

Abstract:

Making Space Holy is a project in which 4th grade students at the Portland Jewish Academy turn the school's Makerspace into a holy space based on the text from Exodus 25-27, the instructions on the building of the mishkan (tabernacle). The project is a collaborative effort of Amy Katz, 4th Grade Jewish Studies and Hebrew teacher, and Michael Hyde, STEAM and Maker Education Integrator.

How the Project Came to be:

In the 2015-16 school year PJA introduced and opened our brand new Makerspace. For several years prior, Michael had been working within unused spaces of the school (an old science lab and computer lab, for example) to introduce students to hands-on technology and "DIY" project-based learning during lunch, recess, and exploratories. It became clear from student interest and demand that the school could and should support more of this type of learning. The school applied for a grant to build a traveling STEAM (Science, Technology, Engineering, Art and Math) cart that would house tools and materials for hands-on learning. When a classroom became available instead, the plans for the cart transformed into plans for a makerspace. We envisioned a learning environment that would put real tools in the hands of students, that would nurture creativity, develop real world problem solving skills, celebrate failure as a crucial part of authentic learning, and value play and student-driven learning. We envisioned a pedagogy of teaching and learning that would deepen our school wide focus on STEAM by scaling the walls and hopping the fences between subject areas - Humanities and Science, Hebrew and Math, Engineering and Art. We imagined team-teaching and collaboration, with students and teachers engaged in deep learning together. This vision, the space, and Michael's role as STEAM and Maker Education Integrator was introduced to the faculty in August during our weeklong in-service before school started.

The Torah study program for our 4th grade examines the key events in the lives of the Israelites during the 40 years in the wilderness. Students are asked to consider "what makes a space sacred?" They study the construction and various components of the mishkan, and compare them to their own ideas of sacred space, as well as those of their peers. Students also look at the mishkan in relationship to the Beit HaMikdash (Holy Temple) and to various modern synagogues. As a part of their text study, students are divided into Hevrortot (pairs) with each hevrotah (pair) responsible for studying the materials, building process, and purpose of a different element of the mishkan. Each hevrotah is then given the opportunity to build a small model of their section of the mishkan using materials found in the classroom, and are also invited to present their learning to their classmates.

When Amy first learned about the makerspace she wondered if she could broaden and deepen the students understanding of sacred space by collaborating with Michael and bringing some of the makespace philosophies into the Mishkan unit. With a September full of Jewish holidays, school doesn't feel like it *really* starts until October - the makerspace had only been fully functional for a week or so. There was a lot of excitement and buzz around the space, but it was not yet being used by students on a regular basis, and only a few classes had had a tools and materials orientation.

As Amy and Michael began to discuss what was possible with the mishkan unit, Michael suggested that the 4th graders could be challenged to turn the makerspace itself into a scale model version of the mishkan using improvised materials; something in the spirit of a living room fort built by industrious kids on a rainy day (of which there are plenty in Portland), not so much a heartily constructed model. After watching the G-dcast video called [*Parshat Terumah: The Mishkan: Some Assembly Required*](#), Michael was even more convinced that attempting to build a mishkan in the makerspace would provide a rich opportunity to connect with the text. By limiting the materials and tools that students had access to, and creating a condition that none of the materials could be altered in any way, the design challenge not only preserved the limited resources available in the makerspace, but mimicked the constraints, challenges, and frustrating conditions experienced by the Levites, whose mishkan had to be assembled, disassembled, and portable under extreme conditions. Amy and Michael set up one teaching session during which they presented the challenge to the students.

The Project

On the first day the students came into the Makerspace Michael asked them to tell him about the mishkan. He then asked them to describe what types of challenges the Israelites might have faced when building the original Mishkan. Michael and Amy then presented students with the challenge to build their own Mishkan. "How might we build our own full-scale Mishkan?" Michael explained the constraints of the project and connected them to the original design constraints given to the Israelites. Students could use only specific materials he had gathered onto a large table, and only tools which he had gathered on a cart. The materials included wood, fabric, cardboard, tarps, styrofoam, copper wire, ribbon, and other odds and ends. The tools were "Quik" clamps and C-clamps. Students were allowed to use existing walls and structures in the room, but they could not alter the materials in any way and could only use the clamps, tape, or rope to attach materials. Michael taught students the safety rules of the space and how to use the clamps. He also demonstrated and then practiced with students the correct

way to safely move large pieces of wood and pipe across the room, yelling out a call and response of “Ready around?” “Ready!” “On the move!” Once students were capable and aware of the dangers of moving materials around, they were set off to begin working.

While some students busied themselves right away, many others approached us looking for further direction. Some wondered if they were supposed to focus on the part of the mishkan they’d studied in class, while others simply didn’t know where to begin. A group of three students declared that none of the materials resembled gold and therefore there would be no way to even attempt a menorah, and some begged us to let them use scissors. We fundamentally agreed that the success of this experiment hinged on how much ownership the students took in their collaborating, problem solving, and creativity; we therefore responded to their concerns by asking them further questions.

We encouraged students to bring a sense of imaginative play to the work they did. We made it clear that we would not be telling them what to do or how to do it; we would not solve any problems for them. Amy responded to requests for different materials by referring back to the text. She asked the students to imagine that all of the valuables the Israelites donated to the building of the mishkan actually represented bringing your very best self to the holy work you attempt. At the end of the first day Michael invited students to reflect on their work, and they shared a broad spectrum of emotions: excitement, joy, frustration, nervousness, tears, and everything in between. Looking around, at the end of that first session, the makerspace looked remarkably similar to how it had when the students first walked in; half-made and failed attempts at walls and alters looked like little more than a pile of raw materials. There was a joy, though, a life and meaning in that pile of materials. Everyone unanimously agreed that the project must continue, and that they could do better.

Before the second class period Amy and Michael discussed what, if any, changes we should make to our approach. Perhaps this project was too open ended for 4th graders. We considered revamping it: creating small groups and assigning each group a task, breaking down the tasks for the individuals in the groups so everyone had a job, but we ultimately rejected that plan. We felt there was more to be learned if students could be trusted to self-organize: that experimenting, tinkering, and giving students a project that was as much theirs as possible was a more important lesson than having them create a finished product based on our vision.

On the second day of the project, Michael provided students with whiteboard markers and invited them to design sketches and draft plans on the giant whiteboard in the classroom. Amy reminded them that in the Torah, God gave Bezelel divine inspiration to create the blueprints for the mishkan, so perhaps there was a Bezelel amongst them. Several students at a time worked at the board on their blueprints. As they took steps back to look at their work, they also looked at the work of their neighbors. Soon, they started to comment on each other's plans - and then began to excitedly join their plans together while others waited and watched. The waiting students looked curiously at a sketch for a few moments, and then as if a light switch was suddenly flipped - they ran off and got busy building. After more drawing and erasing, pointing and talking, everyone walked away from the board and all 22 students got busy experimenting. Small groups formed to begin construction on the ark, table and curtain for the holy of holies. Students who just the day before complained about the lack of gold, began building the menorah out of styrofoam, clamps, and PVC pipes. Other groups began to tie fabric and copper pipes together to create walls. By then end of the second day a skeleton of a space began to take shape, but more importantly every student in the class became invested in the beginning of a shared vision. They had stopped asking us for ideas, or permission, or help, and began to rely on each other. We, the teachers, faded into the background and became little more than clocks that would announce the time left to work.

Over the course of the next week students continued working in small groups and as a whole class in the makerspace to build their version of the Mishkan. Occasionally, Michael would offer a mini lessons to any students interested in a particular skill; for example, how to lash two sticks together. If a student thought this skill could come in handy to fixing a problem in their construction, they would come to the mini lesson. If not, they kept working on what interested them. Soon, though, the students who did learn to lash sticks together were showing other students how to do it. When conflicts inevitably arose, Amy encouraged the students to take a step back and meet with each other to communicate clearly. Students began to take this on by themselves when it became clear that the teachers expected them to work out their own conflicts. Over the course of the week students developed an awareness of their own capacity and attention span, and how to manage their frustration levels. Students realized sometimes they just needed to take a break, and were allowed and encouraged to travel between the 4th grade classroom and the makerspace whenever teachers were available in both spaces. As students started to trade off roles, they left notes to their classmates describing what they'd accomplished and what still needed to be done on the whiteboard.

Each day the makerspace was beginning to look a little different as walls were put up, an enclosure made of reflective ribbon and duct tape began to loop around the room, and a distinct altar made of stacks of various sizes of wood started to take shape just inside the enclosure. Meanwhile there was a palpable sense of excitement in the students, the classroom, and the larger school community. 4th grade students were beginning to insist that their parents park and walk them into the school, rather than just dropping them off, so they could show them the mishkan - excitedly pointing out what part they had made, why it was so challenging, and what needed to happen next. Students filled the space making repairs to whatever had fallen apart over night, right up until the bell signaled the official start of the school day. Students arrived and left school discussing their project, and many of them spent their recess time working on the mishkan. Students in other classes were beginning to find excuses to poke their heads into the makerspace, and administrators and our Rabbi dropped in, observing Amy and Michael's joint teaching, asking questions of the students, and surreptitiously snapping photos on their phones.

After about a week of construction, including a hastily added roof, the students declared their mishkan finished. Inside the walls was a table holding ceremonial bowls for incense and paper and cardboard loaves. The styrofoam/pvc pipe/rope menorah stood proudly across from the ark enclosed by a curtain. As a full class community Michael and Amy gathered together in their space and Amy read aloud *Exodus 40:33 When Moses finished the the work, the cloud covered the tent of Meeting, and the presence of God filled the Mishkah.* A hush filled the space as many students looked up, expecting to see God's presence fill their Mishkan. For many, it did.

Together the students and teachers prayed the morning service together and enjoyed a few extra moments marveling at their creation. At best glance, the makerspace looked exactly like a living room fort-style Mishkan. At worst, it was a jumbled array of random materials haphazardly stuck together with too much duct tape - little more than a fire hazard. Through the eyes of an educator and anyone who understands children - it looked like clear, indisputable, authentic student work. Over-engineered in some places, under-engineered in others, but remarkable in every way. To all who had a hand in the Mishkan construction, this space had become exactly what we intended; it became what we made it. If not made of our best materials, it was made with our best selves - with our best intentions, collaborations, frustrations and tears. We made a space for holiness, a space for prayer, a sacred space. A mishkan.

Over the next several days the 4th grade students led tours and services for each grade level in the school. They took even more ownership of their work as they described their process to other students and invited them to see the space the way they had come to see it, a holy space.

Standing inside the Mishkan, Amy and Michael presented the project and their collaborative, team-teaching process to the lower school and middle school faculty, as well as community members and visiting rabbis. We all used the space as much as we could. Eventually, just like in the Torah, the students were asked to take down their mishkan. It was time for the makerspace to be used for other purposes, and besides, we had been allowed to keep it up for longer than we should have since we were in violation of more than one fire code. The students were sad to take down their creation, but did so collaboratively and with very little help from their teachers. While the makerspace was once again transformed into a classroom across from their the own, they carried the lessons they learned with them across the hall. That holy presence, that sense of space and time did not disappear when the structure did. We all still carry that.

Afterwards:

The 4th grade students opened the door for other classes and grades to use the makerspace on a regular basis. Once the teachers and students in the school saw the power of the Miskhan project, teachers began collaborating with Michael to design problems and projects for students using their own curriculum as a guiding principal. Amy encouraged all of her colleagues to bring their students to the makerspace, and became a true champion of maker education and hands-on, process-oriented teaching and learn. Michael continues to be fascinated by the intersection of Judaism and Engineering Design that the mishkan project inspired.

Michael and Amy were asked to think about ways to share our work and the work of our students with the wider school community. We created a video that was shared at a community gathering called "Special Friends and Family Day," and wrote an article for board members and donors describing our project. In May of 2016 we were invited to present our project at the Maker Ed convening in Oakland, CA. During that same trip we spent a day mentoring teachers on collaboration, STEAM integration, and design thinking at the Contra Costa Jewish Day School. At that conference we called our project "Learning to Let Go," which was an important takeaway for us: once we let go of expected outcomes and control, the students owned their learning. We both continue to

use this philosophy as an essential tool to create meaningful learning experiences for all of our students at PJA.

Conclusion

Our project was much more than an exercise in learning to give students ownership of their work. Somewhere along the way the all of us stopped seeing PVC pipes, wood scraps, cardboard and tape, and began to see acacia wood, gold, and fine twined linen. As the students brought their best selves to our new space at PJA, the space itself took on a new meaning. The 4th graders sanctified it with their excitement, creativity and collective wisdom; they were the first ones to use the space in the school, and they made it holy. We look forward to continuing to work with 4th graders and giving them opportunities to transform our now well-used and beloved makerspace into their own visions of a holy space, we look forward to building and collaborating together and with them, and eventually to praying and sitting with them in their own mishkan.

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