

Developing a Hands-On Food Science Curriculum with Bilingual, Elementary-Aged, Hispanic Heritage Students

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Abstract

In the United States alone there are over 48 million cases of foodborne illness, with most of these cases deriving from food cooked in the home (Young 2016). Many themes have been assessed such as confidence, knowledge, habits, taste in food preferences, and societal/social influences (Young 2016). However, when food safety curriculums are targeted towards younger populations including young adults and children, attitudes and behavior change (Mullan 2018 and Young 2016). As there is a lack in home economics education in today's current curriculum, students and their families may not know food safety behaviors (Finch 2005; Young 2016). It has also been shown that families are influenced by what their kids learn in school and are likely to change their food safety behaviors because of it (Young 2016). As more bilingual kids come into to the United States, they are becoming a target population for teaching public health and food safety concepts. This study will target 20-22 primarily Spanish-speaking youth of ages ranging from 5-12 and will assess their knowledge of food safety concepts such as hand-washing and avoiding cross-contamination.

Methods

Lesson Plan

Lesson	Topic	Activities	Learning Objectives
Week 1	How Bacteria Spread	<ul style="list-style-type: none">"Infected" 3 kids with Glo-Germ mimicking if they went to the restroom without washing their hands or if they sneezed without washing their handsAsked the kids then to shake other students' hands	<ul style="list-style-type: none">Germ's cannot be seen without a microscope but that they are everywhereHow quickly germs can spread if you do not wash your hands
Week 2	Proper Hand-washing	<ul style="list-style-type: none">Used GloGerm on kids and then asked them to wash their hands as they normally wouldInstructed students on the proper way to wash handsLet them use the GloGerm again to see if their habits improved	<ul style="list-style-type: none">Students will be able to wash their hands correctlyStudents will understand the importance of washing their hands correctly
Week 3	FightBac At Picnic Park	<ul style="list-style-type: none">Read a story and then split the kids into groups with the older children teaching the younger ones proper food safety behaviors	<ul style="list-style-type: none">Understand proper food safety behaviors when going to a picnic or cookout
Week 4	Non-perishable vs. Perishable Foods	<ul style="list-style-type: none">Split the students up into four groups and asked them to sort out a grocery bag of food from if it belongs in the fridge, freezer, or on the shelves	<ul style="list-style-type: none">Understand the difference between perishable foods and non-perishable foods and why we need to store them
Week 5	Kool-Aid Evaluation	<ul style="list-style-type: none">Made the students go through a trial and error of 10 different Kool-Aid5 of the Kool-Aid had the same color/flavor associated with it (Orange = Orange; Purple = Grape)The other 5 were the same flavors just dyed different colors (Green = Cherry; Red = Grape)	<ul style="list-style-type: none">Students will understand how senses such as sight affect our perceptions of taste
Week 6	Día de los Muertos	<ul style="list-style-type: none">Discussed with the students what food was prevalent during Día de los Muertos that they do not normally see in TennesseeColored skulls and gave out sweets	<ul style="list-style-type: none">Students will understand how food is a significant part of culture and why we associate some foods with certain holidays
Week 7	Fruits Evaluation	<ul style="list-style-type: none">Split the students up into 4 groups and rotated around bananas, apples, oranges, and strawberriesAsked the students to evaluate the sensory differences between each fruitCrunch associated when eating an apple, fragrance of an orange, etc.	<ul style="list-style-type: none">Students will understand that all five senses are involved when eating and how sensory applications add value into our experience when eating food
Week 8	Vegetables Evaluation	<ul style="list-style-type: none">Split the students into 4 groups and rotated around broccoli, radishes, eggplant, and spinachAsked the students to evaluate the sensory differences between each vegetable and the differences between cooked and raw vegetables	<ul style="list-style-type: none">Students will understand how all five senses contribute to eatingStudents will understand the differences between cook and raw vegetables
Week 9	Junk Food Evaluation	<ul style="list-style-type: none">Split the students into three groupsAsked the students to evaluate the difference in butterscotch, cinnamon, and peppermint candies (especially the pungency)Asked the students to evaluate the difference between kettle-cooked, wavy, and regular potato chips.	<ul style="list-style-type: none">Students will be able to distinguish the sweetness in all hard candies along with the pungency in candiesStudents will be able to distinguish the textures of different types of potato chips

Observations

When Spanish Club was first established at Inskip Elementary School, it was established as a place for students of Hispanic descent to speak Spanish freely. One of the rules in Spanish club was "No English. *Puro español*," meaning that I had to teach all lessons in Spanish. However, as I was teaching the kids, we discovered that many do not know how to read and write in Spanish, which then lead me and my supervising teacher to then teach the fundamentals of Spanish to the students. When the students were in groups, we did ask the older ones to assist the younger ones. However, the older students would "help" the younger students by just doing the entire worksheet for them. When moving into the sensory lessons, we needed the students to describe textures, tastes, smells, sounds, and appearances. This lead to better vocabulary acquisition in both English and Spanish as sometimes the students had a better word or phrase to describe the food in Spanish, while at other times they only knew the English word and we had to teach them the Spanish word.

Expected Outcomes

From previous literature, we expect that there will be a behavior change in the home environment, and that the students will understand the food safety and food science concepts taught to them. However, we do not expect a behavior change in the students washing their hands properly every single time they need to wash their hands. This is because many studies have shown that while people may have the proper knowledge on a food safe behavior, they may not put it into practice due to convenience or other external factors. Additionally, we expect the students to have a greater interest in science due to the engaging nature of these activities. The beauty of food science is that it is an applied science. Generally, college-aged students understand how basic concepts from biology and chemistry such as fermentation, titration, and oxidation are utilized in the "real world" allowing deeper understanding of these concepts. We expect a similar understanding of sensory science with these activities. Furthermore, since the students were having fun with these activities, we expect that the students were learning without realizing that they did.

Conclusions and Future Directions

We have determined that it is important to educate the general public about food safety due to the recent increase of foodborne outbreaks. However, it is important to teach food safety in an effective and engaging way to build habit strength in order to reduce the number of noncompliance. One of the most effective ways is to target the youth, because the youth are susceptible to building habit strength. If they are taught proper food safety behaviors at a young age, they will build the habit strength over time. Additionally, it is shown that students can foster a behavior change as parents are more likely to change a behavior if it affects the health of their child. Finally, food safety must be taught in an engaging, and culturally-relevant way to be effective. If people of ethnic populations cannot understand why they need to practice these food safe behaviors, the amount of foodborne outbreaks will not decrease. Further evaluation would need to be done through focus groups or surveys to see if the students retained the information and enjoyed the lessons. Additionally, it would be interesting to see if the language the curriculum is taught in affects the retention of material in bilingual students. Finally, it would be beneficial to see if a stronger behavior change will occur if a bilingual student is taught in the language he/she is more comfortable reading/writing in.



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