Cincinnati Museum Center

COSI Center of Science and Industry | CENTER FOR RESEARCH & EVALUATION

Food for Thought Summer Camp 2023

Evaluation Report

December 27. 2023

Prepared by:
Laura Weiss, M.A.
Joe E. Heimlich, Ph.D.

Prepared for:
Cincinnati Museum Center

This project was completed with support from the National Science Foundation (#1906706).

We would like to acknowledge our *Food for Thought* collaborators Bradley Morris from Kent State University, and Jacob Cason, Brian Pollock, Arynn McCandless, and Whitney Owens from the Cincinnati Museum Center.

Recommended citation: Weiss, L., & Heimlich, J. E. (2023). *Food for Thought Summer Camp 2023: Evaluation Report*. [Technical Report for Cincinnati Museum Center.] COSI's Center for Research and Evaluation.

Table of Contents

Tables

Figures

Introduction

Food for Thought is an NSF-funded project (AISL # 1906706) that focuses on teaching the science of food preparation to families with children ages 7-13. This report focuses on the second year of *Food for Thought* summer camp.

About the Program

The Cincinnati Museum Center (CMC) hosted two weeks of *Food for Thought* summer camp in 2023. The camps were designed for elementary-aged students, specifically third and fourth graders. The first week of camp had a stronger food science focus, while the second week focused more on the cooking aspect of the project. The descriptions for each week are as follows:

> **Premium Kitchen Science, Grades 3-4, June 26-30**
> *Have you ever wondered how astronauts eat lunch in space or wanted to extract DNA from strawberries? Explore the science behind food, from the first chop to the last bite!*
>
> **Premium Junior Chefs, Grades 3-4, August 7-11**
> *Come cook with us! Hone your skills as we focus on new techniques each day. Slice, sauté and sear your way through tasty recipes, culminating in a culinary cookout at the end of the week!*

Each camp week consisted of a mix of classroom-based activities (e.g., extracting DNA from strawberries) and cooking demonstrations in CMC's test kitchen. The evaluation for this camp focused on the cooking demonstrations as the classroom-based activities were evaluated during Year 1 of the program. During the cooking demonstrations, campers watched a CMC team member make the recipe, tried making the recipe themselves, and ate the foods they made or brought them home. The recipes for each week are listed below, and the full recipes can be found in Appendix A.

Camp week 1 recipes

- French toast
- Sweet potato tacos
- Grilled cheese
- Pizza
- Ice Cream

Camp week 2 recipes

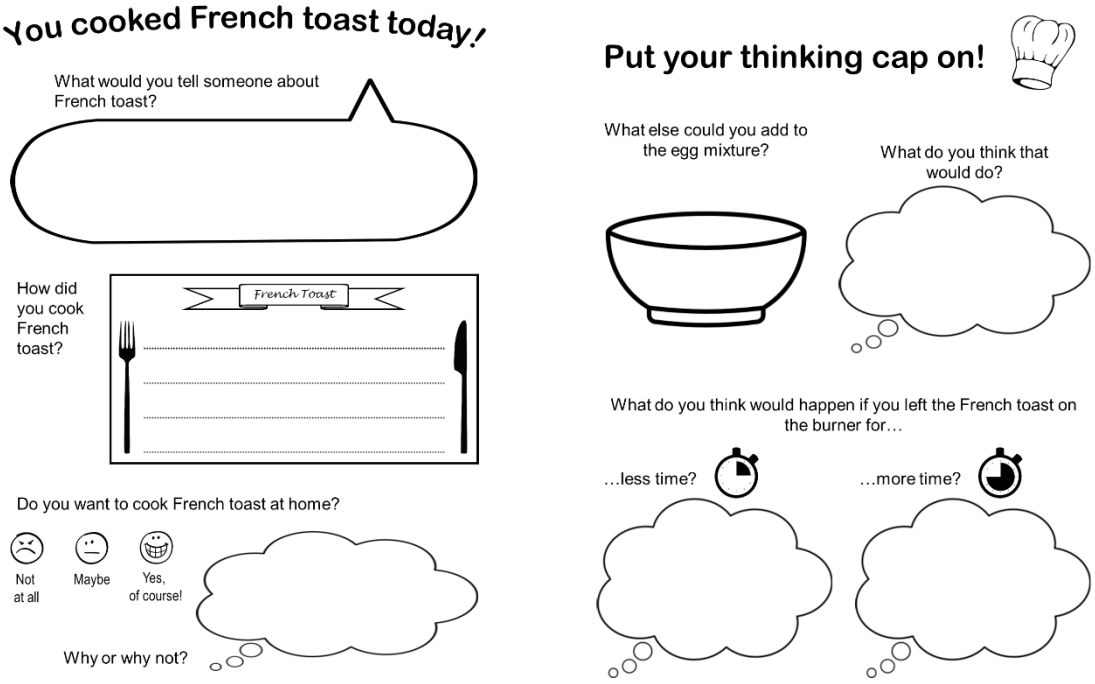
- Omelets and deviled eggs
- Sushi vegetable rolls and seaweed salad
- Pasta, pesto, and alfredo sauce
- Cake
- Solar oven cook out (turkey burger kabobs & roasted veggies)

About the Evaluation

Building off the success of the embedded "menu" assessment for the *Lunch in Space* science show, CRE decided to use an embedded measure for the 2023 camp evaluation as well. Embedded measures are a way of gathering data through normal program activities. This allowed for a data collection method that was less intrusive, as well as a method that could be conducted easily without CRE team members needing to be present.

The CMC team was already planning to give each camper a journal with the recipes for the cooking demonstrations and other pages to take notes. In collaboration with the team, CRE identified the journals as a good opportunity to embed the evaluation measures. The evaluation pages were designed to look like fun workbook pages to avoid feeling like school worksheets to campers (see Figure 1 and Appendix B). At the end of each day, camp instructors invited campers to reflect on their experiences and fill out the journal pages for that day. During the first camp week, 18 campers completed journal pages, and during the second week, 20 campers completed journal pages. Not all campers were present each day or responded to every question or page though.

Figure 1: Example Journal Pages



The evaluation journal pages focused on efficacy and Wh- questions. As defined by Bandura (e.g.(1977, 1978, 1989) efficacy is about behavior. In essence, he noted that learners need to know how to do something, know they can do that something, and then want to do it. Self-efficacy was later refined in different behavioral models building on Bandura's work in the Theory of Reasoned Action (Fishbein & Ajzen,1975), the Theory of Planned Behavior (Ajzen, 1991), the Transtheoretical Model of Behavior Change (Prochaska et al., 1994), and the Health Belief Model (Sheeran & Abraham, 1996). All these models rely on efficacy to address the three central concepts of knowledge about, knowledge how, and desire to act.

Wh questions are used as they are interrogative and allow for non-polar thinking. These are also known as content questions and are the Wh- words "who, what, where, when, and why" plus "how." Such questions can be used to allow learners to think more broadly as they are, or can be when used with the intention to make them so, not necessarily seeking the correct response as much as critically thinking about the question. In developmental psychology, Wh-questions are used in early childhood for language and cognitive development.

A note on the realities of Summer Camp

One of the challenges of informal learning contexts (e.g., camps, museums) is that externalities intrude on the teaching/learning exchange far more often than they do in formal settings like schools. One issue is the free-choice element of these settings that the learner is not held accountable to the intended learning outcomes, whereas in formal settings, they are judged based on how well they progress toward mastery of the content (e.g. Falk & Dirking 1999). Camps in museums magnify some of these challenges. For example, a sold-out performance in a record-breaking concert tour in the stadium close to the museum required the museum to end programming early and with no prior notice on the last day of camp. Because of this, there are no data for the final day of the second week of camp.

Results

Efficacy Questions

To measure efficacy, each day of the camp week, campers were asked to respond to three questions about the food they cooked that day.

1. What would you tell someone about [food]?
2. How did you cook [food]?
3. Do you want to cook [food] at home? Why or why not?

Across the different foods cooked, many campers shared general, positive responses for the first question (e.g., *It was good, they were amazing, I love it, it is really yummy*). Other themes seen across the responses are detailed below.[1]

Some campers shared that they would tell someone about making the food.

- *It is good if you make it right* [French Toast]
- *I love making grilled cheese* [Grilled Cheese]
- *That I'm going to make ice cream at home* [Ice Cream]
- *There are a lot of different ways to make it* [Sushi]
- *Fun to make but also very hard to make* [Sushi]
- *It takes patience* [Pasta]
- *You can make it any flavor* [Cake]

A few campers shared advice they would give to someone about the food.

- *They are good if you mix them with other ingredients, but just OK on their own* [Eggs]
- *If you like fish, you'll like sushi* [Sushi]
- *It's good with a type of sauce* [Pasta]

[1] Spelling mistakes from campers' journals were corrected as part of data entry.

Campers also wanted to tell someone about their personal preferences toward the food.

- *It is my favorite food* [Pizza]
- *I think pizza is better without sauce* [Pizza]
- *It is disgusting* [Ice Cream]
- *It's gross* [Sushi]

A few campers specifically mentioned nutrition or food safety in their responses.

- *Don't eat too much cheese* [Grilled Cheese]
- *Eggs are healthy and awesome* [Eggs]
- *Can't eat them raw* [Eggs]
- *It's really good and healthy* [Sushi]

Lastly, a couple of campers noted facts they would share with someone about the food.

- *They're Mexican* [Tacos]
- *It has a yellow circle in the middle called the egg yolk* [Eggs]

When asked to describe how they cooked the different foods, campers' responses varied in level of detail. While a few campers each day wrote that they "forgot," most campers shared something about the recipe or cooking process.

Some campers shared responses with minimal to no detail.

- *Dip it in the egg mix* [French Toast]
- *I followed the recipe* [Tacos]
- *You make dough. You make sauce. You put cheese on.* [Pizza]
- *We made the dough for the noodles and then made the sauce* [Pasta]
- *make it, bake it, decorate it, eat it* [Cake]

Other campers wrote responses with much more detailed steps.

- *I got 2 pieces of toast put them on a pan cracked 2 eggs then mixed it then put the 2 pieces of toast in the eggs then put butter in the pan and then put my bread in the pan and added some spices and flipped the toast and I was done.* [French Toast]
- *I put the bread and the pan and let the bread cook for 5-7 minutes and then added cheese and let it melt for 2 minutes then it was done.* [Grilled Cheese]
- *Milk in a cup, sugar and vanilla, split it in bags. We put it in one big bag then we put in ice and salt and shook!* [Ice Cream]
- *1. crack 2. put in bowl 3. mix 4. add ingredients 5. put on pan 6. after a few minutes flip to make an omelet 7. flip twice 8. put on plate and eat* [Eggs]
- *We boiled the rice and chopped the veggies. Next, we spread the rice and veggies on the seaweed and rolled it.* [Sushi]
- *We made the dough with eggs, flour, and salt and put in through the machine. Then we boiled it for 4 minutes.* [Pasta]

Campers also shared responses that focused specifically on the ingredients included in that day's food.

- *Lettuce cheese tortilla sweet potato* [Tacos]
- *Bread + cheese + heat* [Grilled Cheese]
- *Milk, sugar, vanilla. Freeze it.* [Ice Cream]
- *Onions, pan, spinach, eggs* [Eggs]
- *With vegetables, nori sheets, and rice* [Sushi]
- *flour, sugar, eggs, milk* [Cake]

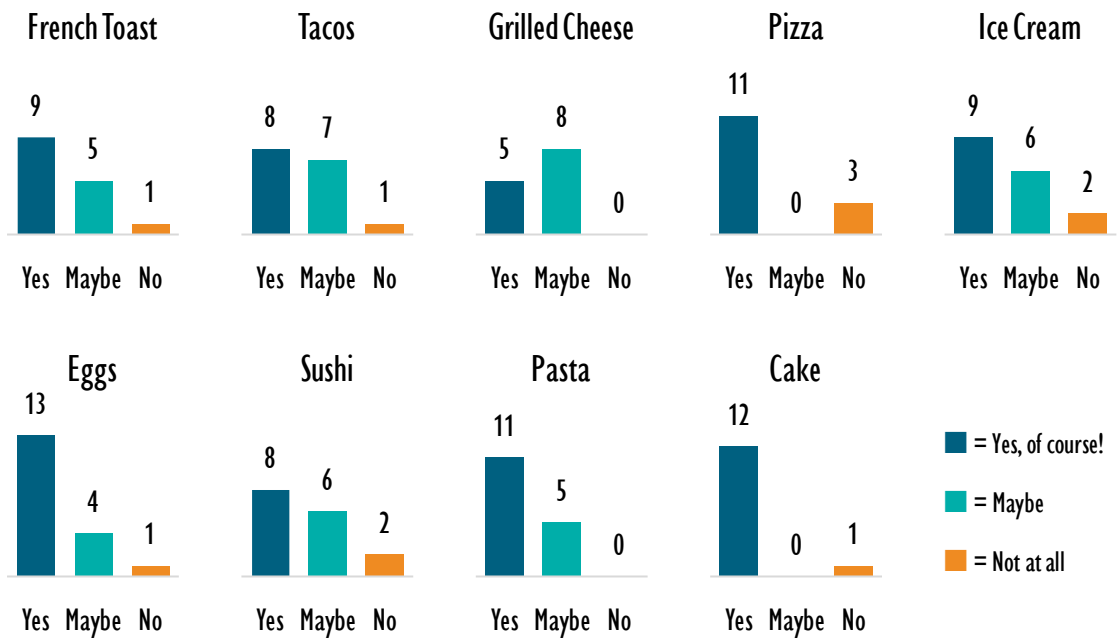
A few campers mentioned the specific cooking implement or technique they used to make the food.

- *I cooked my eggs on a stove* [Eggs]
- *Boiling noodles* [Pasta]
- *With an oven* [Cake]

The responses to the first two questions suggest there was generally strong agreement on the knowing about and the knowing how elements of efficacy.

Campers' responses to the third question about wanting to cook food at home demonstrated a larger difference in the resulting scores (see Figure 2). Pizza and cake clearly showed strong desire to cook these foods at home. Eggs had the single highest number of "yes, of course!" responses of all the foods, and pizza was tied for third in in terms of "yes, of course!" ratings but had zero "not at all" responses. (It should be noted again that not all youth were present or responded to the prompts in the journal each day). The only other food with zero "not at all" responses was grilled cheese. Yet, grilled cheese had more "maybe" than "yes, of course!" responses, and was the only food item that where there were more tentative responses than absolute yes or no.

Figure 2: Do you want to cook this at home?



As a follow-up to the rating scale, campers were asked why they would or would not like to cook those foods at home. Responses show campers considered personal preferences, their families, and logistical challenges in making their ratings. For campers that did want to cook the food at home ("yes, of course!" ratings), responses included: the food being fun to make, the food being delicious or a food they love, and wanting to make it for their family. For those that maybe or did not want to cook the food at home, reasons shared were: not liking that food, being concerned they would not be allowed to, being afraid they would mess it up or not be good at it, thinking their family would not like it, not having the ingredients, and not remembering how to make it.

These findings suggest that the choices of foods provided at least some recipes that appealed to each child to some degree. We do acknowledge that limitations of home conditions may influence some of the responses, but as there are real barriers for children cooking in any home, the desired intention is a strong sign of self-efficacy in the youth.

Wh- Questions

Each day of the camp week, campers responded to two or three Wh- questions about the food they cooked that day. For the purposes of this report, their responses are grouped by question type rather than by food. Descriptions of the five question types are included below. Table 1 lists all the Wh- questions from the journals.

Additions/Substitutions: These questions asked campers to think about how they might change a recipe by adding to it or replacing an ingredient with something else. As follow-ups to these questions, campers were asked to share why they chose those ingredients or how they think their choice would affect the recipe.

Predictions/Hypotheses: These questions asked campers to think through different "what if" scenarios such as changing a recipe step or leaving out an ingredient.

Comparisons: These questions asked campers to identify similarities and differences between the foods they made and other foods or types of that food.

Observations: These questions asked campers to describe what they saw happen at specific points in the recipe process.

Explanations: These questions asked campers to share how certain cooking processes work and reasons for making specific types of food.

Table 1: List of Wh- Questions

Question	Question Type	Food	Camp
What else could you add to the egg mixture? What do you think that would do?	Additions/Substitutions	French Toast	Week 1
What else would you put in a taco? Why?	Additions/Substitutions	Tacos	Week 1
What else could you add to the cream mixture? What do you think that would do?	Additions/Substitutions	Ice Cream	Week 1
If you did not have onions or spinach, what would you add to your omelet instead? Why did you choose those ingredients?	Additions/Substitutions	Eggs	Week 2
What else would you put in your sushi? Why?	Additions/Substitutions	Sushi	Week 2
If you did not have vanilla, what else could you add to flavor your cake? How would that change the cake?	Additions/Substitutions	Cake	Week 2
What do you think would happen if you left the French toast on the burner for less time? More time?	Predictions/Hypotheses	French Toast	Week 1
What do you think would happen if you did not boil the potatoes before baking?	Predictions/Hypotheses	Tacos	Week 1
What do you think would happen if you did not put salt in the ice?	Predictions/Hypotheses	Ice Cream	Week 1
What do you think would happen if you boiled eggs for less time? More time?	Predictions/Hypotheses	Eggs	Week 2
What do you think would happen if you did not rinse the rice before cooking it?	Predictions/Hypotheses	Sushi	Week 2
What do you think would happen if you did not add baking powder?	Predictions/Hypotheses	Cake	Week 2
What else do you think you could *fully cook* in *your* solar oven?*	Predictions/Hypotheses	Solar Oven	Week 2
What else browns like grilled cheese?	Comparisons	Grilled Cheese	Week 1
How is making cheese like making butter?	Comparisons	Grilled Cheese	Week 1

What other foods need yeast?	Comparisons	Pizza	Week 1
What is special about the shape of pasta you made?	Comparisons	Pasta	Week 2
How is cooking in a solar oven different from cooking in a kitchen oven?*	Comparisons	Solar Oven	Week 2
What did the yeast do when you added it to the water and sugar?	Observations	Pizza	Week 1
What happened to the dough after it rested?	Observations	Pizza	Week 1
Why do you let the pasta dough rest?	Explanations	Pasta	Week 2
Why do you think there are so many different shapes of pasta?	Explanations	Pasta	Week 2
What would be a reason for you to bake cake at home?	Explanations	Cake	Week 2
How does a solar over work?*	Explanations	Solar Oven	Week 2

** Campers did not complete their journal pages on the Solar Oven day, so no data were collected for these questions.*

Additions/Substitutions

Across the foods, a reason campers gave for making their additions or substitutions was flavor or taste. For example, with French toast, campers wanted to add brown sugar to *make it sweeter*, lime juice to *make it sour*, and cinnamon to *spice it up*. With tacos, campers suggested adding meat because it *would add flavor*, *it tastes better with meat*, and *the taco I ate did not taste good*. A camper also wanted to add meat to their omelet *because it tastes bad without them*. For ice cream, campers thought candy would *make it sweeter* and chocolate syrup would make it *taste better*. Campers wanted to add yellowtail to their sushi *because it is yummy*, crab *because it tastes good with sushi*, and corn and beans *because I think it would taste good with other veggies*. When considering what to add to their cake, campers thought chocolate would make it *taste like chocolate* and adding strawberry juice would *make it have a strawberry flavor*.

Campers also shared explanations of their additions or substitutions that were more focused on general improvement of the food. For example, with tacos, a camper explained that meat *makes it better*. Chocolate and sprinkles were also described as making ice cream better. A camper wanted to add ham, cheese, and parsley to their omelet *because they are good*. For sushi, campers wanted to add fish *so maybe it would be better* and *because it would be good*.

For a couple of the foods – tacos and sushi – camper responses to addition/substitution questions touched on familiarity and cultural norms. Campers shared that they would add meat to their tacos *because you need it*, some type of chicken *because that's how I usually eat it*, and shredded cheese because *it's my favorite type of cheese*. With sushi, one camper shared that they would add fish because *it's traditional* and one said they *would put meat like chicken in it because I like meat and chicken*.

A few campers shared responses about how their additions to the recipe would change the food's texture. For example, one camper wrote that milk would make French toast *softer*. For ice cream additions, campers described sprinkles as *crunchy* and whipped cream as

floppy. One camper wanted to add avocado to their sushi *because sushi with avocado makes a nice chewing texture*.

Predictions/Hypotheses

With both French toast and eggs, campers were asked what they think would happen if they cooked them for less time or for more time. It is important to note that while the original schedule had campers making deviled eggs on the day with the egg journal pages, they ended up only making omelets that day. Campers were able to make these time-based predictions when they got to try cooking the food in question (French toast), but struggled to make those connections to a different method of cooking an ingredient (boiling eggs).

With French toast, campers generally seemed to understand the effects of leaving it on the burner for different amounts of time. They thought that French toast cooked for less time would be *not cooked*, *soggy*, *softer*, and *not brown*, and that French toast cooked for more time would be *burnt*, *crispy*, *harder*, *dark brown*, and *overcooked*. However, with the questions about boiling eggs, most of the campers left them blank, and the answers were less consistent amongst the few that did guess. These campers thought boiling the eggs for less time would make them *squishier*, *raw*, *cold,* and *undercooked*, and that boiling them for more time would make them *harder*, *burnt*, *hot*, and *overcooked*. The difference in the campers' predictions between the two foods suggests the importance of being able to cook a recipe on their own and observe the process to inform their hypotheses.

With tacos and sushi, campers were asked what they thought would happen if they left a step out of the recipe. The responses for both of these foods were varied, suggesting campers were doing more guessing. For tacos, slightly more campers thought not boiling the sweet potatoes would affect the taste (e.g., *they would taste bad*, would be *not very sweet*) than thought it would affect the texture (e.g., *would be really hard*, *would be crunchy*). For the sushi, most of the campers responses about not rinsing the rice had to do with texture, though there were a lot of different ideas about how the texture might be different (e.g., *sticky*, *mushy*, *hard*, *not sticky*). Focusing their predictions on taste and texture suggests that campers understood these as important reasons for following recipe instructions, even if they did not quite understand the science behind the specific steps in the recipe.

With ice cream and cake, campers were asked to predict what would happen if they left out an ingredient. Campers did slightly better at making these predictions than they did with predictions for leaving out a step. When asked what would happen if they did not add salt to the ice, most campers understood that it had to do with temperature. Many of the campers shared how without the salt the ice would not be as cold. A couple of the campers said the ice would take longer to melt without the salt, which is incorrect but understandable confusion given the general use for road salt on icy roads and sidewalks. When asked what would happen if they did not add baking powder to their cake batter, some got it exactly right (e.g., *it would not rise*), some got close with more general responses (e.g., *it would not bake right*), and a couple of the campers went back to texture and thought it would be *squishy*. Again, campers did not seem to fully understand the science behind these ingredients, but were able to share predictions based on what they understood of the recipes (e.g., ice is cold, so putting something in the ice probably has to do with temperature) or ingredients (e.g., "baking" power must have to do with the baking process).

Comparisons

Two of the comparison questions asked campers to compare the food they cooked to other foods. When asked what browns like grilled cheese, most campers said *toast*, but other responses included *French toast*, *steak*, and *pizza*. All of these foods browning are examples of the maillard reaction, which is also seen with grilled cheese. One camper responded to the question with *fruit*, which does not brown as a result of the maillard reaction but is an interesting call back to the activities about enzymatic browning earlier in the camp week. When asked what other foods need yeast on the day campers made pizza, the most frequent answer was bread. These responses suggest that generally, the campers were able to make connections between the foods they were cooking with other foods they knew about.

Also on the day campers made grilled cheese, they were asked to make a one-to-one comparison of how making butter is like making cheese. The most common responses to the quest were about the ingredients being similar (e.g., *milk*) and *I don't know*. A couple of campers mentioned the process of making cheese and butter – *you moosh it up* and *they're both fun to make*. Compared to the responses for the first two comparison questions, the responses to this question suggest campers had more trouble making more specific comparisons.

The final comparison question asked campers to compare the type of food they made to other types of that same food – in this case the shape of their pasta. Most of their responses were about the physical appearance of their pasta, noting how wide, long, and thin it was. One camper compared what it eating the shape of pasta they made is like, noting that *the strips of pasta are fun to sip*. Another camper drew on their knowledge of pasta shape names writing that *it is an original shape of fettuccine noodles*. These responses suggest that campers were able to observe what they made and compare it to their existing knowledge of other pasta shapes.

Observations

Both of the observation questions were about making pizza dough during the first week of camp. First, campers shared what the yeast did when it when they added it to the water and sugar. Some of the campers' responses indicated an understanding of the purpose of yeast in the dough recipe (e.g., *made it rise*, *it activated the yeast*, *it made good bubble to the bread*). Other campers shared their observations of the yeast dissolving (e.g., *it turned into water*, *it turned watery*). One camper wrote that *it turned brown and smelled bad*.

Campers' observations of what happened to the dough after it rested were more varied. Several of the campers shared how the dough grew (e.g., *it made more dough*, *it got fat*, *it became big*), indicating they observed the dough rise during proofing. Other responses from the campers seemed to contradict each other. A few campers said the dough got sticky, while a couple said it was not sticky. A couple campers said they dough got hard, another said it was soft. While this could indicate confusion with the question or concepts, it could also be a result of potential subjectivity with observations (e.g., what counts as sticky or soft).

Explanations

Campers were asked why they let the pasta dough rest as part of the recipe instructions. There was not a consistent understanding of the reason for this step. A few campers got close to the reason – *so it has time to mix with the ingredients*, *to soak in moisture*, and *to make*

so it has the right consistency. The same number of campers thought it was to make the dough *less sticky*. Other responses included making the dough *less crunchy*, *cook faster*, and *dry*. These responses suggest that, overall, campers did not fully understand or were not able to explain the reason for letting the dough rest.

Campers were also asked why they think there are so many different shapes of pasta. There was no one answer for this across campers. Example responses for the different shapes of pasta included *to make fun*, *to try new pastas*, *for different textures*, *so it looks cool*, and *because it would be weird to just have one shape of something*. As this was a more open-ended question, none of these answers were wrong, but none mentioned more common reasons for different pasta shapes like sauces and regional differences.

The last explanation question asked campers to share a reason they would bake a cake at home. Again, there was no one answer for this, but it was a more open-ended question. The most common responses had to do with social reasons, such as a birthday, celebration, or to *make my parents happy*. Other reasons given were for *fun*, because cake is *good* and because it is *yummy*. One camper mentioned baking equipment as their reason writing, *my oven is better*.

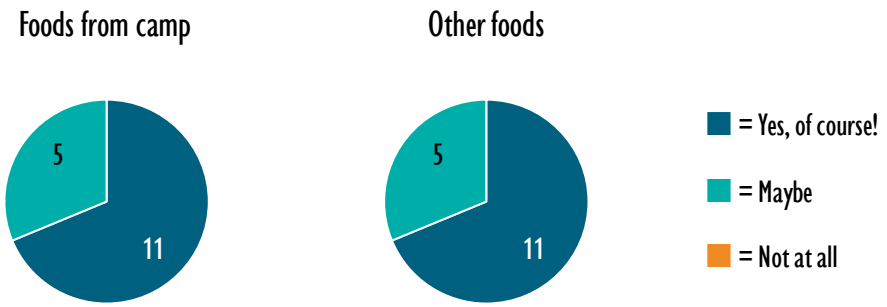
End-of-Week Reflections

At the end of the camp week, campers responded to four questions about cooking at home. These questions were included in the journal to explore campers' confidence in cooking and intentions to cook at home with their families.

Only responses from the first week of camp are included in this report because campers did not fill out their journals on Friday during the second week of camp.

Campers were asked to respond to the following questions using a three-point scale: *Think about the foods you cooked at camp this week. Do you think you could cook those foods at home? Do you think you could cook other foods at home?* The majority of the campers that answered expressed high confidence in their ability to cook foods from camp at home or their ability to cook other foods at home (see Figure 3). Zero campers responded "not at all," suggesting that all campers left camp with some level of confidence in their cooking abilities.

Figure 3: Do you think you could cook these foods at home?



While the overall ratings look the same for each food category, a few campers shared different ratings for the two questions. Two campers felt more confident in their ability to cook food from camp than other foods, while another two campers felt more confident in their ability to cook other foods than those from camp. Nine campers responded "yes, of course!" to both questions and three campers responded "maybe" to both.

Campers also responded to the question of what foods they were most excited to try cooking at home. Two-thirds of campers that answered mentioned foods they cooked during camp: ice cream, pizza, and French toast. These were also the three foods that campers most frequently rated "yes, of course!" when asked if they wanted to cook them at home on the efficacy journal pages. This suggests that they were the most popular or well-liked recipes of the week. The remaining third of the campers shared foods they were excited to cook that were not part of the camp cookbook: steak, berry compote, oatmeal, and "a lot of things."

Finally, campers were prompted to think about cooking at home with their families and asked what kinds of things they might talk about. While several campers were unsure about what they might talk about, others said they would talk about cooking, ingredients, and taste. A couple of campers said they would talk about camp, and one camper said they would talk about *science*. As an example, one camper imagined the following conversation cooking with their family: *Add more sugar, get more salt. How was camp!?*

Conclusion

Overall, the journal pages worked well as an embedded assessment to capture campers' feelings of efficacy and responses to Wh- questions. The journal pages fit into the already scheduled end-of-day reflection time, and campers more often than not shared responses to the questions, suggesting a willingness or interest in participating. While camp staff were unable to collect journal responses on the final day of camp week 2 due to circumstances outside of their control, journal distribution was able to happen normally on all of the other camp days.

Campers' responses to the efficacy questions demonstrated knowledge about, knowledge how, and a desire to act. Campers shared descriptions of what they would tell someone about the foods they cooked and also of how they cooked those foods. While the steps for making the food varied in amount of detail, the responses still show some understanding of parts of the cooking process. Also, while just how much campers wanted to cook each food at home was different across foods, very few campers did not want to cook the foods at home. Especially considering constraints for youth cooking at home, these ratings for desire to act were strong.

For the Wh- questions, campers were best at answering the additions/substitution questions. This suggests that campers were able to apply the more culinary aspects of camp. The questions with more of a science content focus were generally more difficult for campers. The one exception to this were things they could observe. Campers were able to predict what would happen if they left the French toast on the burner for different amounts of time, share other foods that brown like grilled cheese, and describe yeast dissolving/activating in water. Even though campers did not always grasp the exact scientific reasons behind various cooking

techniques or phenomena, the thought they put into their Wh-questions – especially the predictions/hypotheses - still represent important parts of the scientific process.

Per end-of-week reflections from campers during the first week of camp, all campers left camp feeling like they could, or at least could maybe, cook the foods from camp as well as other foods. This indicates that camp helped build or strengthen campers' confidence in their cooking abilities.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211.

Bandura. A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Bandura, A. (1978). Reflections on self-efficacy. *Advances in Behavioural Research and Therapy, 1,* 237-269.

Bandura. A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122-147.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Prochaska, J. O., Redding, C. A., Harlow, L. L., Rossi, J. S., & Velicer, W. F. (1994). The transtheoretical model of change and HIV prevention: A review. *Health Education Quarterly, 21*(4), 471–486.

Sheeran, P., & Abraham, C. (1996). The health belief model. In M. Conner & P. Norman (Eds.), *Predicting health behavior: Research and practice with social cognition model* (pp. 23–61). Buckingham, UK: Open University Press.

Appendices

A.

French Toast

Age: 7 and up
Ability Level: Easy
Time: 20 minutes

Ingredients

- 2 medium eggs
- 1/4 cup milk
- 4 slices of bread
- 1 teaspoon cooking oil or butter
- **Optional spices:** cinnamon, nutmeg, ginger, vanilla
- **Optional toppings: Strawberries, blue berries, brown sugar**

Equipment

- Burner
- Pan
- Spatula & Whisk
- Measuring cups & spoons (Liquid and dry)
- Bowls for mixing
- Knives and cutting board
- Spoon for stirring and serving

Instructions:

1. Begin by cracking the eggs in the shallow bowl.
2. Add milk.
3. Whisk until the two parts of the egg and milk are well mixed.
4. Optional: Add 1 teaspoon of your favorite spices, such as cinnamon or nutmeg.
5. Add 1 teaspoon cooking oil or butter to the pan over medium heat on the stove.
6. Dip each slice of bread in the egg and milk mixture and allow the excess to drip back into the bowl. The bread should be evenly covered in the mixture.
7. Once both sides of the bread are coated, add to the pan. Add more than one slice if you have the space.
8. Cook on med heat until the outside of the bread begins to look like a fried egg, then use your spatula to flip the bread over.
9. Wash hands after handling raw egg.
10. Repeat Step 8 for the other side and continue to rotate until both sides are golden brown.
11. Add toppings and enjoy.

Journal Prompts

What do you notice about the content of the egg when you crack it open? How would you describe the different parts?

What is different about the egg mixture after it is cooked (compared to before)?

How do you think cooking time affects the egg on the French toast?

Experimenting: How could you test to see how the French toast changes when you use more eggs in the mixture? How about if you used only egg whites or only egg yolks?

Adjustments:

Taco Tuesday

Age: 7+
Ability Level: Medium

Ingredients:

- **Sweet Potato**
- **Taco shells (Soft or crunchy)**
- **¼ Cup of cilantro**
- **2 cloves of garlic**
- **3 tbsp fresh lemon juice**
- **16 oz of black beans**
- **1 cup lettuce**
- **1 tablespoon baking soda**
- **Shredded cheese (optional)**

Equipment

- Oven & Stove top range
- Sauce pot & Skillet
- Parchment paper & foil
- Can opener
- Flat spatula
- Oven mitt
- Vegetable peeler
- Cutting board
- Knives
- Measuring spoons & cups
- Micro plane or food processor for chopping garlic

Instructions:

1. Begin by preheating oven to 425.
2. Peel sweet potatoes and chop lettuce. Set aside.
3. Place parchment paper baking sheet, lightly cover in oil
4. Cut sweet potatoes into small squares.
5. In a large pot bring water, salt, and baking soda to boil, add potatoes and return to boil.
6. Remove from heat when sweet potatoes are slightly tender. (About 7 mins) Transfer to baking sheet.
7. Add optional spices, salt, and pepper, drizzle lightly with oil.
8. Place in oven for 10 minutes, remove and flip and return to oven.
9. Meanwhile, open black bean can and get rid of bean juice.
10. Place beans in small pot and gently warm
11. Remove potatoes from oven. (Take out earlier if less browning is wanted)
12. If they are not at desired tenderness pop back into oven.
13. Once cooked and done, set aside.
14. Next place taco shells on a baking sheet and warm.
15. Place beans in aluminum foil in oven. (This is to reduce waste; heat however is preferred.)
16. Add all ingredients to taco shell
17. Place cheese on top

Draw your favorite part of the recipe!

Journal Prompts

1.) What changes do you notice when you boil the sweet potatoes? What changes do you notice when they are roasted?

2.) What is the difference between the texture of the raw and cooked potato? How does it feel, smell or taste different?

3.) How will the flavor of the sweet potatoes change as you boil, add baking soda and roast?

Adjustments:

Cheese Making

Age: 7+
Ability Level: Difficult
Time: 1 HR

Ingredients:

- **Whole milk Half Gallon**
- **Cheese salt ¼ of tsp**
- **Citric Acid**
- **Rennet tablets**
- **Cold water**

Equipment

- Cheese cloth
- Hot plate
- Large pot
- Gloves
- Slotted spoon & Colander
- Long knife
- Heat resistant Bowls
- Dairy thermometer
- Measuring cups

Instructions:

- Dissolve ¼ rennet tablet in ¼ cup cold water.
- Mix 1 teaspoons of citric acid into 1 cup cool water and add to pot.
- Pour ½ gallon milk into pot and stir.
- Heat milk to 90°F while stirring. (Check temp with thermometer)
- Remove from heat and add rennet solution. Stir for 30 seconds with an up/down motion.
- Cover and let sit for 5 minutes.
- Using a knife, cut through the curds.
- Heat to 110°F while stirring slowly. (Check temp with thermometer)
- Remove from heat and let sit 5 minutes.
- Pour off excess whey.
- Ladle curds into a colander.
- Dip the curds into a pot of water at 185°F. (Check temp with thermometer)
- Remove from water and cut pieces for campers.
- Add a pinch of salt to each piece.
- Time to stretch the cheese! The more the cheese is stretched and folded the more like string cheese it will become. If cheese cools off to much, microwave for 30 seconds before stretching again.
- Eat the cheese! (use for grilled cheese)

Draw your grilled cheese with super stretchy cheese!

Journal Prompts

1.) What do you notice about the consistency of the cheese as it heats?

2.) Why do you think stretching the cheese is important? Compare before and after stretching.

3.) What surprised you most about the cheesemaking process? What are your favorite ways to eat cheese?

Adjustments:

Grilled Cheese

Age: 5+
Ability Level: Easy
Time: 30mins

Ingredients:

- Bread
- Cheese
- Butter

Optional Additions

- Veggies
- Meat
- Eggs
- tart fruits

Equipment

- Stove top burner
- Skillet
- Spatula
- Knife for spreading butter
- Cheese grater
- Bowl for shredded cheese

Instructions:

1. Let butter reach room temp to soften
2. Shred cheese into bowl
3. Preheat a nonstick skillet.
4. Heavily butter one side of each slice of bread.
5. Place individual pieces of bread (butter side down) on skillet. Take desired amount of cheese from the bowl and place on bread.
6. Take desired amount of cheese from the bowl and place on bread.
7. Leave them on the skillet till they are slightly browned. Use a spatula to gently lift corner to check doneness
8. Place other slice of bread on top and press with spatula.
9. Flip until both sides are brown and cheese is melted.

Draw a picture of you enjoying your grilled cheese!

Journal Prompts

1.) What do you think would be different if you used shredded/block/slices of cheese?

2.) How would you change your recipe if you were cooking your grilled cheese in the oven?

3.) What would happen if you didn't add butter to the outside of the bread?

4.) If you wanted to use spinach in your grilled cheese, when would you add it?

Adjustments:

Pizza Sauce

Age: 5+
Ability Level: Easy
Time: 30mins

Ingredients

- 1 can (28oz) peeled whole tomatoes
- 1Tbsp Olive Oil
- ¼ cup grated onion
- ½ tsp of dried basil
- ¼ tsp red peppers
- 3 cloves garlic
- 1 tsp sugar
- 1tsp salt

Equipment

- Oven Cook top
- Blender
- Knife
- Saucepot
- Spatula
- spoon
- Cutting board
- Measuring spoons and cups
- Micro plane
- Can opener
- Grater (for onion)

Instructions

1. Drain all water out of tomato can.
2. Using immersion blender/Blender/Food processer/or hands blend roughly leaving small tomato chunks or to desired consistency.
3. Place oil in sauce pot and put on medium heat. (Just enough to simmer.)
4. Add all other ingredients and allow to heat.
5. Bring up to high enough heat to simmer/low boil to reduce water content.
6. Let sauce simmer for 15-20 minutes
7. Stir to keep from sticking to bottom.

Draw all the ingredients and tools used to make pizza sauce!

Journal Prompts

1.) What would happen if you left your sauce to simmer all day?

2.) How would you describe the smell of the sauce cooking?

3.) Did you experience any discomfort when cutting onions? What do you think is happening?

Adjustments:

Pizza Dough

Age: 7+
Ability Level: Medium
Time: 1 hour +

Ingredients

- 1 Cup of warm water (110 Degrees F)
- 1 package of active yeast
- 1.5 tsp white sugar
- 2.5 cups bread flour + extra for flouring surface
- 2 tablespoons olive oil
- 1 teaspoon salt

Equipment

- Oven
- Pizza steel or stone
- Stand mixer with hook attachment.
- Mixing bowl
- Whisk or fork
- Spatula
- Oven mitts/potholder
- Bowl for mixing and dough resting.
- Measuring cups & Spoons
- Saran wrap (cover dough)
- Parchment Paper with name

Instructions

1. Lightly flour a flat surface and hands for rolling out the pizza.
2. Place warm water, yeast, and honey to a bowl and mix until creamy. (About 2mins)
3. In that same bowl add 2 ¼ Cup flour, salt, oil and begin mixing until smooth.
4. Place Hook attachment on and begin mixing for 3-4mins.
5. Let **rest for 1 Hour (Make Pizza Sauce)**
6. Preheat Ovens to 450 degrees**.**
7. Put 2 tbsp of oil on cooking surface and spread.
8. Place dough on cook surface and let rest for 10mins.
9. Spread dough to make a “thin” pizza shape.
10. Let rest for 15 mins.
11. Place in oven for 10mins
    a. Cook for 5 minutes, flip and cook 5 minutes.
12. Remove and cover with toppings and cheese.
13. Place back in oven till desired crispiness.

Draw a pizza with all your favorite toppings!

Journal Prompts

1.) Notice what happens when yeast is added to warm water? What do you think is happening?

2.) What would happen if you did not knead the bread? How would it affect the overall texture?

3.) How do you think the dough will change when we let it rest/rise for longer? What do you think is happening?

Adjustments:

Omelette

Age: 6+
Ability Level: Easy
Time: 30-45mins

Equipment

- Stove top range
- Skillet
- Mixing Bowl (Small bowl works)
- Whisk or fork.
- Spatula

Ingredients

- 2 eggs
- Shredded cheese (To taste)
- Onions
- Spinach
- 2 teaspoon Oil or butter
- Pinch of salt
- Pepper (To taste)

Instructions:

1. Get out all ingredients and have them easily accessible.
2. Crack eggs and whisk together with salt.
3. Turn stove on medium heat and place frying pan on it.
4. Place oil/butter in pan, let heat and melt.
5. Once melted throw spinach, onions, and veggies into frying pan to **cook down.**
6. When veggies are at desired tenderness either move them onto a separate plate or leave them in.
7. Add egg mixture and watch for **setting.**
8. As the eggs set begin picking up the edges and allow the liquid to run under.
9. Add all topping on one side of the omelete.
10. Fold omelete from either side to cover the toppings and press down lightly.

11. Once omelete is "sealed" flip to evenly cook on both sides!

Need Pic

Journal Prompts

1.) What drink/smoothie flavor do you think would go well with your omelette?

2.) If you have some friends over for breakfast what type of toppings/fillings would they like?

3.) If you wanted to make a lot of omelette's for your family how would you save time?

4.) If you wanted to make an omelette filled with fruit, what fruit would you use?

Adjustments:

Sushi

Age: 5+
Ability Level: Easy
Time: 30-45 min

Equipment

- Bamboo sushi mats
-

Ingredients:

- 1 Nori Sheet
- 1 avocado
- 1 cucumber
- 1 large Carrots
- Sushi Rice 1 cup per sheet

Instructions:

Rice Base

1. Bring a sauce pot of water with a pinch of salt to boil.
2. Cook rice (1 cup for each nori sheet.)
3. Mix vinegar sugar and salt in a bowl and heat until sugar dissolved.
4. Once dissolved pour over cooked rice.

Sushi roll

1. Place nori wrap in oven and slightly warm them.
2. Spread rice evenly across the Nori sheet and leave some space on the edges.
3. Cut all your fillings into long thin sticks and place them length wise on the sheet.
4. Roll Sushi (Needs expansion)
5. Seal nori wrap with finger and water!
6. Once complete, using a sharp knife (Slightly wet the blade) cut the roll in half then place them next to each other. Then cut the two rolls into six pieces!

Journal Prompts

1.) After trying your sushi, what other filling do you think would go well in your sushi?
   a. What filling do you think would go well with your sushi and not go bad?
2.) If you didn't have Nori wraps on hand, what could you use to make sushi?
3.) If you had to make a Cincinnati sushi wrap, what would it be made of?
4.) If you were making a sushi roll for breakfast, what would you add in it?

Adjustments:

Fettuccine

Age: 7+
Ability Level: Medium
Time: 1.5-2 HR

Equipment

- Oven
- Saucepan
- Sheet pan
- Parchment paper
- Pasta machine
- Clear wrap
- Spatula
- Stand mixer.

Spices

- Thyme
- Rosemary
- Pepper

Ingredients:

- 2 cups of all-purpose flower
- 2 large eggs
- 4 large yolks
- 2 tbsp of kosher salt

Recipe

- Pour flour on a clean workspace and make a well in the center.
- In that well place all eggs, yolks, and 1 tsp of salt.
- Slowly whisk and incorporate the egg mixture into the surrounding flour.
- Continue incorporating flour and rotating.
- Once all incorporated, push forward and down then rotate.
- Continue flattening and rotating until the ball is elastic and moist. If it gets too dry spray some water and continue working.
- Once the dough ball is elastic and flour fully incorporated.
- Let rest for 30min – 1Hr depending on time.
- While resting clean-up workstation, place parchment paper on a cutting board or sheet tray lightly flour.
- Once rested cut the dough in 4 quarters.
- Place one quarter on your workstation and give the rest to other groups.
- Using a rolling pin flatten this piece of dough to about ½ inch thick.
- Set noodle maker to largest size setting. Put through pasta machine roller section three times.
- Once flattened fold long ends toward the center. (Limit amount of air between sheets.)
- Bring down the thickest one step and repeat previous step.
- Continue doing this until at desired thickness.
- Once at thickness, lightly flour dough and place on sheet pan and cover until ready to cut.
- Set pasta machine to desired pasta type/thickness and cut.
- Once cut place on sheet pan and lightly flour.
- FINALLY hang on pasta drying rack or cook fresh.

Journal Prompts

1.) How do you think the pasta would change if used whole eggs and not just yolks?

2.) How would the pasta change if you did not let it rest/rise? (Research if needed.)

Adjustments:

Alfredo

Age: 5+
Ability Level: Medium
Time: 1 HR

Equipment
- Stove top range
- Sauce pot
- Whisk
- Measuring spoon

Spices:
- Salt
- Pepper
- Rosemary
- Thyme

Ingredients:
- Half cup parmesan
- Half cup mozzarella
- 2 tbsp heavy cream
- 1 egg
- 1 tsp cornstarch
- 2 tbsp extra virgin olive oil
- 1 tsp garlic
- 2 tbsp unsalted butter

Recipe
- Place all ingredients in the amount you need within reach of workspace. (Mise En Place)
- Mix heavy cream, egg, cheese, cornstarch, butter, and spices. Whisk until all lumps are melted and sauce is smooth.
- In a large sauce pot bring salted water to boil on high heat. Once boiling add pasta and cook lightly. (Noodles should be firm but not totally cooked.)
- Take out about 2 cups of pasta water and dispose of the rest.
- Place pasta in sperate bowl add olive oil and garlic and toss. Set aside.
- Scrap the bottom of the of the pasta cooking pot then add the cheese mixture and begin to whisk.
- While continually mixing, slowly add about 1.5 cups of pasta water.
- Bring sauce to boil over medium high heat while mixing continually.
- Bring down to simmer to thicken sauce.
- If over-thickened us the half cup of pasta water left over to hydrate.

Clean Up:
- Scrape any food scrap into trash.
- Fill pots and bowls with hot water.

Journal Prompts

1.) How would you thicken the sauce if you needed to?

2.) What vegetables would go good in this dish?

3.) How could you lighten the sauce if it was too thick?

Adjustments:

Cake

Age: 7+
Ability Level: Medium
Time: 1.5-2 Hrs

Equipment

- Oven
- Cake pans.
- Spatula
- Whisk or stand mixer.

Ingredients:

- 1 cup white sugar
- ½ cup unsalted butter
- 2 large eggs
- 2 teaspoons vanilla extract
- 1 ½ cups all-purpose flour
- 1 ¾ teaspoons baking powder
- ½ cup milk

Recipe

- Preheat Oven to 350 F
- Combine butter and Sugar mix.
- Add eggs one at a time while mixing.
- Add vanilla.
- Combine flour and baking powder in a separate bowl then add ingredients in other mixing bowl.
- Add milk and mix until smooth batter.
- Cover springform pan with cooking spray and place parchment paper on the bottom of the pan.
- Pour batter into pan and even out the top.
- Cook for 30-40minutes or until top of cake rebounds after pressing on it.

Clean Up:

- Once complete allow all pans to cool down.
- Run all pans and bowls under water and allow to sit if needed.
- When complete, allow approved staff to use dishwasher.

Journal Prompts

1.) What fruits could you add to your batter?
    a. What fruit juice would you add to the frosting?
2.) If you were preparing this cake for a party, what ice cream could you serve?
    a. What design could you make on the cake for them?
3.) If you wanted to make this cake chocolate, where would you add chocolate?

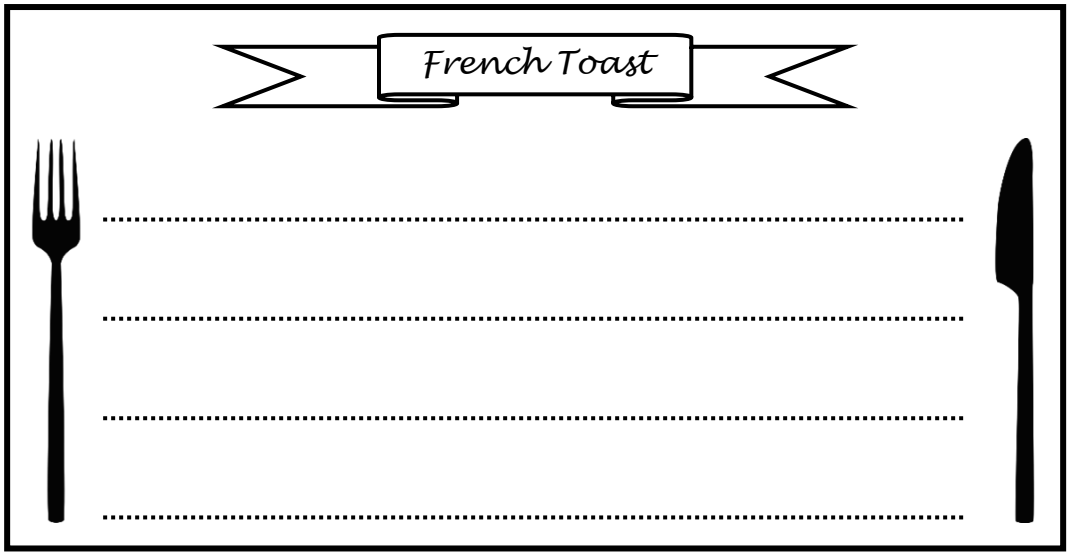
Adjustments:

B.

You cooked French toast today!

What would you tell someone about French toast?

How did you cook French toast?



Do you want to cook French toast at home?

Not at all

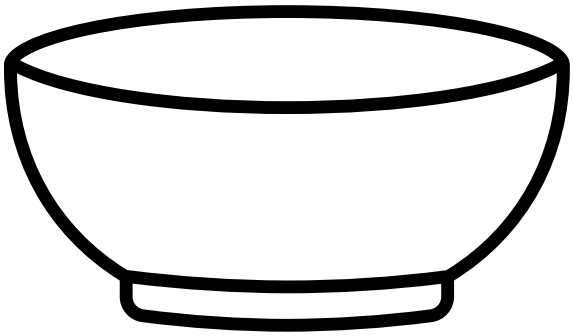
Maybe

Yes, of course!

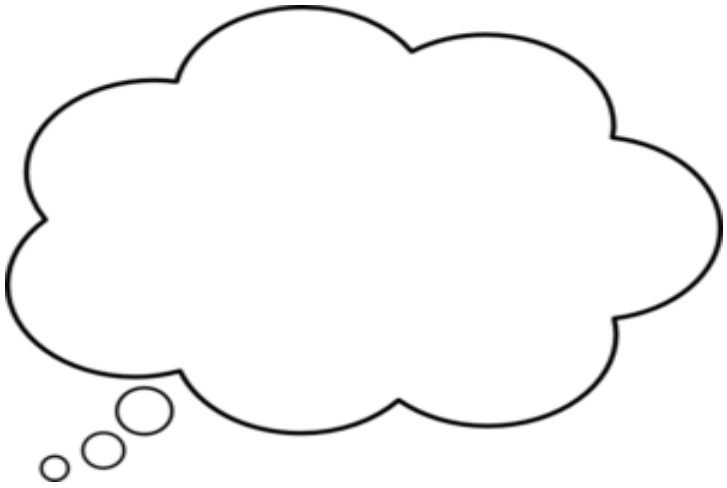
Why or why not?

Put your thinking cap on!

What else could you add to the egg mixture?



What do you think that would do?



What do you think would happen if you left the French toast on the burner for…

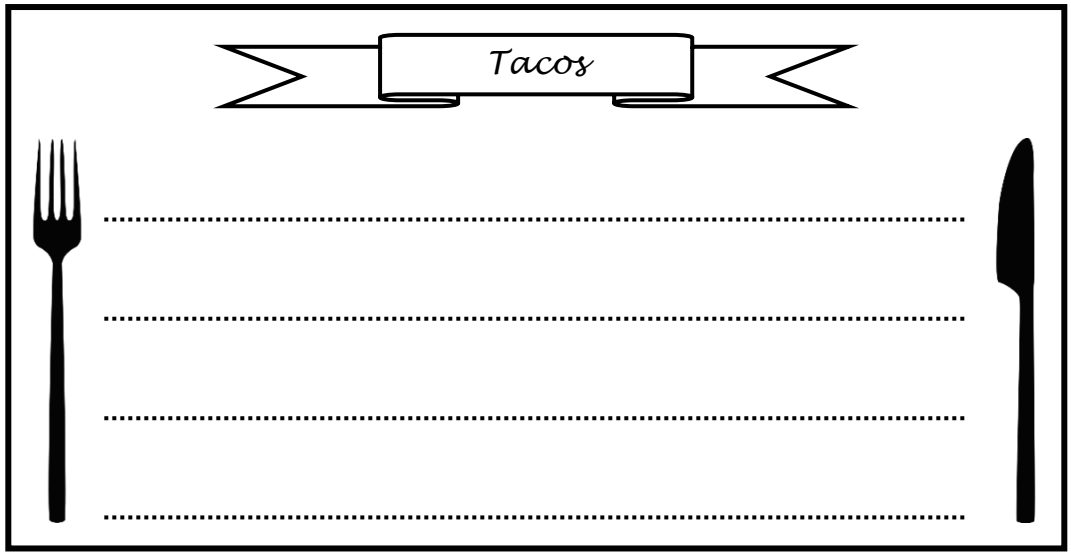
…less time?

…more time?

You cooked tacos today!

What would you tell someone about tacos?

How did you cook tacos?



Do you want to cook tacos at home?

Not at all

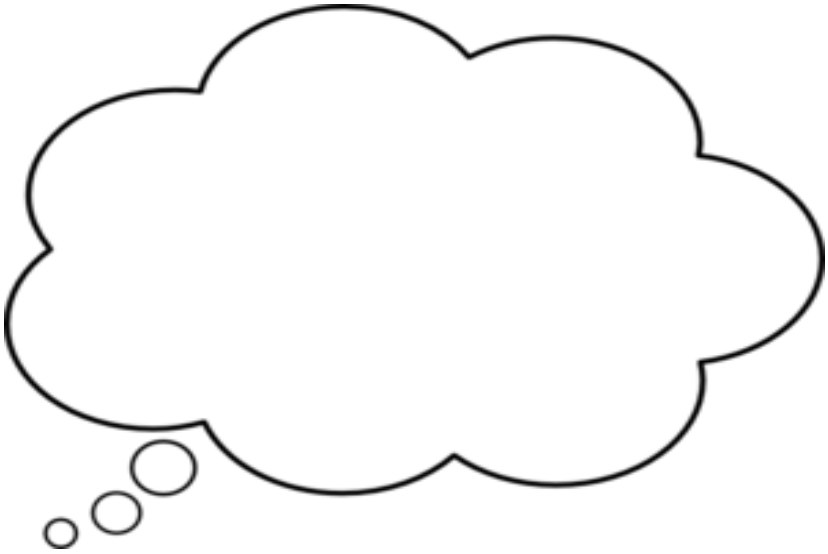
Maybe

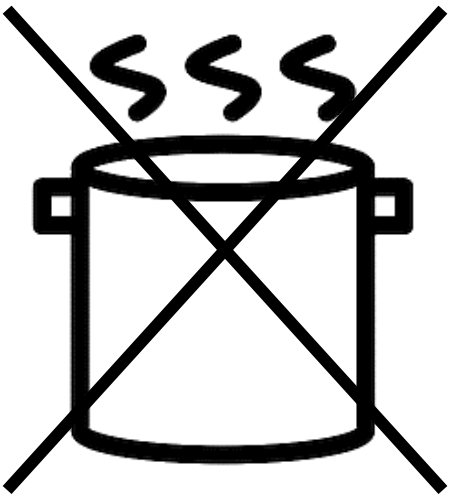
Yes, of course!

Why or why not?

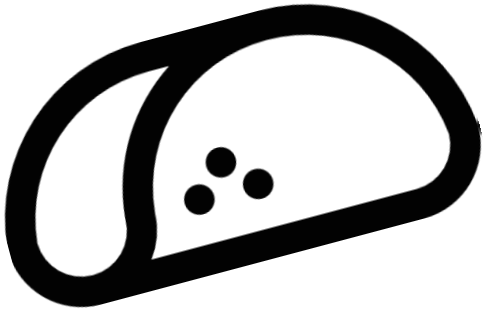
Put your thinking cap on!

What do you think would happen if you did not boil the potatoes before baking?

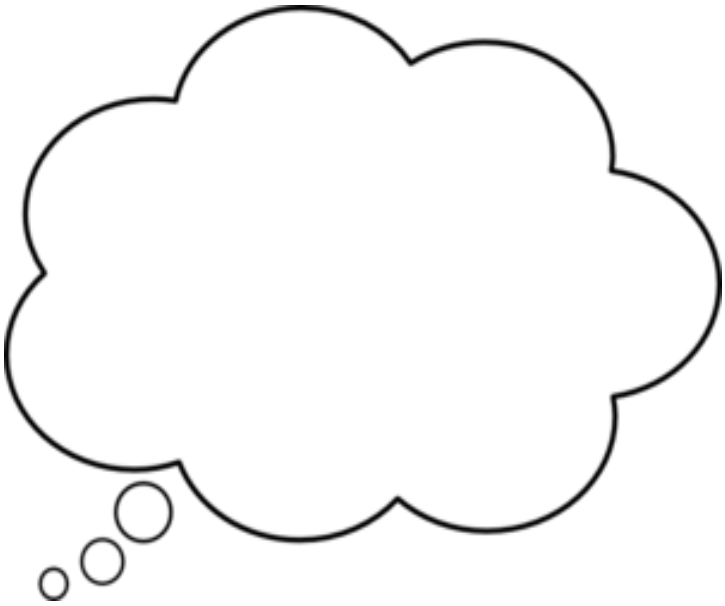




What else would you put in a taco?



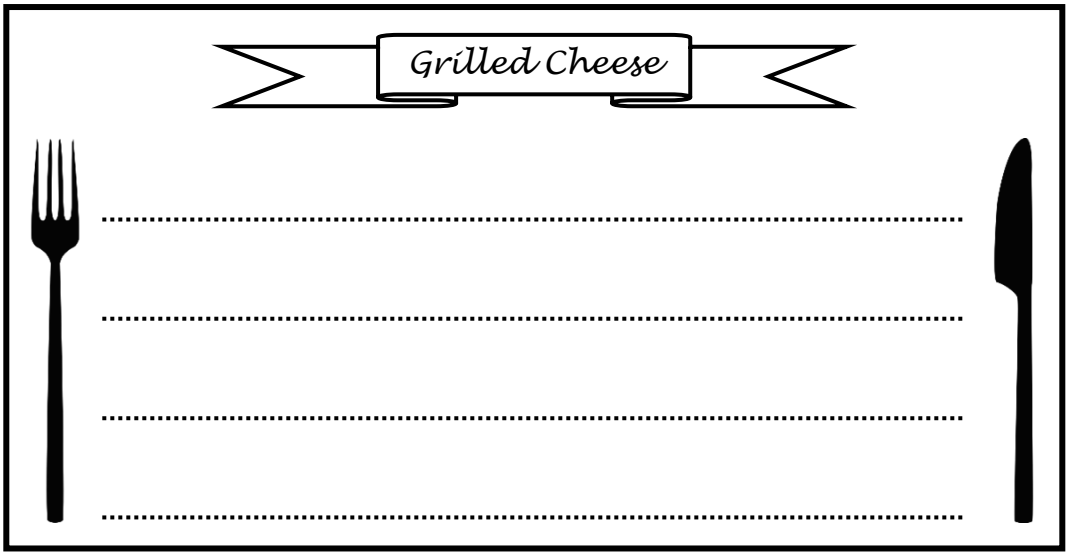
Why?



You cooked grilled cheese today!

What would you tell someone about grilled cheese?

How did you cook grilled cheese?



Do you want to cook grilled cheese at home?


Not at all

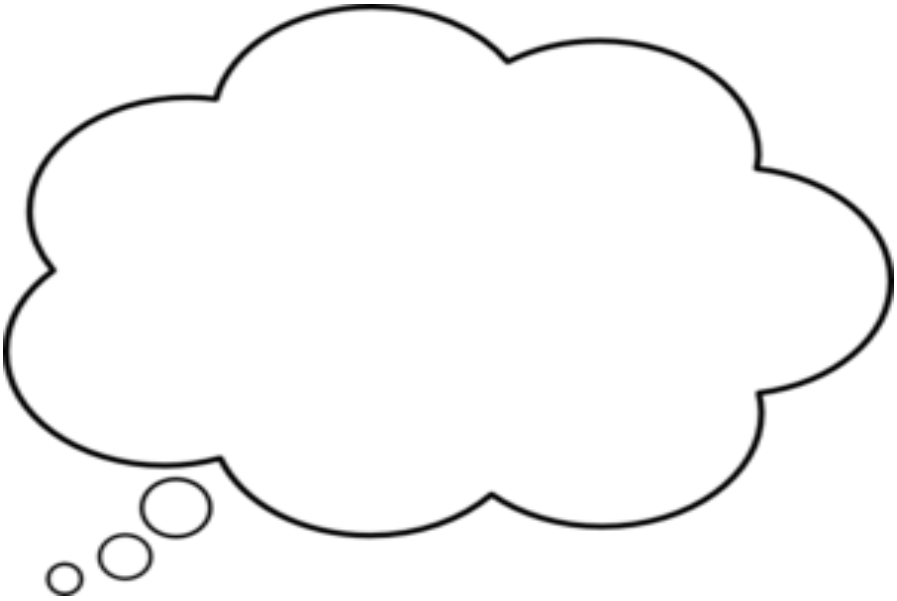

Maybe

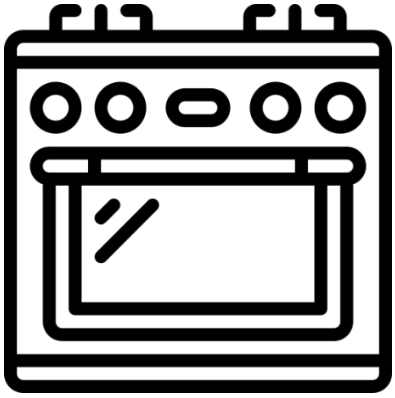

Yes, of course!

Why or why not?

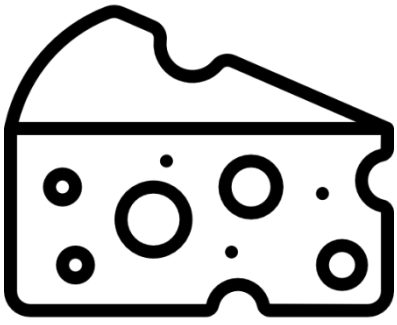
Put your thinking cap on!

What else browns like grilled cheese?





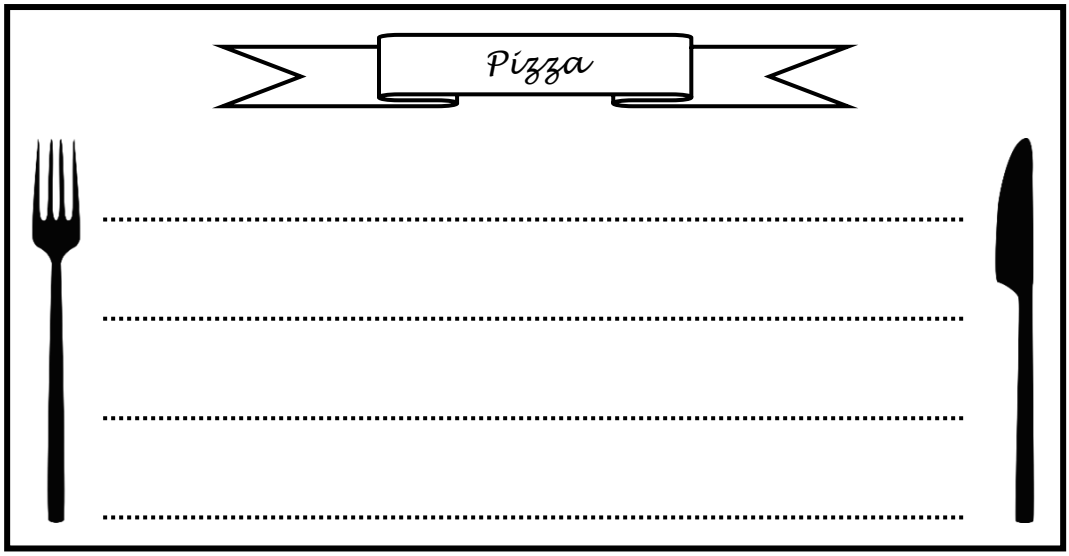
How is making cheese like making butter?



You cooked pizza today!

What would you tell someone about pizza?

How did you cook pizza?



Do you want to cook pizza at home?


Not at all


Maybe


Yes, of course!

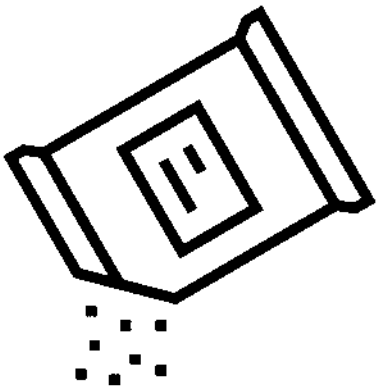
Why or why not?

Put your thinking cap on!

What did the yeast do when you added it to the water & sugar?

What happened to the dough after it rested?

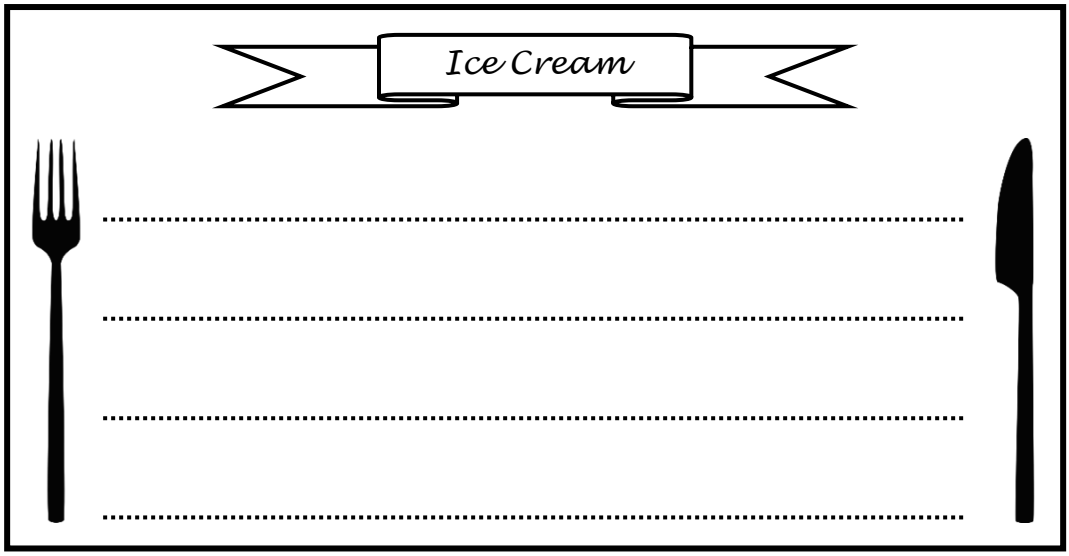
What other foods need yeast?



You made ice cream today!

What would you tell someone about ice cream?

How did you make ice cream?



Do you want to make ice cream at home?

Not at all

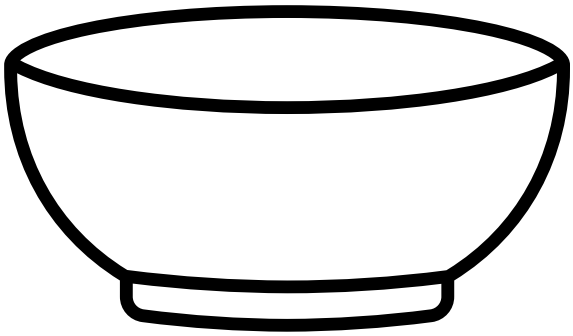
Maybe

Yes, of course!

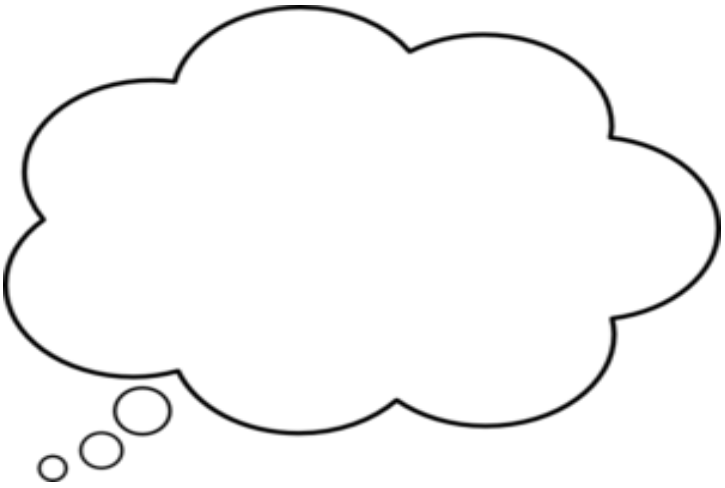
Why or why not?

Put your thinking cap on!

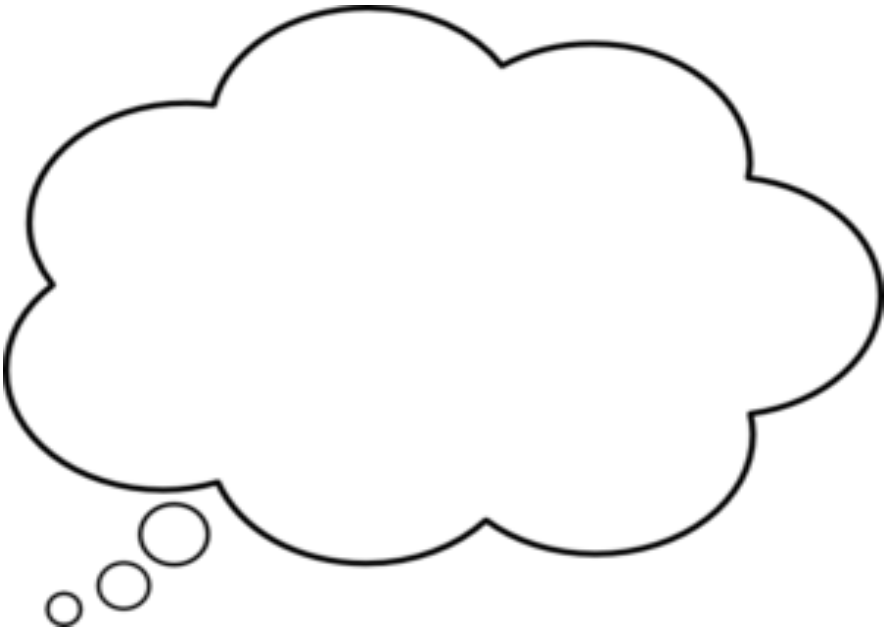
What else could you add to the cream mixture?

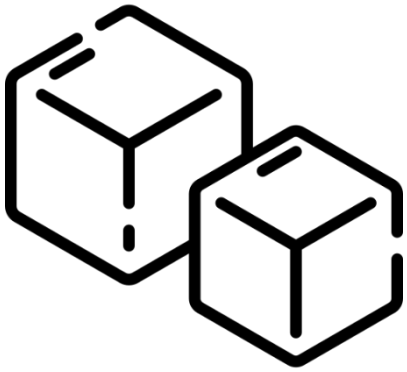


What do you think that would do?



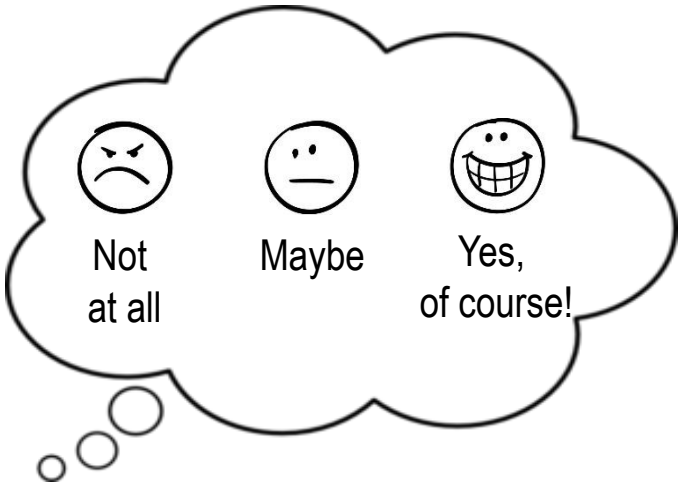
What do you think would happen if you did not put salt in the ice?



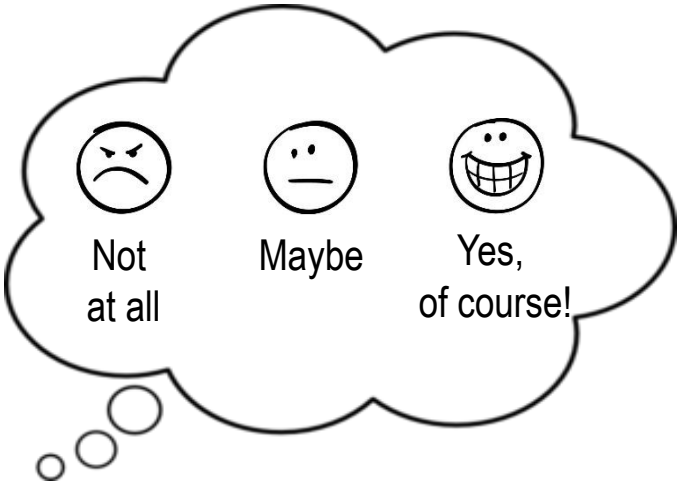


It’s the end of camp!

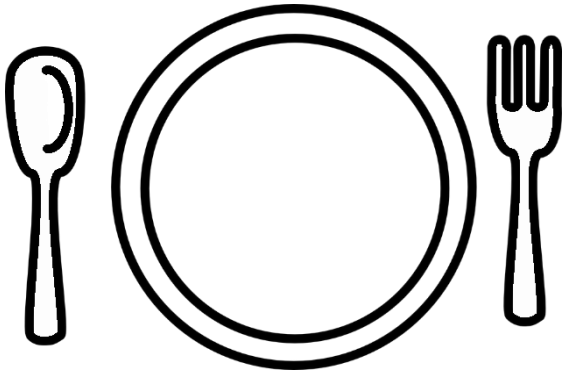
Think about the foods you cooked at camp this week.
Do you think you could cook those foods at home?



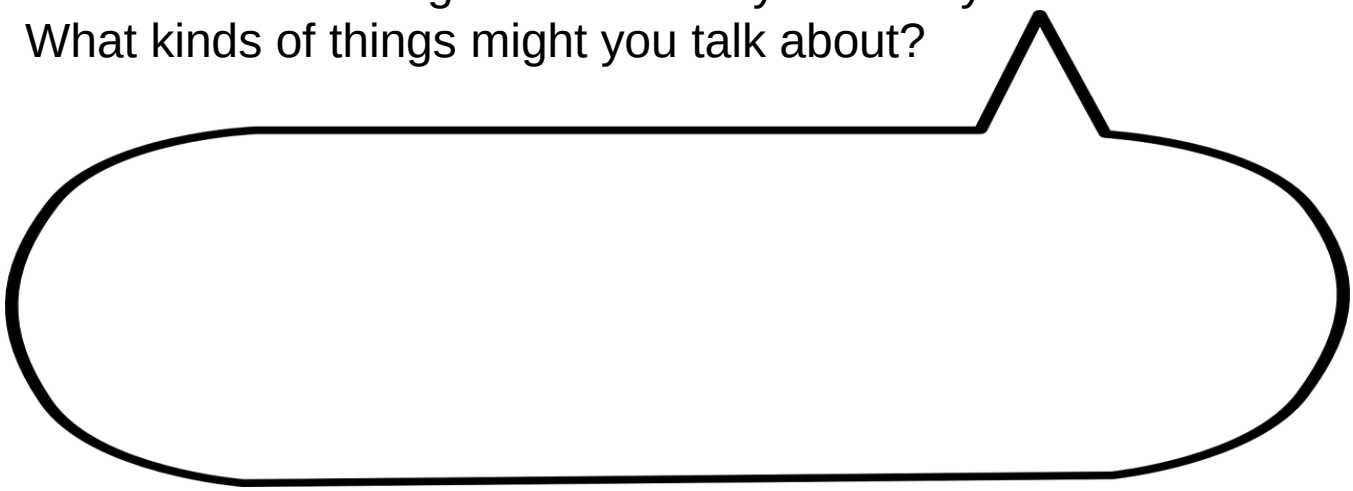
Do you think you could cook other foods at home?



What are you most excited to try cooking at home?



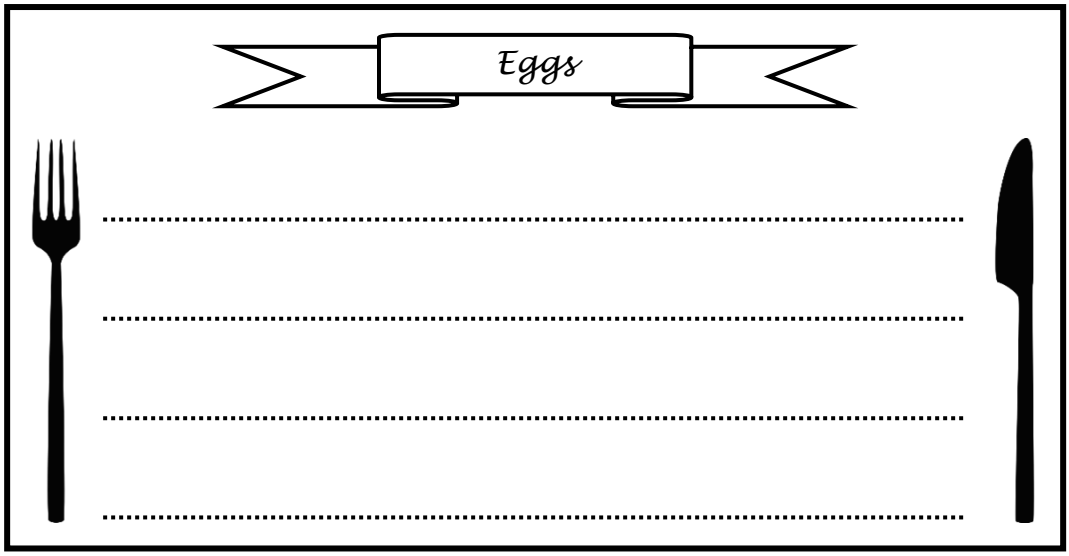
Think about cooking at home with your family.
What kinds of things might you talk about?



You cooked eggs today!

What would you tell someone about eggs?

How did you cook eggs?



Do you want to cook eggs at home?

Not at all

Maybe

Yes, of course!

Why or why not?

Put your thinking cap on!

If you did not have onions or spinach, what would you add to your omelet instead?

What did you choose those ingredients?

What do you think would happen if you boiled eggs for…

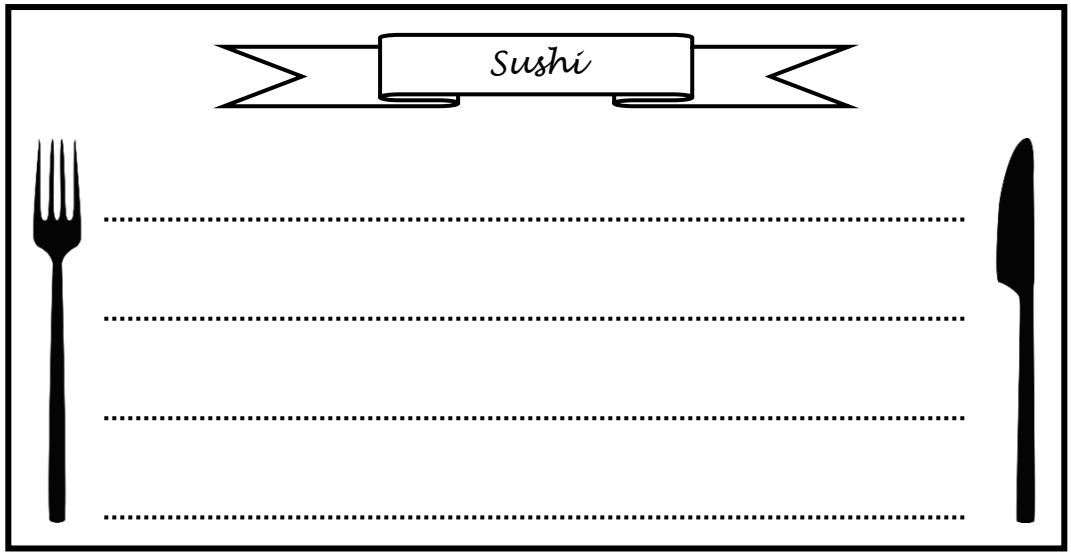
…less time?

…more time?

You made sushi today!

What would you tell someone about sushi?

How did you make sushi?



Do you want to make sushi at home?

Not at all

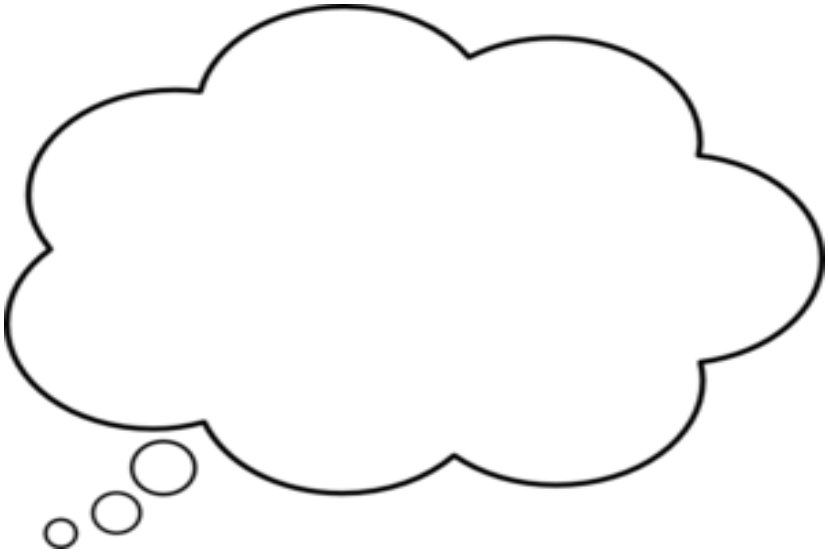
Maybe

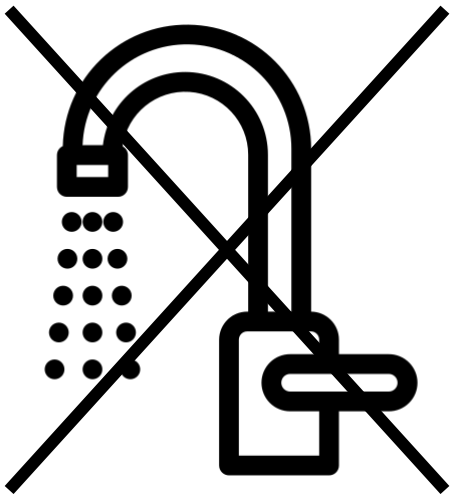
Yes, of course!

Why or why not?

Put your thinking cap on!

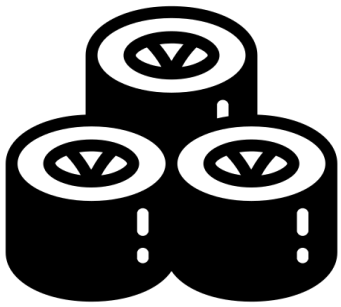
What do you think would happen if you did not rinse the rice before cooking it?

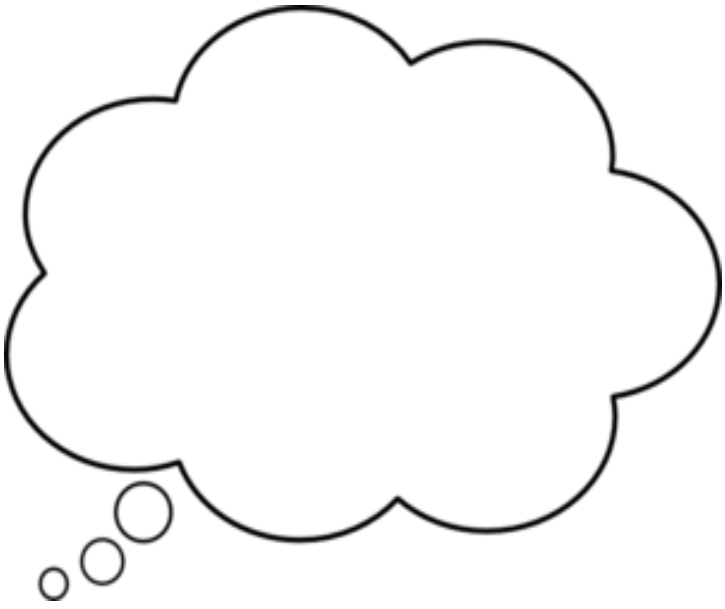




What else would you put in your sushi?

Why?

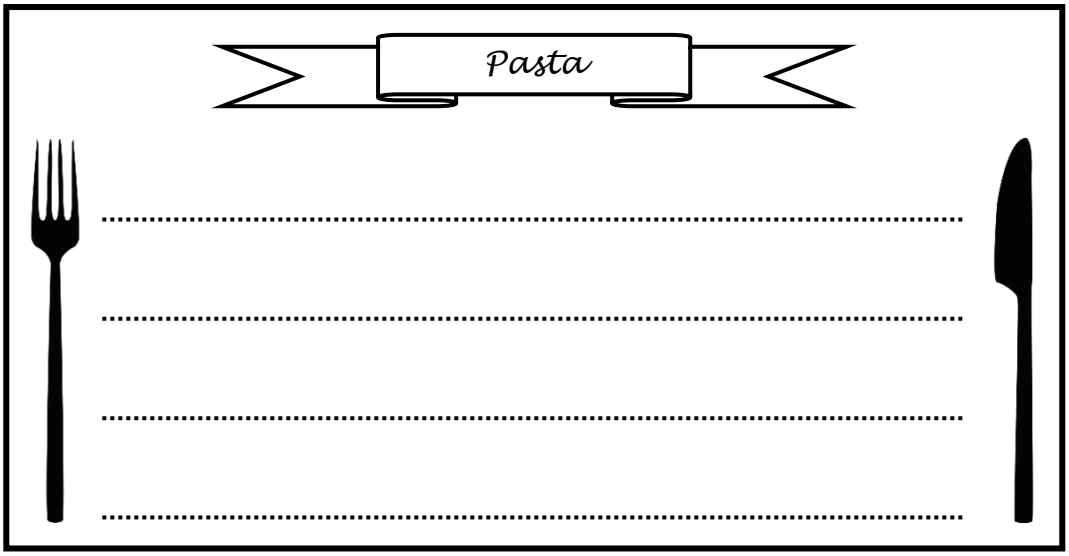




You made pasta today!

What would you tell someone about pasta?

How did you make pasta?



Do you want to make pasta at home?

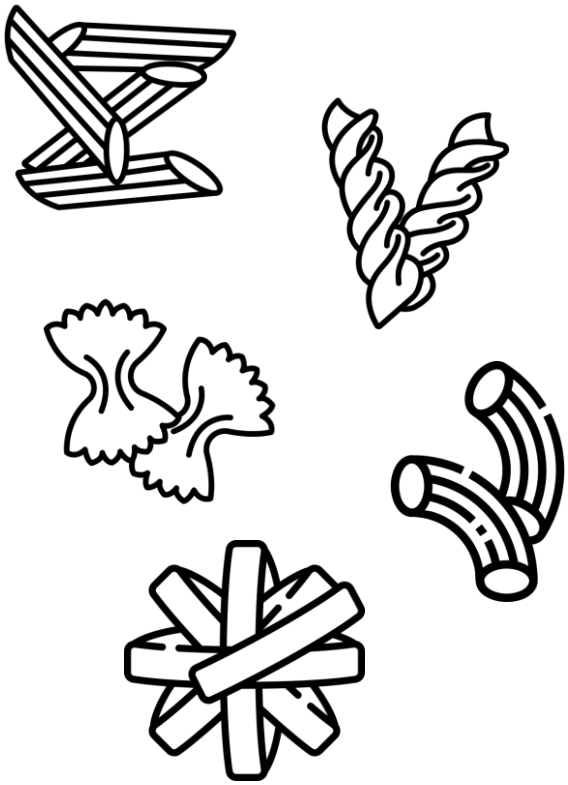

Not at all


Maybe


Yes, of course!

Why or why not?

Put your thinking cap on!



Why do you let the pasta dough rest?

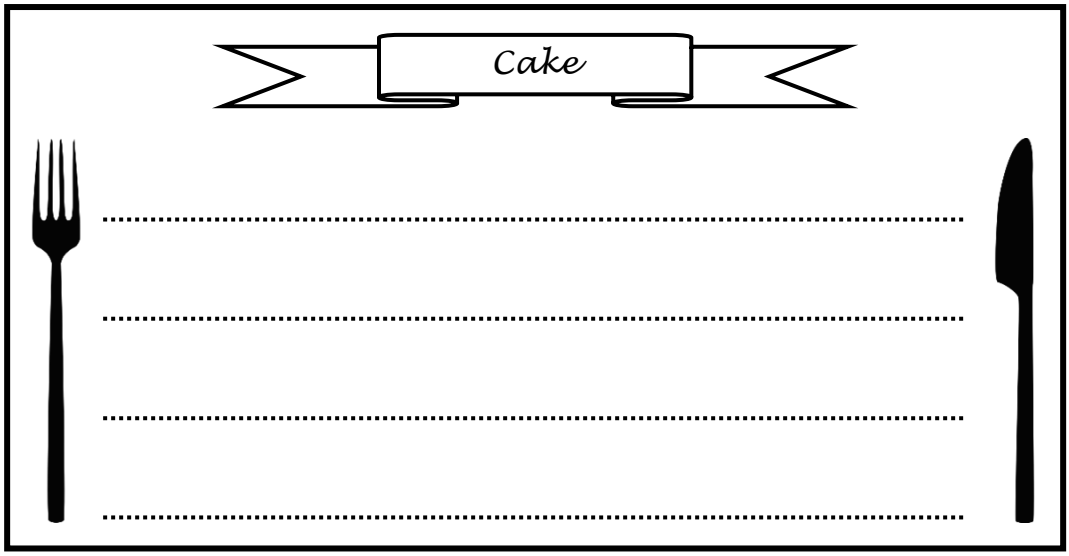
Why do you think there are so many different shapes of pasta?

What is special about the shape of pasta you made?

You baked cake today!

What would you tell someone about cake?

How did you bake cake?



Do you want to bake cake at home?

Not at all

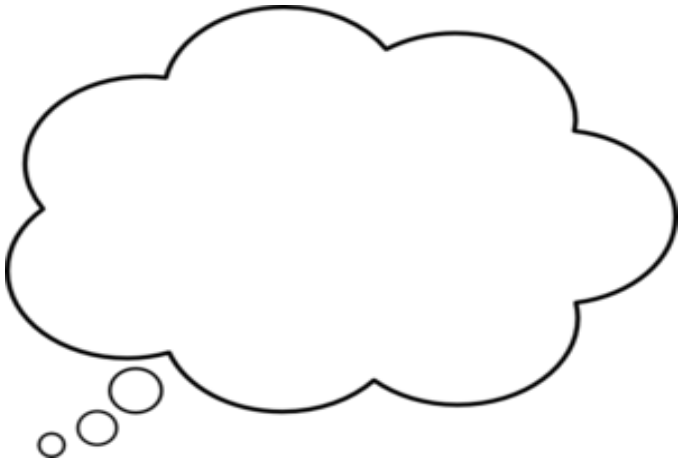
Maybe

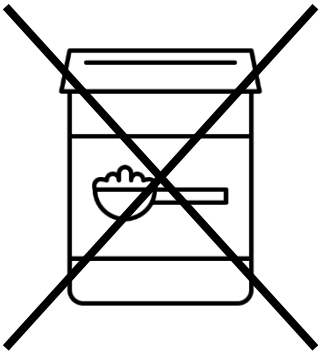
Yes, of course!

Why or why not?

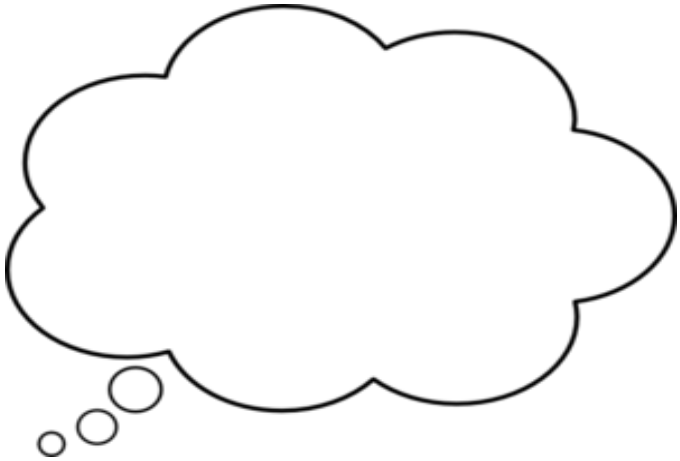
Put your thinking cap on!

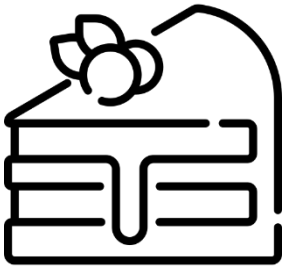
What do you think would happen to the cake if you did not add baking powder?





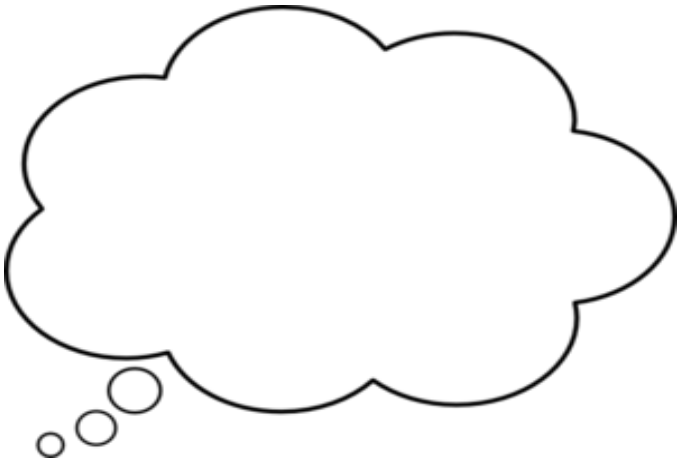
What would be a reason for you to bake cake at home?





If you did not have vanilla, what else could you add to flavor your cake?

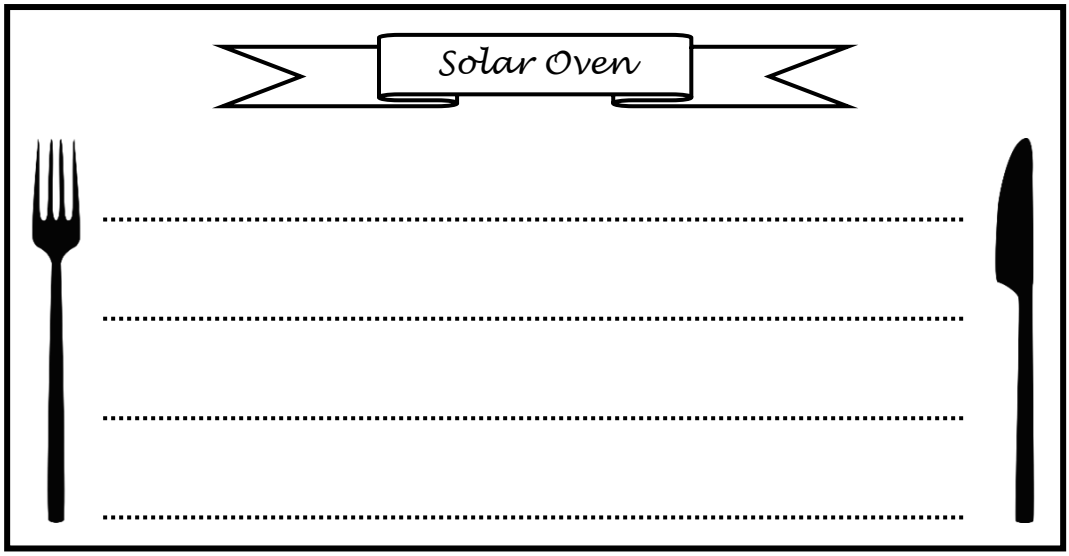
How would that change the cake?



You cooked with a solar oven today!

What would you tell someone about cooking with a solar oven?

How did you cook with a solar oven?



Do you want to cook with a solar oven at home?


Not at all

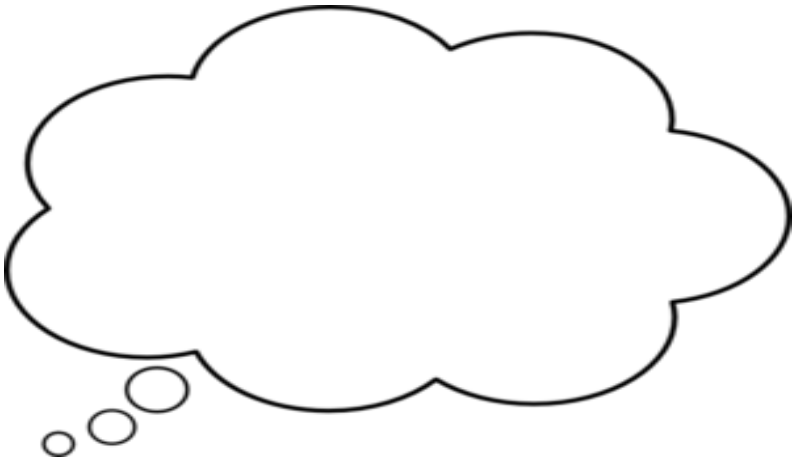

Maybe

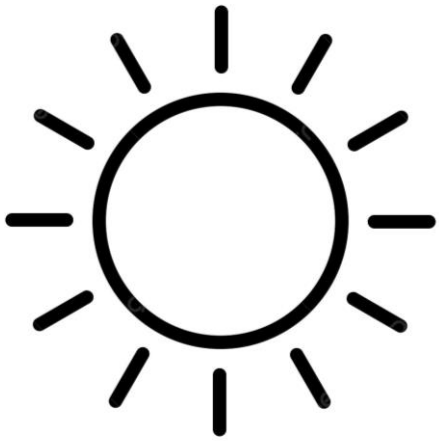

Yes, of course!

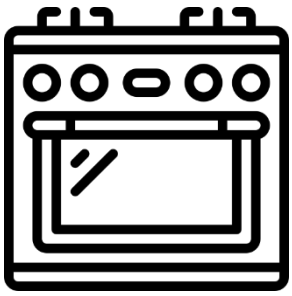
Why or why not?

Put your thinking cap on!

How does a solar oven work?

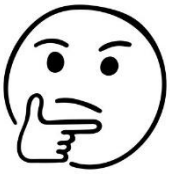


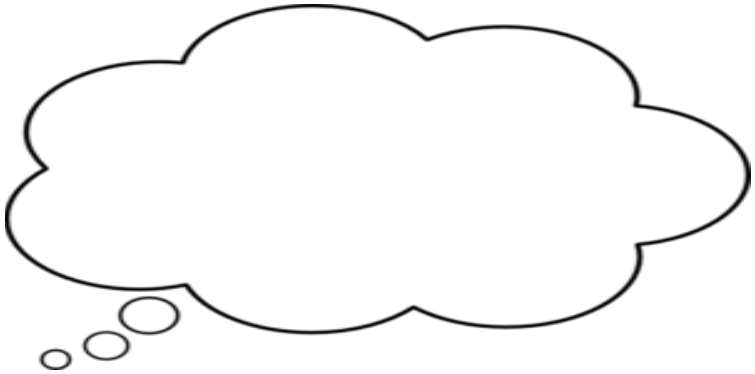




How is cooking in a solar oven different from cooking in a kitchen oven?

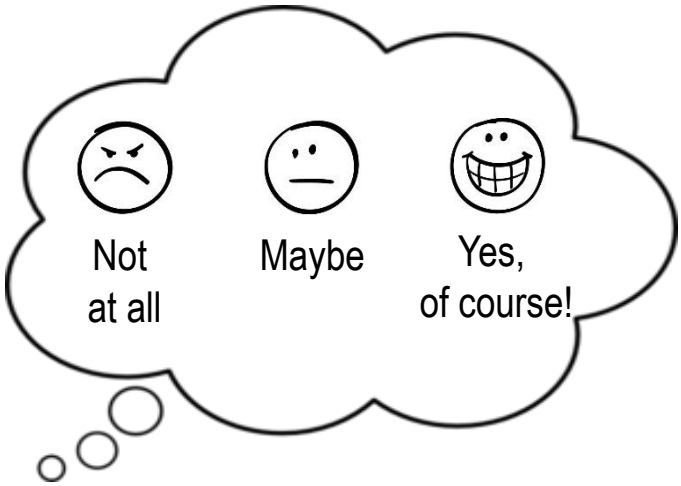
What else do you think you could *fully cook* in *your* solar oven?



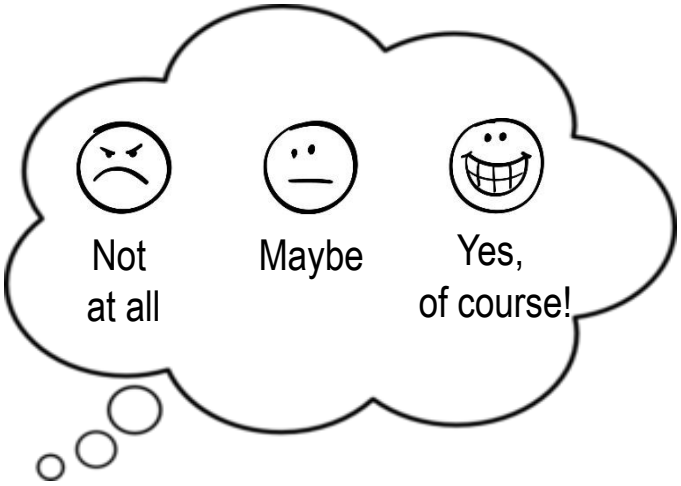


It’s the end of camp!

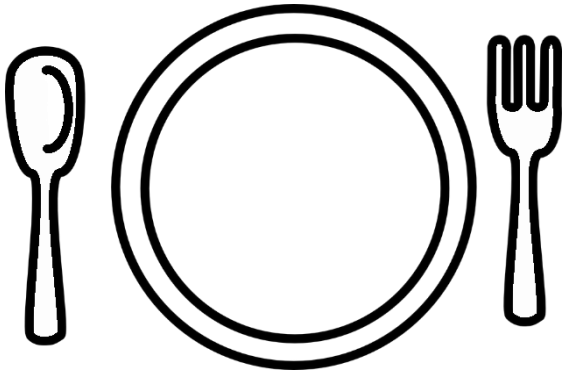
Think about the foods you cooked at camp this week.
Do you think you could cook those foods at home?



Do you think you could cook other foods at home?



What are you most excited to try cooking at home?



Think about cooking at home with your family.
What kinds of things might you talk about?