

**Makerspace Playbook Site Survey:
Lighthouse Community Charter School Creativity Lab
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CONTACT INFORMATION

Name: Aaron Vanderwerff

Title: Creativity Lab Director

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ORGANIZATION

Organization Name: Lighthouse Community Charter School/Lighthouse Creativity Lab

How would you describe your organization type (library, museum, school, community organization, etc.)? School

Organization website: <http://lighthousecreativitylab.org/> and <http://lighthousecharter.org/>

Organization social media links: <https://www.facebook.com/Lighthouse-Community-Charter-School-68801202799/>

Blog and/or site most related to programming, making: <http://lighthousecreativitylab.org/>

Location (city, state): Oakland, Calif.

Is your organization rural, urban, or suburban? Urban

Is your space and/or elements of your programming mobile? Elaborate, if necessary.

The elements of our program that we take on the road are mostly focused on professional development. On-site, our program has a central, physical space—the Creativity Lab—but making is integrated into the core classrooms, and several classrooms have mini makerspaces. We also have several mobile carts that we use for expos and outdoor making.

Target audience(s): Students K-12 and workshops for educators

Percentage free and reduced lunch served (if known): 80%

Access: Is your organization open to public, age restricted (elaborate below), membership-based, free, and/or admission required? Are there specific groups that you serve?

K-12 public charter school, primarily serving children of low-income families.

Tell us about your organization. What distinguishes you from others?

The Lighthouse Creativity Lab is integrating making into the Lighthouse Community Charter School program with a focus on changing core instructional practice. We approach this work with a growth mindset, so it is constantly evolving. We have seen that design, making, and inquiry build student ownership of learning, and lead to higher engagement, deeper understanding, and stronger character development.

MAKING AND CORE VALUES

What is your mission statement? The mission of Lighthouse Community Charter School is to prepare a diverse, K–12th-grade student population for college and the career of their choice by equipping each child and youth with the skills, knowledge, and tools to become a self-motivated, competent, lifelong learner.

In order to achieve our mission, Lighthouse Community Charter School has committed to five priorities in its school design:

- High Expectations for All Students
- A Rigorous Curriculum
- Serving the Whole Child
- Family Involvement
- Professional Learning Community

How does the above relate (or not relate) to your core values?

Making in our Creativity Lab is in tune with our core values as we foster the value of independent thinking, which in turn helps with different projects with making or with conventional learning, all skills that are a necessity for furthering education. By experimenting in different fields, students can discover different careers and interests as well, sparking an interest in a future career.

What forms of making (all creative endeavors) occur?

Robotics, art, Makey Makey, Arduino (physical computing), Turtle Art, Scratch, sewing, 3D modeling, building, engineering, design, knitting, programming, soldering, woodworking, Scribble machines, paper circuits, paper making.

Are you influenced by any particular pedagogies (approaches to learning)?

Inquiry—exploration through inquiry. Our challenge is to give students ownership of their learning by letting them discover through their own persistent inquiry and discovery.

Constructivism—Concepts are built in each individual mind, never transferred from the teacher to the student. Deep conceptualization comes to the individual by building the knowledge through experience. It must come from our own subjective experiences and understanding.

Constructionism—Seymour Papert’s idea that learning happens best when attached to a personally meaningful project that can be shared with others. We learn what we are engaged and interested in.

GOALS

What are the goals of the programming and experiences provided?

- Deeper learning experiences and giving learning context
- Learning to be problem solvers
- Building student exposure to a wider variety of careers and interests

How do your environment, tools, and materials reflect these goals?

The Creativity Lab is learner-driven, where students are not given constant direction but instead an end goal and from there must use experimentation to find solutions to questions, receive constructive criticism from other students, and—if a project does not work exactly as the student wants it to perform—must look at the different ways to improve upon it or see why it didn’t work. This helps our goals emphasizing the growth mindset and getting students to improve to the way they think.

How do you know when you’ve met your goals? What are your metrics of success?

While we strive to integrate making into our curriculum as much as possible, we don’t rely on it as a sole means of learning and proof of understanding. We use making to drive our learning—as a way of iterating ideas and engaging students through inquiry. We also may sometimes use it to gauge comprehension—by asking a student to build a working circuit or to make a working program, and often success is measured by their persistence or improvement. Nevertheless, we supplement this learning with other assessments to ensure consistent learning targets are met.

What are your plans and hopes for the future of your space and programming?

We are hoping to incorporate making more deeply into our core classes. We also hope to support others (especially those serving youth in low-income communities) who are starting in the process in integrating making into their practice.

TOOLS

What are your most frequently used and commonly available tools? (Anything used to make with, no matter how simple. Scissors count!)

Scissors, handsaws, miter boxes, clamps, hot glue guns, box cutters, computers, circular saws, drills, screwdrivers, Makey Makeys, Arduinos, soldering irons, squares, measuring tapes, files, sandpaper.

List any special tools that require supervision, training, and/or certification.

Laser cutter, 3D printer, saws, box cutters, soldering iron

MATERIALS

What are some of the most popular, and frequently used materials?

Cardboard, glue, popsicle sticks, Legos, wood, pompoms, rubber bands, motors, Play-Doh, LEDs, felt/thread, paper, copper tape, batteries.

What are some of your most interesting/ unexpected materials?

Dissected electronics.

What are the most continually reused materials? Most consumed?

Reused: Legos, LEDs, batteries, motors, plastic containers

Consumed: Glue, cardboard, wood, popsicle sticks

Share any specific or general sources for materials.

Amazon and <http://www.batteriesandbutter.com>.

COLLABORATION

What are some of the institutions and organizations that are sources of inspiration, support and influence?

Tinkering Studio, Agency by Design, Sonoma State Maker Certification, Maker Ed, TLTL, d.school

Describe any local, national, and global partnerships and collaborations.

Maker Education Initiative, The Tinkering Studio, Transformative Learning Technologies Lab, Sonoma State Maker Certification

Local: Maker Educator Meetups, San Lorenzo High, Wood Middle School

SPACES AND ENVIRONMENT

In what physical places does making happen in your organization? A single dedicated space, multiple dedicated spaces, general use areas, a workshop (metal, wood, sewing, etc.), outdoors, a theater, a music studio, an art studio? Everywhere? Somewhere else?

At Lighthouse, we have a Creativity Lab, in the K-8 building and on the high school side as well, where the electives of making and robotics occur. Making also occurs in classrooms, whether it be programming, arts and crafts, or woodworking, depending on the subject.

How are the spaces, tools, and materials organized?

The space is organized around three functions: making, thinking, stuff (materials and project storage). Tables, a sink, countertops, and cart tops are used for making spaces. Table space, a large whiteboard, group whiteboards, post-its, and journals are used for thinking. Shelving and cabinets are used for stuff. Materials and tools are organized neatly in labeled bins in shelves, as well as additional storage in closets for excess materials or materials that are not used as regularly. Spaces are cleaned up after each class and are organized by the whole team once a month.

How large is the space(s) where making happens?

The K-8 Creativity Lab is 632 sq. ft.

Please describe how your site and maker space(s) are staffed, including numbers of full and part-time staff and volunteers.

1 Creativity Lab Director, 1 high school robotics/making electives teacher, 1 Creativity Lab teachers, 2 after-school program making teachers, 2 AmeriCorps VISTA volunteers.

First impressions of space(s):

Ideally, when participants first enter the Creativity Lab, they see students who are deeply engaged in learning. They hear excitement and collaboration. They feel inspired and ready to dive in. They experience deep learning. They leave with a sense of pride and deeper understanding.

PROGRAMMING

How did your space and programming get started? Making was first introduced at Lighthouse by Aaron Vanderwerff, a dynamic educator who recognized the potential of making as a vehicle for deeper learning when he began to integrate hands-on project-based learning into his high school physics class, starting with a low-tech project where students designed and tested mousetrap cars. Since 2009, Vanderwerff has spearheaded efforts to expand opportunities to design and make at Lighthouse. He established a making elective in the high school for students to develop independent projects based on their interests. In Fall 2013, with Vanderwerff's support and vision, Lighthouse opened a K-12 Creativity Lab, a space within the school where students and educators from all grades can come to make.

How do you decide on/design/make possible the space and components of the program?

When thinking about the physical space of our Creativity Lab, we consulted with an architect who

prompted us to think about our space in three ways: as a space for making, a space for thinking, and a space for stuff.

Our program and space are constantly evolving. For instance, laser cutting was added to the program after students expressed an interest in it. Our space evolves as our program does. We try to keep (safe) materials where they can be seen so as to inspire making, organized such that the most frequently used materials are made the most available.

We consider clean vs. dirty making and make workzones so as not to have projects “fight” with one another. Ventilation, power, and plumbing have become increasingly important for facilitating our making as it has grown. Once a month we reorganize and rethink our space.

How has your environment and programming evolved? What has worked well and why? What has changed? What could still be improved?

We allow some clutter in our space so as to allow for a feeling of freedom with making, but try to keep it limited, so as not to make anyone uncomfortable with an overwhelming mess.

Our walls are yellow and purple—yellow, in an attempt to inspire activity, and purple to inspire thought. Even our name “Creativity Lab” was created with the idea that we wanted to mix the ideas of art (creativity) and science (lab).

EQUITY AND ACCESSIBILITY

Are there segments of the population that you hope to serve better?

At Lighthouse, we believe all students should have the opportunity to participate in designing and making. Students who attend Lighthouse come from neighborhoods characterized by high unemployment, poverty, linguistic isolation, and low educational attainment rates. 90% of LCCS graduates will be first in their family to go to college. The Lighthouse educational program is set up to serve these students who face great obstacles in their pursuit of an excellent and equitable education.

What strategies do you employ to help increase the accessibility of your space/program to all learners? At Lighthouse, we are a public school so even with our state-of-the-art equipment, students from all walks of life can attend our school. For a third of the year, our seventh and eighth-grade students have an entire class dedicated to making. For high schoolers, making is a yearlong elective. The Creativity Lab also has an afterschool program from 4:00 p.m. to 6:00 p.m. for all of our students, kindergarten through twelfth grade. We also have tried to integrate making into our classrooms as much as possible, in all ages.