

## 26

## Eighth Graders Design Monuments to Historic Figures

by Heather Allen Pang



Figure 26.1: A completed monument model.

For several years, I have ended eighth-grade history with a project that brings together two themes we have looked at through the year: individuals who make a difference and historical monuments. The students have finished their research and class presentations on the 1950s, 1960s, 1970s, and 1980s. They pick one of the important women, or women's issues, from their group research projects and design and build a model of a monument to a person that they would like to see on the National Mall in Washington, DC (fig. 26.1). I only grade the presentation to the class, not the monument itself. The students need to be able to explain how the parts of the monument would make a visitor feel and learn, how the monument reflected the life and values of the person, and how their design and building process had worked.

These presentations on the last day of school are a fantastic way to hear from the students, and they enjoy the chance to show off their work. We don't do a peer critique at that point because the year is over; they couldn't change anything.

After they have picked their subject from the work they had already done on women in the twentieth century, I tell them to think big but to keep in mind that they would have to figure out how to build the model of the monument. They have two weeks in the lab to design and build the models.

When I designed the project, I had two goals. The first was to create an engaging, thoughtful, and challenging project on which to end the year thinking about important themes from their studies. The second was to stretch students to think more critically about using history to become the active designers of historical works rather than consumers of other people's created histories. This project achieved those goals. It also presented some new challenges for the preparations I needed to make for the students to engage in this type of historical practice. We also have a great deal of fun.

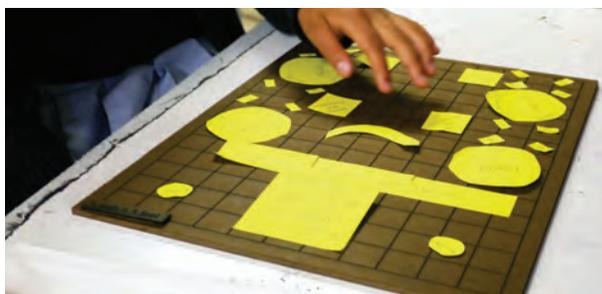
I was asked by a prospective parent who came into the lab while we were working why we would take so much time from "real history" to build things. The question is an important one, and I described some of my observations to the visitor. Students were debating the merits of representing historical events literally or metaphorically. They had long discussions about the need to include negative information in a monument for historical accuracy. They discussed the need to present their subject as a hero, a role model without flaws. They had delved deeply into their historical knowledge to find ways to show a modern visitor the historical realities of the lives of their subjects. I had seen more "real" historical thinking in the project up to that point than even I had expected.

This project brings together several threads from the eighth-grade year, including the ways we memorialize history, the importance of women in American history, and the ways in which students are themselves practicing historians, not just consumers of information. The students used the tools in the fab lab at school to realize their designs, primarily the laser cutter, the foam cutter, and the 3D printer.



**Figure 26.2:** The model includes the monument and the surrounding area.

This project requires students to think about which important aspects of their subject they want to show in the monument, how literal or symbolic they want their monument to be, and how to design the best user experience (fig. 26.2). It also requires them to do a great deal of math to get the right proportions and scale (fig. 26.3). All group projects require collaboration, but one of the benefits of building something physical turns out that it is much harder for a student to hide and let her classmates do all the work. It also requires a different kind of collaboration because no one is sure of the “right” thing to do.



**Figure 26.3:** Planning and measuring.

After the students had successfully presented the projects to the class, we talked about the challenges of the project. Some of these challenges are the same in any group project: time management, delegation of work to group members, and resolving differences of opinion about creative or technical issues. But they also talked about challenges that only came from actually building their monument models, or that came out very differently because of the making process.

First they talked about skills: they had to learn new software and improve their skills on the machines in the lab, which are important challenges in their learning process. These challenges brought out leadership in some students in ways

that other settings had not. They also talked about the interdisciplinary nature of the project, not the way teachers sometimes do, fitting one subject into another because it is a current trend, but authentically, because they could not possibly build what they imagined without using math. They talked about working out issues of scale and understanding how people would react to their presentation of historical material in physical and symbolic ways. The students also talked about how to take an idea (“What if we had lights on our fountain?”) through the process of design and creation.

Other students described the benefits of doing a new type of project. They acknowledged that they had to think through what an architect thinks about, for example, thinking about a fountain going down into the ground rather than at ground level and how they would build that. They had to think about constraints; for example, they couldn’t just put up a façade without thinking about struts for supporting the façade and how that might work for someone visiting the monument. My favorite comment was “Something that’s unexpected during building can actually work out!”

Bringing fabrication tools into the history class opens up ideas about the role of making in all academic subjects. When students experience history through the process of fabrication, they become historians and have to come to a deep understanding of their subject. This opens up a wider variety of project-based learning for social studies and humanities classes, and brings students and teachers more options for creativity and deeper investigation of core academic topics and skills.

This project also reflects an ongoing and evolving interdisciplinary collaboration among Yvette Yamagata, the algebra teacher; Angi Chau, director of the fab lab; and me.

Each year I have increased the connections with math topics. We noticed the scale issues, and the students did too, so now I work with Yvette; she designs some indirect measurement activities to support the project. When we go to see the monuments in Washington, DC, the students do indirect measurements and record their data in their journals, and we save that material for the spring project. We also have them record their

reactions to different monuments in terms of the scale, structure, and style of the places they visit. They will have already done a sample activity measuring buildings on campus.

The idea came from some of the students, who realized that if they wanted to know how a thirty-foot-tall monument would look (fig. 26.4), they needed to find something that was thirty feet tall and stand next to it. They started out measuring the lab itself to compare, but I like the idea of building the measurement process into the curriculum and so does the math teacher. In addition, the math teacher has come down to the lab, observed the students doing the scaling, and intervened in their discussions or pushed their thinking a bit further. The students have been creative about how they tried to imagine scale; we don't want to interrupt that process, but we do want them to apply skills they have learned in other places.



**Figure 26.4:** Dealing with scale.

The collaboration with Angi in the fab lab has been a huge part of the project. I developed it with Diego Fonstad, our tinkerer in residence, and refined it the next year with Angi. The girls get more comfortable asking for help and working together with another expert adult in the room, and that allows for greater creativity. Students who want to go further with one of the tools can do so since sometimes Angi is able to spend significant time with one group, working on some technical challenge; that would not be possible without two people in the lab at least some of the time.

Bringing history class down to the fab lab to build monuments is one more tool we can use

to expand what we think of as history instruction and introduce students to how the work of historians happens in our culture. After building their own monument prototypes, students are more likely to think critically about historical monuments they see, and they are more likely to feel that they have the ability to present historical material in creative ways (fig. 26.5). Doing history in the lab fosters making, and making in the lab makes them better historians.



**Figure 26.5:** The monument project has a student doing the work of a historian, not just learning about history.