Salsa for Science!

SUGGESTED TIME: Two 1hr sessions
GROUPING: 15 - 30 STUDENTS DIVIDED INTO 4-6 GROUPS

SUMMARY

This lesson will introduce and engage students in all of the steps of the scientific method as they invent their own salsa recipe to share with their classmates in a blind-taste test experiment. The students will **observe** ingredients with their senses, **hypothesize** and prepare a recipe, which they theorize will be the school favorite. At lunch or in the classroom students will serve their peers in a blind taste test **experiment**. Finally as a class they will **graph, and analyze results** to determine a winner to be served for lunch later that week.

ACTIVITY EXPLANATION:

Depending on time constraints, this lesson can include up to three hands on activities to involve students in a classroom setting and it provides an excellent opportunity for a school-wide taste test event in the lunchroom. Alternatively the taste test could occur in the classroom.

Part 1: Salsa Making *(Classroom)*
Part 2: Taste Testing *(Lunchroom or Classroom)*
Part 3: Data analysis and graphing results. *(Classroom)*
Part 4 (Optional): Serve the winning recipe on the menu *(Lunchroom)*

For this activity, students will be organized in groups of 4-6 for the most manageable cooking environment and effective group dynamic.

LEARNING OBJECTIVES

- Students will try tomatoes, onions, carrots, black beans, jalapenos and make purposeful objective observations about them using taste, color, and texture in order to plan a recipe. (*MI GLCE S.IP.04.11)*
- Students will identify tomatoes, onions, carrots, and peppers as summer seasonal crops and will learn about one local source for the produce used in this activity
- Students will ask questions based on their observation of ingredients in order to create a recipe that meets the group's taste preference. *(MI GLCE S.IP.04.12)*
- Students will plan and conduct a simple and fair investigation through a blind taste test of their peers (*MI GLCE S.IP.04.13)*
- Students will manipulate measuring beakers and cups in to prepare their salsa. (*MI GLCE S.IP.04.14)*
- Students will make accurate volume measurements in mL of ingredients using beakers. (*MI GLCE S.IP.04.15)*
- Students will construct simple charts and graphs from data and observations. (*MI GLCE S.IP.04.16 & S.IA.04.11)*
- Students will analyze and present findings from taste test leading to individual recipe revisions. (*MI GLCE S.IA.E.1)*

MATERIALS & RESOURCES:

- For each student: Pencil and Science Notebook or Paper
- For each group: Index card, sticker label, cutting board, mixing bowl, butter knives, container with lid, serving plate for each ingredient
- Metric volume measurement instruments (I love the "metric wonder cup" because it allows for metric conversions)
- Several printouts or photocopies of store-bought salsa nutrition facts with lists of ingredients
- Salsa Ingredients from local farms chosen for a wide variety of colors and flavor characteristics. **If you are planning a lunchtime taste test, connect with your school food service staff about the possibility of them purchasing these ingredients for your classroom activity. Afterwards, give them a big "thank you"!**
    - Cherry tomatoes
    - White onion
    - Sweet pepper
    - Peaches
    - Black beans
    - Cilantro
    - Chives
    - Carrots

- (Optional: Food Processor for quick blending of ingredients)

Part 1: Question, Observation, and Experimental Design (45min – 1hr)
Preparation:
Cut sample size pieces of all the ingredients you will be using for making salsa. Arrange the classroom so students can sit in 4-6 person groups and divide students into groups accordingly.

1. **Ask students if they have tried or heard of salsa. If several students have tried it, ask them to name some of the ingredients of salsa. Also ask students for adjectives that describe salsa. *It is important to explain the difference between subjective and objective words and explain that your goal as experimenters is to focus on objective descriptions.* (If students are unfamiliar with salsa you may pass around your nutrition fact printouts for volunteers to read ingredients aloud and you may alternatively ask them to share words, which can be used to describe food). As students share their descriptions, record new objective adjective on a board or piece of large paper. For ideas of words, which you can use, see the example class word bank at the end of this activity.**

2. Introduce or review the steps of the scientific method. Ask students, "How do you think the scientific method could be incorporated into an activity involving food?" Guide the class to the experimental question, "What recipe will produce the salsa, which is the favorite of the students in their class/at their school?"

3. Explain to students that they will be forming a hypothesis in the form of a recipe, which they will test for popularity with students from the entire class/school. Describe that they are about to use their senses to make observations about the color, smell, texture and taste of salsa ingredients using a variety of senses. Instruct students to have a pencil and paper ready to record their observations and explain the observation procedure.

4. At the front of the class so that all students can see, demonstrate cutting individual salsa ingredients into salsa-sized pieces and place enough for each student on plates for each group.

5. **Invite well behaved student volunteers to distribute samples of each of the salsa ingredients. After a few moments for sight only observations of each ingredients, instruct students to pick up the first ingredient for touch, smell, and finally taste observations. After students have had a few moments to record observations for the first ingredient, call on students to share a few descriptions and begin a table to record these words by ingredient. Students may then proceed to observe the rest of the ingredients one at a time**

6. Spend a few minutes to compile descriptive words for each ingredient on the class word bank.

Part 2: Prepare Salsa (45min – 1hr)

1. Emphasize the following opposite words Spicy & Mild, Liquid & Solid on your word bank and explain that these are major components in determining your salsa recipe.
2. Make sure each group has one index card and instruct each student to write his or her name on the group card. Explain that students will discuss with their group to decide which ingredients they will use for their salsa and write these ingredients on their index card along with a description of the quantity such as A little, Moderate amount, or a lot.
3. **After 5 - 10 minutes visit each groups independently to discuss their ingredient decisions and help the students determine approximate measurements for each ingredient, which one student will document on the index card. Also encourage students to come up with a fun name for their recipe.**

   You may use the following chart for reference; keep in mind proportions of liquid to solid will be relative to the recommended 1 cup of tomatoes

	Onion	Bell Pepper	Black Beans	Salt	Hot Pepper	Vinegar	Garlic	Cilantro
A Little	1 ½ Tbsp	2 Tbsp	2 Tbsp	¼ tsp	½ tsp	¼ tsp	¼ tsp.	¼ Tbsp
Moderate Amount	¼ Cup	⅓ Cup	¼ Cup	½ tsp	1 ½ tsp	½ tsp	½ tsp.	½ Tbsp
A Lot	1/2 Cup	¾ Cup	½ Cup	1 tsp	1 Tbsp	1 Tbsp	2 Tsp	1-2 Tbsp

4. When recipe is written, ask two student volunteer to take cards to the teacher or lesson aide who will give them the ingredients necessary for the group's recipe in a large mixing bowl along with 2-3 knives, measuring cups, and a food container with a lid. The teacher or aide will also share the instructions to begin cutting their ingredients into salsa sized pieces and add them to mixing bowl with the other ingredients. If you have a food processor, students can chop vegetables into rather large pieces and mix in bowl, then the entire contents of the bowl can be processed for 3-5 seconds.

5. Visit each group individually and pour each group's salsa into a container with a lid. If you have time, encourage each student to take a taste of their recipe and to record their observations of it.

6. Conclude the lesson by asking the students about their experience preparing the salsa, you may also address the benefits of eating a variety of fruits and vegetables and talk about the nutrition of tomatoes and peppers specifically. If you are serving the salsa tomorrow, explain that it is best when refrigerator overnight to allow flavors to blend.

7. After students have left the classroom, place a matching label or sticker on each recipe card and the corresponding salsa container so that they can be distinguished.

Part 3: Blind Taste Test Experiment

The same day as your salsa preparation or the day immediately following, plan for a taste test in the classroom or in the school cafeteria during lunchtime. Here are some recommendations for a lunchtime school-wide taste test. Explain to the class the double blind component of the taste test. Recount that you labeled each salsa after the students left the room. Describe that during the experiment neither your class student nor the experimental subject students know which salsa corresponds to which recipe.

Plan with school food service and janitorial staff.

- Coordinate with you food service director to purchase tortilla chips for the tasting
- Request one or two tables set up near the food service line, but not obstructing the flow. (Best participation has been observed before students get their lunch)
- Make sure that students continue to get through the lunch line promptly. Encourage students waiting for salsa to come back after they have received their lunch if necessary.

Schedule Parent and Student Volunteers

- You will need the support of one adult volunteer to remain at the taste test set-up for the duration of the experiment
- Schedule classroom volunteers in shifts to be involved with each lunch period. Assign students to the following roles:
    - Chip distributor
    - Salsa attendant 1
    - Salsa Attendant 2
    - Vote taker

Serve it Up!

1. Set up the salsa in line along your tables and place a number, color, or sticker label in front of each. Another great feature is to place a sheet of paper and writing utensil in front of each salsa to allow taste testers to write comments. Optional: You may choose to decorate the end of table with real food examples or illustrations of salsa ingredients.
2. As students come through the lunch line the chip distributor will give them 1 chip for every 2 salsas, which you have and explain that they will break their chips for tasting. (For K-2 break the chips into bite sized pieces for them)
3. The salsa attendants will stand behind the salsa to help students as they go through the tasting process and will answer questions about the ingredients used or the salsa making process, but will not reveal the chefs or recipes of individual salsas.
4. After students have tasted all of the salsas, the vote taker will ask them which salsa was their favorite. It may be helpful to have a sheet with the salsa in order or to have a small display with all of the salsas for final taste test discriminations. Finally they will record the results on a tally sheet or using voting cards in ballot boxes labeled for each salsa.

Part 4: Analyze Results

During your science or math time following the experiment, you have the opportunity to lead your class in analyzing and interpreting your experimental data.

1. Assign student groups to tally the votes for a randomly selected salsa.
2. As a class, compile results in a table
3. Practice graphing results in a bar graph and pie graph.
4. Finally, announce groups related to each salsa and celebrate the winner by reading the winning recipe!

(Optional Extension) Part 5: Celebrate the Winner!

Coordinate with your school food service to prepare and serve the winning salsa recipe again later that week or month as a special salad bar item or an accompaniment to a special Mexican food entre.

Sample Word Bank

Word Bank and Tasting Chart from *Got Veggies?* a publication by Community GroundWorks at Troy Gardens. Available in PDF form online at:
http://www.dhs.wisconsin.gov/health/physicalactivity/pdf_files/GotVeggies.pdf

Name_____ Tasting Chart

Name of Fruit or Vegetable				
Look				
Smell				
Feel				
Taste				
Sound				

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Name of Fruit or Vegetable				
Look				
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