

Call It Macaroni

Objective

Students will use dry pasta in a variety of math activities.

Background

Pasta is made from unleavened dough, usually from durum wheat. It comes in a variety of different shapes, sometimes for decoration and sometimes as a carrier for the different types of sauce and foods. Pasta also includes varieties, such as ravioli and tortellini, which are filled with other ingredients, such as ground meat or cheese.

There are hundreds of different shapes of pasta. Examples include spaghetti (thin strings), macaroni (tubes or cylinders), fusilli (swirls), and lasagna (sheets).

Pasta is enriched with iron, folate and several other B-vitamins, including thiamine, riboflavin and niacin. It is even nutritionally enhanced with whole wheat or whole grain or fortified with omega-3 fatty acids and additional fiber. Very low in sodium and cholesterol-free when no eggs are used in some varieties, pasta is low in sugar, which means it is digested more slowly, and provides a slow release of energy without spiking blood sugar levels.

“Macaroni” with various sauces was a fashionable food in late 18th Century Paris. The future American president Thomas Jefferson tasted the pasta in both Paris and northern Italy. He drew a sketch of the pasta and wrote detailed notes on the extrusion process. In 1793 he commissioned American ambassador to Paris, William Short, to purchase a machine for making it. Evidently the machine was not suitable, as Jefferson later imported both macaroni and parmesan cheese for use in Monticello. In 1802 Jefferson served a “macaroni pie” at a state dinner.

Follow the directions below to make colored pasta to use in the following activities:

- Add $\frac{1}{2}$ c of rubbing alcohol and 20 drops of food coloring to zip sealed plastic bag. Swish well to mix. Then add 2 cups of a variety of pasta (so that you will have some of each type of pasta for every color that you make) to the bag and zip shut. Mix it well by shaking.
- Lay each bag flat and flip every 30 minutes for 2 hours (or until you reach the color you desire).
- Open the bag, drain the alcohol and spread pasta on newspapers to dry overnight.
- Store in zip baggie or other container.

Math

1. Read and discuss background and vocabulary.

Oklahoma Academic Standards

PRE-KINDERGARTEN

Number & Operations: 1.1; 2.2,4; 3.1. Algebraic Reasoning: 1.1,2. Measurement: 2.1,2,3.

Data: 1.1,2

Speaking and Listening: R.1,2,3,4; W.1,2. Reading and Writing Process: R; W. Critical Reading and Writing: R.3,4; W

KINDERGARTEN

Number & Operations: 1.1,2,5,6; 2.1; 3.1. Algebraic Reasoning: 1.1,2. Geometry & Measurement: 1.2,4; 2.1,2,3.

Data: 1,2,3

Speaking and Listening: R.1,2,3,4; W.1,2. Reading and Writing Process: R.1; W.1. Critical Reading and Writing: R.3,4; W

GRADE 1

Number & Operations: 1.2,4,8; 2.1. Algebraic Reasoning: 1.1. Measurement: 2.1,5. Data: 1,2,3

Physical Science—1.1; 2.2

Speaking and Listening: R.1,2,3,4; W.1,2. Reading and Writing Process: R.1. Critical Reading and Writing: R.3,4,5; W.2

GRADE 2

Number & Operations: 2.5. Algebraic Reasoning: 1,2; 2.1,2.

Data: 2

Speaking and Listening: R.1,2,3,4; W.1,2. Critical Reading and Writing: R.1,3,4,5,6,7; W.2

Materials

Variety of sizes/shapes of pasta

Rubbing alcohol (1/2 cup for every
2 cups of pasta)

Liquid Food Coloring

Gallon size zipper bags

2. Provide pasta in a variety of shapes, sizes and colors and use them as manipulatives in the following activities:
 - Construct addition and subtraction facts.
 - Use pasta pieces to create patterns.
 - Sort dry pasta pieces into groups by shape, size, color, etc.
 - Count dry pasta pieces by ones, twos, fives, etc.
 - Use pasta and structured arrangements, such as repeated addition, arrays and ten frames to develop understanding of multiplication.
 - Create bar graphs to show how many of each kind of pasta students have counted. Glue one of the pasta pieces at the top of each column.
 - List all possible arrangements and combinations of the kinds of dry pasta provided.
 - Partition a regular polygon using pasta and recognize when those parts are equal.
 - Partition sets of pasta into equal groupings..
 - Use the pasta as a nonstandard unit to measure objects in the classroom. Measure the pasta with a ruler and convert findings to a standard unit of measurement.
 - Use pasta to identify volume/capacity. Compare and sort containers that hold more, less, or the same amount.
 - Give students a Venn diagram, or have them draw one on a paper.
 - Students will glue the pasta into the Venn diagram and then write why they sorted the pasta into the groups they chose.
 - Students will share their Venn diagrams with the class and orally explain their findings.
 - Make a classroom graph of the different ways students sorted the pasta. How many different ways were used? How many students sorted the pasta in the same way?

English Language Arts

1. Bring a variety of cooked pastas for students to sample. Include whole wheat pastas and pastas made with spinach and other vegetables. Provide a simple spaghetti sauce and canned Parmesan cheese for a snack.
 - Students write observations and compare and contrast. Students develop their own criteria for comparison (e.g., texture, shape, flavor, etc.)
2. Read the spaghetti poems from the Reading Page, included with this lesson. Discuss the rhythm, theme, and meanings of the poems.
3. Students will write their own poems about pasta.
4. Students will write acrostic poems using pasta names—macaroni, rotini, spaghetti, etc.
5. Students will share their poems out loud or record them for others to hear.

Extra Reading

Cleary, Brian P., and Martin Goneau, *Macaroni and Rice and Bread by the Slice: What is in the Grains Group?* (Food is CAtegorical), Millbrook, 2011.

Dordick, Barry, *Macaroni on the Moon*, iUniverse, 2003.

King, Hazel, *Carbohydrates for a Healthy Body (Body Needs)*, Heinemann, 2009.

Murphy, Frank, *Thomas Jefferson's Feast*, Random House for Young Readers, 2003.

Ohanesian, Diane C., *Macaroni Math*, McGraw-Hill, 2000.

Watt, Fiona, and Kim Lane, and Howard Allman, *Pasta & Pizza for Beginners (Usborne Cooking School)*, EDC, 2003.

Vocabulary

dough—a soft mass of moistened flour or meal thick enough to knead or roll

durum wheat—a wheat that yields a flour used especially in pasta, as opposed to hard wheat, which is used for bread

extrusion—the art or act of forcing, pressing, or pushing out

unleavened—made without the yeast or other leavening normally used to make dough rise

Spaghetti Poems

SPAGHETTI! SPAGHETTI!

Spaghetti! Spaghetti!
You're wonderful stuff,
I love you spaghetti,
I can't get enough,
You're covered with sauce
And you're sprinkled with cheese,
Spaghetti! Spaghetti!
Oh, give me some please.
Spaghetti! Spaghetti!
Piled high in a mound,
You wiggle, you wriggle,
You squiggle around.
There's slurpy spaghetti
All over my plate.
Spaghetti! Spaghetti!
I think you are great.

—Jack Prelutsky

SPAGHETTI

Spaghetti, spaghetti, all over the place,
Up to my elbows—up to my face,
Over the carpet and under the chairs,
Into the hammock and wound round the stairs,
Filling the bathtub and covering the desk,
Making the sofa a mad mushy mess.

The party is ruined, I'm terribly worried,
The guests have all left (unless they're all buried).
I told them, "Bring presents."
I said, "Throw confetti."
I guess they heard wrong
'Cause they all threw spaghetti!

—Shel Silverstein