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Cells : Schemes

puzzle #1

I eat half a banana and pause.

I then eat half of what remains and pause.
How much of the banana have I now eaten?

I then eat half of what still remains, and pause. How much banana in total have I now eaten?

I then eat half of what is still left, and pause. Have I eaten the whole banana yet? How much have I eaten?

If I follow this eating pattern, will I ever eat the whole banana?

puzzle #2

Instead of predicting what toss of a coin people receive--HEADS or TAILS--what if I tried to predict people's roll of a single die--1, 2, 3, 4, 5, or 6.

If I want about 16 friends to experience me being correct with my predictions six times in a row, about how many letters to friends should I first write?

ANSWER TO PUZZLE 2:

You will need to write to about
$6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 16 = 279,936$
friends.That's a lot of friends!

ANSWER TO PUZZLE 1:

You will eat 1/2 the banana, and then 1/2 + 1/4 = 3/4 of the banana, and then 1/2 + 1/4 + 1/8 = 7/8 of the banana, and then 1/2 + 1/4 + 1/8 + 1/16 = 15/16 of the banana. (There is a pattern to these fraction answers!)

Technically, you will never eat the whole banana. But eventually, what you will have left to eat will be smaller then an atom and then smaller than a subatomic particle, and so on.

But I don't think it is physically possibly to keep going to smaller and smaller particles forever. Hmm!

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The NMF Weekly is written by mathematician Dr. James Tanton as a resource for friends and fans of the 2021 National Math Festival.

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