Nuggets for Sale

Julia Robinson Mathematics Festival

Around the world, you can find chicken[1] nuggets being sold in packages of 6 and 10. I want to buy exactly 43 chicken nuggets. Can you sell me 43 nuggets with these packages?

1. Or a meatless alternative!

Nuggets for Sale

Welcome to Nuggetville! In each season of the year, Nuggetville sells nuggets in different-sized packages. For each season:

1. Can you buy exactly 100 nuggets? 43 nuggets?
2. What numbers between 1 and 100 can you buy?

Fall: Nuggetville only sells nuggets in packages of 5 and 10.

Winter: Nuggetville only sells nuggets in packages of 10 and 25.

Spring: Nuggetville only sells nuggets in packages of 6 and 15.

Summer: Nuggetville only sells nuggets in packages of 3 and 10.

In which season did you have the most options? The fewest options? What makes each of these seasons different?

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You decide to open a nugget store in Nuggetville. You have to decide on **two** sizes of nugget packages. Your options are packages of 4, 6, 9, 12 or 20 nuggets.

1. Which two package sizes should you choose to give your customers the **greatest** number of options when buying nuggets?

2. Which two package sizes would give your customers the **fewest** number of options when buying nuggets?

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Challenge Nuggets:

1. If nuggets are only sold in packages of 6 and 10, can you buy any number of nuggets? Is there a largest number of nuggets that you cannot buy?

2. Given any two sizes of nugget packages, how can you tell whether there is a largest number of nuggets that you cannot buy?

3. When there is a largest number of nuggets that you cannot buy, how can you find that largest number?

4. If nuggets are sold in packages of 6, 9, **and** 20, can you buy any number of nuggets? Is there a largest number of nuggets that you cannot buy?

5. Given any **three** sizes of nugget packages, how can you tell whether there is a largest number of nuggets that you cannot buy?

6. When there is a largest number of nuggets that you cannot buy, how can you find that largest number?