



**MULTIMEDIA RESEARCH**

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**Implementation Evaluation of  
*Cyberchase Season 8 Summer Challenge***



Report for Thirteen//WNET  
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**EXECUTIVE SUMMARY**  
**IMPLEMENTATION EVALUATION OF CYBERCHASE SEASON 8**  
**SUMMER CHALLENGE**  
**MULTIMEDIA RESEARCH • OCTOBER 2010**

As part of a National Science Foundation grant for Season 8 of the *Cyberchase* elementary math series, Thirteen/WNET produced Summer Challenge broadcasts with accompanying online and offline activities to be posted weekly for eight weeks in the Summer of 2010. Summer Challenge learning opportunities included viewing broadcast and online half-hour episodes; viewing short video excerpts; earning points and rewards online by answering trivia questions about episodes; making one's own games; and doing at-home activities. To learn how children engaged in the opportunities and to explore strengths and weaknesses of the online and offline activities in engaging children, Multimedia Research collected website usage data from two user groups: a random sample of 400 Summer Challenge website users and a recruited sample of 101 rising 4<sup>th</sup> graders who received a weekly announcement of *Cyberchase* Summer Challenge opportunities. The recruited users were also interviewed by phone once mid-summer and once at the end of the Challenge period.

Most Summer Challenge website users were sufficiently engaged by their online experience to come back for more after their initial visit. Most users also played catch up by engaging in the activities of a previous week's posting. Low website participation by a small portion of the recruited visitors was not due to lack of interest but more due to vacations, busy schedules, computer problems and an August return to school.

Users engaged in all four available activity types, but most preferred watching video and making games over answering Cybertrivia and doing home activities. During most of the eight Challenge Weeks, most active users chose to engage in more than one activity.

Viewing *Cyberchase* videos was a popular activity. A majority of users opened the online video player during the summer period, including those recruited users who had never previously watched the series. A majority of users reported enjoying both long and short episodes but preferred the full-length videos. Half of the recruited sample also reported watching broadcast episodes. Online viewing was preferred by a majority because the computer permits more playback control and choice of episode or viewing time, but some users reported playback problems and a fuzzy picture quality. Those who preferred viewing on television liked the bigger screen size.

Making games was an equally popular activity. Children liked making their own games because they could choose the design of the game and play it themselves, but some children reported difficulty making a game or wanted different game assets than the ones available. Half of the recruited users also reported playing games made by others, but half did not see this feature on the website. Of those who played games made by others, half liked this activity "a lot," because they could get design ideas and playing the games was fun; whereas some users were confused by others' games.

Eight-in-ten recruited users and three-in-ten random users submitted Cybertrivia answers during the summer. Those who did not take advantage of the trivia activity either did not watch the videos or did not see the questions on the website. The majority of participants liked Cybertrivia “a lot” because the questions were challenging and fun, and a small portion wanted more than three questions.

Users took advantage of the Do-At-Home activities less frequently, with half of the recruited users and 9% of random users reporting on at least one of eight activities. However, a majority of users who did an activity reported liking each of the eight activities and described seven of the eight as “showing them something new about math.” Most recruited users reported that they liked the activities, because they were fun and could be done with others, although some children felt some activities were hard or boring.

A majority of users earned points by completing point-giving activities, but a low percentage of those who qualified for rewards actually redeemed them. For the majority of recruited users, earning points and redeeming rewards were not prime motivating factors in site usage. The children suggested that more games would entice them to visit the site more frequently, and their parents noted that most of the children were motivated to participate by the email announcement and the website activities themselves.

Hypothesizing about activity in their next school year, large proportions of recruited users thought they would visit the *Cyberchase* website (94%), watch *Cyberchase* shows on television (90%) and participate in a Summer Challenge next summer (85%). Overall, the Summer Challenge of presenting children a sequenced set of a variety of opportunities to think about math successfully engaged both the random and recruited user, although small modifications in screen and activity design would have yielded even greater usage and appeal. Moreover, creating more thematic synergy and direct connective linkages among all the components would generate greater participation and likely greater satisfaction as the child could carry what is experienced in one activity into a successful engagement with another activity.

## INTRODUCTION

Produced by Thirteen/WNET New York, *Cyberchase* is a public television series of half-hour animated math shows for 8-11 year olds, accompanied by web activities, print activities and outreach kits.<sup>1</sup> The overall goals of the multimedia project are to improve problem-solving and math skills and to inspire children with confidence and enthusiasm toward mathematics.

As part of a National Science Foundation grant, Thirteen/WNET produced for Season 8 a set of *Cyberchase* Summer Challenge broadcasts with accompanying online and offline activities, positing that involving kids in summer math-related events helps maintain their confidence in their math abilities over the non-school summer months.

For children at home during eight weeks in June, July and August of 2010, the *Cyberchase* Summer Challenge included the possible activities of viewing half-hour episodes and short video excerpts of *Cyberchase* and earning points and rewards online by answering trivia questions about the episodes, making one's own games, and doing at-home *Cyberchase* activities. The first week's Summer Challenge webpage is illustrated to the right.

Multimedia Research, an independent evaluation group, assessed the implementation of the Summer Challenge with a naturalistic study to learn how children engaged in the Summer Challenge opportunities and to explore strengths and weaknesses of the various activities in engaging children online and offline.



<sup>1</sup> For a more complete description, see <http://pbskids.org/cyberchase/parentsteachers/show/index.html>

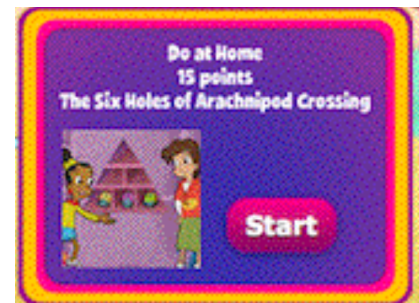
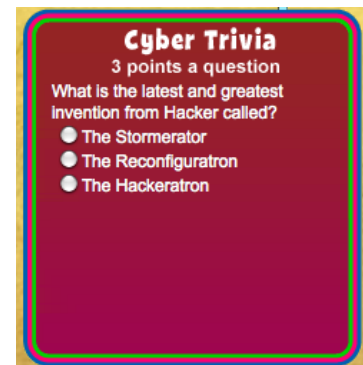
## CYBERCHASE SUMMER CHALLENGE ACTIVITIES

On Fridays during each of eight summer weeks, *Cyberchase* made available in a special section of the website Summer Challenge videos, online activities and offline activities, detailed in Table 1 on the next page. By doing activities, children could earn up to 292 points and redeem those points to download rewards.

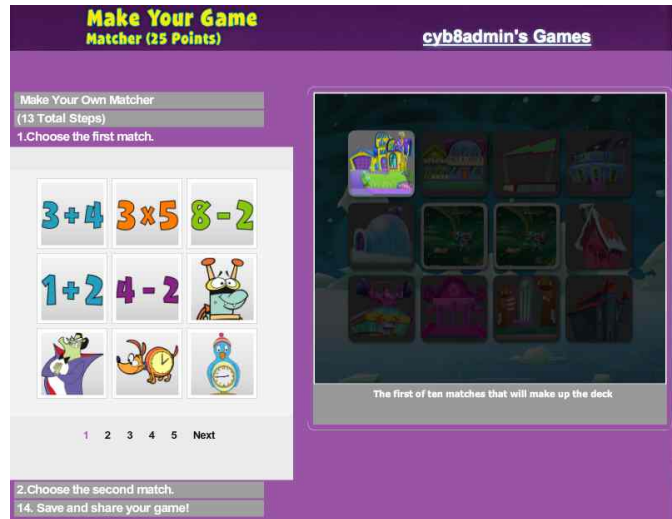
- **Cyberchase episodes** for the Summer Challenge comprised programs broadcast on eight Fridays in most PBS areas and also posted on the Summer Challenge website for online viewing. Weekly videos included five new episodes followed by three encore episodes. Additional short video excerpts from the longer episodes were also posted on the website, as shown in the illustration of the online video player. Viewing videos did not earn points.



- **Cybertrivia questions** posted online challenged viewers' recall of story content in each week's videos, as shown in the illustration to the right. Users could continue to try to answer the multiple-choice questions until they chose the correct answer. Users earned three points for each correct answer, up to 72 points.
- **Do-At-Home activities** related to each video were posted online every week as downloadable pdf files (illustration to the right). Users were encouraged to carry out the activity at home and report back online (a) if they did the activity, (b) if they liked it, (c) if they learned something new about math, and (d) to tell more about their experience. Each of eight online reports earned users 15 points for a total of 120.



- **Game** assets for users to make their own games were posted online every other week, for a total of four different game types (Matcher, Dots, Catcher, Rancher). The make-it page for the *Matcher* game, a concentration-memory type game, is illustrated to the right.



Users earned 25 points for making each one of the four different game types for a total of 100 points. Users could make more than one of each of the four games without earning additional points.

On the Summer Challenge website, users could play their own games as well as games made by other users (illustrated to the right); however, playing games did not earn points.

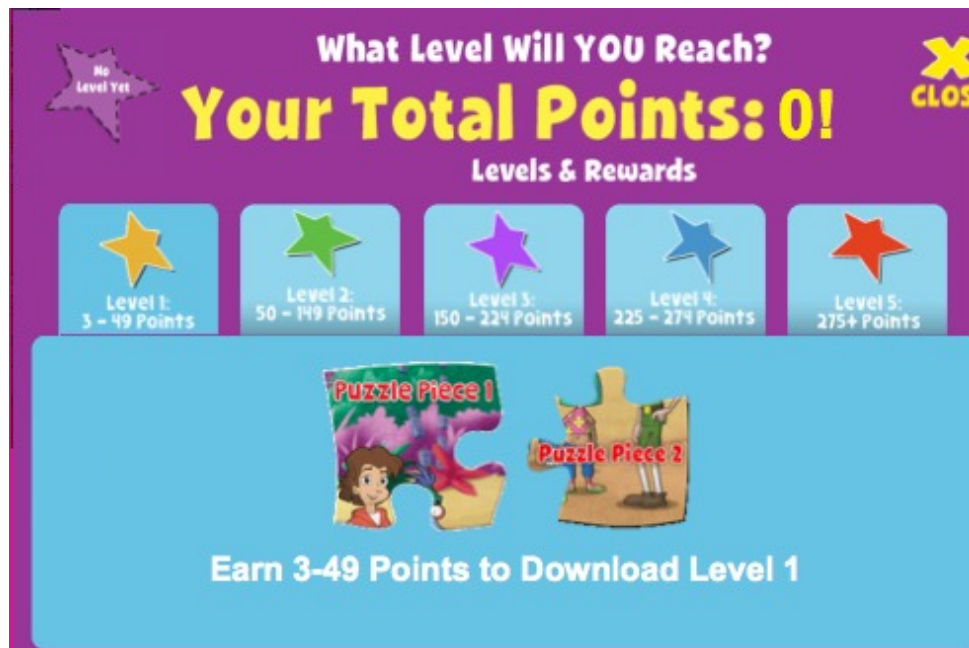


**Table 1. Cyberchase Season 8 Summer Challenge Activities**

Date available	Cyberchase Videos		Online Activities		Offline Activities
	Full-length episodes broadcast and online	Short online videos drawn from episodes	Cybertrivia questions 3 pts each answer	Games 25 pts each game type	At-home activities 15 pts each online report
<b>Week 1</b> 6/25/10	<i>The Hacker's Challenge</i> (new)	3 videos	3 questions	<i>Matcher</i>	<i>The Six Holes of Arachnipod Crossing</i>
<b>Week 2</b> 7/2/10	<i>Face-off</i> (new)	3 videos	3 questions		<i>You Be the Judge!</i>
<b>Week 3</b> 7/9/10	<i>Peace, Love, and Hackerness</i> (new)	3 videos	3 questions	<i>Dots</i>	<i>My Cyberchase Ruler</i>
<b>Week 4</b> 7/16/10	<i>Hackerized</i> (new)	3 videos	3 questions		<i>Go for the Goal!</i>
<b>Week 5</b> 7/23/10	<i>The Bluebird of Zappiness</i> (new)	3 videos	3 questions	<i>Catcher</i>	<i>Shadow Math</i>
<b>Week 6</b> 7/30/10	<i>Escape from Merlin's Maze</i> (encore)	2 videos	3 questions		<i>Lifting with Levers</i>
<b>Week 7</b> 8/6/10	<i>Inside Hacker</i> (encore)	1 video	3 questions	<i>Rancher</i>	<i>Robot Retriever</i>
<b>Week 8</b> 8/13/10	<i>EcoHaven Ooze</i> (encore)	3 videos	3 questions		<i>Make a Pop-Up Card</i>

The Summer Challenge website provided a progress report to the user of points earned and points needed for their next reward level. Points were redeemable for downloadable rewards at five levels:

- Level 1: 3-49 points: 1<sup>st</sup> and 2<sup>nd</sup> puzzle pieces (illustrated below)
- Level 2: 50-149 points: 3<sup>rd</sup> puzzle piece and wallpaper
- Level 3: 150-224 points: 4<sup>th</sup> puzzle piece and *Cyberchase* adlib story
- Level 4: 225-274 points: 5<sup>th</sup> puzzle piece and picture frame
- Level 5: 275+ points: Final puzzle piece and calendar and board game



## GOALS OF IMPLEMENTATION EVALUATION

The overarching goals of the implementation evaluation were

- to learn how children engaged in the Summer Challenge opportunities and
- to explore strengths and weaknesses of Challenge activities in engaging children.

To this end, the study collected data from two user groups:

- 1) 400 of those users who logged onto the Summer Challenge website during Week 3 of the 8 weeks were randomly selected for a random sample. This group provides us with a picture of how children naturally engaged with the Summer Challenge opportunities. Their activity on the website was anonymously tracked for all 8 weeks, including making games, opening video players, answering Cybertrivia, reporting offline activities, and earning points and rewards.



2) 109 rising 4<sup>th</sup> graders were recruited around six nationally distributed sites to form a recruited sample. Parents shared with their children a weekly email announcing new offerings on the website and special broadcast episodes. In addition to tracked web activity, the children were interviewed briefly by telephone during the summer and after the challenge ended. This group provides us with feedback on the strengths and weaknesses of the Summer Challenge activities.

The study analyzed eight weeks of web-tracking data for both samples and two telephone interviews of the recruited sample to explore evaluation questions presented in Table 2.

**Table 2. Evaluation Questions and Methods**

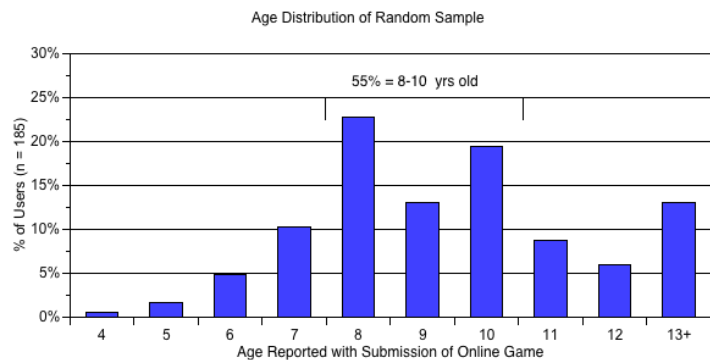
Evaluation Questions	Methods	
	Tracked behaviors on Challenge website for recruited and random users	Interview questions for recruited users
How did children engage in the Summer Challenge opportunities?		
How did users interact with the Summer Challenge website?	Make games Open video player Answer Cybertrivia Report on offline activity Earn points and rewards	Open-ended responses
What was appealing or not about the Summer Challenge experience?		Open-ended responses
What motivates users to participate?		Open-ended responses + Parent interview
What were strengths and weaknesses of Challenge activities in engaging children?		
What usage, appeal and usability issues arose with video?	Open video player	Ratings and Open-ended responses
What usage, appeal and usability issues arose with Cybertrivia?	Answer Cybertrivia	
What usage, appeal and usability issues arose with games?	Make games	
What usage, appeal and usability issues arose with do-at-home activities?	Report on offline activity	
Other Summer Math Activity:		
What ways was math used during the summer?		Open-ended responses
Interest in Future <i>Cyberchase</i> Participation		
What was user interest in future <i>Cyberchase</i> viewing, website visits, and participation in another Summer Challenge?		Open-ended responses

## METHOD

### Random Sample

During the third week of the campaign, 400 users were drawn randomly from 14,652 who had signed into the *Cyberchase* Summer Challenge website during that week. Challenge website activity was tracked and analyzed for this random sample for each of the eight weeks and can be generalized to the population that logged on in the third week. In retrospect, the evaluation should have drawn the random sample of 400 at the end of the eight week period from the full population of logged on Challenge users, which numbered about one million unique visitors.

The only demographic information we have for the random sample is age, which was requested with the submission of an online game design. The chart shows that less than half of the random sample provided their age ( $n = 185$ ), and half of these respondents (55%) were 8 to 10 years old, which is the age of our recruited sample.



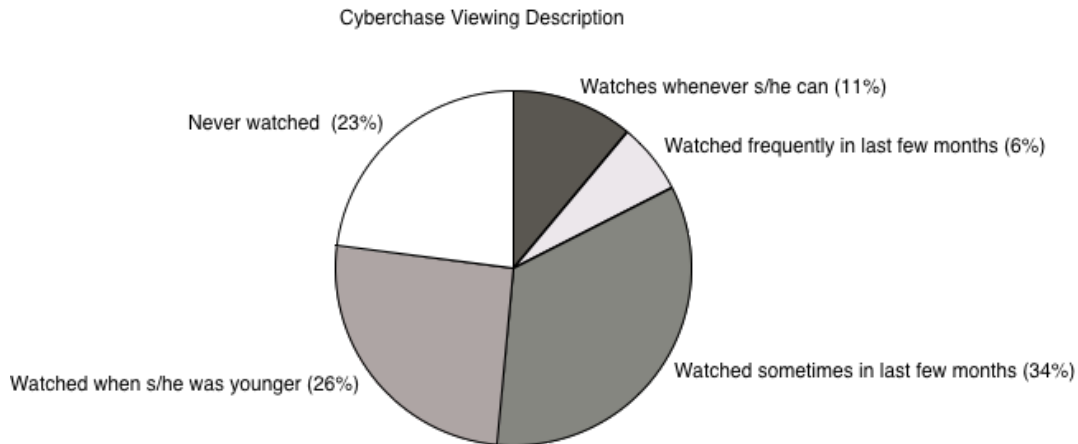
### Recruited Sample

Rising fourth graders were recruited around six national sites where *Cyberchase* summer episodes were aired on public broadcasting stations, including Providence, RI; Milwaukee, WI; St. Louis, MO; Austin, TX; Sacramento, CA; and Portland, OR. To be involved in the evaluation, children had to have access to a computer with broadband Internet connection and agree to be interviewed briefly twice by telephone about their summer activities. Parents needed to have an active email address, agree to receive weekly emails from *Cyberchase* and share them with their child in a timely manner. An honorarium of \$75 was given upon completion of the project.

Of the 113 recruited children who began the study, 109 completed the evaluation. The drop-outs included two whose parents reported them as not interested in participating after receiving the welcome email from *Cyberchase*; one lost Internet access; and one could not be located for the first interview.

The sample of 109 included equal gender groups (51% female; 49% male) and children who were eight (17%), nine (80%) and ten (3%) years old at the beginning of the study. Minority children comprised 42% of the sample, including 17% Asian, 15% African-American/black, and 11% Hispanic. Almost one-third (30%) of the sample lived in a zip code in which children under 18 years are below the average US poverty level, and half (54%) of this group were minorities.

The pie chart below illustrates that half (51%) of the recruited sample had recent *Cyberchase* viewing experience within a few months previous to joining the evaluation; 26% viewed *Cyberchase* “when younger,” and 23% had “never watched” the series. Initial recruitment efforts focused on obtaining recent viewers; however, this criterion was relaxed to include those who watched “when younger” and those who “never watched” in order to meet our desired sample size of 100 willing parents and rising 4<sup>th</sup> graders with broadband Internet access. Our sample’s viewing distribution is not necessarily representative of the population of rising 4<sup>th</sup> graders. Viewing behavior was independent of gender, age, and minority status.



## Procedure

**Informed consent.** Parents of recruited children signed informed consent confirming their understanding of the evaluation. The consent letter explained the procedure as follows:

*We are looking for 3rd graders who watch and enjoy Cyberchase. We are looking for parents willing to receive and share with their child nine weekly emails from Cyberchase during the summer. The emails announce new shows and online and offline activities. There is no obligation for your child to do any of the suggested activities but participating is a fun way for your child to grow his or her math skills over the summer.*

*Here are some more specifics of the project:*

- *You will receive an email welcome message from Cyberchase on June 17 that gives your child a Cyberchase logon name and password, so s/he can earn points doing activities on the Cyberchase summer website. These points can be redeemed for virtual rewards.*
- *On eight Thursdays during the summer, Cyberchase will send an email to share with your child announcing weekly shows and online activities. If you miss an email due to vacation or other reason, just share the ones you miss as soon as you can.*
- *Once during the summer and once at the end of August, we will arrange a short telephone interview with your child at a mutually convenient time to talk about their experiences with Cyberchase.*
- *In recognition of participation by you and your child, you will receive an honorarium of \$75 upon completion of the project. Your email and phone number will only be used for this project and will be purged from our records at the end of the project. Your child’s interviews will be combined with others and not identified by name.*

Weekly Email Messages. Parents received via email a welcome message from *Cyberchase* one week before the Summer Challenge began, providing the participating child with a logon name and password and confirming an accurate live email address:

*Dear Parent:*

*Thank you for agreeing this summer to encourage your child to watch Cyberchase videos and to experience the fun of the Cyberchase website. To learn more about what's coming in the Summer Challenge, watch a brief video at <http://pbskids.org/cyberchase/video.html>*

*On the next 8 Thursdays, you will receive an email to share with your child announcing each Friday's special show and online activities. To earn points and rewards in the Cyberchase Summer Challenge beginning Friday, June 25, your child can use the log on name and password provided here:*

*logon name: xxxxx*

*logon password: yyyyy*

*Twice during the summer, your local evaluator will telephone at a convenient time to talk briefly to your child about his/her experience.*

*Please confirm that you have received this message by hitting 'Reply' and 'Send.' By replying, we know that we have the correct email address to reach you with the weekly messages that will start next Thursday, June 24.*

*Thank you in advance for your help.*

*Sincerely,*

*Cyberchase Producers*

For the first week of the *Cyberchase* Summer Challenge, parents received the following email message to share with their child:

*Dear Parent, please share this message with your child.*

*Are you ready for this week's Cyberchase challenge?*

*Log on at <http://pbskids.org/cyberchase/week1/> to view Cyberchase videos, make your own games, play Cyber Trivia, do fun activities at home, and earn points for cool rewards.*

*You can also watch each Friday's special Cyberchase episode broadcast on PBS KIDS GO!. Check local listings at <http://to.pbs.org/CyberchaseLocalListings>*

*We hope you and your child enjoy the Cyberchase experience!*

*Sincerely,*

*Cyberchase Producers*

The first week's message above encouraged the recruited children to view Friday's special *Cyberchase* episode on TV; however, subsequently we discovered that PBS stations serving three of the six research sites had changed their schedules to air the special episodes not on Fridays as expected but on the following Tuesdays. Thus, half of the recruited sample could not view the special episodes on TV on Fridays as originally intended. Starting with the week 2 message, information about how to view the week's special episode online was added to the remaining weeks' email messages:

*You can also watch this week's special Cyberchase episode, "[Name of Episode]", when you click on "This Week's Video", or watch it on TV on PBS KIDS GO!. Check local listings at <http://to.pbs.org/CyberchaseLocalListings>*

The first interview with children indicated no awareness of how to redeem points for rewards, so starting with week 4 and following, a note about how to get rewards was added to the parents' emailed messages:

Have you earned enough points to get rewards? Find out by visiting this page and clicking "Check out the Rewards!"

<http://pbskids.org/cyberchase/challenge/>

A note was added also to messages for weeks 6-8 informing participants how they could easily access activities from earlier weeks. This note was added because the weekly URL sent users to a specific Challenge Week's page rather than the general Summer Challenge home page that gave access to all 8 weeks.

If you missed doing activities in the previous weeks, go to <http://pbskids.org/cyberchase/challenge/> and log on to earn more points for cool rewards.

Interviews. The mid-summer and end-of-summer interviews collected verbal reports from the 109 recruited participants on what they had done on the *Cyberchase* website and the appeal of those activities; what was done offsite with respect to *Cyberchase* broadcast viewing and other math activity; and why they may not have participated in activities onsite or offsite. The interviews asked for recommendations to improve the Challenge experience and interest in participating in more *Cyberchase* opportunities. The second interview also elicited some brief feedback from parents.

Online Tracking. The following online activities were tracked for both the recruited and random samples over the eight weeks of the Summer Challenge:

- Opening of each Challenge Week's video player
- Submission of one, two or three Cybertrivia answers for each Challenge Week
- Making one each of four games (Matcher in Challenge Week 1; Dots in Week 3; Catcher in Week 5; Rancher in Week 7)
- Submission of a report for the Do-At-Home activity for each Challenge Week
- Points earned each week
- Downloading of one to five levels of rewards

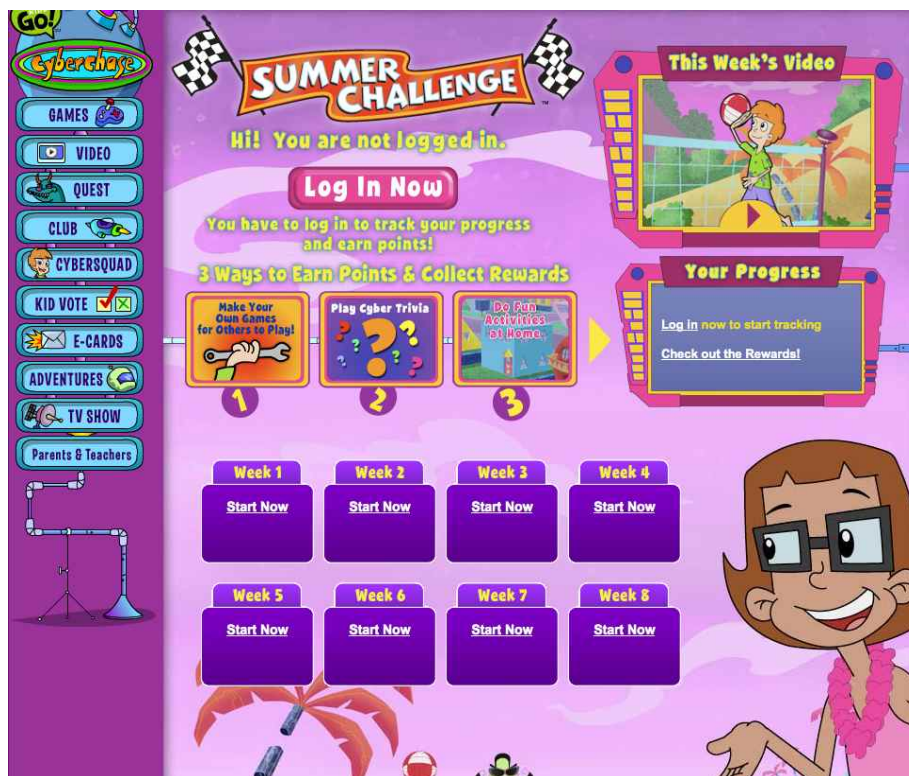
To describe how the Summer Challenge website engaged users, tracking data were analyzed with frequencies for overall usage and weekly usage for the different activities on the site. The tracked random sample included 400 users, randomly drawn from those who signed onto the site during Week 3 of the Challenge period. The sample of 109 interviewed children was reduced by eight for the tracking data. Six recruited children who never logged on were dropped from the recruited tracking data because the random tracking data represented only active users. Two more recruited children were dropped because they were inadvertently given the same username, so their tracking reports did not accurately represent their activity. Thus, the recruited tracking data included 101 active children.

## Data analysis

In the Results sections of this report, the quantitative data are presented with means and rounded-off percentages. Where appropriate for the recruited sample, chi-square tests were applied to assess the influence of the measured variables of gender, minority status, and prior *Cyberchase* viewing. (Such information was not available for the random sample). Statistical tests that gave a p-value, or probability value, lower than .05 are described as “significant” in the text. Qualitative responses to open-ended questions were coded by keywords and key phrases and are reported with user percentages and illustrative quotes for each thematic category.

## HOW DID CHILDREN ENGAGE IN THE SUMMER CHALLENGE OPPORTUNITIES?

Each week, for eight weeks, a new set of activities was posted on the Summer Challenge website, as shown in the purple “Week #” file folders on the home page below. When users logged on, they could engage in activities of the current Challenge Week or catch up with activities they missed in previous weeks.



For each week, website activity was recorded when random and recruited users (1) opened a video player to view long or short *Cyberchase* videos; (2) submitted Cybertrivia answers related to a week’s video episode; (3) submitted a game they made, and (4) submitted a report on a Do-At-Home activity.

Points earned and rewards downloaded also were recorded.

See page 1 for an illustration of these opportunities on the Week 1 homepage.

## How did Users Interact with the Summer Challenge Website?

The main goal of the Summer Challenge website was to provide opportunities for users to engage with math over the summer months. The site design intended to encourage those who visited the website once to “get ‘hooked’ on the sequenced set of summer offerings, returning during the summer for the new offerings and moving from one educational opportunity to another within a given week’s set of shows, short videos, game design opportunities, off line activities, and trivia contest.”<sup>2</sup> For both the random and recruited samples, this section explores various measurements of “engagement” in the Summer Challenge opportunities as provided by the tracking data, including

- number of Challenge Weeks in which users were engaged
- frequency of catching up with previous Challenge Weeks
- frequency of engaging in different activity types over the summer period
- frequency of engaging in two or more activities within a Challenge Week
- number of points earned
- levels of rewards downloaded.

The tracking data reveal that most Summer Challenge website users were sufficiently engaged by their online experience to come back for more after their initial visit. Most users also played catch up by visiting a previous week’s activities. Users engaged in all four available activity types, but most preferred watching video and making games. During most of the Challenge Weeks, most active users chose to engage in more than one activity. A majority of users earned points by completing point-giving activities, but a low percentage of those who qualified for rewards actually redeemed them.

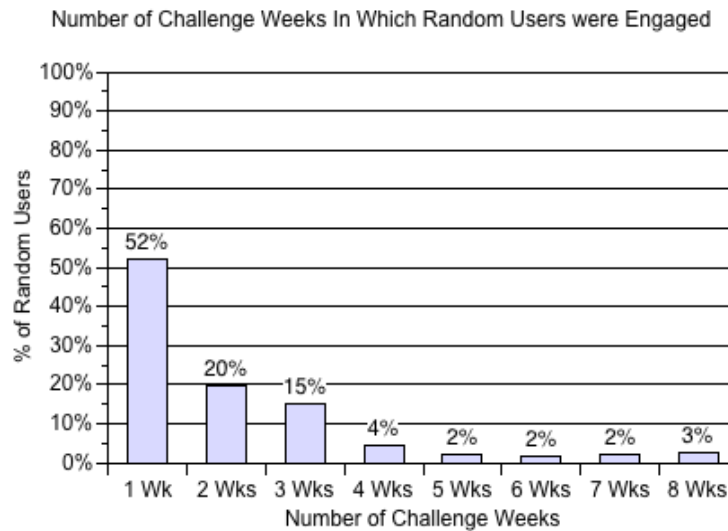
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<sup>2</sup> Michael Templeton (personal communication, 10/14/10).

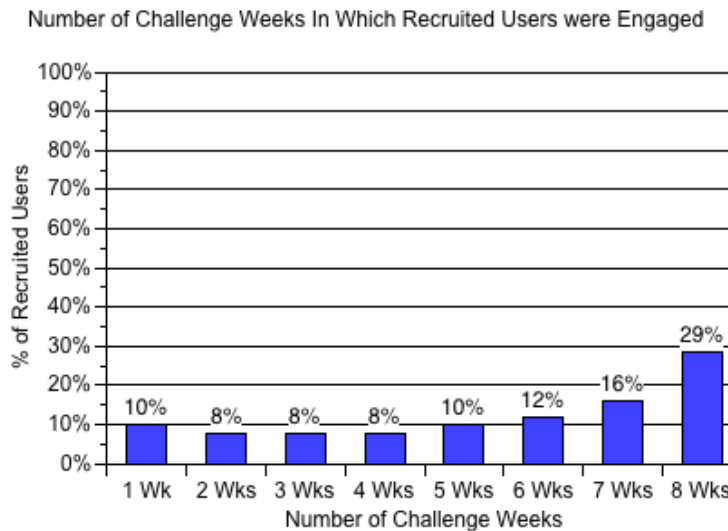


### Number of Challenge Weeks in which Users were Engaged

Weekly posting of new content was to promote repeat visits to the website, although there was no expectation that children would visit over all eight weeks. The chart below indicates that about half (48%) of the random sample returned to the website after experiencing their first Challenge Week, and 28% were quite engaged showing activity during three or more of the eight summer weeks. The latter group is more like our recruited sample in terms of investment in the summer opportunities.



Parents of recruited users shared with their children weekly emailed announcements to visit the website. As expected, such encouragement yielded repeat visits as shown in the chart below. Almost all (90%) of the recruited sample returned to the website after their first week's visit; and 82% visited during three of the eight summer weeks.



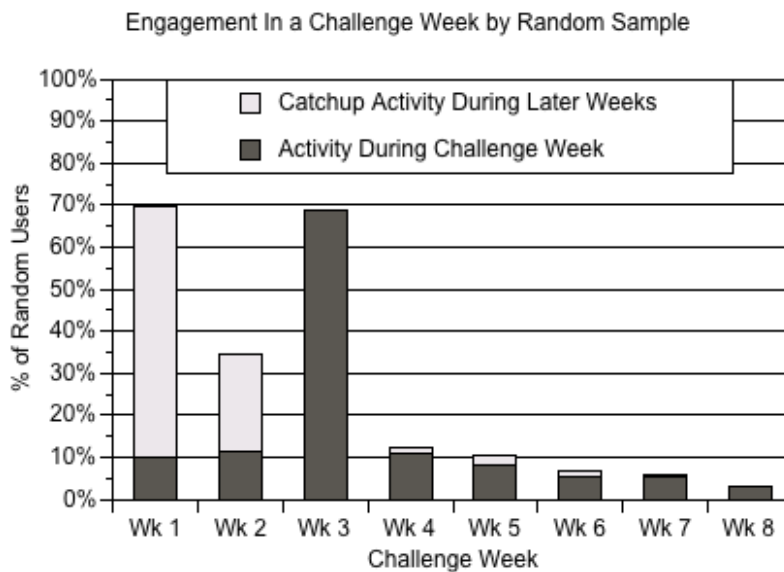
Thus, most Summer Challenge website users in both samples were sufficiently engaged by their online experience to come back for more after their initial visit.

## Frequency of Catching Up with Previous Challenge Weeks

To compete with summer’s busy time of vacations and outdoor activities, the web design of posting activities weekly and giving points for completion of a week’s activities was intended to encourage return visitation (discussed above) as well as catching up with previous week’s activities if a summer week was missed.

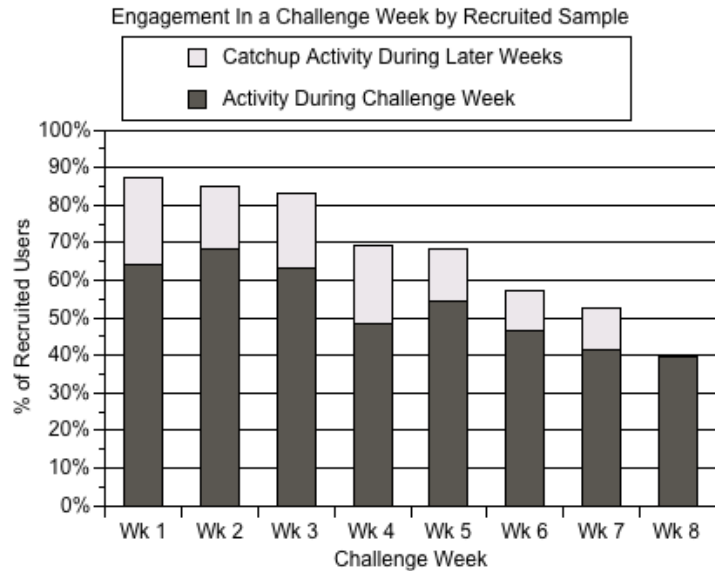
The chart below presents the frequency of engaging with any Summer Challenge website activities during the actual Challenge Week and also during a later calendar week in the summer. The chart’s darker color represents the proportion of users from the random sample who did Challenge activities during the calendar week they were posted. The lighter color represents users who “caught up” with Challenge Weeks they missed. For example, a user going online during the third calendar week of the summer when Challenge Week 3’s activities were posted might make a game associated with Challenge Week 1, watch a video from Challenge Week 2 and not do any activity from Challenge Week 3. In the chart below, this example user would appear in the lighter bars for Wk1 and Wk2 but not at all in Wk3.

Note that the high participation in Challenge Wk3 activities reflects the fact that all of the random sample were drawn from those who were active during the third calendar week. The high catch up percentage in Wk 1 is almost entirely due to the availability in the Challenge Week 1 webpage of a make-your-own game. Over the eight weeks, 7-in-10 random users (69%) caught up with previous weeks’ activities.



The chart to the right shows high weekly activity for the recruited sample, as might be expected with the weekly emailed announcement: 87% of users participated in Challenge Wk 1 activities decreasing gradually to a low of 40% who participated in the final week of activities. Interviews indicated that the late summer decrease was due mostly to vacations and returning to schools in August.

Over two-thirds (78%) of the recruited sample caught up with some previous weeks' activities during the eight weeks of summer.

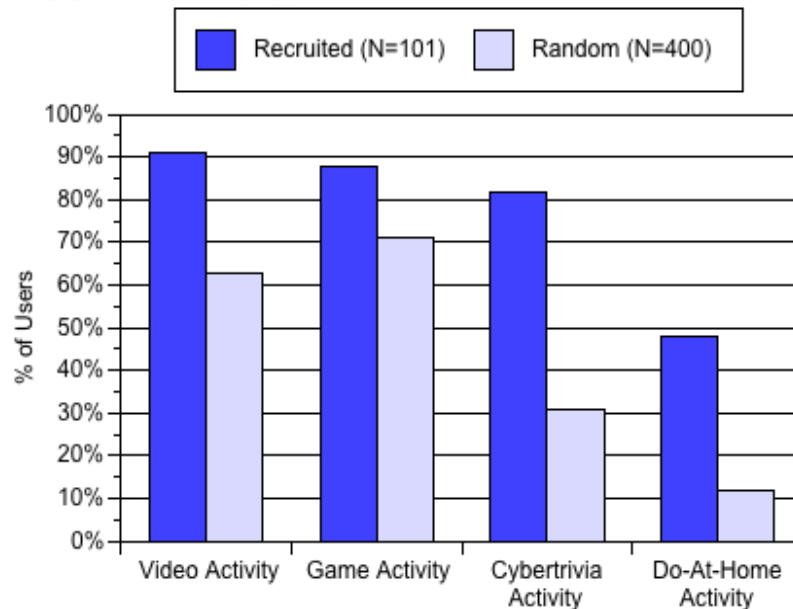


Thus, most Summer Challenge website users in both samples played catch up by engaging in a previous week's activities.

### Frequency of Engaging in Different Activity Types over the Summer Period

To appeal to a wide range of children and to broaden their math experience, the website presented four different activity types (video, game, trivia, do-at-home). Both user samples engaged in all four activity types (see chart below), with video being the most popular among the recruited users (91% participating) and making games being the most popular among random users (71%).

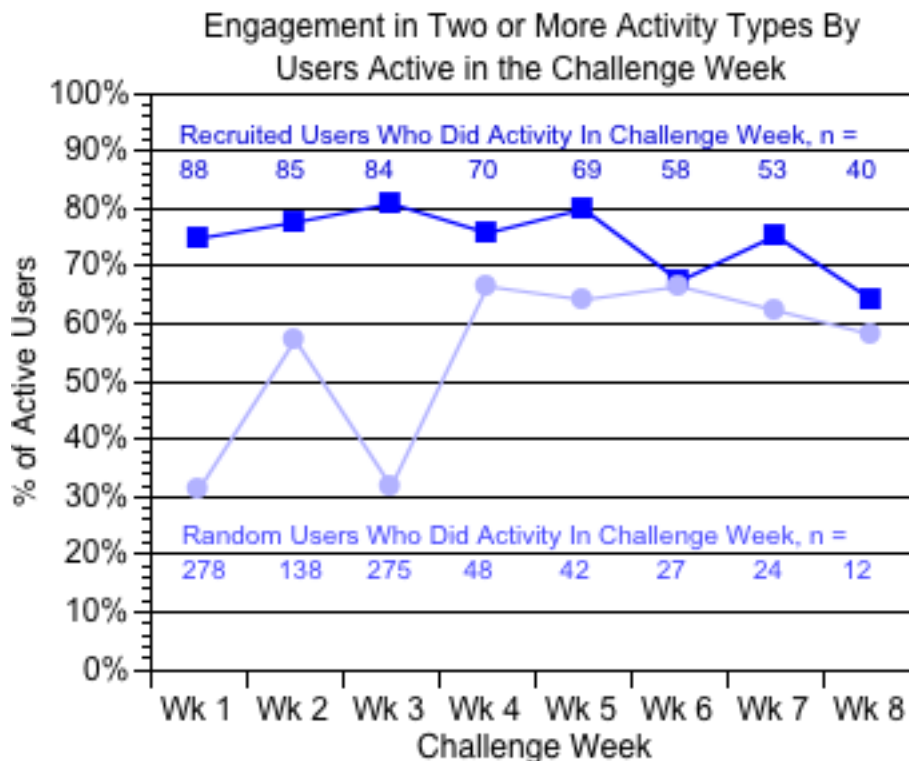
Engagement in Activity Type At Least Once Over 8 Summer Calendar Weeks



### Frequency of Engaging in Two or More Activities within a Challenge Week

Efforts were made within each Challenge Week to link thematically the various activities; for example, watching the *Hacker's Challenge* video in which the *Cyberchase* kids solved number puzzles would help users answer the Cybertrivia questions and complete the number puzzle Do-At-Home activity. Looking at how many activities users engaged in within a Challenge Week gives us a quantitative measure of how the thematic linkages played out in practice. Interviews with the recruited sample, discussed later in this report, give us qualitative feedback.

The chart below looks at those who did an activity associated with a Challenge Week and shows the percentages of those active users who engaged in two or more activities. The majority (60-80%) of active recruited users, who received announcements of the four activity types, participated in more than one activity in each of the Challenge Weeks. The picture is more complicated for the random users. In Wk 1 and Wk 3, when new games were posted, a large number of random users played only the games, but still one-third (32%) of active users did two or more activities in Wks 1 and 3. In Challenge Wk 2, when a game was not available, 57% of active random users participated in more than one activity. In Wks 4-8, the random sample winnows down to an active 5-10%, and the majority of this group engages in more of the activities. These actively engaged random users are similar to our recruited users.



Thus, during most of the Challenge Weeks, most active users chose to engage in more than one activity.

### Number of Points Earned

To help motivate participation in the variety of activities, points were given for answering Cybertrivia questions, making a game, and reporting on a Do-At-Home activity. No points were awarded for opening a video player. Users could earn a certain number of points for each Challenge Week, which added up to 292 points over the summer. Points could be redeemed at five different levels to download rewards.

Table 3 presents the range, mean and median point scores of the two samples and the distribution of users earning points in each Reward level. A majority of both samples worked toward earning points (96% of recruited sample; 75% of random sample), and both samples included users who obtained the highest point level. As would be expected, the recruited sample was more active in point-earning activities over the eight weeks than the random sample; however, one-quarter (25%) of the random sample only opened the video player, an activity which did not earn points.

**Table 3. Distribution of Summer Challenge Points Earned Over Eight Weeks**

Group	N	Range	Mean Pts	Median Pts	% 0 pts Opened video player only	% Reward Level 1 3-49 pts	% Reward Level 2 50-149 pts	% Reward Level 3 150-224 pts	% Reward Level 4 225- 274 pts	% Reward Level 5 275-292 pts
Recruited	101	0-292	125.7	120	4%	19%	41%	19%	8%	10%
Random	400	0-292	40.5	25	25%	47%	23%	3%	2%	1%

Those in the recruited group who reported that they had watched *Cyberchase* in the months before the evaluation earned a significantly higher average of points (mean = 146) than those who had watched the series when they were younger (mean = 106) or had never watched *Cyberchase* (mean = 102).

### Levels of Rewards Downloaded

The Summer Challenge website provided a progress report to the user of points earned and points needed for each of five reward levels. Points were redeemable for downloadable rewards of puzzle pieces, wallpaper, an adlib story, picture frame, calendar and board game.

Of the random sample, 75% earned over 3 points qualifying for at least a Level 1 reward but only a small portion (7%) of those with points downloaded any rewards. Of those who had the required point scores for Level 1, 6% downloaded; for Level 2, 5%; for Level 3, 9%; for Level 4; 10%. None of the few users who reached Level 5 points redeemed rewards at any of the five levels.

Similarly, a high proportion (96%) of the recruited sample earned over 3 points. One-fifth (21%) of those qualifying redeemed rewards. Of those who had required points for Level 1, 21% redeemed rewards; 8% at each of Levels 2 and 3; 17% at Level 4, and 30% at Level 5. For the recruited group, those who had watched *Cyberchase* recently were significantly more likely to download rewards (76%) than those who reported that they had watched the series when they were younger (14%) or had never previously watched *Cyberchase* (10%).

### Usage Of Other Sections of *Cyberchase* Website

Half (50%) of the recruited users reported activity in areas on the *Cyberchase* website not related to the Summer Challenge:

- 34% said they played games elsewhere on the site
- 12% noted playing Quest
- 4% played Lucky Star
- 3% looked at the characters in Meet the Cybersquad
- 2% watched videos other than the Summer Challenge videos

## What Was Appealing Or Not About The Summer Challenge Experience?

Interviews with recruited users revealed that they most liked the games and video in the Summer Challenge experience. Small portions of the sample felt some games were confusing or too easy or that videos were difficult to play or not appealing.

In the final interview, the recruited participants were asked what they liked most about their Cyberchase Summer Challenge experience. The games and video were the most appealing activities:

- 43% liked most the games; for example,  
*I liked making the games. Testing them was the most fun, to see what will happen.*  
*I liked the games. The challenges were fun. I like to challenge myself sometimes.*  
*When you got to create your own game. I liked that you got to pick what you wanted to do in the game.*  
*I liked all the games that they had. I liked how you can make your own game and play it like you want to.*  
*Doing the games is fun. My favorite thing was making them. It made me feel good to make stuff. I liked the Matcher game the most. I also played a lot of different kids' ones [games].*  
*Making the games and playing other kids' games. It was fun to decide what happens in the game. I especially liked the Dots game.*  
*I think I like making the games and playing mine. ...I like how it has the setup, and it was really easy to put it together, and then you get all the fun of playing them.*  
*I liked to make your own game. It was fun and got to play your own game and other people's games.*
- 34% liked most the videos; e.g.,  
*I liked watching the videos. I liked watching how they always figured out how the problem was solved or how to stop Hacker.*  
*I like watching the shows. They shows always have a mystery and something in the middle that stops them, but they always figure it out in the end.*  
*I liked watching the shows and learning about it. I like the mysteries and what they're going to be building.*  
*It was fun to watch the shows. They tried to make math not boring.*  
*The videos – the long ones – really cool to figure out what they were trying to do. The long ones, you get to see all the information, not just one part of it.*  
*I liked how I had to figure stuff out. During the show, I like having to guess what the solution is for the problem.*  
*I liked watching the videos there. They got me more interested in Cyberchase. I liked how you had free choice, and you didn't have to do a certain one.*
- 15% liked most Cybertrivia; e.g.,  
*I liked answering the questions. I liked sometimes I knew the questions and sometimes I didn't, so when I didn't, I used to watch the videos first to see if any of the questions were there.*  
*I got to answer questions that I never saw on the episode. Makes it a little harder – I like it harder.*  
*I liked to answer the trivia questions. If I would miss the questions, I could go back and answer them all, and I would answer them correctly.*  
*Probably the trivia questions. To me, they were really fun. I like trivia.*  
*I liked that it quizzed me like what I know about the TV shows – what was their names and stuff in the show.*

- 8% liked most the Do-At-Home activities; e.g.,  
*I liked doing all the activities cause I got to make things and measure things. I made a pop up card and a robot remote.*  
*Probably the things at home, do the thing at home. Usually it's like an art project, and that's fun.*  
*I liked the writing about what you did. I liked submitting it. I liked how you got to write what you think, you get to write what you chose. It's kind of freedom.*  
*I liked mostly doing the activities – the one you download. Once you are done, you can post what you learned for everyone to see.*

The interviews did not ask specifically about learning, but 17% of the answers about what they liked best noted that they learned from their summer experience; for example:

- All the games really helped me in math. The Matcher game really helped me. I was bad at multiplication and division, and now I'm better at it.*
- Playing the games. You have to read the instructions, so it helps with my reading.*
- I liked mostly the shows. I learned measuring and multiplication from the shows.*
- The best thing was watching the videos, because they were cool, because I learned some stuff. It was real fun.*
- Watching the weekly videos. They help me learn to solve problems, and it could help me in math.*
- I liked watching all the videos, and I liked learning more stuff like math. Some of the videos were funny, and some of them, you got to learn something.*
- I liked answering the questions, because they made my brain think.*
- I learned how to make a pop-up.*
- I really liked the activities because sometimes they taught you something new about math, and sometimes they taught you something new about how something works.*

The majority (70%) of recruited respondents could not think of anything that they did not like about the Summer Challenge experience. Others commented about the four main activities and the point and reward system, as follows:

- 13% commented about games. Some felt the games were confusing, but others thought the games were too easy and boring:  
*They should give instructions for the third level of Rancher. It was hard to play and win.*  
*Some of the games were confusing because you don't know what some words mean, so it is harder to read and know what it is about.*  
*I didn't understand some of the games. Some of the instructions for the games were confusing.*  
*Sometimes I don't really get, I get confused about some of the games. I think the confusing one is the one where you do the matches. It was confusing.*  
*Better instructions on the games.*  
*I didn't like how you don't get to listen to the music before you put it in your game. [Ed: This feature was available but apparently not obvious]*  
*I didn't like the Catcher game. It was boring.*  
*After a while some of the games that you have to make got boring.*  
*The games were a little bit easy, because it was easy, it made it less challenging.*  
*The games were too easy and didn't challenge me enough.*  
*I didn't really get why the game I made was the same one every time.*  
*I think they should have had more games.*  
*There weren't many games I could play.*
- 6% commented on the videos, noting either that the videos were difficult to play on their computer or that the stories were not appealing:  
*My computer is not used to playing videos. Sometimes it took a long time to download and sometimes it would stop and "scratch" a little bit.*  
*The movies didn't load that fast so I would end up waiting. I waited a long time.*



*I liked everything else about the website except that I could not download the videos. The videos were not playing.*

*It didn't really ask you to do things that they did in the movie that much. It doesn't like get you in it.*

*I didn't really like some of the TV shows. I didn't really like the stories.*

*I didn't really like the show that much, but it was okay. Some parts were kind of weird a little bit – the Hacker guy, the theme song, and they were kind of robots except for the kids.*

▪ **6% commented variously on the Do-At-Home activities:**

*The things that you printed out -- they were really easy.*

*Some things were confusing. My mom would help me re-read it 'til I understood. It was usually the directions, not the activities.*

*One thing I kind of don't like – the ones you have to do at the house. I want to do the things that are on the computer instead of just trying to do things off the topic.*

*I didn't really enjoy doing the thing where you do a challenge – the place where you have an activity and you are supposed to write about it. Most of those - I didn't really want to do the activity.*

*The Do-At-Home things - a little boring.*

*What was a little funny is that you could just hit submit before you even did it [Do-At-Home Activity]. I just saw that "submit" right there, and people could do that and say 'I liked that.' I think you should save the possibility to submit 'til the end.*

▪ **4% commented on Cybertrivia:**

*The trivia questions. There were only three of them. You only got to do three. If you could do more, you could get more points.*

*The trivia was over like that – really quick and easy to do. Make them give you less points, and put more questions on there.*

*It was pretty simple. It was still interesting but like the questions at the end, those were pretty easy.*

*I sort of didn't like Cybertrivia, because it wasn't really fun. All you did was really answer questions.*

▪ **4% commented on confusion related to the Point and Reward System:**

*I didn't like that I couldn't find my points. I was looking and didn't find it anywhere.*

*I played the games but I didn't get points, even though I logged in with my username and password. I would play a game, and it said I won points but when I went to check how many points I had, none of them showed up. [Ed: Child assumed that the score posted when playing games were "points earned."]*

*Sometimes I did the activities but I didn't get the points. I used the password and username, but when I went to print out the activities I didn't receive any points. [Ed: Downloading did not receive points. An online report was necessary to receive points.]*

*I redeemed my points for rewards. The rewards that I got were puzzle pieces. I got puzzle pieces 1, 3, 4 & 5. There was no puzzle piece #2. I can't complete the puzzle without it. Why is there no #2? [Ed: #2 piece was available with #1 in Level 1 rewards].*

## What Motivates Users to Participate?

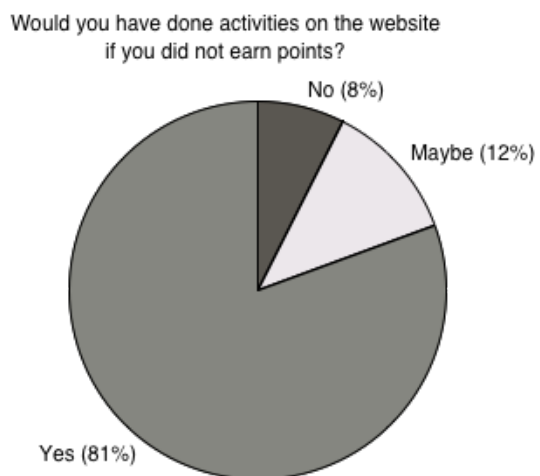
Recruited participants reported that no or low visitation to the Summer Challenge website was not necessarily a lack of interest but more due to vacations, busy schedules, computer problems and returning to school late in the eight week period. For the majority of recruited users, earning points and redeeming rewards were not prime motivating factors in site usage. The children suggested that more games would entice them to visit the site more frequently. Two-thirds of parents described their children as motivated to participate by the email announcement and website activities themselves.

A majority of the recruited children were active on the website during the first six of the eight calendar weeks. Site visitation was not required of recruited children, although the weekly emailed announcement described site activities. A small portion (17%) of the sample had no or low activity over the eight weeks, and these children were interviewed about their lack of activity.

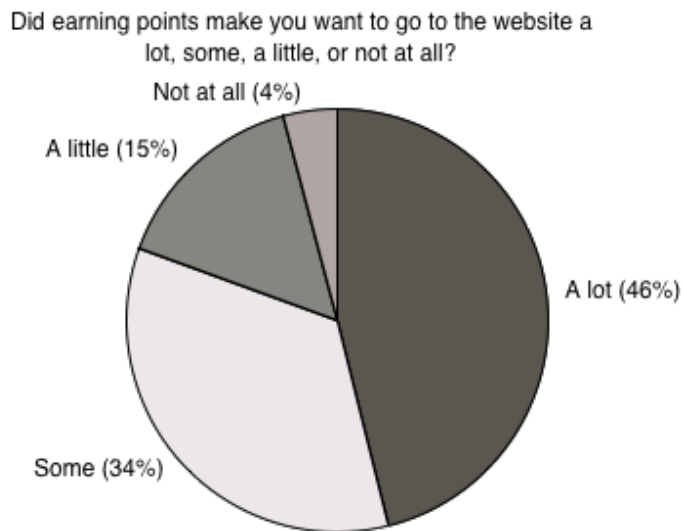
**No Visitation.** Six recruited children did not visit the Summer Challenge website at all, although two of these watched some *Cyberchase* episodes on broadcast television. Four of the six reported lack of time due to vacations, preference for outdoor play, or a too-busy schedule; and two of these children also reported computer problems. One of the six reported only visiting the regular *Cyberchase* website, and one family reported that they do not encourage use of the computer.

**Low Visitation.** Four of the recruited sample visited the website only once over the eight weeks. These children reported an interest in the little that they experienced in their only visit, but two said they were too busy to go to the site more often and two reported computer problems. Nine of the recruited sample did not visit the website in the latter half of the summer. These children said they were “interested” in the activities; but four reported returning to school in early August, four were “too busy” with vacations or sports practice, and one lost the password.

**Motivation By Points.** As illustrated in the pie chart, a large majority (81%) of recruited users predicted that they would have done activities on the website if they did not earn points. The 8% who said “maybe” remarked that points made them do more activities than they would have without points. Only 8% felt that earning points motivated them to do the web activities.



Although many may have done activities without points, most recruited users felt that earning points made them want to go to the website “a lot” (46%) or “some” (34%), as illustrated in the chart to the right.



**Motivation By Rewards.** Users could begin to download rewards at Level 1 with only 3 points (i.e., answers to 3 Cybertrivia questions). Almost all (96%) of the tracked recruited users earned sufficient points to download rewards, but 78% of those who could did not redeem their points. When asked why they did not turn their points into rewards:

- 36% reported that they did not know how to turn their points into rewards
- 18% intended to redeem their points but had not had a chance to do so
- 11% did not know that they could turn points into rewards
- 9% were not interested in the rewards available and just liked earning points
- 5% wanted to earn more points before redeeming for rewards

Of the 21 tracked recruited users who actually downloaded rewards, 14 recalled in the interview that they had done so. Of these 14, 11 felt that getting rewards made them want to go to the website “a lot,” 2 felt that rewards made them want to go “some,” and 1 was motivated “a little” by rewards.

It would appear that points and rewards in the abstract are motivating but how the system was implemented and presented in the Summer Challenge website did not motivate activity as expected.

**Other Motivating Devices.** Recruited users were asked to suggest what *Cyberchase* could do, besides giving points and rewards, to encourage doing activities on the website. Most users offered no specific mechanism for motivating activity but suggested adding activities: more games (12%); more challenging activities (6%); more fun things to do (4%); more videos (3%); and more at-home activities (2%).

Recruited users were also asked what could be added to the *Cyberchase* website to make them want to visit there more often for a longer time:

- 43% suggested adding games; e.g.,
  - There could be more games with math*
  - More math games*
  - Like Hacker, make a big huge weapon and you would have to disable it using math problems*
  - Multiplication games*
  - Making practicing adding and subtracting and division*
  - On the games, maybe having game builders that you could use there. That would be a nice touch.*
  - Probably make something like a game that had different worlds that you had to complete*
  - Maybe like you get your own character*

*A game where you have to make the right choices in order to live and go on; otherwise, you can't go on.  
Probably games that are harder to play  
Maybe you could do something where you could make comments on the games  
Games for every single week, because some [weeks] didn't have games and you can't earn points.*

- 7% suggested adding videos; e.g.,  
*Extra videos  
More full episodes to choose from*
- 6% wanted more trivia questions; e.g.,  
*Maybe some harder trivia to go with the easy trivia  
More questions with more points  
The trivia with more questions would make me want to visit again*

A look at what qualities recruited users like in their favorite websites might also give some guidance as to what motivates this age group to visit a site. During the weeks following completion of the 8-week Summer Challenge, 69% of the recruited sample reported that they had visited a website. Websites noted by more than one respondent included Cyberchase (13%), “dress-up” websites (7%) like GirlsGoGames, DisneyFairies, i-dressup, stardolls; Webkinz (5%), Disney (3%), PBSKids (3%), Club Penguin (3%), Miniclip (3%), Lego (2%), Runescape (2%), and Youtube (2%). The components that the children liked best on these sites were the “games;” “videos;” “dressing/shopping” for characters; “having/taking care of pets/monsters;” and “making/talking to friends.”

**Parental Viewpoint.** In the final interview, parents were asked if their child saw the *Cyberchase* Summer Challenge as an assignment, something that had to be done, or did their child want to participate whenever s/he had the time and opportunity. Two-thirds of the parents described their child as enthusiastic and motivated to participate. One-fifth of the parents reported that their child enjoyed the experience but typically had to be reminded, and 15% thought their child saw the Challenge as more of an assignment. Example responses are given below:

- 62% of recruited parents felt that their child was motivated to participate; for example:  
*He wanted to participate whenever he had the time and opportunity. He was always looking forward to the online challenges and watching the episodes. He missed a few and was frantic to catch up online. He saw it as fun. He is pretty motivated, like when you earn points and stuff. I think that he liked the whole computer part of it. What I would do was forward the email to him on his account, and he thought that was cool. He would just log in and do it. So it was good. It was a positive experience.*  
*He wanted to participate whenever he had the time. He would call me at work and ask if the weekly letter had been sent yet! He really liked playing the games. It was fun and interesting for him, and he really liked all the math games.*  
*He loved it, absolutely loved it. He looked forward to it and was asking me Thursday morning if the email was here yet. It was an adventure for him.*  
*He wanted to participate whenever he had the time and opportunity. He was super enthusiastic about it. It was never a chore. He was engaged, never got bored. Would play for as long as he was allowed on the computer.*  
*She wanted to do it all the time. She enjoyed it and reminded me every week it was time!*  
*She wanted to participate whenever she had time. I think she got to use her computer skills. The website is interactive, not just reading, and do projects, measuring, cutting, etc. She got her siblings involved.*  
*She really liked it. She liked Cyberchase, so it was kind of cool, and she got to look at episodes over again. She enjoyed doing it. Even after answering [cybertivia] questions, she wanted to go back and look at the episodes.*

*She was very excited every week. I noticed she liked the game with the boy and stuff was falling from the sky. And the one where she had to choose if they had the hats on and hats off. She really liked the games. I think she found it fun and wanted to participate whenever she had the time. I think she enjoyed it. She watched all the videos, liked making the games, doing the trivia questions. It started out as an assignment, then as time went on, she would ask if the email was up, and she would enjoy the experience.*

- 23% of parents felt that their child enjoyed participating but needed to be reminded; for example:

*There'd be times I had to push him to do it, but once he was on, he liked it. I think he's done pretty well. He enjoyed it. He said the math was too easy. He liked playing the games.*

*He wanted to participate. I would have to remind him that he needed to do it, but he would be okay cool – and run to the computer.*

*I would remind him that he needed to do it, but then when he was doing it, he was totally engaged. He liked it. He really seemed to enjoy the website and said that there were some fun things on there.*

*Sometimes she would be off doing something else and had to be reminded to do it, but when she was there she enjoyed it. She had fun with it and enjoyed it.*

*When she had time, she wanted to participate. Sometimes I had to remind her, but once she was on, she really enjoyed it. It gave her an excuse to go online. She had fun watching, and some of the games she didn't like so much.*

*There were a couple of times that I had to remind her. And there were a couple of times that she went on extra times to play. I think once she got the hang of things, she liked it. But some of the things, like the games, weren't clearly defined for her. Once I sat with her and she understood it, she was fine.*

- 15% thought the experience felt like an assignment for their child, particularly as the weeks went by; for example:

*Initially he wanted to participate but after a while it became more of an assignment because he felt the games were too babyish. He was frustrated by not earning points after playing so many games.*

*He was thinking of it more as an assignment, although I do think that if we weren't as busy this summer, then he would have done it more. I thought that it would be more fun for him than it turned out to be. He liked the shows, but he didn't like the games as much.*

*It was like an assignment for him. He has not been engaged. It hasn't caught his attention. He was not enthusiastic. He watches the half-hour thing. I didn't watch with him. I asked what he doesn't like. He says that they seem predictable, and the mystery was too easy for him.*

*I think at first she was excited to try it, at first, but didn't like it after that. She had some problems, and she didn't like it as well as the other websites they go to.*

*It became more of an assignment for her. She became less and less enthusiastic. In the beginning, she was eager, but there were a number of things that interrupted the flow, so it became a challenge to get her on there.*

*In the beginning, she wanted to do it, and then it became more like an assignment. She started out into it, and then she just didn't like the shows. She would do some of the challenges, but then when she wasn't into the show, she wasn't into the show.*

Although parents were not asked directly about learning, 11% of parents spontaneously described how their child learned from the experience, as follows:

*I think it's been great and very educational. It kept him on his toes as far as math skills. He was able to practice a bit more because of this.*

*He really does like it. It's a different way of him learning some things, and I see him reflecting back on it once or twice a week.*

*His attention was good. He enjoyed it. From an adult perspective, I enjoyed him watching it, and we talk about it afterward. We talked about it, and we reinforced what was taught. It really was a very good educational experience.*

*I think he had fun. It was a good learning tool for him.*

*I think he really liked it. I think he learned a lot too.*

*She really enjoyed it. There was one with fractions that she particularly liked. She was always scared of fractions, and I think she is less scared of them now.*

*She enjoys it and says she is learning from it.*

*It has been a good challenge with her for math. She was more into the shows than the computer.*

*I've been pretty impressed with some of the math concepts and math vocabulary that my child has picked up from the show.*

*She really liked the activity about advertising and the truth, and what can be proven. It had a permanent impact on her. She'll bring it up now whenever she sees a commercial and start analyzing it.*

*Relevant and good experience – good when they teach them about propaganda and how media tries to persuade you. Good lifetime experiences.*

*She liked it. It made her think about math a little bit more. We did renovations this summer, and she thought of things spatially. She liked the video on symmetry.*

## WHAT WERE STRENGTHS AND WEAKNESSES OF CHALLENGE ACTIVITIES IN ENGAGING CHILDREN?

Recruited participants were interviewed to provide feedback about appeal and usability of the activities, giving us qualitative information about the strengths and weaknesses of each of the activity types.

### Videos

Viewing *Cyberchase* was a popular activity. A majority of users opened the online video player during the summer period, including all recruited users who had never previously watched *Cyberchase*. A majority of recruited users reported enjoying long *Cyberchase* episodes online, and half watched broadcast episodes. Three-quarters of recruited users watched short videos online; however, most children preferred watching the full-length videos more than the short excerpts.

Online viewing of videos was preferred by a majority of users because the computer permits more playback control and choice of episode or viewing time, although some users reported playback problems and a “fuzzy” picture quality. Those who preferred viewing on television liked the bigger screen size.

Usage. Each Challenge Week featured a video player presenting one long *Cyberchase* episode and several short videos. Almost all recruited users (91%), and even those recruited users who had never previously watched *Cyberchase* (23%), were motivated to watch shows online at some point during the Summer Challenge period. Two-thirds (63%) of random users watched summer videos online.

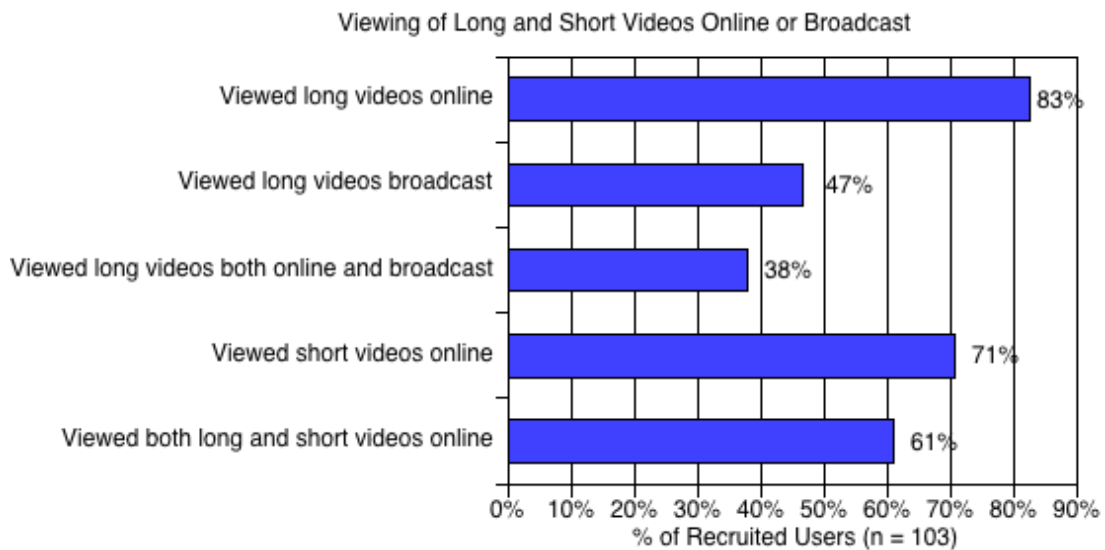
On average, recruited and random users watched slightly but statistically significantly fewer videos during the new game weeks than during the off-weeks. This result could be due to users’ preference for games over videos or a function of the screen design of Wks 1, 3, 5, and 7 in which the video choice appeared ‘below the fold,’ less visible to users (see illustration). In Wks 2, 4, 6 and 8, the video choice was sized and placed where the right-hand illustration shows the game choice.



The chart below summarizes viewing of long half-hour *Cyberchase* episodes and short video excerpts as reported in interviews of the recruited users who visited the website. Most (83%) reported viewing half-hour episodes on their computer. Those who did not watch long videos on the computer described problems with playing the video, limitations on computer time, or preference for watching on television.

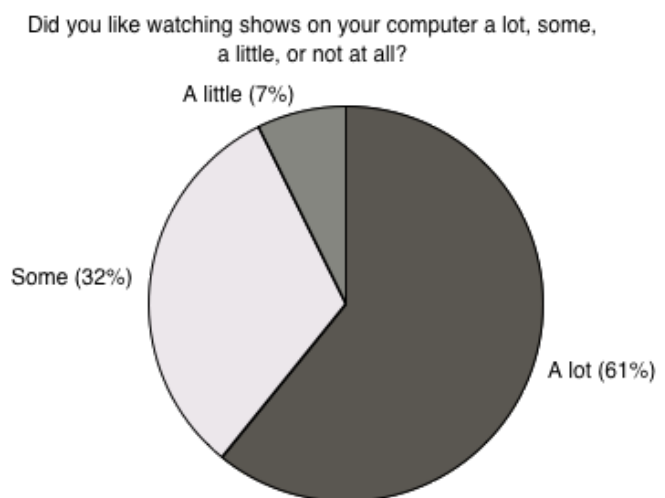
Half (47%) of the sample reported watching episodes on their television over the summer. Boys (58%) in the recruited sample were significantly more likely than girls (36%) to report viewing broadcasted *Cyberchase* episodes.

Both online and broadcast episodes were viewed by 38% of recruited users. Almost three-quarters (71%) of recruited users reported watching short videos online, and 61% viewed both long and short videos online. Those who did not watch short videos online preferred the full episodes to watching excerpts.



Appeal and Usability. Of those recruited children who watched long half-hour episodes on the computer, 61% liked watching the shows on the computer “a lot” and 32% liked it “some,” as indicated in the pie chart.

Children reported that watching on the computer was appealing because they could control the playback, see shows at anytime, and go to games or trivia immediately before or after viewing.

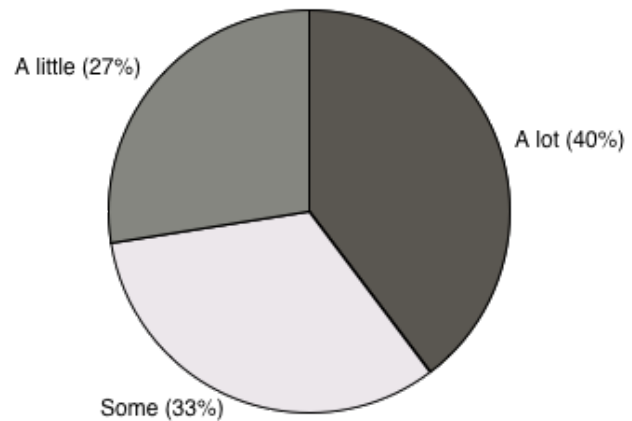




On the other hand, watching on the computer was not appealing to some because of difficulty with playback, the smaller screen, or a “fuzzy” picture quality.

The pie chart to the right shows that of those who watched short video excerpts on the computer, 40% liked watching them “a lot,” 33% liked them “some,” and 27% “a little.” Users enjoyed the short videos because they were short; they gave a preview of the longer video; they were fun and interesting; and they helped with the trivia questions. However, most children preferred viewing the full episodes rather than excerpts.

Did you like watching short videos on your computer a lot, some, a little, or not at all?



A majority (58%) of those who viewed shows online preferred watching *Cyberchase* on the computer because the computer permits more control to play, pause, fast forward, choose an episode or choose a time to view; for example:

*Because you can always choose which show you watch and if you need to do something you can stop the show and do what you need to do.*

*I can watch it any time, not just when it's on tv*

*Because maybe you could pick any episode you wanted.*

*Because I can minimize, make it large, play and pause- it has more options*

*On the TV you have to watch what is on. On your computer you can choose which episode to watch*

*Because you can fast forward if you don't like a part.*

The 42% who preferred watching episodes on the television thought TV was better because of the bigger screen; for example:

*Because on the computer it is a smaller screen so you can't really see it, and on the TV it is a bigger screen so you can see it better*

*It's 47 inch diagonally*

*Because it is bigger.*

*The screen is bigger.*

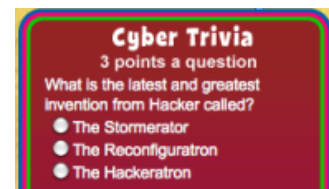
## Cybertrivia

Eight-in-ten recruited users and three-in-ten random users submitted Cybertrivia answers during the summer. Those who viewed a video were more likely to answer Cybertrivia when new games were not available. Recruited users who did not answer the trivia questions either did not watch the videos or did not see the questions on the website. The majority of recruited users liked Cybertrivia “a lot” because the questions were challenging and fun. Some children wanted more than three questions.

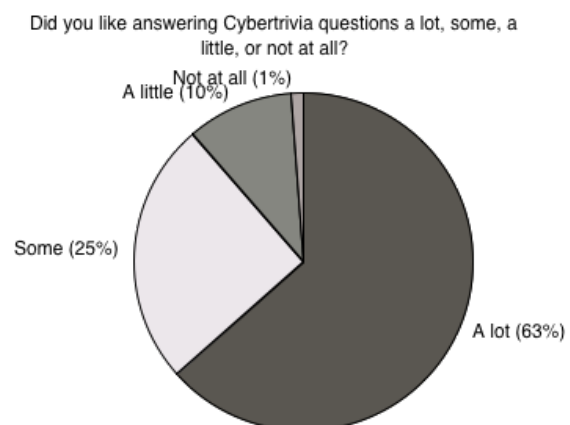
**Usage.** Users could answer 1, 2, or 3 Cybertrivia questions related to the weekly video. If a child answered one trivia question, then they typically answered all three; rarely was a question skipped. A majority of recruited users (82%) and one-third (31%) of random users submitted at least one Challenge Week’s set of Cybertrivia answers. Viewing a video and answering the related questions were moderately correlated activities ( $r_s = .30$ ); however, the availability of new games depressed the synergy between video viewing and answering trivia. The likelihood of answering Cybertrivia with viewing a video was lower on the four weeks when games were newly posted ( $r_s = .44$ ) than on the four non-game weeks ( $r_s = .75$ ). Answering Cybertrivia was highly correlated with summer point scores ( $r_s = .92$ ). We can predict 84% of the variance in a child’s point score by knowing the number of weeks that the user answered Cybertrivia questions.

Recruited users who reported watching half-hour episodes online were significantly more likely to answer Cybertrivia than those who did not watch the longer episodes (88% vs. 67%, respectively). Watching short videos did not influence trivia submission rates.

Those recruited users who did not answer Cybertrivia questions reported that they either did not watch the videos or they did not see the trivia questions on the site. The Cybertrivia activity was not directly tied to the viewing activity either by placement of the choice box or text description in the box.



**Appeal and Usability.** The pie chart shows that 63% of the recruited users who answered Cybertrivia questions liked them “a lot,” 25% liked them “some,” 10% “a little,” and 1% “not at all.” Users liked Cybertrivia because the questions were “challenging” and “fun” and helped them “remember the show.” Users also liked that they earned points and that they could try again if their response was incorrect. However, some users recommended more than three questions and some harder questions.



## Games

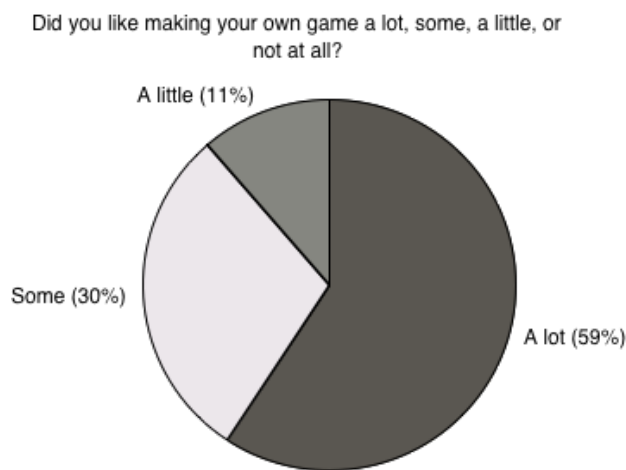
Making games was a very popular activity with a large majority of users making one of the four possible games. The majority of recruited users liked making their own games “a lot,” because they could choose the design of the game and play it themselves, but some children reported difficulty making a game or wanted different assets from the ones available.

Half of the recruited users also played games made by others, but the other half did not see this feature on the website. Of those who played games made by others, half liked this activity “a lot” because they could get design ideas and playing the games was fun. Some users thought playing others’ games was confusing.

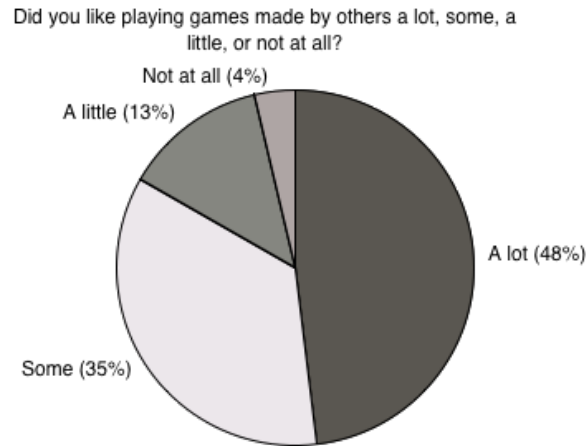
**Usage.** On the Summer Challenge website, users were provided with four sets of game assets (Matcher, Dots, Catcher, Rancher) to make their own game. A large majority of recruited users (88%) and random users (71%) submitted at least one game of the four available. Making games was not highly correlated with watching video, answering Cybertrivia, or reporting on a Do-At-Home activity. Recruited users who reported having watched *Cyberchase* recently, prior to starting the evaluation, were significantly more likely to report making their own game (56%) than those who had watched the series when they were younger (23%) or had never watched *Cyberchase* (22%). Recruited users who did not make their own game reported computer problems, could not figure out how to make a game, or did not want to make a game.

Half (52%) of the recruited sample reported playing games made by others. This group was significantly more likely to have made their own game (98%) than not (2%). Those who did not play games made by others reported that they did not see that choice on the website. Poor page design likely depressed this activity.

**Appeal and Usability.** The pie chart shows that 59% of recruited users who made their own game liked the activity “a lot,” 30% liked it “some,” and 11% “a little.” Users liked making games overwhelmingly because they had control over the choices that went into the design of their game. Users also liked that they could play the game they made and that others could also play it. Small portions of the recruited sample complained that the game-making process was confusing, that they wanted asset choices that were different from those available, or that sometimes games did not save.



The pie chart below shows that 48% of the recruited users who played games by others liked the activity “a lot,” 35% liked it “some,” 13% “a little,” and 4%, “not at all.” Users enjoyed seeing other design ideas and how other games differed from their own. They thought it was “fun” and “challenging” but in some cases “confusing” to play games made by others.



## Do-At-Home

Half of the recruited users and 9% of random users reported doing at least one Do-At-Home activity during the summer. A majority of users liked each of the eight activities and described seven of the eight as “showing them something new about math.”

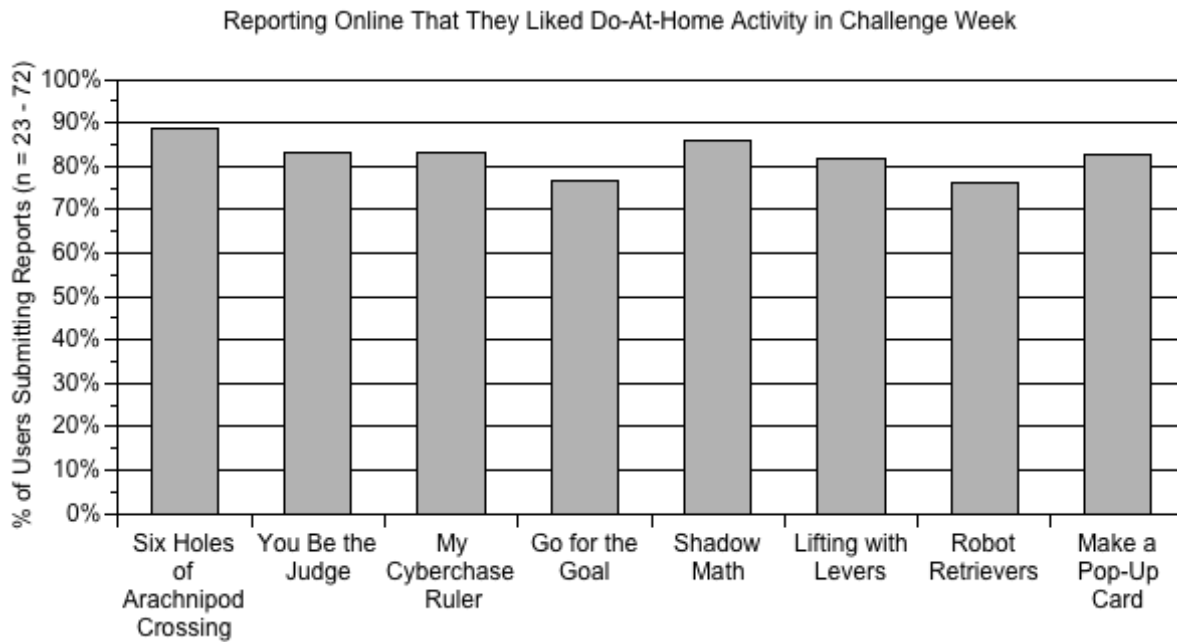
The majority of recruited users reported that they liked the Do-At-Home activities, because they were fun and could be done with others, although some children felt some activities were hard or boring. Reported barriers to doing the activities included no printer, no awareness of the home activities or no time.

Usage. Every week users could download printables of an activity to do at home. Users could earn points by submitting a report online telling if they did the activity or not, if they liked it or not, and if they learned something new about math.

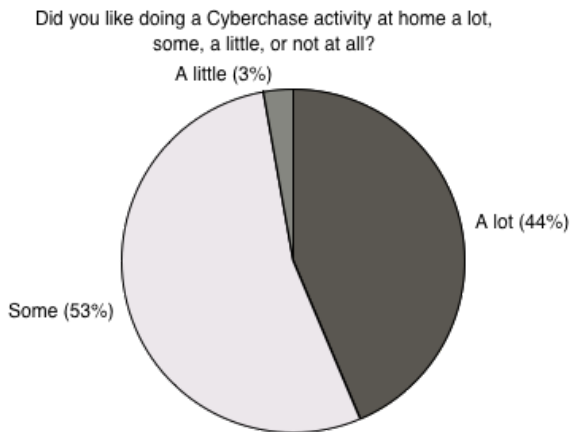
About half of recruited users (48%) and 9% of the random sample reported that they “did” at least one Do-At-Home activity over the eight week period. Reporting on an activity was correlated with answering Cybertrivia questions ( $r_s = .51$ ), perhaps indicating an effort to earn points. Reasons given for not doing home activities included no access to a working printer, no awareness that the activities existed on the website, or no free time to do the activities.

Those who had watched *Cyberchase* recently did significantly more home activities on average (mean = 2.4 activities) than those who reported that they had watched the series when they were younger (1.2) or had never previously watched *Cyberchase* (1.0).

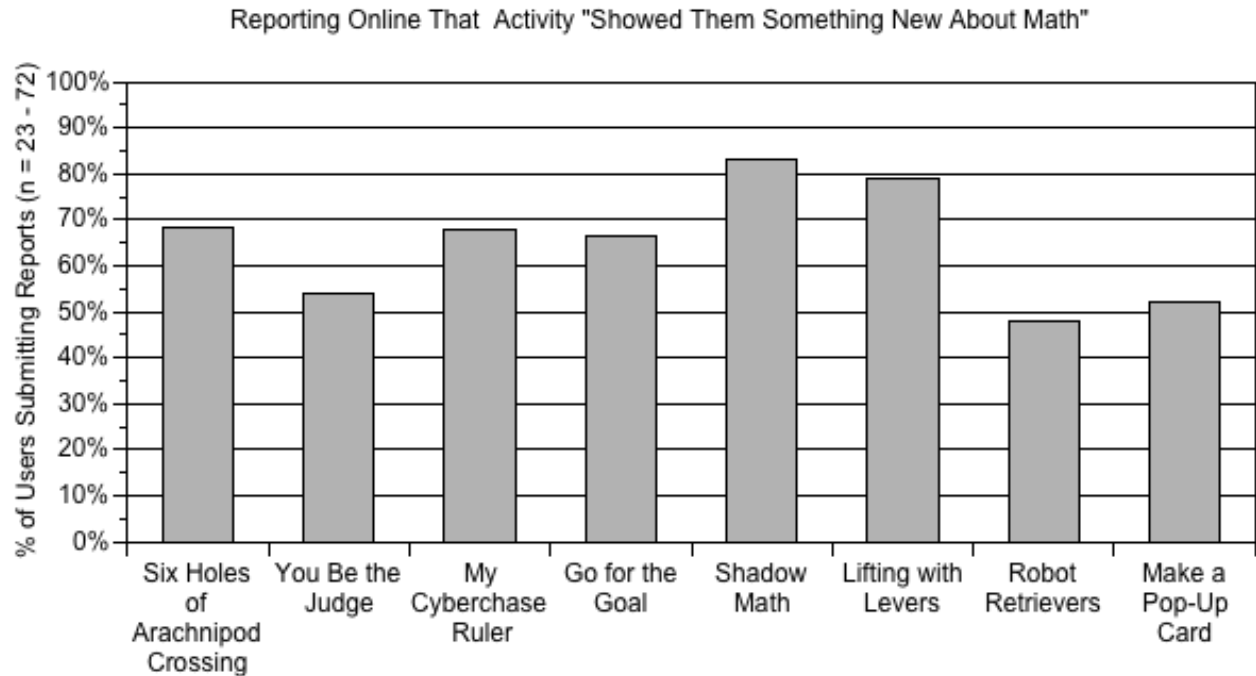
Appeal and Usability. The chart below presents the proportion of both recruited and random users who reported online that they “liked” a Do-At-Home activity. The eight activities appealed to a very high 76% or more of the sample who provided online reports.



Looking at appeal in a more differentiated way, 44% of interviewed children who had completed activities liked doing an at-home activity “a lot,” 53% liked them “some,” and 3% “a little” (see pie chart). These children liked the home activities because they were fun or interesting; they involved working with others like siblings or friends; and they required making things. Some recruited users reported that some activities were hard or boring.



Math Content. With submission of an activity report online, users also reported whether the activity “showed them something new about math” or not. The chart below presents the proportion of reports with a positive response choice. A majority of users thought that seven of the eight activities showed them something new about math.



## OTHER SUMMER MATH ACTIVITY

### What ways was math used during the summer?

During the summer, recruited users reported using math mainly in activities related to money, measurement, food preparation, games and travel.

During the two interviews, recruited users were asked about what ways they have used math during the summer, either just for fun or to figure something out.

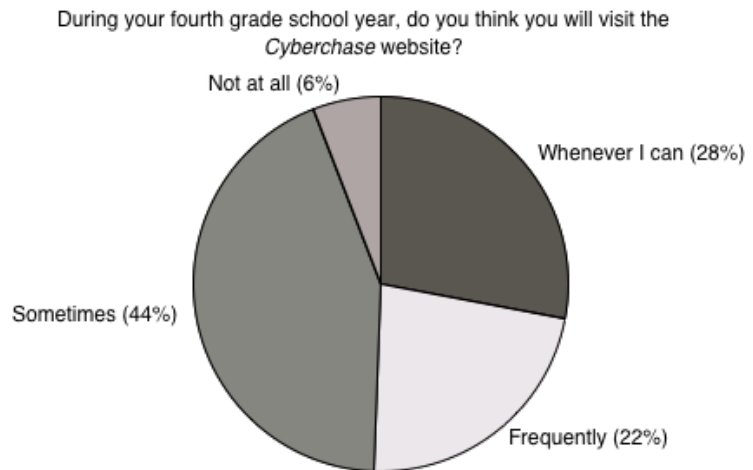
- 25% reported activities related to money; for example, counting to see if they could buy something or to get an exact amount; figuring to see how much they could earn in a week or how to save money.
- 17% described measurement activities; for example, measuring how far a ball is hit; where the center of a pool is; to make a book jacket; or to help a parent seed a yard, build a deck, or see if a refrigerator fits in a kitchen spot.
- 17% noted a *Cyberchase* activity.
- 17% reported that they did summer math workbooks or practice sheets given by school or a parent.
- 17% could not suggest a way they had used math during the summer.
- 11% related stories of math in food preparation; for example, measuring ingredients or place settings; dividing or distributing apples, birthday cake, turkey or bread.
- 11% recounted using math in games such as Scrabble, Monopoly, All Around the World, and video games or trading games.
- 5% told of applying math during their summer travels to calculate speed, time on the road, miles to go, and numbers of different state license plates.
- 5% said they had taught some math to friends or younger relatives.

## INTEREST IN FUTURE *CYBERCHASE* PARTICIPATION

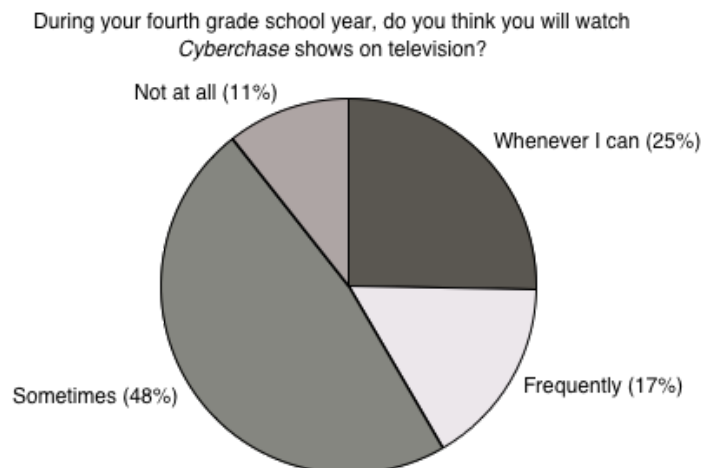
### What was user interest in future *Cyberchase* viewing, website visits, and participation in another Summer Challenge?

Hypothesizing about activity in their upcoming fourth grade school year, large proportions of recruited users thought they would visit the *Cyberchase* website (94%), watch *Cyberchase* shows on television (90%) and participate in a Summer Challenge next summer (85%).

As the pie chart to the right illustrates, 94% of recruited users thought they would visit the *Cyberchase* website when they go back to school in fourth grade. Half (50%) of the group felt they would visit 'whenever they can' or 'frequently.'

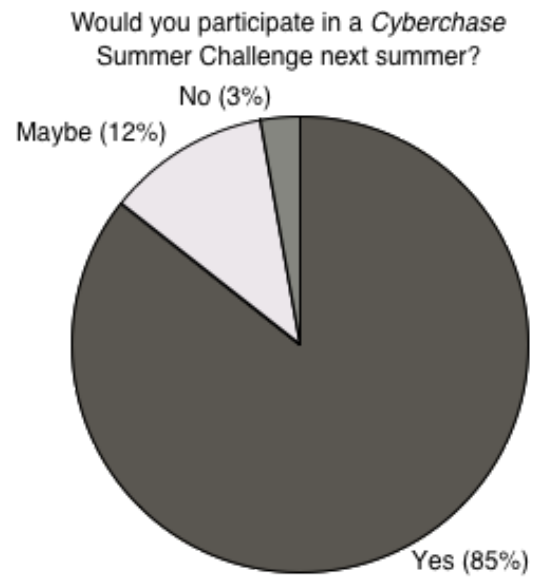


Slightly fewer recruited users (90%) suggested that they would watch *Cyberchase* television shows during their fourth grade year (see bottom pie chart). Of the 23% of the recruited sample who had never watched *Cyberchase* prior to the Summer Challenge experience, 17% thought they would watch whenever they can, 13% frequently, 46% sometimes, and 25% not at all.





As shown in the pie chart, 85% of recruited users thought they would participate next summer in a *Cyberchase* Summer Challenge. Of those who responded with a “maybe” or “no,” half explained that they would not have time, naming obstacles like camp, sports, or travel, and the other half could not provide a reason.



## DISCUSSION

The two main goals of the implementation evaluation of the *Cyberchase* Summer Challenge were to learn how children engaged in the Summer Challenge opportunities and to explore strengths and weaknesses of Challenge activities in engaging children.

Most Summer Challenge website users were sufficiently engaged by their online experience to come back for more after their initial visit. Most users also played catch up by engaging in the activities of a previous week's posting. Vacations, busy schedules, computer problems and an August return to school were most often reasons for not participating on the website. Consideration of the late June school closings in parts of the country and the early to mid-August school openings in most of the country might support a more focused activity period of four weeks in July rather than a stretched out experience of eight weeks.

Users engaged in all four available activity types, but most preferred watching video and making games over answering Cybertrivia and doing home activities. During most of the eight Challenge Weeks, most active users chose to engage in more than one activity. Young children enjoy having choices, and the variety of formats was important to initial and repeat engagement with the website.

Viewing *Cyberchase* videos was a popular activity. A majority of users opened the online video player during the summer period, including those recruited users who had never previously watched the series. A majority of users reported enjoying both long and short episodes but preferred the full-length videos. Half of the recruited sample also reported watching broadcast episodes. Online viewing was preferred by a majority because the computer permits more playback control and choice of episode or viewing time, but some users reported playback problems and a fuzzy picture quality. Those who preferred viewing on television liked the bigger screen size. Two design modifications might have increased the frequency of video viewing: placing the video choice always "above the fold" and drawing attention to the linkage between the Cybertrivia questions and the week's video.

Making games was an equally popular activity. Children liked making their own games because they could choose the design of the game and play it themselves, but some children wanted different game assets than the ones available or reported difficulty making a game. Formative evaluation of the game design would have improved the user friendliness of the game making activity, increasing engagement and repeat play. Half of the recruited users also reported playing games made by others; and of these, half liked this activity "a lot" because they could get design ideas and playing the games was fun. A small portion were confused when they tried to play others' games. The opportunity to play others' games was not apparent to half of the recruited users; a modified screen design could have highlighted this component. Linking the games thematically with the other activities might have increased game play as well as frequency of engagement with the other activities.

A majority of recruited users and a third of random users submitted Cybertrivia answers during the summer. Participants liked Cybertrivia “a lot” because the questions were challenging and fun, and a small portion wanted more than three questions. Frequency of Cybertrivia activity could be increased by directly linking video viewing to the activity and/or by redesigning the page and button to bring user attention to the availability of the activity.

Users took advantage of the Do-At-Home activities less frequently, with half of the recruited users and 9% of random users reporting on at least one of eight activities. However, a majority of users who did an activity reported liking each of the eight activities and described seven of the eight as “showing them something new about math.” Most recruited users reported that they liked the activities because they were fun and could be done with others, although some children felt some activities were hard or boring. Providing the Do-At-Home activities in an online form as well as printables might increase usage. Also highlighting that the activities are things to do with friends and family would take advantage of the social appeal of the activities.

A majority of users earned points by completing point-giving activities, but a low percentage of those who qualified for rewards actually redeemed them. For the majority of recruited users, earning points and redeeming rewards were not prime motivating factors in site usage. Part of this might be due to the lack of visibility of the point and reward system as many users did not know that they had points, or that they could turn points into rewards, or how they might redeem rewards. An analysis of other age-appropriate websites’ reward systems could provide guidance as to mechanisms that might engage additional interaction.

Overall, the Summer Challenge of presenting children with a sequenced set of a variety of opportunities to think about math successfully engaged both the natural user and the user encouraged to visit the site by weekly emails. Improved page design and creating more synergy among all the components would generate greater participation and likely greater satisfaction as the child can carry what is experienced in one activity into a successful engagement with another activity.