Secret SPYder Society – ABSTRACT

Introduction: There are national efforts to encourage kids to eat more veggies. We decided to help because most of these efforts did not understand the perspective and references of kids.

Methods: We created two versions of a survey, the experimental and the control. The experimental group playfully exaggerated the benefits of the veggies. The control group was the black & white survey, which was not as eye catching as the experimental survey, but gave more factual information about the vegetables.

Results: Our results were that kids had mostly scored veggies higher in the experimental survey than the control survey. However we found that when the kids were asked what information would help them choose foods, the people with the experimental surveys wanted to know more about the negative aspects of the food, such as how much sugar and fat was in it. The people who were in the control group wanted to know more about the positive aspects of the food, like the vitamins and health benefits.

Conclusion: We learned that the kid's responses varied on which survey they took. The kids who took the experimental survey rated how much they liked certain veggies higher than the people who took the control survey. This proves that if we change the way the veggies are presented into a more playful way, then kids may be more likely to be attracted to those veggies. Overall our experiment showed that the presentation of a food can affect one's opinion about eating it.

Mission Folder: View Mission for 'Secret Spyder Society'

State
Virginia
Grade
6th
Mission Challenge
Food, Health and Fitness
Method
Scientific Inquiry using Scientific Practices
Students

Kmustace
Rowhamboe
AppleBunny
Hedgie

Team Collaboration

(1) Describe the plan your team used to complete your Mission Folder. Be sure to explain the role of each team member and how you shared and assigned responsibilities. Describe your team's process to ensure that assignments were completed on time and deadlines were met.
Our team used the method of teamwork to complete our mission folder. We would find out what needed the most work.We divide up the researching and working on the project according to our interests. If we could not come to an agreement we would vote. At the end of each meeting we volunteer to do a question and/or some research. We shared ideas with each other and the next meeting we discussed what we researched or answered. We also worked together to make the graphs and analyze the data.

Scientific Inquiry

Uploaded Files:

- [View] **Results to Survey** (By: AppleBunny, 02/15/2015, .doc)

  Our results to the survey are attached
- [View] **Our Prezi** (By: Hedgie, 02/26/2015, .docx)

  This our Prezi about our project.

  http://prezi.com/9wdqpdivpkrq/?utm_campaign=share&utm_medium=copy&rc=ex0share
- [View] **Letter to Mrs.Obama** (By: Hedgie, 02/26/2015, .docx)

  We decided to write a letter to Mrs.Obama explaining our project and results to help her in her veggies in schools projects.
- [View] **Control Survey** (By: Hedgie, 02/26/2015, .docx)

  Here is our control survey.
- [View] **Expierimental survey** (By: Hedgie, 02/26/2015, .docx)

  Here is our experimental survey.
- [View] **Survey approval** (By: Advisor, 02/26/2015, .pdf)

  Survey approval form is attached.
- [View] **IRB** (By: Advisor, 02/26/2015, .pdf)

IRB is attached.

Problem Statement

(1) What problem in your community did your team try to solve? Why is this problem important to your community?

Our team is trying to solve the problem of children not eating enough veggies. This is an important problem because, according to the Cardiff University in the UK, not eating healthy foods may lead to a greater chance of dementia and cognitive decline. Also, eating healthy can reduce the risk of diseases, cancer, diabetes, and more. Although eating healthy is not the only way to prevent the previous conditions, it still plays a big role in your body's healthiness. The Secret SPYder Society attempted to learn what would make children more likely to eat veggies.

(2) List at least 10 resources you used to complete your research (e.g., websites, professional journals, periodicals, subject matter experts).

We used multiple resources such as websites, studies within articles, and diagrams. Some of the websites include MyPlate.gov, UK (University of KY), The Atlantic, and www.reutersreprints.com. Some of the articles include: "Getting Children to Eat Vegetables", "Getting Kids to Eat Vegetables Through Inaction", "Flavor-Pairing may Teach Kids to Like Vegetables", "Catchy Vegetable Names Increase Affinity for Greens" (foodandbrandlab@cornell.edu), and "Gardening Gets Kids to Try New Fruits and Vegetables "(FruitsAndVeggiesMoreMatters.org).

(3) Describe what you learned in your research.

In our research, we learned many things. When we had just begun the project we did a lot of research on taste buds and their different functions. We learned that there are many different tastes that your tongue can sense and depending on the food, certain parts of your tongue react. We learned about the food pyramid from USDA (United Sates Department of Agriculture) and how people should stay healthy by exercising and eating plenty of greens everyday. We also found multiple studies on how kids sometimes respond more positively to bright colors and fun sayings. Some of these studies and articles include "Getting Children to Eat Vegetables", "Getting Kids to Eat Vegetables Through Inaction", "Flavor-Pairing may Teach Kids to Like Vegetables", "Catchy Vegetable Names Increase Affinity for Greens" (foodandbrandlab@cornell.edu), and "Gardening Gets Kids to Try New Fruits and Vegetables "(FruitsAndVeggiesMoreMatters.org).

Hypothesis

(4) State your hypothesis. Describe how your hypothesis could help solve your problem.

Our hypothesis was that If we exaggerate the benefits of the veggies in a playful way, then kids will be more likely to want to eat them. Our hypothesis helped us by giving us a specific spot to do our research on, so that we wouldn't all end up researching totally different things. It also helped us fully grasp what our experiment was going to be about, so it also helped us design our survey. With our hypothesis, we were able to create a survey that would help capture nearly all the information we needed to make a valid conclusion.

(5) Identify the independent variables and the dependent variables in your hypothesis.

Our Independent Variable is the way the veggies were presented to the kids on the survey. The independent variable also included which survey was given to the kid because we created two different versions. Our control survey was in black and white. Our second survey, the experimental survey, served as the independent variable. It was colorful and was more eye-catching than the control survey. It also included a vegetable super-hero. Both surveys asked the same questions and they were to be answered the same way. A large majority of the questions were answered with a rating scale of 1-10 of how likely the kid was to eat the veggie or do the action asked. The other questions were answered by checking in a box, like a multiple choice question. Our dependent variable was how likely kids are going to want to eat their veggies through the ratings and answers they gave.

(6) How did you measure the validity of your hypothesis? (In other words, how did you determine that your hypothesis measures what it is SUPPOSED to measure?)

Given that we aren't allowed to test on people, we can not access the external validity of our experiment. Surveys are generally very accurate, because it is coming from the people themselves and most people judge themselves accurately. The way to access the validity is to make colorful labels with fun facts about veggies. And presenting them to kids to see how it changed their behavior.

Experimental Design

(7) List the materials you used in your experiment. Include technologies you used (e.g., scientific equipment, internet resources, computer programs, multimedia, etc.).

In are experiment we used six technologies. The six technologies we used are: excel, Prezi, Word, websites, Google, and Scratch. We used excel to build our data base, analyze our data and create the graphs. We used Word to write the surveys and for our results section. Prezi was used to create our presentation, explaining our research and data. We used Google as a search engine for finding a variety of websites and studies for our research which served as a huge resource. Finally, we used Scratch to create animated veggie-super-hero characters to make our Prezi more creative.

(8) Identify the control group and the constants in your experiment.

The control group of our experiment is the kids who filled out the black and white survey. In the black and white survey, there are no fun pictures, colors, and fonts. Some of the constants of our experiment were the age of the survey takers, the questions on both surveys had to be similar, and the location that the survey was taken.

(9) What was your experimental process? Include each of the steps in your experiment.
Our first step to the experimental process was to create two surveys. Both surveys used a one to ten scale to rate the likelihood of the kid eating the veggie or doing the action asked. (example: How often do you bring lunch from home?). Our first survey served as a control and was in black and white text. Our second survey, the experimental survey, asked the same questions but was colorful and was more eye-catching. Our second step was administering the surveys to 91 elementary school aged kids. Both surveys were printed on paper and distributed the same way. The final step to the process was to create a data-base to compare the ratings on each question in between the two surveys.

Data Collection and Analysis
(10) Describe the data you collected and observed in your experiment. The use of data tables, charts, and/or graphs are encouraged.
After we collected our surveys we put it into a data base and made tables and graphs. We noticed that on some of the graphs, the colorful survey had better results. Some of the data we collected wasn't what we expected.

Please see the attached results document. The results section below doesn't include the graphs.

Results:

We gave out 91 surveys to elementary aged kids. Twenty-seven percent of the kids were in the experimental group. Sixty-three percent of the kids were in the control group. 57.6% of the boys and 42.4% of the girls were in the experimental group.
On the other hand, 55.2% of the boys and 44.8% of the girls were in the control group. In our survey, there was a question where survey takers would rate how much they like veggies on a 1-10 scale. Then, when we found the average for the experimental and control group, the averages were the same. In the experimental group, 65.6% of the people brought lunches from home while in the control group, 63.4% of the people brought lunch.

In our survey on the first question, we found that the people that saw the colorful carrots were more likely to want to eat carrots than the people who saw the word in black and white copies. However, for the peas, it was the opposite results. The black and white survey's (control) results said they were more likely to eat peas than the colorful survey. On the veggies question, the control survey had a lower average than the experimental survey.

While looking at the graphs and percentages, we found that the people who we gave the positive (or colorful/experimental) survey to wanted to know more about the negative aspects of the food, such as the calories, sugars and fats of the food. For the negative (black and white/control) survey, they wanted to know more about the positive aspects of food, such as protein, vitamins, minerals, and health benefits.

On one question in our survey, we asked if the survey taker would eat more veggies if they were offered a prize for

every 20 veggies ate. It turns out that more people that took the experimental (colorful) survey said yes than the people who took the control (black and white) survey. For the colorful survey, 21.2% of the people said yes, while in the black and white survey, 20.7% said yes. So in the whole scheme of things, there wasn't that much of a big difference compared to the other question results.

(11) Analyze the data you collected and observed in your experiment. Does your data support or refute your hypothesis? Do not answer with a yes or no. Explain your answer using one of the following prompts: 'Our data supports/refutes the hypothesis because...'
Our data supports the hypothesis. We know this because, like we said in our prediction, the people who took the colorful, or experimental, survey rated some questions higher on the 1-10 scale than the people who took the control, or black and white, survey. We knew that both groups of children liked veggies the same amount from our last question in the survey. The averages of both groups were exactly the same (6.28). That way, we knew for sure that we weren't testing a group of healthy, athletic kids and a group of less healthy, not as athletic kids. So, with two groups that were equal in their interests for vegetables, we got a higher result from the experimental group, which supports our hypothesis.

(12) Explain any sources of error and how these could have affected your results.
One source of error could have been that some people didn't answer the surveys properly. They could have exaggerated or lied about their answers, which would have meant that our data was inaccurate. Another source of error could have been that some people had braces, retainers, expanders, or things like that, and that could have affected their eating habits. Our team had forgotten to add a question involving that particular matter, so that could have affected our results, too. It could have affected our results because if someone had braces and they were uncomfortable eating carrots because they were hard, they might have rated our carrots question a lower number for a completely different reason than a person who didn't have any mouth gear who just didn't like the taste of carrots.

Drawing Conclusions
(13) Interpret and evaluate your results and write a conclusion statement that includes the following: Describe what you would do if you wanted to retest or further test your hypothesis. Evaluate the usefulness of the data your team collected. What changes would you make to your hypothesis and/or experimental design in the future, if any?
We learned that the kid's responses varied depending on which survey they took. The kids who took the experimental survey rated how much they liked certain veggies higher than the people who took the control survey. This proves that if we change the way the veggies are presented into a more playful way, then kids may be more likely to be attracted to those veggies. Overall, our experiment showed that the presentation of a food can affect one's opinion about eating it.

To further test or retest our hypothesis, we would try to launch our first conclusion into action. We could talk to our school officials about improving the presentation of their veggies, or we could do a follow up survey to see if our data is still the same. We feel as if the data we collected was really important, because we feel the problem of local health is a big issue. If we were to make a change in our experimental design process, We would add a question in our survey involving whether or not you have mouth gear such as braces.

To share out findings, we have sent a letter to Michelle Obama about our studies and hope she uses our data to help with her veggies in schools projects,

Community Benefit

(1) How could your experiments and data help solve your problem and benefit your community? Describe next steps for further research/experimentation and how you have or how you could implement your solution in the future.
In the future, we could use the data that we collected on the previous survey and make another one, to see if the data results are still accurate. We could also present the veggies at schools with colorful labels, fun facts, and benefits that could help the kids with their hobbies. For example, if someone was a good soccer player, we could put a label next to a muscle strengthening vegetable that says "Play soccer? Eat these, they will improve your kick." We could also make another survey and see which vegetables kids like the most, and then serve them during school lunches. Also we could have posters that display the "Veggie of the Week" and encourage people to eat it.

Mission Verification

(1) Does your Mission Folder project involve vertebrate testing, defined as animals with backbones and spinal columns (which includes humans)? If yes, team must complete and attach an IRB.
No

(2) Did your team use a survey for any part of your project? If yes, team must complete and attach a survey approval form.
Yes

(3) You will need to include an abstract of 250 words or less. As part of the abstract you will need to describe your project and explain how you used STEM (Science, Technology, Engineering and Mathematics) to improve your community
Introduction: There are national efforts to encourage kids to eat more veggies. We decided to help because most of these efforts did not understand the perspective and references of kids.
Methods: We created two versions of a survey, the experimental and the control. The experimental group playfully exaggerated the benefits of the veggies. The control group was the black & white survey, which was not as eye catching as the experimental survey, but gave more factual information about the vegetables.
Results: Our results were that kids had mostly scored veggies higher in the experimental survey than the control survey. However we found that when the kids were asked what information would help them choose foods, the people with the experimental surveys wanted to know more about the negative aspects of the food, such as how much sugar and fat was in it. The people who were in the control group wanted to know more about the positive aspects of the food, like the vitamins and health benefits.
Conclusion: We learned that the kid's responses varied on which survey they took. The kids who took the experimental survey rated how much they liked certain veggies higher than the people who took the control survey. This proves that if we change the way the veggies are presented into a more playful way, then kids may be more likely to be attracted to those veggies. Overall our experiment showed that the presentation of a food can affect one's opinion about eating it.

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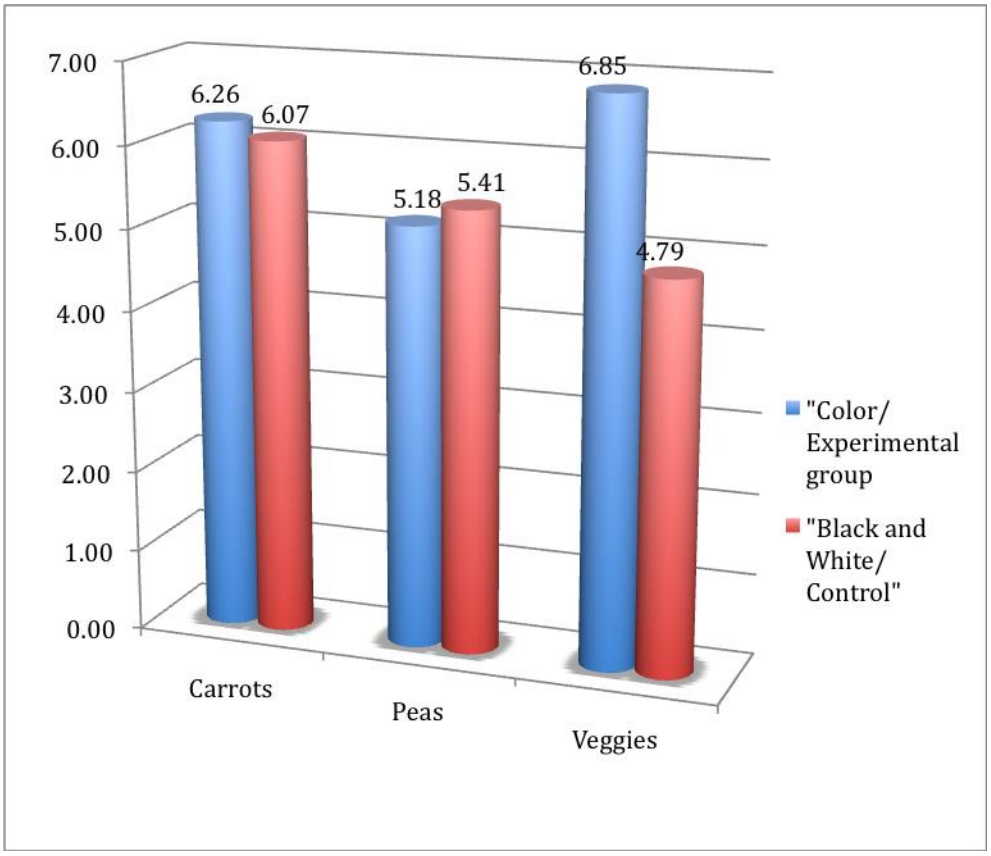

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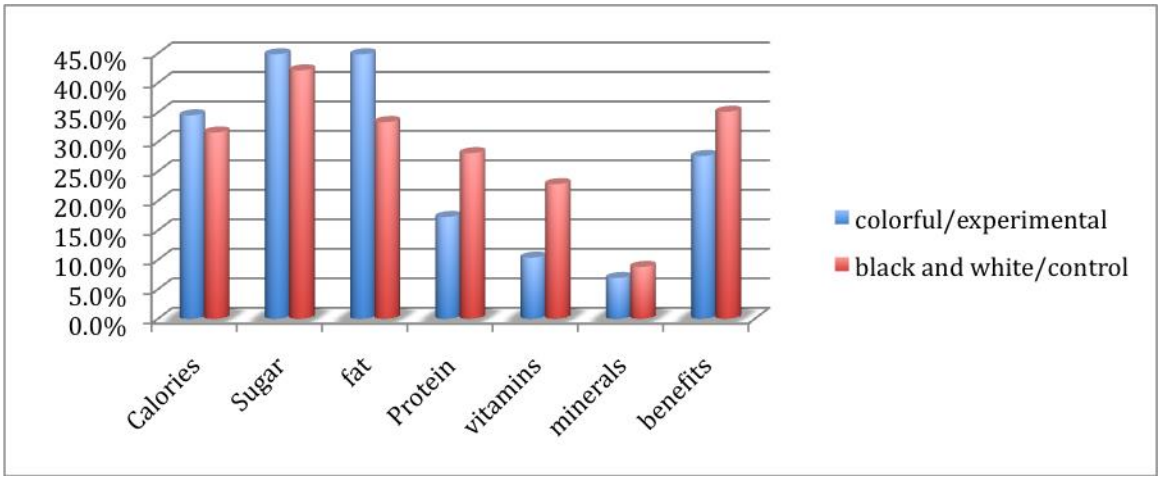
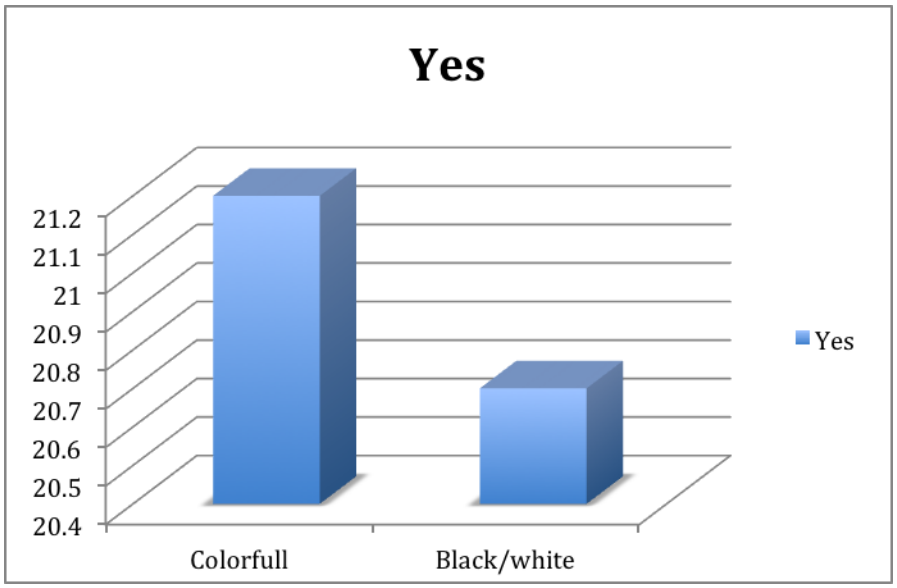


On one question in our survey, we asked if the survey taker would eat more veggies if they were offered a prize for every 20 veggies ate. It turns out that more people that took the experimental (colorful) survey said yes than the people who took the control (black and white) survey. For the colorful survey, 21.2% of the people said yes, whilas in the black and white survey, 20.7% said yes. So in the whole scheme of things, there wasn't that much of a big diiference compared to the other question results.


Yes
21.2
21.1
21
20.9
20.8
20.7
20.6
20.5
20.4
Colorfull
Black/white
Yes

Here is the link to our Prezi:

http://prezi.com/9wdqpdivpkrq/?utm_campaign=share&utm_medium=copy&rc=ex0share

Dear Mrs.Obama,

We are part of a science competition called eCYBERMISSION. In this competition we need to pick a community problem and make an experiment or survey to find a way to solve it. We were interested in the fact that kids in schools are not eating the recommended amount of veggies. We created two surveys and gave it to our classmates. One of the surveys was full of color and pictures with positive questions. The other survey was black and white and was not very eye appealing. We would like to give you the results to help you with your veggies in school project.

From our survey we learned that kids' reactions to veggies change based on the appearance and how the veggies are presented. The surveys showed that the veggies seemed more appealing to the kids when they were labeled colorfully and had fun facts about what they could do for you. For example if we told them that carrots give amazing eye sight they would want to eat it more than if we showed them a sign with the word carrots in black text. We also found from our experiment that the kids would rather know about the benefits of the veggie rather than how many calories it contains and information like that.

We hope our research helps you for your programs to encourage kids to eat healthier. We have attached two documents. The first is an abstract of our research project and the second is an example of some veggie super heroes that we made.

Sincerely,

Linnae Casebeer, Kate Geiszler, Madison Obermeyer, and Ashley Yang

THIS SURVEY IS ABOUT YOUR VEGGIE EATING HABITS. PLEASE ANSWER EACH QUESTION.

LOOK AT EACH PICTURE OR SENTENCE BELOW AND RATE THE LIKELIHOOD OF HOW MUCH YOU WOULD WANT TO EAT IT. 1 IS THE LEAST LIKELY AND 10 IS THE MOST. BE HONEST!

1. CARROTS

1 2 3 4 5 6 7 8 9 10
GROSS! Love them!

2. Peas

-High in nutritional value
-Low in calories

1 2 3 4 5 6 7 8 9 10
EWW! YUM!

3. Raw Veggies:

1 2 3 4 5 6 7 8 9 10
EWW!! YUM!!

4. DO YOU HAVE A SWEET TOOTH?

1 2 3 4 5 6 7 8 9 10
NOPE YES!!

5. DO YOU LIKE DARK COLORS?

1 2 3 4 5 6 7 8 9 10
NOPE YES!!

6. HOW MANY TIMES THIS WEEK HAVE YOU BROUGHT LUNCH FROM HOME?

1 2 3 4 5 6 7 8 9 10
NEVER! ALWAYS!

7. WHAT INFORMATION DO YOU THINK WOULD MAKE YOU CHANGE YOUR MIND ABOUT YOUR FOOD?

- ❑ CALORIES
- ❑ SUGAR
- ❑ FAT
- ❑ VITAMINS
- ❑ PROTEIN
- ❑ MINERALS
- ❑ HEALTH BENEFITS
- ❑ OTHER_____

8. ARE YOU A:

- ❑ GIRL
- ❑ BOY

9. IF YOU GOT A PRIZE FOR EVERY 20 VEGGIES YOU EAT, WOULD YOU EAT MORE VEGGIES?

- ❑ YES
- ❑ NO
- ❑ DEPENDS ON THE PRIZE

10. IF YOU COULD IMPROVE YOUR FAVORITE VEGETABLE, HOW WOULD YOU DO SO?

- ❑ MAKE IT SWEETER
- ❑ CHANGE THE COLOR
- ❑ MAKE IT MORE BITTER
- ❑ MAKE IT MORE HEALTHY
- ❑ OTHER: _____

11. DO YOU LIKE VEGGIES?

1	2	3	4	5	6	7	8	9	10
NO!									YES!

THANKS FOR TAKING THE SURVEY! PLEASE, PUT IT IN THE BIN NEAR THE THURSDAY FOLDERS. :) :)

THIS SURVEY IS ABOUT YOUR VEGGIE EATING HABITS. PLEASE ANSWER EACH QUESTION.

LOOK AT EACH PICTURE OR SENTENCE BELOW AND RATE THE LIKELIHOOD OF HOW MUCH YOU WOULD WANT TO EAT IT. 1 IS THE LEAST LIKELY AND 10 IS THE MOST. BE HONEST!

1. CARROTS

1 2 3 4 5 6 7 8 9 10
EWW! YUM!

2. POWER-PACKED ACTION PEAS!

1 2 3 4 5 6 7 8 9 10
EWW! YUM!

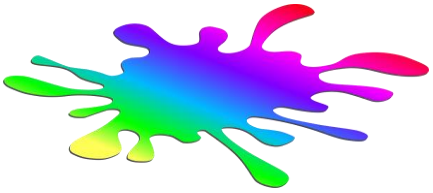
3. Veggie Straws

1 2 3 4 5 6 7 8 9 10
EWW! YUM!!

4. DO YOU HAVE A SWEET TOOTH?

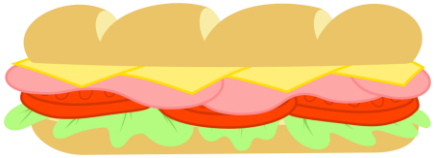
1 2 3 4 5 6 7 8 9 10
NO! YES!

5. DO YOU LIKE BRIGHT COLORS?



1 2 3 4 5 6 7 8 9 10
NO! YES!

6. HOW MANY TIMES THIS WEEK HAVE YOU BROUGHT LUNCH FROM HOME?



1 2 3 4 5 6 7 8 9 10
NEVER ALL THE TIME!

7. WHAT INFORMATION DO YOU THINK WOULD MAKE YOU CHANGE YOUR MIND ABOUT YOUR FOOD?

- ❑ CALORIES
- ❑ SUGAR
- ❑ FAT
- ❑ PROTEIN
- ❑ VITAMINS
- ❑ MINERALS
- ❑ HEALTH BENEFITS
- ❑ OTHER : _____

8.ARE YOU A:

- ❑ GIRL
- ❑ BOY

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- ❑ YES
- ❑ NO
- ❑ DEPENDS ON THE PRIZE

10. IF YOU COULD IMPROVE YOUR FAVORITE VEGETABLE, HOW WOULD YOU DO SO?

- ❑ MAKE IT SWEETER
- ❑ CHANGE THE COLOR
- ❑ MAKE IT MORE BITTER
- ❑ MAKE IT MORE HEALTHY
- ❑ OTHER: _____

11. HOW MUCH DO YOU LIKE VEGGIES?

1	2	3	4	5	6	7	8	9	10
HATE THEM!									LOVE~ THEM!

THANKS FOR TAKING THE SURVEY! PLEASE PUT IT IN THE BIN NEAR THE THURSDAY FOLDERS. :)

eCYBERMISSION Survey Approval Form

eCYBERMISSION team name: Secret SPKder Society

Team Advisor name: Adrianne Caccheeo

Team Advisor email: [illegible]@gmail.com

Team Advisor phone: 703 206 9967

Student usernames: Hdyjia, Bouthanbee, Applebinary, Kmusteer

School name: N/A

School address:

Describe the survey your team will conduct:

[illegible]

Describe the participants you plan to distribute your survey to:

[illegible]

Project approved by ~~school~~ Ashley administration?

☑ Yes ☐ No

Approved by:

Title: [illegible signature] PhD

Date approved: 7/10/2015

Signature, School Administrator

*Please save form and upload to your team's Mission Folder

aeop ARMY EDUCATIONAL OUTREACH PROGRAM | eCYBERMISSION ACCEPT THE CHALLENGE U.S. ARMY

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

Student(s) Name(s): Linnie Casebeer, Kate Geizler, Madison Obermeyer, Ashley Yang

Grade: 6 **Science Teacher:** Adrianne W. Cr

Title of Project: Getting kids to eat veggies

Brief Description of Project: The project involved distributing a short survey to other 6th graders. It asked about the kids willingness to each vegetables.

Teacher: Please sign here if the project proposed is a viable eCYBERMISSION Project in which neither animals nor humans will be harmed.

Science Teacher Approval Signature: Adrianne W. Cr

IRB Waiver of Written Informed Consent for Human or Animal Participation

The IRB may waive the requirement for documentation of written informed consent/assent/parental permission if the research involves **only minimal risk *and* anonymous data collection *and* if it is one of the following**:

- Research involving normal educational practices.
- Research on individual or group behavior or characteristics of individuals where the researcher does not manipulate the subjects' behavior and the study does not involve more than minimal risk.
- Surveys, questionnaires, or activities that are determined by the IRB to involve perception, cognition, or game theory and do NOT involve gathering personal information, invasion of privacy or potential for emotional distress.
- Studies involving physical activity where the IRB determines that no more than minimal risk (Daily Activity) exists and where the probability and magnitude of harm or discomfort anticipated in the research are not greater than those ordinarily encountered in DAILY LIFE or during performance of routine physical activities.

If there is any uncertainty regarding the appropriateness of waiving written informed consent/assent/parental permission, it is strongly recommended that documentation of written informed consent/assent/parental permission be obtained.

For School/Site Use Only:

HUMAN or ANIMAL SUBJECTS
Permission Slips needed? _____ **Yes** ____ **No** **(Scan and attach slips to Mission Folder)**
Check-up of Human or Animal Subjects required by Doctor, school nurse or Veterinarian? _____ **Yes** ____ **No** **If yes, Doctor's, Nurse's or Veterinarian's (before and after experimentation) check-up must be attached to Mission Folder.**

APPROVALS –

Principal / Administrator Signature — Date Reviewed: 1/10/15

Doctor or Medical Professional Signature — Date Reviewed: 1/10/15

Science Fair Coordinator Signature — Date Reviewed: 1/10/15