

Randomness Worksheet

Name: _____

On this worksheet we are going to do a simulation to see how many times Heads appears in 5 trials of 20 tosses of a fair coin. Use the following random number designations for Heads and Tails:

Heads: 0, 1, 2, 3, 4

Tails: 5, 6, 7, 8, 9

- Count the number of Heads in 5 trials simulating 20 flips of a **fair** coin.

Trial	Random Numbers	Number of Heads
Trial 1:	9 9 2 5 3 9 4 5 4 2 3 6 6 5 7 7 9 2 0 9	_____
Trial 2:	2 5 8 6 7 6 4 6 8 1 6 6 4 7 6 7 7 8 8 7	_____
Trial 3:	8 2 5 7 2 7 1 9 7 5 2 5 0 0 9 2 6 9 2 3	_____
Trial 4:	8 9 8 6 2 2 4 0 3 5 7 7 7 4 8 8 0 1 9 5	_____
Trial 5:	3 4 8 5 1 1 3 4 2 5 7 4 7 7 0 8 1 9 8 0	_____

- Calculate the average number of heads for the 5 trials.
- In this situation, the random event is “the number of heads in 20 coin tosses”. Why is this a random event? (check all that apply)
 - ☐ Before the trial, the outcome is unknown.
 - ☐ The distribution of Heads over the long run is predictable.
 - ☐ Each time I “flip” a coin, heads and tails are equally likely.
 - ☐ There are no outliers in the data.
- There is a lot a variability in the outcomes of the trials. This is commonly referred to as “sampling variability”. If we did a sixth trial, which of the following would be possible values for the number of heads we might observe? (*check all that apply*)
 - ☐ 0 Heads ☐ 6 Heads ☐ 11 Heads ☐ 15 Heads ☐ 19 Heads
- In the real world, when we collect data we only get to do one “Trial”. In which of the previous 5 trials do you think we are most likely to conclude that we do not have a fair coin. (*note: this would be an incorrect conclusion because of an unlucky sample*)
 - ☐ Trial 1 ☐ Trial 2 ☐ Trial 3 ☐ Trial 4 ☐ Trial 5