

In framework of discussion on developing statistical and computational thinking as an inevitable part of mathematical education, I had presented a certain fascinating mathematical model connected to a lifelike situation of getting of a full collection of different and uniformly spread objects. For example, the commonly known interpretation of the model is getting a full collection of toys from Kinder Surprise.

The tasks originating from the model are very various in their difficulty, educational value and require miscellaneous tools for modelling and solving. Introduction of the model is possible with dice or primitive RNG (Excel or like that) as well as writing small programs for computers. Due that, students of grade 6 – 7 could get familiar with some aspects of random changeability and a concept of random value and its average.

More serious tasks arise when we're talking of mathematical background of the situation involving probabilities of numbers of missing objects, mathematical expectations of random values connected to the model.

The model in its different faces might be included as a real life based example when learning many mathematical topics like geometric and harmonic series, probabilities in experiments with equiprobable outcomes, logarithms, integrating and many others. The fig. below shows the initial slides of the presentation.

KINDER SURPRISE'S PROBLEM

All parents meet a math problem given by their kid having got first Kinder Surprise with a toy inside. The collection can contain 12 princesses or 10 hippos or something even more exiting.

The immediate question – how many eggs do we need to buy to complete the collection?

This leads to a curious statistical and probabilistic model which is being originally simple grows to a disproportionally and offensively sophisticated generalization as we need two collections for two kids.

