiment with structures and observe the outcomes of their building efforts. Through this process they learn about mass, weight, proportionality and balance, and can use their new concepts to plan and predict outcomes.

Block play supports other aspects of development as well, including language learning as children talk about their structures with the adults and children around them. Blocks also provide opportunities for children's social and emotional development as they build and share with others, and manage the frustration that comes when structures collapse. In addition, children are challenged cognitively as they solve the problems that arise in the construction process.

BLOCK Fest

Idaho Parents as Teachers (PAT) developed Block Fest to provide a block building experience for young children and their parents. Block Fest is a hands-on building extravaganza featuring five different block types.

The initial Block Fest events were held in Boise, Idaho, where children enjoyed block play in the company of their parents or teachers, along with 20-40 other children ages 8 months to 8 years. Children attended Block Fest with their child care or school class in the rotunda of the Idaho State Capitol, or with their parents and other families at Boise State University (BSU). The adults at the Capitol included early childhood professionals and parents. Children came with their parents at the BSU setting. Children moved through five different block building stations over a one hour period.

As the children played at Block Fest, information about early science and math was available to the accompanying adults in banners and at play stations. Block Fest stations also offered parenting strategies to encourage learning through block play. The adults received two books to take home at Block Fest. *The Block Play Handbook: Learning and Playing with Blocks*

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explained learning aspects of block play and some family strategies for block play at home. *Every Child Ready for Math* is a primer for parents and caregivers on math concepts children learn in the early years, along with activities that can support everyday math learning.

As the children concluded their play sessions, the accompanying adults were asked to respond to a few questions about the event. We report those survey responses separately for the two venues, since the groups attending were somewhat different (i.e. child care/schools at the Capitol vs. families at BSU). There were 96 respondents in the child care/school groups at the Capitol and 207 in the family groups at BSU. Table 1 shows the ages of children who came to Block Fest.

children at home (69% Capitol; 66% BSU).

These survey results show that Block Fest provided an effective learning environment for parents, child care providers, and teachers. However, the story of the Block Fest experience may be best told in the adults' own words. Table 2 shows a sample of those comments.

Table 1: Block Fest Participants

	BSU	Capitol
# of Adults	316	104
# of Children	308	156
Children ages:		
< 3 years	40%	70%
3-4 years	35%	56%
5 years +	25%	27%

Parents and Children Learn at BLOCK Fest

After the play session was over, the adults used a 7 point scale to rate their agreement with three statements about what they learned at Block Fest (-3 = strongly disagree, 0 = neutral, +3 = strongly agree). Ratings of +2 and +3 were combined to represent agreement with the statements. Adults agreed that they could see how their children learned through block building at Block Fest (91% at the Capitol, 76% at BSU) and that they learned ways to support early math and science learning for their children (74% at the Capitol, 66% at BSU). Participants also learned how block building helps children learn early math and science ideas (78% at the Capitol, 76% at BSU). Most participants were able to describe an idea from Block Fest that they would use with their

Table 2: Selected Responses to: What would you tell another parent about BLOCK Fest?

Adults Learn at Block Fest

- It was a great way to experience some of the learning a child works on every day!
- It was an amazing, exciting experience for myself as well as my children.
- What a great way to get down on the floor and see the world they do and build something amazing at the same time.
- It was fun for us as parents to see her "get" a certain concept and it was exciting for her.

Enthusiastic Children

- Children loved it – stayed focused entire time.
- See how much fun the kids have – and how much they can learn from playing with blocks.
- Experience a fun time that inspires enthusiastic, truly interested kids.
- Go and let your child have fun while they develop their brains; and bring your camera!
- Fun for all! My child told me "I want to play blocks again."

Exploration and Creativity

- Creative juices flow at Block Fest!
- This was a great and fun way for children to explore and problem solve through play.
- It has been great to see how creative the children are! They have a natural ability to build sturdy structures.

Math and Science Learning

- Great way to encourage math and science at a young age.
- A great opportunity to learn and play with kids. Blocks really do set the stage for school learning.
- Block Fest is a good way for children to learn about creative play and working with others about science and a bit of math.

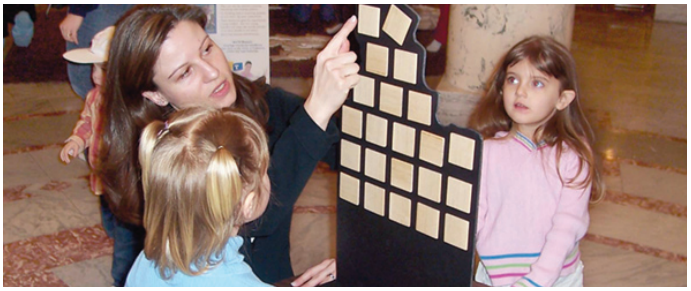
Finally, respondents were asked to review 30 descriptors and circle those that characterize the behaviors of their child at Block Fest. Each descriptor represented an example behavior within five different developmental domains: language (e.g. describing, asking questions), social/emotional development (e.g. acting excited, sharing), science (e.g. predicting, experimenting), math (e.g. counting, adding), and cognition (e.g. focusing, problem solving). There were 6-7 descriptors within each developmental domain. The final category included possible negative responses to Block Fest (e.g. feeling frustrated, bored). These negative attributes were rarely (<10%) used by parents to describe their children's experiences in the two Block Fest sessions, and are dropped from further analysis.

We focus our discussion on the BSU event because the sample size was large enough to look at parents' descriptions for children of different ages. To accommodate the age analysis, only those surveys which identified the child's age were included (122 surveys). Table 3 shows the children at three different age levels who were described by two or more attributes within each of the five developmental domains.

Table 3: Children's behaviors at BLOCK Fest

Age	Language	Social/ Emotional	Science	Math	Cognitive	Number
Under 3 years	13%	85%	41%	31%	54%	54
3-4 years	46%	92%	68%	78%	84%	37
5 years and up	29%	74%	81%	64%	87%	31
All ages	29%	84%	63%	58%	75%	122

As the table shows, parents are especially likely to see social/emotional, science, math, and cognitive behaviors as their children engage in the Block Fest activities (58%-84% across all ages). Language is a less commonly observed category of behavior (29%). Furthermore, behaviors increase with age in the language, science, math, and cognitive domains (χ^2 (2 df) >12.0, p <.01) for each of the four comparisons. Social-emotional behaviors are prominent in the youngest years and continue high for the older children as well, thus age trends were not significant. These parent observations show that Block Fest was a very successful learning context for several important aspects of development. Interactions among the children offered plenty of opportunity for social/emotional development, and active play with the block materials challenged them cognitively. Block play also provided a rich environment to explore concepts in math and science. Even many of the youngest children showed behaviors in these areas, but active engagement in the domains was even greater for the older children at the exhibit. Block play is sometimes considered to be primarily for pre-schoolers -- not challenging enough once children enter school; however, these results show that older children found a lively learning environment at Block Fest.



BLOCK Fest Learning Goes Home

Three months after Block Fest, parents who participated in the BSU setting were invited by e-mail to participate in an internet survey. The survey invitation was sent to the 110 parents who provided e-mail addresses. Of those invited, 54 completed the survey, a 49% response rate. Those parents report many follow-up activities to Block Fest.

Nearly all respondents (96%) told someone else about Block Fest, and 78% talked with their child about their

time at Block Fest. Parents reported reading the two books they were given at the event -- 83% read the *Block Play Handbook* they received, and 74% read the book, *Every Child Ready for Math*. Many respondents checked out the Block Fest website (40%) or talked to their child's preschool teacher or care giver about

early math and block play (24%), or inquired about the event sponsor, Parents as Teachers (17%).

Since attending Block Fest, respondents have done many block related activities at home, including getting out their blocks and making them more available (70%), playing blocks with their child (89%), building with objects instead of blocks (61%), purchasing blocks (31%), making blocks (13%), and looking for information on the internet about blocks (28%).

Parents also "got" the math/science message at Block Fest, using more math and science words (44%), seeing opportunities to talk about math and science ideas with their children (55%), and finding math and science in everyday activities (72%). In addition, parents took home strategies to encourage their children's learning from the ideas presented in the written materials at Block Fest (banners, play stations, books), with 46% of parents reporting that they're using more open ended questions with their children, 54% playing more on the floor with their child, 50% describing their child's play more often than directing it, and 36% using different ways to encourage their child to clean up when play is done.

In summary, evaluation results show that Block Fest was a hit with the kids, and that parents saw their children engage in challenging cognitive and social activities, including math and science concepts and behavior.

Parents learned at Block Fest as well, increasing their understanding of early math and science learning, and becoming more aware of the math and science in everyday events. Even 3 months after the event, the lessons of Block Fest were still strong in parents' thoughts and in their activities with their children.

Block Fest was developed as a traveling exhibit and has toured the state of Idaho so that families in communities of all sizes can experience the excitement of block play.

These findings underscore the learning children can experience through block play, whether in a special exhibit like Block Fest or in everyday environments of home and child care. Learn more about Block Fest at www.blockfest.org.

References:

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