November 2019: *Pizza Counting*
Written by: Christina Dobson
Illustrated by Matthew Holmes

These pizzas have all the right ingredients. Pepperoni, cheese, and onions make a purr-fect pizza cat. Is it time for a clock pizza made of sausages and peppers? Count the toppings on these pizza masterpieces, then divide them up into filling fractions. Zesty pizza facts add to the flavorful fun.[1] Did you know that farmers and ranchers produce all of your favorite pizzas toppings? In this activity sheet, you will learn where these ingredients come from, discover even more pizza math, and make your own "cracker pizzas."
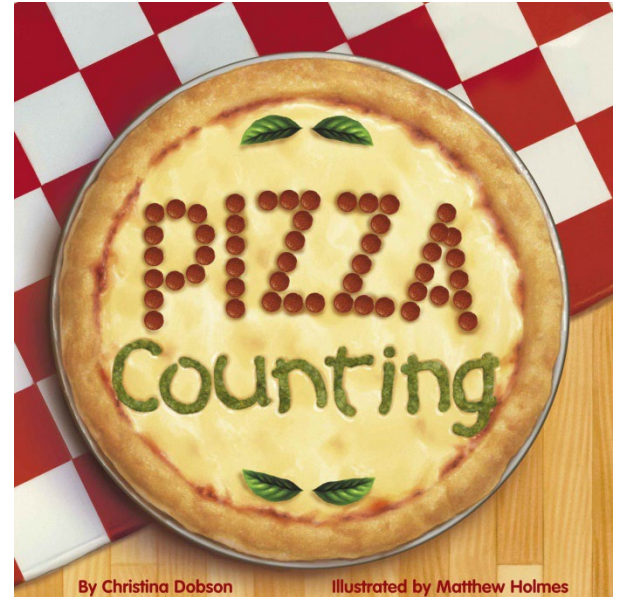
Pizza Counting
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Fun Facts
- The first pizza parlor in America was Lombardi's in New York City. They started selling pizza in 1905, and they are still open today.[2]
- Frozen pizzas arrived in grocery stores in 1962.[2]
- In 2001, pizza was delivered to the International Space Station.[2]
- There are four primary kinds of mozzarella used to make pizza: *mozzarella di bufala* (made from the milk of water buffalo in Italy, and used on Neopolitan-style pizzas), *fior di latte* (similar to mozzarella di bufala, but made from cow's milk), *burrata* (a fresh Italian cheese known for its creamy filling), and "pizza cheese" (the less perishable whole-milk or part-skim mozzarella used by the majority of American pizzerias).[2]
- Pizzerias started popping up in North Carolina in the 1960s, appealing to an interest in Italian food sparked by soldiers who had served in World War II.[3]
- By the 1970s, Italian fare, such as pizza, was still considered foreign food to rural North Carolinians, but was commonplace in most parts of the country.[3]

Interest Approach—Engagement[4]
1. Ask students to identify their favorite pizza toppings. List them on the board.
2. Ask your students if they know where the pizza toppings came from.
3. Inform your students that they will do the following:
   a. Identify where pizza ingredients were produced.
   b. Calculate how long it takes to produce pizza ingredients beginning with production on the farm.
   c. Practice skills in division and graphing using the pizza

d. Locate the states where pizza ingredients were produced.
4. Read the book, *Pizza Counting*.

Pizza Counting Questions
1. It says in the book, *Pizza Counting*, that it would take more than 131,000,000 twelve-inch pizzas to circle the Earth at the equator. Calculate the total inches.
2. It says in the book, Pizza Counting, that you would need more than 1,260,000,000 twelve-inch pizzas placed crust to crust to build a pizza path to the moon. How many total inches would the pizza path be?
3. What do some cultures put on their sweet pizzas?
4. How many colors of bell peppers does the book, *Pizza Counting* say are there? Using viable sources, search for examples of the pepper varieties. For example, a variety of yellow bell pepper is called 'Sweet Sunrise.'
5. What are anchovies? Do you like anchovy pizzas?
6. If pizza in the past cost a nickel a slice, and now costs 30 times that amount, how much does pizza cost now, according to this calculation?
7. What is the difference between flower and flour? What are these two words examples of? Can you think of other homophones?
8. What does *Pizza Counting* say is in pesto? Have you ever had a pesto pizza?
9. Make a list of pizza ingredients mentioned in *Pizza Counting*. How many of these ingredients have you eaten on a pizza?
10. How many pizzas do Americans eat in one year?

Fabulous Fractions[4]
1. Have students complete the Pizza Starts on the Farm activity sheet (in **Links** section, and attached to this activity sheet).
2. Have the class draw a round pizza crust. Use a ruler to divide the pizza into two halves. Next, divide the pizza into four fourths. Finally, divide the pizza into eight eights. How many pizzas would you need to give everyone in your class one slice?[5] If you had to split the pizza into sections for the whole class, what would that fraction be?
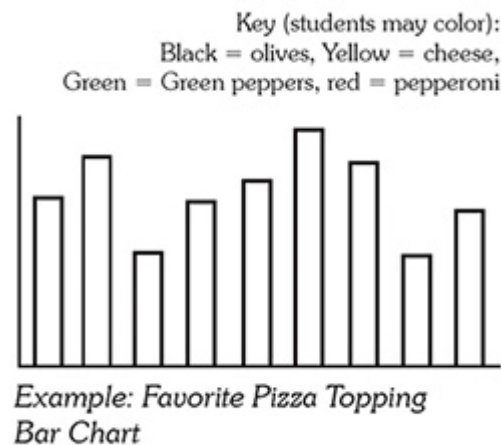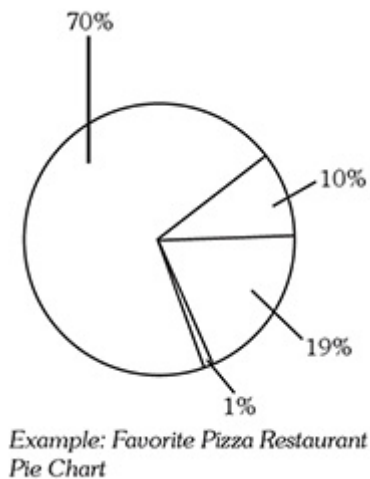
Pizza in Real Time[4]
1. Share the information on *Ingredients—Where Do They Come From*? handout with students, and have them consider the time it actually takes to produce a pizza. Then have them complete the *In Real Time* worksheet. (both in **Links** section, and attached to this activity sheet).

Pizza Math[4]
1. Have students interview their classmates about what their favorite pizza toppings and/or pizza restaurants are and graph the results. You may use the *My Favorite Pizza*

worksheet included with this activity sheet (or in Links section), or you may simply use them as a guideline for other interview questions and charts that your students may enjoy.
2. This is also an opportunity to introduce or review with your students how to read and create different types of graphs for different kinds of date.

Example: Favorite Pizza Restaurant Pie Chart

Key (students may color):
Black = olives, Yellow = cheese,
Green = Green peppers, red = pepperoni

Example: Favorite Pizza Topping Bar Chart

Pizza Crackers[4]

1. Provide students with ingredients to build their own cracker pizzas. As each ingredient is distributed, review with students where the ingredient originated or how it was produced or processed.
2. Display a map of the United States and have students locate the state that is the top producer of that pizza ingredient. As each state is identified, point out its characteristics such as climate and open space. Explain to students that pizza ingredients, with the exception of pineapple, can be produced in any state. However, some states, due to their climate or other available resources can produce certain food products more efficiently. For example, California is the highest producing state for milk, peppers, and tomatoes. California's warm and temperate climate makes farming very easy and efficient. Tomatoes and peppers can grow in any state, but the natural growing season may be too short, requiring the added expense of using a greenhouse. Cattle require open land and pastures to graze. Texas is an example of a state that can provide the open space for cattle to grow.

- **Pizza Crust (cracker):** The primary ingredient of a pizza crust is wheat. Kansas is the highest wheat producing state in the United States.
- **Pizza Sauce:** The primary ingredient of pizza sauce is tomatoes. California produces the most tomatoes for commercial sale.
- **Pepperoni:** Pepperoni is seasoned beef and pork meat. Texas produces the most beef cattle of any state. Iowa is the highest producing state for market pigs.

- **Peppers:** California is the leading producer of peppers.
- **Cheese:** California is the leading producer of milk. Cheese is one of many dairy products produced from milk.
- **Mushrooms:** Pennsylvania is the leading producer of mushrooms.
- **Pineapple:** Hawaii is the leading producer of pineapple in the United States. Pineapples require a tropical climate to grow.
   3. When all toppings have been distributed, allow students to eat their cracker pizza.

Pizza Probability[5]
Pretend you are cooking pizzas. You have pepperoni, sausage, and mushrooms to put on the pizza. How many different pizzas can you make with these toppings? (None of the pizzas can be the same as any of the others.)

Pizza Bracelets[5]
Want to make your own jewelry? Make your own pizza bracelet. You will need a tan or brown pipe cleaner for the crust. You will also need brown, pink, red, yellow, white, black and green beads for the toppings. Put your favorite toppings on the pizza crust!
- Brown – Beef/sausage
- Pink – Bacon
- Red – Pepperoni
- Yellow – Cheese
- Green – Peppers
- White – Onions
- Black – Olives

My Plate Toppings[5]
On a paper plate, draw your favorite kind of pizza. See if you can add a topping from each of the five food groups. Visit http://www.choosemyplate.gov/ for more information about the five food groups.

Links
- *Pizza Starts on the Farm* (worksheet)
  https://naitc-api.usu.edu/media/uploads/2015/05/15/Pizza_Starts_on_the_Farm.pdf
- Ingredients—Where Do They Come From? (handout)
  https://naitc-api.usu.edu/media/uploads/2015/05/15/Ingredients-Where_Do_They_Come_From.pdf
- In Real Time (worksheet)
  https://naitc-api.usu.edu/media/uploads/2015/05/19/InRealTime1.pdf
- My Favorite Pizza (worksheet)
  https://naitc-api.usu.edu/media/uploads/2015/05/15/My_Favorite_Pizza.pdf

Sources
1. https://www.penguinrandomhouse.com/books/238396/pizza-counting-by-christina-dobson-author-matthew-holmes-illustrator/
2. http://mentalfloss.com/article/69737/46-mouthwatering-facts-about-pizza
3. https://www.ourstate.com/a-slice-to-remember/
4. https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=228&author_state=0&search_term_lp=pizza%20time
5. American Farm Bureau Foundation for Agriculture. Pizza Ag Mag.

K-5 Subject Areas

Reading, Speaking and Listening, Healthy Living, Mathematics, Science, and Social Studies

Common Core/Essential Standards

Reading
- **RL.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RL.1.1** Ask and answer questions about key details in a text**.**
- **RL.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding **of key** details in a text.
- **RL.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the **basis for** the answers**.**
- **RL.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
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- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Speaking and Listening
- **SL.K.4** Speak audibly and express thoughts, feelings, and ideas clearly.
- **SL.1.4** Produce complete sentences to describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- **SL.2.4** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent and complete sentences.
- **SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly in complete sentences at an understandable pace.
- **SL.4.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; adjust speech as appropriate to formal and informal discourse.
- **SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; adapt speech to a variety of contexts and tasks.

Healthy Living
- **K.NPA.1** Understand MyPlate as a tool for selecting nutritious foods.
- **K.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.
- **1.NPA.1** Understand MyPlate as a tool for selecting nutritious foods.
- **1.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.
- **2.NPA.1** Understand MyPlate as a tool for selecting nutritious foods.
- **2.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.
- **3.NPA.1** Apply tools (MyPlate, Food Facts Label) to plan healthy nutrition and fitness.

- **3.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.
- **4.NPA.1** Apply tools (MyPlate, Food Facts Label) to plan healthy nutrition and fitness.
- **4.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.
- **5.NPA.1** Apply tools (MyPlate) to plan healthy nutrition and fitness.
- **5.NPA.2** Understand the importance of consuming a variety of nutrient dense foods and beverages in moderation.

Mathematics
- **NC.K.CC.4** Understand the relationship between numbers and quantities.
- **NC.K.CC.5** Count to answer "How many?" in the following situations:
  - • Given a number from 1–20, count out that many objects
- **NC.K.NBT.1** Compose and decompose numbers from 11 to 19 into ten ones and some further ones by**:**
  - • Using objects or drawings. Science
- **NC.1.OA.1** Represent and solve addition and subtraction word problems, within 20, with unknowns, by using objects, drawings, and equations with a symbol for the unknown number to represent the problem, when solving:
- **NC.1.OA.6** Add and subtract, within 20, using strategies such as:
  - • Counting on
- **NC.1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks.
- **NC.1.MD.5** Identify quarters, dimes, and nickels and relate their values to pennies.
- **NC.2.OA.1** Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:
  - • One-Step problems:
- **NC.2.MD.8** Solve word problems involving:
  - • Quarters, dimes, nickels, and pennies within 99¢, using ¢ symbols appropriately.
  - • Whole dollar amounts, using the $ symbol appropriately.
- **NC.2.MD.10** Organize, represent, and interpret data with up to four categories.
  - • Draw a picture graph and a bar graph with a single-unit scale to represent a data set.
  - • Solve simple put-together, take-apart, and compare problems using information presented in a picture and a bar graph.
- **NC.3.OA.3** Represent, interpret, and solve one-step problems involving multiplication and division.
- **NC.3.NBT.2** Add and subtract whole numbers up to and including 1,000.
- **NC.3.NF.1** Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts;
- **NC.3.MD.1** Tell and write time to the nearest minute. Solve word problems involving addition and subtraction of time intervals within the same hour.
- **NC.3.MD.2** Solve problems involving customary measurement.
- **NC.3.MD.3** Represent and interpret scaled picture and bar graphs:
  - • Collect data by asking a question that yields data in up to four categories.
  - • Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.
  - • Solve one and two-step "how many more" and "how many less" problems using information from these graphs
- **NC.4.OA.1** Interpret a multiplication equation as a comparison. Multiply or divide to solve word problems involving multiplicative comparisons using models and equations with a symbol for the unknown number. Distinguish multiplicative comparison from additive comparison.
- **NC.4.NF.1** Explain why a fraction is equivalent to another fraction by using area and length fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.
- **NC.4.MD.4** Represent and interpret data using whole numbers.
  - • Collect data by asking a question that yields numerical data.
  - • Make a representation of data and interpret data in a frequency table, scaled bar graph, and/or line plot.
  - • Determine whether a survey question will yield categorical or numerical data.

- **NC.5.NBT.7** Compute and solve real-world problems with multi-digit whole numbers and decimal numbers.
  - • Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
- **NC.5.NF.1** Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths.
- **NC.5.NF.3** Use fractions to model and solve division problems. • Interpret a fraction as an equal sharing context, where a quantity is divided into equal parts
- **NC.5.MD.2** Represent and interpret data.
  - • Collect data by asking a question that yields data that changes over time.
  - • Make and interpret a representation of data using a line graph.
  - • Determine whether a survey question will yield categorical or numerical data, or data that changes over time.

Science
- **4.L.2** Understand food and the benefits of vitamins, minerals and exercise.

Social Studies
- **1.G.1** Use geographic representations, terms and technologies to process information from a spatial perspective.
- **2.G.1** Use geographic representations, terms and technology to process information from a spatial perspective.
- **3.C.1** Understand how diverse cultures are visible in local and regional communities.

Ingredients in a Pizza—Where Do They Come From?

Wheat—A Grain
Pizza crust is made from wheat. When wheat is ready to harvest, the farmer combines the wheat, loads it onto trucks or wagons, and takes it to the county elevator. The county elevator then ships the wheat by truck, rail, or barge to a terminal. At the terminal, the wheat is sold to the various industries which make food and feed, or it is shipped overseas. The place where wheat is shipped to make food is called the mill. The mill breaks the wheat kernels into pieces and sifts the pieces to get the bran and germ (parts of the wheat kernels) out. This is repeated many times to make the substance we know as flour. The miller then adds B-vitamins and iron for nutrients. The flour is shipped in bags to the bakery or grocery store. Bakers use wheat flour because it contains a magical protein called gluten. To make crust, active yeast, warm water, and oil are added to the flour. The gluten traps the air bubbles the yeast releases and causes the crust to rise.

Tomato Sauce—A Vegetable
Tomato seeds require 75-85 days to develop into mature plants with ripe fruits. When the tomatoes are ripe enough to ship, they are carefully packed in boxes. The boxes are then loaded into semi-trailers for transporting to grocery stores. Some tomatoes are sent to a cannery where they are processed (cooked, squashed, preservatives added) to make sauces or ketchup.

Cheese—A Dairy Product
Cheese is a healthy, tasty food that is made from milk. The cows on the farm are milked by using suction cups to pump the milk from the cow into huge storage tanks. These storage tanks cool the milk until refrigerated tank trucks come to pick it up. The milk is then made into cheese. First, the milk is heated and quickly cooled. This is called pasteurizing. Pasteurizing is a process that kills any harmful bacteria. The processed milk is then treated to form a soft, custard-like substance called curd. The curd contains a liquid called whey, which must be taken out through a special process before cheese can be made. Special knives cut the curd into thousands of small cubes, and the whey oozes from them. Heating and motion force more whey from the curd, and the curd "ball" is then lifted from the vat. The "ball" is broken up into small pieces and put into presses that keep the cheese under great pressure for a few hours to a few days. During pressing more whey drains out, and the curd is shaped into blocks or wheels. After it is pressed, it is immediately wrapped in plastic. The cheese is then aged in cool storage rooms or warehouses. The aging times vary for different cheeses. Brick cheese and others need two months to age while Parmesan requires about a year. After being aged, the cheese is packaged in a wide variety of shapes and sizes.

Pepperoni & Sausage—Pork Products
Pigs go to market in only five to six months at the weight of 240-260 pounds. Pigs may be sold at an auction market or sale barn, or may be bought directly by an order buyer who buys for a packer. Meat inspectors employed by the United States Department of Agriculture inspect live hogs, hog carcasses, and the entire packing plant to make sure that pork is safe to eat. The pork is ground up, and special seasonings are added to make sausage, salami, hot dogs, and pepperoni. About half of the pork produced in the United States is sold in supermarkets. The other half is eaten at restaurants, hospitals, schools, and business cafeterias. Yet, we get a lot more from pigs than pork—we also get insulin to treat human diabetes, and the skin from hogs is used to treat victims of severe burns. Other by-products are glue, glass, rubber, plastics, and heart valves.
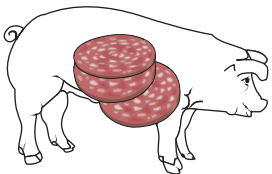
In Real Time

How long does it take to get a pizza or pick up a combo meal? Three minutes, thirty minutes? How long does it really take? Build your favorite pizza and/or combo meal using the ingredients on this page. Calculate in months or years how long it really takes to make a pizza and a burger and fries.

Pizza in Real Time

Ingredients   **Time**

Crust _____   _____

Sauce _____   _____

Cheese _____   _____

_____   _____

_____   _____

_____   _____

Tomatoes
7 months from seed to ketchup
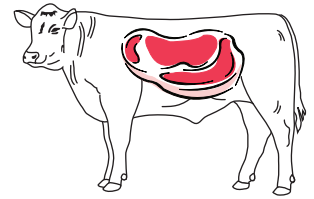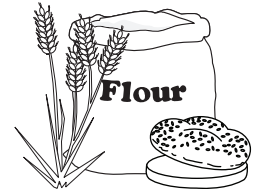
Beef
18 months from birth to market

Mushrooms
3 months from spore to harvest

Wheat
6 months from seed to harvest

Olives
5 years for a tree to produce fruit (olives)

Garlic
9 months from planting to harvest

Onion
5 months from seed to harvest

Cucumber
6 months from seed to cucumber pickle

Burger and Fry in Real Time

Ingredients   **Time**

Buns _____   _____

Burger _____   _____

Fries _____   _____

_____   _____
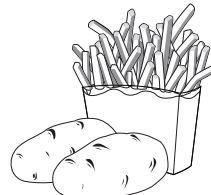
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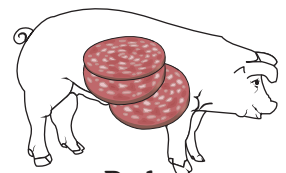_____   _____

Cheese
3 years from birth to cheese

Peppers
6 months from seed to harvest

Potato
5 months from seed to fries

Pork
5 months from birth to market

Pizza Starts on the Farm

Pizza crust is made from wheat. Farmers plant tiny wheat kernels in the ground using a drill. Wheat looks like fresh new grass when it comes out of the soil. It grows to about 24 inches high. The farmer harvests the wheat and hauls it in trucks or wagons to the country grain elevator. From there it is sold to food companies. There are a lot of steps to make wheat into flour for pizza dough. After the wheat is shipped to a mill, it is cleaned to remove weeds, stems, and other plant material. Then rollers press the kernels to break them into pieces. Finally, the small wheat pieces are shaken onto screens to sift out the bran and germ not used in wheat flour.
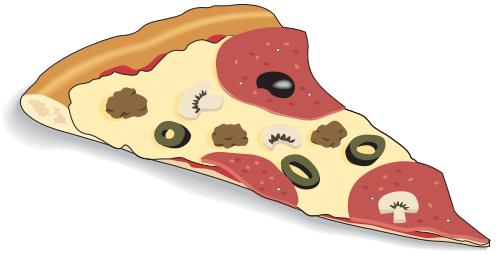
Fabulous Fractions

1. Using the round pizza below and a ruler, divide the pizza into two halves.
2. Next, divide the pizza into four fourths.
3. Finally, divide the pizza into eight eighths so each slice is one-eighth of the whole pizza.
4. How many pizzas would you need to give to everyone in your class one slice of pizza?
5. How many pizzas would you need to give everyone in your class two slices of pizza?
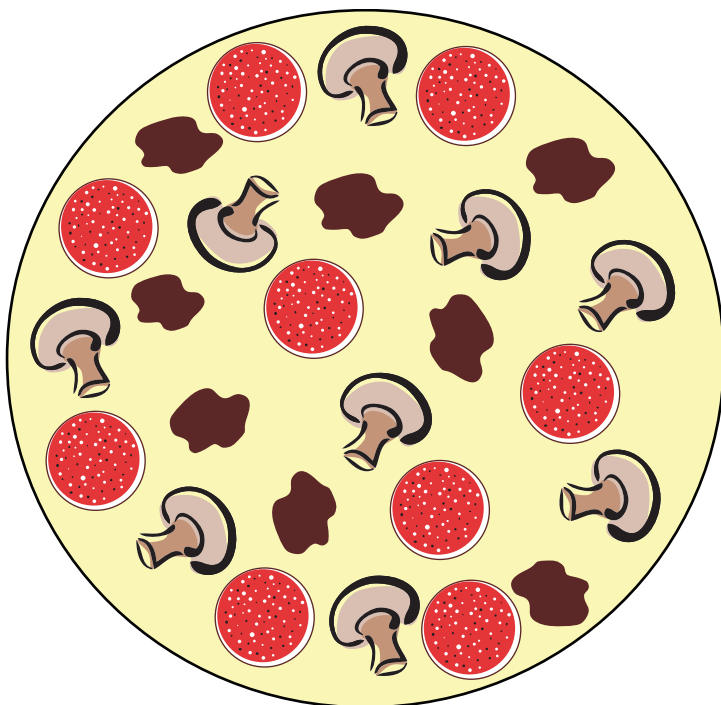
Pizza Probability

Pretend you are making pizzas and you have pepperoni, sausage, and mushrooms for toppings. How many different pizzas can you make with these toppings? (None of the pizzas can have the same toppings as any of the others.) Fill in the circles below until you run out of pizza topping combinations. The first one is done for you.