Family Math

math, we've got this!

Everyone can participate in these puzzles, compare notes, and share solutions. ***Enjoy!***

Wrapping Up the Year

Before making New Year's resolutions, it is a good idea to "wrap up" the current year and think about what you have accomplished. And now that it's cold outside, it is important to wrap up and stay warm! Many people will be wrapping up presents for the holidays and could use some tips. As the year comes to a close, discover some mathematical patterns, tips, and tricks about "wrapping up" in the December Family Math puzzles.

Wrap Up Your Resolutions

One of Rita's resolutions for this year was to write thank you notes to her family and friends each month. Her goal was to write 1 note in January, 2 notes in February, 3 notes in March, 4 notes in April, and continue writing an additional note each month until she wrote 12 notes in December.

If Rita met her goal, how many thank you notes did she write by the end of the year?

Wrap Up to Stay Warm

Cold weather has arrived, and it is important to bundle up before going out. Brent checked his closet for hats, scarves, and mittens. He found 3 hats, 5 scarves, and 2 pairs of mittens.

How many different combinations of outerwear can Brent create?

Wrap Up for Giving

Nora's family has made a special trail mix as a gift for family members. They want to create their own containers using wrapping paper. Nora has taken on the challenge to figure out how to fold the wrapping paper so the containers will hold the most trail mix.

Gather the materials listed below to complete the challenge.

Materials Needed

- dry beans, cereal, popcorn, rice, or other small grain (about 4 cups)
- heavyweight paper or lightweight cardboard (2 sheets)
  - The size can range from 8 inches by 10 inches to 11 inches by 14 inches.
  - Sheets of regular 8.5-inch by 11-inch paper can be used.
- a large bowl or pan
- measuring cup
- tape

Experiment Directions

• Using the paper and tape, create each of the containers described below.
• Once you see the containers side-by-side, predict which will hold the most trail mix and which will hold the least.
• Conduct the experiment after you have written down your predictions.
• Based on your experiment, recommend which container Nora's family should use.

Container 1

1. Fold one sheet of paper in half so that the longer sides meet.
2. Make a crease.
3. Open the paper and fold each end in to meet at the center crease.
4. Connect the long ends of the paper with tape.
5. Open the shape to form a bottomless rectangular prism that is tall and narrow.

If you use 8-inch by 10-inch paper, each side of the prism will measure 2 inches and the height will be 10 inches.

Container 2

1. Fold one sheet of paper in half so that the shorter sides meet.
2. Make a crease.
3. Open the paper and fold each end in to meet at the center crease.
4. Connect the short ends of the paper with tape.
5. Open the shape to form a bottomless rectangular prism that is short and stout.

If you use 8-inch by 10-inch paper, each side of the prism will measure 2.5 inches and the height will be 8 inches.

Container 1

Container 1

Prediction

Before doing the experiment and actually filling the containers, predict which one you think will hold the most trail mix: the tall, narrow one or the short, wide one.

Experiment

Put container 1 inside container 2 and set them in the bowl or pan. Fill container 1 to the top with the beans or grain you chose to use. Carefully pull container 1 out of container 2. Is container 2 filled to the top? Did it overflow? Is there additional room for more?

Wrap Up the Trail Mix

Which container should Nora's family create in order to give each person the most trail mix possible?

Wrapping Up the Year **Answers**

Wrap Up Your Resolutions
Rita will have written 78 thank you notes.

Wrap Up to Stay Warm
Brent can wear 30 different outerwear combinations.

Wrap Up for Giving
Nora's family should use container 1 to hold the most trail mix.