



# Bridge Project

Owl - St. Nicholas: Jr. Camp

## Background

This project took place during summer camp in the Jr. Camp program at Owl - St. Nicholas. We started this project at the beginning of July 2016 and ended the project at the end of August 2016. The children that participated in this project ranged from ages 4-6 years. We had 20 children enrolled in the summer camp program but not all the children participated at one time. The educators highlighted in the project are Ashley V. RECE, Lisa S. ECF, and Emily G. RECE.

## Phase 1: Beginning the Project

This project all began when we had our first field trip to Victoria Park in Kitchener. We had a scavenger hunt to find all the bridges in the park. After our field trip we noticed the children started to build bridges with our large wooden blocks in the classroom. We observed how they would build their bridge but created new designs every time. As a teaching team we wanted to see if there was enough interest in this emerging topic. We approached the further exploration by having the children research the names of the different styles of bridges around the world.

We first started by asking the children what they knew about bridges to give us an idea of their knowledge. Some of the children immediately said you need bridges to get from one side to another, to get across water and that they are made out of wood and metal. Others disagreed and said they were not made out of metal just wood, which brought us to the question, "What would they like to know about bridges?" Some of the children asked questions such as, "What type of materials and tools do you use to make them?" "How do they build them, and what are they made of?" We also talked about how we could get more information about this topic and we came up with books, i-Pad, go to bridges near us to investigate for ourselves and to ask someone in the construction field. See figure #1 for this list.

Figure #1

<p><u>About Bridges!</u></p> <p>Its made of wood and go over water - Aiden          It takes people places, it helps people get to the other side - Daniel          These wooden and attaches two places together - Andrew          Cars can over - Lucas</p>	<p><u>What Do We Want To know About Bridges?</u></p> <p>Glass bridges? - William          Trains go on bridges - Aiden          People go on bridges - Gavin          Can bridges go over other things, other than water          What type of material - Eric          are they made of</p>	<p>Videos watched:</p> <ul style="list-style-type: none"> <li>• Why are there so many</li> <li>• Brief Introduction to Bridges</li> <li>• Bill Nye Structures</li> </ul> <p>Books Read:</p> <ul style="list-style-type: none"> <li>• How did they build that bridge by: Vicky Franchino</li> <li>• How a Bridge is Built by: Sam Aloian</li> <li>• Building Bridges by: Rebecca Steffo</li> </ul>
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We created a vocabulary list at the beginning of the project with words that the children already knew. As the project developed, we learned new words and our list started to grow with new words. See figure #2 for this list.

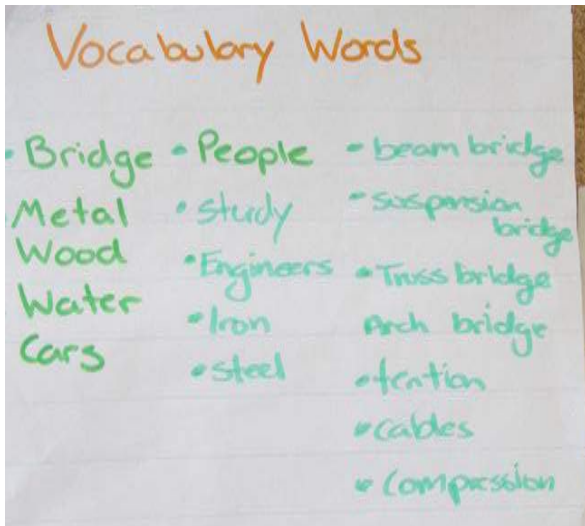


Figure #2



Figure #3

At the beginning of the project we started a web on the different sub-topics that we could learn about as well as topics that could come from the sub-topics. As we learned more and more about bridges our topics started to grow around our sub-topics. See figure #3 for our web.

## Phase 2: Developing the Project

One of our first tasks we did on this project was to ask the children to draw what they thought a bridge looked like. Many of the children's drawing had water under the bridge. While they were drawing their bridges, Ashley said, "I noticed a lot of you have your bridge crossing over water. What else could a bridge cross over?" Many of the children shrugged their shoulders but Elissa said, "they can go over a road for people to cross." Most of the children were not aware of what bridges cross over, so we added that to our list of questions of what we wanted to know about bridges. See figure #4 for the children's drawings.



Angela (4) first drawing of a bridge. Figure #4

The children drawing their first drawings of a bridge. Figure #5

Right from the beginning of this project the children had been using the large wooden blocks to create their own bridge in the classroom. As we watched the children work together to create these structures we noticed that some were built up higher around their waste height where as others were built closer to the ground. They all had the same idea, they built pillars and the bridge expanded across the pillars. As we learned more about bridges we started observing the children add more to their bridge such as triangular blocks on the top to imitate the suspension bridge and they started to add ramps going up or down for their vehicles. It was amazing to see the imagination, when they learned something new about bridges and how they incorporated that information into their play. See figure #5



Daniel (5), Isaac (5), & Dylan (5) are building a beam bridge



William K. (4), Gavin (4), & Emmett (4) are building their version of a beam bridge



Aiden's (5) version of a suspension bridge



Michael's version of a suspension bridge



Remy (5), Kane (5) & William K. (4) built a low bridge so that way if their cars fell off it would not be a far drop for them.

William K. (4) & Advaith (4) created a beam bridge on top of a beam bridge so that their cars and trains had a place to drive.



Simon (5), Remy (5) & Gavin (4) created a bridge that was the length of the classroom

The educators introduced new materials to expand the children's bridge building. We brought in a bucket of sand and placed popsicle sticks and Jenga blocks around the bucket to see what they would do with them. Kane started to place the popsicle sticks in a row and said, "These sticks are easy to put in the sand." Then he began to add some on top and laying them across the standing ones. This turned out to be harder than he realized because as he would lay the popsicle sticks down on top of the other ones standing upright they kept falling over. He started to sigh when this continued to happen until Rhys showed him how he was using the Jenga blocks. Rhys said, "These blocks work better Kane, they even hold up these blocks so you don't have to use the popsicle sticks." Lochlan then heard their conversation and came over asking them what they were doing. Rhys responded, "Look I can make a bridge with these blocks right in the sand." See figure #6 for these bridges

Figure #6



Kane (5) building a bridge using popsicle sticks.



Rhys (6) started using the Jenga blocks to try and construct his own bridge in the sand.



Here is the finished product, see how he even incorporated the bin into his construction.

We learned about quite a few different types of bridges; arch bridge, beam bridge, suspension bridge, truss bridge and cable stay bridge. We had a large piece of paper with drawings and

photographs of different types of bridges. We placed this poster of drawings and photographs in the block centre to possibly inspire the children to build these structures with the blocks. Instead we noticed that the children brought their own paper and markers over to this area and started to draw the different types of bridges. Elissa showed me her drawing and said, "Look, I drew all the bridges so others can look at mine and copy what I did." Elissa then took her drawing and placed it on the table for others to look at. Later that afternoon Kane went over to the table and started drawing. When Ashley went over to investigate, Kane looked up at her and said, "I am drawing pictures of bridges like those ones." He was pointing to Elissa's picture on the table.



Elissa's (5) drawing of the bridges that we learned about during the summer. Here she drew from top to bottom: Beam Bridge, Arch Bridge, Suspension Bridge, Cable Stay Bridge, Truss Bridge



Kane's (5) drawing that he did after looking at Elissa's (5) drawing of the different bridges.

Educators Emily and Ashley placed some popsicle sticks and white glue on the tables to see if the children would build bridges. All the children wanted to participate in this activity and immediately started to gather their popsicle sticks. Isaac, Lochlan and Rhys decided to build one together. Dylan and Andrew did their own but worked close together giving each other tips and ideas to add to their bridge. It was great to see how hard they concentrated on this challenge. It was interesting to see that the children either built a beam bridge or a suspension bridge with the popsicle sticks. All the children began creating the frame of their bridge by laying the popsicle sticks flat on the table in the shape they wanted their bridge to look like. After gluing their frame together, it was time for them to work on the rest of it. Michael said, "This bridge looks like one that I have been on." As they glued the sticks together to form their bridge the children found it difficult to keep their pieces standing up as they were forming their suspension bridge. Isaac said, "The glue is taking a long

time to dry, the pieces keep falling apart.” Lochlan said, “I think we need to let the pieces dry first then put it all together.” With that, Lochlan, Rhys and Isaac made their bridge one piece at a time to allow the glue to dry. Michael and Lucas made 4 triangles each for their suspension bridge and set them aside to dry. The 5 boys continued to stop what they were doing to come and check on their pieces to see if the glue was dry enough to continue. As the pieces started to dry they then attached them to form their suspension bridge. They needed some assistance from Ashley and Emily to help them make cross bars to connect the triangles to one another which also helped the triangle parts stand up right. This activity helped the children to recall what a bridge looked like and recreate it in a 3D form. The children demonstrated patience, team work and communication skills by working together to create a bridge. See figure # 8 for pictures on this activity and process.

Figure #8



Lochlan (6), Rhys (6) and Isaac (5) working together to create their suspension bridge



Andrew (6) and Dylan (5) working alongside each other creating their Beam bridges



Michael (5) putting his last few touches on his Suspension bridge

Lochlan (6), Rhys (6) and Isaac (5) finished popsicle stick Suspension bridge



It was great to see during this project how the children incorporated bridges in their play. Lochlan was being creative with goop and created an Arch bridge. He started out creating a large snake, then he said, "Hey if I pull this part up and then pull this other side up it looks like an Arch bridge." See figure #9 for this creative thinking he did with goop.

Figure #9





Lochlan (6) was exploring goop and said, “Hey I can make a bridge with this.” Here is his Arch bridge made from goop

The train tracks were also a big hit this summer and were used a lot while the children played cooperatively together. Once the bridge project took off the children were observed building bridges for their trains. Lisa showed them pictures of bridges from around the world one afternoon and one that really caught the children's interest was the roller coaster bridge in Japan. They learned that it had to be really high in the middle for ships to go under which created a really steep descend for cars. This had the children thinking how they could accomplish this with their train tracks. They tried using pieces of wood to keep the tracks upright. This seemed to work as it allowed them to drive their trains or cars up the track. There were many shouts of excitement, “Yes it worked!” The children independently worked together as a team, developed their own creative ideas and learned to problem solve. It’s great to see them smile and feel so proud of their successes. See figure #10 for the photos of their creativity.

Figure #10



William (4) created an Arch bridge. He said. "it goes straight up and then the train drops really quick on the other side"



Stephan (5) saw William's bridge and constructed one farther down the track so there were two bridges for the trains.



William (4) created his own version of the roller coaster bridge in Japan.



William (4) and Joshua (4) constructed another type of bridge that then attached to their train tracks.

Some of the children were talking about what types of bridges they have been on while they were building with the blocks. This gave Ashley and Lisa an idea to create a survey. With the children executing the survey they would be able to find out exactly what types of bridges we have all been on and which ones were more driven or walked on. Remy took the survey and walked around the room asking all the children and educators if they have been on a Beam bridge, Suspension bridge or an Arch bridge. Some of the children responded right away and for others Remy had to show them the pictures at the top of the survey so they could recall what each bridge looked like. Tanner said, "I have been on a Beam bridge and have seen them on the highway too." Joshua got excited when answering and said, "When I was a baby I went on a Suspension bridge in San Francisco." It was not only great to hear how the children answered the survey and remembered what types of bridges they have been on but also how they identified the location of the bridge. With that it sparked an idea to create another survey but this time to survey if the bridge they were on was

over water, a road or if it was a bridge only for people to walk on. There were only a few children that said they didn't remember but with our surveys we found out that more of us have been on a Beam bridge and that the bridges were over the road. See figure #11 for our surveys.

Figure #11



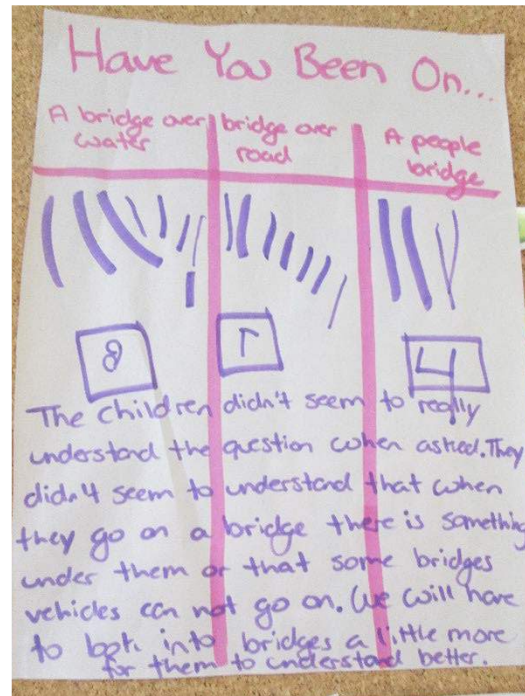
Remy (5) surveying the children on what type of bridges everyone in the classroom have been on before.



The finished survey



Elissa (5) had the survey of what was your bridge over or if it was a people bridge



The finished survey

One day Emily and Ashley took the children to a nearby bridge to do our own investigation. When we arrived we walked across it and looked over the railing and Emily asked them what type of bridge is it. Colby said, "Its a Beam bridge because its flat and has a post under it." We then talked about what it was made of and the children all answered at once and said, "WOOD!" After looking around on the bridge Ashley brought out a couple of tape measures and some rulers. She told them that these are the tools we are going to use to measure the bridge. Colby, Ryla and Gavin asked for the rulers and Kane and Michael wanted to try out the measuring tapes. Colby started at one end of the bridge and wanted to see how many rulers long the bridge was. Ashley showed him to place the ruler right at the edge of the railing then place your finger where the ruler ends on the other side. That way you know where to move the ruler next. He did this all the way to the other end of the bridge and found out it took 64 rulers to get to the other side. Colby then took a clip board with a marker and recorded his observations. Razan, Brooklyn and Michael with Emily's help made notes about the bridge. They noted that it was made of wood and it had nails which they believed were made of metal. They measured the width and found it was 5 feet wide. They also drew a picture of the bridge below their documentation. They titled their drawing, "Beam Bridge" because they believed it was that type of bridge. Kane and Gavin walked around the whole bridge measuring the length, width and height of the bridge. Gavin said, "I like using the measuring tape but it's easier to use it with two people so Kane is helping me." Before leaving Razan was drawing another picture of the bridge but this time she added trees around it because the bridge was surrounded by a forest that went over a little creek that had dried up. See figure #12 for our investigation of the bridge.

Figure #12



Colby (6) measuring the length of the bridge with a ruler



Gavin (4) & Remy (5) writing out their findings on the bridge



Everyone exploring the bridge and its surroundings

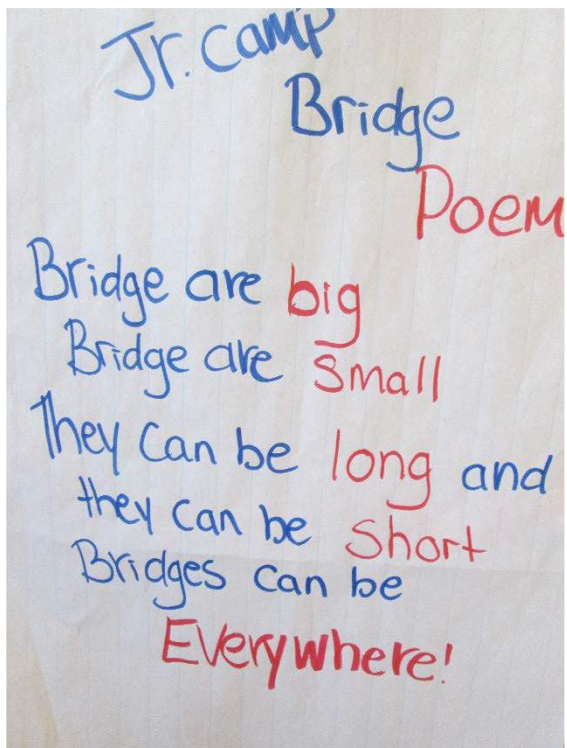


Lucas (5) trying out the tape measure and learning how it works

LEARNING • CARING • SHARING • GROWING

Lisa and Emily helped the children create a poem for our bridge project. They asked the children different questions about bridges or when they think of bridges what do they think of. The children came up with some good answers that Emily and Lisa put into the poem. See figure #13 for our poem

Figure #13



## Phase 3: Concluding the Project

Our final 3D project was a bridge we built and gifted to our preschool and toddler playground. For this project we talked about what type of bridge we could build for our child care playground. Aiden said, "Let's build a Beam bridge because it would be easy to make it straight across." Remy said, "An Arch bridge because then they can drive their cars up and down it." So Remy drew a picture of what the bridge would look like. Then we had to decide what materials we needed to build our bridge. Aiden recorded the materials that we needed onto a piece of paper as the children shouted them out. Brooklyn added the dimensions of the bridge. Once we had our materials Ashley brought in a screw driver and a drill so the children could see what tool they found easier to work with. The first step was to build our frame Michael said, "Just like how we built our popsicle stick bridges". Sophie Y. tried using the screw driver first and found it really hard to screw the nail into the wood. She asked if she could use the drill, so with help from Ashley she was able to get the screw into the wood with ease. After using it she took her safety glasses off and had a big smile on her face.

Once the children saw her use the drill everyone else wanted to try it. William found the drill loud and covered his ears when others were using it but still wanted a turn. He was hesitant at first but once he tried it a big smile came over his face. A lot of the children said they have never used a drill before. Andrew said he has used one before helping his dad build their deck. The gleam in the children's eyes and the smiles on their faces after using the drill was great affirmation that learning can be so much fun! After the frame was built, the children helped place the floor boards down. They had to make sure there was enough room for all the pieces to fit so they had to slide them around a bit before they all fit. Once all the floor boards were down they started to screw the boards together. Once one side was down and secured the children started to gather and walk on top and try it out. Colby and Bruno said, "This is cool!" Once it was completed all the children ran on top of it and started walking across it, sitting on it and hanging their feet over the edge. There was lots of talking amongst themselves such as, "This is so neat.", "We built our own bridge!", "Did you use the drill?", "It was so cool but loud." "I love it!" It was great to see the excitement and how proud they were about building their own bridge. See figure #14 on the construction of our bridge.

Figure #14



Brooklyn (5) writing out the dimensions of the bridge



Aiden (5) writing out the materials needed for our project



Razan (5) trying out the drill for the first time while working on the frame of the bridge



Michael (5) helping to build the frame of the bridge



Gavin (4) helping to lay the floor boards on the bridge.



Dylan (5) helping put the last screw in the final floor board of our bridge



Our bridge, the children were very excited to show it off and take a picture.

Sophie (5), Dylan (5), Aiden (5), Gavin (4), Nico (5), Colby (6), Remy (5) and back row Simon (5), Razan (5), Michael (5) and William K. (4)



The new addition to the Owl St. Nicholas playground thanks to all the Jr. Campers that help build the bridge



LEARNING • CARING • SHARING • GROWING

## Teacher Reflections

Ashley - It was interesting to observe how the children incorporated the topic of bridges into their daily play. Watching videos and reading books to support their interest about bridges really showed me my role as an educator. The children shared their input, expressed their ideas and were thinking outside of the box during their play. This really got me excited about learning along with the children through inquiry and exploration. Getting them involved and letting them take the lead also helps build their confidence and critical thinking. This allows them to want to learn more, ask questions and learn the different ways of getting the answers. The children know that you are there to help them which makes it easier for them to ask those questions. I also learned providing specific materials builds their imagination, interests and creativity. It brings their ideas to life and allows them to share their knowledge with others. This project really helped me grow as an educator. It helped me understand that children are eager to learn if you are there to support them and be a partner. This was a great way to see the children express themselves as investigators and explorers. This was a great experience for me and I am glad I was able to be part of it.

Lisa - I loved working on the bridge project along with the children. I learned so much about bridges and about myself. I often heard the children talk about bridges and comment about places we could go to see a bridge. It was wonderful to build upon their interest. It was great to see them explore, play and inquire on their own. I was able to sit back to observe the learning and wonder how I can continue to support it. I think as educators we find it difficult at times to just sit back, take everything in and let the children explore without always giving them the answers to their questions. I felt with this project it was very much child- directed and child – initiated. As educators we were there to support the learning through research and introducing new materials into the program. Overall, it was a great project and I learned just as much as the children did about bridges. The final 3D model of the bridge is my favourite and for it to remain in the outdoor environment for the children to use is amazing.