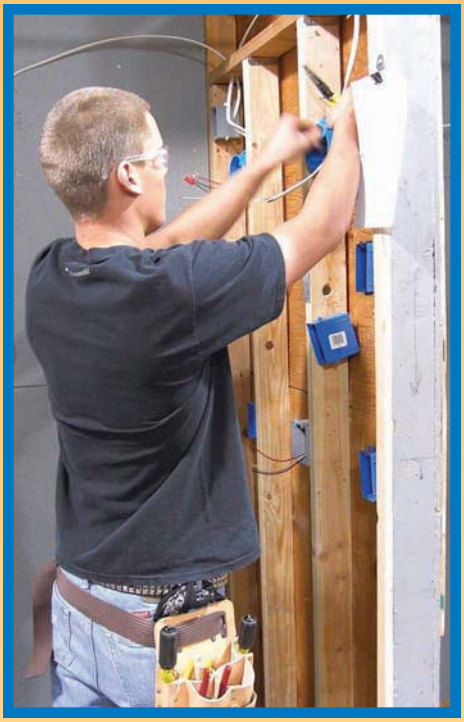


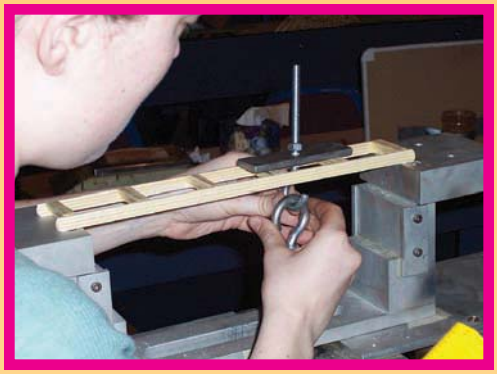
Seeing is Believing

ACE Academy offers creative ways to learn; students give charter school rave reviews



Portland's newest charter school, the Architecture, Construction and Engineering Academy (ACE), opened its doors last September to 142 juniors and seniors eager to learn about career opportunities. The students, from Parkrose, Centennial, Gresham-Barlow, Reynolds and Sandy high schools, split their time between their home campuses and the academy to mix traditional high school coursework with classes targeting the built environment.

Housed in the Willamette Carpenters Training Center, the academy's instructors give hands-on lessons in the fields of architecture, construction and engineering. After six months of classes, five students share their experiences on attending the charter school and how it is making a difference in their lives.



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ACE Academy: A Place to Build a Future

ACE Academy is a place where I want to come to school, where education prepares me for my future career, not only to fulfill a state requirement. At ACE, I have the desire to produce quality work because I can see how what I am learning will directly be applied to my career.

The first weeks at ACE can only be described as a shockingly new experience. I was amazed at the facility, staff and students. This new environment was one where students are held accountable for their actions. We were treated as adults, and this was a new feeling of trust that I can never recall having at my home high school. We were given the responsibility to take care of ourselves and to work hard on the task at hand.

Previous to ACE, I had underestimated the knowledge that tradesmen have. I had the mindset that the job was all physical and that there was no mental activity required. I was embarrassed when proven wrong to have such an error in my judgment. When I was given a task such as framing a wall, or wiring an electrical circuit, I was lost. I had never realized that math and science were such a huge part of the trades. Having to think critically about my next move in a project, and then physically doing it, has shown me respect for this area of work. This new respect and understanding provides a tool when I started designing a house. Architecture is the reason for my attendance at ACE Academy. I want to become an architect and the tools that I am learning in construction and engineering will help me in making better designs for my clients and in increasing better understanding among those working with me.

During the first semester at ACE, I was put into a group of nine students who were specializing in architecture, construction or engineering. We were put into these groups to design, engineer and construct a two-level building that included a residence as well as a retail area. This task alone would have been difficult, but when put into a team to incorporate everyone's ideas and to fit the parameters, the task becomes more complicated than originally conceived. I can recall the week after we first brainstormed, trying to figure out how to design the building to be both appealing to the eye and space efficient. I spent hours sketching out a floor plan that would flow and trying to create a unique shape to the building that would be remembered. Finding a balance between the two tested me mentally as an architect in a way that I had never experienced.

A month after we were put into these teams we were given the task for all nine of us to work together to frame two walls. This was a great visual example of teamwork. After we had built the walls on the floor, we had to lift them into place and secure them. It took all nine of us to do this, and if someone wasn't helping it was apparent. You could tell the wall was unstable because it either wasn't lifted to the 90-degree position or it wasn't secured to the ground. We were all coming from different high schools, but I'm sure we all had never seen teamwork in this exact light before. The flaws within the team were obvious, unlike other projects where at times one person may carry the load of another person who skates through unnoticed. At ACE we are held accountable for carrying our own load. This exercise showed us that if we do not carry our load, our team doesn't finish the task - and in the end, all that matters is finishing the task.

ACE Academy is giving a direction to my career, as well as my classmates, in a way that our home high school could not. We have to adjust our perspectives, think critically, work in teams and act in a mature manner to perform at the school.

– Megan Lesowski

ACE Academy: Endless Opportunities

At the beginning of September when ACE Academy students arrived, we were separated into three groups depending on our interest: construction, engineering or architecture. We then were divided into seven groups and were to imagine we were building a structure, known as the ACE Building. As construction-oriented students, it was our task to learn about all of the systems involved in a structure. For example, at the International Brotherhood of Electrical Workers (IBEW), construction students learned the complexity behind wiring circuits. Like the electrical experience at the IBEW, construction workers also had the opportunity to learn about tiling and plumbing at the Northwest College of Construction (NWCC).

Similarly, at the Sheet Metal Institute (SMACNA), construction students built gutters through an intricate sketch, which was then transferred and applied to sheet metal. Lastly, at the Willamette Carpenters Training Center (WCTC), construction students had the opportunity to frame a wall and build a small roof.

Through these experiences construction students at ACE have become more familiar with the systems involved in a structure, which will be useful throughout the course of our careers.

On Jan. 13, ACE Academy construction students had the opportunity to explore one of the many construction career paths. This opportunity was provided by the Northwest College of Construction.

On Tuesday, when ACE Academy construction students arrived at the college, we were directed into classroom 107 where we were briefed on the job at hand by our construction instructor, John Martin. It was then that we were instructed on how to install the sheetrock, and then we went into the shop and applied the knowledge. As construction students, it is safe to say that most of us learn best through hands-on learning, which makes ACE such a beneficial experience. Before my visit to the NWCC, I had never placed sheetrock on a wall or even seen it done. You may come to the conclusion that this task is straightforward, but when working on the project yourself, you might find that it is very complex. For example, when placing the drywall onto the wall it is essential that the nails are placed every six inches around the perimeter. As for the screws within the board, it is vital that they are positioned every eight inches. Similarly, as we began to mud the seams, we were provided with hints and tips on the best possible way to do this. It is for these reasons and experiences that this program is unique.

There is knowledge to be learned that cannot be learned in a classroom environment. We at ACE acquire work experience during high school that most do not attain until after they're accepted into apprenticeship. Like applying sheetrock at the NWCC, ACE Academy students have practiced an assortment of different things. For instance, ACE Academy construction students cut and pasted tiles onto a wall at the NWCC. Further, at the IBEW, construction students wired a variety of different circuits and also bent conduit. Similarly, at SMACNA, construction students built gutters by sketching a complex drawing and transferring it to sheet metal. Lastly, at the WCTC, construction students had the opportunity to frame a wall and build a small roof. With the work experience that we will obtain throughout the course of the year, we will be given the opportunity to apply our knowledge in an internship during the summer between our junior and senior year.

As described, if I apply myself within the program in as many opportunities as possible, my desired potential to become what I want becomes more of a possibility, and I believe it can be achieved through the ACE Academy Charter School.

– Marco Benois

ACE Academy: Promoting Teamwork

ACE Academy students began a team housing project called ACE Building to learn all there is to know about what goes into constructing a building. There are three different types of students at ACE Academy, separated by our interests of architecture, construction and engineering. As a construction-oriented student, I learned more about the construction features of erecting a building than that of the architecture and engineering components. My favorite of the construction aspects was learning how to build a roof.

To learn how to build a roof, you need to start with the basics. As construction students, we first had to take a look at what different types of roofs there are. After learning several types of roofs, we took a trip back to basic math to calculate the slope of a roof, also known as the rise constant. From there, using the rise constant, we calculated the unit line length, which is the hypotenuse of a right triangle, the length of a rafter.

After learning about the slope we went down to the deck so we could cut a sample rafter. Before we began to cut, we looked at a sample roof project done by the apprentices. Looking at that we learned about a bird's mouth, which is a cut into the rafter so it can sit on the plates, creating the slope of the roof. We also learned of a plumb cut, which is a cut that is vertical when the rafter is in place. This cut is placed at both ends of the rafter so that it can be connected to the ridge board, which is the rafter that goes along the top of the roof horizontally.

We became the experts by continuing to learn about the roofing industry, how to calculate the numbers and to understand why we were calculating the numbers we used. Reviewing how to calculate for what we weren't provided with, we joined our original house building teams to teach them how to perform the needed calculations and build a miniature roof.

Before we could build our roof, we first needed to have a base. As a team we took some pre-made walls and cut them down to be 32 by 60 inches in size. Then we double checked that they were sturdy and the same length and width. When checking our walls, my team decided that we needed to rebuild one of them. When it was cut, the wall only had one stud and it was no longer 16 on center, which is a requirement for framing walls. To make it easier for ourselves, we took the wall apart and reconstructed it. Since it only had one stud, we measured the one we had, so that we could measure and cut two more from the extra 2x4s. When that was done we measured and marked where each stud needed to go to be 16 on center and nailed them into place with a waffle head framing hammer. After the wall was built and we had four walls that were identical, we needed to nail the walls to the ground so that they would be square. Once that was done, we had our base.

The first thing we needed to know about our roof was the slope we were assigned. My team's slope was 8/12. With that information we had to figure out what angle we needed to cut the 2x4 to make the peak of the roof on the ridge board. To do that we needed to take the inverse tangent of the rise constant, giving us 33.69 degrees, so we rounded up to 34 degrees for the skill saw cut. Hey look, it's high school math all over again! After our angle was cut on both sides of the ridge board to create the tip of the roof, we now needed to cut the bird's mouth so that the board could sit on the plate. Then we used the stair system using the slope to create triangles down the board so that we could make the plumb cut. Next we had to attach the rafters to the house, creating the first section of the roof. Using the framing hammer, we nailed one rafter to the top of the wall on one side and added a second rafter on the other side to the top of the wall. Then we put the ridge board in between the rafters and nailed them together. We needed to put another board in to hold the ridge board up while we made the other rafters. Once all the other rafters were done, we attached them as well, creating one whole roof. The project was complete!

For the first time we were taking math we learned in our high schools and applying it to something that we do in real life. If we did these math equations wrong, we would get more than a wrong answer – we would have an incorrect roof, which would have to be redone and cost a lot of time and money.

ACE Academy is more than just the classrooms, it is a future. What we learn at ACE can be taken and applied to the real world. Any and all of the aspects of ACE Academy have a lot of worth. With the knowledge ACE provides us, we can take any direction and make a difference.

– Sharie Krouse

ACE Academy: Day in the Life of a Student

On a normal day of school at Barlow High School, I walk into my first class. Some of the people I know, others, not so much. I sit in the same desk every day, and my teacher lectures me about English, math, science, or history. The teacher then assigns me homework. Once the bell rings, I am off to my next class. The same things happen and the bell rings again. I continue out my whole day with this routine.This is how most high schools are run. I do the same things every day and most of the stuff I don't know how to apply to real world situations. However, a day at ACE Academy is much different. Sometimes, it doesn't even feel like I am going to school, but it feels more like I am going to work.

At ACE, the classes are set up much differently. All students are assigned seven courses: English, math, science, architecture, construction, engineering and work place skills. When I get to ACE, I don't immediately go a classroom and start in a subject. I go to my anchor room. This is like a home room at my high school. There, my anchor teacher tells me the schedule for the day. Then I can work on anything that needs to be finished for any of my classes. Then, we all split up into the groups we are assigned to for the day. This could be determined on fields of interest (architecture, construction or engineering), ACE building groups, or everyone is divided into three different groups randomly. I go to the first room assigned for the day for our first block. After about an hour and 40 minutes of doing various activities or assignments, I go on a 15-minute break. I can go to the break room, eat a snack, talk, use my cell phone, listen to music, or just relax. Then once break is over, I go to the next room I am assigned for second block. After an hour and 40 minutes of doing these activities, I have a half-hour lunch. Then, once lunch is over, I go to my third block. This lasts another hour and 40 minutes. Finally, I go back to my anchor room to finish out the day.

One of the best things about the day's activities constantly changing is that I am constantly learning new things and different concepts. Last year as a sophomore at Sam Barlow High School, I found that even though I had a different set of classes every other day, I was still getting bored of the same old routine. Get up. Go to Barlow. Go to my class. Then, the next day I did the same exact thing. The only difference was I went to different classrooms. However, I was still learning the same things. Also, the only way they taught was either through bookwork or lectures. There were very little hands-on activities.

I know a lot of other students feel the same way and are looking for a way to make their high school experience more enjoyable and insightful. At ACE Academy you can experience this. You don't have to leave your home high school; you go there half-time instead of every single day. By doing this, it makes school a lot more exciting. Since I've been at ACE, I haven't felt that desire to just get out of high school. I actually like going to school. I mean sure, sometimes I get tired of going to Barlow and want to go to ACE full time, but that quickly changes after a couple days. Then, I want to go to Barlow full time. That also changes. It ends up being a perfect balance of my time.

At ACE, I am primarily an engineering student. ACE's engineering curriculum is mostly based on civil and structural engineering. I want to be a civil engineer. We learn how to calculate forces, test soil infiltration, and design trusses. A truss is the structural frame that consists of triangles and straight members. A truss can support both compression and tension. You can see this on a bridge, or in the roof of

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a house. These are some of the basic principles of engineering that we have learned so far at ACE.

Another great thing about ACE is that I have met a lot of new people. ACE consists of students from Gresham, Barlow, Centennial, Parkrose, Reynolds, and Sandy high schools. This means that you will have to learn to work with people you don't know. This gives you the opportunity to make new friends and work with different people. In the real world, you work with new people, whether a temporary client, or if it is just a new co-worker. You don't just stay with the same people your whole life. When you have to work with a variety of people at ACE, it just helps and prepares you for the real world.

All in all, ACE has been a wonderful experience. Not only do I get to work with different people, but I also get to work hands-on, and in a different environment. This school can help prepare me for my future. Most of all, it has helped me get a feel of what it's like to be in the design-build industry.

– Laura Riehl

ACE Academy: The Best Choice I Ever Made

My name is Trevor Clemans. I go to Reynolds High School and ACE Academy, and this is quite possibly the best choice I have ever made. If you had asked me what I wanted to do for my junior and senior year of high school before I knew about ACE, I would have told you that I wanted to continue math and work on drafting and engineering at Reynolds High. But I am glad that did not happen. Since being at ACE I have learned things that I might not have learned at Reynolds, and on top of that have made friends with people who are from different school districts and diverse backgrounds.

The school year so far has been, if anything, more than I could have dreamed of doing. It all started out pretty weird with no one really knowing each other except for the people they go to school with. But soon after that everything turned into a very pleasant workplace. The main projects we were working on were based on trying to find out what each person was good at and what they wanted to do. About half way through the semester we split into architecture, construction and engineering. I personally chose engineering. From then on we worked mostly in our own separate fields of expertise. The first major project after that, which was called ACE Building, required each of the three areas of expertise to split up into seven groups, which consisted of architecture, construction and engineering. From there, each of the seven groups designed and plotted out buildings in the lawn in front of the ACE building.

As the year progressed we worked more and more in our personal groups. That meant that I was doing some math that for me was not very hard at all, but to others it was some pretty new stuff that they had never encountered before, mostly pre-calculus. The second major project at ACE was to split into groups of three and four to design, build and later race a mouse trap car that could only be powered by a mouse trap and built with items that are cheap and found around the house. That took a few weeks and my team went from one design to another. The first design was built by my new friend AJ. I am sorry to say we started from scratch when we learned that the mouse trap was not going to work at all. The second design, however, was built by me and worked surprisingly well considering it was built in an hour and from Legos and duct tape. When it came time to compete (the competition comprised of three events: distance, time over 6 feet and force) the mouse trap car initially traveled 25 feet and sped the 6 feet in about 1.5 seconds. The force competition, however, was lost almost immediately. In the end, however, the 6 feet time stayed the same but we won the distance portion with 31 feet and 6 inches, which was an inch farther than the runner-up and 20 feet farther than third place!

That has been the highlight of the year thus far. The second best thing is the fact that I have made more new friends at ACE than I would have if I had stayed at Reynolds full time. I am closer to these new friends than almost all of my old friends, but will never completely replace them. Also, most of these friends are in engineering with me.

The newest thing that we engineering students are learning is how a truss works and how to calculate the stress on the members in that truss. This is also part of pre-calculus work I was talking about earlier. Most of this work is review for me because I am also taking pre-calculus at Reynolds as well, which means that I have a head start on how to work the calculations and rearrange them to fit the answer I am looking for.

But now the semester is ending. We at ACE are working on finals and that puts a lot of stress on all of us to finish any projects that are due or past due. I for one, along with all of my friends, will stay through the next semester as well as the following year. I am really looking forward to what ACE has in store for me in the next year and a half, and I am planning on facing and mastering all of those challenges.

– Trevor Clemans