Simulation for Free Magnets at a Restaurant

A restaurant is giving away free magnets each time you go to the restaurant. There are three different types of magnets and when you go, you have an equally likely chance of getting any of the three designs. We need to design a simulation that will help us find how many times we must go to the restaurant until we have all 3 designs.

The typical way of working this problem is to use a spinner divided into 3 equal sections (each section representing a different magnet) and spin it as many times as you need until you finally land in all 3 sections. Maybe you get lucky and it only takes 3 times, but that is not very likely.

We are going to simulate this event, but instead of using a spinner, we will create a spreadsheet and use the skills we have learned to simulate going to the restaurant multiple times. Since we don't know how many times we would have to go until we received all three magnets, we will need to make sure that we simulate going at least 12 times. Watch this video first before following the directions below on setting up the spreadsheet.

The video is at https://www.youtube.com/watch?v=t5wDEHx47L4 and a link to the video is located on the website where you got this sheet. It is titled "Video to set up a Simulation on a Google Sheet."

Directions to create Google Sheet for Simulation

Go to your email account and open Google Sheets
Hit CTRL-A to highlight everything and set your font size as 14.
In cell A1, type "Trip"
In cell B1, type "Magnet (1, 2, 3)"
Widen your columns in A and B if you need.
In cell A2, type the number 1
In cell A3, type the number 2
Use your mouse to highlight cell A2 and A3 and let go.
Drag the bottom corner of A3 with the blue dot down to cell A13 and let go.
This should have done a FILL SERIES giving you the numbers 1 to 12.
In cell B2, type "=RANDBETWEEN(1, 3)"
Highlight B2 and drag down to B12 and let go of your mouse.
Hit CTRL-D to do a FILL DOWN.
You have now simulated going to the restaurant 12 times.

Here is an example of what your screen might look like

Trip	Magnet (1, 2, 3)
1	2
2	2
3	1
4	2
5	3
6	3
7	1
8	2
9	3
10	3
11	2
12	1

From this example you can see that it took 5 trips of going to the restaurant to finally get all three magnets. In our chart below, we will be recording the number of trips it took, so in this case, you would record 5 in Trial 1 below.

If you go to any blank cell in your spreadsheet and type anything, including hitting the space bar, and then hit Return, the spreadsheet will recalculate everything. You can also hit F9 and it will recalculate. Each time it recalculates, you have a new set of data. Do this to get your 2nd trial, 3rd trial, etc. until you have gotten 20 trials. Record your answers in the chart below.

	Number of Trips
Trial 1	
Trial 2	
Trial 3	
Trial 4	
Trial 5	

	Number of Trips
Trial 6	
Trial 7	
Trial 8	
Trial 9	
Trial 10	

	Number of Trips
Trial 11	
Trial 12	
Trial 13	
Trial 14	
Trial 15	

	Number of Trips
Trial 16	
Trial 17	
Trial 18	
Trial 19	
Trial 20	

You now want to create a new spreadsheet in Google Sheets where you can enter the data that you have now recorded for your 20 trials. How you set that up is up to you, but you can see two examples on the website where you got this sheet.

Use the data from your 20 trials to calculate these three things, which you will need when you fill in the Google Form:

1. the least amount of times it took you to get the three magnets.
2. the largest amount of times it took you to get the three magnets.
3. the average number of times it took you to get the three magnets.

Remember that you should use minimum, maximum, and the average functions to get these answers. Organize your data neatly.