

# Science and Math in Spanish Language Media

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## Summative Evaluation Report

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May 2010

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## Program Overview

The Science and Math in Spanish-language Media Project introduced standards-based science and math activities into the homes of Latino/Hispanic communities traditionally underserved by science centers. The Lawrence Hall of Science (LHS) at the University of California in Berkeley partnered with New America Media (NAM), an association of 500 ethnic media organizations serving California's 17 million ethnic residents, the Children's Museum of Houston, and Miami Science Museum. The project's math challenges and science experiments, already field-tested by LHS, focused on content strands including number and operations, algebra, geometry, science as inquiry, and unifying concepts and processes in science and mathematics.

The intellectual merit of Science and Math in Spanish-language Media lied in its adaptation of LHS content to engage Latino/Hispanic families through easily accessible print media with which they are most familiar. The family-friendly activities, targeted to children aged 7-10 and their parents, were presented as educational cartoons that are culturally sensitive, translated into Spanish, and distributed through community-based newspapers. Activities that appeared in the Spanish-language newspapers were followed up with family math and science programs, planned and organized with local libraries, community centers, science centers, and after-school programs. To ensure replicability of this model, LHS partnered with the Children's Museum of Houston (CMH) and Miami Science Museum (MSM). In Years 2-4 of the project, CMH pilot tested the products with its large urban audience, through a major Houston area Spanish-language newspaper, while Miami did the same in Years 3-4. Again, follow-up family science and math programs capitalized on interest generated by the media's presence.

The broader intended impact of this project was the development of a replicable program to increase the level of coverage of science and mathematics in the ethnic media, beginning with the Spanish-speaking community. The cartoons continue to be available in Spanish on the project website, along with information from classes, and resources to facilitate media/science center/community collaborations. The project also aimed to validate the key role ethnic media play in bridging language and cultural barriers that separate ethnic communities from each other and from mainstream society. Ultimately, the project attempted to increase the number of institutions and media outlets involved in community science outreach initiatives.

The goals of the project were to:

1. provide Latino/Hispanic families with engaging science and mathematics activities through their local community resources.
2. create more exposure to science and math content in the Spanish-language media.
3. strengthen the relationship between science centers and community organizations in a replicable model.

There were four main components of the program:

Newspaper activities: LHS developed an educational cartoon series, *Mateo y Cientina*, in which math and science topics were presented in an engaging, culturally sensitive format and run in community-based Spanish speaking newspapers in the San Francisco Bay Area, San Jose, Miami and Houston. The cartoons were designed as a way to bring science and math into the homes of Spanish speaking families. Table 1 shows the different publications at the four sites in which the cartoons were published. (See Appendix A for a sample math cartoon and a sample science cartoon.

**Table 1. Publications in the Three Regional Sites**

| Site                  | Name of publication                                  | Duration of publication | Frequency of cartoon publication | Ethnicity of Audience            | Circulation |
|-----------------------|--|-------------------------|----------------------------------|----------------------------------|-------------|
| Bay area/<br>San Jose | <i>La Oferta</i>                                     | 4 years                 | Bi-weekly                        | Latino/<br>Hispanic              | 40,000      |
|                       | <i>El Mensajero</i>                                  | 3 years                 | Bi-weekly                        | Latino/<br>Hispanic              | 112,000     |
| Houston               | <i>Semana News</i>                                   | 2 years                 | Weekly                           | Latino/<br>Hispanic              | 140,000     |
| Miami                 | <i>South Florida Parenting Magazine</i><br>(English) | 1 year                  | Monthly                          | Latino/<br>Hispanic/Non-Hispanic | 110,000     |
|                       | <i>Padres de Hoy</i><br>(Spanish)                    |                         |                                  |                                  | 47,000      |

Family Classes: LHS designed a class series featuring the *Mateo y Cientina* cartoon to further engage Latino/Hispanic families in the Bay Area, San Jose, Miami, and Houston. The class series was designed to capitalize on interest generated by the cartoons' presence in the local newspapers.

Community Events: To complement the cartoons' presence in the newspapers and the family classes, *Mateo y Cientina* cartoons and activities were also publicized through local community events, such as San Jose's Cinco de Mayo festival. Project staff used a large *Mateo y Cientina* banner to advertize the cartoon brand and then engaged families in activities that were short

and only needed a few materials. The cartoons were then provided in Spanish and English for families to take home with them. The events were intended to be an additional venue through which the three science centers could engage with the Spanish speaking community. CMH was able to bring the cartoon to two community events and LHS and MSM had a project booth at 18, and three festivals, respectively.

Web site: The original design of the project called for a *Mateo y Cientina* bilingual Web site where both children and adults could access the cartoons and supplemental activities. The English version of the Web site was launched in year 4 and the Spanish version has yet to be launched, as of the time of this writing. A discussion related to issues around Web site development can found in the “Replicability and Sustainability” sub section of the Findings.

## Evaluation Overview

In 2006 Lawrence Hall of Science received funding from the National Science Foundation (NSF) to use local newspapers and other community resources to bring science and math into the homes of Latino/Hispanic families (children ages 7-10). Rockman et al (REA), a research and evaluation company based in San Francisco, CA, was subcontracted by the Lawrence Hall of Science to conduct ongoing implementation analysis and evaluate the project’s impacts. REA worked closely with LHS over the course of the NSF grant to provide programmatic feedback and to ensure the evaluation activities aligned with the program’s activities.

REA conducted formative analysis throughout the grant period. Key formative evaluation deliverables included:

- Focus Group Report on Content for *Mateo Y Cientina* Web site
- Four Comic Testing Reports
- Yearly updates on evaluation activities for NSF annual report

The purpose of the summative evaluation was to explore the various factors that influenced the program’s implementation and the extent to which its impact goals were met. The report that follows builds on the findings from the formative evaluation activities and presents the major findings from the summative evaluation, highlighting the program’s outcomes and the context in which these outcomes occurred.

### *Data Collection*

The summative evaluation incorporated a mixed-methods design that included surveys, interviews and observations. Each evaluation component addressed multiple evaluation questions. Table 2 presents an overview of these questions and the methods used to collect data.

Surveys: At each regional site, a sample of the following groups completed a survey following their exposure to one of the *Mateo y Cientina* cartoons:

- Class participants

- Visitors to the *Mateo y Cientina* booth at community events
- Visitors to the Web site
- Students in third through fifth grades and their families (in select schools)

The surveys were distributed in both English and Spanish, were short and asked mostly closed ended questions. While all surveys assessed reactions to the cartoon's activity, the questions differed slightly depending on the group being surveyed. Moreover, as the evaluation team learned about the target audience, the surveys were adapted. Scales and language was simplified to increase the response rate and ensure accuracy. It should be noted that while a Web survey was posted to collect data from visitors to the project's Web site, this survey did not yield any responses. This is likely due to the fact that the site launched late in the project and is currently only in English. (See Appendix B for all survey instruments.)

Free Response: Pamphlets containing *Mateo y Cientina* cartoons were distributed at local libraries, stores, health clinics, community centers, and eateries for community members to pick up and complete at home. The pamphlet included a response section where readers could comment on their experience doing the cartoon's activity, as well as free postage. Contact information from those who responded was stored in a database at LHS.

**Table 2. Data Collection Overview**

| Evaluation Questions  | Data Collection Methods |              |              |               |                       |                       |                   |                    |               |
|---|-------------------------|--------------|--------------|---------------|-----------------------|-----------------------|-------------------|--------------------|---------------|
|   | Web Site survey         | Class survey | Event survey | School survey | Classroom Observation | Instructor Interviews | Family Interviews | Partner Interviews | Free Response |
| To what extent do children's and parent's interest in math and science increase as a result of exposure to one or more of the project's components?                               | √                       | √            | √            | √             |                       |                       | √                 |                    | √             |
| To what extent do children and parents want to engage further with <i>Mateo y Cientina</i> after initial exposure to the cartoon through one or more of the project's components? | √                       | √            | √            | √             |                       |                       | √                 |                    |               |
| To what extent do parents and children think they've learned new concepts about math and science as a result of completing a <i>Mateo y Cientina</i> activity?                    | √                       | √            | √            | √             |                       |                       | √                 |                    | √             |
| To what extent do parents and children gain confidence in their understanding of math and science as a result of completing a <i>Mateo y Cientina</i> activity?                   |                         |              |              |               | √                     |                       | √                 |                    | √             |
| To what extent do new media outlets promote the cartoons and/or math and science learning?  |                         |              |              |               |                       |                       |                   | √                  |               |
| To what extent do class leaders enhance their ability to work with parents and children   |                         |              |              |               | √                     |                       |                   | √                  |               |

Classroom Observation: In years two through four, the evaluation team conducted two to three observations at each site. A standardized protocol was used to measure the quality of instruction and to allow for a comparison of the similarities and differences of the classes across sites. (See Appendix C for the observation protocol.)

Interviews: REA conducted a series of interviews to contextualize some of the survey data and to further explore the project's impacts. (See Appendix D for all of the interview guides.) Interviews were conducted with the following groups:

- Four families in the Bay Area
- The project directors and key staff from each site
- The class instructors at all sites

While implementing this evaluation, REA staff had ongoing conversations with LHS about the project's activities, changes in the timeline, and even changes in the intended impacts. The close working relationship resulted in the evaluation becoming an integral part of the project cycle. Likewise, as the project morphed over time, so did the evaluation activities. For example, we decided to interview a small group of families when we were unable to collect data from newspaper readers or Web site visitors. The findings discussed in the next section reflect these changes to the program design and, consequently, the evaluation.

## Findings

Over the course of the evaluation, 57 surveys were collected from attendees at community festivals, 191 from participants at community classes, 404 from students at select schools, and approximately 500 "free response surveys" from parents and children in the Spanish speaking community who picked up the cartoon at local establishments and completed the activity at home. In the last year of the project, twelve interviews were conducted with project implementers and four interviews were conducted with families in the Bay Area who had attended multiple family classes over the past year. (See Appendix E for detailed information on the number of surveys collected, and a complete list of data tables from all of the surveys used.)

Both the quantitative and qualitative data collected through these evaluation activities are presented here, grouped into five main themes. The quantitative data describes trends from the evaluation surveys administered over the course of the grant. These trends are supported by quotations taken from open-ended survey questions as well as interviews. The interview data also provides in-depth information on the program's implementation and highlights the underlying reasons why certain components had particular outcomes.



### *Engagement with Spanish Speaking Community*

All three of the regional directors were in agreement that one of the main objectives of the project was to effectively reach Spanish speaking families with math and science activities. To meet this goal, math and science activities were presented in the form of a cartoon, named *Mateo y Cientina*. REA conducted formative evaluation activities in the first three years of the project to inform LHS on the project's development, particularly related to the cartoon. Cartoons were then published in local Spanish publications in the Bay Area, Houston and Miami. Community classes, featuring the activities in the cartoons, were offered free to Spanish speakers at the three regional sites. The cartoons' activities were presented at local community festivals. In the Bay Area, cartoons were also made into pamphlets and were distributed at locations with a high concentration of Spanish speakers. The extent to which these three components of the project achieved the objective of engaging the Spanish speaking community in math and science is presented in the discussion that follows.

**Overall, the three sites engaged the Spanish speaking community differently: LHS in the Bay Area and CMH in Houston brought project resources directly to Spanish speaking communities whereas MSM in Miami sought to bring the Spanish speaking community into the science center.** In the Bay Area, the Project Director wanted to connect with the Spanish speaking community by identifying "communities of influence" or places where families congregate (e.g. a health clinic, library, school, or church).

*We saw these centers as a good place to tap into the community and share the resources that we have. We wanted to help people in these centers make a connection with the museum.* Project Director, LHS

To identify these centers of influence and develop a relationship with the community, the LHS Project Director hired a community liaison to "sell the project," "knock on doors" and introduce the Spanish speaking community to the resources available to them. The LHS Project Director attributes much of the project's success in the Bay Area to the community liaison:

*As we knew going into this project in many of the Spanish speaking communities...very few of them [the families] even thought of having their kids ever come to the University of California Berkeley. Many of them never even went to the campus to visit for whatever reason much less brought their kids up to Lawrence Hall of Science...So that was an important connection for us to make, to be able to say look we are here for you. This is your resource that you can take advantage of for yourself and for your kids. Like I said, without the community liaison knocking on doors we would not have been able to achieve our goals. The*

*materials...have been time tested over the years and they are great math and science activities but we needed a sales person.*

Connections with the communities in the Bay Area led to the selection of venues for the Saturday workshops. Rather than asking families to come to the museum, LHS took the museum's resources into the communities, offering classes at local community centers, libraries, and schools. Families signed up to attend on the day of the class.

Furthermore, the community liaison distributed *Mateo y Cientina* cartoons, folded into pamphlets on a stand, for community members to pick up at local libraries, stores, and eateries, and complete at home. Included with the cartoon pamphlet was information about the project and contact information. She replenished the cartoons often as they disappeared from their stands quickly. In all, she has visited and distributed project material in over 225 Bay area locations in the targeted community. This grassroots approach increased the visibility of LHS and the University and added to the project and science center's credibility in the community. Strong trusting relationships with Spanish speaking families have resulted.

Already familiar with community outreach through other programs, Houston took a similar approach by offering classes at libraries in Spanish speaking neighborhoods. It was decided that this approach would be the most inviting and the easiest way to find families to attend. A community liaison was not hired, however, and families largely found out about the events by coming into the library.

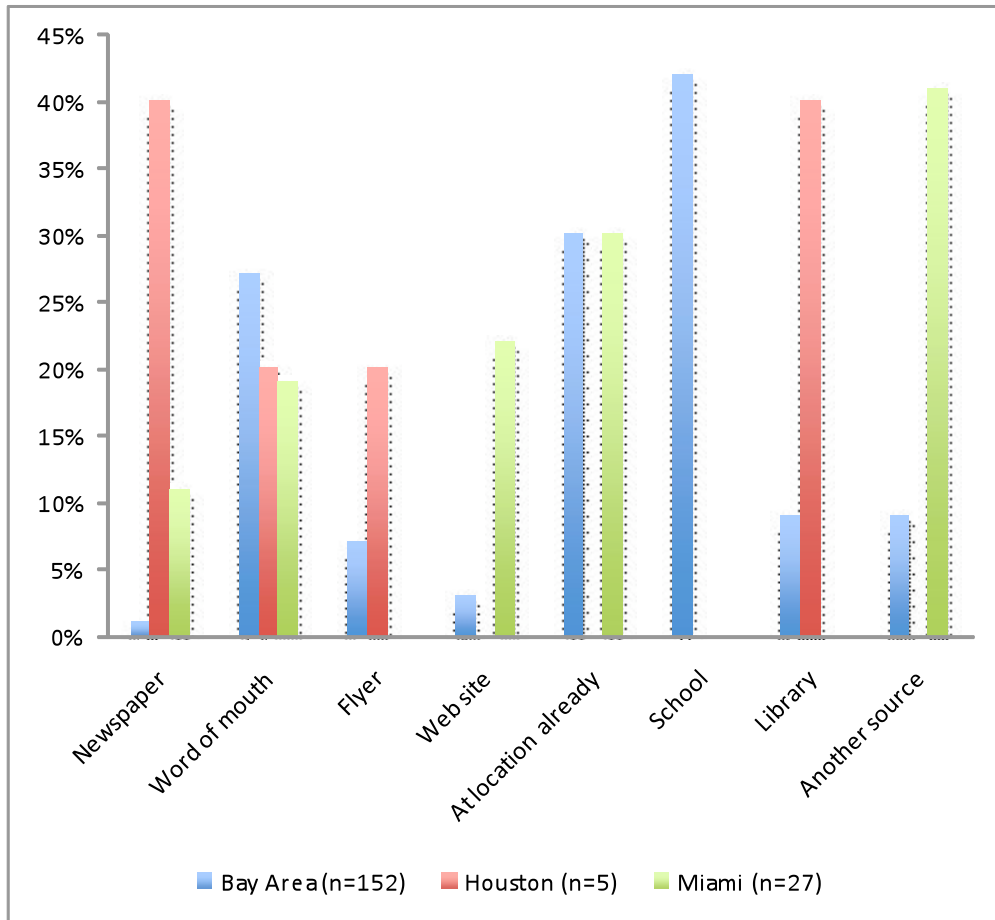
In Miami, the classes were offered in the museum, with families calling in advance to sign up to take the class. Rather than going into the community with the museum's resources, the Miami Project Director wanted to bring the community to the museum, make them feel welcome, and give the museum a new audience. She also saw it as an opportunity to train museum staff in bilingual family education, a new area for the museum. Like Houston, Miami did not have a community liaison position.

**Given the different engagement strategies used by the three sites, it is not surprising that respondents heard about the classes through different means.** Of the class participants who were surveyed, the Bay Area respondents were most likely to hear about a class through a school (42%) while Miami respondents heard about the class through "another source" (41%) and Houston respondents through the library or the newspaper (40%).<sup>1</sup> (See Figure 1.)

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<sup>1</sup> Sample sizes for both Miami and Houston are low (n=27 and n=5, respectively); therefore, conclusions are tenuous.

Figure 1. How did you hear about this class/event?



In Miami, “another source” included *South Florida Parenting* and *Padres de Hoy* magazines, in which the cartoons were published for nine consecutive months, a personal phone call, or a museum employee. In the Bay Area, relationships with certain schools were established and then someone from the school often notified parents of the class. In Houston, a flyer at the library alerted parents or parents visiting the library for another reason the day of the class were recruited to attend.

**Different engagement strategies across the three sites led to different class models. Despite the different models, the Project Directors from the three regions considered the classes the program’s strongest component.** A professional development trainer from LHS trained class instructors at all three regional sites with the intention of standardizing the structure of the classes and delivery of the instruction. She conducted four trainings in Berkeley and one each in both Houston and Miami.

While the training was identical, each regional site adapted the original model to fit the context in which the classes were to take place and reacted to unforeseen events as best they could. In the Bay Area the original group of trained instructors stayed with the project throughout the grant period. In Houston and Miami this was not the case; there

was a high turnover rate in these two locations, and the number of trained teachers in Miami and Houston was ultimately significantly smaller than in the Bay Area. The turnover rate and fewer contact hours with the trainer in Houston and Miami contributed to the emergence of different class models. Table 3 compares the three regional sites across a set of class characteristics. A description of each characteristic and relevant findings follows.

**Table 3. Characteristics of Family Classes, Across Regional Sites**

| Class characteristic                     | Bay Area/San Jose (LHS)   | Miami (MSM)   | Houston (CMH)                                  |
|--|---|---|--|
| Series/individual                        | Series  | Individual  | Individual                                     |
| Instructional model                      | Facilitator-led   | Station   | Station  |
| Class location                           | Schools, libraries  | Museum classroom  | Libraries                                      |
| Timeline and number of people reached    | 2006-10<br>2300   | 2008-09<br>250  | 2007-2009<br>200                               |
| Type of Instructor                       | Teachers from the community   | Museum staff  | Museum staff                                   |
| Participant make-up                      | Latino and non-Latino; adults and children ages infant to 17 years old; sometimes just adults | Latino and non-Latino; adults and children ages 2 to 17 years old | Latino; mostly children ages 2 to 14 years old |
| Number of activities completed per class | 1 to 2  | 3 to 6  | 4 to 5   |

Series/one time: In the Bay Area classes were offered as a series. For example, a class was held at a given location every Saturday for four to six weeks. Participants were expected to attend all the classes in the series. Offering the classes as a series was “an intentional design choice,” according to the trainer of trainers of classes at LHS. “Offering classes in a series deepens change because parents have the chance to come...we didn’t really get it last time, this time we’ll get it. Every time they come they are less scared.” The original intention was to have all the regional sites offer classes as part of series. However, in Houston and Miami classes were offered individually and not

as part of a series. Houston's Class Leader said that given another opportunity he would like to offer family classes as part of a series, or at the very least, at days and times advertised well in advance so that families could have the opportunity to come repeatedly. The Miami Project Director felt differently. She wanted to give as many different families as possible an opportunity to come.

Instructional model: The Bay Area classes used the whole group approach, while the Houston and Miami classes used some variation of the station system. In Houston, the instructor set up stations that the participants could freely move between. The instructor visited each station to provide guidance. In Miami participants either rotated from station to station at a set time or stayed at one station for the duration of the workshop. A facilitator was assigned to each station. A whole group activity was often used to close the class session.

Class location: In Houston classes were offered at neighborhood libraries with high concentrations of Latino families. The CMH project director believed that bringing the activities to the community was a way to reach families that the museum wouldn't normally reach. In Miami, the project director preferred to offer the classes at the museum. By offering the classes at the museum rather than in the community she gave Latino families a chance to connect with the science center and see it as a place where they belonged. In the Bay Area and San Jose, classes were offered in the Latino communities, as in Houston. However, classes were also offered in schools' gyms or cafeterias. The school sites proved to be the most challenging for instructors because it was hard to keep everyone focused. As one instructor pointed out, "...it was hard to keep their attention [in a gym] because the kids could run around...in the library they can't talk above a certain level."

Type of Instructor: In the Bay Area, the project director sought teachers from the Spanish speaking communities to join the project as class instructors. The project directors in Houston and Miami used internal science center staff to lead the classes.

Class composition: In the Bay Area and Houston, anyone who wanted to come the day of a class could attend. By contrast, Miami families signed up in advance. This meant that in Houston and especially the Bay Area, instructors didn't know if they were going to get a monolingual or multilingual group of participants. While most participants at the two regional sites were Spanish speaking, in the Bay Area this wasn't always the case; some classes were ethnically diverse and the primary language was not always Spanish. As one instructor noted, "In Berkeley, one class had ten different languages represented. In Hayward it would be almost all Hispanics." In addition to ethnicity, the class composition varied by the type of participants: adults, children, or both adults and children. This composition varied across regional sites but also within each site. In Houston it was often only children who would attend. In the Bay Area, some locations drew families, others drew mostly children, and others mostly adults. In Miami, parents, children, and other family members came together. This was partly because the Project

Director in Miami could control who attended through advance enrollment. Across the three regional sites, most of the families surveyed brought two to three children to a class. While the cartoons were designed for 8 to 10 year olds (3rd – 5th graders), this group only represented 25% of the children in attendance whose families were surveyed. Regardless of the class composition, one instructor said, “they were very enthusiastic, very thankful...they really enjoyed it.”

Timeline and number of people reached: Before the project began, LHS had a history of offering family math and science classes and had some connections with teachers in the area who would make quality family math and science instructors. For this reason, and because the project was led out of LHS, the Bay Area classes started before classes at other regional sites, were offered over a longer period of time, and were offered at multiple locations simultaneously. Consequently, they reached a larger number of people. In the Bay Area [72] classes were offered from 2006-09 and reached 2300 people. In Houston nine individual classes were offered from 2008-09 and reached 250 people. In Miami five individual classes were offered in 2009 and reached 200 people.

**Classes and festivals succeeded in attracting Spanish speaking individuals and families to engage with the project’s math and science activities, although classes were slightly more successful than festivals.** The majority of festival respondents spoke Spanish at home (61.5%) and completed the survey in Spanish (54.4%), yet respondents were split evenly when reporting their preferred language for reading as English or Spanish (Figure 2). The class data for language revealed more respondents whose primary language is Spanish (Figure 3). Compared to the festival data, a greater percentage of class respondents completed the survey in Spanish (73.3%), spoke Spanish at home (77.6%), and preferred to read in Spanish (71.8%).

Figure 2. Event Language data (n=57)

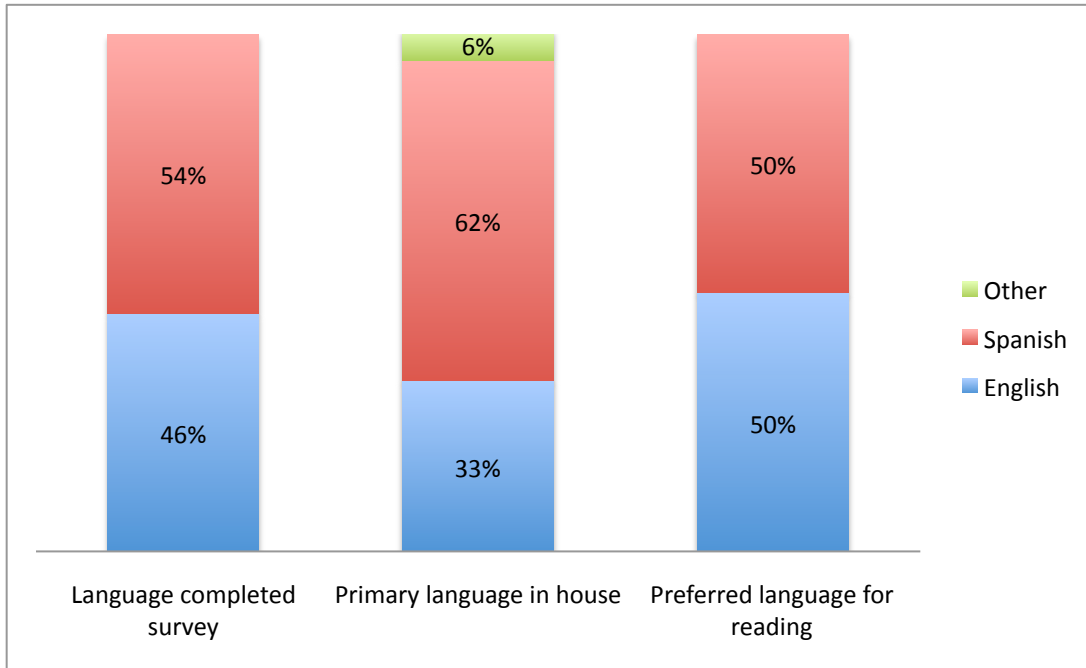
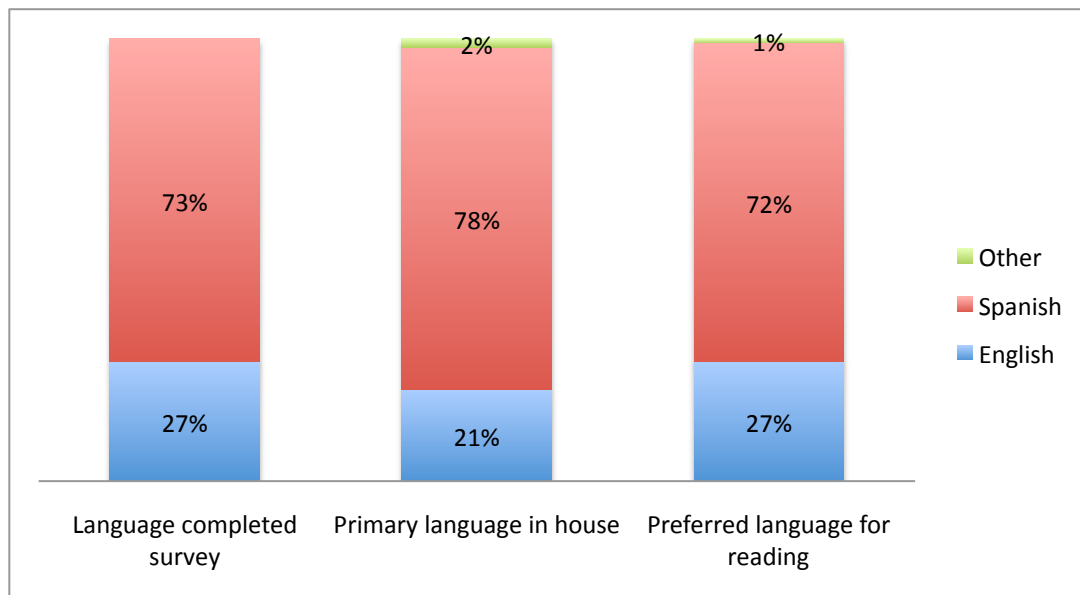


Figure 3. Class Event data (n=191)

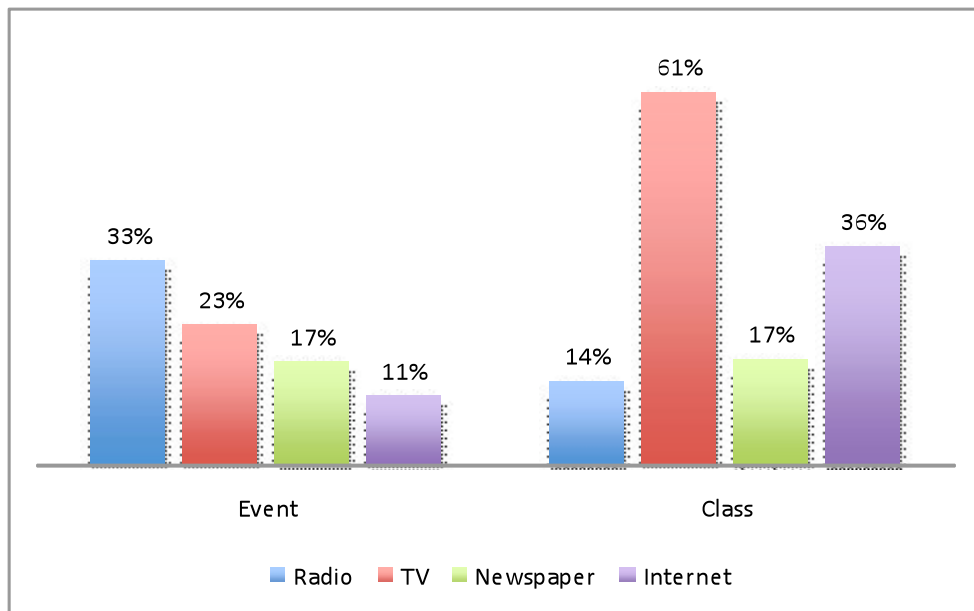


A few respondents asked that classes also be taught in English with comments like, “Less in Spanish, more in English.” Overall, the decision to produce the cartoons in both languages was wise as the data shows many Spanish speakers, especially children, prefer to read in English, and both the classes and the festivals attracted some non-Latino families.

The evaluation cannot answer the extent to which the Spanish speaking communities in the three regional sites engaged with the math and science cartoons through the newspapers and/or magazines. While a link and a phone number to a survey were included with each cartoon publication, there were no responses. This lack of response could be because readers did not have access to the Internet and were fearful of calling. Various strategies were used to try to reach readers: brief complimentary articles ran with a link to the survey on weeks that the comic didn't run and the font size of the survey announcement was enlarged. Nevertheless, no responses were received.

Another possible reason for the zero percent response rate could be that newspapers were not the optimal media outlet for engaging the Spanish speaking community in math and science. Evidence to support this speculation includes class and festival respondents who reported their primary source of information as "radio," "internet," and "T.V.," choosing this option consistently over "newspapers." Class participants were 44% more likely to get their information from T.V. than from newspapers. See Figure 4 for the breakdown of how class and festival respondents get the majority of their information. As the Community Liaison for the project reports, "People who are working class...they don't go for the newspaper for information. They don't read the newspaper at night – they watch TV. They watch the 6:00pm news or the 11pm news." However, of the four families in the Bay Area who were interviewed, three started to look for the cartoon in the local paper after attending a class. As one mother said, "I find the activities in the *Tribune* and then practice the activities at home [with my children.]"

**Figure 4. Where respondents get the majority of their information (n=102)**



LHS responded to the possibility that the cartoon in the newspapers weren't reaching as many people as hoped by seeking other media outlets through which the project could publicize the cartoon and emphasize math and science. For example, the



Community Liaison cultivated a relationship with UNIVISION radio and UNIVISION channel 44 and 14 and 48. The project used their relationship with UNIVISION 14 to promote Cal Day in the Spanish Speaking community, one of the festivals held at LHS in which a *Mateo Y Cientina* booth was featured.. More Latino families were present than ever before (although exact numbers are unknown) and anecdotal evidence suggests that the majority of these families found out about the festival on Channel 14.

**While we don't know about cartoon engagement through the publications, we did learn that many family members engaged with the cartoons that were distributed at local shops, libraries, schools, and community centers in the Bay area.** Over 500 families wrote to LHS to report on what they liked best about the cartoon and the activity. Table 4 below groups responses into four categories and provides select quotations from children and adults for each category.

**Table 4. What families liked best about the cartoons/activities**

| What families liked best about the cartoon/activity | Select Comments (Name of Cartoon)  |
|---|--|
| Fun and educational                                 | <p>[I] liked that it was very fun for kids and adults (Stamps)</p> <p>I like that it is fun and kids learn at the same time (Balloon Ride)</p> <p>What a fun strategy game. The air balloon took off without me. I lost but it was fun (Balloon Ride)</p> <p>I think this game is very important because it is a moment when our kids cooperate together and learn together (Balloon Ride)</p> |
| The story line/characters                           | <p>They are a good team and good siblings who help each other (Oobleck)</p> <p>I like how Mateo and Cientina act (Fizzy Foamy)</p> <p>I liked that Cientina likes to explore things a lot (Parachutes)</p> <p>What I liked was when Mateo and Cientina began to resolve the problem together like siblings and not fight because siblings are there to love not to fight with</p>              |

|                                 |  |
|---------------------------------|--|
| Cultural aspects of the cartoon | Liked the idea of reading these comic strips because they are educational and a way of teaching kids and adults about the culture (Papel Picado)   |
|                                 | I liked the comic strip a lot because it had a cultural and a mathematical aspect to it. In a lot of Spanish-speaking countries, they use Papel Picado for parties. In the middle of this comic strip I remembered those traditions but I also learned how to cut up paper to make Papel Picado. I liked the idea of reading these comic strips because they are educational and a way of teaching kids and adults about the culture. (Papel Picado) |
| Made me think                   | Liked it because I had to think (Balloon Ride)<br><br>The papel picado activity is very interesting and extraordinary in the way it explains the symmetrical forms. (Papel Picado).<br><br>I now know what form my fingerprints are (Fingerprints)   |

**Across all regional sites, instructors delivered quality instruction and felt like they were making a difference in the lives of parents and children.** In all the classroom observations, instructors stated the goals of the lesson, provided opportunities for reflection, and kept both parents and children engaged. For example, in one class, instructors directed his/her questions towards the parents who were not volunteering to share and also had parents answer each others' questions, rather than giving out the answers. Instructors' statements about their achievements in the classroom echo what REA observed in the classroom. All six of the class leaders interviewed in the Bay Area felt that they were successful in increasing parents involvement with their children's education, and two mentioned that they were also successful in increasing the parents' knowledge of math and science. One Bay Area instructor felt this was particularly true of parents who came back week after week. Another Bay Area instructor who commented on increased parental involvement made the following statement:

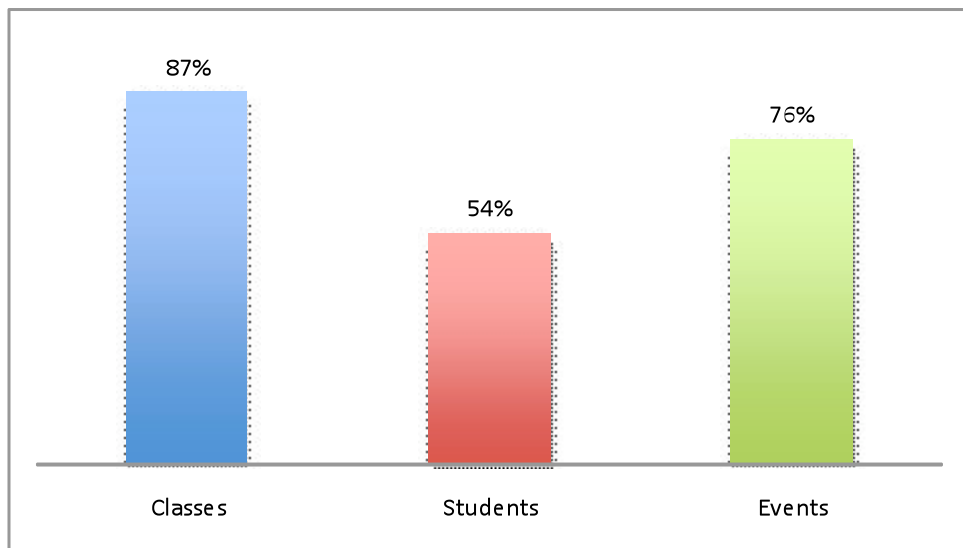
*We became an extra resource for them [the parents]. They would save their math questions and they would come, and they would say 'my son brought this home, and I didn't know how to solve it.*

*Can you help me solve it?’ I thought that was an achievement, because then you have parents working to learn about math.*

One instructor also pointed out that as a result of the classes parents seemed less scared of math and science, and the children began to see that math and science are fun, that “they can have a good time.” After classes, families lingered in the classroom, often talking with each other or with the class instructors about the content they had just learned. For the class instructors as well as the classroom observers, this aspect showed how comfortable families felt in the environment. Survey respondents asked for classes to continue and praised the classes with comments like, “Keep giving us these types of classes,” and “It was interesting and above all else I can explain it to my kids too!”

**Class and festival participants were as enthusiastic in their reactions to the *Mateo y Cientina* activities as the instructors with 87% of class respondents and 76% of festival respondents saying they liked the activities “a lot.”** Additionally, 97% of class respondents agreed or strongly agreed that they “enjoyed this class,” and 95% agreed or strongly agreed that the class was easy to understand. Students who participated in the school survey were less likely to cite liking the activity, “a lot” (54%) (Figure 5). It’s not surprising that the students who participated in the school survey were generally less enthusiastic about the activity, given that they were asked to complete it at home in a “homework-like” setting rather than with a trained facilitator.

**Figure 5. I liked the Activity a lot**



Participant responses mirrored the same pattern whether respondents completed a science or math activity. Instructors agreed with the participants in their classes, commenting on the success of both the math and science cartoons. That said, two of the six instructors interviewed found the science activities to be “more engaging and more hands-on.” The science activity Fizzy Foamy was a particular favorite among the

instructors. Meanwhile, of the 4 families who were interviewed, math activities were favored over science. Reasons cited by the families included: feeling like the math activities were easier to repeat at home, increased understanding and confidence in math, and the ability to now help children with math homework. As one mother said, “I like and enjoy that the math activities are different. They draw and they play.” Over 95% of class respondents agreed or strongly agreed that there were enough materials to complete the activities and that the instructor gave enough support to complete the activities.

The *Mateo y Cientina* cartoon was not always central to the class instruction. While the math or science content from a particular cartoon was the focus of each class, the emphasis placed on the cartoon itself varied from instructor to instructor. For example, sometimes the cartoon was distributed at the beginning of the class and was then referenced repeatedly throughout the class. Other times it wasn't mentioned until the very end. Sometimes it wasn't mentioned at all and would simply be available for participants to pick-up as they exited the class. At MSM classes (at the museum), comics were on the tables as the participants entered, allowing them to read on their own and begin the activity. At two LHS workshops, both held at school locations, the comics were read out loud at the end of the activity. At the CMH community library class copies were left on the table for participants to take on their way out. In interviews the class instructors and the site directors commented on the fact that cartoons were used in varying ways and degrees. Instructors' comments about their use of the comic included:

*[We used the comics in different ways]. Sometimes we taught from it. We read the story and sometimes we did the activities that came with it.*

*We would start the session by reading them together. That was all we could do with it.*

*We would either start or end with it. We would ask about the one we gave before and ask if they had tried it. We would give them a new one and ask them to try it at home with their kids. There was a discussion about it. Sometimes we used the comic and did activities in class, and would follow up on how they could do it at home.*

*Every time we did an activity we would remind families about cartoon.*

*We wanted them to remember the cartoon so that they would recognize it outside the classroom.*

Further evidence of the differing degrees to which the instructors used the cartoon as a central component of their classes is given by one Bay Area mother who attended classes with her three children for over two years but did not know *Mateo y Cientina* cartoons appeared in two Bay Area Spanish language newspapers. While the cartoon may have been used as part of instruction in her class, it is clear the instructor did not connect the activity and its accompanying cartoon to the availability of the cartoon in the local newspaper and the possibility of engaging with the activities at home.

**While the original design of the project called for the integration of the cartoons in the publications with the classes, only 15% of those families surveyed in the Bay Area had heard of *Mateo y Cientina* before attending a class.** While this question was only asked of Bay Area class attendees, there were participants at the classes in Houston who said they found out about the class through *La Semana*, the publication featuring *Mateo y Cientina*. This may indicate that in Houston, *Mateo y Cientina* experience was more integrated at this regional site.

Overall, the classes benefited the families in attendance but the goal of having families immersed in an informal learning environment at home and in their communities cannot be determined from the data. Nevertheless, after completing the class over 76% of families said they would do another activity at home with their families. This positive response rate was even higher for students who completed the cartoon in their homes with their families (84%).

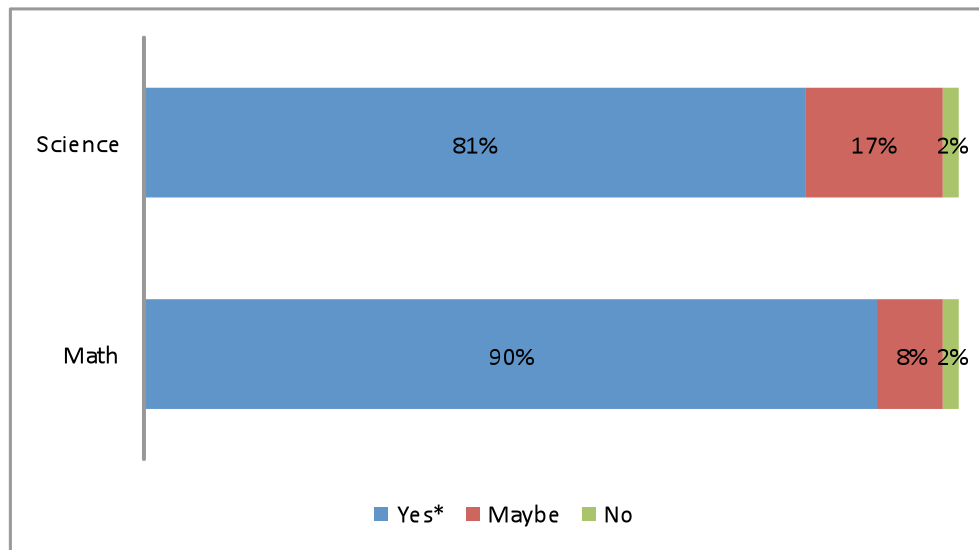
#### *Future Engagement*

Regardless of how respondents were introduced to *Mateo y Cientina* and the extent to which the cartoon was emphasized in their class or event, it is clear that respondents wanted to stay engaged with the math and science activities. Adults and children both indicated their desire to engage in a variety of actions beyond the completion of the activities, with many parents requesting more classes.

**As a result of attending a *Mateo y Cientina* class, 99% of parents said they would spend more time doing math or science with their children; the other 1% said "maybe."** These data illustrate that parents are not only interested in helping their children with math and science but also have a new confidence in their ability to do so. This confidence in their abilities and interest in helping their children with school work, coupled by their satisfaction with the class (discussed above) likely contributed to the highly positive response rate for recommending the class to a friend or a family member. Nearly 100% of respondents said that "yes" they would recommend the class to a friend or family member. One mother of three and long time participant in the Bay Area classes said in an interview that "the classes have helped me explain math to my children and their interest in math seems to have increased." A mother of five who attended more than ten classes said in an interview: "Because of what I have learned in the classes, I feel more comfortable helping my children with their math assignments."

**Students who completed the school survey were more likely to want to do another *Mateo y Cientina* activity if they had completed a math cartoon than if they had completed a science cartoon.** Ninety percent (90%) of students who were given a math cartoon wanted to participate in follow-up activities compared to 80% of students who were given a science activity (Figure 6). One reason for this preference could be that respondents of this survey completed the activity at home without a facilitator. Given this context, the math activities may have been easier to understand and complete successfully.

**Figure 6. Would you do another *Mateo y Cientina* activity?**



\*  $\chi^2(2, n=399) = 7.74, p < .05$

To further explore the possibility of a statistically significant relationship between type of cartoon completed and likelihood of doing another cartoon, a Chi-Square analysis was conducted. A significant relationship was found between the two variables, Pearson  $\chi^2(2, n=399) = 7.74, p < .05$ . The data were split into math or science and then disaggregated by grade, and Chi-Square analyses were again conducted. No significant relationship was found between grade and willingness to complete another cartoon for math or science. This finding suggests that student reactions to the math and science cartoons were similar across grade levels. This result may be due to ease of understanding the activity, materials needed to complete the activity, or pre-existing interest in the topic.

**When class and event respondents were asked in what ways they would likely continue to be involved with *Mateo y Cientina*, if at all, they most frequently cited “by attending a class” (86% and 83%), followed by “do an activity at home with other family members” (77% and 64%), and “look for a comic in the newspaper” (68% and 62%).** A mother of three and long time participant in the Bay Area classes

discussed in an interview how she often did the class activities at home with her children.

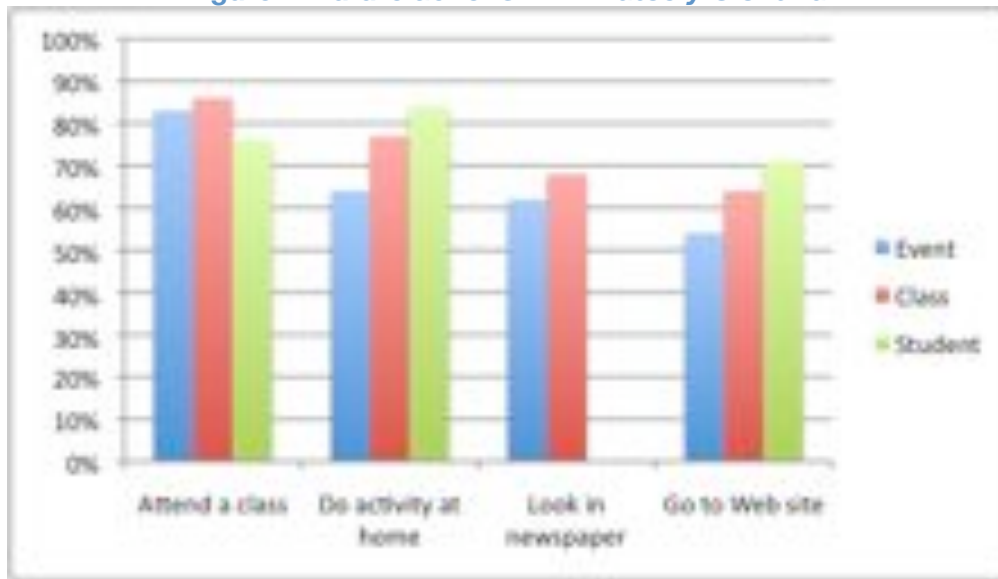
*One time I went out and bought the materials I needed and then spent about forty-five minutes with my children doing one of the activities.*

Of all the choices, both class and event respondents were the least likely to want to go to the Web site (64% and 54%, respectively). Two of the four mothers interviewed in the Bay Area said they did not know how to use a computer, likely one reason that the Web is the least likely form of future engagement for families. Another reason may be that families didn't know about the site's existence. The two top responses imply that class participants find the communal or collaborative aspect of their engagement with the cartoons and the activities to be the most rewarding, and event participants are likely drawn to the same characteristics. As one parent said:

*I like that the kids were included for those of us who don't know how to help them in the house. This was a good example.*

The students who took the school survey were slightly less likely than the class and event respondents to want to attend a class (76%, compared with 86% and 83 percent, respectively), but more likely than class and event participants to want to visit the Web site (71%, compared to 68% and 62%, respectively). Sixteen percent of the students from the school survey said that they might want to attend a class compared to 9% of the class respondents. It is not surprising that the students are slightly more ambivalent about the classes, considering their only exposure to the *Mateo y Cientina* was through a controlled research setting; they did not benefit from facilitator led instruction and therefore may not be as likely to want to continue their engagement. School respondents may be more likely to want to visit the Web site because younger respondents are more likely to have access to and/or use a computer on a regular basis than older respondents. It's also possible that they had more access to computers at the school versus at home. Figure 7 shows the percentage of respondents from classes, events, and the schools who reported an interest in engaging further with *Mateo y Cientina*.

Figure 7. Future actions with *Mateo y Cientina*



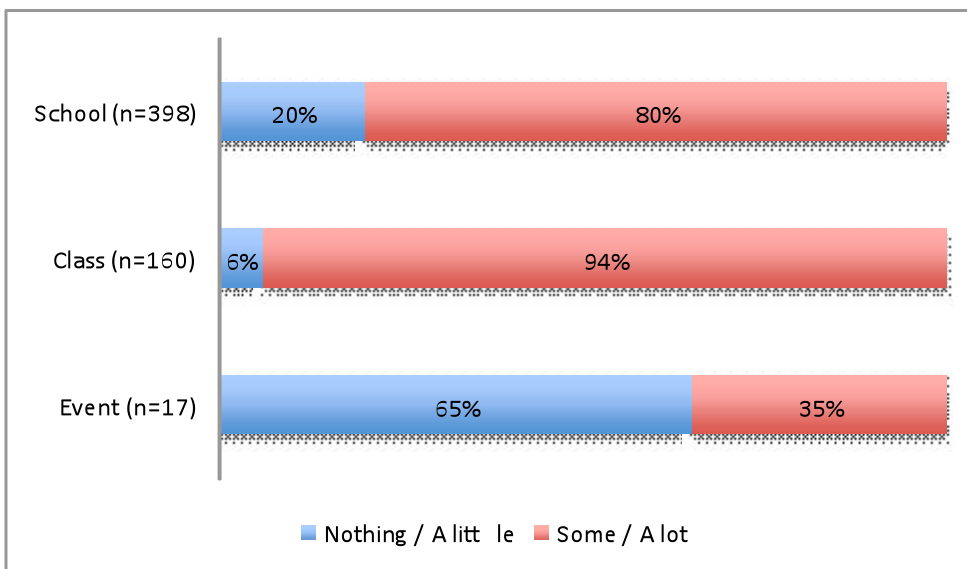
### *Perceived Learning*

Respondents were asked to rate how much they learned doing the activities on a 4-point scale, with 1 meaning “not at all” and 4 meaning “a lot.” For the classes and students from the school survey data were separated by type of activity: math or science. For the event data, the type of comic completed was often unknown; therefore these data are not disaggregated.

**The majority of all surveyed participants from the classes (94%) and schools (80%), felt like they learned “some” or “a lot” from completing a *Mateo y Cientina* activity.** Event participants, on the other hand, did not feel like they learned very much with the majority of respondents reporting to have learned either “nothing” or “a little.” On a 4 point scale with 1 meaning “not at all” and 4 meaning “a lot,” the mean score for perceived learning was 3.60 (SD=.62) for class respondents, 2.47 (SD=.72) and 3.56 (SD=1.52) for event respondents and student respondents, respectively. Twenty-three students (13%) felt they learned “nothing” about science or math from the cartoons. Of those 23 students, 70% were Spanish speakers and 30% were English speakers. These percentages closely mirror the overall breakdown of Spanish speakers (78%) and English speakers (19%). As with other reported findings, it can be implied that students felt like they learned less than the other two types of respondents because they completed the activity without the assistance of a facilitator. Figure 8 compares the different types of respondents and their corresponding levels of perceived learning.



Figure 8. Perceived Learning



When asked what parents and children learned from *Mateo y Cientina* and in what ways they were able to connect the new material with prior knowledge, responses were aligned with the constructs intended by the cartoon’s creators. Table 5 below lists perceived learning and select comments for select cartoons.

Table 5. Perceived Learning by Cartoon

| Name of cartoon | What they said they learned   | Select Comments  |
|-----------------|-------------------------------|--|
| Papel Picado    | Connection with Latin Culture | In a lot of Spanish-speaking countries, papel picado is used for parties. I remembered those traditions and also learned how to cut up paper to make papel picado                                  |
|                 | Symmetry                      | I learned that symmetry is found in different places: in a table, in a chair, in a book and in a lot of things we use daily. Symmetry is when we cut an object in half and both sides are the same |
| Stamps          | How to be a collector         | I like to collect stuff too. I separate my collections by color<br><br>I also collect things like bracelets and I classify my bracelet collection  |

|                |                                 |   |
|----------------|---------------------------------|---|
| Fingerprints   | Characteristics of fingerprints | Discovered what form my fingerprints take   |
| Oobleck        | Chemical reactions              | I realized that the cornstarch and water mix makes Oobleck  |
| Brain symmetry | Symmetry                        | <p>I learned that symmetry is found in different places: tables, chairs, books and a lot of things we use daily</p> <p>I learned that not everything has an axis of symmetry and that to have an axis of symmetry one half has to be equal to the other half</p> <p>I learned that you can do symmetry with letters, animals and things</p> |

**Class respondents felt like they learned more from the math activities (70%) than the science activities (58%), while students who completed the school survey felt like they learned more from the science activities (53%) than the math ones (46%).**

The four families interviewed in the Bay Area felt like the math activities taught during the community classes were the most applicable to their daily lives. Comments included:

*I'm more confident now. The classes have helped me with my grocery shopping and using coupons...now my children like to do a grocery lists and are aware of prices. The classes have also helped me with recipe measures...and I can help my kids with their math classes. I like that my kids think of me as "knowing."*

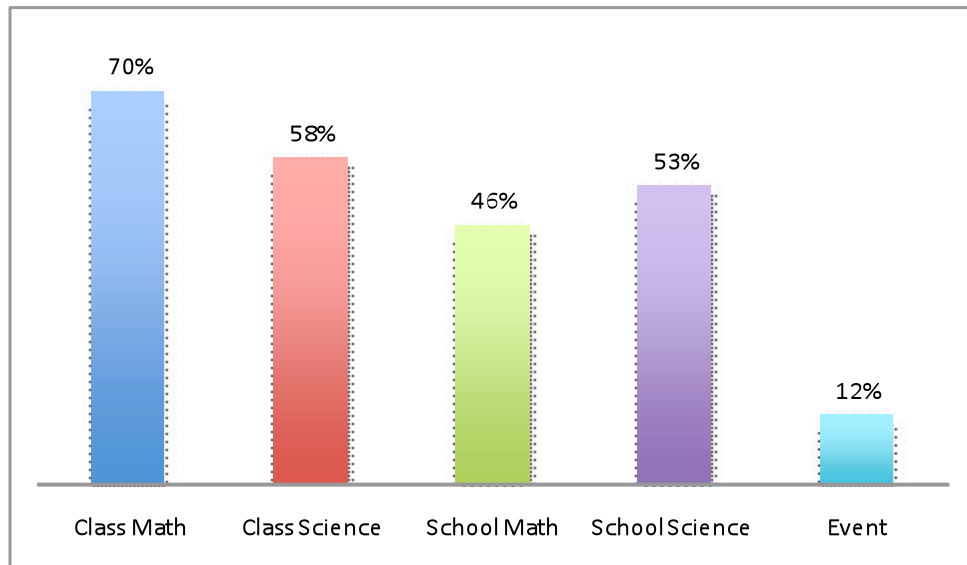
*The classes have helped me support my kids' learning but also [has helped] in our daily lives. It has helped with our grocery shopping.*

*My kids learned about shapes by doing Papel Picado.*

Survey data suggests that math class participants felt they understood the material better and had more support than science class participants. When asked if the class was easy to understand, 71% (n=80) of math respondents strongly agreed, while only 58% (n=22) of science participants strongly agreed. The difference between classes increased when participants were asked to what extent they agreed that the instructor(s) gave them enough support to do the activities. Eighty two percent of math respondents strongly agreed, while 68% of science respondents strongly agreed with

this statement. Figure 9 compares perceived learning by class and student respondents who completed either a math or a science cartoon.

**Figure 9. Respondents that reported having learned a lot doing the activity**



### *Training and Support*

The Project Director at LHS led the project, coordinating efforts with the regional directors at MSM in Miami and CMH in Houston to publish the cartoons in regional publications, offer classes, distribute learning materials, and have a presence at community events. The LHS Project Director also established and maintained partnerships with museums, media outlets, and outreach sites. LHS's Trainer of Trainers was responsible for training class instructors at the three regional sites. To this end, she familiarized them with the cartoons, taught them how to deepen the participants thinking about the construct(s) in the cartoon by teaching them how to ask questions, and emphasized how to model quality learning behavior.

All of the class instructors in the Bay Area as well as the project directors in Miami and Houston felt very prepared by the trainings. Instructors in the Bay Area attended far more trainings than those in Miami and Houston with most Bay Area instructors attending anywhere from three to four trainings and instructors in Miami and Houston attending only one. Regardless of the number of trainings attended, all of the instructors felt the trainings were successful. Instructors said the trainer from LHS would "model how to do the activities." Other comments include:

*Trainings were well planned.*

*[The trainings were] really good, especially the science training.  
The math were easy to follow, but the science were kind of*

*confusing, especially the moon activity. Going to the training helped a lot.*

*They were pretty good at informing [me as to] what would be expected in the boxes.*

*The training was excellent and was different from anything my staff had ever received.*

**While the trainings were viewed as effective, there were concerns raised about the boxed kits.** These concerns ranged from not getting the boxes well enough in advance to missing materials. Most instructors agreed that they would have preferred to receive the boxes earlier than they did, and one instructor would have liked to meet with her co-presenter ahead of time to plan. Comments on the materials from Bay Area instructors included:

*It would be nice if we got our materials then to make sure everything was complete...sometimes there were no markers or no post-its.*

*Sometimes there were surprises in boxes that came to us. There were activities that we hadn't done, and some of the ones we had done weren't included.*

*We sometimes didn't have enough materials, so we put two families per packet. Sometimes we were told to give out prizes, but we didn't have any.*

*Sometimes I would get the box the day before, and I wouldn't be able to look through. I would be prepared, but we would realize they were missing stuff. That's has been kind of an issue. Either not having enough materials, or missing things.*

Language was another issue for the instructors, as well as the Project Director in Miami. One instructor commented on the lack of bilingual materials:

*The materials were not always in English and in Spanish. Sometimes, they were in English, sometimes in Spanish, sometimes in both. As a presenter, my materials were in English. Sometimes the translation was tricky. It would have been nice to have the teachers' instructions in both languages. We were trained in English, and often the science vocabulary was hard to translate. We all don't know academic or scientific Spanish. Class instructor, Bay Area*

*When we got the first packet of materials we were surprised that not all of the materials were in both languages. This was particularly true with the Science materials. Project Director, Miami*

Despite challenges, instructors commented that they were able to solve problems and make each class successful.

Some class instructors in the Bay Area and the Project Director in Houston reported excellent communication with LHS while the Project Director in Miami and other class instructors in the Bay Area expressed frustration. As one class instructor said, “Jose and Grace were great...they got back to us quickly.” Another expressed similar feelings, “If I had any questions or problems, I could send an email...and get a response right away.” But a third classroom instructor said they were so busy that “I’d have to go to the museum myself [to get the materials].” He continued, “There were logistical problems about pickup and delivery of the boxes.”

The site project directors echoed the instructors’ mixed experiences. The Project Director in Miami felt that Jose, the Project Director at LHS, “was great.”

*He was receptive and informative. He let me know everything. I could call or email him easily. He’s a busy man and he made time for me. It was really great to be welcomed into a project like that.*

MSM’s Project Director felt differently. She felt like when she had a problem, there was nobody at LHS to listen and support her. She said she would call repeatedly before someone took action. She also felt that her museum’s deadline weren’t respected and that materials arrived late and still in need of work. In her words,

*It was painful to get [the materials] ready for publication and for the classes. The project became stressful. We wanted to get the job done. But we weren’t getting cooperation.*

The LHS Project Director was aware that this frustration existed on the Miami team and tried hard to mitigate it. He recalls feeling disappointed that he couldn’t pull through for them in the way they needed because of his dependencies on other people and partners to get the work done. Reflecting back on the communication he had with various partners in the project, he said the following:

*“It takes a lot to have a good partnership.... It’s a relationship that you need to develop and nurture and you need to be able to give and take. You can’t always give and you can’t always take... It was just like having a family. Everybody in the family has a different personality. So it’s like how do you take care of this person in the family versus this family because you can’t do the*

*same thing. It worked out in the end but that's something that you really have to be cognizant of, I have to be cognizant of [that]."*

### *Replicability and Sustainability*

At the time of writing, Project Directors are making efforts to capitalize on the cadre of materials developed for the project and the science centers' increased interest in serving Latino families. There are six key ways in which the momentum generated by the project for family learning within the Spanish-speaking community is being sustained:

**New print outlets:** Throughout the life of the project, the LHS Project Director publicized the project at events and conferences around the country<sup>2</sup>, with many people from the Hispanic and Non-Hispanic community expressing interest in the idea of using educational cartoons to promote informal learning. In June of 2009 LHS project staff attended the National Ethnic Media Expo and set up a *Mateo Y Cientina* booth. The booth attracted a lot of attention and was one of the few with a focus on family involvement in mathematics and science education. Interest in the cartoons generated by the project's presence at the Expo materialized into action and the *Tohono O'odham Nation*, a federally-recognized tribe that has approximately 28,000 members on tribal lands in Southwestern Arizona, covered the expense of placing six cartoons (in English) in the Ak-Chin O'odham Runner newspaper.

**Expansion in the Media:** To increase the project's media exposure beyond the newspapers and the science centers outreach efforts, the project Community Liaison at Lawrence Hall of Science reached out to television and radio programs throughout the year. One program was "Encuentros en la Bahía", a weekly television program produced by Univisión Channel 14 in San Francisco. The Community Liaison also participated in an interview on "Noticias y Más" on Univisión Radio. In turn, Univision Radio aired the interview on their radio outlet stations—Recuerdo, La Kalle, and Estereo Sol. LHS has used these opportunities to talk about *Mateo Y Cientina* as well as other family oriented programs being offered by the hall. They plan to extend the reach even further in year five, after the funding has ended, through a series of eight pre-recorded interviews for radio. The topics for the series will include:

- Assisting children with homework (parent involvement)
- Talking about race (building on the current Race exhibit at LHS)
- Inviting teens to do science (teen role models)
- Getting ready for college (parent advocacy)
- Helping to understand the concept of multiplication (mathematics)

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<sup>2</sup> Project representatives attended the California Mathematics Council Conference (Palm Spring, CA), New America Media Expo (Atlanta, Georgia), Expanding Informal Science Education for Latinos Conference (Albuquerque, New Mexico), National Council of Teachers of Mathematics Conference (Washington DC)

- Exploring the different phases of water (science)
- Understanding how ratios and proportions are related (mathematics)
- Doing science at home (science)

At the conclusion of the series, LHS staff will re-evaluate the shows and discuss plans for future interviews. Overall, the project's outreach through print, radio, and television media outlets has given LHS opportunities to raise public awareness concerning educational issues. While the print media introduced the cartoons to families in four states, radio and television programming is giving the project more exposure; it has peaked the interest of parents and children to learn more about the project's content as well as its offerings in the community.

**Use of project resources in other programs:** The Project Directors want to see the materials in use, even if the classes and publications cannot continue. While the Houston Project Director can no longer hold community classes at the libraries, he integrated the math and science activities into the kits for their pre-existing afterschool program. In the Bay Area, a new LHS-led family education program hopes to use the existing relationships with community libraries, schools, and other community centers in implementing the new project; likewise, the hope is to utilize the trained instructors. Instructors themselves see a great need for the continuation of family education in the Spanish speaking community and are eager to continue teaching. As one teacher said, "I wish we could provide more services to people..." The Tech Museum, one of LHS's partners, successfully sought external funding to continue to offer the family math and science classes (with the project's original resources). Miami's team echoed the desire to meet the needs of the community with continued programming. "We have a long waiting list of people who want to do this [the classes] again. We need to figure out how to do this."

Beyond these relationships, The Tech Museum of Innovation in San Jose has been an extremely enthusiastic partner in hosting classes for families with a program, *MathWorks*, designed on our model. As a result of the classes' success in 2008-09, The Tech sought and received funding from the Yahoo Foundation to offer *MathWorks* in 2009-10. The Tech felt the *MathWorks* classes would complement their programs and exhibits and attract more Spanish-speaking families to their institution..

**The Mateo y Cientina Web site:** To develop additional resources for a varied audience, the project launched the project website <http://www.mateoycientina.org/> in late November 2009. In designing the Web site, the project staff took into consideration the needs of parents, children, teachers, libraries, science centers, and media outlets. To meet these needs the site provides all of the Mateo y Cientina cartoons, additional math and science activities, sample news releases for the media, and other resources of interest to the target audience.

The site provides an opportunity for parents and children previously exposed to the project to continue to access the project's materials. Anecdotal evidence strongly suggests that families would like to continue to access the project's resources outside of a class setting. As one Bay Area mother said, "*Now that I know these [the project's activities] are on a Web site, I'll go and look.*"

By linking up with other sites, the site also provides an opportunity for parents, children, and educators who have no previous exposure to the project to become engaged with *Mateo Y Ciencia*. When possible, the project director chose to link the site with other sites that were at a minimum partially translated in Spanish. For example, to target new families [www.mateoycientina.org](http://www.mateoycientina.org) was linked to:

- Boston Children's Museum:  
<http://www.bostonchildrensmuseum.org/grownups.html#home>
- TERC: <http://www.terc.edu/work/641.html>
- Monterey Bay Aquarium:  
<http://www.montereybayaquarium.org/lc/activities/default.asp>
- Museo de los Niños  
[www.curiosikid.com/view/index.asp?pageMS=2309&ms=158](http://www.curiosikid.com/view/index.asp?pageMS=2309&ms=158)

The project also selected additional sites that are part of a growing network of organizations that target Spanish-speaking families or the promotion of mathematics and science in informal settings. Staff from the selected organizations were familiar with the project because they had either served on the project Advisory Board or had collaborated on other NSF sponsored initiatives such as the Expanding Informal Science Education for Latinos Conference and Family Engineering Project. The organizations are considering a link to [www.mateoycientina.org](http://www.mateoycientina.org) on their site include:

- Self Reliance Foundation <http://www.accesohispano.org/>,
- New Mexico Museum of Natural History & Science  
[http://www.nmnaturalhistory.org/edu\\_proyecto.html](http://www.nmnaturalhistory.org/edu_proyecto.html), and
- Advancing Hispanic Excellence in Technology, Engineering, Math and Science (AHETEMS) Foundation  
<http://www.ahetems.org/pre-college/aymijaaymijo-book-series/>
- TODOS: Mathematics for All <http://www.todos-math.org/>.

Staff from Advancing Hispanic Excellence in Technology, Engineering, Math and Science (AHETEMS) and the Math Forum @ Drexel newsletter are giving the site additional exposure. AHETEMS staff is by referring their families to the project materials and Web site. The Math Forum @ Drexel newsletter publishes a newsletter once a week and has chosen the Mateo and Cientina Web site to feature in a recent issue (<http://mathforum.org/electronic.newsletter/mf.intnews15.4.html>). The project director hopes to get additional exposure or promotion from other mathematics or science related organizations in the coming year.



Even though the target audience for the site is Spanish-speaking families in the United States, Google analytics show that individuals from Mexico, Peru, Colombia, Spain, Chile, Venezuela, Argentina, and other countries have also been visiting the project Web site.

**Permanent presence of *Mateo y Cientina* at the museums:** At LHS and MSM, the cartoons have been integrated into existing exhibits. For example, in Miami, the project team made one of the cartoons a downloadable resource for a CSI crime scene exhibit. AT LHS, the cartoons have been made into an exhibit and are on permanent display.

**Continued distribution of the cartoon pamphlets in the Bay Area:** The community liaison at LHS has continued to distribute the cartoon pamphlets in libraries, schools, local eateries, etc., in an effort to continue to increase the number of community members who understand how the *Mateo y Cientina* cartoons can benefit the Spanish-speaking community and to provide Spanish speaking families with math and science learning opportunities. This continued involvement is also designed to reinforce the connection LHS is currently making in underserved communities.

In conclusion, the project has made connections with—and influenced the programmatic offerings of—science and children’s museums, media outlets, libraries, schools, and community centers in California, Texas, Florida, and Arizona. It’s assumed that hundreds of thousands of readers have been exposed to the cartoons in the print media and thousands more have heard radio broadcasts promoting mathematics and science content. Thousands of parents and children have participated in classes or tried the activities at community festivals. Beyond the original partners, the project was able to recruit three additional science museums and two more newspapers to join in this effort to reach out to the Spanish-language community. The project staff reports that they will continue to investigate and follow up on other possible collaborations to enhance the welfare of communities throughout the country and in other parts of the world.

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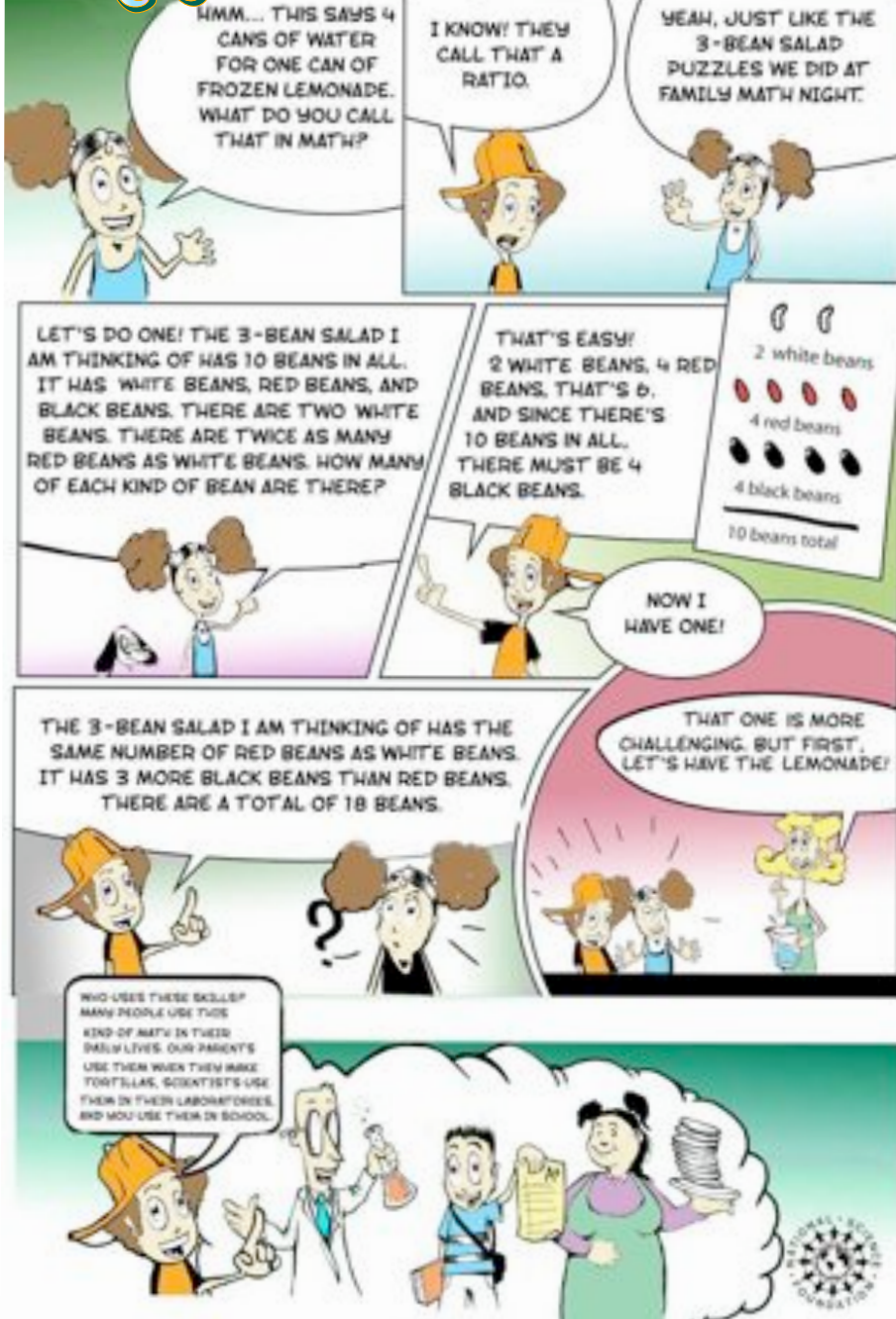
**Partner Interview Protocol**

Appendix E: Survey Data Results

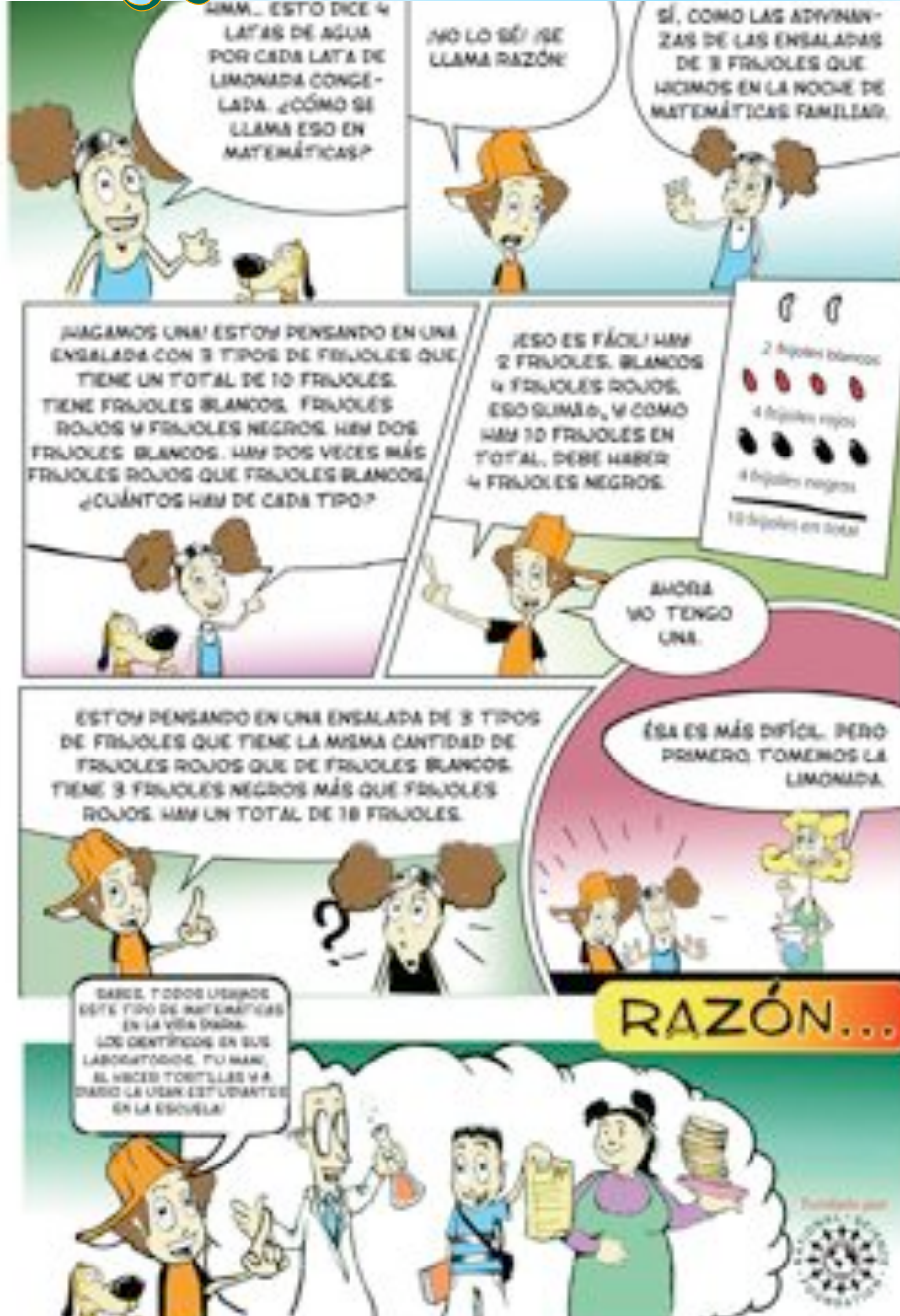
## Appendix A: Sample Comics



# THREE BEAN SALAD!



# FRIJOLITOS!



¡Visiten a Mateo y Cientina en línea! Diríjanse a <http://www.mateoycientina.org>

## Appendix B: Survey Instruments

Family Math Class Survey

Family Science Class Survey

Student Math Survey

Student Science Survey

Festival Survey

Instructor Interview

## Family Math Class Survey

|  |   |
|--|---|
| <b>Name</b> (optional):  | Number of <b>children attending</b> today's class with you:<br>_____  |
| <b>Email</b> (optional):   | <b>Ages</b> of these children: _____  |
| <b>Zip code</b> where you live:  | Primary <b>language</b> you <i>spea</i> k at home:<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____   |
| <b>Age:</b> <input type="checkbox"/> 18-24 <input type="checkbox"/> 25-29 <input type="checkbox"/> 30-34<br><input type="checkbox"/> 35-41 <input type="checkbox"/> 42-50 <input type="checkbox"/> Over 50 | <b>Language</b> in which you prefer to <i>read</i> :<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____ |
| <b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female   |   |

1. How do you get most of your information?

- Radio
- T.V.
- Newspapers
- Internet

2. How did you hear about this class?

- Newspaper—*Which newspaper?* \_\_\_\_\_
- Through listserv/newsgroup—*Which listserv/newsgroup?* \_\_\_\_\_
- Word of mouth
- Through another program – *Which program?* \_\_\_\_\_
- A poster in your neighborhood
- Web site—*Which Web site?* \_\_\_\_\_
- Other—please specify: \_\_\_\_\_

3. How much did you **learn about MATH** from today's activity(ies)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Nothing                  | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. How much did you **like doing the MATH activity(ies)**?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Not at all               | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

***Please turn over to complete page 2***

5. Based on today's class, will you: (Check 1 answer for each question.)

|  | Yes                      | No                       | Maybe                    |
|--|--------------------------|--------------------------|--------------------------|
| Look for <i>Mateo y Cientina</i> comics in the newspaper?                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Do <i>Mateo y Cientina</i> activities at home with other family members? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Look at the <i>Mateo y Cientina</i> Web site?                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Attend other math or science classes for families?                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Spend more time doing math or science with your child(ren)?              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Recommend this class to others?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. Please tell us how much you agree or disagree with each statement about today's class:  
(Check 1 answer for each statement.)

|   | Strongly Disagree        | Disagree                 | Agree                    | Strongly Agree           |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| I enjoyed this class.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| This class was easy to understand.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| There were enough materials to complete the activity(ies).        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The instructor(s) gave us enough support to do the activity(ies). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Do you have any suggestions about how to improve the class?

**Thank You**



## Family Science Class Survey

|  |  |
|--|--|
| <b>Name</b> (optional):  | Number of <b>children attending</b> today's class with you:<br>_____   |
| <b>Email</b> (optional):   | <b>Ages</b> of these children: _____   |
| <b>Zip code</b> where you live:  | Primary <b>language</b> you <i><b>speak</b></i> at home:<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____    |
| <b>Age:</b> <input type="checkbox"/> 18-24 <input type="checkbox"/> 25-29 <input type="checkbox"/> 30-34<br><input type="checkbox"/> 35-41 <input type="checkbox"/> 42-50 <input type="checkbox"/> Over 50 | <b>Language</b> in which you prefer to <i><b>read</b></i> :<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____ |
| <b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female   |  |

1. How do you get most of your information?

- Radio
- T.V.
- Newspapers
- Internet

2. How did you hear about this class?

- Newspaper—*Which newspaper?* \_\_\_\_\_
- Through listserv/newsgroup—*Which listserv/newsgroup?* \_\_\_\_\_
- Word of mouth
- Through another program – *Which program?* \_\_\_\_\_
- A poster in your neighborhood
- Web site—*Which Web site?* \_\_\_\_\_
- Other—please specify: \_\_\_\_\_

3. How much did you **learn about SCIENCE** from today's activity(ies)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Nothing                  | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. How much did you **like doing the SCIENCE** activity(ies)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Not at all               | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

***Please turn over to complete page 2***

5. Based on today's class, will you: (Check 1 answer for each question.)

|  | Yes                      | No                       | Maybe                    |
|--|--------------------------|--------------------------|--------------------------|
| Look for <i>Mateo y Cientina</i> comics in the newspaper?                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Do <i>Mateo y Cientina</i> activities at home with other family members? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Look at the <i>Mateo y Cientina</i> Web site?                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Attend other math or science classes for families?                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Spend more time doing math or science with your child(ren)?              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Recommend this class to others?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. Please tell us how much you agree or disagree with each statement about today's class:  
(Check 1 answer for each statement.)

|   | Strongly Disagree        | Disagree                 | Agree                    | Strongly Agree           |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| I enjoyed this class.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| This class was easy to understand.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| There were enough materials to complete the activity(ies).        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The instructor(s) gave us enough support to do the activity(ies). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Do you have any suggestions about how to improve the class?

**Thank You**

# Rockman et al

Independent · Insightful · Informative

**Parents, please help your kids fill out this survey.  
Return this survey to your teacher and get a prize!**

1. Which language does your family speak **the most**?  
(*Check one.*)

- Spanish
- English
- Both English and Spanish
- Other: \_\_\_\_\_

2. What **grade** are you in? \_\_\_\_\_

3. **Who** did the activity? (*Check all that apply*)

- Me
- My mom and/or dad
- My brothers and/or sisters
- Other family members (e.g., aunts, cousins, grandparents, etc.)

4. **How many people** did the activity? \_\_\_\_\_

5. How much did you **like doing the activity**?

- Not at all
- A little
- Some
- A lot

6. Did you have **any trouble** doing the activity?

- Yes
- No

7. If you had trouble **why did you have trouble**?  
(*Check all that apply.*)

- I didn't understand what I was supposed to do.
- I didn't have the things I needed to do the activity (e.g., baking soda, crayons)
- Another reason—**please explain:**

8. How much do you think you **learned about Math** from doing the activity?

- Nothing
- A little
- Some
- A lot

9. If you learned something about **Mathematics**, what did you **learn**? (*Check all that apply.*)

- What factors are
- What multiples are
- How to recognize patterns
- How to identify symmetrical objects
- How to use a number chart to multiply
- That I can do math activities at home
- That I like math
- That it is fun to do math with my family
- Something else—**please explain:**

10. How much do you think you **learned about Science** from doing the activity?

- Nothing
- A little
- Some
- A lot

11. If you learned something about **Science**, what did you **learn**?

12. Would you **do another Mateo y Cientina activity**?

- Yes
- No
- Maybe

13. **In the future**, in which of the following languages would you like to see this comic?  
(*Check all that apply.*)

- Spanish
- English
- Other: \_\_\_\_\_

14. Would you **visit the Mateo y Cientina website**?

- Yes
- No
- Maybe

15. Would you be interested in **going to a Math or Science class with your family**?

- Yes
- No
- Maybe

# Rockman et al

Independent · Insightful · Informative

**Parents, please help your kids fill out this survey.  
Return this survey to your teacher and get a prize!**

1. Which language does your family speak **the most**?  
(*Check one.*)

- Spanish
- English
- Other: \_\_\_\_\_

2. What **grade** are you in? \_\_\_\_\_

3. **Who** did the activity? (*check all that apply*)

- Me
- My mom and/or dad
- My brothers and/or sisters
- Other family members (e.g., aunts, cousins, grandparents, etc.)

4. **How many people** did the activity? \_\_\_\_\_

5. How much did you **like doing the activity**?

- Not at all
- A little
- Some
- A lot

6. Did you have **any trouble** doing the activity?

- Yes
- No

7. If you had trouble **why did you have trouble**?

(*Check all that apply.*)

- I didn't understand what I was supposed to do.
- I didn't have the things I needed to do the activity  
(e.g., baking soda, crayons)
- Another reason—**please explain:**

8. How much do you think you **learned about Science** from doing the activity?

- Nothing
- A little
- Some
- A lot

9. If you learned something about **Science**, what did you **learn**? (*Check all that apply.*)

- How to do observations
- The scientific process
- How to do a science experiment
- That I can do science experiments at home
- That I like science
- That it is fun to do science with my family
- Something else—**please explain:**

10. How much do you think you **learned about Math** from doing the activity?

- Nothing
- A little
- Some
- A lot

11. If you learned something about **Mathematics**, what did you **learn**?

12. Would you **do another Mateo y Cientina activity**?

- Yes
- No
- Maybe

13. In the future, in which of the following languages would you like to see this comic? (*Check all that apply.*)

- Spanish
- English
- Other: \_\_\_\_\_

14. Would you **visit the Mateo y Cientina website**?

- Yes
- No
- Maybe

15. Would you be interested in **going to a Math or Science class with your family**?

- Yes
- No
- Maybe

## Festival Survey

|  |  |
|--|--|
| <b>Name (optional):</b>  | Number of <b>children attending</b> today's festival with you:<br>_____  |
| <b>Email (optional):</b>   | <b>Ages</b> of these children: _____   |
| <b>Zip code</b> where you live:  | Primary <b>language</b> you <i><b>speak</b></i> at home:<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____    |
| <b>Age:</b> <input type="checkbox"/> 18-24 <input type="checkbox"/> 25-29 <input type="checkbox"/> 30-34<br><input type="checkbox"/> 35-41 <input type="checkbox"/> 42-50 <input type="checkbox"/> Over 50 | <b>Language</b> in which you prefer to <i><b>read</b></i> :<br><input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other: _____ |
| <b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female   |  |

1. How do you get most of your information?

- Radio
- T.V.
- Newspapers
- Internet

2. How did you hear about this festival?

- Through another festival that I attended
- Newspaper—*Which newspaper?* \_\_\_\_\_
- Through listserv/newsgroup—*Which listserv/newsgroup?* \_\_\_\_\_
- Word of mouth
- A poster in your neighborhood
- On the radio
- Web site—*Which Web site?* \_\_\_\_\_
- Other—please specify: \_\_\_\_\_

3. How much did you **learn** from today's *Mateo y Cientina* activity(ies)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Nothing                  | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. How much did you **like** today's *Mateo y Cientina* activity(ies)?

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Not at all               | A little                 | Some                     | A lot                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. Based on today's event, will you: (Check 1 answer for each statement.)

***Please turn over to complete page 2***

|  | Yes                      | No                       | Maybe                    |
|--|--------------------------|--------------------------|--------------------------|
| Look for <i>Mateo y Cientina</i> comics in the newspaper?                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Do <i>Mateo y Cientina</i> activities at home with other family members? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Look at the <i>Mateo y Cientina</i> Web site?                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Attend a math or science classes for families?                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. Do you have any suggestions about how to **improve** the *Mateo y Cientina* activity(ies) for families?

7. Is there **anything else** you would like to share?

***Thank you***

## Spanish Media Project Instructor Interview Protocol

| <b>Background Info</b>                 |  |
|--|--|
| <b>Interviewer:</b>                    | <b>Date:</b>   |
| <b>Respondent Name:</b>                | <b>Partner contact:</b> <input type="checkbox"/> LHS <input type="checkbox"/> Houston <input type="checkbox"/> Miami |
| <b>Length of time as class leader:</b> |  |
| <b>Time of Interview:</b>              | <b>Duration of Interview:</b>  |
| <b>General Comments:</b>               |  |

### **Respondent Background**

---

1. Besides class leader, have you played any other role in the Spanish Media Project?
2. How did you first become involved?
3. How has your involvement changed, if at all?

### **Project Involvement**

---

1. What were your primary goals during your involvement in the Spanish Media Project?
  - a. How well did the project meet your intended goals?
2. What type of training did you receive for Spanish Media?
  - a. How many trainings have you attended?
  - b. When was the last training you attended?
  - c. How well did the trainings prepare you for your role as class leader?
  - d. Do you have any recommendations on how to improve the trainings?
3. In terms of activities you implemented (i.e., in classes and/or in other venues such as festivals):
  - a. How did LHS/Children's Museum of Houston/Miami Science Museum prepare and support you for implementing activities?
  - b. Which activities appeared more successful? Less successful?
  - c. What would you do differently in the future, if anything?
4. Where you involved in recruiting participants for classes? If yes, how did you recruit participants? Were any particular recruitment strategies more successful than others?
5. How would you describe the families who attended your classes?
6. What were the greatest achievements/ successes of your involvement with the project?
7. What challenges did you face in participating in the project? How did you deal with these challenges?
8. In what ways, if any, did you promote the *Mateo y Cientina* cartoon?
9. Please describe how you used the *Mateo Y Cientina* cartoon in your classes.

- a. For example, were the cartoons the central focus of the class or were they handed out at the end of class for participants to bring home?

### **Interactions with LHS [or Houston or Miami]**

---

1. What was most beneficial in your interactions with LHS/Children's Museum of Houston/Miami Science Museum?
2. What were the biggest challenges in your interactions with LHS/Children's Museum of Houston/Miami Science Museum? What would you like to see them do differently?
3. What supports would have enhanced or extended your ability to implement Spanish Media Project activities?

### **Other**

---

1. Is there anything else you'd like to comment on that we haven't asked you about?



# Appendix C: Observation Protocol

**SPANISH MEDIA CLASS TRAINING OBSERVATION PROTOCOL**

|   |                    |
|---|--------------------|
| <b>Sketch/Description of Setting:</b>   |                    |
| <b>Date:</b>  | <b>Location:</b>   |
| <b>Duration of visit:</b>   | <b>Instructor:</b> |
| <b># of participants present:<br/>(breakdown of Museum staff of participants from partner organization)</b> | <b>Observer:</b>   |
| <b>Resources used:</b>  |                    |
| <b>Activity 2</b>   |                    |
| <b>Resources used:</b>  |                    |
| <b>Activity 3</b>   |                    |
| <b>Resources used:</b>  |                    |
| <b>Activity 4</b>   |                    |
| <b>Resources used:</b>  |                    |

| <b>Activity #</b>   |   |   |   |   | <b>C o m m e n t s</b> |
|---|---|---|---|---|------------------------|
| <b>Amount of time:</b>  |   |   |   |   |                        |
| <b>Collaboration</b>  |   |   |   |   |                        |
| ① Activity involved participants working in teams and/or across teams to collaborate. | ① | ① | ① | ① |                        |
| ② Participants working alone  | ② | ② | ② | ② |                        |
| ③ Activity involved whole group presentation, no collaboration.                       | ③ | ③ | ③ | ③ |                        |

|  |             |             |             |             |  |
|--|-------------|-------------|-------------|-------------|--|
| <p><b>Clear goals &amp; aligned activities</b></p> <p>① Goals clearly stated and activity clearly related to goal</p> <p>② Goals stated, activity only somewhat or not at all related</p> <p>③ Goals not stated, purpose of activity unclear</p>   | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |
| <p><b>Engagement</b></p> <p>① Participants mostly engaged</p> <p>② Participants somewhat engaged</p> <p>③ Participants not very engaged</p>  | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |
| <p><b>Classroom Adaptation</b></p> <p>① Activities/resources are modeled for classroom use and opportunities to practice is provided</p> <p>② Activities/resources are modeled for classroom use but there is no opportunity to practice</p> <p>③ Activities/resources are not modeled for classroom use</p> | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |
| <p><b>Instructor feedback on quality of participant work</b></p> <p>① Specific feedback that enhances participants' understanding of some aspect of science/math.</p> <p>② Specific feedback about following proper procedures, but no deeper explanation about why.</p> <p>③ General feedback only.</p>     | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |
| <p><b>Reflection</b></p> <p>① Many opportunities for reflection on learning and how to apply learning</p> <p>② Few opportunities for reflection on learning and how to apply learning</p> <p>③ No opportunities for reflection on learning</p>   | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |
| <p><b>Logistics</b></p> <p>① The arrangement for the activity is conducive to learning</p> <p>② The arrangement for the activity is somewhat conducive to learning</p> <p>③ The arrangement for the activity is not conducive to learning</p>  | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ | ①<br>②<br>③ |  |

|   |                  |                  |                  |                  |  |
|---|------------------|------------------|------------------|------------------|--|
| <b>Math/Science Opportunities for Learning</b><br><i>Activity provided:</i><br>① Math/Science vocabulary development<br>② Math/Science procedural knowledge<br>③ Math/Science conceptual knowledge<br>④ Real-world applications | ①<br>②<br>③<br>④ | ①<br>②<br>③<br>④ | ①<br>②<br>③<br>④ | ①<br>②<br>③<br>④ |  |
| <b>Focus of Instruction</b><br>① Mechanics<br>② Pedagogical content<br>③ Science Content  | ①<br>②<br>③      | ①<br>②<br>③      | ①<br>②<br>③      | ①<br>②<br>③      |  |

### **Descriptive Summary**

Please give a one-paragraph descriptive summary of the observation, including:

- Date, facilitator, presenters, activities in general
- Description of our evaluation activities (who attended, what you did)

### **General Impressions**

Please include comments on how clearly the goals of the activities were presented, what expectations were communicated, how much support was provided, and the level of engagement and success of the activities (i.e., how much did participants appear to be engaged in and learning from activities)?

### **Questions for Facilitators** (5 min interview post training activities)

*Questions can be adapted to fit context.*

How many training sessions similar to this one have you led for Spanish Media?

How was this training similar or different from previous trainings you have led?

Do you think the participants are now well equipped to lead Spanish Media Classes? If not, what extra training do you think they would need?

What are the two most important things/lessons/new information you want participants to take away from today's training?

## Appendix D: Interview Guides

Family Interview Guide

Partner Interview Guide

Partner Interview Protocol

## Spanish Language Media Project

### Family Interview Guide

\*\*\*\*\*

*We've been coming to the Breakfast Club for quite some time now and we're interested in learning more about families like yours and about your experience doing Math and Science with us. First, before we get started, can you please read and sign this consent form. Thank you. Also, I have a recorder here that I'm going to turn on so that I can go back and listen if I can't take notes fast enough.*

*Ok, before we get started I want you know that anything you share here is confidential and no names or identifying information will be shared with anyone. This next 20 minutes should feel like a conversation – the more you share with us, the richer the story about this project will be. Ok, let's get started. We'll start by talking a little bit about your family and then I'll turn to your experience with the Math and Science Workshops.*

#### **Background**

---

1. First, tell me about your family. *(Note: ask one family and then the other family)*
  - a. What city do you live in?
  - b. How many people live with you?
  - c. Of those people, how many are adults and how many are children?
  - d. What languages do you speak at home? Which language would you say is dominant?
  - e. What types of things do you normally do together for fun as a family?

#### **Experience with the Classes**

---

2. Around how many Math and Science class series have you participated in at the Breakfast Club?
3. *(If more than one)* What motivates you to want to keep coming back?  
*(Note: this is an important question so if you don't get a full response, see probes below)*
  - a. What do you and your child(ren) like most about the workshops?
4. Who do you typically come with?
5. How has your confidence level in Math and Science changed, if at all, as a result of coming to this workshop series?
  - a. How comfortable did you used to feel about Math and Science? And how comfortable do you feel about Math and Science now?
  - b. What additional Math and Science resources would make you even more comfortable?
6. In what ways, if any, has attending these classes prepared you to help your kids with Math or Science?

- a. Can you give an example of a time when you've helped your child with his/her Math or Science homework?
  - b. What other resources would help you work with your child(ren) on Math and Science?
7. In what ways, if any, has attending these classes helped you make Math and Science a part of everyday? For example, perhaps you talk about Math when you're measuring food in the kitchen or buying groceries. Perhaps you stop to talk about ants when you cross an anthill on a walk).
- a. In what ways, if any, has your child(ren)'s interest in Math and Science changed since you started coming to the classes?
8. How has this class series changed your understanding, if at all, of how Science and Math is taught and learned? For example, have you ever taken a class like this? How is this class different?
- a. What do you like about this class that you didn't like about previous Math and Science classes?

### **Experience with Mateo Y Cientina**

---

9. What do you think works well about using the cartoon *Mateo Y Cientina* to help teach Math and Science?
10. Do you typically take a cartoon home with you?
11. Have you have done one of the cartoon activities at home?
12. If so, which one(s)?
- a. Tell me in as much detail as you can about the time that you did [insert name of cartoon activity] at home. Who did you do the activity with? What materials did you use? Where did you find them? How long did it take?
13. Have you ever come across one or more of the Mateo Y Cientina cartoons in the paper?
14. If so, were you looking for it at the time or did you come across it while reading the rest of the paper?
15. If not, did you know that 30 of the cartoons appeared in two Spanish language newspapers in the Bay area?
- a. Do you read a Spanish-language newspaper?
  - b. Which newspaper(s) do you read?
  - c. If so, how often?
  - d. What sections are you most interested in?
16. Other than the newspaper, have you seen the cartoons somewhere else outside of class?
- a. Have you ever tried to visit the Mateo Y Cientina website?
  - b. If yes, what is up and running when you went there? What did you expect/want to find on the site?
  - c. If no, did you know that the creators of the cartoon made a website where you can find all the cartoon activities?

*Thank you so much for taking the time to talk with me today. We really appreciate getting an opportunity to learn more about you and your experience at the Breakfast Club. Do you have any questions for me?*



## Spanish Media Project

### Partner Interview Guide

\*\*\*\*\*

#### Respondent Background

---

1. What role did you play in the Spanish Media Project?
2. How did you first become involved?
3. How has your involvement changed, if at all?

#### Project Involvement

---

1. Did you have to gain support for overall project involvement within the museum? If so, how did you gain support?
2. What were the primary goals for you're the museum's involvement in the Spanish Media Project?
3. How well did the project meet your intended goals/the intended goals of the museum?
4. How did you incorporate Spanish Media Project activities into your regular activities, if at all?  
Has the museum ever sponsored family Math and Science classes before? If so, what capacity?
5. How did the museum's involvement change over time, if at all?  
Were there activities that you stopped doing? Adapted? Added?
6. What do you think was the most successful part of the project? Less successful?  
What were the greatest achievements/ successes of your involvement with the project?
7. What would you do differently regarding implementation in the future, if anything?

8. Approximately how many people have you reached...
  - a. Classes?
  - b. Partnerships with newspapers?
  - c. Other activities?
  
9. What challenges did you face in participating in the project? How did you deal with these challenges?

Let's talk about the classes for a second. You mentioned in a previous conversation that the classes would have benefited from two instructors, one lead instructor, and another support instructor to circulate the room and assist with materials. Is there anything you'd like to add to that?

10. How do you think the classes benefited participants?
  - a. How did you recruit participants? Were any particular recruitment strategies more successful than others?
11. What about the newspapers? Do you know at all who was reading the cartoons or whether they were well received?

## **Project Sustainability**

---

1. How likely are you to continue project activities in the future? Why?
2. What, if anything, do you have in place to sustain project activities in the future (e.g., funding, donations, volunteers, etc.)?

## **Interactions with LHS [or Houston or Miami]**

---

1. How did LHS prepare and support you for implementing activities? Is there additional support that you would have liked?
2. What was most beneficial in your interactions with LHS?
3. Did you ever interact with Miami?
4. What supports would have enhanced or extended your ability to implement Spanish Media Project activities?

## **Other**

---

1. Is there anything else you'd like to comment on that we haven't asked you about?

**SPANISH MEDIA PROJECT  
PARTNER INTERVIEW PROTOCOL**

| <b>Background Info</b>    |  |
|---------------------------|--|
| <b>Interviewer:</b>       | <b>Date:</b>   |
| <b>Respondent Name:</b>   | <b>Partner contact:</b> <input type="checkbox"/> LHS <input type="checkbox"/> Houston <input type="checkbox"/> Miami |
| <b>Role/Position:</b>     |  |
| <b>Organization:</b>      |  |
| <b>Time of Interview:</b> | <b>Duration of Interview:</b>  |
| <b>General Comments:</b>  |  |

### **Respondent Background**

---

1. What role did you play in the Spanish Media Project?
2. How did you first become involved?
3. How has your involvement changed, if at all?

### **Project Involvement**

---

1. Did you have to gain support for overall project involvement within the museum? If so, how did you gain support?
2. What were the primary goals for you're the museum's involvement in the Spanish Media Project?
3. How well did the project meet your intended goals/the intended goals of the museum?
4. How did you incorporate Spanish Media Project activities into your regular activities, if at all?  
Has the museum ever sponsored family Math and Science classes before? If so, what capacity?
5. How did the museum's involvement change over time, if at all?  
Were there activities that you stopped doing? Adapted? Added?
6. What do you think was the most successful part of the project? Less successful? What were the greatest achievements/ successes of your involvement with the project?
7. What would you do differently regarding implementation in the future, if anything?
8. Approximately how many people have you reached...
  - a. Classes?
  - b. Partnerships with newspapers?
  - c. Other activities?
9. What challenges did you face in participating in the project? How did you deal with these challenges?

Let's talk about the classes for a second. You mentioned in a previous conversation that the classes would have benefited from two instructors, one lead instructor, and another support instructor to circulate the room and assist with materials. Is there anything you'd like to add to that?

10. How do you think the classes benefited participants?
  - a. How did you recruit participants? Were any particular recruitment strategies more successful than others?
11. What about the newspapers? Do you know at all who was reading the cartoons or whether they were well received?

### **Project Sustainability**

---

1. How likely are you to continue project activities in the future? Why?
2. What, if anything, do you have in place to sustain project activities in the future (e.g., funding, donations, volunteers, etc.)?

### **Interactions with LHS [or Houston or Miami]**

---

1. How did LHS prepare and support you for implementing activities? Is there additional support that you would have liked?
2. What was most beneficial in your interactions with LHS?
3. Did you ever interact with Miami?
4. What supports would have enhanced or extended your ability to implement Spanish Media Project activities?

### **Other**

---

1. Is there anything else you'd like to comment on that we haven't asked you about?

## Appendix E: Survey Data Results

## All Survey Data

### Number and Type of Surveys Collected

|                 | <i>Locations</i> | <i>Number of respondents</i> | <i>Number of Math cartoons</i> | <i>Number of Science cartoons</i> | <i>Percent Spanish speaking</i> |
|-----------------|------------------|------------------------------|--------------------------------|-----------------------------------|---------------------------------|
| <b>Events</b>   | Bay Area         | 57                           | Unknown                        |                                   | 67%                             |
| <b>Classes</b>  |                  | 191                          | 145                            | 46                                | 71%                             |
|                 | Bay Area         | 156                          | 130                            | 26                                | 80%                             |
|                 | Miami            | 30                           | 10                             | 20                                | 20%                             |
|                 | Houston          | 5                            | 5                              | 0                                 | 80%                             |
| <b>Students</b> |                  | 404                          | 159                            | 245                               | 78%                             |
|                 | Bay Area         | 182                          | 85                             | 97                                | 83%                             |
|                 | Miami            | 164                          | 74                             | 90                                | 78%                             |
|                 | Houston          | 58                           | 0                              | 58                                | 63%                             |

### Age of Respondents

|               | <i>18 to 24</i> | <i>25 to 59</i> | <i>30 to 34</i> | <i>35 to 41</i> | <i>42 to 50</i> | <i>&gt; 50</i> | <i>Totals</i> |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|---------------|
| <b>Class</b>  | 6<br>(3.4%)     | 29<br>(16.3%)   | 53<br>(29.8%)   | 55<br>(30.9%)   | 33<br>(18.5%)   | 2<br>(1.1%)    | 178<br>(100%) |
| <b>Event</b>  | 1<br>(5.9%)     | 2<br>(11.8%)    | 3<br>(17.6%)    | 7<br>(41.2%)    | 3<br>(17.6%)    | 1<br>(5.9%)    | 17<br>(100%)  |
| <b>Totals</b> | 7<br>(3.5%)     | 31<br>(15.9%)   | 56<br>(28.7%)   | 62<br>(31.8%)   | 36<br>(18.5%)   | 3<br>(1.5%)    | 195<br>(100%) |

**What is your gender?**

|               | <i>Male</i>   | <i>Female</i>  |               |
|---------------|---------------|----------------|---------------|
| <b>Class</b>  | 31<br>(18.5%) | 137<br>(81.5%) | 168<br>(100%) |
| <b>Event</b>  | 6<br>(37.5%)  | 10<br>(62.5%)  | 16<br>(100%)  |
| <b>Totals</b> | 37<br>(20.1%) | 147<br>(79.9%) | 184<br>(100%) |

**How many children came with you to the event?**

|               | <i># of responses</i> | <i>One child</i> | <i>Two children</i> | <i>Three children</i> | <i>Four children</i> | <i>Five or more children</i> | <i>Total # of children</i> | <i>Mean # of children</i> | <i>SD</i> |
|---------------|-----------------------|------------------|---------------------|-----------------------|----------------------|------------------------------|----------------------------|---------------------------|-----------|
| <b>Class</b>  | 180                   | 48<br>(26.7%)    | 70<br>(38.9%)       | 42<br>(23.3%)         | 18<br>(10.0%)        | 2<br>(1.1%)                  | 317                        | 2.20                      | .98       |
| <b>Event</b>  | 18                    | 6<br>(33.3%)     | 9<br>(50.0%)        | 1<br>(5.6%)           | 2<br>(11.1%)         | 0<br>(0%)                    | 35                         | 1.94                      | .94       |
| <b>Totals</b> | 198                   | 54<br>(27.2%)    | 79<br>(39.9%)       | 43<br>(21.7%)         | 20<br>(10.1%)        | 2<br>(1.0%)                  | 352                        |                           |           |

**How many children are living with you in your house? (Festival, original version only)**

|                          | <i>Frequency</i> | <i>Mean # of children</i> | <i>SD</i> |
|--------------------------|------------------|---------------------------|-----------|
|                          |                  | 2.15                      | .91       |
| <b>One</b>               | 8<br>(24.2%)     |                           |           |
| <b>Two</b>               | 25<br>(45.5%)    |                           |           |
| <b>Three</b>             | 7<br>(21.2%)     |                           |           |
| <b>Four</b>              | 3<br>(9.1%)      |                           |           |
| <b>Total respondents</b> | 33               |                           |           |

## Languages Used

|              | <i>Language Completed survey</i> |                |       | <i>Primary Language in house</i> |                |          | <i>Preferred language: reading</i> |                |           |
|--------------|----------------------------------|----------------|-------|----------------------------------|----------------|----------|------------------------------------|----------------|-----------|
|              | English                          | Spanish        | Other | English                          | Spanish        | Other    | English                            | Spanish        | Other     |
| <b>Class</b> | 50<br>(26.7%)                    | 139<br>(73.3%) | N/A   | 36<br>(20.7%)                    | 135<br>(77.6%) | 3 (1.7%) | 46<br>(27.1%)                      | 122<br>(71.8%) | 2 (1.2%)  |
| <b>Event</b> | 26<br>(45.6%)                    | 31<br>(54.4%)  | N/A   | 17<br>(32.7%)                    | 32<br>(61.5%)  | 3 (5.8%) | 24<br>(50.0%)                      | 24<br>(50.0%)  | 0<br>(0%) |

## How did you receive the majority of your information? (Revised survey only)

|               | <i>Number of responses</i> | <i>Radio</i>  | <i>Television</i> | <i>Newspaper</i> | <i>Internet</i> |
|---------------|----------------------------|---------------|-------------------|------------------|-----------------|
| <b>Class</b>  | 87                         | 26<br>(13.6%) | 53<br>(60.9%)     | 15<br>(17.2%)    | 31<br>(35.6%)   |
| <b>Event</b>  | 18                         | 6<br>(33.3%)  | 13<br>(22.8%)     | 3<br>(16.7%)     | 2<br>(11.1%)    |
| <b>Totals</b> | 105                        | 32            | 66                | 18               | 33              |

*Note: some respondents chose more than one answer*

## Before today's class, had you seen a Mateo y Cientina comic in the newspaper? (original survey only)

|               | <i>Number of responses</i> | <i>Yes</i>    | <i>No</i>      |
|---------------|----------------------------|---------------|----------------|
| <b>Class</b>  | 82                         | 11<br>(13.4%) | 70<br>(85.4%)  |
| <b>Event</b>  | 38                         | 6<br>(15.8%)  | 32<br>(84.2%)  |
| <b>Totals</b> | 120                        | 17<br>(14.2%) | 102<br>(85.0%) |



**How did you hear about the event/class?**

|                       | <i>Class</i>  | <i>Event</i>  |
|-----------------------|---------------|---------------|
| <b>Other Festival</b> | n/a           | 9<br>(39.1%)  |
| <b>Newspaper</b>      | 7<br>(3.8%)   | 5<br>(8.8%)   |
| <b>Listserv</b>       | 0<br>(0%)     | 1<br>(1.8%)   |
| <b>Word of mouth</b>  | 46<br>(25.5%) | 16<br>(28.1%) |
| <b>Flyer</b>          | 12<br>(6.5%)  | 5<br>(8.8%)   |
| <b>Website</b>        | 7<br>(6.8%)   | 3<br>(5.3%)   |
| <b>School</b>         | 64<br>(35.0%) | 1<br>(1.8%)   |
| <b>Library</b>        | 15<br>(8.2%)  | 0<br>(0%)     |
| <b>Another source</b> | 25<br>(13.6%) | 14<br>(24.6%) |

**How much did you like doing the activity? (Student, Class and Event data)**

|                      |     | <i>Not at all</i> | <i>A little</i> | <i>Some</i> | <i>A lot</i> | <i>Mean</i> | <i>SD</i> |
|----------------------|-----|-------------------|-----------------|-------------|--------------|-------------|-----------|
| <b>Total Class</b>   | 168 | 2%                |                 | 98%         |              | 3.83        | .46       |
| <b>Math</b>          | 126 | 1%                | 2%              | 10%         | 87%          |             |           |
| <b>Science</b>       | 42  | 0%                | 2%              | 14%         | 87%          |             |           |
| <b>Total Event</b>   | 17  | 24%               |                 | 76%         |              | 3.29        | .85       |
| <b>Total Student</b> | 399 | 22%               |                 | 79%         |              | 3.26        | .95       |
| <b>Math</b>          | 157 | 5%                | 16%             | 24%         | 54%          |             |           |
| <b>Science</b>       | 242 | 6%                | 16%             | 23%         | 54%          |             |           |

**How much did you learn by doing the activity? (Student, Class and Event data)**

|                      |     | <i>Nothing</i> | <i>A little</i> | <i>Some</i> | <i>A lot</i> | <i>Mean</i> | <i>SD</i> |
|----------------------|-----|----------------|-----------------|-------------|--------------|-------------|-----------|
| <b>Total Class</b>   | 160 | 6%             |                 | 94%         |              | 3.60        | .62       |
| <b>Math</b>          | 124 | 0%             | 7%              | 23%         | 70%          |             |           |
| <b>Science</b>       | 36  | 0%             | 3%              | 39%         | 58%          |             |           |
| <b>Total Event</b>   | 17  | 65%            |                 | 35%         |              | 2.47        | .72       |
| <b>Total Student</b> | 398 | 20%            |                 | 80%         |              | 3.56        | 1.52      |
| <b>Math</b>          | 158 | 10%            | 15%             | 30%         | 46%          |             |           |
| <b>Science</b>       | 240 | 3%             | 14%             | 31%         | 53%          |             |           |

Based on today's class, will you:

|  | Type of respondent     | Number of responses | Mean | SD  | Yes (1) | Maybe (2) | No (0) |
|--|------------------------|---------------------|------|-----|---------|-----------|--------|
| <b>Look for Mateo y Cientina comics in the newspaper?</b>                | Class                  | 143                 | 1.11 | .56 | 68%     | 22%       | 11%    |
|  | Event                  | 55                  | 1.09 | .62 | 62%     | 24%       | 15%    |
|  | Student                | n/a                 |      |     |         |           |        |
|  | Total: All respondents | 198                 |      |     | 88%     |           | 12%    |
| <b>Do Mateo y Cientina activities at home with other family members?</b> | Class                  | 141                 | 1.01 | .49 | 77%     | 12%       | 11%    |
|  | Event                  | 53                  | 1.17 | .58 | 64%     | 26%       | 9%     |
|  | Student                | 399                 | 1.29 | .69 | 84%     | 14%       | 2%     |
|  | Total: All respondents | 593                 |      |     | 95%     |           | 5%     |
| <b>Look at the Mateo y Cientina Web site?</b>                            | Class                  | 133                 | 1.00 | .60 | 64%     | 18%       | 18%    |
|  | Event                  | 54                  | 1.06 | .69 | 54%     | 26%       | 20%    |
|  | Student                | 396                 | 1.40 | .77 | 71%     | 16%       | 5%     |
|  | Total: All respondents | 583                 |      |     | 81%     |           | 9%     |
| <b>Attend other math or science classes for families?</b>                | Class                  | 145                 | 1.04 | .37 | 86%     | 9%        | 5%     |
|  | Event                  | 53                  | 1.02 | .42 | 83%     | 9%        | 8%     |
|  | Student                | 400                 | 1.42 | .78 | 76%     | 16%       | 7%     |
|  | Total: All respondents | 598                 |      |     | 93%     |           | 7%     |
| <b>Spend more time doing math or science with your child(ren)?</b>       | Class                  | 150                 | 1.01 | .12 | 99%     | 1%        | 0      |
|  | Event                  | n/a                 |      |     |         |           |        |
|  | Student                | n/a                 |      |     |         |           |        |
| <b>Recommend this class to others?</b>                                   | Class                  | 148                 | 1.01 | .12 | 99%     | 1%        | 0      |
|  | Event                  | n/a                 |      |     |         |           |        |
|  | Student                | n/a                 |      |     |         |           |        |

**Student respondents: Would you do another Mateo y Cientina Activity?**

|                                      | <i>Yes</i> | <i>No</i> | <i>Maybe</i> | <i>Sig.</i> |
|--------------------------------------|------------|-----------|--------------|-------------|
| <b>Total (n=399)</b>                 | 84%        | 2%        | 14%          |             |
| <b>Math (n=155)</b>                  | 90%        | 2%        | 8%           | p<.05       |
| <b>Science (n=242)</b>               | 80%        | 2%        | 17%          |             |
| <b>Grade 3 (n=124)</b>               | 82%        | 2%        | 15%          | n.s.        |
| <b>Grade 4 (n=155)</b>               | 82%        | 3%        | 16%          |             |
| <b>Grade 5 (n=118)</b>               | 88%        | 3%        | 9%           |             |
| <b>California (n=180)</b>            | 83%        | 4%        | 13%          | n.s.        |
| <b>Texas (n=57)</b>                  | 63%        | 4%        | 32%          |             |
| <b>Florida (n=162)</b>               | 92%        | 0%        | 8%           |             |
| <b>Home language Spanish (n=308)</b> | 85%        | 2%        | 13%          | n.s.        |
| <b>Home language English (n=74)</b>  | 84%        | 3%        | 14%          |             |

n.s = not significant; n/a = no statistical analyses conducted due to low sample size

**Student respondents: Would you visit the Mateo y Cientina website?**

| <i>Number of Responses</i> |     | <i>Yes</i>  |                | <i>No</i>   |                | <i>Maybe</i> |                |
|----------------------------|-----|-------------|----------------|-------------|----------------|--------------|----------------|
|                            |     | <i>Math</i> | <i>Science</i> | <i>Math</i> | <i>Science</i> | <i>Math</i>  | <i>Science</i> |
| <b>Total</b>               |     | 81%         | 75%            | 5%          | 6%             | 19%          | 19%            |
| <b>Grade 3</b>             | 126 | 84%         | 68%            | 4%          | 9%             | 7%           | 23%            |
| <b>Grade 4</b>             | 153 | 85%         | 82%            | 5%          | 5%             | 10%          | 13%            |
| <b>Grade 5</b>             | 116 | 71%         | 4%             | 4%          | 4%             | 24%          | 21%            |

**Student respondents: Would you be interested in going to a Math or Science class with your family?**

|  | <b>Yes</b> | <b>No</b> | <b>Maybe</b> |
|--|------------|-----------|--------------|
| <b>Total (n=400)</b>                                 | 76%        | 7%        | 16%          |
| <b>Math (n=157)</b>                                  | 80%        | 6%        | 15%          |
| <b>Science (n=243)</b>                               | 73%        | 7%        | 20%          |
| <b>Grade 3 (n=127)</b>                               | 78%        | 8%        | 14%          |
| <b>Grade 4 (n=156)</b>                               | 77%        | 4%        | 19%          |
| <b>Grade 5 (n=116)</b>                               | 72%        | 9%        | 19%          |
| <b>California (n=180)</b>                            | 76%        | 7%        | 17%          |
| <b>Texas (n=57)</b>                                  | 54%        | 12%       | 33%          |
| <b>Florida (n=163)</b>                               | 83%        | 4%        | 13%          |
| <b>Home language Spanish (n=307)</b>                 | 78%        | 6%        | 16%          |
| <b>Home language English (n=76)</b>                  | 68%        | 8%        | 24%          |
| <b>Home language both English and Spanish (n=13)</b> | 62%        | 15%       | 23%          |

Please tell us how much you agree or disagree with each statement about today's class:  
(class surveys only)

|   | Type of respondent | Number of responses | Mean | SD  | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) |
|---|--------------------|---------------------|------|-----|-----------------------|--------------|-----------|--------------------|
| <b><i>I enjoyed this class.</i></b>   | Total: Class       | 158                 | 3.68 | .60 | 2%                    | 1%           | 23%       | 73%                |
|   | Math               | 120                 | 3.75 | .52 | 1%                    | 2%           | 19%       | 78%                |
|   | Science            | 38                  | 3.47 | .76 | 5%                    | 0%           | 37%       | 58%                |
|   |                    |                     |      |     |                       | 3%           |           | 97%                |
| <b><i>This class was easy to understand.</i></b>                                | Total: Class       | 151                 | 3.60 | .68 | 3%                    | 3%           | 27%       | 67.5               |
|   | Math               | 113                 | 3.66 | .58 | 1%                    | 3%           | 26%       | 71%                |
|   | Science            | 38                  | 3.39 | .89 | 8%                    | 3%           | 32%       | 58%                |
|   |                    |                     |      |     |                       | 5%           |           | 95%                |
| <b><i>There were enough materials to complete the activity(ies).*</i></b>       | Total: Class       | 83                  | 3.66 | .72 | 5%                    | 0%           | 19%       | 76%                |
|   | Math               | 55                  | 3.71 | .66 | 4%                    | 0%           | 18%       | 78%                |
|   | Science            | 28                  | 3.57 | .84 | 7%                    | 0%           | 21%       | 71%                |
|   |                    |                     |      |     |                       | 5%           |           | 95%                |
| <b><i>The instructor(s) gave us enough support to do the activity(ies).</i></b> | Total: Class       | 151                 | 3.74 | .56 | 2%                    | 0%           | 20%       | 78%                |
|   | Math               | 114                 | 3.80 | .46 | 1%                    | 0%           | 18%       | 82%                |
|   | Science            | 37                  | 3.57 | .77 | 5%                    | 0%           | 27%       | 68%                |
|   |                    |                     |      |     |                       | 2%           |           | 98%                |

\*Note: Included on original version of survey only.

**What was the best part of today's event? (Festival, original version only)**

***All the hands on activities***  
***Color guessing game***  
***Explanation and doing the activities***  
***Haven't seen everything, but the variety and the fact that it was free***  
***Helicopter [cartoon]***  
***It's free and made my daughter think!***  
***Making rockets for the wind tunnel***  
***Wind resistance activity***  
***That the kids learned and had fun***  
***Mateo y Cientina***

## Suggestions

| <i>Math classes</i>   | <i>Science classes</i>   | <i>Events</i>   |
|---|--|---|
| <p><b><i>More time</i></b></p> <p><b><i>More materials</i></b></p> <p><b><i>Send flyers in the mail so we know when the next meeting is</i></b></p> <p><b><i>Less in Spanish and more in English</i></b></p> <p><b><i>Learn how to support our kids with their homework</i></b></p> <p><b><i>Pay a little more attention to those who don't understand</i></b></p> <p><b><i>Keep bringing more suggestions to the schools</i></b></p> | <p>More time to complete the class</p> <p>Explain in English as well</p> <p>Have lots more [classes]!</p> <p>Some harder games for bigger kids</p> | <p>Continue with the activities</p> <p>Free food?</p> <p>More for parents and students</p> <p>Not on a Sunday, we had to miss church for this event</p> |

## Comments

| <i>Math classes</i>  | <i>Science classes</i>   | <i>Events</i>   |
|--|--|---|
| <p><b><i>Everything was magnificent.</i></b></p> <p><b><i>So easily taught and easy to understand. Very nice teachers.</i></b></p> <p><b><i>All of the classes were great; thank you.</i></b></p> <p><b><i>Everything was good.</i></b></p> <p><b><i>I like that the kids were included for those of us who don't know how to help them in the house.</i></b></p> <p><b><i>This was a good example.</i></b></p> <p><b><i>It was interesting and above all else, I can explain to my kids how to do these activities too.</i></b></p> <p><b><i>Keep giving us these types of classes.</i></b></p> | <p>I hope you continue doing more for parents</p> <p>I would like to learn more</p> <p>Keep up the good work and ideas</p> <p>All of the classes were great. Thank you for everything</p> <p>Very nice program, thank you!</p> <p>It was perfectly good.</p> | <p>I will advise friends to attend</p> <p>The helpers at the tables all did an excellent job</p> <p>This type of event socializes and unifies, thank you</p> <p>I like to play with my daughter</p> <p>Thank you!</p> |