The Building Blocks Project

Building Blocks—Foundations for Mathematical Thinking, Pre-Kindergarten to Grade 2: Research-based Materials Development

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As co-directors of the Building Blocks project, we are delighted with your participation. In this, our first newsletter, we describe the project, including our staff, progress, and future plans. Let us start with the project itself.

The project was born in our concern that quality mathematics education materials for young children have been difficult to find. We wrote a proposal to create a mathematics program for early childhood education. Funded by the National Science Foundation, this $1 million, four-year Building Blocks project will provide a comprehensive curriculum for preschool through grade 2 that encompasses the Standards of the National Council of Teachers of Mathematics (NCTM). The program will consist of computer software and print materials that suggest how to use everyday objects to teach math. The materials

We Need You!

Your role in the Building Blocks project

We believe that building a quality curriculum requires substantial involvement and advice from teachers, supervisors, administrators, and parents. So, we are making every effort to invite people such as you to help us create Building Blocks. First, let us tell you "where we are" in the project, so you'll know what to expect from us…and when.

Where are we now?

Because we are only just beginning the project, we expect that we will have a very draft of the proposed materials—really an outline of possibilities—during this Spring 1999 semester. That will only involve people who wish to review at this level (see the following section).

Curriculum development is, of course, a complex task that often takes longer than originally planned. And software always takes longer than anyone originally thinks. So, we hope to have the first trial activities ready for some age/grade levels by Fall 1999. It is too early to know if software will be a part of this first field testing.

The bottom line is: Never think we forgot you! We are working hard to get the materials to you in this large, four-year project. So when we what to send you, make sure you’ve told us your preferred "level of involvement."

Levels of involvement

We recognize that everyone may not wish to be involved to the same degree. We ask all participants to tell us what level of participation they prefer. Of course, certain levels apply only to those near us!
will be progressively layered—users will be able to "dig deeper" into them to reach increasingly rich, but demanding, teaching and mathematical levels.

**Why preschool math?**

There is increasing attention to preschool mathematics education. Consider the following.

1. Increasing numbers of children attend early care and education programs.

2. The National Council of Teachers of Mathematics (NCTM) and numerous states are creating new standards for mathematics education for young children. (Clements is a member of the PreK-2 Standards 2000 writing group).

3. Several states are instituting universal preschool education.

4. International comparisons indicate that mathematics education in the U.S. must be improved.

These are reasons we need to think about preschool mathematics education.

**Preschool math curriculum**

So, it is increasingly important that teachers, caregivers, and parents have exemplary PreK-grade 2 curriculum materials that enable all young children to build solid content knowledge and develop higher-order thinking. They will be designed for home, daycare, and classroom environments, and for children from a variety of backgrounds, interests, and ability levels.

This is the major goal of our Building Blocks project. We believe that the project has substantial potential to develop effective curriculum materials that will serve as tools of educational reform. The project will also produce research that ensures the curriculum is effective through formative evaluation and contributes to what we know about young children and mathematics.

Building Blocks is a cooperative venture among the University of Buffalo (UB), Wayne State University, and numerous schools and early childhood centers. During field tests, project staff will conduct extensive classroom observations which, combined with advice from teachers and students, will provide the basis for the revision process. Research on students' understanding of certain mathematical concepts will be conducted concurrently with the field tests and used to inform the development of the curriculum.

The Building Blocks materials, then, will be based on research. Further, our approach is finding the mathematics in, and developing mathematics from, children's every day activity. The materials will help children extend and mathematize their everyday activities, from building blocks to art to songs to puzzles. In this way, the activities will be designed based on children's experiences and interests, with an emphasis on supporting the development of mathematical activity. Mathematization emphasizes representing activity — creating models of activity with mathematical objects and actions. These are children's cognitive building blocks.

The materials will emphasize the development of basic mathematical building blocks—ways of knowing the world mathematically—organized into two areas: (a) spatial and geometric competencies and concepts and (b) numeric and quantitative concepts, based on the considerable research in that domain. Most important will be the synthesis of these domains, each to the benefit of the other. The two basic building blocks of the structure are not elementary school topics "pushed down" to younger ages, but developmentally appropriate domains.

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*Making a diamond with bodies*
The following describes the levels of involvement.

1. Review even early (draft) materials and give feedback
2. We borrow 1-2 children from your class and try out materials
3. We teach small groups of children in your class
4. You teach and we may visit (when and if we can); you send us feedback
5. You teach with the materials and communicate with us via e-mail, phone, meetings, etc.

Those who choose level 1 are brave enough to want to comment on such early drafts.

Teachers close to us who do not mind us intruding may wish to allow us to come into their classrooms as described in levels 2-3. We will only be able to visit a few classrooms of the many we are working with, of course.

Most teachers will choose only level 4 (if they live close) or 5.

In the meantime...

Much communication will be through e-mail and the Web. Please make sure that we have your e-mail address if you have one.

Page 4 discusses curricula for K-5 that might be interesting to teachers of 3-5 and teachers of K-2 who need good ideas before the Building Blocks materials are available.

Communicate with Us Electronically!

E-MAIL
Though we may get out an occasional newsletter, it would be much easier to communicate with e-mail.

Please make sure that we have your e-mail address if you have one.

THE WEB
We plan to have a Building Blocks Web site sometime this semester that will also allow us to communicate with you more frequently and more fully. We will tell you when we have the site operational.
WHILE YOU’RE WAITING: THE INVESTIGATIONS CURRICULUM

Together with many colleagues, Doug Clements and Julie Sarama created the K-5 mathematics program, *Investigations in Number, Data, and Space*. (We directed the “space,” or geometry units, and wrote all the software for the project.) This might be useful to teachers in grades 3-4.

For more information, go to the *Investigations* Web site: http://web1.terc.edu/investigations/.

Or contact the publisher:
Dale Seymour Publications
Wk: (800) 237-3142
Fx: (914) 997-2192

We would be glad to send you research we have conducted too.

Turtle Math

Another “curriculum + software” package that Clements and Sarama developed for grades 3-6 is called *Turtle Math*. We are proud that *Turtle Math* was awarded *Technology & Learning* Software of the Year award in the category “Math.”

*Turtle Math* is a mathematically powerful version of Logo, accompanied by activities—on and off computer—geared to the upper elementary grades. The 72 activities include software, teacher lessons, and student activity sheets. *Turtle Math*’s tools and activities are tailored specifically for investigations in seven mathematical topics: Paths and Measurement, Shapes, Scaling, Coordinates, Motions and Symmetry, Number and Computation, and Counting and Chance. We designed it based on classroom experience and years of research by others and ourselves.

As yet, we only have a Mac version done (we’re working on Windows). The best purchasing deal we’ve found is from 3 national groups: Fast Track 800-927-3936, Educational Resources 800-624-2926, Learning Services 800-877-3278. If you have difficulty, contact us and we’ll make sure you get a copy.

We’ll also send you research and papers on *Turtle Math*.

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ADDRESS CORRECTION REQUESTED