## 2010

## "FETCH!" Interactive Webisode Evaluation Report



Prepared by:
Concord Evaluation Group, LLC

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## Contacts

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

## Christine Andrews Paulsen, Ph.D.

Owner and Principal Scientist
Concord Evaluation Group, LLC
PO Box 694
Concord, MA 01742
978.369.3519
cpaulsen@concordevaluation.com

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

## Susan Buckey

Outreach Project Director
WGBH
One Guest Street
Boston, MA 02135
617.300.3958
susan buckey@wgbh.org

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## About the Project

## Purpose

Concord Evaluation Group (CEG) performed an evaluation study in the fall of 2010 on behalf of WGBH to evaluate the effectiveness of an online, interactive webisode developed as an educational component of the FETCH! with Ruff Ruffman series (http://pbskids.org/fetch/).

The webisode was not connected to the FETCH! website at the time of the evaluation study, but will be after the study is complete.


Figure 1. Introduction to interactive webisode.

With an emphasis on building math skills, the interactive webisode was designed to teach and engage elementary-aged kids (ages $6-10$ ) to identify and create combinations. The premise of the webisode is that Ruff Ruffman wants help in creating a number of virtual smoothies comprised of pre-defined ingredients: meats and fruits. The webisode specified which meats and fruits kids could use to make a smoothie, and guided them along through the webisode to teach them how to use mathematical reasoning and predict the possible combinations at each step. As the webisode progressed, additional fruits and meats were added to encourage kids to make a greater number of smoothies with more ingredients.

For example, the first round of the webisode asked kids to create as many one meat / one fruit combinations as possible from an overall selection of 2 meats and 2 fruits, as indicated in Figure 2a below.

After kids completed Round 1, the webisode increased the number of available fruits and meats so that kids were asked to create as many one meat / one fruit combinations as possible from an overall selection of 3 meats and 3 fruits (see Figures $2 b$ and 2c). Round 4, which included 4 fruits and 4 meats, was completed by the main character, Ruff, and designed for the kids to watch, as depicted in Figure 2d. The webisode showed kids how to use a chart to determine the maximum number of combinations possible.


Figure 2a. Round 1 starting page.


Figure 2c. Round 3 starting page.


Figure 2b. Round 2 starting page.


Figure 2d. Round 4 starting page.

During each round, the webisode provided assistance when necessary. For example, if a kid made a smoothie he or she had already made, Ruff reminded the kid to check the chart to see what smoothies he / she had already made (see Figure 3). Or, if a kid combined two meats or
two fruits, rather than the required one meat and one fruit, Ruff reminded the kid of the rules and asked him or her to try again.


Figure 3. The chart used in the webisode to teach kids to track which combinations they had already made and which ones remained.

In addition to providing kids the ability to identify and create their own combinations by making virtual smoothies, the webisode provided opportunities for additional user interaction and content creation. For example, the webisode asked kids to choose which additional fruit they wanted to work with prior to Round 2 (see Figure 4) and which additional meat they wanted to work with prior to Round 3. Additionally, the webisode gave kids the opportunity to create their own label (see Figure 5), which Ruff would use on the final smoothie products that the kids made during the webisode.


Figure 4. The stage where kids are asked to choose a fruit.

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Figure 5. The label-making stage of the webisode.

The goals of the evaluation study were to assess the following three topics:

- Learning. To what extent did the webisode help kids learn how to identify and predict combinations? To what extent did the webisode help kids identify combinations more efficiently and systematically over time?
- Appeal. How did the webisode appeal to kids? Did kids think it was fun? Did it keep kids engaged and interactive? Did kids appear to enjoy the webisode overall? To what extent did user-generated content and interactivity create or sustain kids' interest?
- Usability. Was the overall user experience enhanced by a usable interface? Were there any specific issues in the design that inhibited kids from interacting with the webisode as intended? Did kids indicate that they lost interest in the game or that they got bored?


## Study Design

CEG conducted 20 one-on-one interviews with kids aged $6-10$ years at the WGBH office in Brighton, Massachusetts (see next section for more details on the sample composition).

Each interview was structured to gather meaningful, actionable data to address our study goals of assessing the educational value, appeal, and usability of the webisode.

To best determine whether kids were learning how to identify combinations, we asked each kid to complete a pretest questionnaire, answer a small number of questions during the interactive webisode, and complete a posttest questionnaire.

The pretest questions consisted of four basic addition and multiplication equations, two combination problems, and a combination prompt before Round 1. The basic math items were included so that we could assess whether kids had the requisite basic skills to learn combinations. These items included:

$$
\begin{aligned}
& 1+2= \\
& 4+10= \\
& 1 \times 2= \\
& 2 \times 4=
\end{aligned}
$$

Two word problems asked kids to identify the total number and composition of pizza combinations given a certain number of ingredients. These included:

Now let's pretend you want to order some pizzas, and you want only one topping on each pizza. The pizza store has three toppings to choose from (pepperoni, mushroom, and sausage). How many different one-topping pizzas could you order? What kinds would they be?

Now let's pretend that you want to order some two-topping pizzas. The pizza store still has three different toppings to choose from. How many different pizzas with two-toppings could you order? What kinds of pizzas would they be?

Prior to playing Round 1 (and before any learning could begin), we asked kids to tell us how many different smoothies they could make using the ingredients provided to them on the screen with the following prompt:

Before you start making smoothies, how many different smoothies do you think you will be able to make with these ingredients?

We also included this prompt prior to Round 2 to gauge whether learning was starting to occur as the webisode progressed and as the rounds became more challenging.

In addition to asking the kids to tell us how many smoothies they could make, we collected extensive observational data while each kid interacted with the webisode. For example, we recorded the extent to which kids followed a systematic process of creating smoothies, or if they were more haphazard in how they completed each round.

After kids completed interacting with the webisode, we asked them to complete two additional word problems to determine if they were able to identify combinations in a way they were unable to before interacting with the webisode:

If you had three fruits and four meats, how many combinations of smoothies could you make with one fruit and one meat? You can use the paper if you like to come up with your answer. What kinds would you be able to make?
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Now let's pretend you wanted to make some ice cream sundaes and you have three kinds of ice cream (vanilla, choc, and strawberry) and two toppings (hot fudge and caramel). How many different sundaes could you make with one topping and one kind of ice cream each? What kinds of sundaes would you be able to make?

Finally, we recorded the time it took for each kid to complete Rounds 1, 2, and 3. Timing data, combined with kids' subjective comments, enabled us to provide WGBH with feedback on the pace at which kids could identify smoothie combinations.

All of the data collected during the testing sessions allowed us to identify and track any learning throughout the course of the interactive webisode. It enabled us to determine if kids that already knew how to identify combinations learned to do so more efficiently while interacting with the webisode. Conversely, this study design also allowed us to determine if kids were unable to grasp the concept of identifying smoothies even after interacting with the webisode.

In addition to identifying and tracking learning, we gathered observational and posttest data to determine the overall appeal and usability of the interactive webisode. For example, we recorded whether or not kids began to turn away from the computer screen and show signs of distraction, and if they did, why they may have done so. We listened and watched to see if kids laughed or smiled during the webisode. Overall, we gathered data on whether the webisode was a "hook" for kids, and if it excited them to learn more about combinations and play the webisode further.

We also watched how kids interacted with the screen to see if there were any problems with human-computer interaction that a usability enhancement might fix. We took careful note to see if any usability issues frustrated kids to the point of distraction, thereby inhibiting their ability to learn.

Finally, we supplemented all of our observational data with a number of subjective interview questions. These questions allowed kids to self-report on whether they enjoyed the webisode, what they liked best and least, if they would play it again, or recommend it to others. We also asked kids about other technical aspects of the webisode, such as its speed, look and feel, and the degree of talking by Ruff.

## Study Participants

CEG contacted adults that resided in the greater-Boston area from our research panel. The adults we contacted had previously indicated to us that they had kids who might be interested in participating in future research studies. We also contacted parents whose kid(s) have previously participated in, or have previously indicated their interest in participating in, a research study with CEG. The participant characteristics are summarized in Table 1 below.

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Table 1:
Participant Characteristics

| Characteristic | Total (N = 20) |
| :--- | :---: |
| Gender |  |
| Female | $11(55 \%)$ |
| Male | $9(45 \%)$ |
| Race | $1(5 \%)$ |
| Asian | $14(70 \%)$ |
| White or Caucasian | $4(20 \%)$ |
| Black or African American | $1(5 \%)$ |
| Hispanic | $4(20 \%)$ |
| Age | $5(25 \%)$ |
| Six | $4(20 \%)$ |
| Seven | $4(20 \%)$ |
| Eight | $3(15 \%)$ |
| Nine |  |
| Ten |  |

## Study Findings

## Over time, kids began to adopt a more systematic process of identifying combinations.

We explored the data to look for patterns in the ways that kids created combinations as they used the webisode. For example, kids that used a systematic process of identifying the combinations placed all fruits with one meat before moving onto the next meat, or vice-versa. Kids that did not exhibit this systematic process tended to haphazardly mix fruits with meats until they had made all of the combinations. Kids who used a less systematic approach were also more likely to repeat combinations and have to check their work.

We found that as kids interacted with the webisode, a greater number began to use a systematic process of identifying combinations. As shown in Table 2, in Round 1, six kids (30\%) demonstrated a systematic process of identifying combinations. By Round 3, 14 kids (70\%) used a systematic process. We found seven and eight year olds were more likely to begin a systematic process after haphazardly mixing ingredients in Round 1.

Table 2:
Total kids that systematically identified combinations over time, by age

| Age | Round 1 | Round 2 | Round 3 |
| :---: | :---: | :---: | :---: |
| $\mathbf{6}(\mathbf{n}=\mathbf{4})$ | 0 | 0 | $1(25 \%)$ |
| $\mathbf{7 ( n = 5 )}$ | 0 | $2(40 \%)$ | $3(60 \%)$ |
| $\mathbf{8}(\mathbf{n}=\mathbf{4})$ | 0 | $3(75 \%)$ | $3(75 \%)$ |
| $\mathbf{9 ( n = 4 )}$ | $3(75 \%)$ | $3(75 \%)$ | $4(100 \%)$ |
| $\mathbf{1 0}(\mathbf{n}=\mathbf{3})$ | $3(100 \%)$ | $3(100 \%)$ | $3(100 \%)$ |
| Total $(\mathbf{n}=\mathbf{2 0})$ | $\mathbf{6 ( 3 0 \% )}$ | $\mathbf{1 1 ( 4 0 \% )}$ | $\mathbf{1 4}(\mathbf{7 0 \% )}$ |

## The greatest learning gains we observed were among eight and nine year olds.

The table below shows the kids' average pretest scores, distributed by age. We found a statistically significant correlation between age and number of pretest questions answered correctly. Not surprisingly, older kids were more likely to respond correctly than were the younger kids ( $r=.774, \mathrm{p}=.000$ ).

Table 3:
Pretest Results

| Age | Average <br> Number Correct <br> $\mathbf{( 7}$ items) | Average Number <br> of Simple Math <br> Items Correct <br> $\mathbf{( 4 ~ i t e m s )}$ | Average Number <br> of Combination <br> Questions Correct <br> (3 items) |
| :---: | :---: | :---: | :---: |
| $\mathbf{6 ( n = 4 )}$ | $1.00(.58)$ | $1.00(.58)$ | $0.00(.00)$ |
| $\mathbf{7 ( n = 5 )}$ | $3.40(.93)$ | $2.40(.68)$ | $1.00(.32)$ |
| $\mathbf{8 ( n = 4 )}$ | $4.67(.88)$ | $3.25(.25)$ | $1.00(.58)$ |
| $\mathbf{9 ( n = 4 )}$ | $5.50(.65)$ | $4.00(.00)$ | $1.50(.65)$ |
| $\mathbf{1 0}(\mathbf{n}=\mathbf{3})$ | $7.00(.00)$ | $4.00(.00)$ | $3.00(.00)$ |

Only two of the six year olds were able to respond correctly to the basic addition questions ( $1+2$ and $4+10$ ) and none of the six year olds was able to respond correctly to the simple multiplication questions ( $1 \times 2$ and $2 \times 4$ ), so we did not include the six year olds in the analysis of learning outcomes because it was likely that they lacked the basic math skills they would need to understand combinations. ${ }^{1}$ There was also no variation in scores among the ten year olds - all of the ten year olds answered all of the questions correctly on the pretest and the posttest. So, due to lack of variability, the ten year olds are not included in the analysis either.

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## Table 4:

Pretest and Posttest Results

| Age | Average Number <br> of Pretest <br> Combination <br> Questions Correct <br> (3 items) | Average Number <br> of Posttest <br> Combination <br> Questions Correct <br> (3 items) |
| :---: | :---: | :---: |
| $\mathbf{7 ( n = 5 )}$ | $1.00(.32)$ | $1.00(.63)$ |
| $\mathbf{8 ( n = 4 )}$ | $1.00(.58)$ | $2.00(.58)$ |
| $\mathbf{9 ( n = 4 )}$ | $1.50(.65)$ | $2.25(.48)$ |

We did not observe any growth in scores among seven year olds. However, the eight and nine year olds appeared to demonstrate improvements in their ability to identify combinations as they played the episode (see Figure 6). ${ }^{2}$


Figure 6. Pretest and posttest scores among seven, eight, and nine year olds.

[^1]
## Kids self-reported that the webisode was educational.

Some kids, regardless of age, understood that the purpose of the webisode was to help kids learn. Some kids said the webisode:

- "(helps me see) what smoothies you did and you need to check."
- "(taught me) how to make combinations and describing it in a way that seems fun."
- "Helps kids learn."
- "Helps you add so you can be better at math"
- "(helps you) make pairs."
- "(helps me learn about) math and combinations."
- "(helps me) learn how to make combos"
- "(is about) finding out how many combos you can come up with."


## Kids reported that they liked the webisode, would visit it again, and recommend it to others.

- $60 \%$ of kids said that they would definitely play the webisode again, mostly because it was "fun." Another six kids (30\%) said they would "probably" or "maybe" play the webisode again. Only one kid told us that she would not play the webisode again because she already knew how to make combinations.
- Sixteen kids ( $80 \%$ ) commented that they would probably or definitely tell their friends about the webisode. When we asked them why they might tell a friend, they said:
- "They would like the decorating part."
- "They could learn."
- "(because) it's funny and crazy."
- "(because) it helps with skills and it's funny."
- "It will help them learn."
- Nine kids (45\%) said Ruff was "funny" or "crazy (in a funny way)."
- Ten kids ( $50 \%$ ) said they would be interested in looking for the webisode again on the pbskids.org or the "FETCH website."
- We found that several kids responded favorably to the introductory video. Six kids ( $30 \%$ ) laughed out loud during the introductory video, appearing engaged with it. Of the six kids that laughed out loud during the introductory video, two were age 6 , two were age 9 , one was age 7 and the other age 8 .
- Kids also responded positively to the label-making activity. Four kids (20\%) specifically commented that they thought the label-making stage was the best part of the webisode.

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In addition to these four kids, two other kids commented positively about the labelmaking stage or the opportunity to create their own content.

- One kid spoke out loud as he created his own label, appreciating his creation by saying "Awesome!" and "Oh, nice!" as he created it.
- Another kid sought even further content-ownership in addition to the label-making. He said, "(I want) to be able to make all 20 smoothies and then be Ruff and sell the smoothies (I) made."


## The webisode was, for the most part, usable.

In all cases, regardless of age, kids were able to interact with the webisode without encountering any major usability problems.

We observed that all kids knew how to begin the webisode and interact with it intuitively. Specifically, we also found the pull-down chart to be a usability strength. Nearly all kids used the pull-down chart at least once during the webisode to verify which combinations they had already made. All kids were able to determine how to pull down the chart to view it and then remove it to return to the main screen.

Additionally, in no instance did kids report that they were overwhelmed or confused by the interface design of the webisode. In fact, the vast majority of kids (75\%) said that they thought the webisode "looked good" to them.

However, despite the overall strength of the webisode's usability, we did observe three minor usability issues.

For example, in all but two cases, kids weren't immediately sure that they had to use the lid prior to making a smoothie when they started interacting with the webisode in Round 1. In some cases, when kids did not put the lid on the blender prior to making a smoothie, they temporarily lost their place in the webisode because they had to remake the smoothie they had tried to make without the lid on the blender. Only a couple of kids purposely did not use the lid so they could see Ruff get drenched in the smoothie they had created.

After the webisode, when we asked kids to tell us what they did not like about the webisode, six kids ( $30 \%$ ) said that not using the lid, causing the smoothie they made to splatter Ruff, was the one thing they didn't like. Only two kids ( $10 \%$ ) commented that they liked what happened when they tried to make a smoothie without the lid.
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Figure 7. The result of not using the lid when making a smoothie.

To ensure that kids are not distracted and that they do not lose their place in the webisode, we recommend that WGBH consider changing the part of the webisode that results in Ruff getting drenched when the lid is not placed on the blender.

We observed two additional minor usability issues:

- In a handful of cases, kids mistakenly put the lid on prior to adding a meat or a fruit and weren't immediately sure how to remove it. While this did not inhibit any of the kids from finishing the round, we observed that it did confuse some kids on how to proceed with making a smoothie when they had put the lid on the blender too early.
- While making the label for the smoothies, some kids continued to press the down arrow in the right-hand menu looking for additional icons to use to make their labels even though they had already scrolled to the bottom of the list.

We consider these two usability issues to be minor, largely because they did not cause any kid to stop playing the webisode or to comment that they were frustrated. All kids that experienced these two issues were quickly able to overcome them without guidance. Thus, while we recommend that WGBH consider addressing these changes to ensure good usability, these two issues should be considered low-priority.

Despite these minor usability issues, overall, kids appeared to easily interact with the webisode. For example, most kids reported that they thought the webisode moved at the right speed, was visually appealing, and that Ruff talked an amount that was "just right."

- Thirteen kids (65\%) said that the webisode moved at a good pace; neither too fast nor slow. On average, kids were able to complete the rounds in very short periods of time, considering the number of combinations they were making by Round 3: Round 1 average
$=1$ minute and 40 seconds, Round 2 average $=2$ minutes and 41 seconds, and Round 3 average $=2$ minutes and 49 seconds.
- Twelve kids (60\%) said that Ruff talked just enough for them.

However, the difference in the amount of time it took for kids to complete Round 3 compared to Round 2 was only 8 seconds. This indicated that even though kids had to make three more combinations of smoothies, they were able to do so more quickly. This indicates the webisode moved at a good pace, as self-reported by most kids.

The table below show the average time it took for kids to complete each round, according to age.

Table 5:
Average time for kids to complete Rounds 1, 2, and 3 (in M:SS) according to age

|  | Round 1 |  | Round 2 |  | Round 3 |  | Tofals |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age | Average | SD | Average | SD | Average | SD | Average | SD |
| $6(n=4)$ | $3: 07$ | $1: 10$ | $4: 51$ | $1: 24$ | $3: 40$ | $: 18$ | $\mathbf{3 : 5 6}$ | $: 52$ |
| $7(n=5)$ | $1: 32$ | $: 23$ | $2: 04$ | $: 46$ | $2: 41$ | $: 44$ | $\mathbf{2 : 0 6}$ | $: 35$ |
| $8(n=4)$ | $1: 43$ | $: 36$ | $2: 44$ | $1: 50$ | $2: 58$ | $: 49$ | $\mathbf{2 : 0 8}$ | $: 43$ |
| $9(n=4)$ | $1: 35$ | $: 15$ | $2: 40$ | $: 43$ | $2: 37$ | $: 26$ | $\mathbf{2 : 2 7}$ | $: 37$ |
| $10(n=3)$ | $1: 08$ | $: 14$ | $1: 25$ | $: 15$ | $2: 07$ | $: 21$ | $\mathbf{1}: 33$ | $: 31$ |

## Summary

## Kids exhibited learning gains, found a more systematic way of identifying combinations, and found the game to be educational.

Pretest and posttest results showed that among eight and nine year olds, kids showed improvements in their ability to identify combinations as they played the webisode. In addition, the percentage of kids that used a systematic way to find combinations rose from $30 \%$ to $70 \%$ from Round 1 to Round 3. In addition, some kids, regardless of age, reported that the game was educational. understood that the purpose of the webisode was to help kids learn.

## We found that kids generally liked the webisode, would visit it again, and would recommend it to others.

Regardless of age, gender, and race, most kids reported that they would play the webisode again and recommend it to others. We also observed that some kids laughed out loud during the introductory video and specifically commented that they liked creating their own label at the end of the webisode.

Most kids commented that they would return to pbskids.org to interact with the webisode again and some kids specifically commented that they liked making their own labels. So, we recommend that WGBH add new and additional label-making components or new meats and fruits, for example, within the webisode so kids can interact in new ways and create their own content. Keeping the webisode frequently updated may help ensure that kids continue to interact with it and be presented with more opportunities to learn.

## We also found that the webisode was, for the most part, usable.

We observed that kids interacted with the webisode and progressed through it without encountering any major usability issues. We also observed that kids were able to use the pulldown chart without difficulty. While we did observe some minor usability issues associated with how to use the lid during the process of making smoothies, this did not majorly inhibit kids from interacting and completing the webisode. While these issues are minor, we recommend that WGBH consider ways to address them to enhance the overall user experience.

Nonetheless, the amount of time it took for kids to complete Round 3 compared to Round 2 was only 8 seconds, indicating that even though kids had to make three more combinations of smoothies, they were able to do so more quickly. This indicates the webisode moved at a good pace, as self-reported by most kids.
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## Appendix: Interview Script

## Introduction

## Time allotted: 2 minutes

Prior to entering the conference room, each child will have provided a signed parental consent form. Children that do not have a signed parental consent form will not be allowed to participate.

The moderator will begin timing and start with the script.
Hi, my name is (Chris / Christine / Sharon). Thank you for coming in today. I work for a company that talks to kids to find out their ideas and opinions.

Today I'm going to ask you a few questions about a new game that WGBH has created. You're going to play the game today. There are no right or wrong answers to the questions I have for you about the game. I just want to know what you think.

Do you have any questions before we start?
Begin recording
OK, let's get started.

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## Discussion

Time allotted: 25minutes

To start, I'd like to hear a little bit about you. What kinds of games do you play on the computer? What about in school?

Before we look at the game, I'd like you to try and answer some fun math questions. Don't worry if you don't know the answer. The kids will respond on paper. We will read the questions and responses to them.

1. $1+2=$ $\qquad$
2. $4+10=$ $\qquad$
3. $1 \times 2=$ $\qquad$
4. $2 \times 4=$ $\qquad$
5. Now let's pretend you want to order some pizzas, and you want only one topping on each pizza. The pizza store has three toppings to choose from (pepperoni, mushroom, and sausage). How many different one-topping pizzas could you order? What kinds would they be?

If they get \#5 correct, move on to \#6. If they don't, then go on to question 7.
6. Now let's pretend that you want to order some two-topping pizzas. The pizza store still has three different toppings to choose from. How many different pizzas with twotoppings could you order? What kinds of pizzas would they be?

Start the webisode by asking the child: What would you do to start the game? (They should hit Play) Pause when you get to the first stage:


At the stage shown here, after Ruff says, "...click the blender button to smoothify." ask:
7. Before you start making smoothies, how many different smoothies do you think you will be able to make with these ingredients?
Begin stage 1. The moderator will only help the child if he / she clearly demonstrates a lack of understanding on how to proceed.
Moderator will collect observational data on the following topics during all 3 phases of the game. He / she will probe as necessary to gather feedback from the children.

## Math Skills:

- How quickly can the child determine which combinations to identify? Does the child need guidance from the moderator to get started? Note: To avoid making the kids nervous, we will not time them during the session. We will refer back to the recording to determine the speed at which kids identified the combinations.
- Does the child understand that the order in which the combinations are identified doesn't matter?
- How does the child identify combinations? Does he / she frequently check back to see how far along he / she is in the process? What process does he / she follow? Is it a clearly defined process or is it more of a "guess and check?"
- Overall while the child plays the Webisode, did he / she gain a better concept of how to identify combinations compared to before they began watching the Webisode?


## Impact:

- To what extent does the interactive nature of the webisode, specifically, help the child understand combinations in a more meaningful way? That is, does the storyline of the webisode and Ruff's character allow for a more immediate understanding of how to identify combinations?
- Does the webisode excite the child to want to learn / use math to identify combinations in a systematic way?
- Does the child appear to need more explanation from Ruff on how to identify combinations? Does the child need more time to think about how to identify combinations?


## Usability:

- At any point did the child become frustrated at how to progress in the webisode or determine which combinations he / she had already identified? Was there anything about the features of the webisode that hindered the child's ability to interact with it?
- Does the context in which the interactive is placed (e.g, within a particular page of the FETCH! website or without any surrounding context) enhance the child's experience or hinder it?
- Does the child understand how to pull down on the combinations window and view the combinations already made?

End Stage 1. Allow child to choose a fruit. Pause after Ruff says, "... using one meat and one fruits." and ask:

8. Before you start making smoothies, how many different smoothies do you think you will be able to make with these ingredients?

Continue to play the game. After the child has the second and third phases, allow the child to watch Ruff Ruffman identify 20 combinations and spend a few minutes designing the bottle. Then ask the following questions. Be sure the kids think aloud as they solve the problem so we can follow along with their cognitive processing (Prompts: Can you tell me what you're doing as you answer the question so I can follow along? And you came up with 12 because...? Please walk me through how you came up with your answer.)
9. If you had three fruits and four meats, how many combinations of smoothies could you make with one fruit and one meat? You can use the paper if you like to come up with your answer $($ Answer $=12$ ). What kinds would you be able to make? Note: If child is unable to answer this question, ask question \#6 again. Be sure to still ask question \#10, regardless.
10. Now let's pretend you wanted to make some ice cream sundaes and you have three kinds of ice cream (vanilla, choc, and strawberry) and two toppings (hot fudge and caramel). How many different sundaes could you make with one topping and one kind of ice cream each? What kinds of sundaes would you be able to make?
11. If child demonstrated a consistent ability to identify combinations, ask: Have you ever worked on math questions like this at school? Where did you learn how to make combinations like you did today?
12. What was your favorite part of this game? If child responds the last part, when making the ad, probe further on the user-generated component. Does it matter if there is a usergenerated component to the webisode or not?
13. What do you think this game was about?
14. Did you like how the game looked? If not, what would he / she change?
15. What did you not like about the game? Don't worry, you won't hurt my feelings.
16. What did you think about Ruff? Did he talk enough? Or too much?
17. What else would you want to be able to do in this game?
18. Did the game move too fast, too slow, or just right? If the game moved too fast, ask what it was about the game that moved fast (e.g., Did Ruff talk too quickly? Or, was the game itself moving at a fast pace?)Probe at the length of the webisode.
19. Was this game challenging enough?
20. What did you learn from playing the game?
21. Would you want to play it again? Why or why not?
22. Would you tell your friend about this game? Why or why not?
23. Where would you expect to find this game? If FETCH! website: Will you visit the website again to play this game?

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## Conclusion

## Time allotted: 2 minutes

OK. Great! Thank you for sharing all of your ideas and thoughts with me. It was very helpful. Those are all of the questions I have today.

Do you have any questions for me?
Stop recording and bring child back to the lobby.


[^0]:    ${ }^{1}$ In fact, the data did reveal that none of the six year olds was able to demonstrate learning, based on the comparison of pretest and posttest scores.

[^1]:    ${ }^{2}$ These sample sizes are too small for statistical analysis.

