Julie Cowan

# *The archKIDecture Build IT! Exhibit Project*


**ArchKIDecture** is an independent architecture education project that encourages children to explore and participate in the built environment. The ArchKIDecture Build IT! exhibit teaches children the vocabulary of building so that they can build and interact with their built environment in a personal way that reflects and empowers them as individuals. It is also an accessible and practical context for exploring mathematical concepts such as tessellations, ornament design, symmetry, scale, proportion and composition in a tangible and stimulating way.

*I am an investigator.*
*I make probes.*
*I have no point of view.*
*I do not stay in one*
*position.*
*I don't EXPLAIN*
*— I EXPLORE.*

Marshall Mcluhan [Stearn 1967: xiii]

## *Introduction*

**archKIDecture** is an independent architecture education project that encourages children to explore and participate in the built environment. **archKIDecture** was established in 1996 to encourage visual literacy and explain math and science concepts through the medium of architecture.

I learned in 1996 that access and proximity to important architectural landmarks are not sufficient alone to ensure that children learn the basic language of architecture. In that year, I discovered that not one of my students in a grammar school class had ever been to downtown Chicago—only 1.5 miles away. Most of these important downtown buildings—the 104-story Sears Tower, the John Hancock building with its towering pyramidal X-shaped exoskeleton, the Louis Sullivan facades—went unvisited, despite the fact that day they were partially visible from miles around. Ironically, either access and proximity may have left the children desensitized to the important things those structures had to say, or simply the children never learned to see the built environment surrounding them. These school-aged children had never come in contact with any of these structures, which are figuratively in their own backyards. And the more immediate structures in their literal backyard—schools, homes, apartment buildings, grocery stores and laundromats—were also invisible to them. When shown a slide of a local McDonald's restaurant, they all cheered with recognition of the graphic symbol in the signage, but they could not describe any of the building's structural elements. It was as if the building's shapes, colors, and symmetries—the visual language of observation—was either invisible to them or completely foreign.

How can we expect these (and most) children to contemplate, consider and then feel empowered to change or preserve their built environments? How will they understand the

relationships between the built environment and nature, or the built environment and people/society? Without exposure and interplay with the built environment, it can seem distant and circumscribed, and leave us feeling not at one with it but apart from it.

So the first step with children is to make their built environment relevant, to teach them how to "see" the environment just as we teach them to "see" that groups of letters form words and sentences that have meaning and sound beyond their color or font size. This type of relevance is ultimately self-referential, and so involves helping children to develop personal opinions about the built environment. Once children develop a vocabulary and a familiarity with the built environment, it also becomes an accessible and practical context for exploring mathematical concepts and ideas in a tangible and stimulating way.

Building is a fundamental human extinct, no less so in children than in adults. In *The Education of Man*, Friedrich Froebel emphasized the role building plays in childhood development:

> Building, aggregation, is first with the child, as it is first in the development of mankind, and in crystallization. The importance of the vertical, the horizontal, and the rectangular is the first experience which the child gathers from building; then follow equilibrium and symmetry. Thus the child ascends from the construction of the simplest wall with or without cement to the more complex and even to the invention of every architectural structure lying within the possibilities of the given material [Froebel 2004: 281].

Our challenge, then, is to teach children the vocabulary of building so that they can build and interact with their built environment in a personal way that reflects and empowers them as individuals. But how can we teach children a language without words or experience?

### *Solutions*

**Classroom Teaching.** Classroom teaching about architecture is quite effective. You can capture the attention of the students through an engaging instructor, interesting visuals, and teacher-led neighborhood tours. But you can only reach the kids that are in that classroom. And the effectiveness of the teaching is dependent upon the ability of that one teacher to stimulate interest.

**A World Wide Web Site.** The Internet has broken down the classroom walls, and exposed the best teachers to broader audiences. In 1997, I created a web site (http://www.archKidecture.org) to share the language of building in a fun and interesting way with a large, diverse number of kids.

As a learning tool, though, the web is not without limitations:

- Only kids with Internet access can reach the information;
- Finding the site may be difficult with all of the sites on the Web;
- As a two dimensional medium, it can be hard to attract and retain the fleeting attention of children;
- Internet surfing is generally an isolated activity;
- Without real-time interaction, it is difficult to determine whether the kids are applying what they learn;
- Two-dimensional ideas, such as color, shape and sound, are easily represented on the Internet, but tactile ideas and visual perspective are very difficult to share online;
- Every child learns differently, and the Internet, as a primarily visual medium, underserves students who because of disability or inclination learn more effectively in other ways.

These and other factors conspired to prevent the site from achieving measurable success. As a solution to engaging kids, the Internet only partly succeeds in realizing the goal of provoking, inspiring, empowering and activating kids. A physical and tangible exhibit was the obvious solution.

### *The exhibit*

By 2003, then, the inadequacy of Internet instruction lead me to create an exhibit that is more likely to engage a broader spectrum of students, and to do so in a more enduring, interactive manner. This exhibit had to be many things: useable with equal ease by teachers, parents or children; experimental and evolutionary, to reflect the changing nature of the built environment; movable from location to location to give access to as many children as possible; durable and interesting enough to garner attention. In this era of technology-based classroom instruction, the exhibit had to succeed without technology and without a classroom.

Children want to build. They want to design. The **archKIDecture Build IT!** exhibit engages kids by making them do the work. This constructive interactive teaching method brings math, art, science, social studies and literature alive through the tangible medium of architecture. **archKIDecture Build IT!** allows children to design a tree house, decorate a skyscraper, make tessellations, build a straw bale house and more.

The exhibit has a modular design. Each of its nine modules has a two-foot base, and varies in height from two to six feet. Tessellations, ornament design, symmetry, scale, proportion, and composition are all simple mathematical lessons that the architectural context of **archKIDecture Build It!** brings forward to children. The modules are constructed of common materials, primarily plywood and paint, with varying amounts of straw, metal, plexiglass, plastic and PVC pipe. The exhibit also relies on some expendable materials, such as blocks, paper, recycled wire, rubber bands, crayons and geometric shapes.

The conceptual foundation of the archKIDecture Build It! exhibit is threefold: To Provoke. To Inspire. To Empower and Activate.

**How does the exhibit provoke kids?** Complacency is the sworn enemy of inspiration, so the exhibit aims to reach out and provoke the child. To provoke a child you have first to attract him; his curiosity must be piqued, and he must choose to be drawn in.

Color attracts kids, so the exhibit is awash in it. The modules are painted in bright hues of yellow, chartreuse, red, blue and gold. A poem swirls around one module in bright white letters, and a gold leaf triangle reflects the light and acts as a beacon. The blocks and Legos are all colored, as well.

Children don't enjoy (or aren't burdened by) the years of experience that adults draw upon in presuming things to be as they appear. Children instinctively want proof, and tangibility gives them what they need—confirmation that things are as they appear, and that they can trust their instincts. So kids cannot help but touch the exhibit's modules, and this is strongly encouraged.

Proportionality puts kids at ease, so the exhibit is kid-sized. The modules are essentially two-foot cubes, with one six-foot tall "skyscraper" and one five-foot tall "pyramid". The exhibit is approachable and not intimidating.

An element of familiarity also attracts kids. The exhibit's shapes are common geometric forms that can be handled and leaned upon. The modules are laid out in a 3' x 3' grid that kids walk through like alleyways. It feels right to walk through the simple grid. Once attracted to the exhibit and curious about it, kids return to explore and to learn.

**How does the exhibit inspire kids?** To inspire a child, an exhibit needs to plant a seed.

In **archKIDecture Build It!** the seeds are plentiful—mathematical, geometric, colorful, scientific, patterned, varied in size and shape, artistic and logical. A child can come to the exhibit and decide to build or draw; the intent is to be permissive and indulgent, not proscriptive. Having erected a basic structure, kids are encouraged to introduce an aesthetic sense to their building with wire, rubber bands, and other expendable materials. Inspiration is constantly in evidence at the exhibit through interaction, participation and creation. Hopefully, persistent inspiration also takes place, as kids leave the exhibit and bring their experiences and ideas home or to their classrooms. Some examples:

- A child can take some paper from the Gable House Module and place it on the roof of the module, which forms a sort of easel. The child can read a small sign on the module that recommends that he or she look over to the tree module and draw a tree house that would fit in that tree.

- A child might approach the Magnetic Module and take all of the metal pieces off of the surface and try to build an entire cityscape, or maybe build a skyscraper, testing how to best balance the metal pieces.
- A child may take all of the rubber bands off of the grid of nails on the side of the Magnetic Module. Then, he or she may start to make patterns that are symmetrical or patterns of various shapes or colors. There are boards that talk about patterns nearby, which might serve as inspiration.

**How does the exhibit empower and activate kids?** Kids are inspired to see, to think, and to act. The exhibit breaks down the barriers that often make the built environment inaccessible to children. Giving them access, and encouraging them to actively interact physically with the exhibit empowers children. They are encouraged to walk right up to the exhibit and manipulate what someone else built and add their own signature. Kids can leave their mark, whether it is a twisted wire on the skyscraper or a tree house drawing on the gable house. So one of the often unexpected benefits is the spontaneous sense of collaboration the exhibit permits, often between children who don't know one another.

Kids can come to the module alone; they can also engage it with other kids or adults. They often interact with kids that they don't know, explaining how you do something or how they accomplished something. The exhibit is communal and community-building. It fosters communication about the exact ideas and vocabulary that we seek to teach.

It enhances discourse among adults too. Often adults are not interactive with kids at an exhibit, but this exhibit draws many of them out to participate through the creation and manipulation of materials. Attached to each module are brief but informative signs that explain how an architect works and tries to explain basic architectural concepts; though these are designed to be understood by children, parents can also help by reading the signs and employing the information in collaborative work with the children.

The built and natural environments must coexist peacefully, so the Straw Bale module attempts to activate an environmental sense within children. This module fosters ideas about Green architecture as one among many architectural approaches, and we hope that it leads kids to think open-mindedly about alternative forms of architecture.

### *Description of exhibit modules*

**Skyscraper Module.** When we were considering materials for building the exhibit, we came upon the louver material used in the lighting industry. We approached A.L.P. Lighting Components, Inc. for a donation. They agreed that if we would build it, they would gladly measure, cut, and donate the materials. What was so interesting was that the staff members at A.L.P who contributed to the project were all very inspired and excited about their part in the project. This exhibit for kids energized the A.L.P employees and got them thinking "outside the box".

We took the louver materials and assembled them into a six-foot tall architectural monument, reminiscent of the Sears Tower in Chicago. A bundled tower, it is rock solid and capable of enduring high "Kid-stress" just as the real Sears Tower can manage the stress of high winds.

- Learning opportunity: Children can take any number of colored wires and figure out interesting ways to wrap the skyscraper, creating a texture or a pattern, or simply problem solving on how to get it attached to the structure. For smaller children, simply attaching the wire is a challenge. Older children sometimes make objects out of the wire and then

attach the objects to the structure creating other dimensions of creative expression, considering the ideas of surface decoration to a structure.

**Golden Pyramid Module.** Inspired by Antoni Gaudi, who hoped in the future that all buildings would be soft and furry, I originally intended to cover this in a furry material. Unable, though, to figure out how to introduce a fragile material into a hands-on exhibit for children, I chose instead to emphasize a golden pyramid, which invokes the golden mean and the perfection of shape.

The shapes on the shelf change. Sometimes they are paper and other times they are plastic, but generally I prefer the trapezoid. I designed the exhibit so that the children would play with the shapes on the shelf surface. I have found most kids prefer to build up the sides of the pyramid with the shapes and see if they can make it balance. Empowerment in action.

- Learning opportunity: Children learn about patterning and tessellation, as well as balance and symmetry, through manipulation of the tiles.

As an additional workshop project, we have kids take a handful of the trapezoids and copy patterns, follow directions to make patterns and then go off and explore their own patterns.

**Floor Plan Module.** A cube with a plexiglass top that reveals a floor plan placed on an inner shelf, the plexiglass is incised with the drawing of the floor plan. A roll of tracing paper is secured to the side of the module and rolled over the plexiglass so kids can rub a copy of the drawing onto the tracing paper with crayons provided on the module. The drawing can then be cut off of the roll, taken home and colored in or filled in with furnishings that are idyllic or realistic.

- Learning opportunity: Children learn about the tools of the architect, by creating their own floor plan rubbing and younger children have the manipulative learning experience of creating the rubbing on the Module.

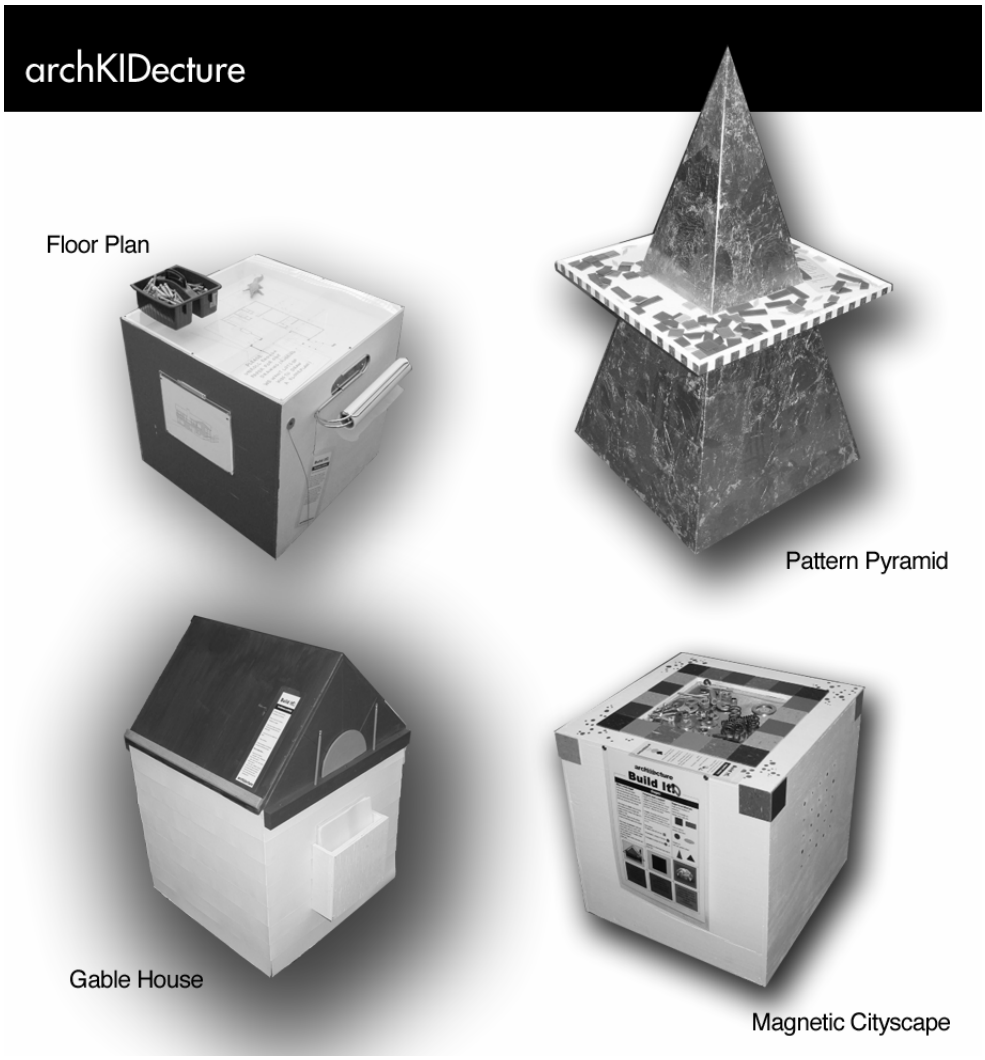
An additional workshop project is having the kids take grid paper and use their own feet as measuring stick to walk out the floor plan dimensions of a room. Many school-aged children have very little experience using rulers and making measurements and this project is excellent to teach space, dimensionality and the use of measuring and drawing tools.

**Straw Bale House Module.** This module is a cube with a straw bale house built on top of it. The least interactive of all of the modules, the straw bale can still be touched. One point this module is designed to emphasize is that each material and every structure has a unique set of attributes—firmness, flexibility, smoothness, transparency—and building things requires a constant set of tradeoffs and decisions. The bales came from a farmer in Indiana who usually builds full-scale bales for his farm.

- Learning opportunity: Children learn that architecture has many different forms and materials.

As an additional workshop project, the children use blocks of foam in the rectangular block shape of straw bales and try to build larger-scale structures with the same techniques used with straw bales.

**Magnetic Cityscape Module.** With a magnetic surface embedded into the top plane of the cube, this module allows kids to build skyscrapers or layout a cityscape using nuts, bolts and other magnetic items. Competitions usually ensue for the tallest structure.




- Learning opportunity: Children play with the metal objects and figure out how to create stable structures versus unstable ones, as well as exploring creative ways to use these unusual items to express structural shapes.

As an additional workshop project, we had baskets of metal items, including shelf brackets and computer motherboards and hardware items on a large cloth. Groups of kids then took these materials and designed an entire cityscape.

**Gable House Module**. This gable-shaped module encourages kids to draw tree houses and to express other architectural ideas directly onto the structure's smooth angled roofs. Made of wood and cardboard siding, these modules also have holders on the sides for paper and pencils, which allows them to function as structural easels.

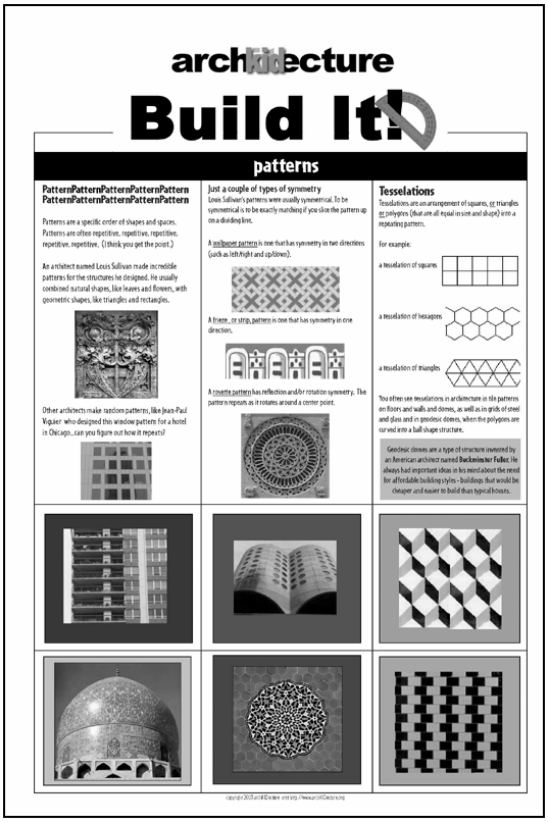
- Learning opportunity: Children can draw freely or work out a sketch based on the recommendation on the signage to draw a plan of a tree house, using their imaginations and arts skills.

As an additional workshop project, kids can take their drawings and then, using recycled materials, attempt to build their project in three dimensions.

**Treehouse Module.** At the center of this exhibit is a real gingko tree branch, which I obtained from my local Parks Department. There are wooden steps nailed into the trunk of the tree, and a poem by Shel Silverstein coils around the base. This module is intended as a source of inspiration for the young architects at the nearby Gable House Module; I store tree house models in this module, so it also serves a functional purpose.

- Learning opportunity: Children can create a 3D tree house model and place it in the tree to gain understanding about scale and utility in design (Does the ladder reach all the way to the ground? Is there a roof to protect against the rain? Is the structure stable enough?)

**Signage Modules**. These modules are both cubes with poles that extend up about 5 feet. Secured to these poles are the vertical signs for the exhibit. On the sides of the cubes are wooden pockets for storing blocks and Legos. The top surfaces are smooth and provide a play/work space for building with these materials.



## *Challenges*

This exhibit was built on a shoestring budget from a small grant and donations of time and materials. It is installed in public spaces such as libraries, community centers, and schools. Because the staff in these spaces cannot constantly monitor or manage the exhibit, the **archKIDecture Build IT!** exhibit is independent and sturdy. It needed to be designed so as to be safe for small children and challenging for kids of many ages. The exhibit also needed to be flexible for installation in different spaces. The modular design was suitable for this purpose. It can also grow and expand with ease for various aged children.

The **archKIDecture Build IT!** exhibit is more message than mirror. It is not meant to be a historical tour of architectural concepts and events, nor is it a practicum in the skills needed to be an architect today. Instead, it is a simple loudspeaker that cries out—in terms children can understand—what architecture is, the role it plays in society, and the notion that as members of the next generation, children can construct and alter the built environment to suit the needs of the world they find themselves in.

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## *About the author*


Julie Cowan is a web designer, artist and teacher of architecture to children for over 10 years in classrooms, public spaces and through the Web. She has designed and built the exhibit, archKIDecture: Build It! and she is the designer and web master of archKIDecture (http://www.archKIDecture.org).

She has recently written and illustrated a book for kids about architecture for kids called "Lucky Luca" to get young kids interested in the built environment.(not yet published). A graduate of the University of Pennsylvania, she is an adjunct professor at Columbia College and Oakton Community College in Chicago in the Digital Technology departments, teaching web design and production. Her web design firm is Solid Print, http://www.solidprint.com.