

STUDIO: Build Our World

Mentor Handbook 2017

Helping youth recognize the STEM in them



Objective

As a STUDIO mentor, your role is to support low income, immigrant, refugee middle and high school students build interest, motivation and identification with STEM. Before exploring the roles and impact of STUDIO mentors on engaging youth, we invite you to think about what a “mentor” means to you. As an incoming mentor, what would you like to bring to the table? For those who are new to mentoring youth, what ideas do you have to inspire passion and curiosity in youth? Those who have previous experience engaging with youth can reflect on their best practices while brainstorming new strategies. If you are new to mentoring, you can think about people in your life who have helped you on your educational path. What were some qualities of the people who helped you most? What did they do to support you? Since there is no single “right way” to respond to and support youth in various situations, we hope this handbook acts as a tool to help you on your journey to be the best mentor you can be in STUDIO.

Pause and Reflect!

As an incoming mentor, what would you like to bring to the table?

Table of Contents

What is STUDIO: Build Our World?	p.3
Mission	p.3
Core Principles	p.4
Philosophy	p.5
Expectations	p.6
The Mentors	p.7
Who Are STUDIO Mentors?	p.8
Weekly Schedule	p.10
An Average Day	p.11
Leadership Opportunities	p.12
Mentor Stories	p.13
Reflecting Questions	p.17
References	p.18

Welcome to STUDIO: Build Our World! We're really excited that you are joining us! In "What is STUDIO: Build Our World?," we will cover why we need STUDIO in the first place, what we aim for, what we value, and what you need to know. In "Mentors," you will learn about different mentor roles, activities, and leadership opportunities. Still not sure what mentors do? Fear no more, "Mentor Stories" is full of stories where past mentors share their challenges and breakthroughs in interacting with youth.

What is STUDIO: Build Our World?

Helping youth recognize the STEM in THEM

The mission of the STUDIO: Build Our World project is to change the face of STEM professions and to address key issues related to accessing STEM education and careers. We know from research that many low income and immigrant students do not always find STEM engaging and interesting, so they aren't accessing opportunities in middle school and beyond. As a result, we create learning opportunities that offer students a new kind of STEM learning experience by offering experiential STEM activities to build interest, motivation, and identification with STEM. We also offer positive STEM role models and access to information about higher education and careers in the STEM field.



Core Principles

What We Aim For

- **Build** capacity for STEM learning within organizations that serve broad community needs
- **Provide** innovative project-based and making and tinkering activities that sit at the intersection of youth interest and mentor expertise to support youths in further developing their STEM interests and identities
- **Develop** sustained mentoring relationships to support youth
- **Offer** every student the support they need to seek out further STEM opportunities, including higher education
- **Work** towards educational equity so that all students have access to STEM education

There are structural barriers that limit low-income and underrepresented youths' participation in STEM learning opportunities including lack of transportation and money to pay for learning opportunities. In addition, most programs do not support learners to engage with new roles, ideas, practices while leveraging the everyday experiences that exist in their communities. In fact, many programs hold deficit views of non-dominant students and their families, assuming that youth are "behind" and lack a strong foundation for STEM learning. Our model continually surfaces and challenges such deficit-oriented assumptions and organizes the STUDIO learning environment to position learners as contributors to the expansion of STEM disciplines.

Philosophy

What We Value



Relationship Building

Programs focused on teaching STEM to youth utilize subject matter to instill passion for STEM careers. **STUDIO not only brings STEM expertise to the program, but also establishes relationships across and within the youths, mentors, graduate students, and staff.** In order to expand the youth's futures in STEM, we make sure to connect their interests and motivations to what we offer through active listening, patience, and respect. Since relationships are at the center of STUDIO, mentors will communicate personal, cultural, STEM, and college experiences with the youth to open up opportunities to learn about each other.



Community of Learners

Previous mentors have expressed that STUDIO is unique in its diversity of mentors' motivations, interests, expertise, and backgrounds. Working across these differences may be a challenge at times. However, **STUDIO is essentially a community of learners in which mentors are united in addressing educational and systemic inequities in STEM and supporting youth through mentoring.** Challenging the status quo is never an easy task, especially at an individual level. Therefore, STUDIO strives to create a learner-centered environment where students and educators are actively and intentionally building knowledge together.



Experiential Learning

Participating in STUDIO is different from most learning opportunities in college. We learn through our experiences working with youth and reflecting on how we can improve our mentoring practices. We also learn by reflecting on ourselves, our goals, values, and identities. As mentoring youth may bring some challenges, **it is imperative to understand that every experience counts as you learn from successes and what you might consider "mistakes," but here in STUDIO we think about as iterations! We are always developing and getting better at what we do as mentors.** Utilizing our community of learners, we will explore, identify, and resolve issues together throughout the course of STUDIO. As we come up with potential solutions, mentors will undergo the process of learning through experience by acting on their ideas, reflecting on the actions, and deepening their knowledge. Powerful and meaningful learning takes place as mentors discover new aspects of themselves, their mentoring styles, interests, etc.

Expectations

What We Hope You'll Do



Actively Participate

Since STUDIO operates on the foundation of relationship-building, we strongly believe that meaningful mentor-mentee relationships do not emerge in a short period. To follow through with our values, we expect mentors to enroll for at least 2 quarters.



Bring YOUR Expertise to Making and Tinkering

Our activities are inspired by the Making and Tinkering movement, which incorporates arts and design into the work with youth. Making and Tinkering encourages exploration and creation of artifacts that have personal and cultural meaning as well as scientific and technological significance. In fall quarter, we often start our program by using these activities. For winter and spring, we then offer opportunities for mentor-initiated curriculum projects that reflect youth interest and mentor expertise or participation in Neighborhood House staff led-curriculum projects.



Be Flexible

As much as we will strive to support you by being flexible with your needs, interests, and schedule, systemic and/or organizational changes may suddenly occur. We hope you will be understanding and flexible with us in that situation in order to make STUDIO the best experience possible to everyone involved.



Seek Support

Mentors come in to STUDIO with passion to serve meaningful learning experiences for the youth, pushing themselves to offer the “best” mentorship. So whenever they encounter difficult situations to handle, some of them feel challenged. It is common to experience discomfort in meeting the social, emotional, and intellectual needs of the youth while striving to carry out personal responsibilities as mentors. Since we are a community of learners, never hesitate to reach out for support!



Reflect

In order to become active agents and actors in your and the youth's learning, mentors are provided with various opportunities to reflect on their thoughts and experiences through classroom discussions and assignments. We have mentors work on weekly reflections where you describe the thought process behind their interactions with youth, staff, and peers. Writing experiences are processes of learning and help the research team assess how they can assist mentors and the program.



Work Across Differences

We invite you to be open and have multiple views about differences since we work across lines of differences in culture, personalities, developmental stages, interests, and backgrounds, etc.

Who Are STUDIO Mentors?



Feeding Curiosity

"STUDIO has allowed me to see mentoring in a different light. It has allowed me to see that mentoring involves immense dedication and sincerity, but also excitement, passion, and happiness. It is not just about focusing on the concepts or key points of biology, for example, that a student should learn, but more about how they want to learn or what encourages them to become curious about that topic."

Near Peer

"I think my identity as a mentor has shifted from being more of a 'teacher' to trying to be more like a 'bigger brother' or 'friend of the youth.' I have found that it is very difficult to try to approach topics from a lecturing point, and rather it is more useful to relate to the youth via humor, common hobbies/interests, and other subjects."



Growing in Confidence

"When I began STUDIO my identity as a mentor to a large degree revolved around my question of whether or not I truly was being an effective mentor to any significant degree. However, as I continue in STUDIO now, and have experienced moments that have validated my position as a mentor, my confidence in my ability to mentor has improved to the point that I can now focus on looking at ways to improve my mentoring skills instead of just worrying whether or not I have any."

Exploring Mentorship

"My identity as a mentor has definitely shifted over the course of STUDIO. During the first quarter my main concern about being a mentor was learning the names of all the youths and learning their characteristics and starting to build relationships. The second quarter with the first round of projects really allowed me as a mentor to build a lot better relationships with the youth as one staff was leading the curriculum and teaching the project. Getting to talk to youths and teach them fun aspects of STEM in music was a great and enjoyable time in building relationships. For the third quarter I really wanted to focus on my STEM association as a mentor. Designing curriculum with Hans has really allowed me to prepare each and every week with a game plan for STEM association. This last quarter has changed the way I think about mentoring in that I'm realizing importance of spontaneous STEM association to prepared STEM association and how often time it's the spontaneous association that I believe is retained better by the youths."



"I wouldn't say my identity as a 'mentor' shifted greatly but my idea of what STUDIO was meant to do has greatly shifted from my initial perspective of coming in as a 'Tutor' to becoming a 'mentor' more so for just being the face of science than being a support structure for the kids. Don't get me wrong, I think supporting the kids through the 'scientific process' or mindset is critical, but I think the kids are not looking to us for emotional support but rather find most success from being pushed to critically think about whatever is in front of them. To me STUDIO is meant to get the students to start learning how to think like a scientist and more importantly to show how attainable science is to them."

Weekly Schedule

***Schedule subject to change due to policy level change in the Seattle Public School System



Reflections

Mentors submit a free-write on their mentoring experiences including interesting interactions, challenges, breakthroughs, and new ideas. In order to encourage different ways of reflections, we also offer opportunities to use multimedia reflections such as audios and videos to share with us.

Friday Seminars

Mentors address key issues through class discussions around readings, other multimedia materials, and experiential learning through experimentations with materials during seminars every Friday. These weekly seminars are also platforms in which mentors interact and consult with each other when challenges surface in mentoring the youth or conducting projects.

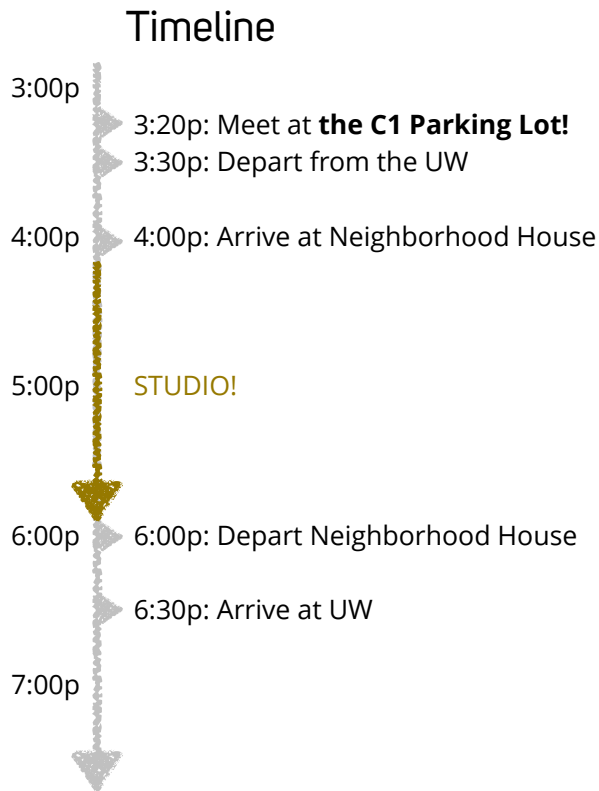
On-site Mentoring

Mentors drive down together in U-Cars to Neighborhood House to have hands-on experiences of mentoring middle and high school students. Starting from making and tinkering activities, the mentors have the chance to either create and implement their own 6-weeks curriculum or participate in the existing curriculum that Neighborhood House has created.

An Average Day



Transportation



In order to go down to Neighborhood House in High Point to provide on-site mentoring, mentors meet at the C1 Parking Lot located under Red Square (see map) and drive the U-Car down to Neighborhood House. If mentors are able and willing to drive, they must meet UW Fleet Services requirements and complete a short online orientation.



What to Bring

- A set of pencils or pens
- UW Attire (If available)
- Yourself!



Making & Tinkering

Before beginning the 6-week projects, there are 3 weeks of making and tinkering activities where mentors and mentees work together to solve problems and get to know each other better. The subjects covered in these activities range from engineering, by building marble machines, to chemistry, by making slime. During these interactions, we try to encourage trial and error, supporting youth in their explorations with the materials and creation of artifacts. These activities contribute to the 6-weeks projects in a way that the youth could continue practicing the skills and mindset of creativity, problem-solving, and reflection.

Leadership Opportunities

Every week, all mentors lead students through curricula and/or one-off projects, so everyone who is part of STUDIO is a leader serving the community. But we also reward those who go the extra mile by taking initiative with these leadership opportunities. The more you are involved, the better you will understand how STUDIO works!

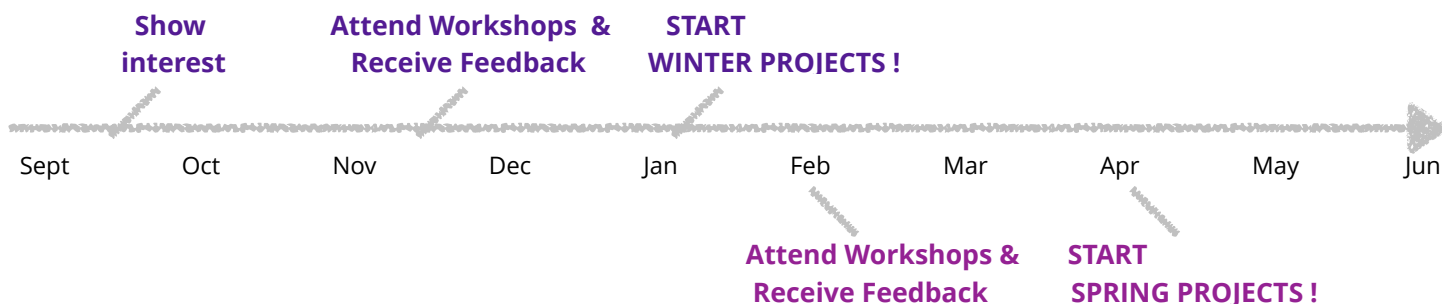
Lead Mentors

Mentors who have been in STUDIO for more than a year have an opportunity to lead fellow mentors by helping organize mentor recruitment, classroom discussions, transportation and logistics, and communication with Neighborhood House staff. They also assist the research team in documentation of the program.



Curriculum Development

Curriculum Development: Experienced mentors have opportunities to create curriculum for the 6-week projects and lead in winter and spring quarter. In order to participate in curriculum development, interested mentors are asked to sign up for a series of one-hour and two-hour long curriculum development workshops in November in preparation for Winter quarter projects (January- March), and in February for Spring quarter project (April- June). During the workshops, mentors and researchers discuss scope and sequence, various instruction strategies, and create lesson plans to design projects that support the youth to see STEM in them.



Mentor Stories

While mentors enjoy making a difference in their community and utilizing their expertise through interactions with youth, there are also times when they feel anxious and uncertain by unexpected circumstances. What are some examples in which mentors felt they were able to make a difference in engaging youth in STEM? What were some challenges that the mentors faced and how did they overcome them? The following are stories that highlight the mentors' experiences in building relationships, and facilitating interest, motivation, and identification with STEM among youth.

Format for Mentor Stories



Challenge: Statement of the problem the mentor had to face.



Strategy: The plan that the mentor developed in order to overcome their challenge.



A detailed story from the mentor explaining their entire situation. Pay specific attention here- it could be that some day as a STUDIO mentor you could find yourself in a similar situation!



Challenge: You feel that you don't have the expertise on a certain activity to help the youth



Strategy: Take a stance on learning together or let the youth learn by themselves through trial and error

I normally give a heavier hand with the students and normally act like to help them to the best of my abilities. This is mostly because I don't have as high skills as most of the other mentors, thus I cannot hold back what I do not have. I remember one student I was helping with their circuits. I only remember a small amount of circuits from high school more than they did so we were very much learning together. Since I did not know much, I just helped the youth out with handling the room or figuring out the paths. It was a lot of trial and error, but I must admit I probably helped a bit more than most. The youth seemed happy at least. If it did come up though, I would probably just tell the truth and say that I was just waiting for them to learn it amongst themselves.



Challenge: You want to help students identify with STEM



Strategy: Connect real life examples to STEM theories and explanations

Getting youths to still identify with STEM when their involved in the activities is our biggest challenge. But what I've come to discover is that their most successful learning (outside of engaging in activities) has come with real life situations. This last week I wanted to teach our group the science and facts behind concussions and their most engagement came when I showed them a highlight clip of Jim McMahon when he was quarterback for the super bowl winning Chicago Bears team and then a video clip of him at 55 and diagnosed with CTE (Chronic traumatic encephalopathy) and early onset Dementia. I think their best learning and STEM identification in this project is going to come from looking intently at science and then taking a giant leap back and looking at the big picture and real life situations.





Challenge: You want to equally challenge every student's knowledge in a group setting



Strategy: Promote student-led teaching and peer-to-peer communication so that everyone is on the same page in terms of knowledge level of the subject

I think we have been doing a good job integrating STEM into gardening and taking opportunities to turn observations in the garden into scientific hypotheses and explanations. For example, I challenged students to identify what the difference might be between leaves that were yellow and those that were green, to which they identified that the yellow leaves meant it was dying or at least less healthy than the green ones and had them support it with a scientific statement (less chlorophyll in yellow leaves means less energy production). Taking this approach seemed to be very helpful and meaningful for students as they can come up with questions and observations and I can steer them into the direction of making a hypothesis and then I can support it with any of my prior knowledge.



One of the challenges of this week's project was equally challenging everybody's knowledge. I know that some kids have an advanced understanding of plant biology compared to others but I am unsure if all are on the same page so when asking questions it is hard to target them in such a way that the advanced learners will be challenged equally with those who may know less.



Challenge: You think that the youth seem disengaged



Strategy: Understand students' motivation by asking questions about their interests, favorite classes, and challenges

Beyond just teaching the curriculum topics, we also performed one-on-one chats with each of the youth to get a feel for what kind of topics and things they wanted to learn. We learned that students were really into fields that were "easy and can make a lot of money." In terms of professions, to them this meant fields such as mechanical engineering, chemical engineering, civil engineering, computer science and engineering, as well as biomedical engineering. Therefore, in the next week we will be sure to dedicate some time for the students to talk more about their interests in these fields and what challenges/classes/expectations.



Thank You!



We wanted to devote this page to **THANK YOU** for taking the time to read this handbook, and for dedicating yourself to something that we all think is important, *Helping Youth Recognize the STEM in Them!* We look forward to having you join us in STUDIO, and welcome the opportunity to learn from you!

What Mentees are Saying

"I knew what I wanted, but it helped me learn a little more. I knew I wanted to do engineering or computer science, but then Studio kind of like helped secure that. Like see what if I was getting into something good."

"They helped us learn more and do more activities in that subject that we wanted to do."

"I think that the mentors have helped not just me but all of us to excel in what we want to do."

Reflecting Questions

Now that you have read all of the information in this handbook, your mentoring journey begins. However, we hope that you have observed that you are not embarking upon this adventure alone! We are committed to providing you with the support you need to succeed, and we intend this handbook to be a resource that you can constantly re-visit and re-learn from. To begin this quest, we have a short reflective exercise to help you start to form your mentoring identity. Try to thoughtfully answer these three core questions, and record your responses. Then, we invite you to come back to your answers in a quarter or two, and see how your answers have changed—and how you have grown!

What personal, cultural, and STEM identities do I bring with me to this work?

How can I help youth make meaning in their learning experiences?

What makes a great STEM mentor and role model?

References

- Neighborhood House:
<http://www.nhwa.org/>
- Seattle Civil Rights Curriculum:
http://depts.washington.edu/civilr/teach_school_plan.htm
- Banks, J. (2007). *Learning in and out of school in diverse environments : Life-long, life-wide, life-deep*. Seattle, WA: LIFE Center, University of Washington, Stanford University, and SRI International : Center for Multicultural Education, University of Washington, Seattle.
- 2016 STEM for ALL Video
<http://stemforall2016.videohall.com/presentations/688>
- 2017 STEM for ALL Video Showcase Funded by the National Science Foundation
<http://videohall.com/p/930>
- freepik.com graphics
<https://tinyurl.com/y7wvudl9>
<https://tinyurl.com/yas2655n>
<https://tinyurl.com/y8u9r3fj>
- Examples of Past Curriculum Projects
 - Gardening and Nutrition
 - Sports Science
 - Material Science
 - Woodworking
 - Videography
 - Careers in Healthcare
 - Coding
 - Photography
 - Biology
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