

The Eating Rainbow:
Encouraging Fruits and Vegetables Through Colors

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Fruits and vegetables are a vital part of a healthy, well-balanced diet, however, they are one of the most difficult food groups for parents to feed their children. Produce has the added disadvantage of not having a cartoon spokesperson push for the sales or being accompanied by a toy prize. According to the Centers for Disease Control, from 2003 through 2010, children had increased their fruit consumption, but vegetables remained stagnant (CDC, 2014). Childhood obesity has become an alarming issue in the United States and a solution is critical to protect the future of the country as a whole. A 2014 study in Poland found “in most cases, excessive weight gain in children can be blamed on parents and caretakers who are not aware of the health consequences of high-calorie foods rich in fats and sugar” (Kostecka, 2014). Since parents and primary caregivers are generally in charge of purchasing food for the household, it is also important to educate and provide them with tools for their child’s success. For these reasons, parents were invited to observe the class and the main handout was intended for parents rather than students.

In The Eating Rainbow, students were provided with a small amount of education on the benefits of eating fruits and vegetables. Since the target audience was 5 to 6-year-olds, the language was kept simple and the education provided easy to understand. Additionally, a nurturing teaching style was employed to maintain attention, encourage participation, and to produce desirable learning outcomes. A study in the *Annual Review of Psychology* comparing transmission style learning and “intent participation” found more favorable outcomes in education if students were given the opportunity to learn through participation rather than observation alone (Rogoff, Paradise, Arauz, Correa-Chavez, Angelillo, 2003). By participating in the class, students learned about the days of the week along with how each day can be used as a guide for a fruit or vegetable.

Lesson Plan

The Eating Rainbow: Encouraging Fruits and Vegetables Through Colors

Duration: 10-15 minutes

Target Group: Kindergarten aged children (typically 5 to 6-years-old)

Overall Goal: To increase the knowledge of the importance of fruits and vegetables within a balanced diet, encourage their consumption, and reduce stress for the person in charge of grocery shopping.

Major Concepts:

Nutrition & Produce:

- Different colors of fruits and vegetables assigned to days of the week to encourage at least one additional vegetable serving per day
- Weekends are given as an exploration day for students to practice parts of the knowledge obtained from this class

Days of the Week:

- Weekdays can be an added challenge for parents to have an assortment of food on the table, especially vegetables
- Assigning colors to each weekday reduces stress to have a full rainbow of colors

Ice Breaker (3 minutes):

After introduction, get a rough view of how much students know about nutrition. The questions are sequential starting broad and getting more narrow.

“Who knows what nutrition is?”

“What about vitamins?”

“Did you know you can get vitamins from fruits and vegetables?”

Objective and Learning Domains; Generalizations and Learning Experiences

1. Students will learn, generally, how specific colors in fruits and vegetables help their bodies stay healthy.

Domain: Affective - Receive

Generalization: Eating colorful fruits and vegetables is important for a healthy body.

Learning Experiences:

Provide a short conversational-style class covering the following topic:

Days of the week, their color assignments, and how they benefit the body

- Monday - red.
Red fruits and vegetables have properties which are beneficial to the heart.

- Tuesday – orange.
Orange fruits and vegetables contain properties for eye health
- Wednesday – yellow.
Yellow produce is beneficial to the immune system
- Thursday – green.
Green vegetables and fruits are help with bones and teeth.
- Friday – purple.
Purple vegetables and fruits support healthy aging.
- Saturday and Sunday are designated The Wacky Weekend where students are able to explore other fruits and vegetables which may not fit into a day of the week or a color they like more.

2. Students will name fruits and vegetables fitting into each day of the week along with the designated color.

Domain: Cognitive – Knowledge

Generalization: Many colorful fruits and vegetables exist.

Learning Experiences:

- Guide students through the days of the week allowing them to showcase their current knowledge of fruits and vegetables.
- Alternate between saying the day of the week and the color in order to allow students to practice their days of the week as well.
- Provide positive feedback when students actively participate and encourage other students to shout out their ideas as well.
- Introduce the idea of Food Explorers as part of the Wacky Weekend.

3. Students will demonstrate their learning by matching fruits and vegetables to their respective colors and day of the week.

Domain: Psychomotor – Demonstrate

Generalization:

Days of the week correspond to a color as represented in a vegetable.

Learning Experiences:

Provide an activity for students to showcase the days of the week and fruit and vegetable matching they learned during the lecture portion.

- Arrange the letters representing the days of the week on a board at the front of the classroom
- Using a set of cards with assorted fruits and vegetables printed on them, 2 cards are randomly distributed to each participating student.
- Students will take their assigned cards to a board and paste them under the day of the week corresponding to the color of the vegetable or fruit.

Teaching Aids/Materials:

- Set of 50 cards with assorted fruits and vegetables printed in color
- Chalkboard or dry-erase board

- Tape
- Fruit and vegetables snack table
- Parent survey regarding consumption and attitudes toward vegetables and fruits
- Coloring page handouts for students
- Informational handouts for parents

Summary:

The importance of eating fruits and vegetables cannot be understated, however, it can be a daunting task for parents to provide a variety of these items. By providing one day per week with an assigned color, students can actively select a fruit or vegetable of their liking to eat on the particular day. Students are engaged by the active participation and the showcasing of their skills. The learning continues at home with a coloring page handout where students are able to pick out a vegetable or fruit to color each day.

Evaluation:

Parents receive an online pre-test with questions about the students' interest in fruits and vegetables as well as part of their shopping patterns. The purpose of the pre-test survey is to determine the children's fruit and vegetable eating patterns and the parents' own interest in improving their student's diet. The post-test also includes a question regarding the interest a child has in eating fruits and vegetables. Parents are also queried for any fruits or vegetables their child has requested since the class. The repeated question and final interest question enables the instructor to gauge the efficacy of the class.

Assignment:

Students are asked to participate as part of the presentation and paste their given fruit/vegetable card on the board to display their knowledge. Students were presented with a coloring page with different fruits and vegetables and the days of the week. This page was sent home with the

student to color at home and show their parents which fruit or vegetable they would like for each day of the week.

Discussion/Evaluation/Conclusion

Students in kindergarten classes are still developing their listening skills and comprehension. For these reasons it is important to be as engaging as possible during the presentation – students may not have the patience to sit still and listen to a structured lecture. The presentation was a combination of discussion (audience participation) and demonstration for effective learning. In the pre-test portion of this presentation, the responses showed 62% of parents with a great interest in improving their own child's health through healthier eating. In regards to the children themselves, parents expressed their child's interest on a 1-10 scale with 10 being the most interested, as 6.1 for fruits and 4.7 for vegetables. The moderate interest presents a challenge when putting together a lesson plan; I aimed to have an informative presentation but one which thoroughly entertained and engrossed the student. Because of this level of interest, I selected the transtheoretical model to follow. The students were in a more contemplative phase of the model; with the interactions in the classroom I aimed to bring them into the action phase. Supporting self-efficacy in children is tricky since they can often feel confident, but can be easily discouraged. The presentation itself went well with most students showing an active engagement in the subject matter. There was ample room for participation which has been shown to be a more effective form of learning than lecturing (Rogoff et al., 2003). I felt the participatory nature of the class as designed was effective in communicating the information to the class. Overall, a more nurturing approach was used to teach the class since this age group would likely not respond well to a transmission approach. The objectives were met rather naturally through the class. The cognitive and affective domains were successfully discussed concurrently; by teaching the

attributes of each color and how they linked to better health, students were able to gain a more personal understanding. Since parents were invited to observe the class, the main handout focused on educating them in techniques to encourage fruit and vegetable consumption at home. The handout also provided a shopping guide to reduce stress for the person in charge of grocery shopping.

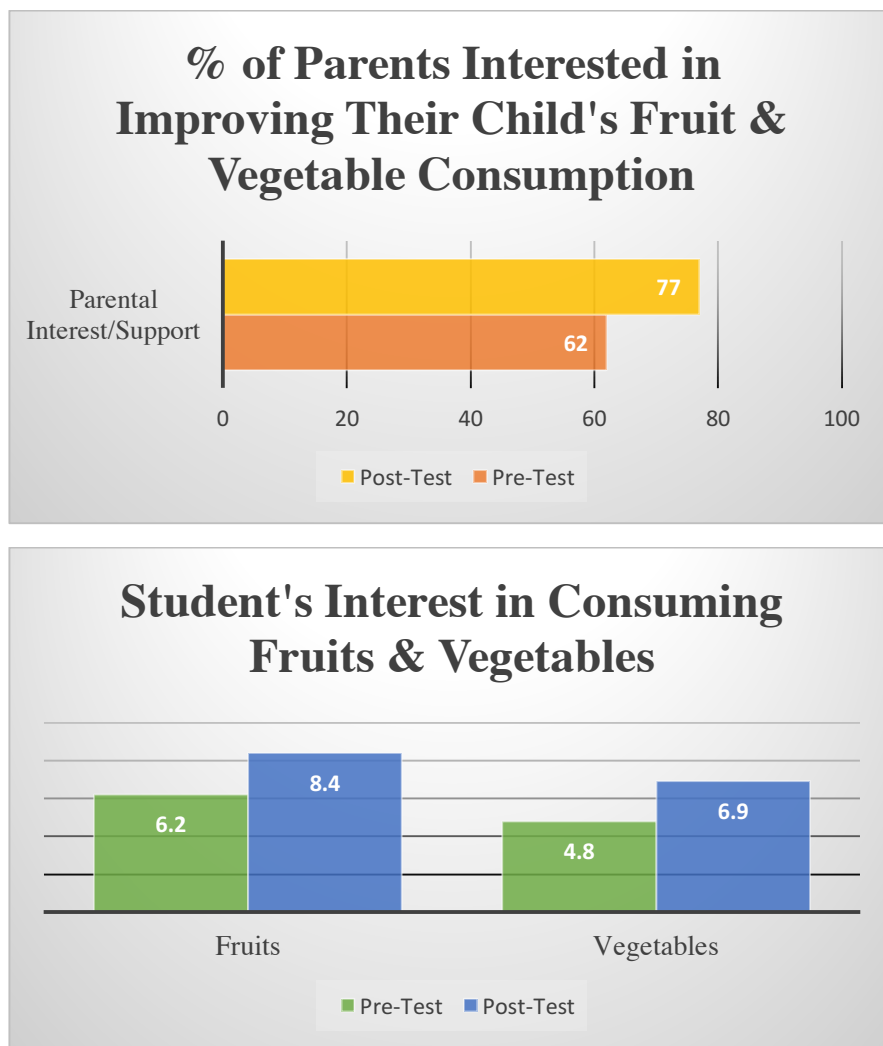
The post-test provided additional insight into the efficacy of the presentation. Parents expressed satisfaction with the amount of information provided for their children. 73% of parents responded “Definitely Yes” to the question, “Did you feel the class provided adequate information for your child to make healthier decisions about fruits and vegetables?” This higher rate coupled with higher interest in eating fruits and vegetables showed the presentation was effective in meeting the overall goal. Some limitations to this data includes a lack of data going forward. There would be a greater degree of certainty regarding the overall effectiveness if we were able to follow up after a certain number of weeks or months. Some information is bears repeating in order to continue to be successful.

While parents ultimately have the deciding vote in what goes to the dinner table, it is important for children to have a role in the decisions. Children are more likely to eat fruits and vegetables if they are engaged in the process of getting them into the home and onto the plate. After reflecting on the outcomes of the class and the feedback I received during the presentation from the class, I believe I presented a successful and repeatable class. Fellow instructors can further develop the individual activities to give the class a personal touch or focus on special populations. Given the state of childhood obesity rates, this class should be repeated in classrooms.

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Appendix A
Summary of Pre-/Post-Surveys



Parents improved their support for healthier eating for their children following the presentation. Although most parents had expressed wanting to help their child make more healthful decisions, the improvement shows parents who may have been in a contemplative state, moving toward a preparation or action phase. Students showed a notable increase in their interest in eating both fruits and vegetables. Given the initial thoughts of parents showed children had an interest in fruits with less in vegetables an increase in both is additional evidence for the efficacy of the class.

Appendix B Parent Handout

The Eating Rainbow

Getting kids to eat vegetables can be a challenging task. By using The Eating Rainbow approach, you can gradually introduce your child to adding both fruits and vegetables to their plates. The immediate goal is not to make a full plate of vegetables, rather to begin to introduce them to small amounts with a long term goal of having half of the plate be colorful vegetables with fruits as a snack.

Use the shopping guide below for some ideas on fruits and veggies to buy.

Handy Shopping Guide		
Color	Veggies	Fruits
Red	Tomatoes*, red onion, red cabbage, red peppers	Strawberries, apples, cherries, watermelon
Orange	butternut squash, lemons, squash, sweet potatoes, orange peppers, pumpkin	Oranges, papaya, peaches, tangerine, cuties, cantaloupe
Yellow	Corn, summer squash, yellow potatoes, peppers, yellow beets, acorn/spaghetti squash	Mango, lemon, pineapple, pears, yellow figs & apples
Green	Kale, spinach, broccoli, snap peas, peas, cucumber, avocado, green beans	Grapes, kiwi, apples, honeydew melon, green pears, starfruit
Purple	Eggplant, beets, dark beans, purple asparagus, purple potatoes	blueberries, blackberries, figs, plums,



Tips to help add veggies & fruits to your day:

- Buy one item of each color for each day of the week
- Use fresh fruits as dessert – you can start by adding honey or yogurt and slowly transition down to just fruits
- Add colorful fruits and veggies to lunchboxes
- Let kids pick a vegetable to enjoy at dinner
- Use Wacky Weekends to experiment with new foods
- Play the Rainbow Dinner Game

THE RAINBOW DINNER GAME

Step 1
Before dinner, draw a rainbow on a sheet of paper. Bring your drawing, a pencil and some scratch paper to the dining table.

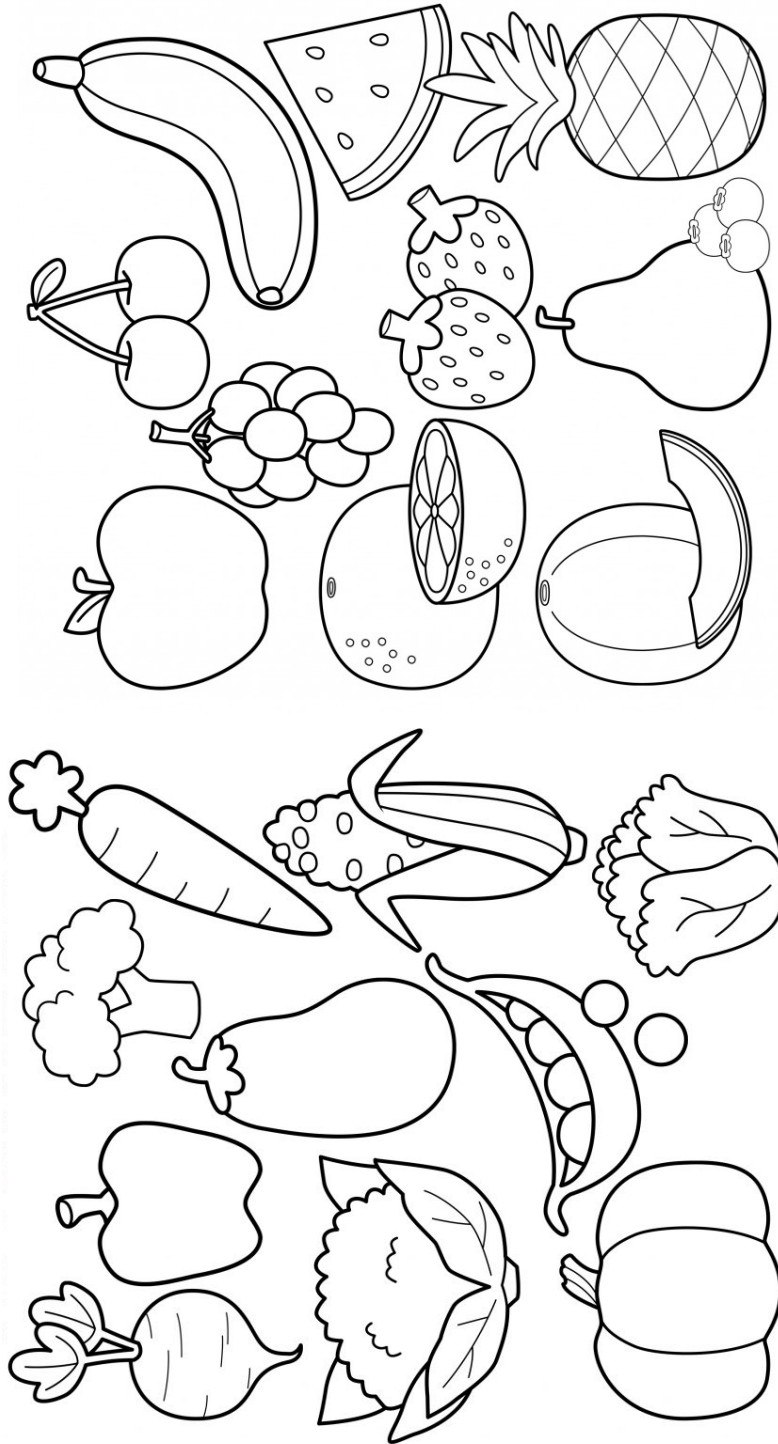
Step 2
Look for a food on the table to match each color on your rainbow. Write down which colors are missing.

Step 3
Make a list of foods that would fill in the missing colors. Then add these to the weekly shopping list.

Bonus
Take your rainbow to school and play this game at lunch with at least 3 friends!

Adapted from: <https://www.wholekidsfoundation.org/downloads/better-bites/better-bites-eat-a-rainbow.pdf>

Appendix B con't.
Student Handout



Monday Tuesday Wednesday Thursday Friday

The Eating Rainbow!

Appendix B con't.
SMOG Evaluation

Parental Handout

Handout has fewer than 30 sentences therefore all words were utilized.

Total words with 3 or more syllables: 46

Approximate Grade Level: 10th

Analysis of results: Appropriate for parents since the SMOG test allows for +1.5 grades, it would likely encompass parents of varying socioeconomic levels.

Student Handout

Handout has fewer than 30 sentences therefore all words were utilized.

Total words with 3 or more syllables: 1

Approximate Grade Level: 4th

Analysis of results: This handout was appropriate for the 5 to 6-year-old student. One word outside of the grade level would be considered fourth grade, however, the handout had only 8 words and would likely not be exceedingly challenging. The intent of the page is mainly to focus the student on the fruits and vegetables.

Appendix C
Self-Reflection Form

1. What was the topic or title of your presentation?

The title of my presentation was The Eating Rainbow (I tried to play on the Reading Rainbow). The topic included teaching kindergarten-aged children to eat a variety of fruits and vegetables.

2. Describe one thing that you did well in this presentation.

I felt I was able to engage the audience well in my presentation. It felt like the room was involved with the presentation even before the activity came around.

3. Describe one thing that you would change about your preparation of this presentation.

I would likely prepare an extended version of the activity. At the time I was concerned about going over since the activity involved the class, it was difficult to tell how long the activity would take. I could have had the students select a fruit or vegetable from the snack tray right after putting their assigned cards up on the board. This could have all been decided prior to the presentation had I included more timing practice of both versions of the activity.

4. Comment on the content of your presentation: do you feel that you provided your audience with information that they did not know prior to your presentation? Explain.

Given the audience's age, I believe I presented information they did not yet know. For example, I incorporated the reasons why different colors were important in terms of how they affect the body. Since children of this age are less likely to understand more detailed information about the specific vitamins, I felt the colors were a good link to how their individual health is affected.

5. Comment on your eye contact: was it sufficient? Why or why not? If not, how do you plan to improve your eye contact for your next presentation?

I believe I had good eye contact with the group, however, since the class was presented as a smaller group of students with parents as observers, I could have looked out to the parents a little more.

6. Comment on your gestures and movement: were they effective? Why or why not? If not, how do you plan to improve your gestures and movement for your next presentation?

The age of the audience really allowed for me to be expressive in my hand movements and gestures. Since this was not part of an on-going class, it was easier to make it a more fun activity which in turn I think gave me freedom to use big, broad gestures. I felt it was a good way to keep the attention of the class given the age group.

7. Comment on your practice for this presentation: did you practice thoroughly? If you believe that you did not practice thoroughly, how will you modify your practice for your next presentation? Be specific.

My practice for this presentation involved getting feedback from family about the actual presentation itself. I believe I was more prepared for this presentation than in previous

assignments, however, I did not practice an actual script. I preferred to have specific points to hit than words to say. Going forward, I would run through the presentation's talking points more and practice with an audience that wasn't my family, since they had just positive things to say. Perhaps other classmates would have been a better audience for my practice.

8. Please provide an overall assessment of your presentation. Were you satisfied with your presentation? Why or why not?

Overall, I was happy with how the presentation turned out. The changes I could make were minor and any missteps I feel went relatively unnoticed. I believe more preparation would have given the class a more polished feel, but for my proposed audience, this was an effective class. Also, since my time ended up being below the lower range of the assignment, I feel I could have added additional time talking about the importance of the specific colors and the vitamins within them or even incorporated this into an activity.