

Push Tasks – Answers



Answers

1. Probability $\frac{1}{2}$ allows 10 heads in 10 flips; it's unlikely but not impossible

2. Small samples naturally vary; $18/20 = 90\%$, but a fair coin can produce this by chance

3. $180/200 = 90\%$, which is far from 50%; such a large sample producing such extreme results is much more suspicious

4. Fairness means equal probability in the long run, not equal wins in short runs; random variation happens

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5. The assumption that each face has equal probability; if the cube is imperfect, the weight may not be even

6. The contents of the bag change after each draw; drawing one item removes it, so probabilities shift

7. Experimental bias (unequal spinning force, starting position, etc.) can favour some outcomes over others

8. No; the outcome is not random if the player has information or control over selection

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9. That each labelled space has equal chance of landing; labelling alone does not guarantee equal probability

10. A biased device shows its true probabilities; theoretical formula assumes fairness, so experimental data is more accurate

11. Gambler's fallacy; rainfall is not independent like fair coin flips; past events do not change future probabilities

12. Example: a bent or weighted die behaves differently than a fair die; theoretical model assumes fairness but reality breaks that assumption