The Community Science Workshop Network Story:

Becoming a Networked Organization

February 2014

Inverness Research Associates

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INTRODUCTION

The Community Science Workshops (CSWs) with funding from the S.D. Bechtel, Jr. Foundation and the Gordon and Betty Moore Foundation created a network among the CSW sites in California. The goals of the CSW Network project have been to improve programs, build capacity throughout the Network, and establish new sites. Inverness Research has been the external evaluator for the Network project, continuing a relationship evaluating the Community Science Workshops that began in 1995.

The evaluation effort of Inverness Research has focused on documenting and portraying the growth and development of both the Network and individual sites, through regular participation in meetings and retreats, ongoing interviews with Network staff, site directors and board members, and visits to sites that included observations of programs, interviews with youth and families, and interviews with workshop staff. We have also worked closely with Network staff on developing and piloting tools for ongoing data collection – student surveys, program overview and learning environment surveys, and a family interview protocol.

The key evaluation questions that have guided our work over the past several years include the following:

- How has the CSW Network developed and evolved?
- How would we characterize the health of the CSW Network, and its development as a networked organization?
- In what ways and to what extent has the Network helped create or increase capacity at the various workshop sites?
- In what ways and to what extent has that increased capacity bolstered programming at the sites?
- What is the impact of the bolstered programming on participating youth and families?

This report summarizes the work and contribution of the CSWs, the evolution of the CSW Network over time, and the functions of and benefits of the CSW Network as a networked organization.

THE WORK AND CONTRIBUTIONS OF THE COMMUNITY SCIENCE WORKSHOPS

Community Science Workshops are community-based non-profit programs that offer underserved youth living in low-income, high-minority urban and rural neighborhoods a fun and safe way to explore their world through science. They are part science museum, part wood shop, and part nature center, located in community centers and schools. They serve children of all ages through a wide array of programs, including after-school drop-in programs, and weekend and summer programs, and work with school groups both in school and at the workshop. Over the past twenty years, these workshops have been at the forefront of the maker/tinkering movement. They provide a space for youth and families to explore working with tools on a variety of self-directed projects. In a supportive environment, with facilitation by directors and staff, and an abundance of materials, youth participants and their families can pursue projects that are personally meaningful to them. The workshops serve large numbers of repeat visitors -- children and families through multi-faceted science-focused programming. The CSWs current locations are:

-Mission Science Workshop, San Francisco
-Excelsior Science Workshop, San Francisco
-Watsonville Environmental Science Workshop, Watsonville
-Fresno Community Science
-Sanger Community Science Workshop, Sanger
-Greenfield Community Science Workshop, Greenfield

There are also several affiliated sites in California listed on the cswnetwork.org site that share some of the values and characteristics of the member CSW Network sites, including:

-Community Science Workshop, San Jose
-MESA Mission Science Workshops, Los Angeles
-Coachella Community Science Workshops, Coachella
-Oakland Discovery Centers, Oakland

The Work of the CSWs

Currently, sites in the CSW Network offer 50 programs at 150 different locations (including the workshop sites, secondary sites, and schools), providing 17,370

program hours.[1] Each CSW[2] has created a suite of programmatic offerings that suit the context and needs of the local community. Programs range from after-school and summer drop-in programs, to school programs that take place both at the Community Science Workshops and in schools, to mobile programs that travel throughout cities, to special events and family science nights. The programs at CSWs encourage youth and their families to create things that are personally meaningful to them. At any given time at a CSW site, one might see youth repairing bicycles, using the workshop materials and tools to build a birdhouse, caring for snakes, building and testing motorized vehicles, or working on required school projects (like building a model of a Mission). At any given time at a CSW site, one might see parents and family members using the sewing machine to mend clothing, using the materials and tools at the workshop to build a tortilla press, or helping their children or other youth at the workshop complete a project.

All of these programs are run by a growing number of highly-qualified and caring staff members across the CSW sites who facilitate materials-based inquiry experiences for youth in a variety of settings. The five core CSW sites have 42 staff members between them, ranging from six to twelve staff per site.

Contributions of the CSWs to Youth and Families

The work of the CSWs benefits the youth participants in many ways. The youth we interviewed and observed clearly value the experiences the workshop provides, and the unlimited number of creative opportunities to explore art and science the workshops provide. For many youth, it changes the way they see themselves and their fellow participants, and has the potential to improve their futures. We encourage readers to review each of the site cases for vignettes, quotes, and additional supportive evidence for the ways in which the CSW sites provide many contributions to youth participants.

> *We get to explore. We get to come here for free and it's like a gift. It's like a museum but they don't charge us any money. We get to come here for free.*

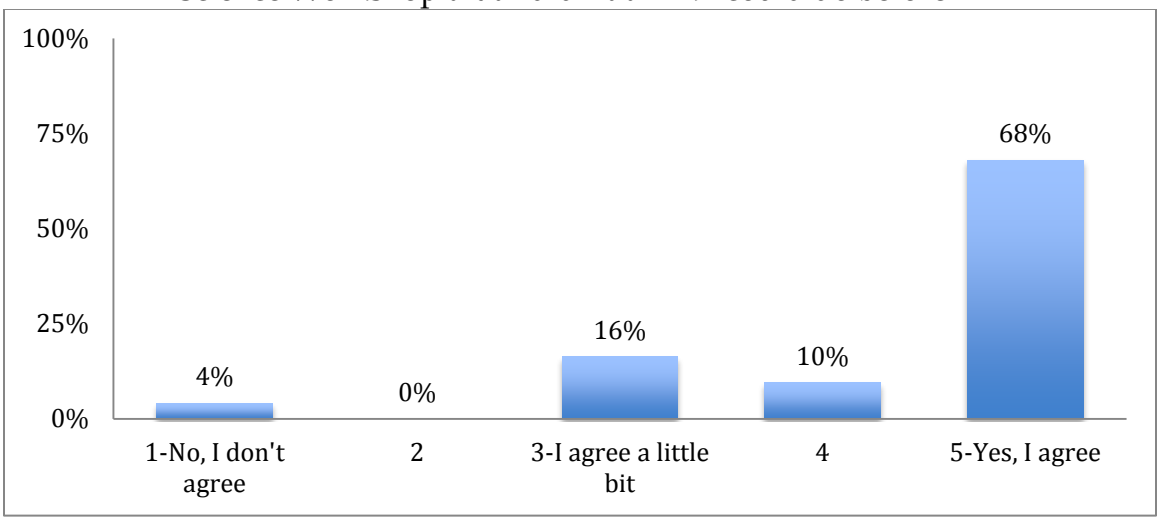
> *The bones were like puzzles. He brought in cow bones, gophers... we had to figure out how to put the bones together. And it made me think about how my own bones are put together. And then my parents came to the workshop with me on Saturday and there were even more bones for us to look at. They love it there.*

[1] For more details on the numbers and types of programs offered by the CSW Network sites, and the participants served, please see Appendix A attached to this report.
[2] We encourage readers to review the individual site profiles for in-depth portrayals of each site.

My favorite project so far would have to be the boat. I like it because you can put it in the water and it just goes… Connecting the battery to the circuit, and the motor to the battery with the circuit, it wasn't frustrating… I can't say it was easy, it was a little complicated.

Perhaps one of the most important ways the workshops contribute to youth is in building their confidence, and opening up possibilities about what they are capable of doing. Data from student surveys show an overwhelming majority of youth who see themselves as being able to do things they didn't think they could do before.

Extent to which participants agree with the statement, "I can do things in the Science Workshop that I didn't think I could do before" [3]



Two students did not respond, so percentages add to 98%.

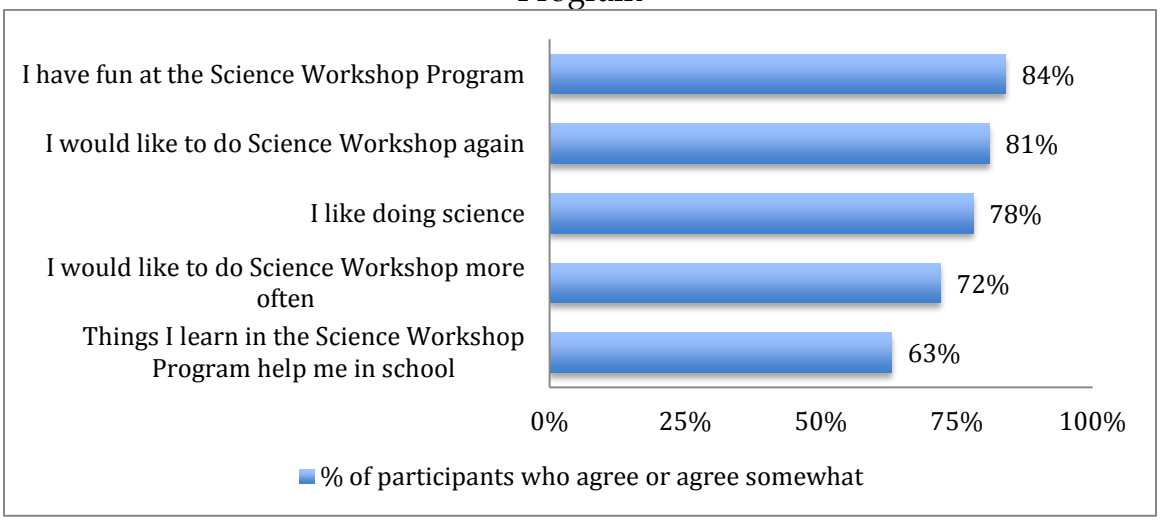
Youth also have overwhelmingly positive experiences at the workshop sites themselves. Youth and their families have the freedom to explore animals, exhibits, fossils, working with tools, and building things, in a very open-ended way. Youth have the opportunity to experiment, learn from the materials and activities, and try again, on their own terms and in their own time. One site director explained this as "trying it different" and noted how important it is for youth: "It means that he is thinking outside of the box and he is putting his own ideas into it while making it work."

Here again youth survey data highlight the positive nature of CSW experiences.

[3] The sites collected data from surveys of students participating in school programs. Sites collected surveys from between 12 and 24 participants each, for a total of 88 student surveys from five sites.

As the table on the following page highlights, the majority of youth report having fun at the workshop, wanting to come to the workshop again, and wanting to come more often. In addition, they report that they like science, and feel the science they do at the workshop supports the science learning they do in schools.

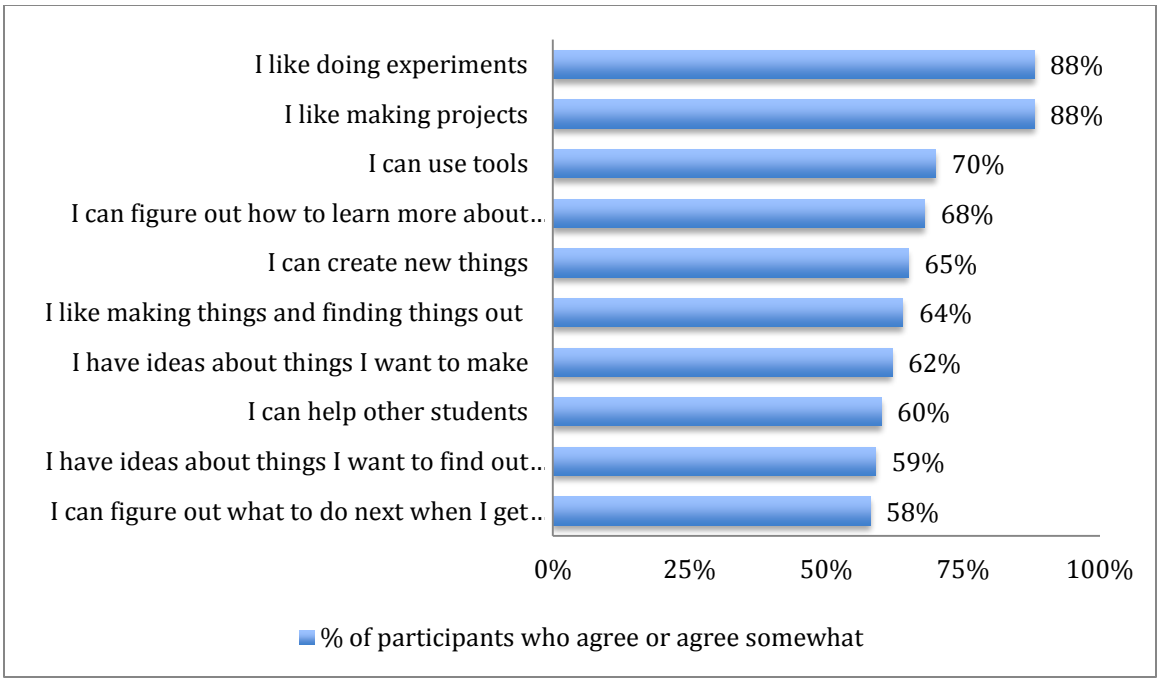
General opinions of youth participants about science and the Science Workshop Program



Percentages in this and the following graph represent the participants who checked "5" or "4" on the following 5-point scale: 5=I agree, 4, 3=I agree a little, 2, 1=I don't agree. We averaged 4s+5s for the sites, so sites with more surveys were not over-represented.

In particular, youth clearly value the experiences they have doing experiments and making projects, learning about tools and how to make things, and learning how to figure things out, as the table of youth survey data below highlights:

Youth participant opinions about specific aspects of the program



The following conversation from a family interview we conducted at one of the CSW sites highlights the delight youth and families experience when youth are entrusted and encouraged to pursue an idea, and given the materials and supplies needed to do just that:

> Youth participant: "We made a bike over here, my bike."
> Parent: "They welded and stuff."
> Youth participant: "We welded two bikes together to make a double bike."
> Parent: "It was cool, they were riding it up and down the street. The back person was pedaling and the front person was steering."
> - Fresno family

Families also find tremendous value in the Community Science Workshops. Parents we interviewed said they value the safe place the workshop provides for their children to be after school, but they also greatly value the experiences the workshops provide for their children, and the resulting confidence, ability, and independence they see the workshop fostering in their children. They also value the informal nature of the workshops that allow them to interact with other children beyond their own, and to also pursue projects of their own.

Families we interviewed reported staying in their community because of the presence of a CSW workshop. In this particular instance, the Network has been vital to the continued operation of the drop-in program at this site.
One parent we interviewed at this site noted:

I have actually considered moving and the reason I didn't want to move, was because of this. There are a lot of bad things happening in the neighborhood and this keeps the kids away from that.

In these neighborhoods, parents are often working parents, which means they cannot always be home with their children afterschool. Knowing there is not only a safe space, but also a place that offers exploration, enrichment, and discovery for their children to be at after school is a tremendous benefit to families in neighborhoods of the greatest need.

When I have a meeting or something, I will call the workshop and whoever answers, I say that I can't make it to meet my kids getting off the bus and so when my kids do arrive at the workshop, the staff will call or the kids will call and say that they are at the workshop now. And I don't have to worry that they haven't made it and I know they are here.

Some of these youth have neither father figures nor garages in their lives – a magical combination that the CSW sites provide in the eyes of some of the parents we interviewed. Two parents at two different sites noted how important having the CSW site directors as role models for young boys was:

They learned to build things and they are more into working on things, you know and things that I can't do with them at home, because there is not a father in the home, first of all, and we don't have a garage, we live in apartments. They don't have access to workshops and Manuel is real good with them, real good.

My oldest son was going and hanging out in the streets until he found the workshop and he started going to the workshop instead. I was really pleased with this and the reason is that Jose is a really respected person. He gives good advice to my son and he has changed from being in the street to being at the workshop.

Parents we interviewed at all of the sites commented on how coming to the CSWs contributes to developing independence in their children.

Since my kids have been coming here, I see them becoming more independent. They have learned how to pay attention to their own safety and use tools in a safe way and they learn the rules for how to do that. They can kind of take care of themselves.

Two of my sons went to Fresno on a camping trip and this was a big event for them. They were scared of the dark when they went and they went and they had a really good time and they came back and they are really acting much more independent and not scared of the dark and doing things for themselves that they

weren't doing before.

She was scared of snakes, but when she came here, she started touching them and then when she was scared she wasn't scared anymore.

In the very beginning she wanted help and that was just in the beginning and I have been sent away ever since and in fact, I want to be involved and she is like 'no, mom you have to go away.' I have noticed her independence and she feels comfortable and I think she feels like she owns it a little and I love this.

In some instances, parents see changes in the dreams and aspirations of their children because of their experiences at the CSWs.

My 15 year old, he wants to work every day in his future. He has changed because he used to just go to school and now he is going to school but thinking about continuing in school to prepare himself to do work and so that he can provide for everything when he is an adult. The workshop probably has contributed to his ideas because there are so many activities that he can do here, that he sees how things can contribute to his ideas and what he wants to do in his life. I am really grateful for the workshop; it has really been an advantage and a benefit for my children.

...[My daughter] wants to grow up to be an artist/scientist.

THE DEVELOPMENT AND BENEFITS OF THE CSW NETWORK

The collective work of the CSW sites is supported by an important infrastructure, the CSW Network. The CSW Network, through its capacity building and site expansion efforts, is creating and broadening opportunities for youth from some of the most underserved neighborhoods throughout the state to encounter high-quality hands-on science, technology, engineering and art experiences.

The History, Evolution and Work of the CSW Network

In 2010, the Stephen J. Bechtel, Jr., Foundation funded a set of four Community Science Workshop (CSW) sites – Mission Science Workshop, Fresno Community Science, Watsonville Environmental Science Workshop, and Oakland Discovery Center – for one year to establish a network among their organizations. With this grant, the CSW Network was formed, a Network coordinator was hired, a governing/voting council for the Network was assembled, a website was created, and a business plan and 501c3 application was completed. In addition, the site in

Greenfield was established, and the Network supported the development of high-quality write-ups of activities to go on the website.

Since that initial grant to form the Network, and with the continued support of the Stephen J. Bechtel, Jr. Foundation and the Gordon and Betty Moore Foundation, over the past several years, the CSW Network has grown and developed further.

The governing council became a board of directors, comprised of the site directors and three external board members. The external board members were "friends" of the CSWs – people who knew the CSWs well, supported them, and believed in their work. Jose Sanchez was elected to the board as director of the Greenfield site, and Jerry Valadez moved from being an external board member to a site director board member as he is now the director of the Sanger Science Workshop site. The board will have four new external board members in 2014, and according to the Network coordinator, the plans are to transition the board to more of a governing board. In addition, the Oakland Discovery Center site transitioned from being a full member of the CSW Network and board to being an affiliated site, by mutual agreement of the Network and the director of the Oakland site.

The Network also established itself as a 501c3, and will soon be divesting itself of Community Initiatives, the umbrella organization that has served as the fiscal agent for the CSW Network since the initial Bechtel grant. In addition, the Network hired an assistant to the coordinator, and recently hired another staff person.

The Network applied for and received two rounds of funding from an anonymous family foundation, and additional support from the Bechtel Foundation to support professional development activities throughout the Network.

The Network also engaged in strategic planning work with an outside consultant, Shiree Teng, an organizational development specialist. Through facilitation of several board retreats and ongoing interviews with Network and CSW site directors and staff, this strategic planning work laid the foundation for the next stage of the CSW Network's development.

Establishing and Supporting New Community Science Workshop Sites

Over the past three years, the CSW Network project (and the Bechtel grant that preceded it) have led to the establishment of three new CSW sites in California: the Greenfield Community Science Workshop in Greenfield; the Sanger

Community Science Workshop in Sanger (near Fresno); and the Excelsior Science Workshop in San Francisco. For complete profiles of these three new sites, please see the Greenfield site case study, the Excelsior Science Workshop case study, and the Fresno case study, which includes a profile of the Sanger site.

Greenfield Community Science Workshop, run by Jose Sanchez, was established in 2011. Located in the former City Hall in the center of downtown Greenfield, this new site has supported an array of programs since it opened its doors. The Excelsior Science Workshop had its grand opening in March of 2013. Located in an auditorium/gymnasium of a church, this site is being run by Sol McKinney, a former student and staff educator of Mission Science Workshop. The Sanger Community Science Workshop is the newest site. This site had its official opening in September of 2013 and is run by Jerry Valadez, a long-time supporter of the existing CSW site in Fresno, and CSW Network board member.

The CSW Network has provided not only funding for site directors and materials for these sites, but has also facilitated the sharing of exhibits and equipment from site-to-site. In addition, the robust reputation of the Network has helped to garner political support within the local communities and helped build solid relationships with city and school officials. Finally, the Network has provided mentoring to new site directors from experienced directors, as well as staff training to directors and staff at these new sites.

Each of these three new sites was developed with great care – securing the location, finding the person to direct the site, ensuring that the values of the new site will reflect the shared values of the CSWs, and ensuring that the local support is such that the site will be sustained over the long-term – all take time and effort. Having the Network to support expansion efforts is key: the Network coordinates the efforts of existing site directors who have the best expertise to assist in the selection and development of new sites, and mentor the new site directors; resources and project ideas are shared amongst the sites in many ways such that when sites first open, they have enough materials, tools, and activities to "hit the ground running." These sites have all opened strong, and continue to grow and develop with the support of the Network.

Capacity Building

The capacity building efforts of the CSW Network have focused on several key areas: staff support and professional development, curriculum development, and resource and expertise sharing. We will say more about the role of the Network related to these capacity building efforts and the resulting benefits to sites in the Networked Organization section of this report.

Professional development: The CSW Network has supported several all-day staff trainings. Hosted at one of the workshop sites, these trainings have provided an opportunity to build community and connections among all the staff at the workshops, share project ideas and discuss science concepts, and continue to build the shared vision and knowledge of the network. Workshop staff we interviewed about the trainings have found them to be useful in many ways, from building relationships with other workshop staff members, feeling a part of a larger vision, and considering new or different approaches to their work. As part of the strategic retreat work facilitated by Shiree Teng, staff members also noted that they wanted more professional development opportunities both inside and outside of the CSW Network, particularly related to science content and pedagogy, and greater access to other sites. With additional support from the Bechtel Foundation, CSW staff members throughout the Network have participated in several other professional development opportunities, including the following:

- 12 staff participated in a Next Generation Science Standards meeting sponsored by the California Science Teachers Association;
- 3 staff attended FabLearn at Stanford
- 2 Network staff attended ASTC;
- 16 people attended a California Department of Education STEM symposium;
- 2 people attended a How Kids Learn conference;
- The assistant coordinator of the Network applied for and was selected to attend an upcoming non-profit leaders conference, and a key staff person at MSW would like to attend a similar course;
- A staff person in Watsonville received support from the network to get her GED so she could begin to take science classes at a local college.

Curriculum development: The Network hired curriculum development specialists at the sites, and there are currently hundreds of high-quality activity write-ups posted on the community pages of the CSW Network website, with materials lists, descriptions, photos, and for some, videos. Site directors and staff we have interviewed at sites are utilizing these write-ups in several ways. Most sites have a binder with the activities printed out for youth to flip through when they need project ideas. Staff also use the binders and websites when youth come to them looking for ideas or additional information. These are viewed as being very useful to the sites, staff and youth participants. As one site director we interviewed noted:

> *That's a big resource for us. We printed out all the write-ups and put them in a folder that is available at the workshop. Whenever someone needs an idea, they*

know to come look in the folder, and they can pull out an idea or follow the write-up.

CSW Network Leadership

The CSW Network is shepherded by an active Network coordinator, an assistant coordinator, and one new additional staff person. They have coordinated and overseen the work of the major activities of the network, written grants that have raised funds for the Network and sites, organized board meetings and the strategic retreat, formalized procedures and protocols necessary for the good of the Network, and recruited new board members. Previous efforts to form a network among the CSW sites did not take hold, largely because there was no coordinator. Having a Network coordinator who pays attention to the whole, and who has time dedicated to do the organizational, administrative and fundraising functions so critical to the Network, has been of key importance in the development and evolution of the CSW Network.

Becoming a Networked Organization

In the last three years, through the help of the grant, the Community Science Workshops have built and strengthened a networked organization.

Networks enable individuals from many different contexts to participate according to their interests and expertise while sustaining collective attention on progress toward common goals (Bryk, Gomez 2011). Over the course of the past several years, the CSW Network has made impressive strides toward becoming a networked organization. A networked organization, as defined by Ken Everett in his book *Designing the Networked Organization*, has three important characteristics:

1) Independence – the members of a networked organization are independent entities that have more freedom than franchisees, for example.
2) Community – the members of are also, paradoxically, part of a bigger community that shares a vision, norms, and a sense of "mutual obligation."
3) Shared "stuff" – it is the work and goals for and products of that work that unite the individual members.

In the case of the CSW Network, each of the sites is its own independent site, operating an array of programs that are most appropriate for the particular local context and the workshop's staff and set-up. Each site also strongly shares the core values of the Community Science Workshops – at a minimum, offering

programs that facilitate materials-based inquiry, offering drop-in programs, and being located in communities of high need. One site director spoke of how the CSW Network is meeting the three areas of definition listed above, by encouraging a degree of local independence, creativity and flavor while still providing a common identity:

> *I really appreciate that about the relationship the Network has set for itself. It isn't a corporate logo stamping… It's sort of a cheerleader for everybody.*

The Community Science Workshops now have a hub – the CSW Network, and multiple affiliates in the CSW sites throughout California. The CSW Network as an entity can connect to the sites, help connect the sites to one another, and connect the CSWs to the broader external world and vice versa – to funders, the field, other networks and projects, and other pieces of the state and national STEM policy context. We see examples of each of these three connections – site-to-site, site- to-network, and network-to-external world – in the CSW Network as a networked organization.

Some examples of the site-to-site function within a networked organization include the following:

- Sites assisting one another by sharing ideas
- Sites engaging in common experiences to strengthen relationships between them
- Sites collaborating on projects
- Sites pooling and sharing resources
- Sites helping other sites, mentoring new sites

In the CSW Network, over the course of the past several years, we have seen examples of all of these site-to-site functions. The idea sharing happens in multiple ways – through the continuing development of the repository of high-quality project activities on the cswnetwork.org website, and through network-sponsored all-staff trainings and staff from CSW sites visiting other CSW sites, where project ideas and instructional approaches are shared and discussed, and "tricks of the trade" are highlighted. We see sharing of resources from sites – at all-staff trainings when one site has a surplus of one material and shares the wealth with other sites, and in particular, when veteran sites share exhibits, materials, fossils, tools and other resources to facilitate the start-up of the new sites.

The professional development provided by the Network has been highly valued by site directors and staff alike. As one site director noted:

For me personally the trainings are so big. The best part of the trainings for me is just seeing everybody and talking and chatting. It's the feeling that you are part of a movement or a bigger thing… more than just one place. So that's special. The trainings have been tremendous.

The activity repository on the cswnetwork.org site is also noteworthy to the new site directors and educators at workshop sites: having a ready repertoire of activities that have been tried, tested, and refined within the setting of a Community Science Workshop is invaluable. One staff person noted:

There's a lot of stuff out there on the Internet. What I've learned more and more and what I really appreciate about the Network site is that there is the credibility… that you have to have done a project with kids, and experimented with it and done for a bit before it gets loaded up there… which I really appreciate. And they are very well written. The quality is so high. A lot of times I find on the internet that people just repeat the same projects that they just read somewhere else, that they may not have made themselves. And then actually trying them, I realize "oh, this doesn't work."

Some examples of the site-to-network and network-to-site function in a networked organization include the following:

- Sites contributing special expertise to the network
- Sites contributing knowledge of context to the network and to other sites
- Sites agreeing to participate in special external initiatives that allow the network to serve outside itself
- The network creating leadership opportunities
- The network offering advanced professional development for staff
- The network convening site leaders to develop programs to meet site and broader priorities
- The network conducting and collecting research beneficial to all sites
- The network gathering and disseminating publications, resources books, websites, listservs, etc.
- The network communicating and interpreting key policies, events, and changes to sites

Again, in the CSW Network, we have seen multiple examples of all of these functions. The whale project began at Mission Science Workshop and staff from MSW has taken the whale bones to most, if not all, of the other CSW sites so that their participants can experience the bones. Watsonville and Fresno have both been participants in the Tinkering Network program coordinated by the Exploratorium, bringing CSW to that program and the work of the Tinkering Network to the CSWs.

Of course, as we stated earlier, professional development has been a key focus of the CSW Network activities over the past three years, including all-staff trainings, and opportunities for the CSWs to participate in external professional development. More recently, with participation at Maker Faire, presentations at national conferences, and invitations to participate in other afterschool and tinkering networks in California, the CSW Network has connected to the broader informal STEM and maker community.

The Network also facilitated the strategic work that has been important in shaping the Network and the relationship of the sites to the Network. And the work the Network and Inverness Research embarked on to develop and pilot metrics for the CSWs is an example of the Network facilitating data collection beneficial to all sites, and potentially to the broader field. The CSW Network staff has also worked to formalize some procedures across all the sites necessary for the greater good of the Network as a whole.

As a specific example of how the CSW Network has contributed to site development, in Greenfield, the Network has advocated for the site with the mayor, the City Council, and the City Manager. The Network helped the site director negotiate the terms of the three-year agreement for the old City Hall where the workshop is housed, and the site relies on the continued support of the Network in its ongoing negotiations with the City Manager's office. In 2012, the Network supported the expansion of the programs by helping the site director negotiate to add a middle school program. The schools and city were resistant to hiring youth assistants to work in the program because of past experiences with liability issues. The outside support of the Network bolstered the argument that the CSW would provide a safe experience. Similar support from the Network helped Greenfield start a fieldtrip program funded by the Community Foundation of Monterey County.

Some examples of the network-to-outside world function within a networked organization include the following:

- The network can cultivate relationships with research communities, professional associations, legislators, etc.
- The network serves as a unitary entity that is able to represent the sites collectively to the broader field, funders, etc.
- The network can work to make the mission of the network visible and important on a national, state level
- The network can collaborate with other national organizations and agencies to co-sponsor conferences, strategize on responding to state initiatives, etc.

- The network can apply for federal and/or private funding
- The network can contribute research to the field
- The network can connect to other networks, projects and initiatives

We've mentioned some of the examples of this network-to-outside world function from the CSW Network already, including the connection to TinkerNet, the California Afterschool Network, the Maker Education Initiative, and Maker Faire. The CSW Network has also successfully applied for grants and received funding from multiple sources.

In our study of other networks in informal STEM education, we've arrived at a set of criteria for judging the "health" of a network. A network works well when members of the network:

- Have a shared sense of purpose
- Have a collective and shared identity
- Do work together
- Have deep knowledge and trust of each other
- Develop leadership in a collective and distributed fashion
- Assume shared responsibility for the mission of the network

We think the CSW Network has made good progress toward being a healthy network. As one former board member noted,

> *They are thinking of themselves more as a network now. They are getting more formal about their paperwork, their grants, their requests, and working more on behalf of the network. You see this paying attention to working together as a whole, sharing resources, bringing in a grant and figuring out how to divvy it up. There is a willingness to see the bigger thing as a whole rather than just their individual sites.*

The Benefits of the CSW as a Networked Organization

First and foremost, the Network-supported expansion of sites, and the expanded program offerings at several of the sites have allowed the CSWs to serve more youth than ever before. In 1998-99, our evaluation of the California CSW sites documented 37 programs providing 7,423 7and serving an estimated 1,232 children. In 2004-2005, we reported data from two of the California sites (MSW and Watsonville): they reported providing 2,476 hours of youth programming that served 10,789 young people. The current data shows sites in the CSW Network offering 50 programs at approximately 150 different locations (including the workshop sites, secondary sites, and schools), providing 17,370

program hours.[4]

Participants noted the growth and development of the new sites as well. As one parent at one of the newer sites we interviewed said,

> *(The Workshop) has developed so much, it is growing. When we first started coming, there were very few materials, very little art materials and now there is plenty, there are animals and there are all sorts of things.*

From our observations of the CSW sites over the past nearly twenty years, we know the growth of the new sites would not have happened as quickly, or with as much steadiness, without the infrastructure of the CSW Network. The new sites are more stable from the start, have greater access to resources, and have added additional staff much more quickly than new sites in the past have been able to.

The Network has also helped to bolster and support the existing sites -- through the curriculum development, fundraising, and professional development we've discussed previously in this report. In addition, staffing for CSWs is another key area where the CSW Network has contributed a great deal to the individual CSW sites. The CSW Network hired the science curriculum specialists at each of the sites, and helped fund the directors of new sites when they first opened. When we evaluated the California Community Science Workshops in 1999, we reported that 20 paid staff ran the eight CSW sites at the time: three full-time site directors, five part-time site directors, and 12 other part-time core staff. In 2005, MSW, Watsonville and the national CSW sites averaged a full-time director and one or two other paid staff. In 2013, the five core CSW sites have 42 staff members between them -- a minimum of six staff members, and two of the sites have 10 and 12 staff members. This represents a key piece of the long-term stability and sustainability of the individual CSW sites.

Opportunities for Further Strengthening of the CSW Network

While the CSW Network has made tremendous strides in the past few years, we see several focal areas that present opportunities for further strengthening of the CSW Network. Most of these areas can be thought about in terms of design tensions that are not atypical for networked organizations to wrestle with as they grow and develop.

The first of these tensions stems from the core value of the CSWs – working with

[4] For more details on the numbers and types of programs offered by the CSW Network sites, and the participants served, please see Appendix A attached to this report.

youth in communities of highest need. It can be difficult for site directors to prioritize or focus on work or funding that does not contribute directly and immediately to youth, families and communities – even if that work and focus will eventually come back to better serve the youth and communities.

Another tension comes in connecting with the outside world. This is an area in which we have seen real growth for the CSW Network, and an area where they should continue to explore where appropriate. In the past, site directors have not always seen the benefit of connecting with others involved in the broader informal STEM and maker/maker education communities, in part because of the specific and unique nature of the audiences the CSWs focus on. As one former board member explained,

> *I think the shared vision about connecting with the outside world is a bit stronger now than it used to be. I'd say it is about at 75% agreed on the value of it. One example of that was whether or not they should have a presence at Maker Faire. That was controversial -- do we really need to be there, and which kids are we serving by going there? That came up. There's a tension that still exists between playing in the maker space world and keeping themselves small, tight and nimble, and a wariness that I would characterize as healthy, as to whether or not the broader maker community has anything to offer them.*

Another tension stems from the transition from "one-man" CSW sites to fully-staffed sites that are part of a networked organization. At a site level, being scrappy and grassroots has been a strong part of the tradition and history, but that is not always beneficial at a networked organization level. Finding a comfort level with additional protocols and procedures that are necessary for the greater good can be difficult. As one board member said,

> *It is part of their view of the Network -- they view that as joining the larger movement and they are a little bit anti-institution/anti-organized.*

Another board member said:

> *There are growing pains and at some point the Network has to see itself as a full-time endeavor. I think there has been a tendency to hold back a little bit because the roots of the CSW are community based and there is a little hesitation to get too big and become one of those bureaucracies that we are trying to avoid.*

SUMMARY

The CSW Network has expanded and evolved into a networked organization

that effectively facilitates the sharing of resources amongst individual sites, the sharing of resources, ideas, tools, and processes from the sites to the Network and the Network to the sites, and the connection of the CSW community with the outside world. The Network has helped create new CSW sites, providing mentoring from existing site directors, resources, and political support that are allowing new sites to start strong and more likely ensure their long-term future. The Network has also helped to bolster and support the existing sites – through added staffing, curriculum development, fundraising, and professional development.

The CSW Network serves as important infrastructure for the sites, expanding and enriching opportunities for sites to better serve youth from some of the most underserved neighborhoods throughout the state, engaging them in high-quality hands-on science, technology, engineering and art experiences. We believe that the CSW Network is critical to the continued sustainability of the current CSW sites, and the potential expansion of CSWs into other communities of need throughout California. Continued support for the CSW Network, and continued focus on the professionalization of the Network and sites, is important work begun with this current round of funding, that is worthwhile to continue.

References

Bryk, A., Gomez, L., and Grunow, A. (Spring 2011). Getting ideas into action: building networked improvement communities in education. *Frontiers in Sociology Education*. Retrieved February 23rd, 2012 from: http://www.carnegiefoundation.org/sites/default/files/bryk-gomez_building-nics-education.pdf

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CSW Network By The Numbers: A Statistical Portrait of the CSWs

In this appendix, we provide a statistical portrait of the CSW sites. Data for the charts and graphs that follow was provided by CSW site directors. Some CSW site directors could provide estimates or actual demographic data for specific types of programs, while others could provide data only for their sites as a whole. The data presented include cross-site charts and graphs for which we have roughly comparable data across sites. In addition, we present charts and graphs for each individual site with demographic, ethnicity, and age data for participants (we did not create cross-site graphs for these items because we did not have comparable data).

What types of programs, and how many programs, do CSW sites offer?

Sites provide between 9 and 14 different programs each, for a total of 57 programs provided across the state.

Nine of the programs are provided in multiple locations by one or more sites. Community events, for example, take place at 25-27 locations per year, enrolled after school programs are held in 26 locations, and school day programs take place in 15 schools and other locations.

Total number of CSWs offering CSW programs and total number of locations for each program*

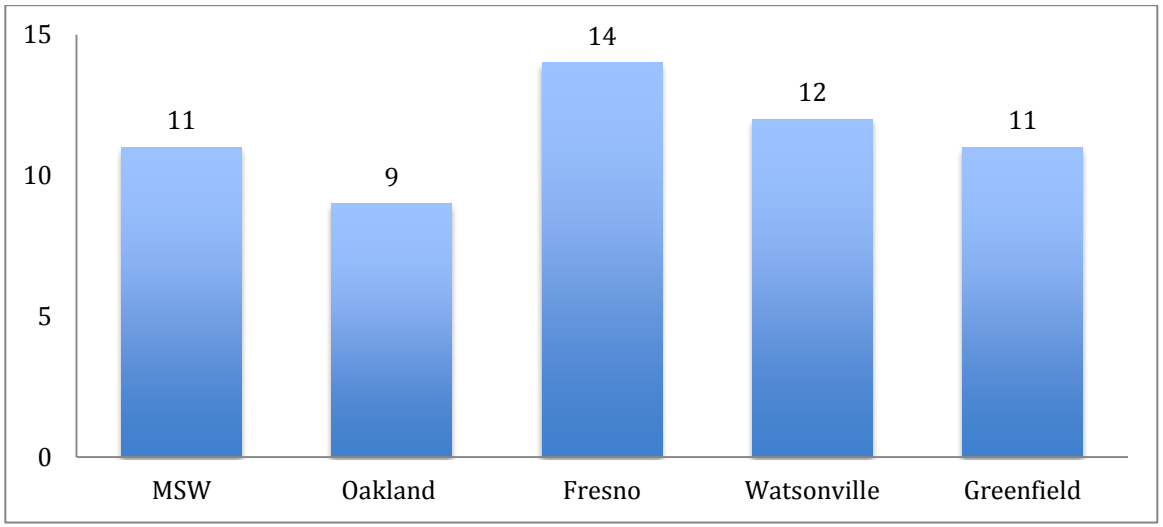
	MSW	Oakland	Fresno**	Watsonville	Greenfield	Total # of CSWs providing this program/ resource	Total locations, if applicable and known
Drop-In at CSW	2	2	1	2	1	5	8
Enrolled Summer Program	2	2	3			3	7
Enrolled After-School	2	2	7	13	2	5	26
School-Day program	4		7	3	1	4	15
Girl's CSW Time				1	1	2	2
Summer School			Y	Y		2	NA
Community Events	2	5 to 7	10	5	3	5	25-27(varies by year at one site)
Family Science			20		2	2	21
Camping & Environmental Education		Y	6	2	Y	4	8+
Family Camp (Camping)			Y			1	NA
Trips with/to other CSWs	Y	Y	Y	Y	Y	5	NA
Secondary permanent locations	1	1	1			3	3
Satellite Sites		2-7, ave. 4		5		2	7 to 12 (varies by year at one site)
Mobile Unit			25			1	25
Whale	Y	Y	Y	Y	Y	5	NA
Teacher Training	2					1	2
Indian Education Evening program	Y					1	NA
Student Employees				Y	Y	2	NA
Student Interns	Y		Y	Y	Y	3	NA
TOTAL TYPES OF PROGRAMS	11	9	14	12	11		

** Note that the counts represent number of locations where a program is offered. "Y" indicates that, yes, a program is offered, but the number of locations is unspecified in site documentation.*

*** Throughout this section the numbers for Fresno do not include the Sanger site; Sanger offers a lot of these programs but we do not have Learning Environment or Program Overview surveys from that site, since they just opened as this report was being completed.*

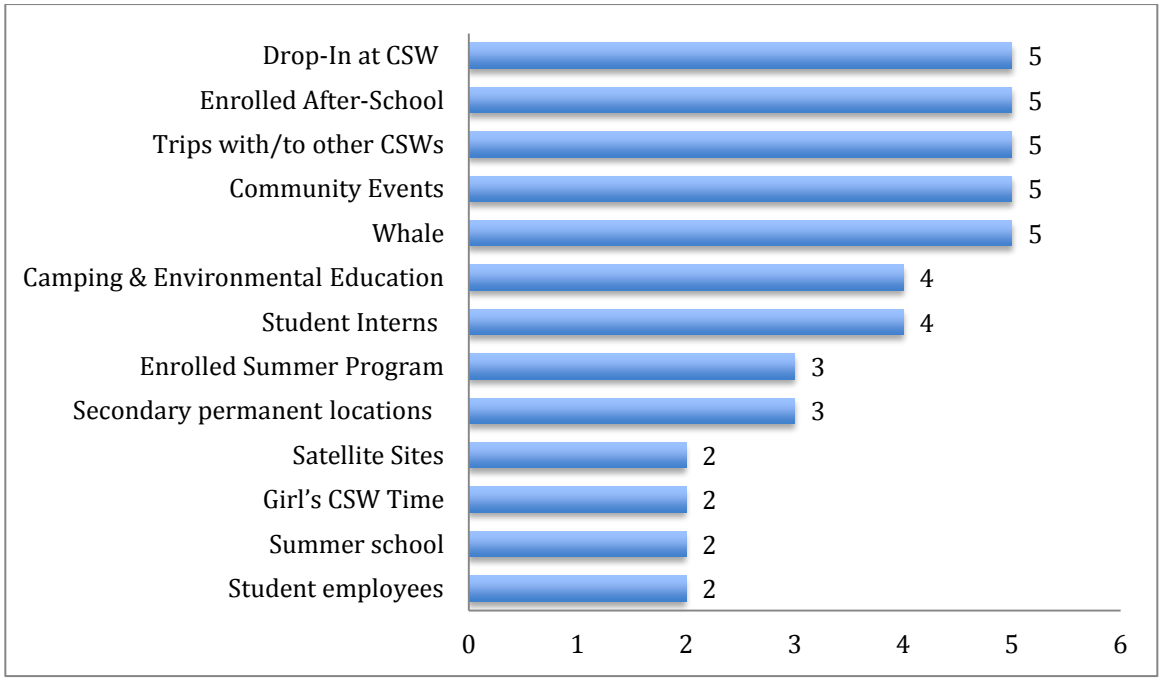
Fresno provides 14 different programs annually, Watsonville 12, MSW and Greenfield provide 11 each, and Oakland provides 9..

Number of programs provided by each site



All five sites provide two of the CSW's core programs: drop in at the CSW and an enrolled after-school program. Three other sites (MSW, Oakland, and Fresno) also offer the third core program, an enrolled summer program. Other programs offered by all sites include community events and trips with and/or to other CSWs (sometimes including youth and sometimes for training purposes) and the "Whale" program. Four sites provide camping and environmental education programs and have student intern programs. Programming at three sites involves secondary permanent locations. Girls' CSW time, summer school and satellite sites are features at two sites each. Two sites (Watsonville and Greenfield) offer paid employment to students. Some programs offered by one site each are not included in the graph below; these include family science, family camp, Indian education evening, mobile unit, and teacher training.

Number of sites offering major programs by type



How many annual session hours of programming do CSWs provide?

CSW programs provide more than an estimated 17, 766 session hours per year. To put that in perspective, if sites operated every day of the year, they would collectively be providing almost 49 hours of programming a day (and this does not include a number of programs for which data about session hours was not available). This high figure is possible because each site offers multiple programs and operates in multiple locations, as noted in the chart above.

Cross-site annual session hours by type of CSW program

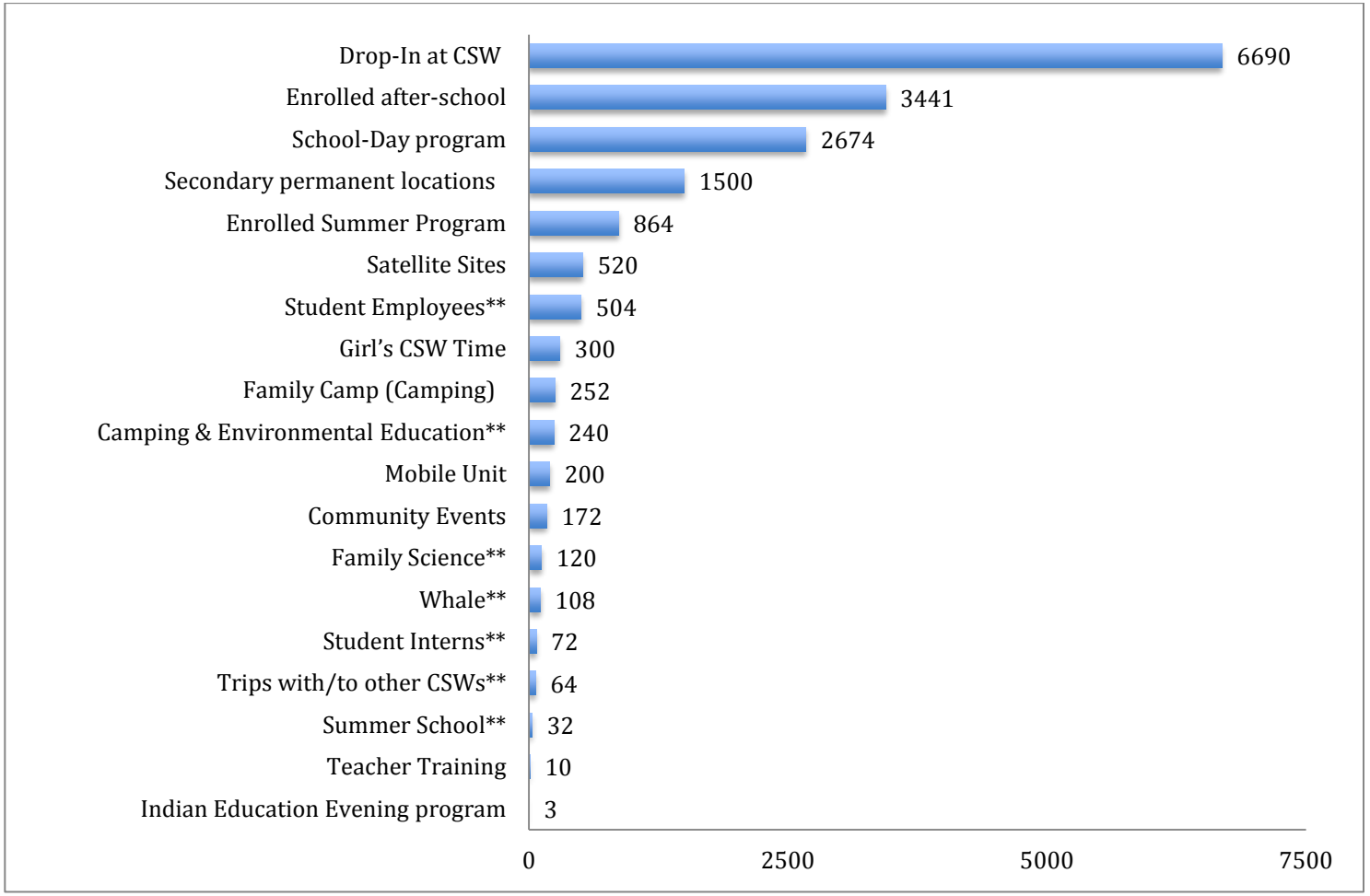
	MSW	Oakland	Fresno	Watsonville	Greenfield	TOTAL CROSS-SITE
Drop-In at CSW	115	2100	1500	2000	975	6690
Enrolled Summer Program	264	420	180	**		864
Enrolled after-school*	233	2100	160	612	336	3441
School-Day program*	1538		720	272	144	2674
Girl's CSW Time				100	200	300
Summer School			32	**		32
Community Events	32	20	80	15	25	172
Family Science			120		**	120
Camping & Environmental Education		**	160	**	80	240
Family Camp (Camping)			252			252
Trips with/to other CSWs	**	**	64	**	**	64

Secondary permanent locations	***	***	1500			1500
Satellite Sites		320		200		520
Mobile Unit			200			200
Whale	108	**	**	**	**	108
Teacher Training	10					10
Indian Education Evening program	3					3
Student Employees				**	504	504
Student Interns	**		72	**	**	72
TOTAL PER SITE	2303	4960	5040	3199	2264	17,776

Session hours are calculated by multiplying the number of hours/session by the number of days over the year an activity is provided.
** For MSW enrolled and school-day programs, these are median annual session hours. Enrolled after-school hours at this site range from 144 to 216; the school day program annual hours range is 1515 to 1564.*
*** Program is offered, but session hours were not available.*
****MSW and Oakland also have secondary locations, but they broke out session hours at these locations by programs and we include them here in program session hours above and in related graphs.*

Drop-in programs are provided for almost twice as many hours as any other program: 6,690 hours annually. Enrolled after-school programs (3,441 session hours), school day programs (2,674 session hours) and programs at secondary permanent locations (1,500 session hours) are the next most substantial programs in terms of hours they operate. Sites provided documentation for two other programs operating at least 500 hours annually: enrolled summer programs (864 hours) and satellite sites (520 hours). As seen in the chart on the following page, seven other programs were provided for at least 100 session hours (along with 504 hours of student employment at one site). Five other programs were provided for fewer hours. Again we stress that not all sites provided session hours for programs other than drop-in and the two enrolled programs, so these figures are very conservative.

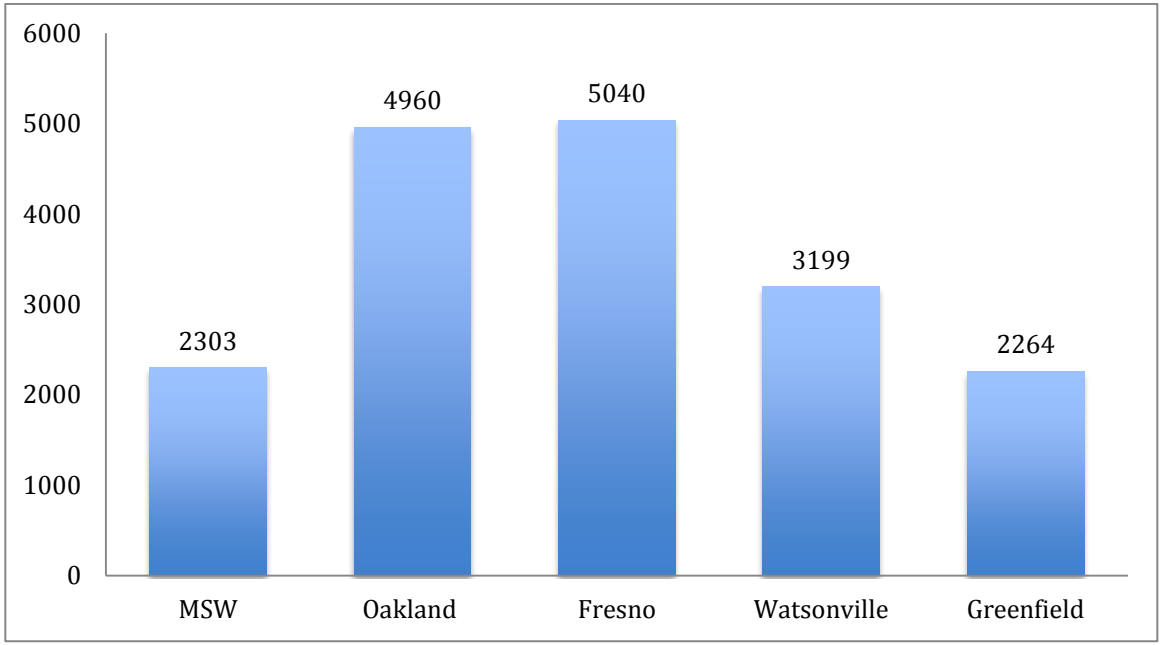
Total annual session hours for CSW programs



** For MSW enrolled and school-day programs, these are median annual session hours.*
*** Additional site(s) offered programs, but session hours were not reported.*

Sites reported session hours sufficient to account for a low of 6 hours of daily programming (Greenfield) to a high of 14 hours daily (Fresno) if the sites operated 365 days a year. Fresno reported 5,040 annual session hours, Oakland 4,960 hours, Watsonville 3,199 hours, MSW 2,303 hours and Greenfield 2,264 hours.

Total annual session hours for selected programs reported by CSW sites*



* *As noted earlier, sites did not report session hours for all programs.*

What is the annual attendance at CSW sites?

It is understandably a challenge for sites to track individual attendance at programs. Staff are busy, many participants are young, and tracking repeat participation is particularly difficult. Therefore, "through the turnstile" counts of annual attendance – where each participant is counted each time she or he participates in a program -- are a better indicator of participation in CSW programs. Attendance at the five sites totals at least 82,052"through the turnstile" participants – nearly all youth. Conservatively, then, 224 youth are involved in just the programs below every day of the year. Site counts and estimates of annual attendance ranged from 10,000 to 23, 335.

Total annual attendance for selected programs*

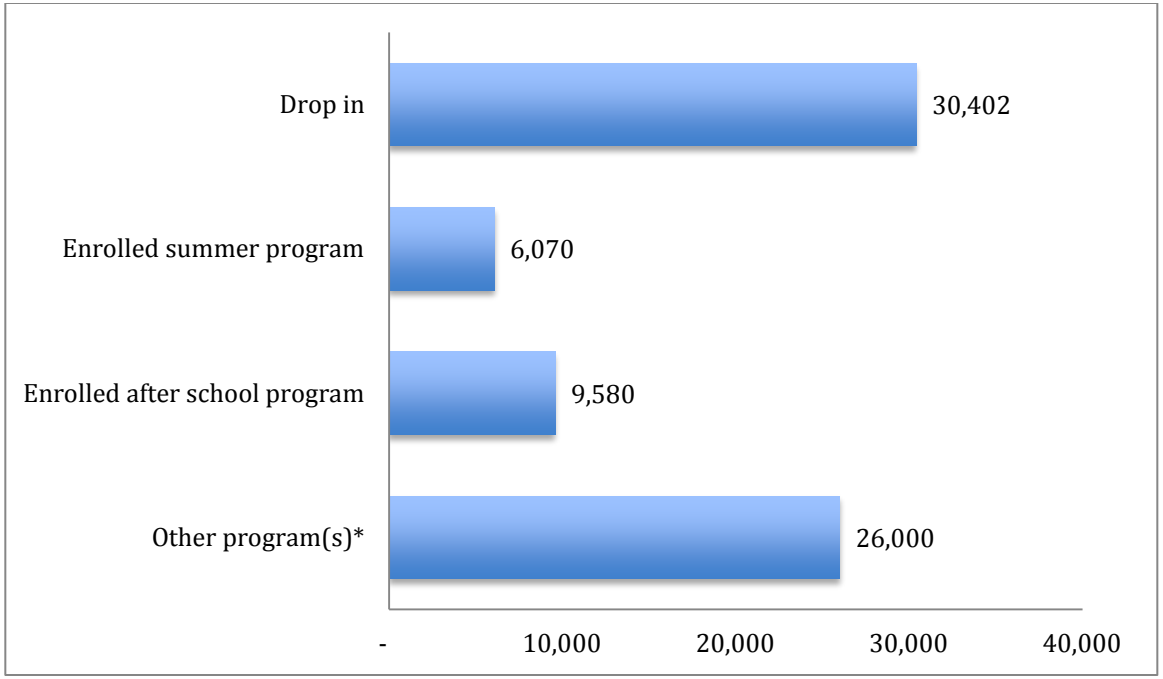
	MSW	Oakland	Fresno	Watsonville	Greenfield	TOTAL ANNUAL ATTENDANCE by program type
Drop in	825	6250	6250	11877	5200	30402
Enrolled summer program	450	1,900	360	NA	3360	6070
Enrolled after school program	1280	3500	4800	**	NA	9580
Other program(s)	12,635		11925	10100**	1440	26000
TOTAL by site	15,190	11650	23,335	21877	10000	82052

**This chart conveys only a very rough portrayal of the scale of the work of the sites. Figures are "through the turnstile" counts/estimates for site-selected programs for which they provided demographic data. Sites varied especially in the thoroughness with which they reported other programs.*

*** Site includes "Enrolled after school" in "other programs": 9,600 for all school programs and 500 for other programs.*

Annual attendance for drop in programs is an estimated 30,402 visits annually. Annual attendance for enrolled summer programs is an estimated 6,070 and for enrolled after school programs is at least 9,580. Sites provided estimates for another 26,000 annual visits to/participation in other programs.

Total annual attendance for selected CSW programs*



This graph conveys only a very rough portrayal of the scale of the work of the sites. Figures are "through the turnstile" counts/estimates for site-selected programs for which they provided demographic data. Sites varied especially in the thoroughness with which they reported programs other than drop in and the enrolled programs. In addition, Fresno (a busy site) provided only figures for its "Granny's" drop in program and Watsonville provided only total figures rather than program-by-program figures.

Sites serve at least an estimated 1,322 individual youth statewide annually in drop in programs, 638 in enrolled summer programs, and 150 in enrolled school year programs.

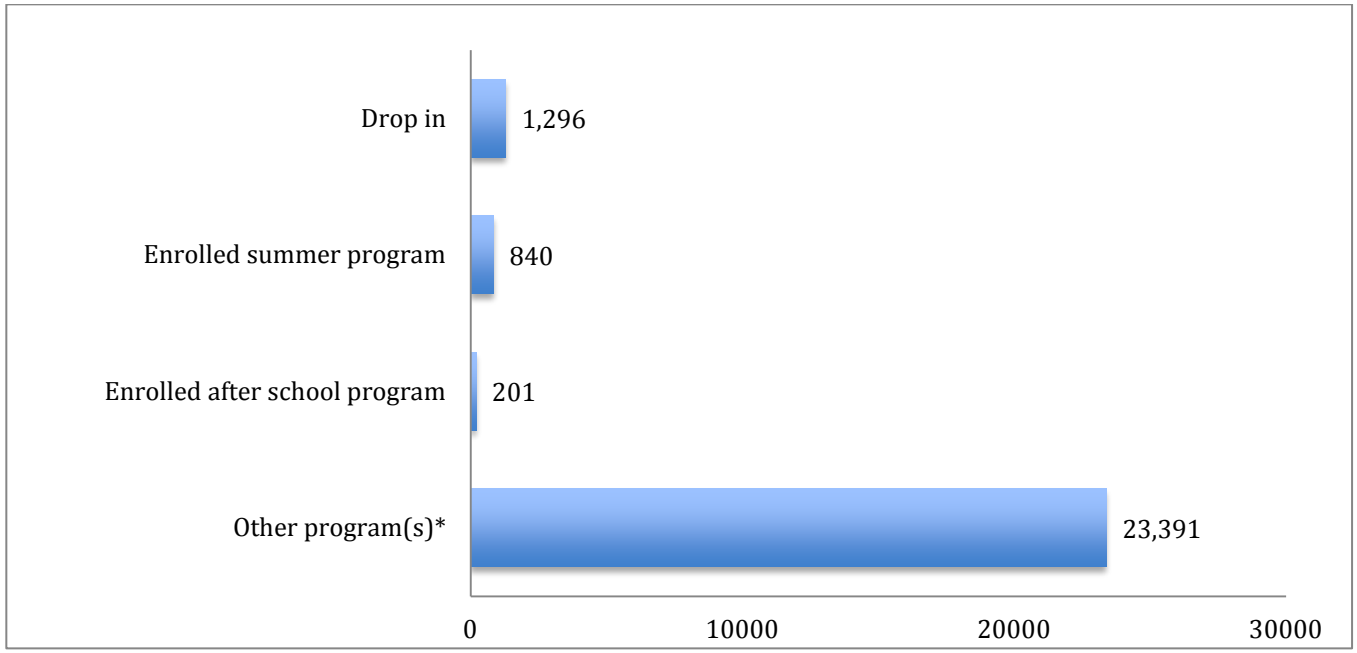
Total individuals attending selected CSW programs annually*

	MSW	Oakland	Fresno	Watsonville	Greenfield	TOTAL INDIVIDUALS ATTENDING ANNUALLY
Drop in	125	671	250	NA	250	1296
Enrolled summer program	254	146	360	NA	80	840
Enrolled after school program	81	120	**	NA	NA	201
Other program(s)	10673	NA	11925	NA	793	23391
TOTAL by site		937	12535 +	2000	1123	25728

This chart conveys only a very rough portrayal of the scale of the work of the sites. Figures for each type of program are incomplete. On the other hand, individuals are counted for each program they attend, so totals may be high. Sites varied especially in the thoroughness with which they reported other programs

In 1998-99, our evaluation of the California CSW sites documented 37 programs providing 7,423 program hours and serving an estimated 1,232 children. In 2004-2005, we reported data from two of the California sites (MSW and Watsonville): they reported providing 2,476 hours of youth programming that served 10,789 young people. The current data shows sites in the CSW Network offering 57 programs at approximately 150 different locations (including the workshop sites, secondary sites, and schools), providing 17,370 program hours.

Total individuals participating in selected CSW programs annually*

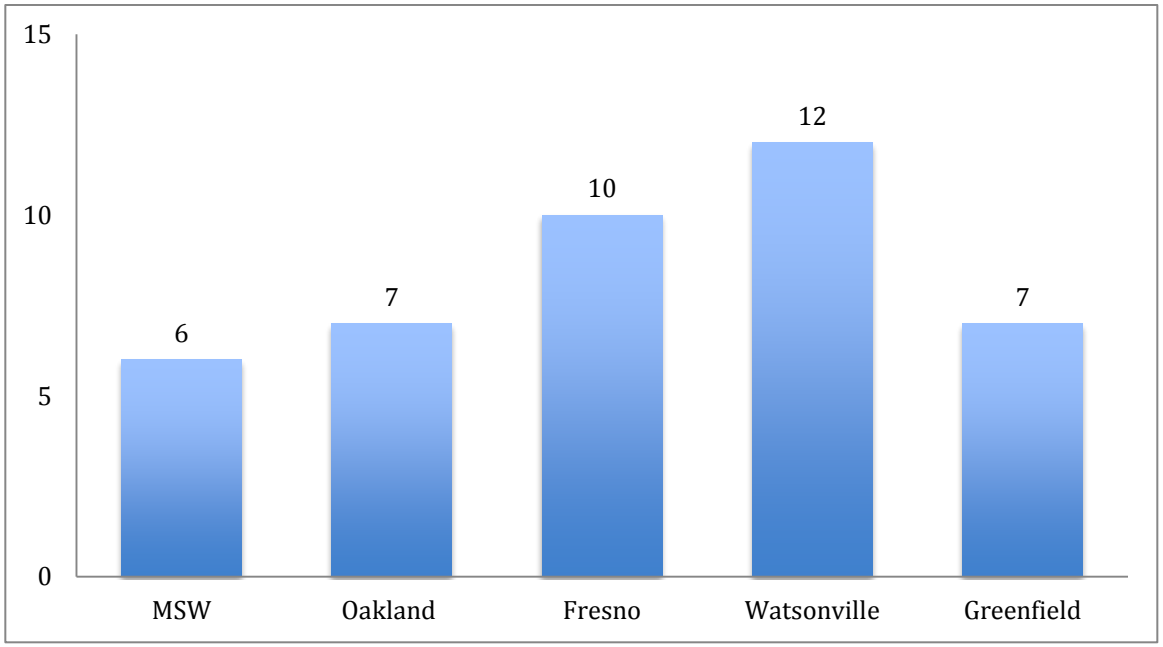


This graph conveys only a very rough portrayal of the scale of the work of the sites. Individuals are counted for each program they attend, so totals are probably high. Sites varied especially in the thoroughness with which they reported other programs.

How many staff members work at CSW sites?

A total of 42 informal educators and support staff operate the five CSW sites. Each site is staffed by between 6 (MSW) and 12 (Watsonville) people.

Number of staff at CSW sites



When we reported on the California Community Science Workshops in 1999, we reported that 20 paid staff ran the 8 CSW sites at the time: three full-time site directors, five part-time site directors, and 12 other part-time core staff. In 2005, when we reported on the national Community Science Workshops, MSW, Watsonville and the national CSW sites averaged a full-time director and one or two other paid staff. In 2013, the five core CSW sites have 42 staff members between them -- a minimum of six staff members, and two of the sites have 10 and 12 staff members. One-third of all adult staff members at CSW sites are former students or parent volunteers. This represents a key piece of the long-term stability and sustainability of the individual CSW sites.

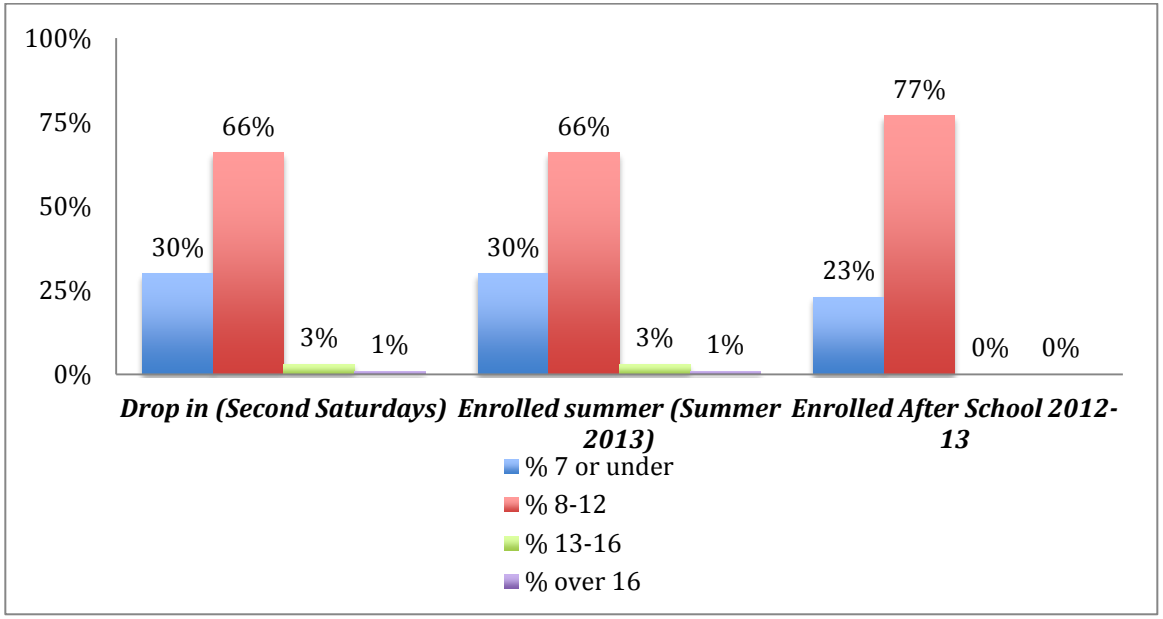
What are the characteristics of participants at the CSW sites, and in the programs they serve?

We are reporting the demographic data breakouts for each site rather than as cross-site for several reasons. One, we think it is important to highlight the diversity of participants at individual sites. We also think there are important differences that the site-by-site and program-by-program data highlights, based on and reflecting the targeted outreach efforts of the sites, that might be lost with an average across all sites. And third, because sites had the flexibility to report demographic data on participants in different ways (some reported for this data only for the site as a whole, while others provided data for individual programs at their sites), creating a cross-site average would be difficult to do accurately.

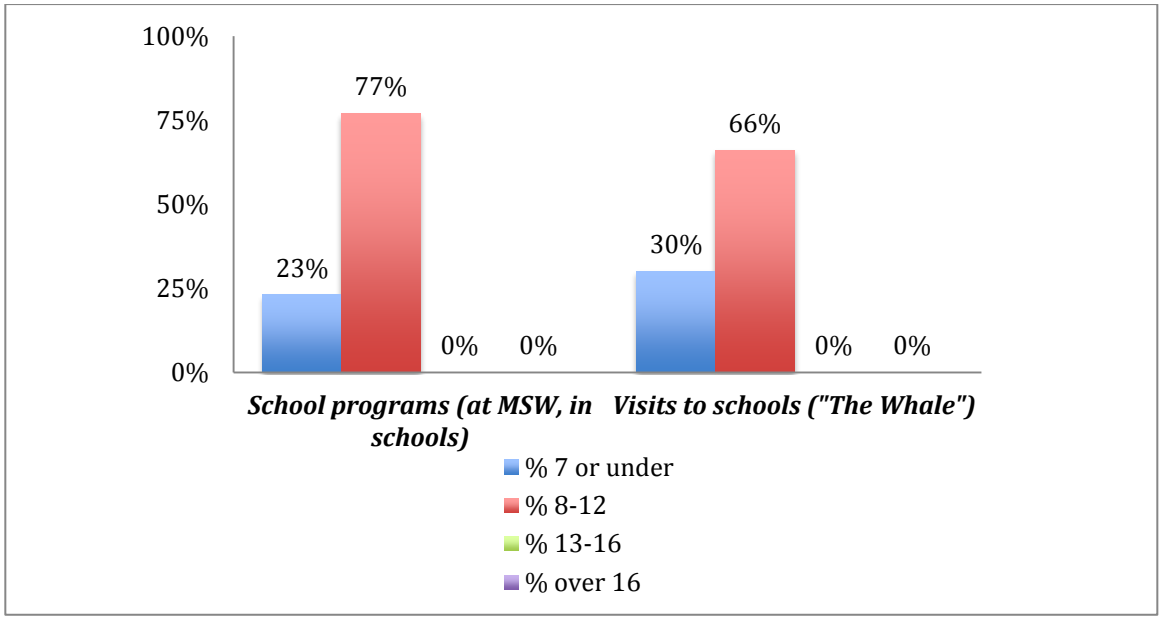
In terms of the demographic data, we think it is important to highlight several things. First of all, in terms of the age range of participants served across all sites, the majority of participants fall in the 8-12 range, a critical time of development of interest in STEM for youth, and a time of development, particularly in underserved neighborhoods, where other opportunities for STEM enrichment may be lacking. Second of all, we note that at most sites, the percentage of female participants is less than the percentage of male participants. And third, the ethnicity data reflects the highly diverse community populations, and individual school populations within individual communities, that the CSWs serve.

Demographics of Mission Science Workshop Participants

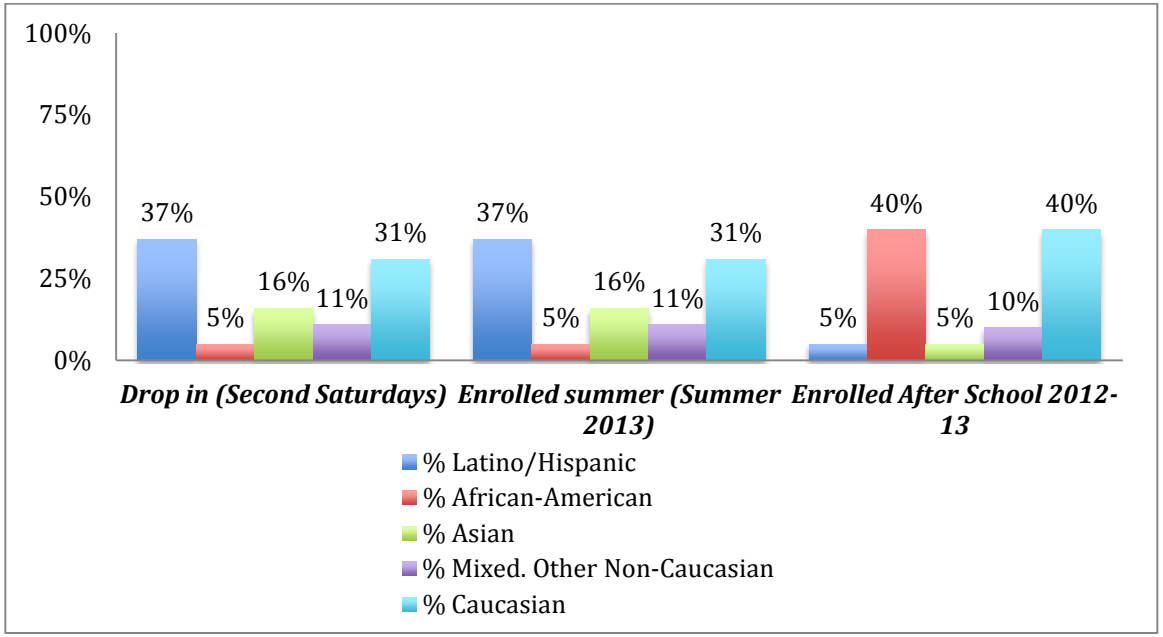
Age distribution (estimated) at selected MSW programs: graph 1 of 2



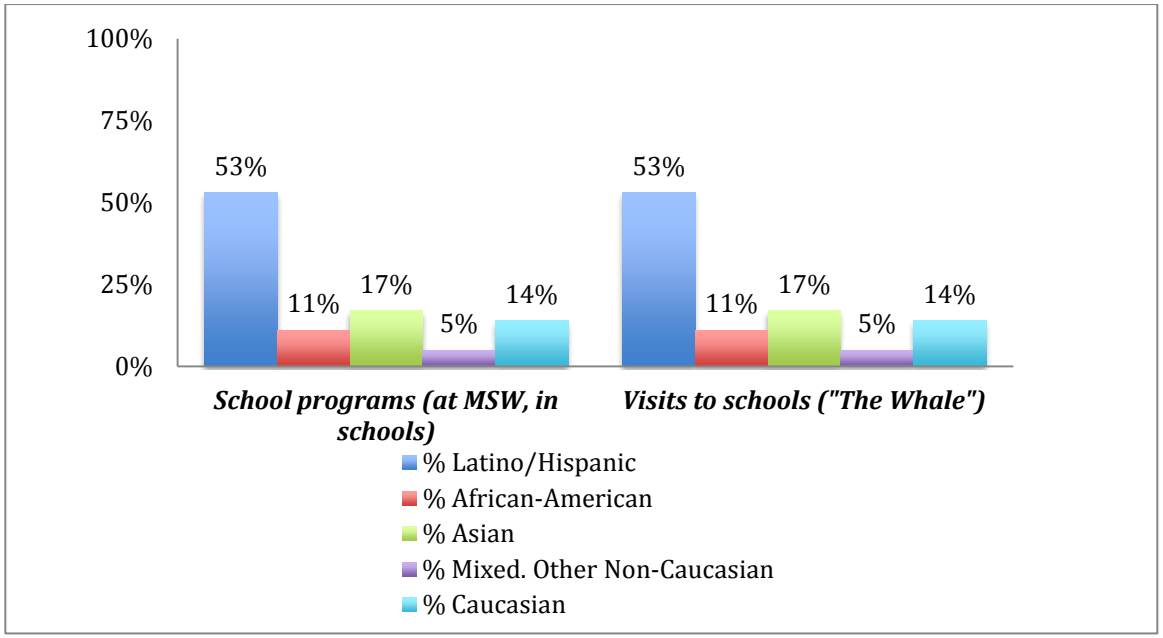
Age distribution (estimated) at selected MSW programs: graph 2 of 2



Ethnic split (estimated) at selected MSW programs: graph 1 of 2

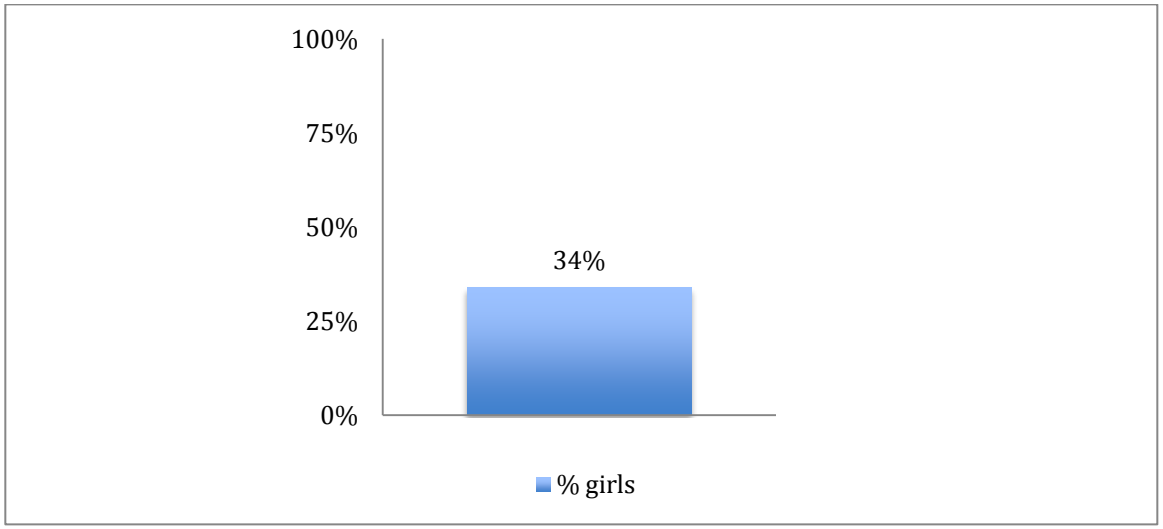


Ethnic split (estimated) at selected MSW programs: graph 2 of 2

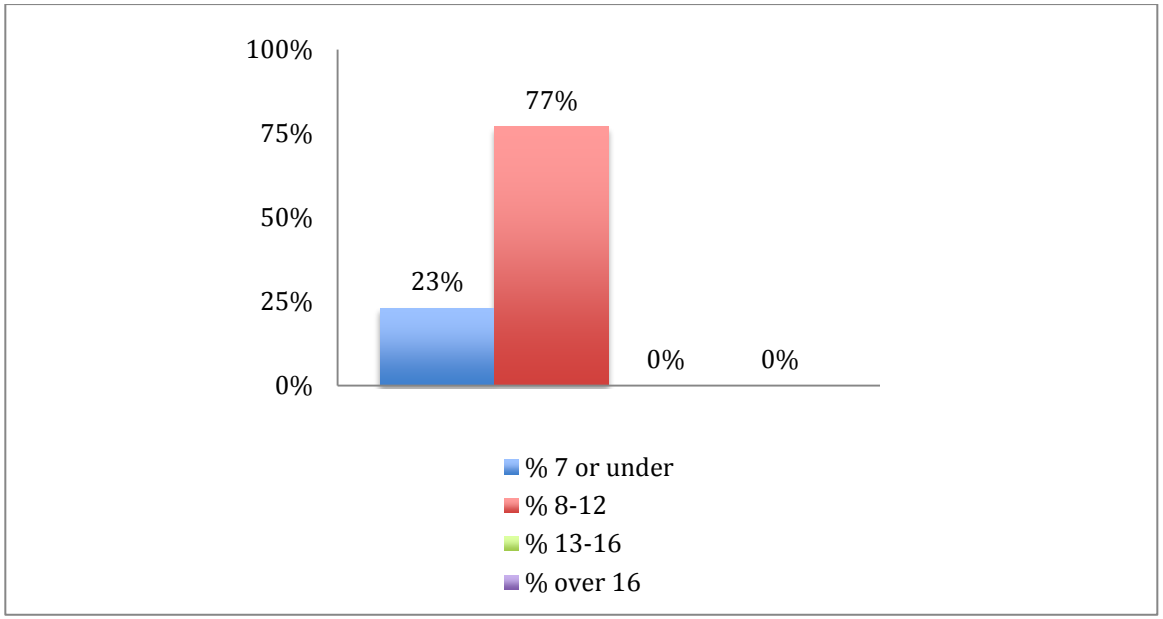


Demographic Data of Excelsior Science Workshops Participants

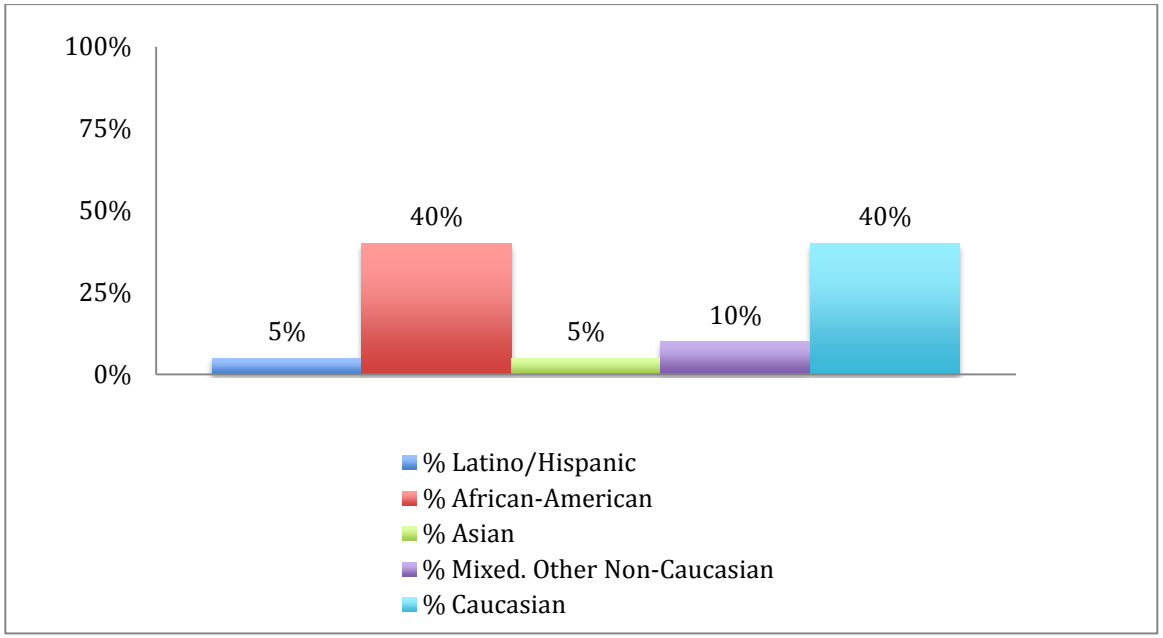
% of participants who were girls at four selected ESW programs (estimated)



Age distribution (estimated) at four selected ESW programs

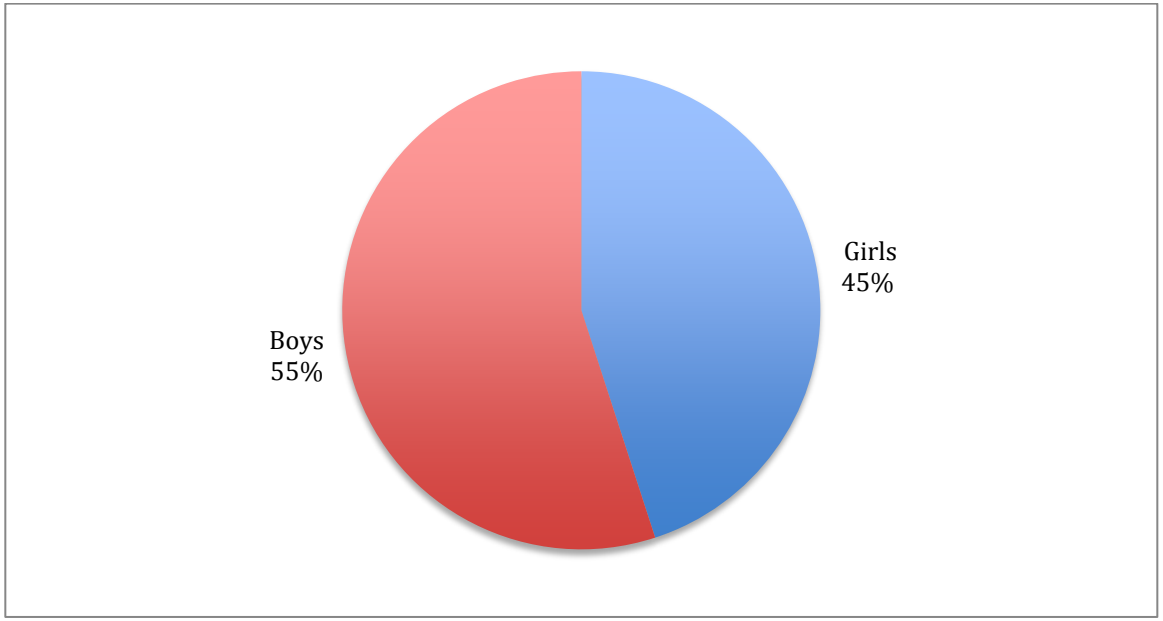


Ethnic split (estimated) at four selected ESW programs

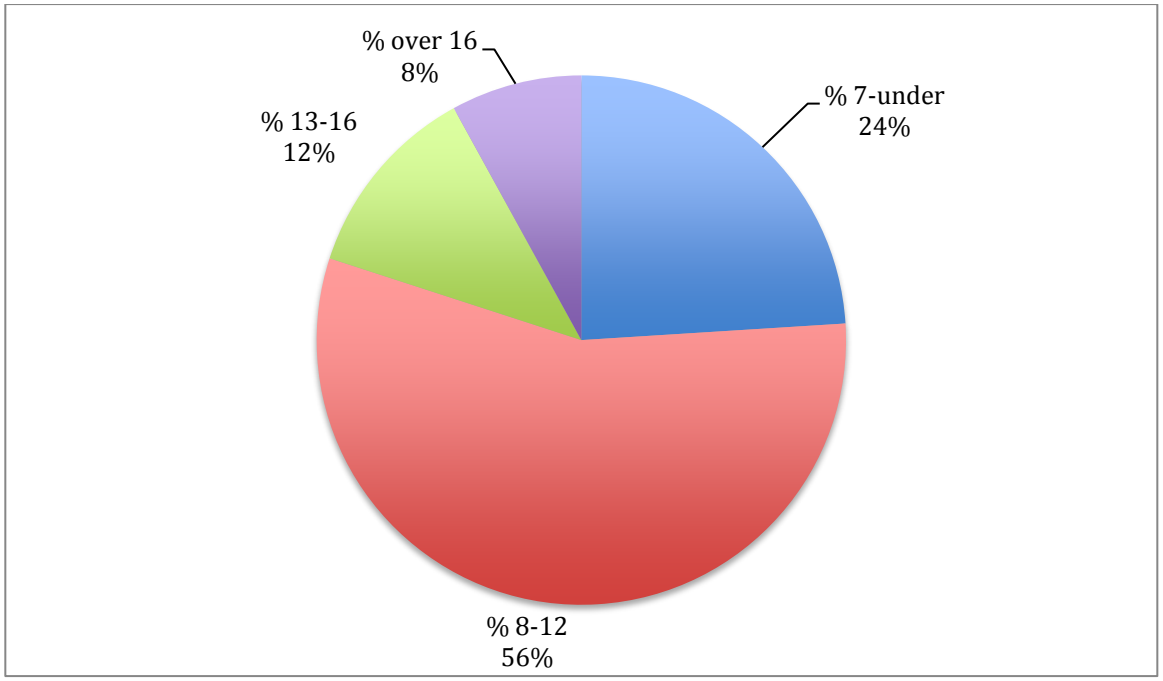


Demographic Data of Watsonville Environmental Science Workshop Participants

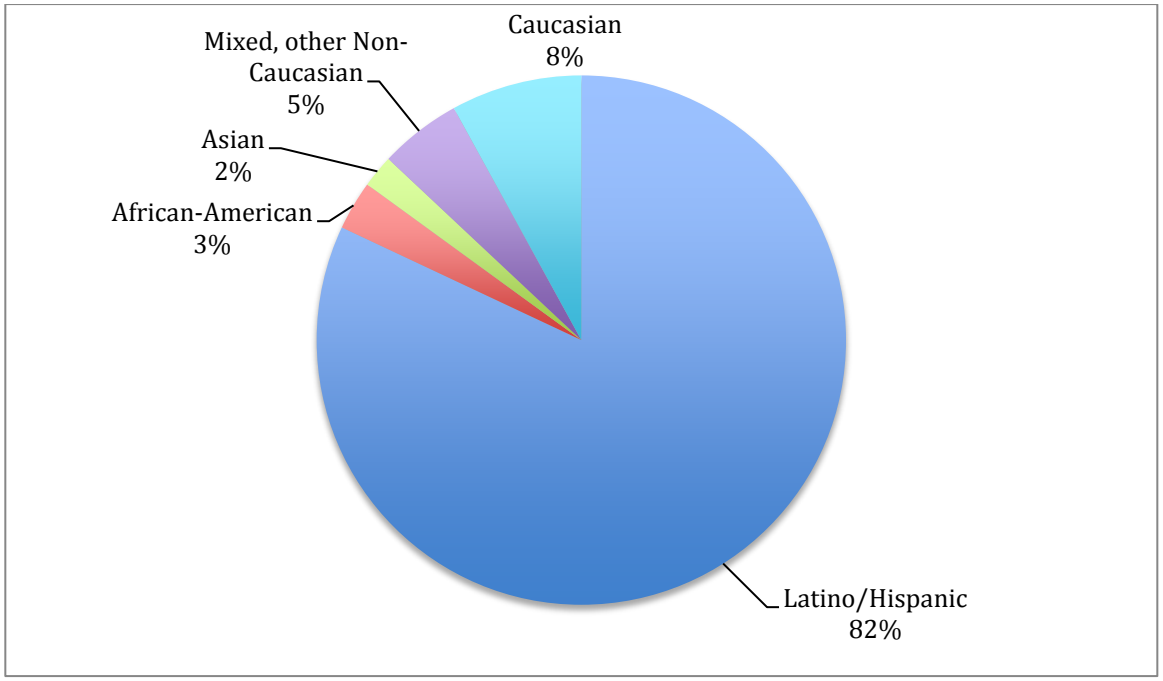
Gender of participants at Watsonville Environmental Science Workshop (estimated)



Age distribution of participants at Watsonville Environmental Science Workshop (estimated)

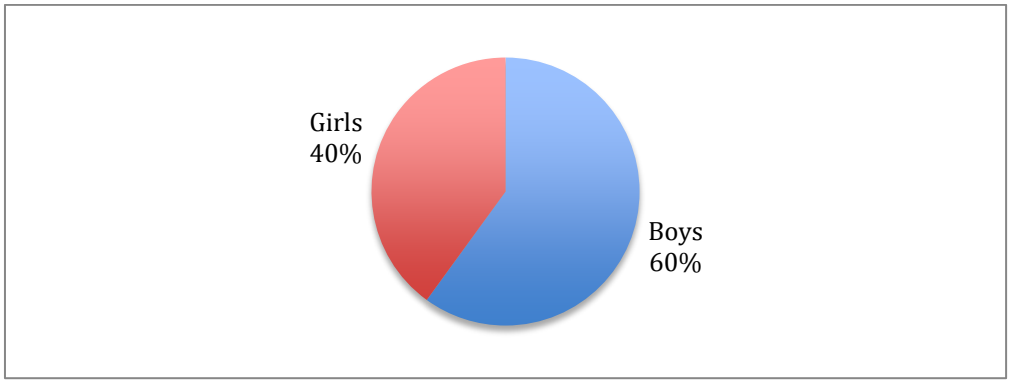


Ethnic split of participants at Watsonville Environmental Science Workshop (estimated)

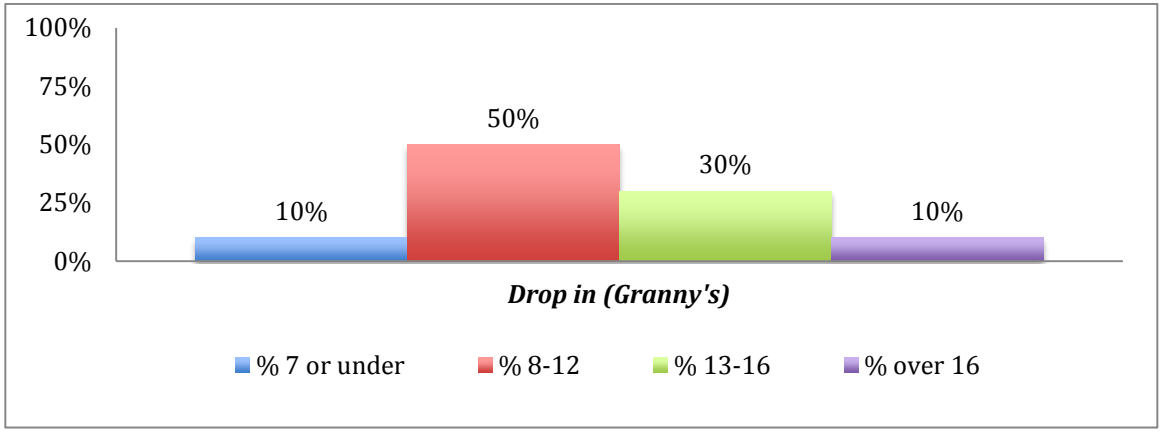


Demographic Data for Fresno Community Science Participants

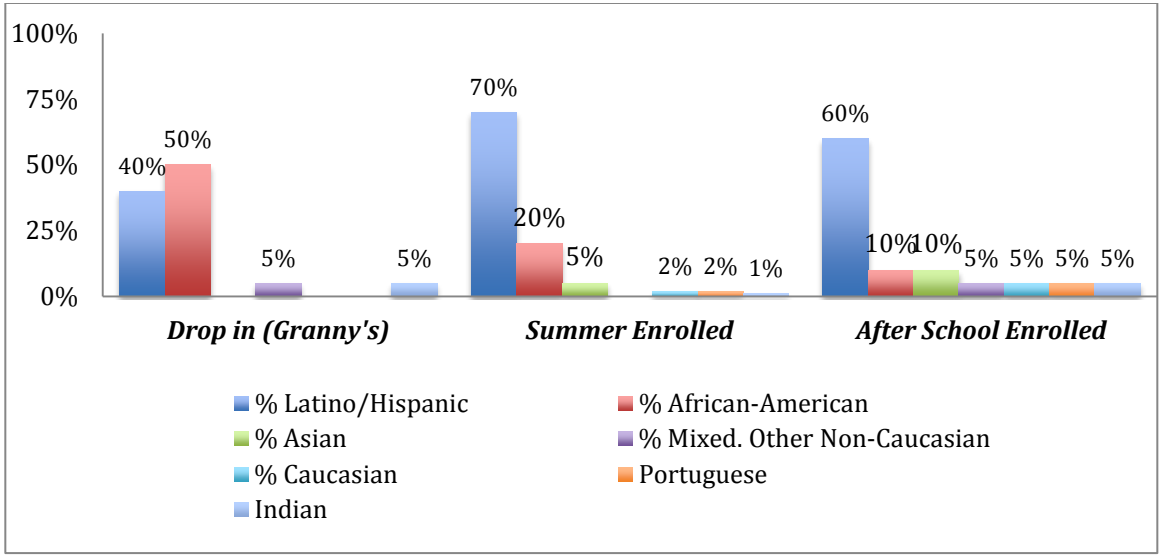
% of participants who were girls at Fresno Community Science's drop-in program (Granny's)



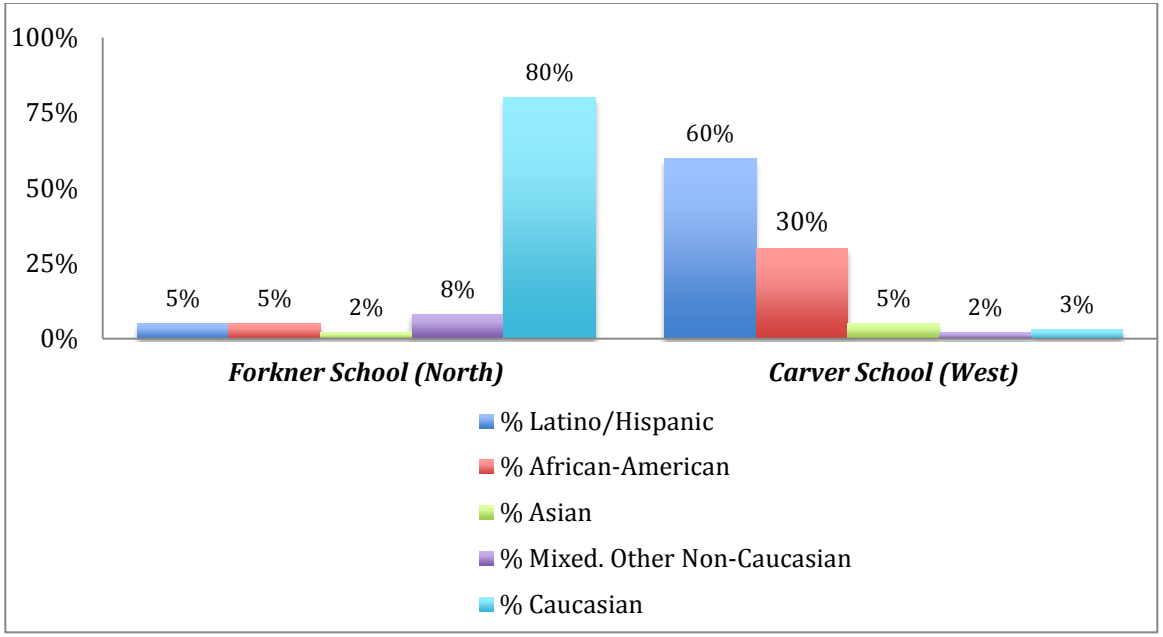
Age distribution at Fresno Community Science's drop-in program (Granny's)



Ethnic split at Fresno Community Science's drop-in and enrolled programs

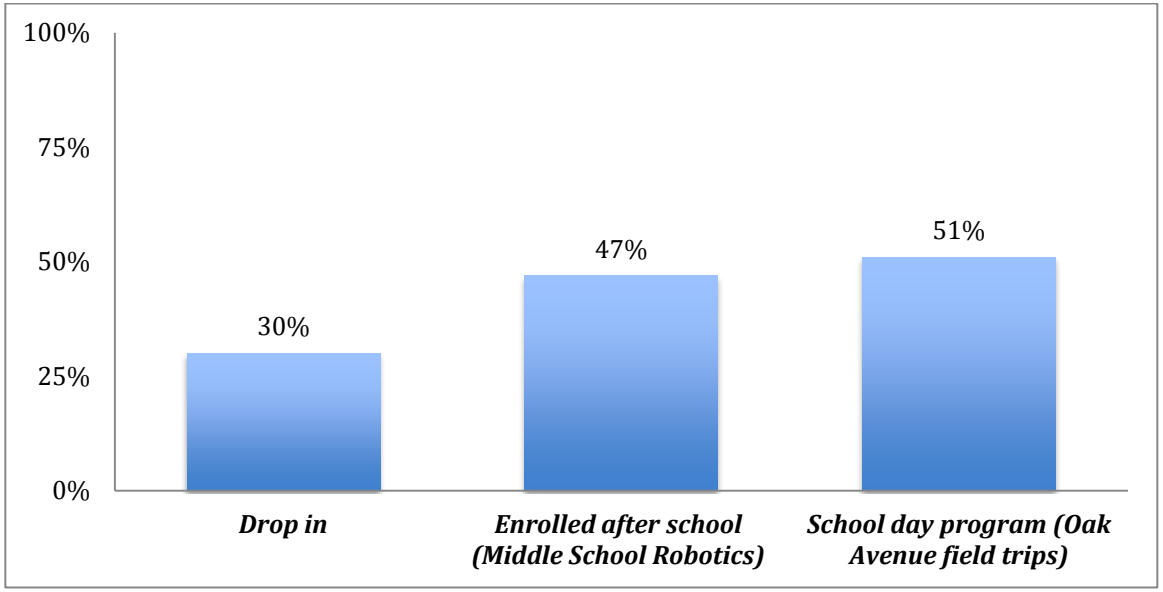


Ethnic split at two schools served by Fresno Community Science's school-day program

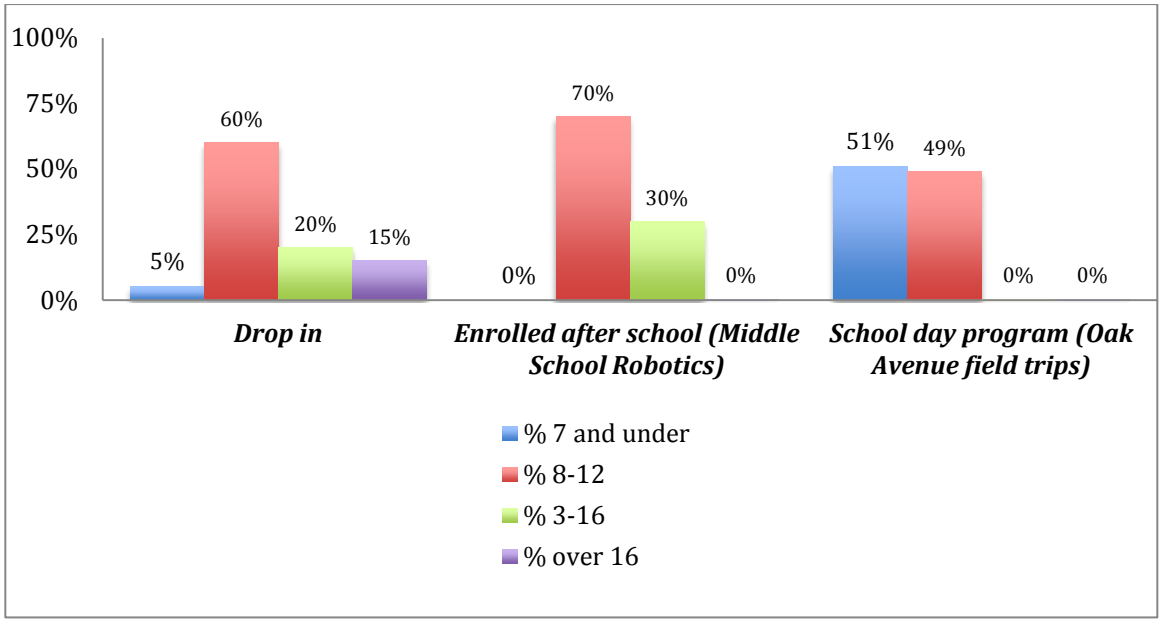

100%
75%
50%
25%
0%
5%
5%
2%
8%
80%
60%
30%
5%
2%
3%
Forkner School (North)
Carver School (West)
% Latino/Hispanic
% African-American
% Asian
% Mixed. Other Non-Caucasian
% Caucasian

Demographic Data for Greenfield Community Science Workshop Participants

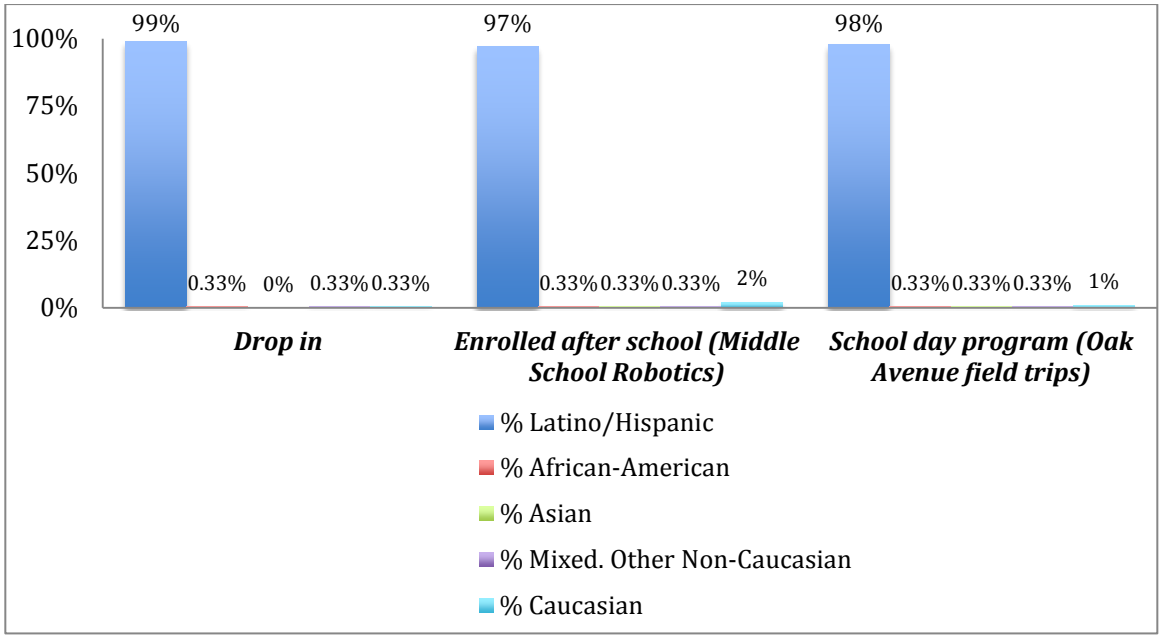
Percentage of girls at selected Greenfield Science Workshop programs (estimated percentages)



Age distribution of participants at selected Greenfield Science Workshop programs (estimated percentages)

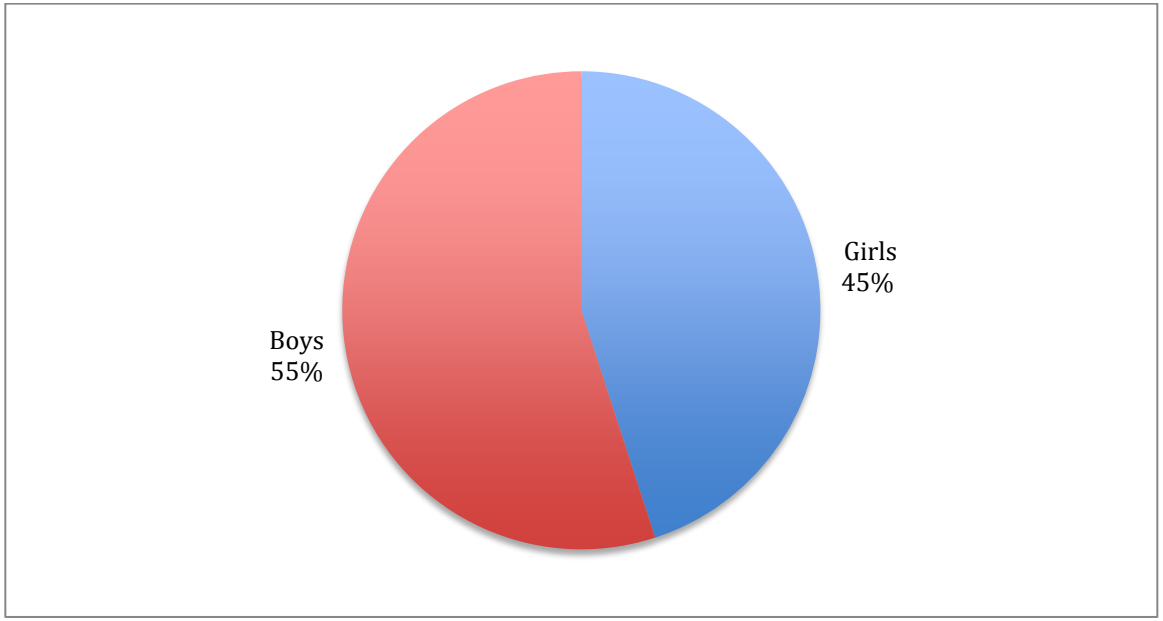


Ethnic split of participants at selected programs at Greenfield Science Workshop (estimated percentages)

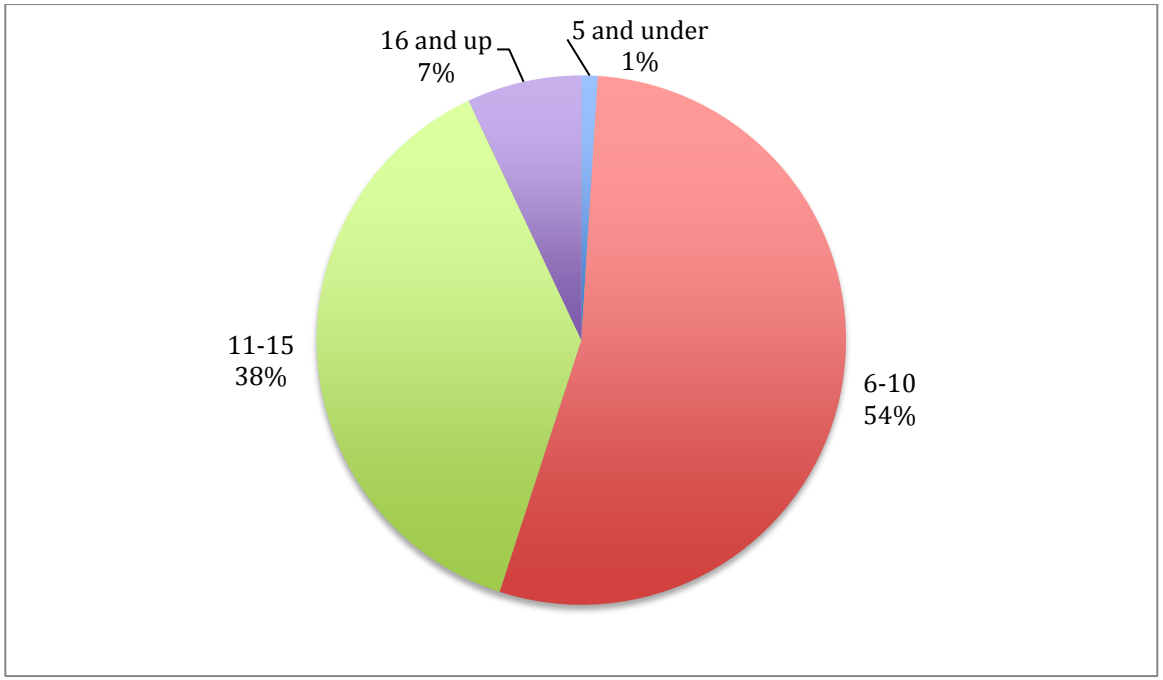


Demographic Data for Oakland Discovery Center(s) Participants

Gender of participants at Oakland Discovery Center(s) (actual percentages, unspecified program(s))

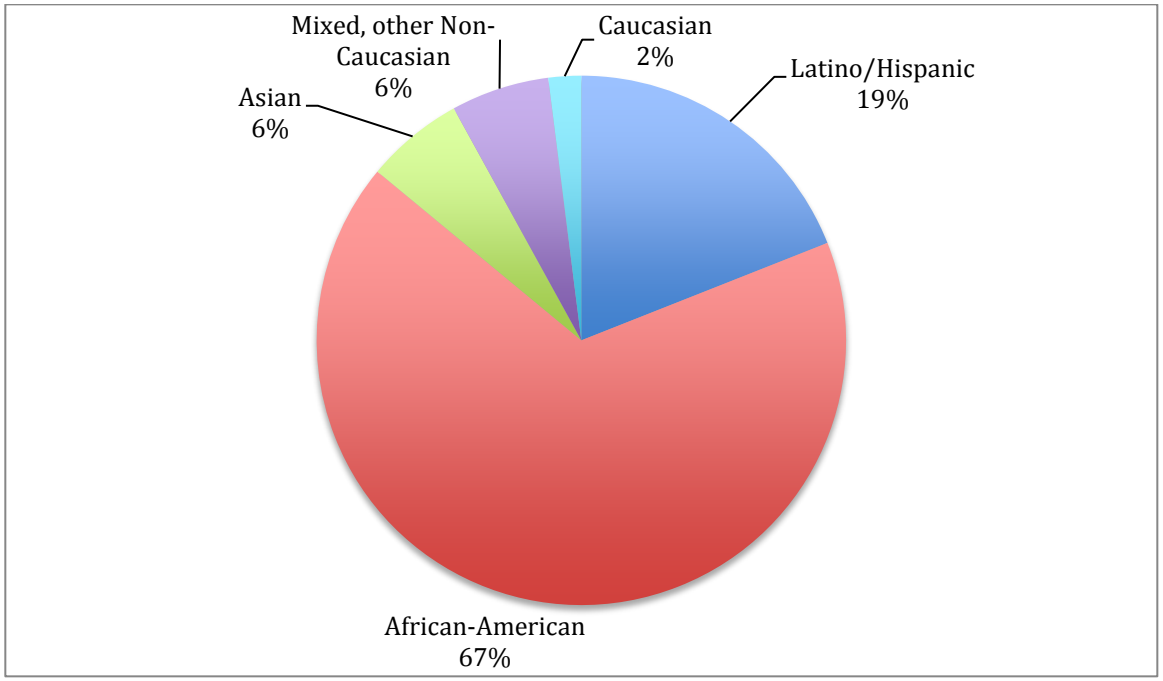


Age distribution of participants at Oakland Discovery Center(s) (actual percentages, unspecified program(s))



Note that this site reports age ranges that differ somewhat from those reported by other CSW sites.

Ethnic split of participants at Oakland Discovery Center(s) (actual percentages, unspecified program(s))



CSW Metrics Data

The tables and quotes on the following pages provide data on areas of impact identified as important by CSW Network leaders for both participants and Science Workshops. Four instruments were created, with questions linked to specific areas of workshop and participant impact, and piloted during this initial phase: student surveys, for students in school programs[5]; family interviews[6]; a learning environment survey for the drop-in program that evaluators completed with site director and staff input; and a program overview survey. Inverness is providing detailed feedback on each of the instruments/processes in a separate memo. Program overview data is shared in the statistical profile section. The data on the following pages comes from the student surveys, learning environment surveys, and family interview protocols and can be considered baseline data for these metrics as the workshops continue to grow and develop. We hope the CSW Network will find this data useful for fostering conversations about participant and workshop impact current status, and where they would like to see sites develop.

Participant areas of impact include engagement, self, skills and choice. Workshop areas of impact include quality, continuity/sustainability, recognition, growth, and accessibility/impact on under-served youth. We provide definitions for each of these areas of impact in the sections that present the data in the following pages.

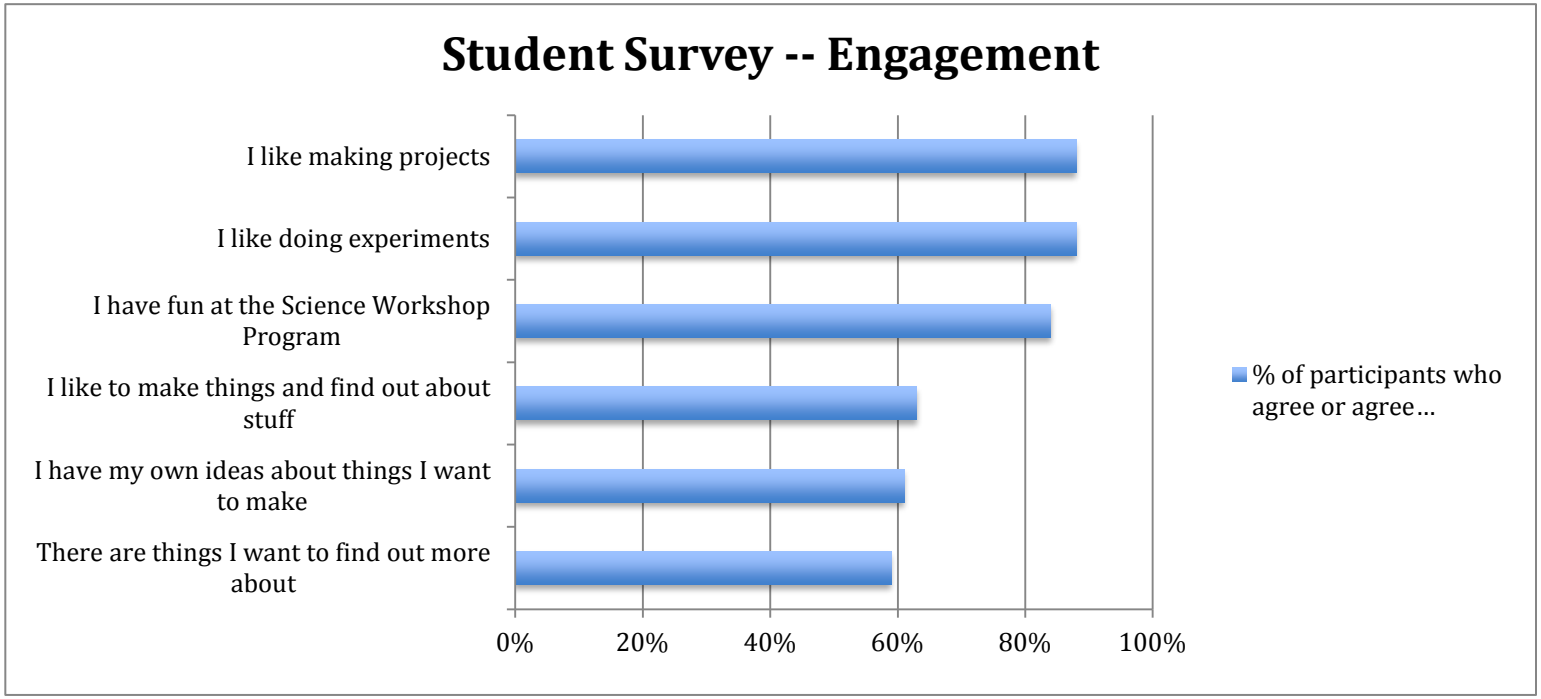
It is important to note that many items in the surveys and interview questions were identified as showing impact in several categories. For the student survey data, we have included the items for each impact in the graphs (therefore, the same items will appear in several graphs). For the family interview data, individual quotes from parents and families could fit multiple impact categories. We have tried to place the quotes in the most representative impact category, knowing that they also fit in multiple other categories. Similarly, some data from the learning environment survey illustrate multiple categories of participant and workshop impact, and we've tried to place it in the most representative impact category.

Participant Impacts -- Engagement

[5] The sites collected data from surveys of students participating in school programs. Sites collected surveys from between 12 and 24 participants each, for a total of 88 student surveys from five sites.

[6] Inverness Research conducted interviews with parents and/or families at the CSW sites.

The CSW Network Leaders defined the impact "engagement" as the following: "Students are engaged in the practice of doing and exploring; are busy and focused; are excited and happy to be in the Science Workshop; have ideas of what they want to make or explore; come in to the workshop and start work right away; follow through on large-scale projects; want to contribute to the workshop by volunteering."



The CSWs are clearly engaging their youth participants. The CSW sites rate highly by the majority of student survey respondents in their ability to engage youth. At all the workshop sites, youth have the opportunity to experiment, learn from the materials and activities, and try again, on their own terms and in their own time. Indeed, the majority of students rated making projects and doing experiments very highly (these were some of the highest rated items on the survey).

Engagement -- Family Interview Data

Family interview data from all five sites also support how engaging the CSW sites are to youth and their families. Both youth participants and parents we interviewed rated the engagement factor highly. The wordle illustrating the key words from the family interview quotes on the following page highlight the level of engagement.

"We can look out my bedroom window and he looks for Manuel's truck to know if it is open, and they are over here every day." - Fresno parent

"They come because it is a place where the kids can do creative things and they feel at home. And they are very free here and that means free to be creative. They can do projects and get help with school projects whenever they need and they get inspired here. It feels like home and it is a friendly place to come to. They fix bicycles with tools here and there are lots

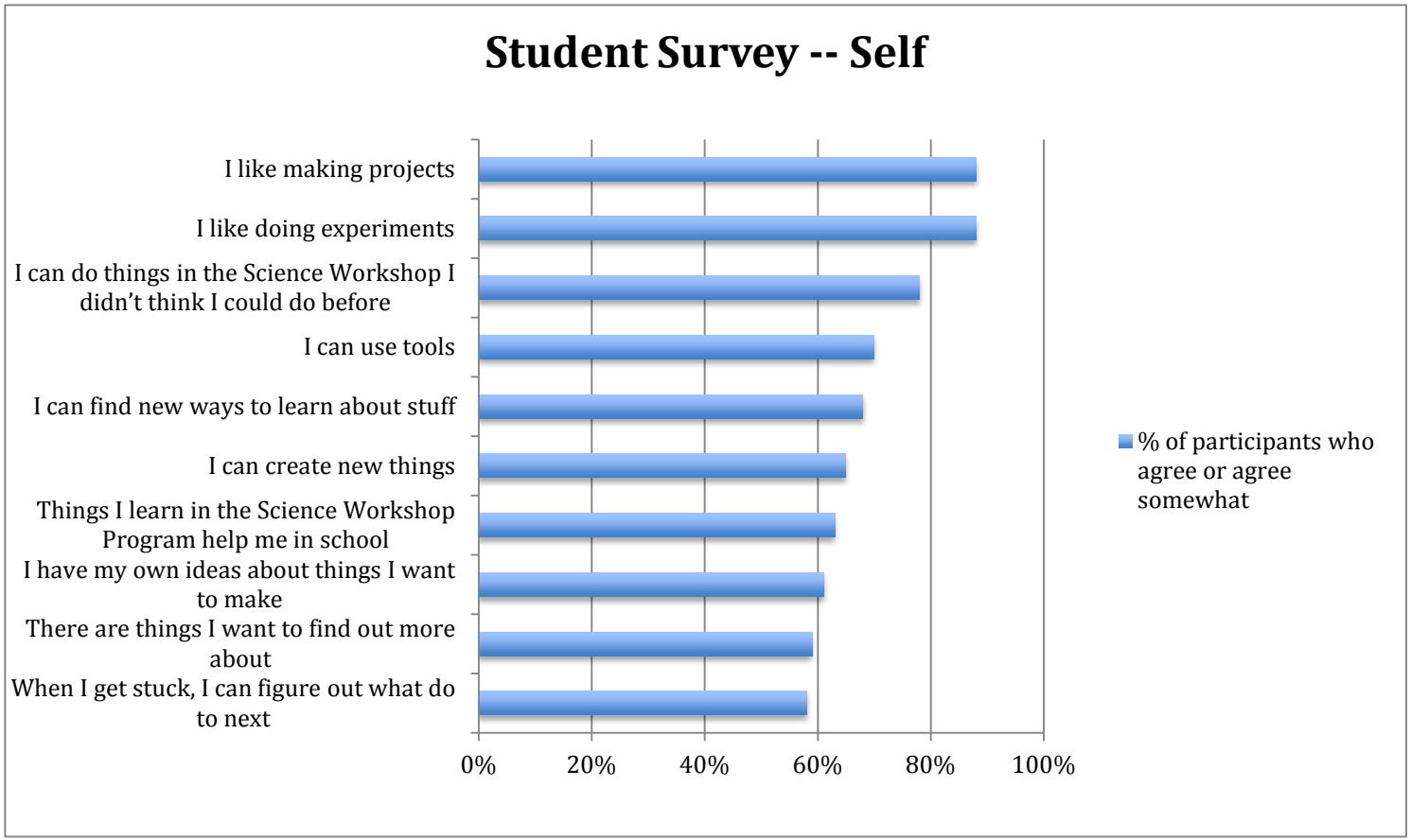
of helpers and if the kids have questions, there are many people to ask questions too and they feel happy here." - Watsonville parent

Engagement -- Learning Environment Survey Data

Data from the Learning Environment Survey also indicate the high engagement factor of the CSWs for youth and families. For each of the CSW sites, evaluators noted that participants generally move freely through the Science Workshop spaces during the drop-in programs. Also for all sites, evaluators noted that the majority of exhibits fall more on the "infinite configurations" end of a spectrum -- where participants have a great deal of choice in deciding the inputs and outcomes. Similarly, at all sites, the majority of materials for making (90-100%) are raw materials, with tools available for participants to use to manipulate those materials.

Participant Impacts -- Self

CSW Network leaders defined the impact "self" as the following: "Students demonstrate self-confidence; can self-regulate and control emotions; seek challenges; identify as makers, doers, explorers, and scientists; can follow instructions without being told exactly what to do, can handle frustration and work through obstacles; confidently pursue their own ideas; are not intimidated by science subjects or challenges."



Student survey data indicate again that youth are benefitting from their participation in the workshops -- developing confidence in their abilities to make things that are personally meaningful to them, and finding new ways to learn.

Self -- Family Interview Data

Family interview data corroborates the student survey data. Parents in particular note the growth they see in their children's confidence, and their independence, as the wordle from the family interview quotes illustrates:

Parents were effusive in their praise of the Science Workshops and their contribution to their children's development.

"They learned to build things and they are more into working on things." - Fresno parent

"My oldest son was going and hanging out in the streets until he found the workshop and he started going to the workshop instead. I was really pleased with this and the reason is that Jose is a really respected person. He gives good advice to my son and he has changed from being in the street to being at the workshop." - Greenfield parent

"Since my kids have been coming here, I see them becoming more independent. They have learned how to pay attention to their own safety and use tools in a safe way and they learn the rules for how to do that. They can kind of take care of themselves." - Watsonville parent

"Two of my sons went to Fresno on a camping trip and this was a big event for them. They were scared of the dark when they went and they went and they had a really good time and they came back and they are really acting much more independent and not scared of the dark and doing things for themselves that they weren't doing before." – Watsonville parent

"My 15 year old, he wants to work every day in his future. He has changed because he used to just go to school and now he is going to school but thinking about continuing in school to prepare himself to do work and so that he can provide for everything when he is an adult. The workshop probably has contributed to his ideas because there are so many activities that he can do here, that he sees how things can contribute to his ideas and what he wants to do in his life. I am really grateful for the workshop; it has really been an advantage and a benefit for my children." – Greenfield parent

Parent one: "I really noticed that about your daughter here -- she is in her element, she really is."
Parent two: "And she wants to grow up to be an artist/scientist." - MSW parents

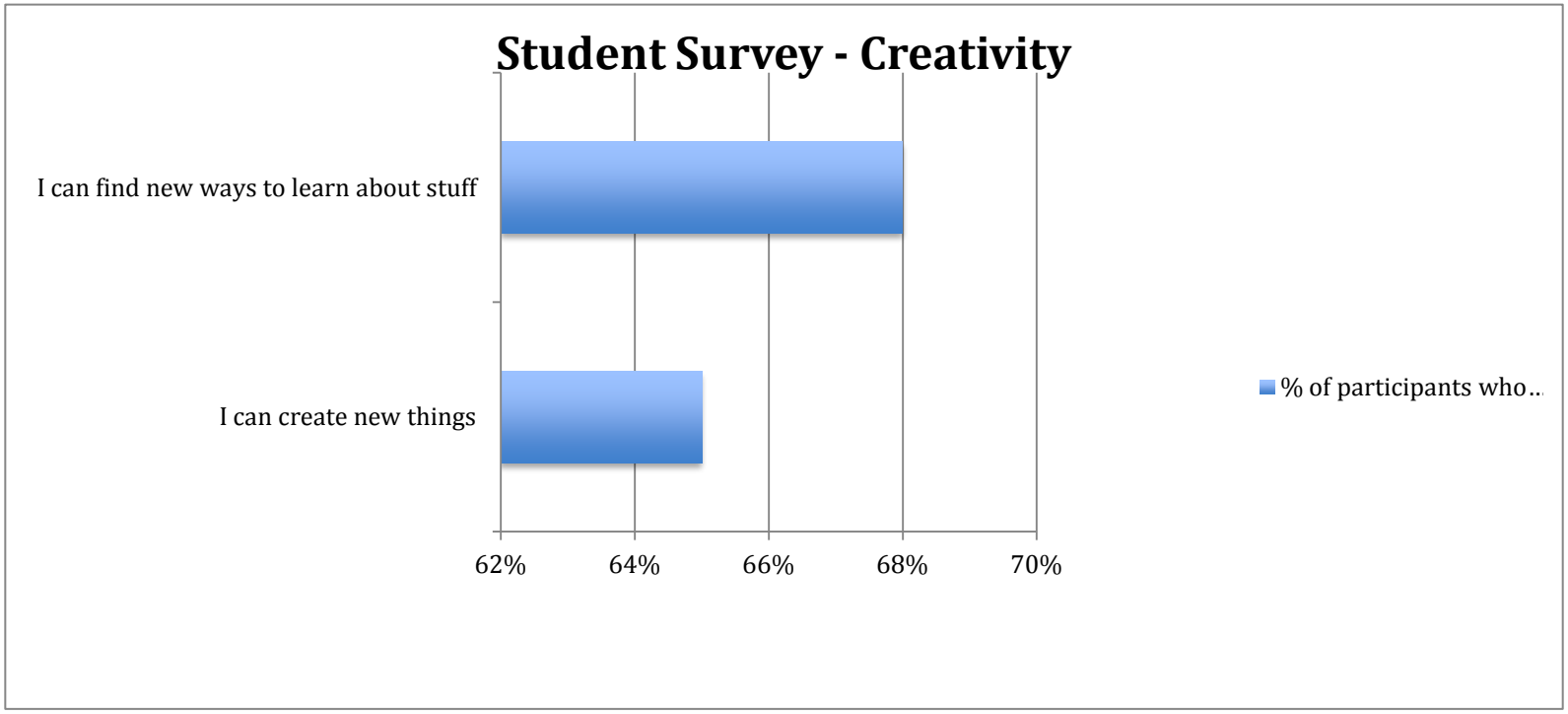
Parent one: "I have observed that her daughter, who has been coming here much longer than mine, is much more confident. She goes straight in there and she just creates, she doesn't need any help and she knows what she is doing and my daughter is getting to be that way after coming here, more than in the beginning. Much more confidence today -- she went straight over to what she felt like doing."

Parent two: "In the very beginning she wanted help and that was just in the beginning and I have been sent away ever since and in fact, I want to be involved and she is like 'no, mom you have to go away.' I have noticed her independence and she feels comfortable and I think she feels like she owns it a little and I love this. I think one reason I might have been sent away early on because she didn't want me to see her figuring it out and now she just doesn't want me around because she is just doing her own thing. I just think it is awesome. – MSW parents

"She was scared of snakes, but when she came here, she started touching them and then she wasn't scared anymore." – MSW parent

Participant Impacts -- Creativity

The CSW Network leaders defined the impact "creativity" as the following: "Students can come up with new ideas; can create new projects; can find new ways around problems; can dream up personal goals outside of their everyday experience."



Student survey data show the majority of student participants in CSW programs feel they can create new things and find new ways to learn about things.

Creativity -- Family Interview Data

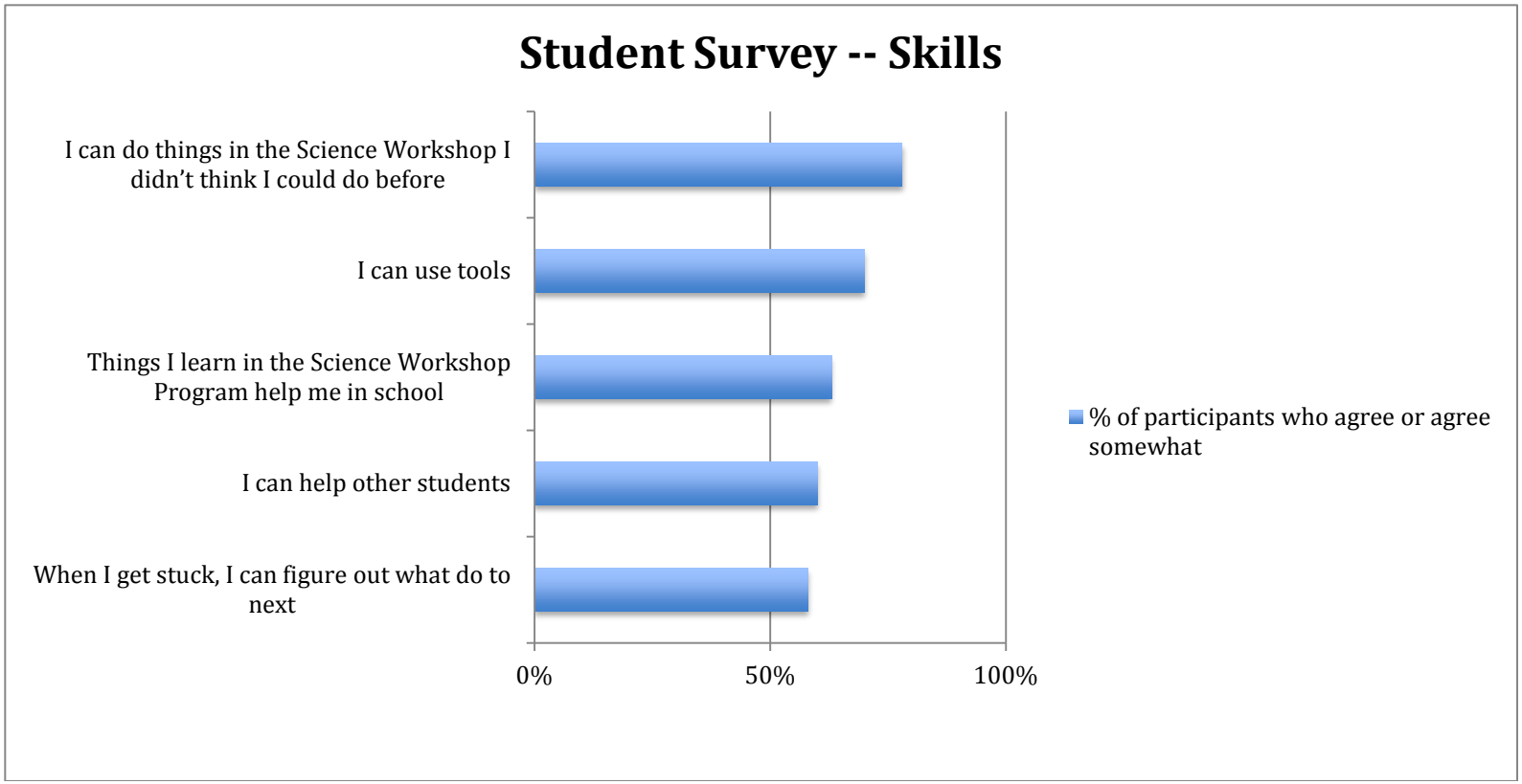
Family interview data corroborate the student survey evidence. Many of the quotes highlighted in the "self" and "engagement" impacts and wordles also highlight creativity. In addition to those quotes, one particularly enthusiastic family told us a story of how two siblings created a bike at the Science Workshop and proudly rode it throughout their neighborhood:

Youth participant: "We made a bike over here, my bike."
Parent: "They welded and stuff."
Youth participant: "We welded two bikes together to make a double bike."
Parent: "It was cool, they were riding it up and down the street. The back person was pedaling and the front person was steering."

- Fresno family

Participant Impacts -- Skills

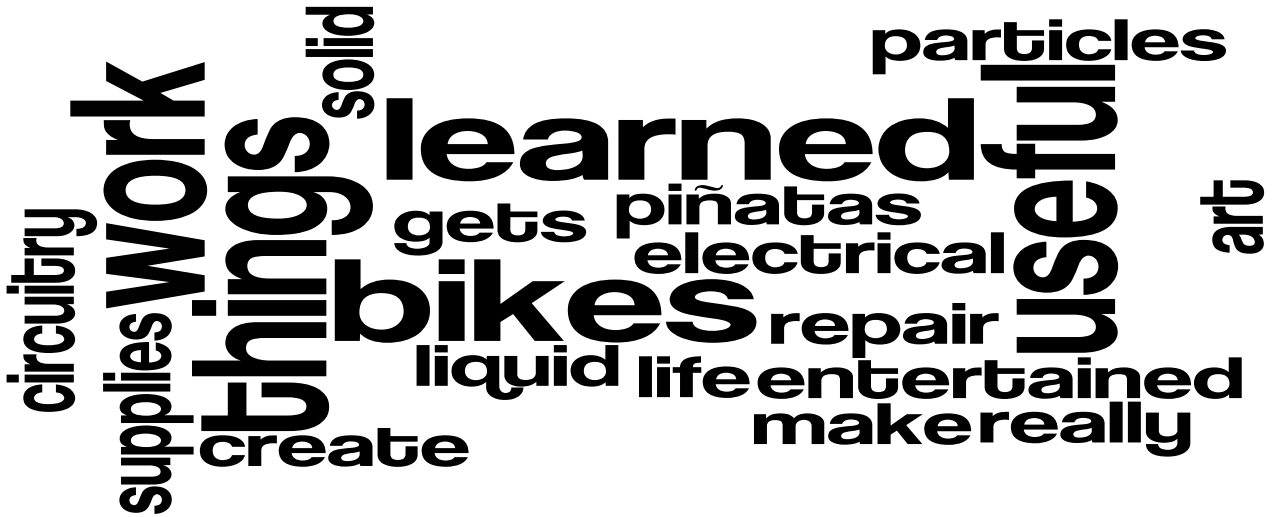
The CSW Network leaders defined the impact "skills" as the following: "Students can communicate their own ideas; can use tools safely; can figure out how to use a new tool; can collaborate with others; can talk about what they're doing; can teach others how to use a tool; can help another kid who is frustrated; can make technical drawings; can troubleshoot problems with their projects; can use logical reasoning to solve a problem or understand a process."



The key item from the student survey related to the impact of skills is that nearly 80% of the respondents agreed or somewhat agreed with the statement, "I can do things in the Science Workshop I didn't think I could do before." Nearly that many also agreed about using tools. Clearly, the workshops are having an impact on the development of crucial skills such as problem-solving, and critical thinking.

Skills -- Family Interview Data

As the quotes we have shared in the previous section illustrate, family interview data also highlighted the extent to which participants are gaining skills through their participation in the workshop programming, as the wordle drawn from the family quotes on the following below shows:



Parent: "They do something with wet sand or whatever, it is really weird."
First youth participant: "No, it is cornstarch and water, and like when you touch it fast, it feels solid."
Second youth participant: "It is solid and liquid."
First youth participant: "Because all of the little particles in there they just lock in place, but when you put your finger in there slowly, it just sinks to the bottom."

- Fresno family

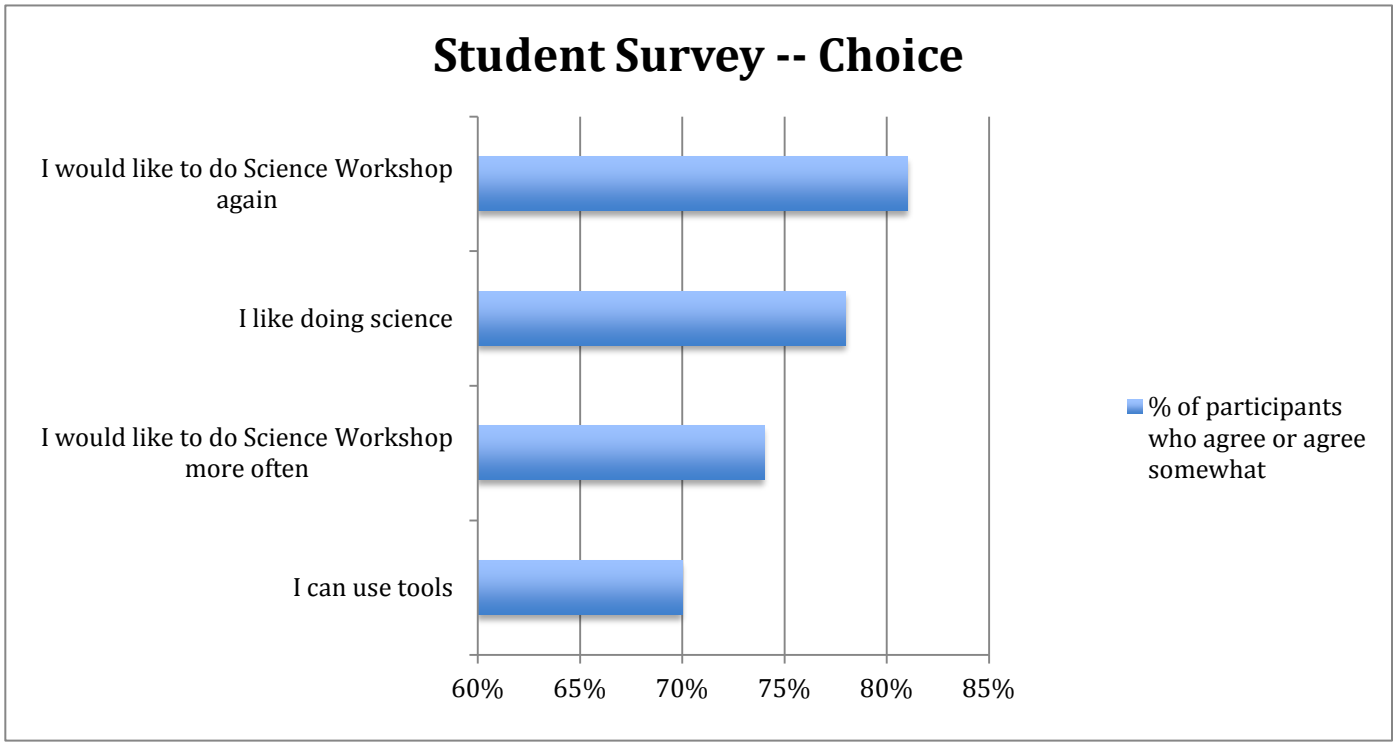
"My younger kids, my daughter, really likes to work with art supplies and make piñatas and create things. They feel very entertained with something to do when they are here. My kids have learned how to work on bikes and they can repair their own bikes. Jose guides them in that and they learn useful things at the workshop that they can use in their life."

- Greenfield parent

Parent one: "My daughter has electrical circuitry, the concept, down. She totally gets it and that is from here. No question. They studied it in school a little bit then we came here right afterwards and Dan had a project set up and she really gets it."
Parent two: "When you just hear it, it goes in one ear and out the other, but when you actually do it, and you are involved, it sticks." – MSW parents

Participant Impacts -- Choice

The CSW Network leaders defined the impact "choice" as the following: "Students choose STEM activities; choose what to interact with in the shop; choose to return to the Science Workshop; choose to pursue STEM in high school, college, or career."



Student survey data show that for the vast majority of respondents, participants like coming to the Science Workshops, would choose to come again, and like the array of science and making experiences they can choose from when they are there.

Choice -- Family Interview Data

Family interview data related to this impact provide powerful evidence of the impacts of the CSWs on participants.

"I don't know what my kids would do if this workshop was not here. The park is there, but here they learn things and they have fun." – Watsonville parent

"Another thing that I usually end up doing, since my daughter sends me away, and the way that it is all just friendly and personal, I will end up helping other kids and I really like that. The informality lets you do that." – MSW parent

"My oldest son was going and hanging out in the streets until he found the workshop and he started going to the workshop instead. I was really pleased with this and the reason is that Jose is a really respected person. He gives good advice to my son and he has changed from being in the street to being at the workshop." - Greenfield parent

"We can look out my bedroom window and he looks for Manuel's truck to know if it is open, and they are over here every day." - Fresno parent

"When I have a meeting or something, I will call the workshop and whoever answers, I say that I can't make it to meet my kids getting off the bus and so when they do arrive, the workshop will call or the kids will call and say that they are at the workshop now. And I don't have to worry that they haven't made it and I know they are here." - Watsonville parent

Choice -- Learning Environment Survey Data

Learning environment survey data about the drop-in programs at the CSWs also confirms the array of choices participants have when they visit the Science Workshops. For example, most of the workshops offer a wide array of activities for their participants to choose from.

Number of activities of different types a participant can choose from at any one time

Types of activities	MSW	Excelsior**	Oakland	Fresno	Watsonville	Greenfield
Specimens (objects, artifacts, etc.)	>500	>1000	50-100	Not asked	Not asked	Not asked
Interactive Exhibits	50-100	<50	50-100	<10	<10	<10
Project Models	<50	<50	<50	<50	50-100	<50
Projects in Binder/Curriculum Database	<50	100-500	<50	<10	100-500	50-100
Other Projects*	<50	>1000	100-500	<10	>1000	<50
Experiments	>500	>1000	50-100	<50	50-100	<50

Six-point rating scale: Light to dark -- <10, <50, 50-100, 100-500, >500, >1000.

*Projects made in the workshop that are not documented in binder/curriculum database, not represented by a model
** Excelsior comments: "Participants can create infinite numbers of artifacts, objects, and experiments"

Workshop Impacts -- Quality

The CSW Network leaders define the impact "quality" as the following: "Science-rich content is being offered to kids, youth development and support is part of program design, programs maximize accessibility for underserved youth, an inspiring workshop environment with an abundance of activity options for youth and families is maintained, participants have access to high-quality equipment, materials, and tools."

Quality -- Learning Environment Survey Data

Data from the learning environment survey on the drop-in program show workshop spaces rich with exhibits and tools, as the tables below and on the following page illustrate:

% of workshop space devoted to exhibits vs. working with tools

Use of space	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
Exhibits	60-80%	20-40%	20-40%	0-20%	40-50%	0-20%
Working with Tools	20-40%	60-80%	60-80%	80-100%	50-60%	80-100%

Six-point rating scale: Light to dark -- 0-20%, 20-40%, 40-50%, 50-60%, 60-80%, 80-100%.

% of surface area in use vs. clear

Surface Area	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
In Use	80-100%	60-80%	60-80%	60-80%	60-80%	60-80%
Clear	0-20%	20-40%	20-40%	20-40%	20-40%	20-40%

Six-point rating scale: Light to dark -- 0-20%, 20-40%, 40-50%, 50-60%, 60-80%, 80-100%.

The Science Workshops are clearly using every inch of available space to its best advantage. The bulk of the space in most workshops is in use, with some space left clear for youth project building. Another key indicator of quality is in the number and types of facilitators participants have to interact with. Again, data from the drop-in program learning environment survey highlight that, for most sites, there are sizeable numbers of adult staff and volunteers, teen volunteers, and family members to interact with on any given day. New sites, Greenfield and Excelsior, have fewer staff; Excelsior's adult volunteer corps is notable.

Number and types of facilitators

Facilitator	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
Adult staff	5	2	3	9	6	2
Teen staff	0	0	0	0	1	0
Adult volunteer	4	12	1	0	1	0
Teen volunteer	4	4	0	2	0	0
Parent/Family member	5*	2	0	2	0	0
Other			2			

Actual counts were collected, then light-to-dark shading was added on a six-point scale: 0, 1-2, 3-4, 5-6, 7-8, 9+.
"Averages 5, depends on turnout"

Quality -- Family Interview Data

Family interview data clearly highlight that the CSWs are valued by participants, and seen as spaces that provide quality experiences. See the quotes in the participant impacts section as well.

"They learned to build things and they are more into working on things, you know and things that I can't do with them at home, because there is not a father in the home, first of all, and we don't have a garage, we live in apartments. They don't have access to workshops and Manuel is real good with them, real good." – Fresno parent

Parent one: "I like the creative chaos of it. I think it is like mad science Exploratorium and I just know how it could overwhelm some personalities, but if you can like chill enough to focus or explore, or not focus, just bounce around, it is just amazing."
Parent two: "And there is just stuff going on in every nook and cranny, all kinds of different stuff, everything."
– MSW parents

Workshop Impacts -- Continuity/Sustainability

The CSW Network leaders define the impact "continuity/sustainability" as the following: "Program elements are stable over time, staffing is stable over time, relationships with other agencies (schools, nonprofits, etc.) are stable over time, funding sources are stable over time."

Continuity/Sustainability -- Family Interview Data

Family interview data demonstrate the importance of having the CSWs as a steady presence in these neighborhoods. Families count on the CSWs to be there as safe havens for their children, and they notice the growth and development of the workshop sites.

"I have actually considered moving and the reason I didn't want to move, was because of this. There are a lot of bad things happening in the neighborhood and it keeps the kids away from that." – Fresno parent

"I live in the apartment next door and my apartment manager, she has been in the area for like 20 years, and she told me that her boys grew up here using the workshop. So we came over the first day and we met Manuel and I told him that the boys would be coming, because we were moving next door and they have been coming ever since." – Fresno parent

"(The Workshop) has developed so much, it is growing. When we first started coming, there were very few materials, very little art materials and now there is plenty, there are animals and there are all sorts of things." - Greenfield parent

Workshop Impacts -- Recognition

The CSW Network leaders define the impact "recognition" as the following: "CSW program is widely known and recognized in the community, positive press coverage, many families and children are aware of the program, allies come forward when program is threatened."

Recognition -- Learning Environment Survey Data

One keep area of recognition comes in the fact that the sites have steady attendance on any given day, of 15-50 youth.

Range of student attendance on a given day

	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
Attendance per day	30-50	30-50	25-30	15-20	25-30	25-30

Seven-point rating scale: Light to dark <5, 5-10, 10-15, 15-20, 25-30 [sic], 30-50, >50.

Recognition -- Family Interview Data

The quotes we have shared in other impact sections also point to the recognition that families give to the CSWs for the benefits and contributions of the workshop programming to their children. We think it is important to highlight a few again here:

"I don't know what my kids would do if this workshop was not here. The park is there, but here they learn things and they have fun." – Watsonville parent

"Our kids are in public school and I don't know what privates are like, but public is filled with the rules and the regulations and the test scores and this [MSW] is the antithesis of that." – MSW parent

"We overprotect our kids and I think in the city, we hover around them because we can't let them go run across the street. And the [Mission Science Workshop] is like my daughter's forest in there and she gets to go explore. So we have made it an effort to bring her here and let her go." – MSW parent

"My 15 year old, he wants to work every day in his future. He has changed because he used to just go to school and now he is going to school but thinking about continuing in school to prepare himself to do work and so that he can provide for everything when he is an adult. The workshop probably has contributed to his ideas because there are so many activities that he can do here, that he sees how things can contribute to his ideas and what he wants to do in his life. I am really grateful for the workshop; it has really been an advantage and a benefit for my children." – Greenfield parent

"They learned to build things and they are more into working on things, you know and things that I can't do with them at home, because there is not a father in the home, first of all, and we don't have a garage, we live in apartments. They don't have access to workshops and Manuel is real good with them, real good." – Fresno parent

Workshop Impacts -- Growth

The CSW Network leaders define the impact "growth" as the following: "Program is reaching out to new populations in its area, developing new program models (including over past year), developing new sources of funding, training new staff members, reaching out to new partners."

Growth -- Learning Environment Survey Data

One of the key areas of impact from the learning environment survey data is the number of new activities added last year. All of the workshop sites added new activities, and this can be directly attributed to the emphasis on curriculum documentation, and professional development sessions where ideas have been shared, as well as site visits to other workshop sites that the CSW Network has fostered.

Number of new activities of different types added last year*

Type of new activity	MSW	Oakland	Fresno	Watsonville	Greenfield
Interactive Exhibit	5-10	5-10	10-20	<5	10-20
Project	5-10	10-20	20-50	50-100	20-50
Experiment	5-10	5-10	20-50	20-50	10-20

Six-point rating scale: Light to dark -- <5, 5-10, 10-20, 20-50,50-100, >100.

* Because Excelsior is a new site, all of its activities were added last year.

Source of new activities added last year*

Source of new activities	MSW	Excelsior	Fresno	Watsonville	Greenfield
Curriculum Database/ Binder	0-20%	0-20%	0-20%	50-60%	40-50%
Network-funded staff	20-40%	0-20%	20-40%	0-20%	No response
Workshop Staff	50-60%	0-20%	60-80%	20-40%	0-20%
Other Workshops	0-20%	0-20%	0-20%	No response	0-20%
Network training/ event	20-40%	0-20%	20-40%	0-20%	20-40%
Other**			0-20%	0-20%	0-20%

Six-point rating scale: Light to dark -- 0-20%, 20-40%, 40-50%, 50-60%, 60-80%, 80-100%.
* We have no data for Oakland for this question.
** Other includes "life and environmental science" for Fresno, "kids" for Watsonville.

Growth -- Family Interview Data

Families notice the growth and development of workshop sites as well, as the following quote from a parent at a relatively new site highlights:

"(The Workshop) has developed so much, it is growing. When we first started coming, there were very few materials, very little art materials and now there is plenty, there are animals and there are all sorts of things." - Greenfield parent

Workshop Impacts -- Accessibility/Impact on Underserved Youth

The CSW Network leaders define the impact "accessibility/impact on underserved youth" as the following: "Staff demographics match participant demographics, including female staff; location is accessible to underserved youth (both selection of city as well as neighborhood, street visibility/location in given building); workshop has transit/walking/biking access; cost is not a barrier to

participants; language is not a barrier to participants (both English as well as Science Vocabulary); minimal requirements for filling out paperwork; minimal requirements for participation."

Accessibility -- Learning Environment Survey Data

All of the CSW sites are readily accessible by underserved youth, are visible and easy to find. All of the CSW programs are free, and all have staff and volunteers representative of the populations they are serving. There is minimal requirement for participation. In addition, exhibits and example projects in the workshop spaces are generally made by hand, by participants.

Percent of exhibits, decorations, and projects made by hand vs. commercially made

How made	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
By Hand	80-100%	80-100%	80-100%	80-100%	80-100%	80-100%
Commercially	0-20%	0-20%	0-20%	0-20%	0-20%*	0-20%

Six-point rating scale: Light to dark -- 0-20%, 20-40%, 40-50%, 50-60%, 60-80%, 80-100%.
*"e.g. globes of planet Earth, guitar, piñatas"

Percent of workshop contents made by participants

	MSW	Excelsior	Oakland	Fresno	Watsonville	Greenfield
Workshop Contents Made by Participants	0-20%	0-20%	60-80%	40-50%	60-80%	80-100%

Six-point rating scale: Light to dark -- 0-20%, 20-40%, 40-50%, 50-60%, 60-80%, 80-100%.