Building

The children's watercolor neighborhood.

THE BENEFITS OF BUILDING

The month of November was devoted to building! The children loved this unit because we had so much fun exploring and building. The teachers loved the unit because within all the fun there was a lot of learning happening!

Block play promotes self esteem.
Block play promotes cooperative play.
Block play promotes language development.
Block play promotes spatial skills.
Block play promotes math skills.
Block play promotes fine and gross motor skills.
Block play promotes creative, divergent problem-solving.
Evy's parents, Josh and Michelle Bard, both who work in the architecture department, spent a day with the kindergarten sharing their knowledge of buildings. In the morning, Michelle talked with us about how buildings are built. She talked to the children about gravity, tension, compression and stability.

We experimented with tension by joining hands and leaning backwards. We were able to support each other. In contrast, we used force to support each other by pushing our hands together. We continued our learning by using our bodies to create structural elements.

We tested the strength of columns, adding wooden blocks to our arms allowed the children to feel the difference in the weight of the block when using just a column or a combination of columns and beams.

We built arches and combined them into domes and tunnels. We each stood on an arch to demonstrate the strength of a compression form.

We discussed the pros and cons of cantilevers, adding weight to our arm to see if it will tip.

We walked on campus and observed photos of campus buildings to find the columns, arches, vaulted ceilings and domes. Carnegie Mellon is filled with these elements!

After our discussions, we began to see the children create these elements in their own block buildings.
BUILDING EXPLORATION

To begin our building experience, we spent the first week exploring the building materials that we have in the classroom. We added some everyday materials such as cups, marker caps and stones.

We combined different materials such as shaving cream and clay to create an interesting experience.

Enabling the children time to really explore the materials allowed for more complex structures and in depth questioning.

We then added height and width constraints. Giving the children a marked ruler, they had to build up and out according to those dimensions.

After reading The Three Little Pigs, the children wanted to know if their structure was strong enough to withstand wind. We brought in a fan to test the stability of their structures. We decided to really challenge the children by adding a wrecking ball! It was very interesting how much they learned about how to build a stable structure.
SIMPLE MACHINES

Simple machines make work easier for us. We tested the lever by trying to pull nails out with our hands versus using a hammer. We explored inclined planes by building ramp systems and comparing the speed of vehicles. We screwed and unscrewed screws into wood. We tested a wedge by trying to hammer a bolt into a piece of wood compared to using a nail. We explored pulleys by hoisting buckets of blocks up and down. We tested wheels by pushing a loaded box compared to using a wagon. We also used the lever as a catapult and launched marshmallows into a box.

Josh Bard, Evy’s dad, designs robotic machines that aid the construction workers in the building of houses. The architecture robotics lab is located directly under the kindergarten. He invited us to visit to see the machine that he designed and built that can help make building easier. The children made the connection between the simple machines we had learned about and the complex one, by pointing out the levers, wheels, screws that could be seen.

The lab gave us parts to assemble our own robotic arm. We drilled holes with an electric drill and used screw drivers, wing nuts and bolts to put together the two levers to construct the arm.

Josh Bard with his robot.
We used one Friday morning for building relationships. The children participated in cooperative building activities. One activity was the Mirror Building. The children were paired so that one child was the builder and the other was the mirror. The “builder” used the given materials to build. The “mirror” had to build the exact same structure. The children really worked together, helping each other to build exact duplicates of the structures.

One of the children’s favorite cooperative building activities was building with the school’s set of Architectural Blocks. The blocks were designed specifically to build cooperation in children. The weight and size of the pieces make cooperating a necessity. The children worked together to build a Kindergarten Mansion that included a library, party room, kitchen, and bedrooms. Not only did they work together to build and play but the cooperation carried over into clean up!
Our culminating project was to design and build our own “Magnificent” structures. Pulling inspiration from the book, “The Most Magnificent Thing” by Ashley Spires, the children created a structure of their own design. “Shopping” samples from Zero Landfill, (granite squares, laminate tiles, pieces of wood flooring and trim, etc.), the children chose a variety of materials and used the low temperature hot glue guns to connect everything. Adding arches and columns from cardboard tubes made their structures truly magnificent.

After the buildings were built to the children's satisfaction, we added glass gems and beads to create a unique piece of art. The buildings are on display in the hallway.

**Mattias in the beginning stages of his structure.**

**Alexander and Matthew in the process of building.**

**Sam**

**Sara**

**Adella**