Name: _____ Mark: _____

Mini-math Gr 4: Monday, May 17, 2021 (15 minutes)

Calculators allowed!

(1) Consider a $5 \times 5 \times 5$ cube with the outside surface painted blue. Alice cuts the cube into 5^3 identical, unit cubes, then picks a cube at random. Given that the cube Alice picked has at least one painted blue face, what is the probability that the cube has exactly two blue faces?

(2) (Challenge) Consider an $n \times n \times n$ cube with the outside surface painted blue where $n \geq 3$. Alice cuts the cube into n^3 identical, unit cubes, then picks a cube at random. Given that the cube Alice picked has at least one painted blue face, what is the smallest value of n such that the probability that the cube has exactly two blue faces is less than 0.11?