

Teaching math by shopping, cooking, and eating

By JENNIFER COLTON

Grocery shopping, cooking meals and preparing plates are parts of a day every parents knows well. What you may not think about is how every one of those activities can be a lesson in math.

Quantities, dollars and cents

Before cooking or baking, you have to know how much you need. Since most ingredients are not sized for a specific recipe, kids can treat the ingredients as a puzzle while they're learning about addition, subtraction and division. If a recipe calls for four cups of flour, you probably only need one bag of flour. If it requires seven eggs, the half-dozen package won't be enough. For teens, try figuring out the quantities needed if you doubled or modified the recipe, then give kids a budget and see if they can purchase all the items they need. If not, what can they change? If there's room to spare, is there anything they could buy to spice it up? If kids have cash and coins to pay with, they can try and figure out the best way to pay to cover what they need – a quick lesson in addition and subtraction while also bringing in fractions and critical thinking. If you want a little more of a challenge, try adding in coupons. Let kids divide sale items into a per-item cost and figure out the best deal. With those coupons, do they have enough for their budget?



Fractions, measurements and volume

For younger children, playing with measuring cups and measuring spoons can be a fun and educational activity. Help your kids understand how the measurements work (two half-cups make one cup or three teaspoons make a tablespoon). Instead of simply adding a cup of flour, try adding three $\frac{1}{3}$ cups or two half cups. When they're ready, let them help with a recipe, seeing the difference between two cups of flour and a cup of sugar or a quarter teaspoon of salt compared to a teaspoon of baking soda. You can also try a recipe like a pound cake where kids can see how different a pound of each material looks (pound cake takes a pound each of flour, butter, eggs and sugar) while still weighing the same. Baking is perfect for teaching fractions – and it's even a good lesson if they mess up on one

of the measurements.

Shapes, patterns, and tessellations

Baking sugar cookies gives you the flexibility to decide what shape those cookies will take. Help young children pick out the correct cookie cutters to make squares, circles or triangles. Have older children cut squares into triangles and create tessellations of alternating ingredients to make a masterpiece on the plate, whether it's sugar cookies with different frostings, brownies and chocolate chip cookies or cantaloupe and watermelon. When looking at shapes and patterns, you can have kids make patterns on the plate or try cooking kebabs and having all the skewers match a pre-set pattern.

Area, radius and diameter

For kids of all ages, words like radius and diameter can be terrifying – and confusing. Learning circumference is much more tol-



erable when it's a pizza or a cake you're cutting up. And area? Make sure your bowls, pans, and plates can handle the recipe you're using them for and that the pie filling will fit in the crust. You can use circular foods to decide division and fractions. If you have eight people and one pizza, how many pieces do you need? What if you have two pizzas but three people want the cheese and four people want pepperoni?

Bonus: Reading, science, history and culture

This one is cheating a bit in an article about math, but the benefits of preparing food go beyond arithmetic. In order to cook effectively, children must be able to read the recipe. For younger children, this can mean recognizing simple words like "egg" or "milk," and for older children and teens, reading a complete recipe requires following directions, some critical thinking and ordering, understanding what it means to read all the steps first and to understand the order events must happen in. For science, children can watch ingredients change state before their eyes, from liquid to gas and solid to liquid. They can see chemical reactions as bread rises or water boils. Cooking can even be a lesson in history or other cultures as you tell the stories behind the recipe and the role it played.

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