

SPYHOUNDS PILOT: EVALUATION REPORT



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Introduction

Background

Spyhounds, created by WGBH, is a new transmedia learning experience for 6- to 10-year old children. *Spyhounds* represents an effort to extend the value of the successful TV series *FETCH! with Ruff Ruffman* by moving to a new media platform and revamping the storyline. The popular character Ruff Ruffman becomes a super spy and must complete top-secret missions. Ruff needs help (both on and offline) from kids at home, who become the *Spyhounds*. Each mission is designed to have kids watch new animation, complete online activities designed to promote STEM exploration, and participate in offline activities that require kids to investigate real world phenomena.



Figure 1. The lead character, Ruff Ruffman.

In 2011, WGBH received a Pathways grant from the National Science Foundation to provide development support to fund a pilot phase of the project. The STEM content in the pilot phase focused on physical science. Deliverables included 4 x 60-second mini animated episodes, 3 interactive games, 3 hands-on activities, 20 x 30-second audio updates from Ruff, daily in-character blog updates as Ruff plays out the mission, online decoding activities, daily social media updates through Facebook and Twitter, editorial staff reviewing/posting user generated content, and Web-based survey data. This content was rolled out over a 4-week period, with new material added every weekday.

While the project design is rooted in an evidence-based curriculum and lessons learned from prior work, the *Spyhounds* concept seeks to offer a new educational media model. The pilot phase supported by this grant will help inform the future development of future *Spyhounds* missions.

Evaluation Design

WGBH hired Concord Evaluation Group (CEG) to perform an external evaluation of *Spyhounds*. CEG conducted a national home-based study to assess whether *Spyhounds* had an impact on:

- Kids' understanding of physical science concepts,
- Kids' and parent's attitudes toward science, and
- Kids' and parents' interest in doing science activities at home.

CEG also assessed the appeal of the materials and the degree to which families reported using math. In addition, CEG collected formative data about the experience of using *Spyhounds* in order to inform future development.

CEG recruited study participants from its national panel of research participants. Potential participants with children were informed about the study via email and were encouraged to complete a recruitment screener if they were interested in participating in the study. One hundred and thirty families (with 157 kids) were eligible and were invited to participate in the study. Some families had two children in the target age range who participated in the study.¹ Of those who were invited to participate, 97 families with 115 kids completed the study. Those who chose not to participate did so primarily because of anticipated time conflicts (the study took place between Thanksgiving and the December holidays).

At the start of the study, in November 2011, we asked families to complete a Web-based pre-test survey together (Appendix). Some questions were designed for the kids to answer and others were designed for the parents to answer. Recognizing that some kids may not be able to read or type before age 8, we carefully instructed parents how to assist by typing their kids' responses without interfering with their kids' answers. We instructed parents to type only what their kids said aloud, even if the kids provided a wrong answer.

Following the pre-test, the families were instructed to try-out the *Spyhounds* transmedia experience over a period of 20 days (i.e., one *Spyhounds* mission). At the end of the mission, CEG administered a post-test (Appendix) to all families to assess changes in learning, attitudes, and interest in doing science activities after using *Spyhounds*.

¹ We expected that kids in the same household would provide responses to the surveys that are more highly correlated with each other than with kids in different households. Since such a phenomenon, called intra-class correlation (ICC), can artificially inflate the results so we controlled for the ICC in our analyses.

About the Participants

Our sample included 97 families and 115 kids from 21 different states across the country. Kids ranged in age from 5 to 8 years, with an average age of 7 years (sd = 1.01). The sample was evenly split between boys (n = 57) and girls (n = 58). The racial and ethnic background of the kids in our sample mirrored national proportions (see the Table below).

Table 1:
Kids' Races/Ethnicities

Race/Ethnicity	Number and Percent (N = 115)
White or Caucasian	85 (73.9%)
Hispanic	16 (13.0%)
Black or African American	15 (13.0%)
Asian	10 (8.7%)
Native American or American Indian	2 (1.8%)

Note: The total percents add up to greater than 100% because some kids identified with more than one race or ethnicity.

Roughly two-thirds of the families (67%) reported that they had average household incomes, while 11.3% reported they had lower than average household incomes and 21.6% reported they had higher than average incomes.

Table 2:
Family Household Income

Characteristic	Number and Percent (N = 97)
Better than the average family	21 (21.6%)
Same as the average family	65 (67.0%)
Worse than the average family	11 (11.3%)

Nearly half of the families reported that the highest level of educational attainment in their household was a bachelor’s degree (48.5%). Another 16.5% reported that someone in the household had achieved a master’s degree, while 15.5% reported that they had some college credit, but no degree.

Table 3:
Family Educational Backgrounds

Characteristic	Number and Percent (N = 97)
High school graduate (e.g., diploma or GED)	9 (9.3%)
Associate degree (e.g., AA or AS) or certificate program	3 (3.1%)
Some college credit, but no degree	15 (15.5%)
Bachelor’s degree (e.g., BA, AB or BS)	47 (48.5%)
Master’s degree (e.g., MA, MS, MEng, Med, MSW, MBA)	16 (16.5%)
Doctorate degree (e.g., PhD, EdD)	3 (3.1%)
Professional degree (e.g., MD, DDS, DVM, LLB, JD)	4 (4.1%)

About half of the kids (51.3%) reported that they had watched *FETCH! with Ruff Ruffman* prior to the study, while 40.9% reported that they hadn’t and 7.8% were unsure. Among the 59 kids who reported that they have watched *FETCH!*, most report that they enjoy watching the show (n = 50, 84.7%). Of the remaining 9 kids, 8 reported that they think *FETCH!* is OK (13.6%) and only one (1.7%) reported that they did not like the show.

Findings

Kids' Science Content Knowledge

On the pre-test and post-test surveys, we asked kids 5 content-related questions designed to assess their understanding of basic physical science concept (Appendix). Kids earned one point for each question they answered correctly. Thus, the range of possible scores was 0 to 5 points.

We found that the average pre-test score (before playing *Spyhounds*) was 2.60 correct (sd = 1.47). The average post-test score (after playing *Spyhounds*) was 3.85 correct (sd = 1.26). This represents a statistically significant increase of 48% in scores ($t_{(df = 114)} = -8.372, p = .000$), with a very large effect size = .84.²

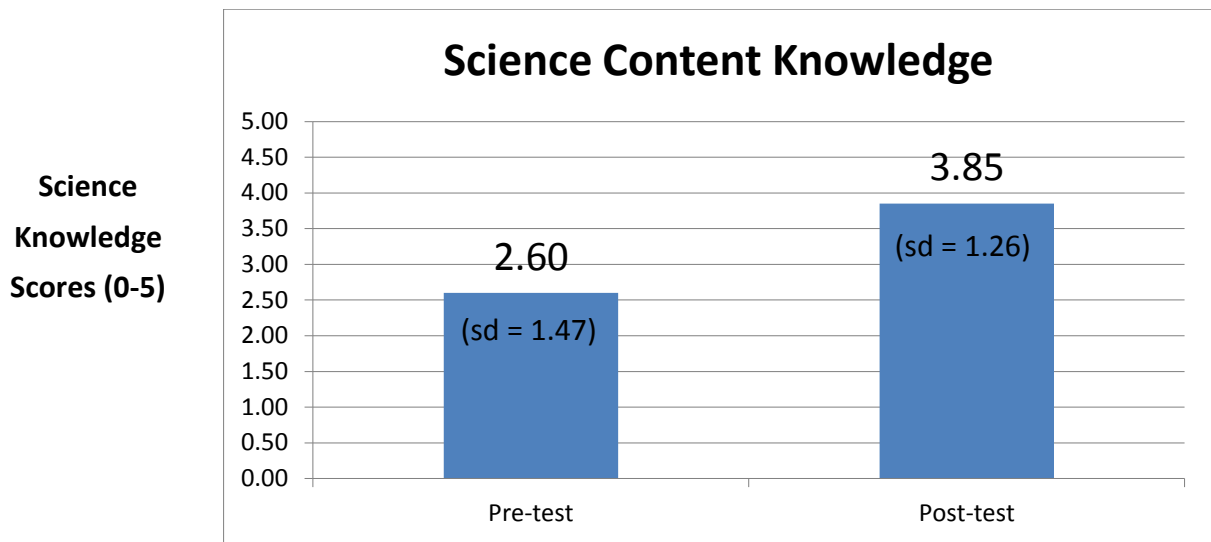


Figure 2. Change in science knowledge scores over time.

We also analyzed the data to see if there were any relationships between demographic or background variables and changes in knowledge scores. The possible predictor variables we examined included: gender, age, white versus non-white status, family income, whether kids watched *FETCH!* before, or frequency of *Spyhounds* website use (daily versus every other day versus something else). None of the variables were significant predictors of content gains. In other words, the gains we saw in content knowledge spanned across all subgroups.

² Controlling for intra-class correlation between siblings ($F_{(1, 115)} = 359.825, p = .000$).

Kids' Science-Related Attitudes and Interest Level

Before playing *Spyhounds*, most kids (91.3%) reported that they thought “science was fun.” This proportion increased to 97.4% after the kids played *Spyhounds*. This was a statistically significant increase ($\chi^2_{(df=1)} = 6.619, p = .020$).³

Table 4:
Kids' Attitudes towards Science

	Science is Really Fun	Science is Sort of Fun	Science is Not Fun	I Don't Really Know What Science Is
Before <i>Spyhounds</i>	71 (61.7%)	34 (29.6%)	6 (5.2%)	4 (3.5%)
After <i>Spyhounds</i>	80 (69.6%)	32 (27.8%)	2 (1.7%)	1 (0.9%)

Before playing *Spyhounds*, about three-quarters of kids (76.5%) reported that they liked to do science activities at home. After playing *Spyhounds*, 87% reported that they enjoyed doing science at home, which represented a statistically significant increase ($\chi^2_{(df=1)} = 7.740, p = .010$).

Table 5:
Kids' Interest in Doing Science Activities

	Yes	No	I Don't Know
Before <i>Spyhounds</i>	88 (76.5%)	10 (8.7%)	17 (14.8%)
After <i>Spyhounds</i>	100 (87.0%)	8 (7.0%)	7 (6.1%)

One research question we explored was whether frequency of exposure to *Spyhounds* would impact science-related attitudes or interest. We found there were no differences in attitudes or interest based on the frequency with which the kids used the *Spyhounds* website. In other words, kids who used the website on a weekly basis were just as likely to demonstrate improvements in attitudes towards science as kids who visited the site daily.

³ Fisher's exact test was used to test the difference in proportions.

Parental Science-Related Attitudes and Interest Level

To place the findings within a context, it may be helpful to know how families used *Spyhounds* together. Most parents (89.7%) reported that they played at least some aspects of the game together with their kids:

- 42.3% of parents reported that they were always present when their kids used the website.
- 10.3% of parents reported that they were never present when their kids used the website.
- 28.9% of parents reported that they always participated in the hands-on activities.
- Only one parent reported that their kids did the hands-on activities alone.

About one-quarter of the parents (23.7%) reported that Facebook motivated them to get their kids engaged with the online content; while only 10.3% reported that Twitter motivated them to do so.

Before playing *Spyhounds* with their kids, most parents (90.8%) reported that they enjoyed learning about science. After playing *Spyhounds* with their kids, this proportion increased to 93.8%. This represents a statistically significant increase ($\chi^2_{(df=1)} = 18.284, p = .000$).

Table 6:
Parental Attitudes towards Science

	I Love to Learn about Science	I Like to Learn about Science	I Don't Really Enjoy Science
<i>Before Spyhounds</i>	57 (58.8%)	31 (32.0%)	9 (9.3%)
<i>After Spyhounds</i>	53 (54.6%)	38 (39.2%)	6 (6.2%)

Before playing *Spyhounds* with their kids, about three-quarters of parents (78.3%) reported that they enjoyed doing science activities with their kids. After playing *Spyhounds*, this proportion increased to 89.7%. This represents a statistically significant increase ($\chi^2_{(df=1)} = 7.311, p = .006$).

Table 7:
Parental Interest in Doing Science Activities

	I Love to Do Science with My Kids	I Like to Do Science with My Kids	I Don't Really Enjoy Doing It	I Have Never Tried	I Don't Know How
<i>Before Spyhounds</i>	46 (47.4%)	30 (30.9%)	0 (0.0%)	12 (12.4%)	9 (9.3%)
<i>After Spyhounds</i>	52 (53.6%)	35 (36.1%)	4 (4.1%)	0 (0.0%)	6 (6.2%)

We also asked parents to report what they perceived to be the impact of *Spyhounds* on them and their kids. Parents agreed that *Spyhounds* taught their families something new about physical science, that it helped get their families excited about physical science, and that it taught parents how to do physical science activities with their children and that they felt more motivated to do so after playing *Spyhounds*.

Table 8:
Parent Reported Impacts (N = 97)
Scale = 1 (“Strongly disagree”) to 5 (“Strongly agree”)

	Average Agreement	Standard Deviation
<i>Spyhounds</i> taught my child something new about physical science	4.6	.63
<i>Spyhounds</i> helped my child get more excited about physical science	4.4	.72
<i>Spyhounds</i> helped me learn how to do physical science activities with my child(ren)	4.4	.64
<i>Spyhounds</i> motivated me to try more physical science activities together as a family in the future	4.4	.70
<i>Spyhounds</i> taught me something new about physical science	4.0	1.03
<i>Spyhounds</i> helped me get more excited about physical science	4.0	.85

Using Math in *Spyhounds*

Almost three-quarters of parents (n = 71, 73.2%) reported that they and their child used math as well as science while playing *Spyhounds*. Parents were most likely to report using math when their kids made and tested parachutes and slingshots, as well as in cracking the codes on the website. Math skills mentioned included counting, measurement, addition, subtraction, data analysis, prediction, and comparing. For example, some parents told us:

- *My daughter measured the string to attach to the parachutes in the air resistance activity.*
- *We made a chart with the parachute game. We tallied our answers.*
- *We played with the parachute a lot and made other parachutes. We weighed objects and made predictions based on the weight.*
- *With the parachute activity she had to add and subtract weight.*

- *During the Secret Codes - my daughter enjoyed writing down each letter which correlated to a number which when put all together formed the words for the Secret Code - she needed to put all the data together in order to discover the message which created a mystery which she enjoyed figuring out.*
- *For the slingshot project we used lots of different materials and wrote down and compared differences, distances.*
- *The slingshot project had us measuring feet and inches for distance as well as angle measurements.*

Feedback on *Spyhounds*

Positive Features

The majority of parents (87%) reported that they would recommend *Spyhounds* to other families with kids in the same age range. The remainder indicated that they “might” recommend it. Likewise, 89.6% of parents reported that their kids would play other *Spyhounds* games in the future. The remainder reported that they “might.”

Almost three-quarters of the kids (72.2%) reported that they “had a lot of fun” playing *Spyhounds* while 25.2% reported they “had a little fun” playing *Spyhounds*. We asked the kids to rate each of the *Spyhounds* website and activity features on a scale of 1 (“Did not like it”) to 5 (“Loved it”). Their responses are summarized in the table below. All of the features were rated highly (i.e., at least a 4.0). The most popular features represented a combination of games, interactive web features, and at-home science activities. These included: the Slingshot Fling and Parachute Plunge games, breaking codes with the Code Breaker, and making and testing a real slingshot (hands-on activity).

Table 9:
Kids’ Ratings of the Various *Spyhounds* Features

<i>Spyhounds</i> Features	N	Average	SD
Playing Slingshot Fling	105	4.6	.72
Playing Parachute Plunge	112	4.5	.75
Breaking codes with the Code Breaker	112	4.4	.74
Making and testing a real slingshot	100	4.4	.93
Making and testing a real parachute	109	4.3	.82
Playing Chicken-ator	99	4.3	.90
Listening to Ruff tell the story	109	4.3	.90

Spyhounds Features	N	Average	SD
Watching the videos of Ruff and Chet	110	4.3	.89
Making and testing a real chicken-ator	96	4.2	.99
Sending drawings or photos to Ruff with the Spy Sketcher	109	4.2	1.03
Listening to the Spy Sounds	110	4.2	.87
Reading Spy Messages from <i>Spyhounds</i>	100	4.1	.99
Sending Spy Messages to Ruff	98	4.0	.96
Looking at drawings and photos from <i>Spyhounds</i>	112	4.0	1.09

Almost two-thirds of the families (62.3%) indicated that they would likely play the *Spyhounds* game if it was available on a mobile device. An additional 27.3% reported that they “might.” Families reported that the most appealing mobile features would be: games (88%), videos (68.8%), Spyttime Mission Directions (58.4%), audio (48.4%), SpySketcher (53.2%), and messages to Ruff (45.5%).

A few kids told us their favorite things about *Spyhounds* were...

- *I got some ideas about science projects for my school fair.*
- *I liked chet and mr ruff they made me laugh and i was happy i help get the poodle diamond back (sic).*
- *The games that you can play.*
- *The games were the best part.*
- *I learned that science fun and it used in everything (sic)!!*
- *I lerned that science can be fun and aboiut air resistance (sic).*
- *Science is fun.*
- *That nothing is impossible as long as i put my mind on it (sic).*

Parents told us...

- Their kids enjoyed the humor and games...
 - *All 3 of my boys (10, 7, and 4) loved how funny Ruff was. The 7 year old did all the 'official' work, but everyone did the site together and they thought the humor was great.*
 - *Fun and interactive.*
 - *I think my child really enjoyed Ruff's humor and the experiments.*

- *My son loved the game. I found him asking to play all the time.*
- *Simple enough and entertaining for young children.*
- *We liked the animated videos with Ruff which are fun & educational, which is a great combo for young kids.*
- Their kids liked the idea of playing a spy and working towards a goal...
 - *She liked the Secret Codes very much which engaged her attention & gave her a sense of accomplishment when she completed them - so she had to work for her benefit which is also a great productive lesson for kids.*
 - *They liked the games and the idea of working towards something at the end.*
 - *My child was happy to feel like a real spy aiding Ruff with his missions.*
 - *She felt important to come back to the website.*
 - *We liked doing daily missions, it really gave him something to look forward to and get excited about. We also liked doing the projects.*
 - *That there was a lot to figure out on their own.*
 - *My daughter liked that it was set up as a mystery to solve.*
- Their kids enjoyed creating pictures and drawings to send to Ruff:
 - *My daughter loved drawing and looking at other kids' drawings.*
 - *My son enjoyed the ability to communicate and view work from other children.*
 - *Coming up with drawings for the mission.*
 - *Creating pictures to send.*
- They enjoyed working together with their children:
 - *We both really had a lot of fun with the "at home" experiments. This was something we could do together and it wasn't very difficult.*
 - *Doing the activity together.*
 - *It was something we could do together.*
 - *Making things together.*
 - *Doing a specific task together that helped us focus our time.*
 - *The chance to learn together.*
- They liked that *Spyhounds* was a game, but also educational:
 - *I liked that the kids can very well relate to the subject making it very kid friendly. I also like the activities that they can play and learn at the same time.*
 - *Incorporate science in a fun activity.*
 - *Just learning new activities and concepts.*
 - *Making science fun.*

- *My child liked the games the most. It illustrated the lessons in a hands-on manner, even more so than the actual hands-on experiments.*
- *Spyhounds make learning fun and funny - my son and I were laughing as we were learning and it was interactive which made it even more fun.*
- *That he can apply skills he is learning in school to other things in life, not just for homework assignments.*

Spyhounds Schedule and Pace

About one-third of parents (33.0%) reported that it was “very easy” to follow the *Spyhounds* schedule. Almost half (46.4%) reported that it was “fairly easy.” The remaining parents reported it was “difficult” or “impossible” to follow the schedule. Only about one-quarter of the families were able to visit the website every day (27.8%). It was more common for families to visit every couple of days (47.4%). The remainder visited the website only weekly or less (24.8%). In fact, more than half of the families (55.7%) reported that they thought the game would be better if families could progress at their own pace (rather than following a daily schedule) and finish the game in one sitting, if they liked. This was also the most frequently reported issue that families did not like about the website. For example, families told us that what they liked the least was...

- *Having patience to wait another day.*
- *Having to come back after the weekend and not be able to use it on the weekends.*
- *Having to come back. It was a long mission.*
- *Having to wait until Monday to do the other days.*
- *With most things in life we all want things quickly and I felt the steps were dragged out too much. Keep it simple and that will keep a child engaged.*
- *It was only one mission..and was too short..We always wanted to played more.*
- *My daughter was excited about the activity & wanted to keep progressing, but instead she had to come back the next day.*
- *Not being able to go at our own pace.*
- *Not being able to work ahead if she wanted.*
- *Not enough stuff to do a day.*
- *I found it hard to keep up daily and wished we could have gone at own pace as it held his interest. He would play with other Ruffman things after he couldn't go further. Also early on it seemed as if the ability to get the next day was not based on time of day but length from last time used. We did one late one night and he tried to do it early before school the next day but it was still on the same day. That was frustrating.*
- *Scheduling was difficult...he would want to work on it and it wouldn't be available yet. We had a really hard time getting the activities done over the weekends...would rather be able to do it during the week.*
- *That you had to wait for the next day for other activities.*
- *That you were limited on the amount to do in one day.*
- *Perhaps more flexibility with time.*

- *Waiting for "the next day" to continue the game. I believe the game would have been better if you could complete on your own schedule and not in days allotted. My son is with his father every other weekend so the every weekend activities were impossible. However, it was fun to play catch up on Monday.*
- *Waiting until the next day to proceed and see what happens.*
- *We didn't like being forced to come back every day to play a new adventure, we would prefer the option of being able to complete the spy adventure in one sitting.*
- *We didn't like the pace of the website. There should be a way you can move ahead faster if you want to.*

Other Features that Families Did Not Enjoy

In addition to the scheduling and pace of the game, families also told us...

- Their kids were frustrated with the drawings because it was difficult for them to use the Spy Sketcher or they never saw their drawing posted on the website:
 - *My child had some difficulty with the drawings. When using the stamps, we did not know how to clear it so you could move the objects around. Also, she had a hard time writing, so it would have been nice to be able to type words.*
 - *My son was excited about his drawings or messages to Ruff being posted on the website, but his never got picked. I know he was a little disappointed about that.*
 - *My child didn't like that what he uploaded was never shown in the Spyhounds.*
 - *The drawings were too hard on the computer.*
 - *The sketching was difficult on the computer.*
 - *The spy sketcher wasn't the easiest to use and we didn't see the point. It would be more fun with more games.*
 - *We did not get to see any of his sketches posted.*
- They would like to see other features added:
 - *Maybe you could have a section "just for the adults" and "just for the kids" then integrate some.*
 - *More variation on the activities would be nice.*
 - *My child consistently said that she would like longer video clips. She also is a big fan of Fetch! so we felt that she expected to see an entire animated show then be able to engage in all of the activities at the SH site.*
 - *Take them to explore places all over the world.*
 - *I think printable color pages would be fun.*

Summary

Study Overview

Concord Evaluation Group (CEG) conducted an evaluation of the *Spyhounds* pilot test in October-December 2011. The goal of the evaluation was to assess the online resources for appeal and interest, as well as to provide WGBH with data on how a full-scale year-long project could be structured. CEG recruited a national sample of 5-8 year old children to participate in the pilot test. We conducted a pre-test survey to measure science-related knowledge (kids only), attitudes and interest (parents and kids). We then invited families to use the online resources during the pilot test and surveyed the kids and parents at the end of the pilot test to assess changes in knowledge, attitudes, and interest as well to gather subjective data on their experiences with the *Spyhounds* resources that can be used as formative data for development of future resources.

The final sample contained 115 children across 21 states. Kids ranged in age from 5-8, with an average age of 7. The sample was evenly split between boys (n = 57) and girls (n = 58). The racial and ethnic background of the families in our sample mirrored national proportions: White (n = 85, 73.9%), Hispanic (n = 16, 13.0%), Black (n = 15, 13.0%), Asian (n = 10, 8.7%), Native American or American Indian (n = 2, 1.8%). Most parents reported that their family income was average, but the sample did include a range of socioeconomic levels: Better than the average family (n = 25, 21.7%), Same as the average family (n = 78, 67.8%), Worse than the average family (n = 12, 10.4%). About half of the kids had watched *FETCH! with Ruff Ruffman* prior to the study.

Spyhounds Helped Kids Learn about Physical Science Concepts

On the 5 content questions, kids earned one point for each question they answered correctly. Thus, the range of possible scores was 0 to 5. The average pre-test score (before playing *Spyhounds*) was 2.60 correct. The average post-test score (after playing *Spyhounds*) was 3.85 correct. This increase of 48% represents a statistically significant increase in scores ($p = .000$), with a very large effect size = .84.⁴ None of the following variables were predictors of content gains: gender, age, white versus non-white status, family income, and whether they have watched *FETCH!* before, or frequency of *Spyhounds* website use (daily versus every other day versus something else). In other words, the gains we saw in content knowledge spanned across all subgroups.

⁴ Controlling for intra-class correlation between siblings.

Playing *Spyhounds* Helped Increase Kids' and Parents' Attitudes towards and Interest in Science

Before playing *Spyhounds*, most kids (91.3%) reported that they thought “science was fun.” This proportion increased to 97.4% after the kids played *Spyhounds*. This was a statistically significant increase ($p = .020$). Before playing *Spyhounds*, about three-quarters of kids (76.5%) reported that they liked to do science activities at home. After playing *Spyhounds*, 87% reported that they enjoyed doing science at home. This was a statistically significant increase ($p = .010$). There were no differences in attitudes based on the frequency with which the kids used the *Spyhounds* website. In other words, kids who used the website on a weekly basis were just as likely to demonstrate improvements in attitudes towards science as kids who visited the site daily.

Before playing *Spyhounds* with their kids, most parents (90.8%) reported that they enjoyed learning about science. After playing *Spyhounds* with their kids, this proportion increased to 93.8%. This represents a statistically significant increase ($p = .000$). Before playing *Spyhounds* with their kids, about three-quarters of parents (78.3%) reported that they enjoyed doing science activities with their kids. After playing *Spyhounds*, this proportion increased to 89.7%, also a statistically significant increase ($p = .006$).

Spyhounds Also Encouraged Families to Use Math

Almost three-quarters of parents (73.2%) reported that they and their child used math as well as science while playing *Spyhounds*. Parents were most likely to report using math when their kids made and tested parachutes and slingshots, as well as in cracking the codes on the website. Math skills mentioned included counting, measurement, addition, subtraction, data analysis, prediction, and comparing.

Most Families Enjoyed Playing *Spyhounds*

Almost three-quarters of the kids (72.2%) reported that they “had a lot of fun” playing *Spyhounds*, while 25.2% reported they “had a little fun” playing *Spyhounds*. Kids rated all the *Spyhounds* features highly (at least 4 on an a scale of 1 to 5). Girls were significantly more interested in looking at drawings and photos from *Spyhounds* than were boys. Otherwise, they rated the features similarly. There were no differences in feature ratings based on white versus non-white status or income.

I got some ideas about science projects for my school fair.

Science is fun!

We liked doing daily missions, it really gave (my child) something to look forward to and get excited about.

My son enjoyed the ability to communicate and view work from other children.

This was something we could do together and it wasn't very difficult.

Spyhounds made learning fun and funny - my son and I were laughing as we were learning and it was interactive which made it even more fun.

Most parents (87%) reported that they would recommend *Spyhounds* to other families with kids in the same age range. The remainder indicated that they “might” recommend it. Also, 89.6% of parents reported that their kids would play other *Spyhounds* games in the future. The remainder reported that they “might.”

Almost two-thirds of the families (62.3%) indicated that they would likely play the *Spyhounds* game if it was available on a mobile device. An additional 27.3% reported that they “might.” Families reported that the most appealing mobile features would be: games (88%), videos (68.8%), Spytime Mission Directions (58.4%), audio (48.4%), SpySketcher (53.2%), and messages to Ruff (45.5%).

Parents told us their kids enjoyed the humor and games, their kids liked the idea of playing a spy and working towards a goal, their kids enjoyed creating pictures and drawings to send to Ruff, they enjoyed working together with their children, and, finally, they liked that *Spyhounds* was a game, but also educational.

Family Feedback on *Spyhounds* Features to Improve

Schedule and Pace

About one-third of parents (33.0%) reported that it was “very easy” to follow the *Spyhounds* schedule. Almost half (46.4%) reported that it was “fairly easy.” The remaining parents (20.6%) reported it was “difficult” or “impossible” to follow the schedule. Only about one-quarter of the families were able to visit the website every day (27.8%). It was more common for families to visit every couple of days (47.4%). The remainder visited the website only weekly or less (24.8%). In fact, more than half of the families (55.7%) reported that they thought the game would be better if families could progress at their own pace (rather than following a daily schedule) and finish the game in one sitting, if they liked. This was also the most frequently reported issue that families did not like about the website. For example, families told us that this was the feature they liked the least.

Other Suggestions

In addition to the scheduling and pace of the game, families also told us their kids were frustrated with the drawings because it was difficult for them to use the Spy Sketcher or they never saw their drawing posted on the website. Finally, a few parents mentioned other features they would like to see added to *Spyhounds*:

- *Maybe you could have a section "just for the adults" and "just for the kids" then integrate some.*
- *More variation on the activities would be nice.*
- *My child consistently said that she would like longer video clips. She also is a big fan of Fetch! so we felt that she expected to see an entire animated show then be able to engage in all of the activities at the SH site.*
- *Take them to explore places all over the world.*
- *I think printable color pages would be fun.*

Appendix

Family Website Study #1

Thank you for participating in the Family Website Study!

CEG and WGBH Boston are studying a new website designed to get young kids excited about physical science. We are recruiting 100 families with kids who are 6-8 years old to be in the study. **Families will receive \$30 for being in the study.**

As a reminder, here is the study schedule:

- Step 1: Help your child complete a brief (10 minute) survey on your computer during the week of **November 21st** (Thanksgiving week)
- Step 2: Visit the website a couple minutes each day or a few minutes each week for a period of **4 weeks**
- Step 3: Try-out fun family science activities (30 minutes) each weekend for a period of **4 weeks**
- Step 4: Help your child complete a brief (10 minute) survey on your computer during the week of **December 19th**

* Contact information:

Parent name:

State:

Email Address:

If you are ready to begin Step 1, **please make sure your kids are with you**, and proceed to the next page. This survey will take about 10 minutes.

INSTRUCTIONS FOR PARENTS

Dear Parents,

The first section in this survey is for your child(ren). If you have more than one child between 6-8 years old, you will have a chance to enter separate answers for both kids.

If your child cannot read or use the computer, you may help them read the questions and type their answers, but PLEASE DO NOT ANSWER THE QUESTIONS FOR YOUR CHILD. These answers should be your child's OWN WORK. It's really OK if your child doesn't know the answer. We just want kids to do their best.

A lot of kids won't know the answers at the start of the study. That's OK. We want to see if the website can help your child learn over time.

* How many kids will be doing the study with you?

1

2

* Child's first name:

(Child only) Do you think science is fun?

Science is really fun.

Science is sort of fun.

Science is not fun.

I don't really know what science is.

Family Website Study #1

(Child only) Do you like to do science activities at home?

- Yes
- No
- I don't know

(Child only) Have you ever watched FETCH with Ruff Ruffman on TV?

- Yes
- No
- I don't know

(Child only) If Yes, how much do you like to watch FETCH?

- I love to watch FETCH!
- I like FETCH
- FETCH is just OK
- I don't like FETCH
- I don't watch FETCH

Now, we have a few questions about science. Don't worry if you don't know the answers to the questions. Please just do your best. It's OK to guess!

(Child only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

(Child only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

Family Website Study #1

(Child only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

(Child only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

(Child only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

*** Please tell us the names of the kids who will be doing the study:**

Child #1

Child #2

(Child #1 only) Do you think science is fun?

- Science is really fun.
- Science is sort of fun.
- Science is not fun.
- I don't really know what science is.

(Child #2 only) Do you think science is fun?

- Science is really fun.
- Science is sort of fun.
- Science is not fun.
- I don't really know what science is.

Family Website Study #1

(Child #1 only) Do you like to do science activities at home?

- Yes
- No
- I don't know

(Child #2 only) Do you like to do science activities at home?

- Yes
- No
- I don't know

(Child #1 only) Have you ever watched FETCH with Ruff Ruffman on TV?

- Yes
- No
- I don't know

(Child #2 only) Have you ever watched FETCH with Ruff Ruffman on TV?

- Yes
- No
- I don't know

(Child #1 only) If Yes, how much do you like to watch FETCH?

- I love to watch FETCH!
- I like FETCH
- FETCH is just OK
- I don't like FETCH
- I don't watch FETCH

(Child #2 only) If Yes, how much do you like to watch FETCH?

- I love to watch FETCH!
- I like FETCH
- FETCH is just OK
- I don't like FETCH
- I don't watch FETCH

Now, we have a few questions about science. Don't worry if you don't know the answers to the questions. Please just do your best. It's OK to guess!

Family Website Study #1

(Child #1 only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

(Child #2 only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

(Child #1 only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

(Child #2 only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

(Child #1 only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

Family Website Study #1

(Child #2 only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

(Child #1 only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

(Child #2 only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

(Child #1 only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

(Child #2 only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

PARENTS: The remaining questions are for you to answer.

Family Website Study #1

(Parent only) How do you feel about science?

- I love to learn about science.
- I like to learn about science.
- I don't really enjoy science.
- I don't know.

(Parent only) Do you enjoy doing science activities with your kid(s)?

- I love to do science activities with my kids.
- I like to do science activities with my kids.
- I don't really enjoy doing science activities with my kids.
- I don't really know how to do science activities with my kids.
- I have never tried.
- I don't know.

(Parent only) If so, what science websites or games do you like to use?

Family Website Study #2

If you are ready to begin, **please make sure your kids are with you**, and proceed to the next page. This survey will take about 15 minutes.

INSTRUCTIONS FOR PARENTS

Dear Parents,

The first section in this survey is for your child(ren). If you have more than one child between 6-8 years old, you will have a chance to enter separate answers for both kids.

If your child cannot read or use the computer, you may help them read the questions and type their answers, but PLEASE DO NOT ANSWER THE QUESTIONS FOR YOUR CHILD. These answers should be your child's OWN WORK. It's really OK if your child doesn't know the answer. We just want kids to do their best.

A lot of kids won't know the answers at the start of the study. That's OK. We want to see if the website can help your child learn over time.

*How many kids did the study with you?

- 1
- 2

*Child's first name:

(Child only) Do you think science is fun?

- Science is really fun.
- Science is sort of fun.
- Science is not fun.
- I don't really know what science is.

(Child only) Do you like to do science activities at home?

- Yes
- No
- I don't know

Now, we have a few questions about science. Don't worry if you don't know the answers to the questions. Please just do your best. It's OK to guess!

(Child only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

Family Website Study #2

(Child only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

(Child only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

(Child only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

(Child only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

*Please tell us the names of the kids who did the study:

Child #1

Child #2

(Child #1 only) Do you think science is fun?

- Science is really fun.
- Science is sort of fun.
- Science is not fun.
- I don't really know what science is.

Family Website Study #2

(Child #2 only) Do you think science is fun?

- Science is really fun.
- Science is sort of fun.
- Science is not fun.
- I don't really know what science is.

(Child #1 only) Do you like to do science activities at home?

- Yes
- No
- I don't know

(Child #2 only) Do you like to do science activities at home?

- Yes
- No
- I don't know

Now, we have a few questions about science. Don't worry if you don't know the answers to the questions. Please just do your best. It's OK to guess!

(Child #1 only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

(Child #2 only) Using a big parachute instead of a small one...

- Would make someone fall slower.
- Would make someone fall faster.
- Wouldn't make them fall faster or slower.
- I don't know.

(Child #1 only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

Family Website Study #2

(Child #2 only) What does "air resistance" mean?

- Air resistance is when it's hard to breathe.
- Air resistance is when air pushes against something and slows it down.
- Air resistance is the path an object takes when it's flying through the air.
- I don't know.

(Child #1 only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

(Child #2 only) What is potential energy?

- Energy that you have already used.
- Energy that is saved up so that you can use it later.
- Energy that you are using right now.
- I don't know.

(Child #1 only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

(Child #2 only) What is kinetic energy?

- Energy of motion, like when a ball is flying through the air.
- Energy of position, like where a ball is placed.
- Chemical energy, like inside a battery.
- I don't know.

Family Website Study #2

(Child #1 only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

(Child #2 only) When you play a guitar, it makes sound because:

- The guitar strings get stronger when you play with them.
- The guitar strings get a little looser each time you play with them.
- The guitar strings move back and forth and push on the air.
- I don't know.

Now we have a couple questions about Spyhounds.

(Child(ren) only) How much fun did you have fun playing Spyhounds?

- A lot of fun
- A little fun
- No fun at all
- I don't know

Family Website Study #2

(Child(ren) only) Please tell us how much you enjoyed the following activities:

	Loved It	Liked It	In the Middle	Did Not Like It Much	Did Not Like it At All	Did Not Do This
Breaking codes with the Code Breaker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sending drawings or photos to Ruff with the Spy Sketcher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looking at drawings and photos from Spyhounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making and testing a real parachute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making and testing a real slingshot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making and testing a real chicken-ator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing Parachute Plunge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing Slingshot Fling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing Chicken-ator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening to Ruff tell the story	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening to the Spy Sounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watching the videos of Ruff and Chet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sending Spy Messages to Ruff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reading Spy Messages from Spyhounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Child(ren) only) Please tell us one thing you learned from Spyhounds.

PARENTS: The remaining questions are for you to answer.

(Parent only) How do you feel about science?

- I love to learn about science.
- I like to learn about science.
- I don't really enjoy science.
- I don't know.

Family Website Study #2

(Parent only) Do you enjoy doing science activities with your kid(s)?

- I love to do science activities with my kids.
- I like to do science activities with my kids.
- I don't really enjoy doing science activities with my kids.
- I don't really know how to do science activities with my kids.
- I have never tried.
- I don't know.

How much would you agree with the following statements?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Spyhounds taught my child something new about physical science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spyhounds taught me something new about physical science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spyhounds helped my child get more excited about physical science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spyhounds helped me get more excited about physical science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spyhounds helped me learn how to do physical science activities with my child(ren)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spyhounds motivated me to try more physical science activities together as a family in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Can you describe a time when you and your child(ren) used math skills (like measuring, collecting data, writing down information, or comparing) to complete a Spyhounds activity?

Family Website Study #2

Which of the following best describes how your family used Spyhounds? (Choose all that apply)

- Your child(ren) used the website alone
- Your child(ren) used the website with you
- Your child(ren) did the hands-on activities alone
- Your child(ren) did the hands-on activities with you
- Sometimes they played alone and sometimes you were with them

As you know, the Spyhounds game required your child(ren) to visit the website several times per week and to try activities each weekend. To what extent were you able to follow the schedule?

- It was very easy to follow the schedule
- It was fairly easy to follow the schedule
- It was pretty difficult to follow the schedule
- It was impossible to follow the schedule

How often did your child(ren) visit the website?

- Every day
- Every couple of days
- Once a week
- Less than once a week
- It varied from week to week
- Other (please specify)

How, if at all, did information from our Facebook or Twitter feeds help you? (Check all that apply)

- Facebook motivated me to get my child(ren) engaged with the online content
- Twitter motivated me to get my child(ren) engaged with the online content
- The information from Facebook or Twitter was not helpful to me
- I don't use Facebook or Twitter
- Other (please specify)

Family Website Study #2

Did your child(ren) like coming back to play along with the adventure or would they rather go at their own pace and finish in one sitting if they wanted?

- Having to repeatedly come back to the website was fine
- It would be better to go at your own pace and be able to finish in one sitting if you wanted

Would you recommend Spyhounds to other families with young children (6-8 years old)?

- Yes
- Maybe
- No

WGBH hopes to create more Spyhounds games. Do you think you and your child(ren) would play other Spyhounds games in the future?

- Yes
- Maybe
- No

If this game was available on a mobile device would you and your child(ren) play it?

- Yes
- Maybe
- No

On a mobile device, what features would you like access to:

- Videos
- Audio
- Games
- Spy Sketcher
- Messages to Ruff
- Spytime Mission Directions

What did you and your child(ren) like MOST about Spyhounds?

Family Website Study #2

What did you and your child(ren) like LEAST about Spyhounds? How can we make it more fun (for children and adults)?