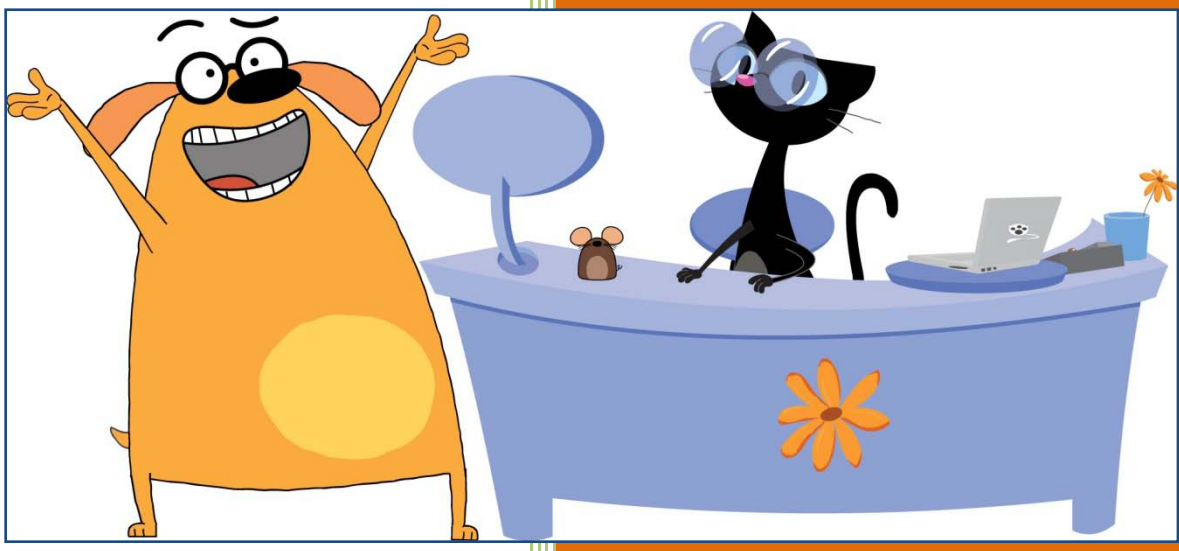
2009

"FETCH!" Online Training Evaluation Report



Prepared by:

Veridian inSight, LLC,

Prepared for:

WGBH-Boston, in support of National Science Foundation Grant # 0813513

Citation

Paulsen, C.A. & Bransfield, C.P. (2009). "FETCH!" Online Training Evaluation Report. In support of NSF Grant Number 0813513. Concord, MA: Veridian inSight, LLC.

Support for this study

This research was performed on behalf of WGBH Boston, with funding from the National Science Foundation (NSF Grant No: 0813513).

Contacts

For questions or more information about the **evaluation study**, please contact:

Christine Andrews Paulsen, Ph.D.
Owner and Principal Scientist
Veridian inSight, LLC
PO Box 694
Concord, MA 01742
978.369.3519
cpaulsen@veridianinsight.com

For questions or more information about **FETCH!**, please contact:

Susan Buckey
Outreach Project Director
WGBH
One Guest Street
Boston, MA 02135
617.300.3958
susan_buckey@wgbh.org

Table of Contents

Study Goals

Veridian inSight, LLC performed an evaluation study in fall of 2009 on behalf of WGBH to evaluate the effectiveness of an online training developed as an outreach component of the *FETCH! with Ruff Ruffman* series (http://pbskids.org/fetch/). The FETCH! Hands-On Science Training was designed for anyone who wants to lead science activities with elementary-age kids (including after-school providers, teachers, camp counselors, librarians, museum staff, parents, and others). Using a combination of text, slideshows, printable handouts, self-evaluations, and a journal to record participants' reflections, the one-hour training aims to help leaders incorporate inquiry strategies into the science activities they lead with kids. The training also strongly encourages participants to practice what they've learned by choosing from a selection of FETCH! activities and leading them with the kids they serve. By comparing their pre- and post-training self-evaluations, participants are able to track their progress and identify areas where they might want to spend more time so as to increase their proficiency in leading science activities.

Figure 1. Home page of the FETCH! training website.

This training was not connected to the existing FETCH! website at the time of the evaluation, but will be after the evaluation study is complete. The training will be shared with afterschool organizations and the general public via targeted e-mails, facebook announcements, listings in partner newsletters, and via other outreach avenues.

The goals of the evaluation study were to assess the extent to which the FETCH! training was successful at:

- Preparing afterschool educators (hereafter referred to as "leaders") for leading hands-on science activities;
- Enhancing leaders' comfort in leading hands-on science activities;
- Helping leaders teach kids about specific science content knowledge and skills (e.g., making predictions, understanding real-world connections); and
- Helping leaders get kids excited and engaged in hands-on science activities.

Study Design

The study design was experimental. We used random assignment in the treatment-control group, pre- and post-test design. The study design is illustrated below:

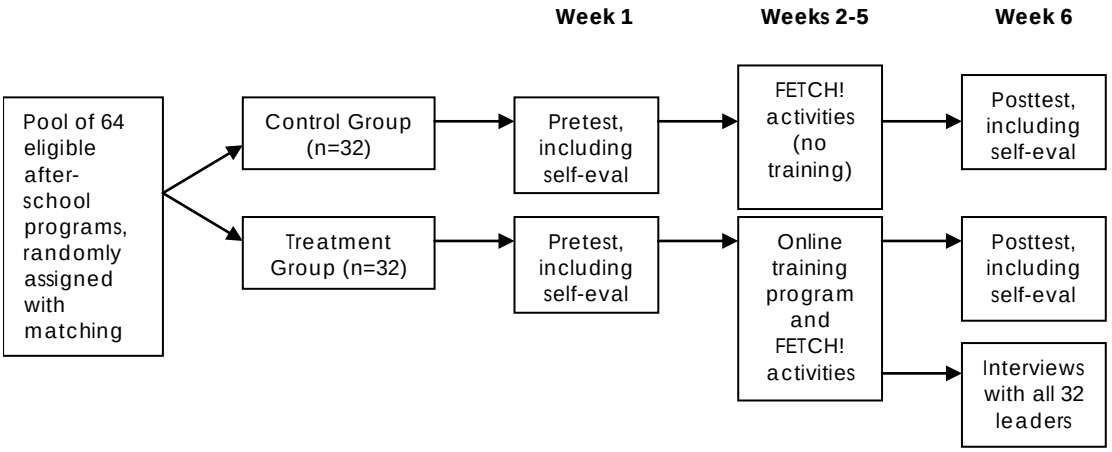


Figure 2. Longitudinal, pre- and post-test, control and treatment group design.

As illustrated in Figure 2, after completing an online pre-test survey, including the self-evaluation tool (Week 1, see Appendix A), leaders in the treatment group participated in the FETCH! training and subsequently led two hands-on FETCH! activities over the course of 1-3 weeks. Meanwhile, leaders in the control group did not participate in the training module; they simply led the same two hands-on FETCH! activities that the treatment group used.

Next, both groups completed a post-test survey, which included the same questions as the pre-test survey (including the self-evaluation tool, see Appendix B). In addition, the post-test survey included an additional section to assess the leaders' satisfaction and experience with the science activities (both treatment and control).

Immediately after completing the pre-test and post-test surveys, we sent treatment group leaders an individualized score report so that they would know which areas to focus on in their training and so they could assess their progress over time (see Appendix C).

Finally, all 32 treatment group leaders participated in an in-depth telephone interview following the completion of their post-test surveys so that we could gather more detailed feedback on their experience with the FETCH! training (Appendix D).

Participants

To recruit participants for the study, WGBH sent notices about the study to national-level contacts at organizations such as the National Afterschool Association, Girl Scouts, and the Boys & Girls Club, and library associations. Programs that were interested in participating in the study were screened for eligibility (Appendix E). Over 250 programs expressed interest in the study.

Programs were selected into the study in order to maximize diversity across geographic regions, urbanicity, aggregate income level of the program participants, and race/ethnicity distribution of the program participants. Figure 3 illustrates the geographic diversity of the sample.

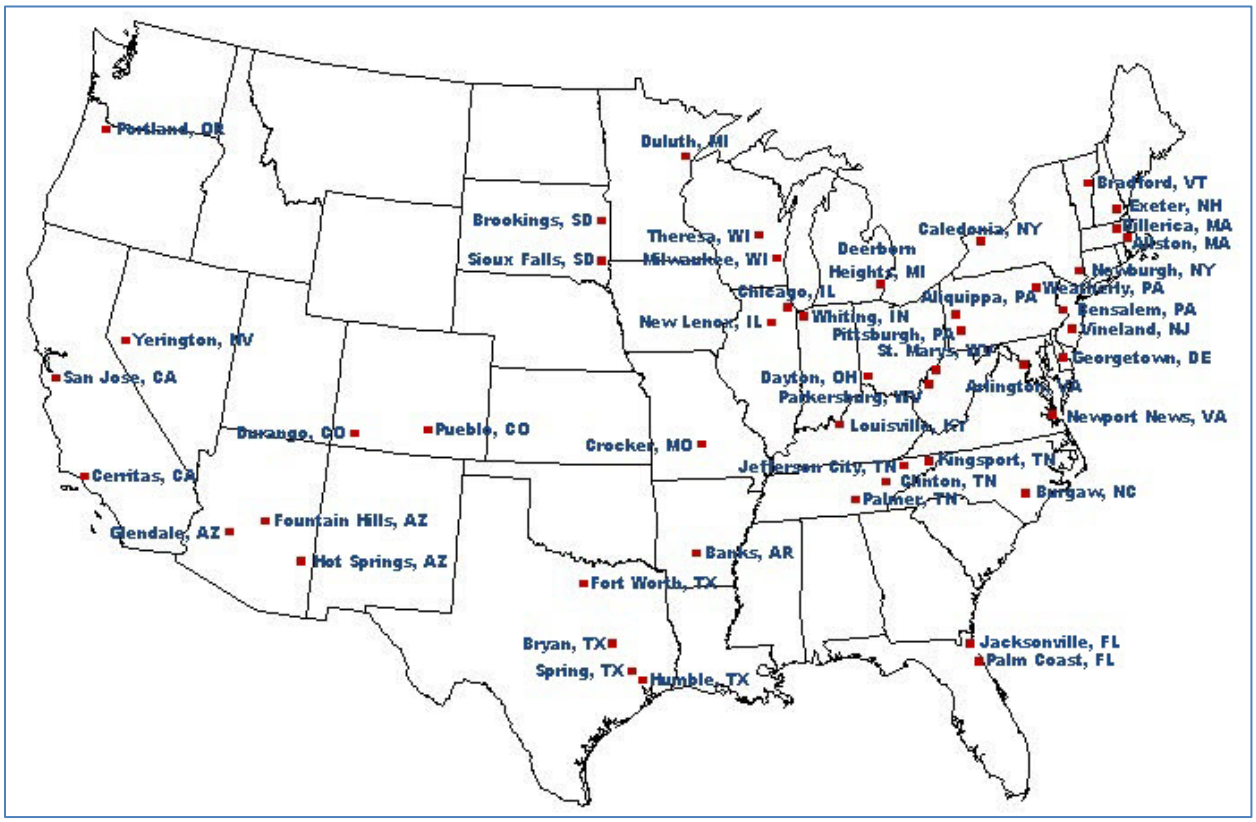


Figure 3. Locations of the 54 programs that participated in the study.

We matched the programs with respect to geographic location, aggregate income level of the program participants, and race/ethnicity distribution of the program participants. This resulted in two pools of programs. From these two pools, programs and their matches were randomly assigned to either the treatment group or the control group. Thirty-two (32) programs were assigned to the control group, while the other 32 programs were assigned to the treatment group.

In some cases, enrolled programs indicated that they did not have time to complete the study. We replaced these programs with another program that had similar characteristics. However, in

the end, there were ten programs that were unable to complete the study so our final sample size was 54 (27 treatment and 27 control group programs).

The program characteristics are summarized in Table 1. The programs served slightly more girls than boys (roughly 60% of the kids served were female in both the treatment and control groups). Eighteen percent of the kids served in the treatment and control groups were of Hispanic, Latino, or Spanish origin. Slightly more than half of the kids served in the programs were White (58%), 17% were Black or African-American, and 6% were Asian, Indian, or Native American. Approximately half of the families (51%) served in the programs were classified as low income by the program leaders, 42% were middle income and only 7% were high income. The highest percentage of programs served urban families (41%), 33% served suburban families, and 26% served rural families. Leaders indicated that most (57%) or some (43%) of the kids in their programs were interested in science.

There were no statistically significant differences between the treatment and control groups with respect to any of these demographic or background characteristics.

Table 1:

Program characteristics[1]

Characteristic	Treatment Group (n = 27)	Control group (n = 27)	TOTAL (N = 54)
Gender			
Average proportion of boys	40%	38%	39%
Average proportion of girls	61%	62%	61%
Hispanic, Latino, or Spanish origin			
Average proportion of kids of Hispanic, Latino or Spanish origin	18%	18%	18%
Race / ethnicity			
Average proportion of Asian, Indian, Native American kids	6%	7%	6%
Average proportion of Black or African-American kids	18%	17%	17%
Average proportion of White kids	71%	75%	73%
Unknown race / ethnicity	5%	1%	4%

[1] Some sections may not add up to 100% due to rounding.

Characteristic	Treatment Group (n = 27)	Control group (n = 27)	TOTAL (N = 54)
Aggregate family income			
Average proportion of families that are low income	52%	49%	51%
Average proportion of families that are middle income	43%	42%	42%
Average proportion of families that are high income	4%	10%	7%
Number of programs located in different area types			
Urban	9 (33%)	13 (48%)	22 (41%)
Suburban	9 (33%)	9 (33%)	18 (33%)
Rural	9 (33%)	5 (19%)	14 (26%)
Proportion of kids in program who are interested in science			
Almost none	0 (0%)	0 (0%)	0 (0%)
Some	10 (37%)	13 (48%)	23 (43%)
Most	17 (63%)	14 (52%)	31 (57%)

Note: None of the differences between the treatment and control groups were statistically significant.

The leader's demographic and background characteristics are summarized in Table 2. All but one of the 54 leaders were female. Most of the leaders fell into the 30-39 year old range (35%), followed by leaders in the 40-49 year old range (26%), leaders in the 50-59 year old range (20%), leaders in the 18-29 year old range (17%), and leaders in the 60-69 year old range (2%). Most of the leaders were not of a Hispanic, Latino, or Spanish origin (7%). The majority were White (83%), followed by those who were Black or African-American (15%) and those who were Asian, Indian or Native American (8%). There were no statistically significant differences between leaders' demographic characteristics between the treatment and control groups.

Most leaders in our sample reported having at least a Bachelor's degree (30%). One quarter of the leaders reported having a Master's degree or MBA. One leader had a Ph.D. Twenty-two percent of the sample had an Associate's or a vocational degree. The remaining 22% had a high school diploma or GED. Most of the leaders reported that they did not have a teaching certificate (91%) – only five leaders reported having one. There were no statistically significant differences between the treatment and control group leaders with respect to educational background.

Leaders in both groups reported that they had led activities with kids for an average of almost 11 years. Most reported having previously led science activities with kids (87%). Three quarters of

the leaders reported leading science activities at least 3-5 times per year, with 30% of the leaders leading science activities more than ten times per year. More than one third of the sample reported having previously led FETCH! activities with kids (37%). During the past year, 15% of the leaders reported leading FETCH! activities once or twice, 11% reported leading the activities 3-5 times, 7% reported leading them 6-10 times, and two leaders reported doing them more than ten times. There were no statistically significant differences between the treatment and control group leaders with respect to whether and how often they reported leading science or FETCH! activities with kids.

Table 2:
Leaders' Demographic and Background Characteristics

Characteristic	Treatment Group (n = 27)	Control group (n = 27)	TOTAL (N = 54)
Gender			
Male	1 (4%)	0 (0%)	1 (2%)
Female	26 (96%)	27 (100%)	53 (99%)
Age			
18-29 years	6 (22%)	3 (11%)	9 (17%)
30-39 years	9 (33%)	10 (37%)	19 (35%)
40-49 years	7 (26%)	7 (26%)	14 (26%)
50-59 years	5 (19%)	6 (22%)	11 (20%)
60-69 years	0 (0%)	1 (4%)	1 (2%)
Hispanic, Latino, or Spanish origin			
Yes	2 (7%)	2 (7%)	4 (7%)
No	25 (93%)	25 (93%)	50 (93%)

Note: None of the differences between the treatment and control groups were statistically significant.

Table 2 (continued):

Leaders' Demographic and Background Characteristics

Characteristic	Treatment Group (n = 27)	Control group (n = 27)	TOTAL (N = 54)
Education level			
High school diploma or GED	8 (30%)	4 (15%)	12 (22%)
Associate's degree or vocational degree	4 (15%)	8 (30%)	12 (22%)
Bachelor's degree	7 (26%)	9 (33%)	16 (30%)
Master's degree, including MBA	8 (30%)	5 (19%)	13 (24%)
Doctoral degree, including PhD, JD or MD	0 (0%)	1 (4%)	1 (2%)
Teaching certificate			
No	26 (96%)	23 (85%)	49 (91%)
Yes	1 (4%)	4 (15%)	5 (9%)
Number of years leading activities with kids			
Average number (standard deviation)	9.6 (6.4)	12.0 (9.2)	10.8 (7.9)
Ever led science activities with kids			
Yes	24 (89%)	23 (85%)	47 (87%)
No	3 (11%)	4 (15%)	7 (13%)

Note: None of the differences between the treatment and control groups were statistically significant.

Table 2 (continued):

Leaders' Demographic and Background Characteristics

Characteristic	Treatment Group (n = 27)	Control group (n = 27)	TOTAL (N = 54)
Number of times led science activities during past year			
None	3 (11%)	4 (15%)	7 (13%)
1-2	5 (19%)	1 (4%)	6 (11%)
Number of times led science activities during past year, continued			
3-5	9 (33%)	7 (26%)	16 (30%)
6-10	2 (7%)	7 (26%)	9 (17%)
10+	8 (30%)	8 (30%)	16 (30%)
Ever led FETCH! activities with kids			
No	19 (74%)	15 (56%)	34 (63%)
Yes	8 (30%)	12 (44%)	20 (37%)
Number of times led FETCH! activities during past year			
None	19 (70%)	16 (59%)	35 (65%)
1-2	5 (19%)	3 (11%)	8 (15%)
3-5	1 (4%)	5 (19%)	6 (11%)
6-10	1 (4%)	3 (11%)	4 (7%)
10+	1 (4%)	1 (4%)	2 (4%)

Note: None of the differences between the treatment and control groups were statistically significant.

Activities

We asked programs to attempt to complete two hands-on science activities with the kids in their program during the period between the pre-test and post-test surveys. The activities included:

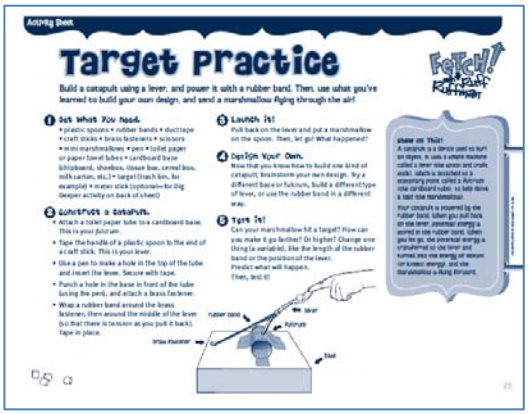

Activity Sheet

Float My Boat

Today, your challenge is to build tinfoil boats and test different designs to see how many pennies you can load without sinking your boat. Let's dive in!

What to Do

1. Get what you need.
2. Round 1: Build boats.
3. Make predictions.
4. Test the design.
5. Round 2: Build more boats.


Activity Sheet

Target Practice

Build a catapult using a lever, and power it with a rubber band. Then, use what you've learned to build your own design, and send a marshmallow flying through the air!

1. Get what you need.
2. Construct a catapult.
3. Launch it!
4. Design Your Own.
5. Test it!

Float My Boat – An activity designed to teach kids about buoyancy.

Target Practice – An activity designed to teach kids about potential and kinetic energy, fulcrums and levers.

Most of the programs (n = 44, 82%) reported that they were able to complete both activities for the study. Six programs (11%) were only able to complete the Target Practice activity and four (7%) were only able to complete the Float My Boat activity.

Within the programs that completed both activities, most tried one activity within a week of trying the other. A couple programs did both activities on the same day, while most did them on separate days.

The number of kids who participated in the activities ranged widely across programs. The number of kids who participated in the activities is summarized below. In one case (a control group site) the program included multiple groups of kids in the hands-on activities (over 100 kids for each activity). However, this program was the exception. Most programs included between 11 and 14 kids in the hands-on science activities (see Table 3).

Table 3:

Number of kids who participated in the activities

Activity	Treatment Group			Control group		
	Minimum	Maximum	Median	Minimum	Maximum	Median
Float My Boat	6	28	11	3	50[2]	14
Target Practice	5	35	12	3	50[3]	12

FETCH! training

The majority of the treatment group leaders took the training within two days of completing the online self-evaluation (93%). One leader waited three days, and another waited four days (because of unrelated problems with their computers). The majority of leaders spent 30 minutes to an hour reviewing the training (55.6%), while an equal number spent less than half an hour (22.2%) and over an hour (22.2%). Many leaders reported that they came back to revisit the FETCH! training several times throughout the study (37.0%). Leaders told us:

> *I did replay the video segment more than once, and took notes.*
>
> *I looked at it afterwards to compare my experience.*
>
> *I went back to look at the videos to see what (Susan) was doing. I've been back since, for more resources.*

With respect to the slide shows, most leaders reported that they viewed the complete set of slide shows once (66.7%) or more than once (25.9%). One leader viewed only the Preparation slide show because she was confident that she could lead the activities without viewing the relevant slide shows. Another leader could not view any of the slide shows because she has "a dinosaur of a computer" that was not technically capable of playing the slide shows.

The majority of leaders (59.3%) waited only a couple of days after completing the training before they began the activities with the kids. Seven leaders (26%) waited about a week to begin the activities, and four leaders (15%) had to wait two weeks because their afterschool programs only met a couple times per month, there was a vacation period, there was a shortage of staff, or it took some time to gather the materials they needed.

The balance of this document describes our study findings.

[2] One outlier (n = 102) was removed from this table.

[3] One outlier (n = 113) was removed from this table.

Findings

Treatment group leaders were more likely to report that their kids learned something new about science, got excited about exploring, and tested their new designs than control group leaders.

We asked leaders to indicate the degree to which their kids were impacted positively by the activities on a scale of 1 to 4 (1 = None of the kids, 4 = All of the kids). Leaders in the treatment group were more statistically more likely than leaders in the control group to report that most of the kids in their groups "learned something new about science," "got excited about exploring, like scientists," and "tested their new designs." Leaders told us:

The kids were excited, jumping up and down, shouting out answers. They really loved it.

I just think it was a very worthwhile activity for me and the kids and my kids love FETCH!

It was a good experience. I didn't expect it to go this good. A lot of kids you have to pull in to do programming, they just walk right out. The ones who participated had a great time and I had to calm them down. They went in hallway and had competitions. It was a blast. I didn't expect it to be that fun. Unexpected fun.

My kids had a ton of fun. With the catapult, we actually had a contest.

The kids were really excited; wanted to learn more. Our community is lower socio economic, so kids seeking additional resources on these subjects was great to see.

Leaders in the treatment group were more statistically more likely than leaders in the control group to report that most of the kids in their groups "learned something new about science ($p = .02$)," "got excited about exploring, like scientists ($p = .02$)," and "tested their new designs ($p = .01$)."

They're very helpful. Not only is it a learning experience for the kids, it was a learning experience for me.

The excitement level we got was great...we did hear a lot of neat observations from the kids. I'm pleased there are 20 other activities on the site.

The girls absolutely loved the projects! It's so imaginative. They loved the target practice with the marshmallows…came up with neat ways to modify their catapults. I am excited to use more of the activities to get the kids more excited about the program.

The girls had a wonderful time doing it. It was really positive for them.

The kids and I really enjoyed the activities.

The kids really liked it. They were excited about it; asking lots of questions, coming up with their own games. They were excited to go home and show their families.

This was great and the girls loved it.

The table below summarizes the results (higher averages are better).

Table 4:

Degree of impact on kids

Outcomes	Treatment Group Average (sd)	Control group Average (sd)	p value (Mann-Whitney U)
The kids showed that they could think systematically, like scientists.	3.41 (0.69)	3.59 (0.50)	0.18
The kids learned something new about science.	3.85 (0.36)	3.59 (0.50)	**0.02****
The kids got excited about exploring, like scientists.	3.78 (0.42)	3.52 (0.51)	**0.02****
The kids took the activities seriously.	3.63 (0.49)	3.48 (0.51)	0.14
After doing Float My Boat, the kids understood that building a flatter boat was a better way to hold more coins.	3.45 (0.51)	3.62 (0.50)	0.14
After doing Float My Boat, the kids saw the connection between how much water a boat displaces and how much it can carry.	3.36 (0.73)	3.35 (0.69)	0.43
After doing Float My Boat, the kids understood that water pushes on the bottom and sides of a boat, holding it up.	3.36 (0.73)	3.38 (0.70)	0.47
After doing Target Practice, the kids understood that potential energy was stored in the rubber band when the lever was pulled back in preparation for launch.	3.28 (0.84)	3.44 (0.71)	0.26
After doing Target Practice, the kids understood the role the fulcrum and lever played in their design.	3.52 (0.51)	3.68 (0.48)	0.13
The kids brainstormed their designs with each other.	3.50 (0.71)	3.50 (0.72)	0.49
The kids made predictions about their designs before they built them.	3.58 (0.70)	3.52 (0.70)	0.33
The kids tested their original designs.	3.93 (0.27)	3.81 (0.40)	0.11
The kids changed at least one variable at a time.	3.69 (0.47)	3.58 (0.70)	0.35
The kids tested their new designs.	3.96 (0.20)	3.62 (0.70)	**0.01****
The kids were able to determine which changes caused different outcomes during testing.	3.44 (0.51)	3.65 (0.49)	0.06
The kids shared their results with each other.	3.74 (0.45)	3.77 (0.43)	0.41

**Differences were statistically significant at the p< .05 level.

The training helped leaders approach, lead and prepare for activities more effectively than before.

Almost uniformly, participants commented that the training was helpful because it helped them approach, lead, and prepare more effectively than they typically do. Several specifically mentioned that the guidance on how to prepare open-ended questions helped get their kids involved. During the follow-up interviews, leaders reported that the training helped them…

- Become better prepared and / or more relaxed in leading and approaching experiments (n = 14)
- Prepare questions, discussion points and get kids involved (n = 4)
- Let kids test and revise (n = 3)
- Let kids take more control and ask questions (n = 3)

Leaders told us:

I was more aware of what I needed to explain to them and what I needed to prepare and the materials I needed. After I did the training, I was able to think about what I could substitute to make it work. Training helped me know what I needed to do and other ways to approach it. The kids were able to be 100% hands-on. Other activities before were more like mini-lectures. They couldn't touch anything. But, with this one, the kids were able to do everything themselves. They were able to think for themselves and figure out what they needed to do. They were more hands-on and involved. They were telling me where we should go with it. They were more involved.

"I learned that I wasn't as prepared to lead an activity as I thought (before the study)."

I felt like the training gave me more ideas. Before the training, I wouldn't have let them revise. It definitely helped me prepare more.

It helped me to learn to let the kids' questions drive it more, even if I knew that what they wanted to do wouldn't work. Then we talked about why it didn't work. I didn't force feed it down their throats.

It provided a different way to approach what I'm doing with them, and hopefully improved the way that an activity is done with younger kids. Now they're getting to the age where they can start thinking for themselves. It helped me to get them to start thinking for themselves.

It was different for my kids because I did a better job. I did a better job because of my participation.

I am now more enthusiastic about doing these activities.

I learned that I wasn't as prepared to lead an activity as I thought (before the study).

We made lots of changes and tried lots of materials. After marshmallows, they wanted to try erasers, paper, all different kinds of things. They loved changing the variables and trying it again and again.

The biggest challenge to overcome… is letting the girls do it themselves. This made me realize parents / teachers always take over and it's important to let the kids do it themselves so they learn.

One of my kids were so excited and wished he could do it in school and he would get an A. He wondered why they didn't do these things in school. He said "I love science!"

It taught the kids to think for themselves instead of us telling them what to do.

The training helped leaders feel more comfortable leading hands-on science activities.

We developed a scale to assess leader's comfort level leading hands-on science activities with kids (see Appendix A). The scale consisted of 15 items that required respondents to report their level of comfort with various facets of leading activities on a three point scale (0 = not comfortable, 1 = somewhat comfortable, 2 = comfortable). We found the 15-item scale to have high internal consistency (with alphas ranging 0.877 at pre-test to 0.811 at post-test), thus the scale may be considered reliable.

The training helped leaders feel more comfortable leading hands-on science activities (p = 0.049)

Table 5:

Self-evaluation scores

	Treatment Group (n = 27)		Control Group (n=27)	
	Pre-test mean (sd)	Post-test mean (sd)	Pre-test mean (sd)	Post-test mean (sd)
Total scale scores	27.8 (3.2)	28.8 (1.9)	27.6 (3.2)	28.3 (2.6)
Wilcoxon Signed Rank Test value (p value)[4]	-1.83 (p = 0.03)*		-0.96 (p = 0.17)	
Ordinal regression, goodness-of-fit test	Chi-square = 9.544, p = 0.049*			

* Difference is significant at the p < .05 level.

As shown in Table 5, when we compared pre-test and post-test scale scores, we found a statistically significant improvement in scale scores for the treatment group after completing the training. The control group did not demonstrate a significant improvement in scale scores over

[4] Non-parametric analyses were performed due to the non-normal distribution of the scale score data.

time. Thus, it appears that the training helped leaders feel more comfortable leading hands-on science activities ($p = 0.049$). During the follow-up interviews, leaders told us:

> *I did feel more comfortable.*
>
> *I was more relaxed. I really had fun watching the children really thinking about it and interacting like scientists.*
>
> *I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids.*

Treatment group leaders felt more strongly that kids should learn about science outside of school *after* they used the training than before they used the training.

Treatment group leaders exhibited a statistically significant increase in the belief that it was important to teach kids about science outside of school. Control group leaders did not report an increase or a decrease in their beliefs of the importance of teaching kids about science outside of school (Table 6).

Table 6:

Beliefs about teaching kids about science

	Treatment Group (n = 27)		Control group (n = 27)	
	Pre-test Mean (sd)	Post-test Mean (sd)	Pre-test Mean (sd)	Post-test Mean (sd)
How important is it for kids to learn about science outside of school?	4.48 (0.73)	4.67 (0.56)*	4.48 (0.73)	4.63 (0.69)

*The difference between pre-test and post-test scores was significant at the $p < .05$ level [$F (df = 2) = 24.687$, $p = 0.000$]

Treatment group leaders were more likely than control group leaders to try the activities first, prepare a list of variables, and perform extra research before leading the activities with kids.

We asked leaders to tell us how they prepared to lead the hands-on science activities. Leaders who participated in the FETCH! training were more likely to report that they tried the activities themselves than leaders who did not. Leaders who participated in the training were also more likely to report that they wrote down a list of variables in order to help the kids experiment than leaders who did not. Also, leaders who participated in the training were more likely to do a little extra research so they could understand the science behind the activities than leaders who did not participate in the training.

Table 7 below summarizes how leaders from the two groups prepared.

Table 7:

How leaders prepared for the activities with kids

Preparations	Treatment Group (n = 27)	Control group (n = 27)
I read the Activity Sheets completely.	27 (100%)	27 (100%)
I gathered all the materials I needed.	27 (100%)	27 (100%)
I tried the activities myself.	26 (96%)	21 (78%)*
I wrote down some variables (aspects of the activities that could be altered) so I could help the kids experiment.	22 (82%)	11 (41%)**
I came up with some learning goals (things I wanted the kids to learn).	20 (74%)	17 (63%)
I wrote down some open-ended questions to use with the kids.	16 (59%)	11 (41%)
I read the Leader Notes completely (only applies to Float My Boat).	15 (56%)	20 (74%)
I did a little extra research on the science behind the activities.	15 (56%)	11 (41%)*

* Difference between the groups is significant at p = 0.05 level.
** Difference between the groups is significant at p < .01 level.

Leaders reported the biggest take-aways from the training were: use open-ended questions, let kids direct the activity, get prepared ahead of time, experiment with different variables, and use hands-on activities to teach kids about science.

We asked leaders to tell us the one or two "big ideas" that they would take away from the training. The most common responses were:

- Use open-ended questions to help involve kids more in the activity without telling them what to do (n = 7).
- Get prepared ahead of time and try the activities yourself first (n = 4).
- Experiment with different materials and lots of different variables (n = 3).
- Kids will respond to science so much better with hands-on activities (n = 3).

Other ideas that leaders shared with us included:

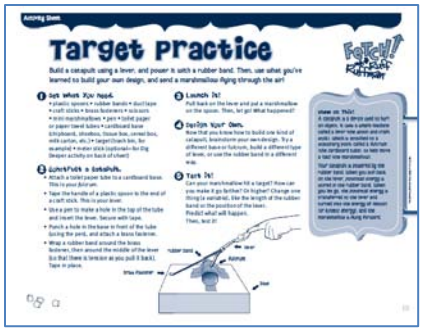
- Science activities can be interesting to kids who you think would not be interested in science activities.

- As an adult leader, you don't have to be a scientist to talk science with kids. It's ok to say "I don't know."
- Don't give materials out right away; let the kids think about it.
- Let kids take control of it. They learn a lot more than way.
- Girls should know that they are scientists.
- Let the kids compare their work with others.
- Revise and test with the kids.
- Document everything in a journal.
- Keep the kids who finish first busy without disrupting everyone else who is still working.
- Kids love physics as much as they love chemistry.

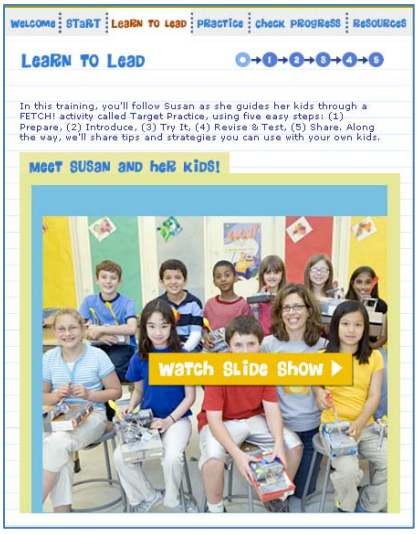
Treatment group leaders reported that most of the training components were very useful in helping them lead hands-on science activities.

We asked leaders to rate the usefulness of the various training components (see Table 8). On average, leaders reported that most of the components were very useful. The top 5 most useful components, according to leaders, were the:

Additional Resources – A section of the site that included additional activity guides and activities, tips for using the FETCH! activities, training resources, and resources to help train others.



Target Practice Activity Sheet (pdf) – The activity sheet that leaders followed in order to lead the Target Practice activity with kids.



Learn to Lead Training – The whole training, including all of the individual modules.

Float My Boat Activity Sheet and Leader Notes (pdfs) – The activity sheet that leaders followed in order to lead the Float My Boat activity with kids.

Table 8 summarizes the ratings that treatment group leaders gave to each of the training components.

Table 8:

Ratings of individual training components

Training Component	Number who used/rated the component	Average usefulness (sd)
The whole FETCH! Hands-on Science Training, in its entirety	27 (100%)	3.59 (0.50)
Prepare section only (section of the training that teachers leaders how to prepare to lead activities)	27 (100%)	3.48 (0.51)
Introduce section only (section of the training that teaches leaders how to introduce an activity to kids)	27 (100%)	3.48 (0.51)
Try It section only (section of the training that encourages leaders how to try-out the activities on their own)	27 (100%)	3.56 (0.51)
Revise and Test section only (section of the training that shows leaders how to help kids revise and test their designs)	26 (96%)	3.50 (0.58)
Share section (section of the training that encourages leaders to help kids share their designs with others)	26 (96%)	3.38 (0.57)
Practice What You've Learned section (section of the training that directs the leaders to try out the two activities)	26 (96%)	3.31 (0.55)
Reflect sections (each page of the training provides leaders with questions to consider and answer in their own journal)	24 (89%)	3.00 (0.66)
Watch sections (each page of the training provides a list of things that leaders should consider as they view the slide shows)	25 (93%)	3.36 (0.70)
Review sections (each page of the training provides a summary / review of the main ideas covered in the slide show)	23 (85%)	3.17 (0.65)
Apply sections (each page of the training provides a list of ideas for leaders to consider as they think of ways to apply what they have learned in the training)	26 (96%)	3.27 (0.53)

Training Component	Number who used/rated the component	Average usefulness (sd)
Activity sheets and leader notes		
Target practice activity sheet (PDF)	27 (100%)	3.63 (0.49)
Float My Boat activity sheet and Leader Notes (PDF)	21 (78%)	3.57 (0.51)
Additional resources	15 (56%)	3.67 (0.49)
Complete slide show	24 (89%)	3.38 (0.50)
Transcript of the slide show (PDF)	15 (56%)	3.20 (0.56)
Learn to Lead (PDF)	25 (93%)	3.32 (0.48)
Activity Checklist (PDF)	26 (96%)	3.50 (0.51)
PowerPoint presentation designed to help leaders train others to lead hands-on science activities	6 (22%)	3.33 (0.52)
Journal	20 (74%)	3.05 (0.83)
Self-evaluation (pre-test, including score report)	27 (100%)	2.81 (0.83)
Self-evaluation (post-test, including score report)	27 (100%)	2.56 (0.80)

In addition to the high ratings that leaders gave almost every aspect of the training, we also noted the frequency with which leaders used the optional training components. For example, even though these components were not required parts of the FETCH! training…

"It was nice to know how to get more in-depth to lead the activities."

"It took our program to a whole new educational level…we actually learned something."

- More than half of the leaders used the Additional Resources page (56%),
- Almost all the leaders downloaded and used the Activity Checklist (96%),
- Almost all the leaders downloaded and used the Learn to Lead document (93%),
- Almost three-quarters of the leaders downloaded and used the Journal (74%),
- More than half downloaded the transcript of the slide show (56%), and
- And almost a quarter of the leaders downloaded the Powerpoint presentation to help them train others to lead hands-on science activities (22%).

About the training, leaders told us:

> *Great—very easy to use. Thought about things I never thought of before.*
>
> *Having the different steps broken down made it more successful.*
>
> *It was a way to prepare and to think about your program. I really wanted the kids to get the science behind the things. I never thought I was strong in science so I didn't want the children to have that same experience. Helped me focus and come up with talking points.*
>
> *It was nice to know how to get more in-depth to lead the activities.*
>
> *It took our program to a whole new educational level…we actually learned something.*
>
> *It kind of gave me more of an idea of what to expect from my kids. Saw the things they were having problems with.*
>
> *(Try It) was the most useful part of the training. I had some friends help me build the thing to find where the pitfalls might be (beforehand).*
>
> *Usually I'm so time-constrained, but I extended our program so the kids could revise their designs. I might not have done that if I had not been prepped in the program.*
>
> *We had some children whose boats sank immediately. So we talked about things that fail that later became successes.*
>
> *Great to see someone doing something with a different approach; different from what I do.*
>
> *Walked you step by step through everything you need to do. Not just on paper. Made me more prepared. Her methods that she used were useful to watch. Like cutting tape and putting it on the table. It saves time.*

The self-evaluation (including score reports) received the lowest usefulness ratings. Despite this, 66.7% of the leaders reported that they would not add anything to the self-evaluation. Some leaders (those who had fewer years of experience with science activities) reported that the self-evaluation was helpful to them because it showed them how much they learned from the training. Leaders who demonstrated an increase in comfort level from pre-test to post-test reported:

> *The training put me more at ease because it was so easy. I knew it wasn't going to be one of those things where I was scrambling to get materials at the last minute.*
>
> *Getting more practice of just watching how someone else would prepare for an activity (was helpful).*
>
> *I had the information. I had more education. Having a plan helped me.*
>
> *I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids.*

I'm not a science person, and that made me a little more comfortable seeing her do it. It helped me interact with my class.

Just by going through experiments on my own...it was easier for me to ask those open-ended questions. To me, people don't ask open ended questions like they should so you don't get the answers you only want. It helped (kids) understand the process and the history.

Some things that I thought I was good at, I realized that I did need help in, and I realized I do have weaknesses in these areas. I couldn't help but feel more confident.

I thought it was useful to see how much I knew.

It (the self-evaluation) did not make me nervous. I thought it was helpful because it helped me be prepared for the areas it was focusing on.

It (the self-evaluation) gives you an opportunity to see how you are beforehand. At first, I was like "this was silly" but then I saw the comparison at the end and realized it was very helpful.

It (the self-evaluation) helped take the training more seriously.

It (the self-evaluation) made me take the training more seriously.

It (the self-evaluation) was fun. It was a good idea to let people evaluate themselves and see how much training they need.

It (the self-evaluation) was good for me personally; to see if I was succeeding.

"I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids."

"Some things that I thought I was good at, I realized that I did need help in, and I realized I do have weaknesses in these areas. I couldn't help but feel more confident."

"It (the self-evaluation) gives you an opportunity to see how you are beforehand. At first, I was like "this was silly" but then I saw the comparison at the end and realized it was very helpful."

However, many leaders told us that they felt confident about their ability to lead *before* they participated in the training and that the self-evaluation was unnecessary for someone like them (who is experienced with leading kids in science activities). Most leaders (55.6%) reported that they were "confident" that they knew what the science process was before they participated in the training. Ten leaders (37.0%) reported that they "had heard of the science process, but were unsure what it was." Only two leaders (7.4%) reported that they had not heard of the science process before participating in the training. Therefore, most rated it as "only a little useful." They reported that the self-evaluation would be more useful for leaders who are new to the field or have never led science activities before. Leaders told us:

It would be very thorough and useful for new teachers and parents.

I thought I was comfortable. Self-evaluation is not as useful for me as it might be for others. I enjoyed taking it because at least I know where I stand.

I was very comfortable. I've been doing this for 10 years. I could see the self-evaluation being useful for new teachers.

No real impact on me, but I do see the use of it, especially those who have no experience.

Despite the fact that the average leader found the self-evaluation to have little utility, some leaders told us that despite showing a lack of improvement from pre-test to post-test, they still felt that they learned something from the training:

"We lead activities like this every day. We use science twice a week in our program. Even though I do a lot of science, I still felt like I learned something about being prepared, keeping a journal, and asking open-ended questions with the kids."

We lead activities like this every day. We use science twice a week in our program. Even though I do a lot of science, I still felt like I learned something about being prepared, keeping a journal, and asking open-ended questions with the kids.

People doing this have experience. I am an engineer. I felt very comfortable with it before I started, but that's not to say I didn't learn anything. I did.

My comfort didn't change, but I did learn something from the training.

Thus, two leaders told us that they would like to see the self-evaluation expanded to included questions about specific science content. Another leader told us that she would like to see the self-evaluation include questions about the degree to which the kids demonstrated that they learned something *and* a way for kids to assess the leaders' ability to lead the activity.

Many of the leaders (66.7%) reported that they would share their self-evaluation results with a supervisor, if they believed that the supervisor considered it a valuable form of professional development. Forty-four percent reported that they would invite their supervisor to observe them leading an activity with kids so as to develop their skills even further, and 29.6% reported that they would use the results of the self-evaluation to make a case for a raise or promotion.

Treatment group leaders were pleased at the visual nature of the training.

We asked leaders to tell us what they expected from the training. They reported that they expected:

- Ideas for science activities (37.0%)
- Ideas for getting kids interested in science (37.0%)
- Tips for becoming better at leading science activities (33.3%)
- Ideas for hands-on activities (29.6%)
- Ideas for leading activities found in the FETCH! activity guide (25.9%)

One leader reported that she expected "to be lectured at" like other trainings she has participated in "because most trainings just write everything down (using text)." She was "pleasantly surprised" that this was not the case with FETCH!.

- A list of general science activities (11.1%)
- Ways to get low income kids interested in any program (3.7%)
- How to ask different types of questions (3.7%)
- Someone modeling teacher behavior (3.7%)

One leader reported that she expected "to be lectured at" like other trainings she has participated in "because most trainings just write everything down (using text)." She was "pleasantly surprised" that this was not the case with FETCH!. Another leader told us:

> *Everybody learns differently. I liked the breakdown, and I like interaction. I like watching the lady talk and using it in her classroom. I can't just read it--I need more of an interactive.*

Leaders reported that the training contained "just the right amount" of information and that it enhanced students' experience of the hands-on science activities.

Most leaders (93%) reported that the training contained "just the right amount" of information. One leader reported that the training contained too much information, while another indicated that the training did not contain enough information. Leaders told us:

> *I didn't feel bombarded. There was stuff I could take away and stuff I was familiar with that I could skim over.*
>
> *It was not overwhelming.*
>
> *There were some things I didn't use, but it was nice to know it was there.*
>
> *There's never too much information because there are different people at different (skill) levels.*
>
> *I would have wanted some more of examples of open-ended questions. It's something I wanted to do better and use better language.*
>
> *I tried to fit it all in, but because I'm new to this way of doing a project, I was trying to hit it all --- I found myself getting flustered, and was trying to incorporate things and make it my own.*

We asked leaders to indicate their level of agreement with a series of statements about the training on a scale of 1 to 5, with 1 = Strongly Disagree and 5 = Strongly Agree.

Table 9 below summarizes their responses.

Table 9:

Feedback on the training

Statement	Average Level of Agreement (sd)
I learned something new about leading hands-on activities with students.	4.41 (0.69)
I learned the steps that scientists and engineers use to solve problems.	3.78 (1.01)
I learned how to lead kids through the steps that scientists use to solve problems.	4.04 (0.81)
I learned how to lead kids in hands-on science activities.	4.11 (0.89)
I learned how to prepare for leading hands-on science activities.	4.22 (0.89)
I learned how to use open-ended questions to encourage kids to experiment.	4.22 (0.80)
I didn't learn anything new.	1.78 (1.12)
The website was informative.	4.52 (0.51)
The website was easy to use.	4.56 (0.51)
I like the use of video throughout the website.	4.56 (0.64)
The training, by extension, enhanced the students' experience of the hands-on science activities.	4.48 (0.70)

Leaders would recommend the FETCH! training to others who work with kids and plan to use it again.

All of the leaders (100%) reported that they would recommend the FETCH! training to someone else. Leaders recommended the training for:

- Anyone that works with kids (n = 6)
- Librarians (n = 4)
- Anyone with a little amount of experience (n = 4)
- Teachers / Assistant teachers (n = 4)
- Staff members / coworkers (n = 4)
- Anyone with a lot of experience (n = 3)
- Other scout leaders (n = 3)
- Parents or other community members (n = 3)
- After school programs (n = 2)
- Science teachers (n = 2)

All of the leaders (100%) indicated that they planned to use the FETCH! training again in the future, either for themselves or to train others.

Leaders in both groups reported they would recommend the FETCH! activities to others and would use them again.

All of the leaders (100%) reported that they would recommend the FETCH! activities to others. All but one leader reported that they planned to use the FETCH! activities again in the future (98.1%); one leader was unsure because it depends on her scout troop's future goals.

Leaders in both groups reporting feeling prepared to lead the FETCH! activities.

Regardless of which group leaders belonged to, all leaders reported feeling "somewhat prepared" or "very prepared" before they led the group activities with kids. There were no significant differences between the treatment group and the control group with respect to whether they reported feeling prepared to lead the activities; 85% of the control group leaders and 89% of the treatment group leaders reported that they were prepared to lead the first activity.

Leaders in both groups reported high levels of satisfaction with the FETCH! activities.

There were no statistically significant differences between the treatment and control groups with respect to leader satisfaction or leader enjoyment of the activities. All but one of the leaders reported that they were satisfied with the activities (96.3%). One leader reported she was "neutral" on the question of satisfaction.

All the leaders reported that they enjoyed leading the FETCH! activities with kids, with most reporting that they "really" (as opposed to "somewhat") enjoyed leading the activities (94.4%).

Leaders in both groups reported they were able to use open-ended questions successfully.

Leaders in both groups reported that they were able to use open-ended questions to encourage their kids to explain their ideas (85.2%). The remaining leaders were able to do so, but not on a consistent basis (14.8%). There were no differences between the treatment and control groups with respect to whether the leaders were able to use open-ended questions successfully.

Leaders in both groups reported FETCH! had positive impacts on their kids.

Leaders in both groups reported that the hands-on science activities had a positive impact on the kids in their programs. We asked leaders to report on a scale of 1 to 5, with 1 = Strongly Disagree and 5 = Strongly Agree, their level of agreement with three different outcomes.

Leaders reported high levels of agreement that their kids were more excited about science, and in doing science activities, and that the kids were able to think more like scientists, after having tried the FETCH! activities. There were no significant differences between the treatment and control groups. The results are reported below:

Table 10:

Outcomes observed by leaders

Outcomes	Treatment Group Mean (sd)	Control group Mean (sd)
The kids were more excited about science.	4.56 (0.64)	4.44 (0.70)
The kids were more interested in doing science activities in our program.	4.59 (0.64)	4.52 (0.64)
The kids were able to think more like scientists.	4.52 (0.64)	4.30 (0.61)

Respondents commented that while doing the FETCH! activities, kids were willing to experiment and try different variables and often wanted to do more activities. Many indicated that their kids enjoyed and benefitted from teamwork, cooperation, and / or competition, and that overall, it was a fun experience. Some noted increased confidence in their kids, and that they were eager to compare results and designs with others. Leaders listed the following positive outcomes. They told us the kids…

- Were more willing to talk further and find more information / do additional activities (n = 10)
- Were more willing and excited to try different variables and experiment on their own (n = 10)
- Enjoyed the teamwork, cooperation, and competition (n = 9)
- Had fun (n = 7)
- Were excited to do hands-on activities (n = 4)
- Compared their results (n = 4)
- Became more confident (n = 4)
- Didn't immediately connect activities to traditional "boring" science (n = 3)
- Wanted to work hard (n = 1)
- Were very focused (n = 1)
- Showed patience (n = 1)
- Were able to relate every day games to science (n = 1)

We asked leaders to tell us what factors led to the positive outcomes. More than one third attributed the positive outcomes to the activities (39.2%). More than half attributed the positive outcomes to the kids themselves (56.9%), while almost all of the leaders attributed the positive outcomes to their own ability to teach (94.1%). There were no significant differences between the treatment and control groups with respect to these attributions.

While some leaders reported that they observed the positive outcomes in kids after only one activity (15.1%), most reported that they did not observe the positive outcomes in kids until after they had completed two hands-on science activities (84.9%). There were no differences between the treatment and control groups with respect to how long it took for leaders to notice changes.

Leaders provided feedback on ways to enhance the FETCH! activities.

Some materials were difficult to gather.

While half the programs reported that they did not experience any trouble gathering the materials required for the activities, some programs did experience difficulty collecting materials. The most difficult items to collect and the number of leaders who reported having difficulty were:

- 100 pennies per kid (n = 14)
- Brass fasteners (n = 11)
- Toilet paper or paper towel tubes (n = 6)
- Cardboard boxes (n = 5)
- Mini marshmallows (n = 4)
- Duct tape (n = 4)
- Meter stick (n = 3)
- Craft sticks (n = 1)
- Tin foil (n = 1)
- Dishpan or bucket half filled with water (n = 1)

Many program leaders made adaptations to the materials or activities.

While many respondents commented that they made adaptations to the activities, it didn't appear to be a roadblock. Most substituted different materials for the cardboard base in the Target Practice activity, while others found other objects aside from marshmallows to use in the same activity.

Target Practice

Materials substitutions:

- **Cardboard base:** Paper plate, Geo-boards, boards with screw, the floor, pizza box (n = 7)
- **Mini-marshmallows**: Regular size, pom-poms, etc, many different items (n = 5)
- **Duct tape**: Book tape, storage tape, thumbtacks (n = 2)
- **Meter stick**: Measuring tape (n = 1)
- **Cardboard tube**: Rolled up cardstock (n = 1)
- **Brass fasteners**: Tape (n = 1)

Additional adaptations / comments:

- Created own leaders guide / additional sheet to write predictions and changes (n = 2)
- Let them have pom-pom war with catapults (n = 1)
- Used large bowl for bulls-eye (n = 1)
- Had students use two spoons, different rubber bands (n = 1)
- Let students create own version of catapult after experiment (n = 1)
- Made the lessons into a competition (n = 1)

Float My Boat

Material Substitution:

- **Pennies:** Macaroni noodles (n = 1)

Additional adaptations / comments:

- Did each activity at least twice to allow the children to play with some of the variables to have more success in subsequent tries (n = 1)
- Let children work in groups (n = 1)
- Added visuals to help explain (n = 1)

Some concepts were difficult for leaders and kids to comprehend.

The most challenging science concepts for leaders and kids to comprehend were displacement, kinetic energy, and potential energy. Table 11 lists each of the concepts covered in the activities and the extent to which the kids and leaders reportedly struggled with them.

Table 11:

Concept difficulty

Concepts	Proportion of Leaders Reporting Kids Struggled with Concept	Proportion of Leaders Reporting They (Leaders) Struggled with Concept
Displacement (the amount of fluid pushed out of the way when an object is placed in water)	22 (40.7%)	5 (9.3%)
Kinetic energy (energy of motion)	17 (31.5%)	3 (5.6%)
Potential energy (stored energy)	16 (29.6%)	3 (5.6%)
Fulcrum (the pivot point for a lever)	13 (24.1%)	0 (0.0%)
Testing a design	8 (14.8%)	0 (0.0%)
Buoyancy (the tendency to float in water)	7 (13.0%)	2 (3.7%)
Brainstorming a design	6 (11.1%)	2 (3.7%)
Sharing results with others	6 (11.1%)	1 (1.9%)
Load (weight to be borne)	5 (9.3%)	0 (0.0%)
Lever (rigid bar pivoted around a fulcrum)	4 (7.4%)	0 (0.0%)
Redesigning something	4 (7.4%)	1 (1.9%)
Designing something	3 (5.6%)	2 (3.7%)
Catapult (mechanical device used to throw an object)	0 (0.0%)	0 (0.0%)
Building something	0 (0.0%)	2 (3.7%)

Leaders provided feedback on ways to enhance the training.

We asked leaders to tell us what additional information WGBH could add to the training to enhance it. Leaders told us:

Suggestions related to the FETCH! training

Add a clip / introduction about FETCH! so people know who Ruff Ruffman is.

It would have helped if I had episodes of FETCH! to get my girls excited. That would have helped.

Maybe a section of real experiences of other people that have gone through this. Like Float my Boat----to expect that it would get very wet. A list of problems that might occur and how to handle them. Helpful tips of things that could go wrong.

More question examples.

Written information on the scientific method.

Suggestions related to the FETCH! activities

More than one suggestion / substitution for materials.

Providing more support information on science topics.

More original activities. We've used these activities before and not from FETCH!

Brochure for little kids that is more kid friendly.

Instructions should specify the right number of kids to participate as well as specific age range.

Summary

This evaluation study found that the FETCH! training successfully achieved its goals of:

- Preparing leaders for leading hands-on science activities;
- Enhancing leaders' comfort in leading hands-on science activities;
- Helping leaders teach kids about specific science content knowledge and skills (e.g., making predictions, understanding real-world connections); and
- Helping leaders get kids excited and engaged in hands-on science activities.

The findings below are summarized according to each goal.

The FETCH! training prepared leaders for leading hands-on science activities.

The treatment group leaders (those who participated in the FETCH! training) reported being better prepared to lead hands-on science activities than the control group leaders. For example, treatment group leaders were more likely to report that they tried the activities themselves before leading the activities than control group leaders ($p < 0.05$). Treatment group leaders were also more likely to report that they wrote down a list of variables in order to help the kids experiment than control group leaders ($p < 0.01$). And, treatment group leaders were more likely to do a little extra research so they could understand the science behind the activities than control group leaders ($p < 0.01$).

Moreover, treatment group leaders exhibited a statistically significant increase over time in the belief that it was important to teach kids about science outside of school ($F (df = 2) = 24.687$, $p = 0.000$). Control group leaders did not report an increase or a decrease over time in their beliefs of the importance of teaching kids about science outside of school.

Almost uniformly, treatment group leaders commented that the training was helpful because it helped them approach, lead, and prepare more effectively than they typically do. Several leaders specifically mentioned that the guidance on how to prepare open-ended questions helped get their kids involved. During the follow-up interviews, leaders reported that the FETCH! training helped them…

- Become better prepared and / or more relaxed in leading and approaching experiments (n = 14)
- Prepare questions, discussion points and get kids involved (n = 4)
- Let kids test and revise (n = 3)
- Let kids take more control and ask questions (n = 3)

Treatment group leaders told us:

> *It was different for my kids because I did a better job. I did a better job because of my participation.*

I learned that I wasn't as prepared to lead an activity as I thought (before the study).

I was more aware of what I needed to explain to them and what I needed to prepare and the materials I needed. After I did the training, I was able to think about what I could substitute to make it work. Training helped me know what I needed to do and other ways to approach it. The kids were able to be 100% hands-on. Other activities before were more like mini-lectures. They couldn't touch anything. But, with this one, the kids were able to do everything themselves. They were able to think for themselves and figure out what they needed to do. They were more hands-on and involved. They were telling me where we should go with it. They were more involved.

I felt like the training gave me more ideas. Before the training, I wouldn't have let them revise. It definitely helped me prepare more.

It helped me to learn to let the kids' questions drive it more, even if I knew that what they wanted to do wouldn't work. Then we talked about why it didn't work. I didn't force feed it down their throats.

The FETCH! training enhanced leaders' comfort in leading hands-on science activities.

We asked leaders in the treatment and control groups to report on their level of comfort with leading hands-on science activities. When we compared pre-test and post-test scores for the treatment group, we found a statistically significant improvement in scale scores after completing the training ($p = 0.03$). When we compared pre-test and post-test scores for the control group, we did not find a statistically significant improvement in scale scores over time ($p = 0.17$). Thus, it appears that the training helped leaders feel more comfortable leading hands-on science activities. During the follow-up interviews, leaders told us:

I did feel more comfortable.

I was more relaxed. I really had fun watching the children really thinking about it and interacting like scientists.

I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids.

Treatment group leaders reported that they found all of the FETCH! training components to be useful. Even those training components that were considered "optional" were used with high frequency among the treatment group leaders. Leaders told us:

It was nice to know how to get more in-depth to lead the activities.

It took our program to a whole new educational level…we actually learned something.

I was more confident (in preparing) because I saw her do the activity already, so I knew what to expect. I felt more prepared about sharing and revising and testing so it was more applicable to the kids.

Some things that I thought I was good at, I realized that I did need help in, and I realized I do have weaknesses in these areas. I couldn't help but feel more confident.

It (the self-evaluation) gives you an opportunity to see how you are beforehand. At first, I was like "this was silly" but then I saw the comparison at the end and realized it was very helpful.

We lead activities like this every day. We use science twice a week in our program. Even though I do a lot of science, I still felt like I learned something about being prepared, keeping a journal, and asking open-ended questions with the kids.

Many of the treatment group leaders (66.7%) reported that they would share their self-evaluation results with a supervisor if they believed that the supervisor considered it a valuable form of professional development. Forty-four percent reported that they would invite their supervisor to observe them leading an activity with kids so as to develop their skills even further, and 29.6% reported that they would use the results of the self-evaluation to make a case for a raise or promotion.

One treatment group leader reported that she expected "to be lectured at" like other trainings she has participated in "because most trainings just write everything down (using text)." She was "pleasantly surprised" that this was not the case with the FETCH! training.

Most leaders (93%) reported that the training contained "just the right amount" of information. They told us:

I didn't feel bombarded. There was stuff I could take away and stuff I was familiar with that I could skim over.

It was not overwhelming.

All of the leaders (100%) indicated that they planned to use the FETCH! training again in the future, either for themselves or to train others and all of the leaders (100%) reported that they would recommend the FETCH! training to anyone who works with kids.

The FETCH! training helped leaders teach kids about specific science content knowledge and skills (e.g., making predictions, understanding real-world connections).

Leaders strongly agreed with the idea that the training, by extension, enhanced the students' experience of the hands-on science activities. We also found that leaders who participated in the FETCH! training were more likely to report that their kids learned something new about science ($p = 0.02$) and tested their new designs ($p = 0.01$) than leaders who did not participate in the FETCH! training.

Treatment group leaders expressed high levels of agreement with the following statements about the FETCH! training:

- I learned something new about leading hands-on activities with students.
- I learned the steps that scientists and engineers use to solve problems.

- I learned how to lead kids through the steps that scientists use to solve problems.
- I learned how to lead kids in hands-on science activities.
- I learned how to prepare for leading hands-on science activities.
- I learned how to use open-ended questions to encourage kids to experiment.

Leaders told us:

> *Not only is it a learning experience for the kids, it was a learning experience for me.*
>
> *It provided a different way to approach what I'm doing with them, and hopefully improved the way that an activity is done with younger kids. Now they're getting to the age where they can start thinking for themselves. It helped me to get them to start thinking for themselves.*
>
> *It was a way to prepare and to think about your program. I really wanted the kids to get the science behind the things. I never thought I was strong in science so I didn't want the children to have that same experience. Helped me focus and come up with talking points.*
>
> *People doing this have experience. I am an engineer. I felt very comfortable with it before I started, but that's not to say I didn't learn anything. I did.*
>
> *Just by going through experiments on my own...it was easier for me to ask those open-ended questions. To me, people don't ask open ended questions like they should so you don't get the answers you only want. It helped (kids) understand the process and the history.*

The FETCH! training helped leaders get kids excited and engaged in hands-on science activities.

We found that leaders who participated in the FETCH! training were more likely to report that their kids got excited about exploring, like scientists ($p = 0.02$) than leaders who did not participate in the FETCH! training. The leaders told us:

> *It was a good experience. I didn't expect it to go this good. A lot of kids you have to pull in to do programming, they just walk right out. The ones who participated had a great time and I had to calm them down. They went in hallway and had competitions. It was a blast. I didn't expect it to be that fun. Unexpected fun.*
>
> *Kids really excited; wanted to learn more. Our community is lower socio economic, so kids seeking additional resources on these subjects was great to see.*
>
> *The kids really liked it. They were excited about it. Asking lots of questions, coming up with their own games. They were excited to go home and show their families.*

During the course of conducting the evaluation, leaders offered suggestions for ways to enhance future FETCH! training materials and science activities. We have included the most common suggestions here for WGBH to consider as it develops future training courses and hands-on science activities:

Suggestions for future trainings

- Consider adding guidance to the training and activity materials that specifies an appropriate number of kids to include in the activities. In the case of our sample, the number of kids in each setting ranged from 11 to 14, which appeared to be an optimal number.
- Consider adding more examples of open-ended questions to the training. Leaders found the discussion of open-ended questions to be one of the most valuable pieces of the training, and it appeared to be one of the areas that leaders needed the most help with. It appears that future trainees could benefit from additional examples of such questions.
- Consider adding a professional development-related suggestion to training participants to share their self-evaluation results with their supervisors or to encourage their supervisors to observe them while they lead hands-on science activities.
- Despite the previous recommendations, we would not recommend adding a *significant* amount of additional information to the training because most leaders reported that the training contained "just the right amount" of information.

Suggestions for future hands-on activities

- In the future, when developing activities for kids, consider developing some new, unique, hands-on science activities. Some leaders have used the FETCH! activities previously or have tried the same activities, even if they didn't come from FETCH! (e.g., the catapult activity). Leaders indicated that they are looking for new, unique activities that haven't been tried before.
- Consider highlighting the fact that the activities are meant for kids aged 8 to 10 years old.
- Consider including suggestions for material substitutions. Materials that were particularly difficult for leaders in our sample to gather included pennies and brass fasteners. Other materials that were difficult for a few of the programs to gather included toilet paper or paper towel tubes, cardboard boxes, mini marshmallows, duct tape and meter sticks.
- Consider adding more background information to explain difficult science concepts and the scientific method. The most challenging concepts for leaders and kids were: displacement, kinetic energy, and potential energy. Additionally, almost 25% of the leaders reported that kids struggled with the concept of a fulcrum, too.

In summary, this summative evaluation study found evidence that the FETCH! training brings an added value to the already-proven FETCH! hands-on activities. The FETCH! training appeared to provide just the right amount of information to adults working with kids across a variety of informal educational settings, across the country. The FETCH! training helped leaders to be more prepared and more comfortable leading hands-on science activities with kids. The FETCH! training also appeared to enhance leaders' ability to convey science concepts and processes and leaders' ability to engage kids and get them excited about doing science activities. While the FETCH! activities alone also appear to be highly effective at engaging kids, the FETCH! training used in combination with the activities were successful at helping leaders approach the activities with more confidence and a higher degree of preparation than leaders who used the FETCH! activities without training.

Appendix A: Pre-test Survey

General Questions

1. I am comfortable with my ability to encourage kids to explore and be curious about the world around them through hands-on activities.

    a. No
    b. Somewhat
    c. Yes

2. I am comfortable with my ability to convey science concepts to kids.

    a. No
    b. Somewhat
    c. Yes

3. I am comfortable with my ability to help kids develop scientific ways of thinking.

    a. No
    b. Somewhat
    c. Yes

Before the Activity

4. I am comfortable with my ability to review the activity and required materials before sharing with kids.

    a. No
    b. Somewhat
    c. Yes

5. I am comfortable with my ability to try the activity myself before teaching it to the kids.

    a. No
    b. Somewhat
    c. Yes

6. I am comfortable with my ability to determine my learning goals (what I want the kids to learn) ahead of time.

    a. No
    b. Somewhat
    c. Yes

7. I am comfortable with my ability to identify open-ended questions about the activity, which ask kids to explain and expand on their thoughts rather than give one or two word answers.

    a. No
    b. Somewhat
    c. Yes

8. I am comfortable with my ability to identify and list variables (aspects of the activity that could be altered) so I can help kids experiment.

    a. No
    b. Somewhat
    c. Yes

During the Activity

9. I am comfortable with my ability to explain the activity and present the materials clearly and concisely to kids.

    a. No
    b. Somewhat
    c. Yes

10. I am comfortable with my ability to introduce new science concepts and vocabulary in language kids can understand.

    a. No
    b. Somewhat
    c. Yes

11. I am comfortable with my ability to encourage kids to make predictions and observations.

    a. No
    b. Somewhat
    c. Yes

12. I am comfortable with my ability to ask open-ended questions to help kids analyze, experiment, and solve problems.

    a. No
    b. Somewhat
    c. Yes

13. I am comfortable with my ability to help kids think like scientists by encouraging them to ask questions, make predictions and observations, test and revise ideas, and analyze results.

    a. No
    b. Somewhat
    c. Yes

14. I am comfortable with my ability to help kids identify and change variables as they do an activity.

    a. No
    b. Somewhat
    c. Yes

15. I am comfortable with my ability to help the kids share their results at the end of an activity and recognize their scientific ways of thinking.

    a. No
    b. Somewhat
    c. Yes

Background Questions

16. For how many years have you been leading activities with kids?

17. In what settings have you led activities with kids? (Choose all that apply)

    a. Boys and Girls Clubs
    b. 4-H
    c. Girl Scouts
    d. Boy Scouts
    e. YMCA
    f. YWCA
    g. Summer Camp
    h. School
    i. Library
    j. Museum
    k. National Engineers Week program
    l. I volunteer to work with kids in my profession / career
    m. Other

18. Have you ever led science-based activities with kids?

    a. Yes
    b. No

19. In what ways do you normally lead science activities with your students? (Choose all that apply)

    a. Lecture to them
    b. Let them work in pairs
    c. Let them work in groups

d. Engage them in group discussion
e. Encourage them to work independently
f. Allow them to lead / teach the class
g. Allow them to be flexible and creative with their designs
h. Encourage them to learn by trial and error
i. Provide a demonstration

20. How many times in the past year have you led science-based activities with kids?

a. 1-2
b. 3-5
c. 6-10
d. 10+

21. Do you enjoy leading science activities for kids?

a. I love it
b. I like it
c. I don't like it very much
d. I don't like it at all

22. Have you ever led kids using FETCH! activities from WGBH (PBS)?

a. Yes
b. No

23. How many times in the past year have you led kids using FETCH! activities?

a. 1-2
b. 3-5
c. 6-10
d. 10+

24. How important is it to you, personally, to teach kids about science?

a. Not important at all
b. Somewhat important
c. Neutral
d. Important
e. Very important

25. How important is it for kids to learn about science outside of school?

    a. Not important at all
    b. Somewhat important
    c. Neutral
    d. Important
    e. Very important

26. How many of the kids in your program are interested in science?

    a. Almost none of the kids are interested in science
    b. Some of the kids are interested in science
    c. Most of the kids are interested in science

27. Please summarize how you typically prepare to lead kids' activities.

28. What is your gender?

    a. Male
    b. Female

29. Are you of Hispanic, Latino, or Spanish origin?

    a. Yes
    b. No

30. What is your race / ethnicity? (Choose all that apply)

    a. American Indian / Alaskan Native
    b. Asian
    c. Black or African-American
    d. Native Hawaiian or Other Pacific Islander
    e. White or Caucasian

31. Within which age range do you fall?

a. 18-29
b. 30-39
c. 40-49
d. 50-59
e. 60-69
f. 70+

32. What is the highest level of education you have completed?

a. No high school diploma
b. High school diploma or GED
c. Associate's degree
d. Bachelor's degree
e. Master's degree, including MBA
f. Doctoral degree, including JD or MD
g. Other

33. Do you have a teaching certificate?

a. Yes
b. No

34. What is your first and last name?

35. What is your e-mail address?

Appendix B: Post-test Survey

General Questions

1. I am comfortable with my ability to encourage kids to explore and be curious about the world around them through hands-on activities.

    a. No
    b. Somewhat
    c. Yes

2. I am comfortable with my ability to convey science concepts to kids.

    a. No
    b. Somewhat
    c. Yes

3. I am comfortable with my ability to help kids develop scientific ways of thinking.

    a. No
    b. Somewhat
    c. Yes

Before the Activity

4. I am comfortable with my ability to review the activity and required materials before sharing with kids.

    a. No
    b. Somewhat
    c. Yes

5. I am comfortable with my ability to try the activity myself before teaching it to the kids.

    a. No
    b. Somewhat
    c. Yes

6. I am comfortable with my ability to determine my learning goals (what I want the kids to learn) ahead of time.

    a. No
    b. Somewhat
    c. Yes

7. I am comfortable with my ability to identify open-ended questions about the activity, which ask kids to explain and expand on their thoughts rather than give one or two word answers.

    a. No
    b. Somewhat
    c. Yes

8. I am comfortable with my ability to identify and list variables (aspects of the activity that could be altered) so I can help kids experiment.

    a. No
    b. Somewhat
    c. Yes

During the Activity

9. I am comfortable with my ability to explain the activity and present the materials clearly and concisely to kids.

    a. No
    b. Somewhat
    c. Yes

10. I am comfortable with my ability to introduce new science concepts and vocabulary in language kids can understand.

    a. No
    b. Somewhat
    c. Yes

11. I am comfortable with my ability to encourage kids to make predictions and observations.

    a. No
    b. Somewhat
    c. Yes

12. I am comfortable with my ability to ask open-ended questions to help kids analyze, experiment, and solve problems.

    a. No
    b. Somewhat
    c. Yes

13. I am comfortable with my ability to help kids think like scientists by encouraging them to ask questions, make predictions and observations, test and revise ideas, and analyze results.

    a. No
    b. Somewhat
    c. Yes

14. I am comfortable with my ability to help kids identify and change variables as they do an activity.

    a. No
    b. Somewhat
    c. Yes

15. I am comfortable with my ability to help the kids share their results at the end of an activity and recognize their scientific ways of thinking.

    a. No
    b. Somewhat
    c. Yes

16. How important is it to you, personally, to teach kids about science?

a. Not important at all
b. Somewhat important
c. Neutral
d. Important
e. Very important

17. How important is it for kids to learn about science outside of school?

a. Not important at all
b. Somewhat important
c. Neutral
d. Important
e. Very important

18. How many of the kids in your program are interested in science?

a. Almost none of the kids are interested in science
b. Some of the kids are interested in science
c. Most of the kids are interested in science

Now we would like to ask you some questions about your experience with the FETCH! activities.

19. Were you able to do both activities with your kids?

a. Yes
b. No, we only did Float My Boat
c. No, we only did Target Practice

20. When did you do the activities?

	Month (e.g., October, November)	**Day (e.g., 1, 14, 28)**
Float My Boat		
Target Practice		

21. Which of the following did you do to prepare to lead the FETCH! activities with the kids? (Please choose all that apply)

    a. I only glanced at the Activity Sheets
    b. I read the Activity Sheets completely
    c. (Float My Boat only) I read the Leader Notes completely
    d. (Float My Boat only) I read the Leader Notes from cover to cover
    e. I gathered all the materials I needed
    f. I tried the activities myself
    g. I did a little extra research on the science behind the activities
    h. I came up with some learning goals (things I wanted the kids to learn)
    i. I wrote down some open-ended questions to use with the kids
    j. I wrote down some variables (aspects of the activities that could be altered) so I could help the kids experiment
    k. Other

22. How prepared did you feel before leading the first activity?

    a. Very prepared
    b. Somewhat prepared
    c. Not prepared at all

23. How prepared did you feel before leading the second activity?

    a. Very prepared
    b. Somewhat prepared
    c. Not prepared at all
    d. I did not lead a second activity

24. How many kids participated in Float My Boat?

25. How many kids participated in Target Practice?

26. Which of the following materials or supplies did you have trouble getting? (Choose all that apply)

    a. Plastic spoons
    b. Other
    c. Rubber bands
    d. Duct tape
    e. Craft sticks
    f. Brass fasteners
    g. Scissors
    h. Mini marshmallows
    i. Pens
    j. Toilet paper or paper towel tubes
    k. Cardboard boxes
    l. Meter stick
    m. Tin foil
    n. 100 pennies per kid
    o. Dishpan or bucket half filled with water
    p. Towels
    q. Rulers
    r. Sticky notes or pieces of scrap paper
    s. Copies of Activity Sheets for kids
    t. I didn't have problems getting any of these materials

27. Did you make any adaptations to the materials or the activity guide?

    a. No
    b. Yes (Please describe)

28. How satisfied were you with the activities?

    a. Satisfied
    b. Neutral
    c. Unsatisfied
    d. Not Applicable

29. Did you enjoy leading the FETCH! activities with the kids?

a. I really enjoyed it
b. I enjoyed it somewhat
c. I only enjoyed it a little
d. I did not enjoy it at all

30. Were you able to use open-ended questions to get the kids to explain their ideas?

a. Yes
b. Not consistently
c. Not at all

31. Which of the following changes did you see in the kids after doing the activities?

	Strongly Disagree	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**
The kids were more excited about science.					
The kids were more interested in doing science activities in our program.					
The kids were able to think more like scientists.					

32. What other changes did you see, if any?

33. What do you think caused the changes in the kids? (Choose all that apply)

a. The activities themselves
b. The kids themselves
c. Your ability to teach
d. Other

34. Did you observe changes in the kids after 1 or 2 activities?

a. After just 1
b. Not until they did 2 activities

35. Please tell us how many of the kids in your group demonstrated the following behaviors:

	All of the kids	**Many of the kids**	**Some of the kids**	**None of the kids**	**Not Applicable**
The kids showed that they could think systematically, like scientists.					
The kids learned something new about science.					
The kids got excited about exploring, like scientists.					
The kids took the activities seriously.					
After doing Float My Boat, the kids understood that building a flatter boat was a better way to hold more coins.					
After doing Float My Boat, the kids saw the connection between how much water a boat displaces and how much it can carry.					
After doing Float My Boat, the kids understood that water pushes on the bottom and sides of a boat, holding it up.					
After doing Target Practice, the kids understood that potential energy was stored in the rubber band when the lever was pulled back in preparation for launch.					
After doing Target Practice, the kids understood the role the fulcrum and lever played in their design.					
The kids brainstormed their designs with each other.					
The kids made predictions about their designs before they built them.					
The kids tested their original designs.					
The kids changed at least one variable at a time.					
The kids tested their new designs.					
The kids were able to determine which changes caused different outcomes during testing.					
The kids shared their results with each other.					

36. Which of the following, if any, did the kids have a hard time understanding? (Choose all that apply)

    a. Buoyancy (the tendency to float in water)
    b. Displacement (the amount of fluid pushed out of the way when an object is placed in water)
    c. Catapult (mechanical device used to throw an object)
    d. Lever (rigid bar pivoted around a fulcrum)
    e. Fulcrum (the pivot point for a lever)
    f. Load (weight to be borne)
    g. Potential energy (stored energy)
    h. Kinetic energy (energy of motion)
    i. Brainstorming a design
    j. Designing something
    k. Building something
    l. Testing a design
    m. Redesigning something
    n. Sharing results with others
    o. None of these

37. Which of the following, if any, did YOU have a hard time understanding? (Choose all that apply)

    a. Buoyancy (the tendency to float in water)
    b. Displacement (the amount of fluid pushed out of the way when an object is placed in water)
    c. Catapult (mechanical device used to throw an object)
    d. Lever (rigid bar pivoted around a fulcrum)
    e. Fulcrum (the pivot point for a lever)
    f. Load (weight to be borne)
    g. Potential energy (stored energy)
    h. Kinetic energy (energy of motion)
    i. Brainstorming a design
    j. Designing something
    k. Building something
    l. Testing a design
    m. Redesigning something
    n. Sharing results with others
    o. None of these

38. Would you recommend the FETCH! activities to someone else?

a. Yes
b. Not sure
c. No

39. If you did not say Yes to the previous question, please explain.

40. Do you expect to use the FETCH! activities again?

a. Yes
b. Not sure
c. No

41. If you did not say Yes to the previous question, please explain.

42. Is there anything else that you would like WGBH to know?

Appendix C: Score Report Examples (Pre- and Post-test)

Appendix D: Treatment Group Post-test Interview Questions

1. How long after completing the self-evaluation did you start the online training?

    a. Immediately
    b. Waited a couple days
    c. A week or so
    d. A couple weeks
    e. A month or more
    f. Other

2. (If more than one week) Was there a reason that you needed to wait before you could start the training? (Probe whether the delay was due to something inherent in the training, the activities, the study or something else)

3. How much time did you spend on the training?

    a. Less than 10 minutes
    b. 10 to 29 minutes
    c. 30 minutes to an hour
    d. Over an hour

4. What did you EXPECT from this training?

    a. Ideas for hands-on activities
    b. Ideas for science activities
    c. Ideas for leading activities found in the FETCH! activity guide
    d. A list of general science activities
    e. Ideas for getting kids interested in science
    f. Tips for becoming better at leading science activities
    g. I didn't have any expectations prior to visiting this site
    h. Other

5. Before doing this training, how familiar were you with the science process -- the steps that scientists use to explore and answer questions?

    a. I had never heard of this process
    b. I had heard of the process, but was not sure what it was
    c. I had heard of the process and felt confident that I knew what it was

6. Did you take the online training?

    a. Yes, more than once
    b. Yes, once
    c. Parts of it, but not all
    d. No

7. Did you watch all of the slide shows provided in the training?

    a. Yes, more than once
    b. Yes, once
    c. Some of it, but not all
    d. No

8. Please rate how useful you found each of the following features of the training:

	Very Useful	**Useful**	**Only a Little Useful**	**Not Useful at All**	**Not Applicable / I didn't use it**
Self-evaluation (pre, including score report)					
FETCH! Hands-on Science Training: The entire Learn to Lead section					
FETCH! Hands-on Science Training: Prepare section					
FETCH! Hands-on Science Training: Introduce section					
FETCH! Hands-on Science Training: Try It section					
FETCH! Hands-on Science Training: Revise and Test section					
FETCH! Hands-on Science Training: Share section Reflect sections					
Watch sections					
Review sections					
Apply sections					
Slide show					
Practice What You've Learned section					
Self-evaluation (post, including score report)					
Learn to Lead (PDF)					
Activity Checklist (PDF)					
Transcript of the slide show (PDF)					
Journal					
Target practice activity sheet (PDF)					
Float My Boat activity sheet and Leader Notes (PDF)					
PowerPoint presentation that helped me train others					
Additional resources (where you could find more FETCH! guides, activities, and tips, along with the tools to hold face to face training for colleagues)					

9. For the ones you rated as Very Useful, please tell us which ones were the Most Useful and why.

10. Can you name 1 or 2 ideas that you took away from this training?

11. Overall, would you say the training provided...

    a. Too much information
    b. Just the right amount of information
    c. Not enough information

12. How long after completing the online training did you start the activities with kids?

    a. Immediately
    b. Waited a couple days
    c. A week or so
    d. A couple weeks
    e. A month or more
    f. Other

13. (If more than one week) Was there a reason that you needed to wait before you could start the activities?

14. On a scale of 1 to 5, from Strongly Disagree to Strongly Agree, how much do you agree with the following statements:

	Strongly Disagree	**Disagree**	**Neutral Useful**	**Agree**	**Strongly Agree**
I learned something new about leading hands-on activities with students.					
I learned the steps that scientists and engineers use to solve problems.					
I learned how to lead kids through the steps that scientists use to solve problems.					
I learned how to lead kids in hands-on science activities.					
I learned how to prepare for leading hands-on science activities.					
I learned how to use open-ended questions to encourage kids to experiment.					
I didn't learn anything new.					
The website was informative.					
The website was easy to use					
I like the use of video throughout the website.					
The training, by extension, enhanced the students experience of the hands-on science activities.					

15. In your second self-evaluation, you reported that you felt more confident (preparing, leading, etc.). Can you please tell us more about that?

16. In your second self-evaluation, you reported that you felt less confident (preparing, leading, etc.). Can you please tell us more about that?

17. In your second self-evaluation, you reported no change in your confidence level (preparing, leading, etc.). Can you please tell us more about that?

18. How did you feel about taking a self-evaluation? (Probe: Did it make you nervous, did it make you take the training more seriously, were you worried about how you would score on the post-test, did it assure you that you would learn some useful tips, etc.?)

19. Was the self-evaluation adequate? Are there other areas you would have liked to assess about yourself and your ability to lead activities with kids?

    a. I wouldn't add anything
    b. I would add...

20. If you knew that your supervisor considered this training a beneficial form of professional development, would you...

    a. Share your evaluation results with him/her
    b. Use the results to make a case for a raise or promotion
    c. Invite your supervisor to observe you leading an activity with kids so as to develop your skills even further
    d. Other

21. In your own words, how was your experience in leading an activity different after you had completed the training? How do you think the experience was different for your students?

22. Would you recommend the training to someone else?

    a. Yes
    b. Not sure
    c. (No

23. If so, who and why?

24. Would you use this training again?

25. What materials or information could WGBH have provided that would have made the training better?

26. Is there anything else that you would like WGBH to know?

Appendix E: Recruitment Screening Instrument

1. Your first and last name:

2. Email address:

3. Best way to contact you during the summer (you may choose more than one):

    a. Cell phone
    b. Home phone
    c. Other phone
    d. Email

4. Best way to contact you during September and beyond (you may choose more than one):

    a. Cell phone
    b. Home phone
    c. Other phone
    d. Email

5. Type of program you lead:

    a. Boys and Girls Clubs
    b. 4-H
    c. Girl Scouts
    d. Boy Scouts
    e. YMCA
    f. YWCA
    g. Summer camp
    h. School
    i. Library
    j. Museum
    k. National Engineers Week program
    l. I volunteer with kids in my profession / career
    m. Other

6. Number of kids in your group that would participate in activities:

For the following questions, please give us your best guess as to the % of kids in each category.

7. What percent of your kids are (should add up to 100 %):

   Male (%) _____
   Female (%) _____

8. What percent of your kids are of Hispanic, Latino, or Spanish origin?

   Hispanic, Latino or Spanish origin (%) _____

9. What percent of your kids are (should add up to 100 %):

   American Indian or Alaskan Native (%) _____
   Asian (%) _____
   Black or African American (%) _____
   Indian or Middle Eastern (%) _____
   Native Hawaiian or Other Pacific Islander (%) _____
   White or Caucasian (%) _____

10. What percent of your kids are (should add up to 100 %):

    Low Income (%) _____
    Middle Income (%) _____
    High Income (%) _____

11. Which of the following best describes the area in which the kids you serve live?

    a. Urban (in a city)
    b. Suburban (near a city, but not in a city)
    c. Rural (far from any cities)

12. Have you ever led science-based activities with kids before?

    a. Yes
    b. No

13. How many times in the past year have you led science-based activities with kids?

a. 1-2
b. 3-5
c. 6-10
d. 10+

14. Have you ever led kids using FETCH! activities from WGBH (PBS)?

a. Yes
b. No

15. Have you ever led kids using ZOOM activities from WGBH (PBS)?

a. Yes
b. No

16. In what state are you based?

17. Are you available to participate in the study in October and November 2009?

a. Yes
b. No

18. Do you have any questions for us about the study?