Probability practice assessment - Werder's example.

Problem:

I wonder what the most likely number of 1s that will appear if I am rolling 5 dice.

I **predict** that the most likely number of 1s that appear will be two 1s.

Plan:

I will be taking 5 dice and rolling them at the same time onto a flat surface - having a flat surface makes me sure of what the number will be and rolling them at the same time means I have no influence over the dice after they left my hand and I can't knock any over after they already have their number rolled.

If any dice fall off the table (flat surface) then I will roll them again.

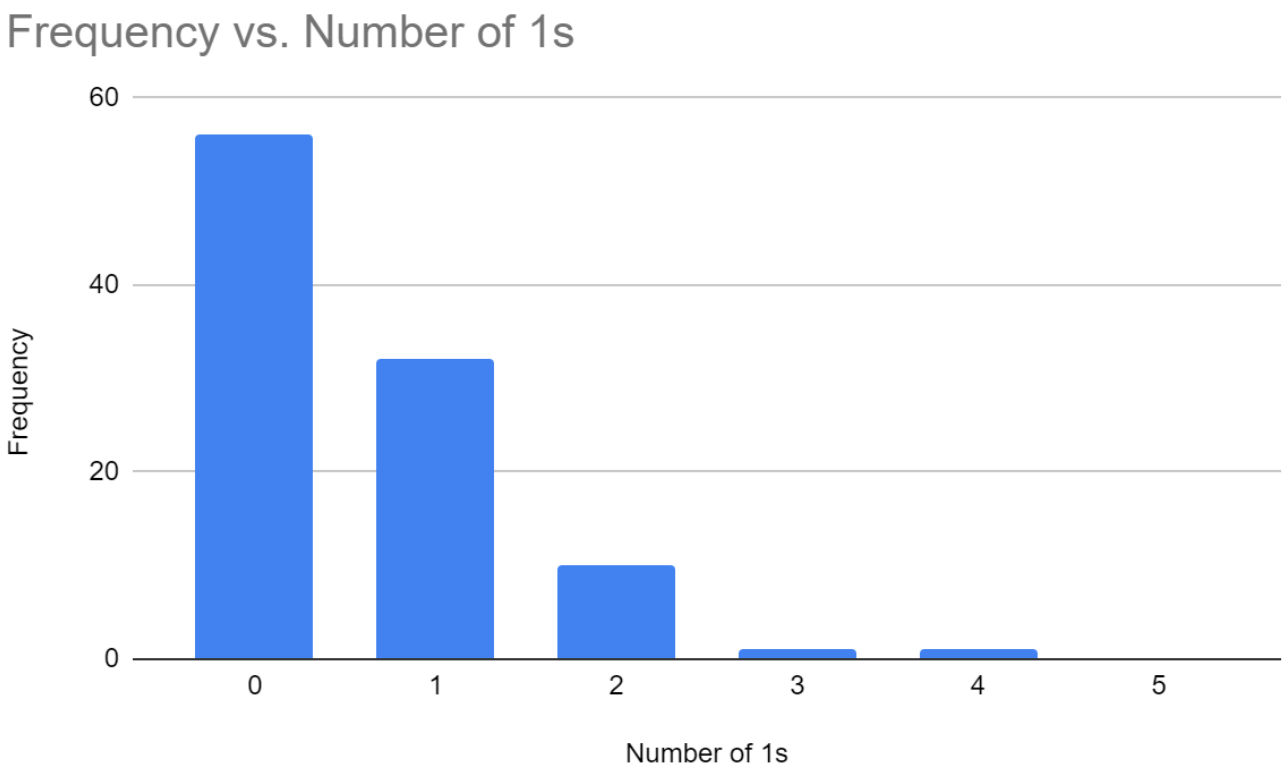
The possible outcomes for this activity are: 0 ones, 1 one, 2 ones, 3 ones, 4 ones and 5 ones.

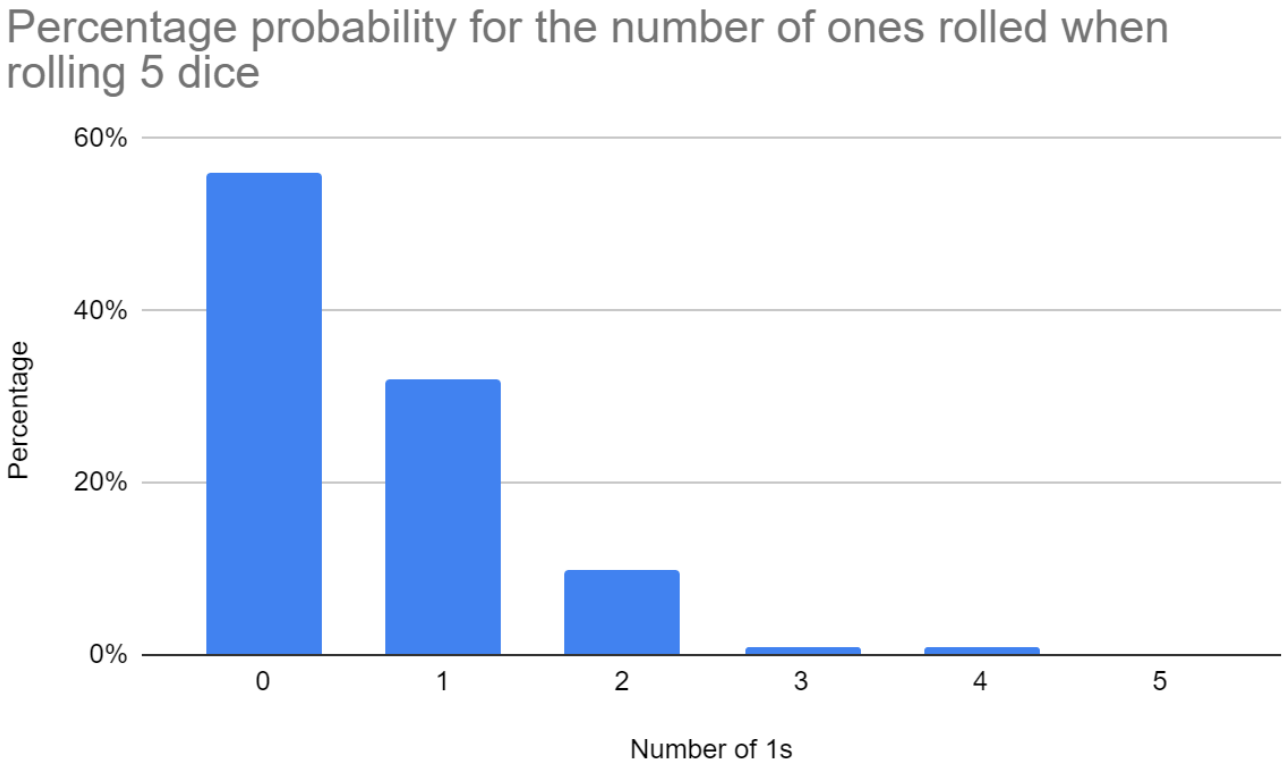
I will do 100 trials. I chose 100 trials as I think this is enough trials to get a good picture of the probabilities without taking too long.
For each trial I will count the number of 1s that come up on the five dice and I will record the number of 1s in tally table below.

Data

Outcome	Tally	Frequency	Relative frequency	Percentage probability
0 ones		56	56/100	56%
1 one		32	32/100	32%
2 ones		10	10/100	10%
3 ones		1	1/100	1%
4 ones		1	1/100	1%
5 ones		0	0/100	0%

Analysis





Shape:
I see that there is a peak at 0 ones (at 56% of the time) then the percentages seem to get lower for more ones on the dice - I can see this in the tapering off of the in the graph to the right side.

Centre:

The most common number of ones is zero (56% of the time) - I predicted two ones, so I was wrong. This result makes sense because if there were 6 dice (to match the number of numbers on the dice then I think that one would be more likely.

Spread
Our results only cover between 0 ones and 4 ones. 5 ones did not come up.

Unusual
Our experiment shows that the probability of rolling 5 ones is 0% (or impossible) I know that it is not impossible to roll 5 ones, it is just very improbable (the actual chances or rolling 5 ones is $(⅙)^5$ which is one in 7776. So if I wanted to have a better picture of the probabilities I should have had more than 7776 trials however that would take a ridiculous amount of time.

It was also unsal that both 3 and 4 had the same chance of happening - I would expect that it is easier to get 3 ones than 4 ones as there are more possible ways to get 3 ones with 5 dice.

Conclusion

In conclusion 0 ones was the most likely outcome with 56% of the time coming up, however we would need to do more trials to fix the issue discussed in the unusual part above.