

Mrs. Maple's Measurement Mayhem



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Maple Cousins



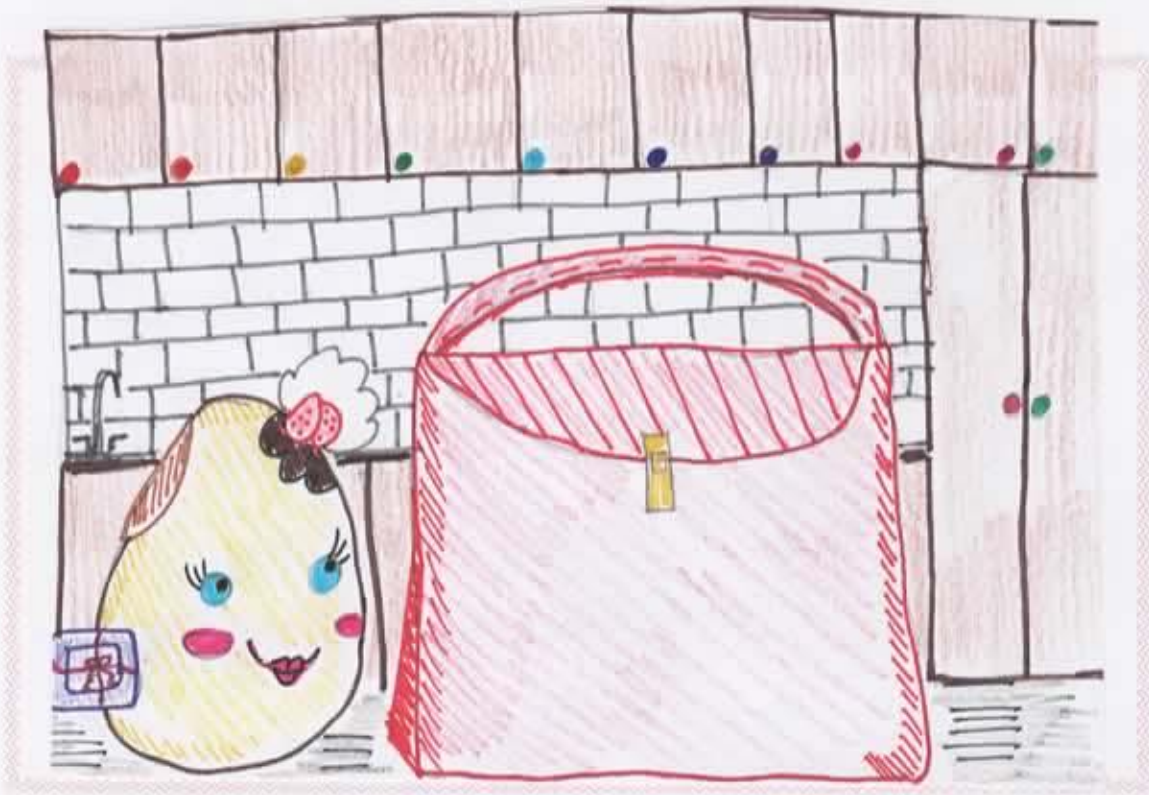
"I am so glad the three of you could come help me get ready for the Maple Family Reunion," said a big fluffy pancake named Mrs. Maple to her three cousins. Camilla Crepe from Paris, Wilhelm Waffle from Belgium, and Mr. Lemon from London each travelled to The United States for their family reunion. "No problem, Mrs. Maple," said Mr. Lemon. "We are all glad to be here." "Yeah! We really are!" exclaimed Camilla Crepe and Wilhelm Waffle.

The Maple family is very large with members from all over the world. Every ten-or-so years they all travel to one country to have a large family reunion. This time, the reunion was taking place in The United States in the city where Mrs. Maple lived called Maplefield. Camilla Crepe, Wilhelm Waffle, and Mr. Lemon all volunteered to come to Mrs. Maple's small apartment to help her prepare some of the food for the reunion. Camilla was delighted, "We were all just miniature goodies at our last reunion. We were only big enough to play in the maple syrup pool and to eat!" "No, we have never cooked for the family before. I am proud to be adding my skills for the first time," added Mr. Lemon.

They were all in Mrs. Maple's kitchen talking about what food to serve. "What should be the main food at the reunion this year?" asked Camilla. All at once each cousin said the food dish that they were. "Waffles!" "French crepes with plump strawberries and chocolate sauce!" "Pancakes with lemon juice and castor sugar!" "Big fluffy pancakes with butter and lots of maple syrup!"

"Quiet down, you're giving me a headache," said Wilhelm Waffle. "We have no time to argue." "Well, if you think about it," said Mrs. Maple. "We are all the same, yet different. Two of us are called pancakes, all of us are round, we all come from batter, and we can all be sweet. Me, I'm big, thick, fluffy, and sassy. Mr. Lemon is large, super thin, and a little tart. Camilla is also very thin but dresses up to be VERY sweet. And Wilhelm, he's thick and bold and has deep pockets to hold whatever he is wearing. Don't you think we should celebrate being from the same family, but also highlight being different? What if we stack French crepes, a giant American pancake, a stack of British pancakes, and a Belgian waffle? It would be a cake! That way we are all included!"

"Great idea, Mrs. Maple!" said everyone. "Let's start cooking and have some fun!" said Mrs. Maple.



Mrs. Maple started to get out her measuring cups and spoons. "Mrs. Maple, where is your kitchen scale?" asked Wilhelm Waffle. "I don't have one," she replied. "Then how do you measure your ingredients?" asked Mr. Lemon, sounding confused. "These," said Mrs. Maple glancing at the colourful cups and spoons. "Oh," said Mr. Lemon. "How can you get a good result without weighing out your dry ingredients?" Mr. Lemon then stated, "These cups don't have liter markings! What is a $\frac{1}{4}$ cup?" "Do you have recipes for each layer of the cake using those instruments?" asked Wilhelm. "Well, no, not all of them. I have the American pancake recipe, and I assume you each have your own?" asked Maple. Everyone nodded in agreement. "But our recipes are in grams and in liters," whispered Mr. Lemon suddenly feeling discouraged. "Hey, where did Camilla go?" asked Maple as they all looked around. "Here I am!" They all looked over to see Camilla coming out of her very large designer handbag carrying a bulky package. "I never travel without my scale and glass liter jug!"

"So are we using the scale or are we using my cups?" asked Mrs. Maple frantically. Before Camilla could shriek, "My scale!" Wilhelm said, "BOTH. I think this will be quite fun! I moved on to higher math courses in my school before I graduated. It would be an honour to teach you how to measure using both sets of instruments. We will learn the Metric System and the US Customary System. I will also demonstrate how to do conversion factors! This is not mayhem. It is just simple math!" Everyone started to calm down.

Mrs. Maple went to her recipe box that sat on top of her marble counter and opened it. She went to the 'F' section of the box and found the card labelled "Fluffiest Pancake." She closed the box and put it back neatly. When she went back to her cousins, they each had their own recipe cards.

"Let's look at all of them so we can see what supplies and ingredients we need. Who wants to cook first?" said Wilhelm. "I will!" said Mrs. Maple enthusiastically. "I think we should get all the supplies and ingredients out for all the recipes first, so we don't have to keep running back and forth from the kitchen cupboard," said Mr. Lemon. "Good idea," said Camilla. She was already running toward the pantry. "Wait!" cried Wilhelm. "Who is going to use which measurement system? I know I'll be teaching you the Metric system when I make the waffles." Mrs. Maple replied, "Then I'll do the US Customary system, so I can teach you how to use cups." Mr. Lemon twitched his moustache adding, "I feel like I shall try both. I am a pancake like Mrs. Maple, but I am very thin like Camilla. Yes, I feel I shall try both." Wilhelm turned to Camilla. "Will you be up to the challenge to try the US system?" She looked worried, but she nodded and said, "I am willing to learn if you teach me!" All of the cousins had no idea that making food would turn into a math class!

US Customary Volume

	fl. oz.	c	pt	qt	gal
fluid ounce	1	8	16	32	128
cup	1/8	1	2	4	16
pint	1/16	1/2	1	2	8
quart	1/32	1/4	1/2	1	4
gallon	1/128	1/16	1/8	1/4	1

US Customary Weight

	oz	lb	ton
ounce	1	16	32,000
pound	1/16	1	2,000
ton	1/32,000	1/2,000	1

They got out flour, sugar, butter, milk and all of the other needed ingredients as well as wooden mixing spoons, mixing bowls, a waffle maker, a skillet, a crepe pan, spatulas and utensils. Everything was placed on the large counter with the measuring cups, measuring spoons and scale. "You use teaspoons and tablespoons?" he asked, looking at Mrs. Maple's spoons. "Yeah, do you?" "Yes, we do, Mrs. Maple!" cried Camilla while jumping up and down. "Ooo, I love your colorful ones!" With another twitch of his moustache, Mr. Lemon stated, "I'd still prefer my stainless steel." Everyone in the room was very excited that they had something in common about measuring ingredients. But they soon found out that what they had in common was very little when it came to math.

"Are you all listening?" said Mrs. Maple. Everyone nodded in agreement. "Okay, so the first ingredient in the recipe is two cups of flour. One cup is the biggest size in my set." She held up a bright red cup. "I pour the flour into the cup and then level it off." She did that two times. As Mrs. Maple showed off her cups and was measuring, Wilhelm was making charts on a very large board that appeared out of nowhere. On the top was US Customary Measurements. He then made a box labeled WEIGHT and another box labeled VOLUME.

Mrs. Maple was still cooking. "Next it calls for $\frac{1}{4}$ cup sugar. One quarter cup is the smallest cup in my set." She held up a small bright yellow cup and measured the sugar into the mixing bowl. "Then four teaspoons baking powder, $\frac{1}{4}$ teaspoon baking soda, and $\frac{1}{2}$ teaspoon salt," she said while measuring the ingredients into the bowl. Then we need 1 and $\frac{3}{4}$ cups of milk. The three-quarter cup is the second biggest cup in my set. And then we need $\frac{1}{4}$ cup butter. Here, it says on the wrapper of the butter stick." She cut the butter with a table knife as all of her cousins acted shocked at what she did. "I cannot believe she did not weigh her butter!" Wilhelm burst as he was still making the charts. Then Mrs. Maple reached for an egg, cracked it open into the bowl. "The last ingredient we need is 2 teaspoons of vanilla extract." She put that in and stirred it all up. She then went to the skillet that was warming on the stove and greased it with butter. They all waited silently until Mrs. Maple cried, "The skillet's hot enough!" She got the large bowl of batter and poured it all into the skillet at once. They were making one giant pancake for the first layer of their cake. Mrs. Maple kept her eyes on the pancake. She flipped it after she saw air bubbles popping along the top, and the bottom turned up to show a perfect pancake color. She waited a few more minutes, checked for the same golden brown on the second side, and then moved the pancake to a colorful plate that she had set out next to the stove. The three cousins clapped for Mrs. Maple. The kitchen smelled delicious!

Metric Volume

	mL	L	kL
millilitres	1	1,000	1,000,000
liters	.001	1	1,000
kiloliters	.000001	.001	1

Metric Weight

	mg	g	kg
milligram	1	1,000	1,000,000
gram	.001	1	1,000
kilogram	.000001	.001	1



Look at how easy everything is to multiply and divide! The metric system is based on the number 10. You will always use an exponent of 10 to move up or down in your weight or volume.

$$10 \times 0 = 0$$



$$10 \times 100,000 = 1,000,000$$

$$10 \times 1 = 10$$

$$10 \times 10 = 100$$

$$10 \times 100 = 1000$$

$$10 \times 1000 = 10,000$$

They waited quite a while for Wilhelm to get out another board and write more charts. He also asked Mrs. Maple to plug in his waffle maker so it could heat up. Finally, he cleared his throat loudly and stated, "Can you all hear me? Can you all see the boards?" Everyone nodded. "The Metric system measures dry ingredients in gram units and wet ingredients in liter units. The US Customary and the Metric Systems both use teaspoons and tablespoons. Refer to my Metric charts on the chalkboard. I have also written my trivia on the Metric System for your enjoyment. A scale weighs out ingredients, such as chocolate, flour, sugar, butter, and nuts. Those who use the Metric system use a liter measuring jug for wet ingredients such as water, juice, and maple syrup. What Camilla will be doing when she makes her Crepe is doing the math to see how many milliliters are in a cup and how to use these cups rather than the scale. Mr. Lemon will also have the thrill of using math when making his British pancakes."

"Now, let's start cooking." Wilhelm walked over to the kitchen counter. "The first ingredient is 250 grams of flour. I just pour the flour into the bowl on the scale until I get to 250g. Ah, there we are, exactly 250! Then I pour the flour from the scale bowl to the mixing bowl carefully. Then I repeat the same with the sugar and butter. Now we go on to the wet ingredients. It calls for 473 ml, so I pour the milk into the measuring pitcher and pour it in the bowl gently." He then added 2 eggs, salt, baking powder, and vanilla extract; he didn't demonstrate these smaller measurements, because the rest of the recipe was in teaspoons and tablespoons which they all had in common. He mixed the batter up and poured it into the waffle maker. Mrs. Maple got out another colorful plate for him to put the waffle on after it was finished. After a few minutes he opened the waffle maker lid and pulled out a perfectly cooked waffle. Everyone clapped and jumped up and down for Wilhelm. It was the biggest waffle any of them had ever seen.

They washed all of the dirty dishes helping one another and put away the waffle maker. Camilla was very worried about doing the conversions. Math wasn't her best subject in school and she wanted her crepes to be as delicious as they usually were. "Ready to start, Camilla?" said Mrs. Maple, excitedly. Camilla could only manage a nod.

$$\frac{500 \cancel{\text{mL}}}{1} \times \frac{1 \text{ c}}{240 \cancel{\text{mL}}} = \frac{500 \text{ c}}{240}$$

$$\frac{500 \text{ c}}{240} = \frac{25 \text{ c}}{12}$$

$$12 \overline{) 25.00}$$

$$\begin{array}{r} 2.08 \\ 24 \\ \hline 10 \\ 0 \\ \hline 100 \end{array}$$

2.08 ≈ 2 cups

Mrs. Maple kindly looked at the nervous Camilla and stated, "I pulled out a blank recipe card so we can write down the conversions for each ingredient as Wilhelm teaches them to us. It can be a souvenir for you!" Wilhelm started, "What is the first thing on your recipe card?" They went through all of the ingredients and did all of the conversions. They first had to know how much 1 cup of each ingredient weighed in order to then know how much to measure. This information was easily found on the computer. Once the weight chart was made, they could then do the conversions. Another chart for volume was made comparing cups to milliliters. Camilla couldn't believe that she had been worried about doing the math! Camilla now had one Metric System crepe recipe card and one US Customary recipe card. "Now that we did the conversions we can start cooking," said Wilhelm smartly. "Yay!" exclaimed Camilla happily. "We will need four crepes to go across the cake for a layer. I figured it out," said Mr. Lemon, holding up a picture of what the cake could look like with all of its layers. "I thought about a maple syrup butter cream frosting," Mrs. Maple added. Everybody said, "Yum!" They started cooking. Camilla had to be very careful not to rip the very thin crepes. She then filled each of the four perfect crepes with whipped cream, strawberries, and yummy chocolate sauce. Mrs. Maple got out yet another plate for Camilla to put on her finished Crepes. Everyone clapped and whooped for Camilla. They repeated the cleaning process, and Mrs. Maple got out another blank recipe card for Mr. Lemon. They converted the recipe just like they did Camilla's.

Volume Conversion Chart

US	Metric
Cups	Millilitres
1/4 c	60 mL
1/2 c	120 mL
3/4 c	180 mL
1 c	240 mL
2 c	480 mL

$$\frac{50 \cancel{\text{g}}}{1} \times \frac{1 \text{ cup}}{227 \cancel{\text{g}}} = \frac{50 \text{ cup}}{227}$$

$$227 \overline{) 50.0000}$$

$$\begin{array}{r} .220 \\ 454 \\ \hline 460 \\ 454 \\ \hline 60 \\ 600 \end{array}$$

0.22 ≈ 1/4 cup

Ingredient Weight to Volume Conversion Factors

Ingredient	Grams in 1 Cup
Granulated Sugar	200g
Powdered Sugar	130g
Flour	125g
Butter	227g

$$\frac{250 \cancel{\text{g}}}{1} \times \frac{1 \text{ cup}}{125 \cancel{\text{g}}} = \frac{250}{125} = 2 \text{ c}$$



"Now," Mr. Lemon said, "I am going to split the recipes in half. Half will be Metric measurements and half US Customary." All of the others nodded. He looked at the recipe and decided that he would do the flour and butter in Metric and the milk and water in US Customary. "Alrighty, let's start." He was looking at the two different recipe cards. "110 grams flour," he weighed out the flour and poured it into the bowl. He measured out the rest of ingredients and stirred up the mixture. He poured the mixture into the already-warm crepe pan. "British pancakes are a play on French crepes and American pancakes," he said while watching the pancake closely. "It has no rising agents like baking powder or baking soda. That means it isn't as fluffy and thick like American pancakes." He flipped the pancake perfectly. "But it is also not a crepe, as we do not fill and role the cake." Mrs. Maple started getting out her maple-aid mixer to make the butter cream. "Britain's eat their pancakes like Americans, though we tend to use lemon juice and castor sugar." Mrs. Maple interrupted and asked, "What's castor sugar?" Everyone else replied, "It's a sugar that is powdery." Mrs. Maple started bouncing. "Oh! *Powdered Sugar!* I had no idea what castor sugar was." "Yes, and I didn't know that Americans called it Powder sugar," said Camilla. "I did," said Wilhelm in a very confident manner.

"Maple, I need a plate." "Oh! Sorry." She got out a plate and Mr. Lemon put his pancakes on it. He made a layer of six because they were so thin. Each layer got a good squirt of lemon juice and a good sprinkling of sugar. Now it was time to stack the layers.

$$\frac{200 \cancel{\text{mL}}}{1} \times \frac{1 \cancel{\text{cup}}}{240 \cancel{\text{mL}}} \times \frac{8 \cancel{\text{oz}}}{1 \cancel{\text{cup}}} = \frac{200 \text{ oz}}{30}$$

$$3 \overline{) 200.0}$$

$$\begin{array}{r} 66 \\ 180 \\ \hline 200 \\ 180 \\ \hline 20 \end{array}$$

$$6.6 \approx 7 \text{ Fl. oz.}$$

$$6 \frac{75 \cancel{\text{mL}}}{1} \times \frac{250 \cancel{\text{mL}}}{60 \cancel{\text{mL}}} \times \frac{8 \cancel{\text{oz}}}{1 \cancel{\text{cup}}}$$

$$= \frac{120 \text{ oz}}{5}$$

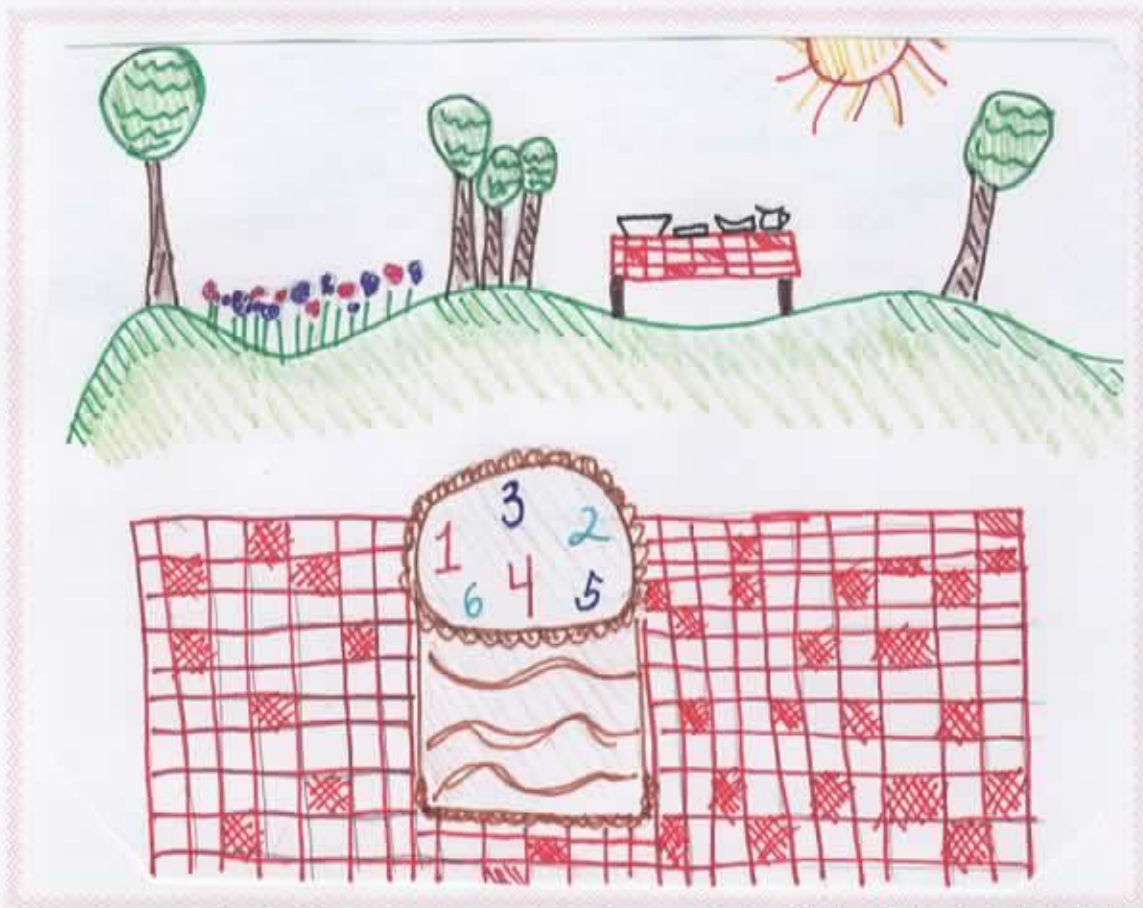
$$5 \overline{) 120.0}$$

$$\begin{array}{r} 24 \\ 10 \\ \hline 20 \end{array}$$

$$2.4 \approx 3 \text{ Fl. oz.}$$



They just got done icing the cake, and they were all laughing because Mrs. Maple licked the bowl clean after they were done icing it. "You are quite something, Mrs. Maple!" said Mr. Lemon. "Well, when you love syrup as much as I do, it's kind of hard to resist something with loads of syrup in it when it's sitting right in front of you!" They all started laughing even louder. "Where's Camilla?" "In here!" she answered. She was coming out of her large handbag just like she had earlier in the day. She was carrying another wrapped up package. "Is it me, or is it a bit of déjà vu action?" asked Wilhelm. "It isn't just you," said Mrs. Maple. "Here, a gift from me to you," said Camilla handing the package to Mrs. Maple. She opened it. A kitchen scale was sitting inside the wrapping. "Yay! Thank you so much, Camilla!" "I always carry a second scale with me, now I know why!" Mrs. Maple walked over to a kitchen cupboard and took out a set of rainbow measuring cups. She handed them to Camilla. "Thank you, Mrs. Maple, but I couldn't take your measuring cups!" "Well, we have a lot in common, Cousin Camilla, they're my extra set!" "Oh thank you!" Camilla said as the two hugged. "Um, sorry to break up this sweet moment, but the reunion starts in fifteen minutes!" said Wilhelm. They all helped lift the large cake on its platter and ran out the door.



Once they got to the family reunion, they set their cake on a picnic table that had a checked table cloth on it. Wilhelm had one last finishing touch. He placed candles in the shape of numbers all over the top. "I travel with odd things as well!" Everyone laughed again. "This cake is not only a part of each of us, now it shows how much we learned about math too!" continued Wilhelm. "This is quite a celebration!" yelled Mr. Lemon. Mrs. Maple and Camilla shrieked, "Simply magnificent!"

As they were looking proudly at their magnificent cake, one of their aunts walked over. "Hello, Emily Egg," said Mrs. Maple. "How's Australia?" "It is fun, but I miss London though. I want to return someday where it is not as hot. How are you four doing? Wait, is that a cake?" "Yes. We made it this morning. It has a giant waffle, a big fluffy giant pancake, 6 lemon British pancakes, and 4 French crepes. We then topped it with maple syrup butter cream frosting." "Mmm!!! Let me go get my mum, your Great-Aunt Hash Brown, she loves cake!" Emily turned around and then shouted, "Oy! Mum! Mrs. Maple and a few other cousins baked a cake!" Whispers started to rise and then suddenly a whole bunch of family came over asking for a piece. Mrs. Maple whispered to Wilhelm, "I think we should have made more than one cake." Wilhelm smiled and said, "You can say that again! More math and more fun!"

Every ten years the Maple Family has a family reunion. This reunion is taking place in The United States in a city called Maplefield. Three of Mrs. Maple's cousins who traveled from Europe offered to help her cook some food for the reunion. But soon they found out that they use two different types of measurement systems. They teach each other about the Metric System and the US Customary System. They have to figure out measurement conversions so they can cook together! But will they succeed? What will the cousins serve to the rest of their family?! Will it be mayhem? Or will it be magnificent?

About the Author



My name is Anna McBride, and I am eleven years old. I am homeschooled, and I live in the United States. The inspiration for this math story came from my stuffed animal pancake, which I named Mrs. Maple. (She is huge and FLUFFY!) I love all breakfast foods, except for eggs, with my favorite being gluten free pancakes covered in lots of maple syrup. Some of my hobbies are reading, writing short stories, coding on the computer, running, and playing the guitar or ukulele. I am a ballet dancer and hope to be on Pointe when I am 12. My secret wish is to be at Hogwarts. I may want to be an author or historian someday, but right now, I love being a kid.