Skittles

Count the rainbow?

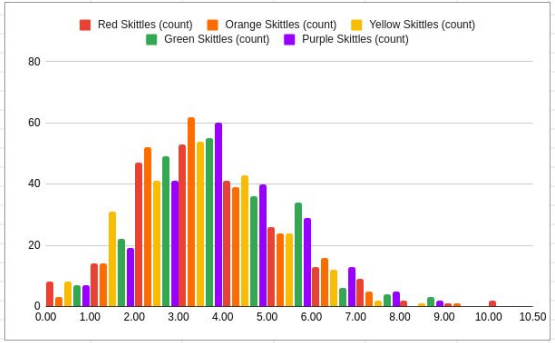
(again)


No two Rainbows are the same.
Neither are two packs of Skittles.
Enjoy an odd mix.
Lemon
Blackcurrant
Strawberry
Lime
Orange


Skittles
Fruits

	Red Skittles	Orange Skittles	Yellow Skittles	Green Skittles	Purple Skittles	Match checker
	5	3	5	2	2	503050202
	1	4	1	3	8	104010308
	5	6	2	2	2	506020202
	4	3	4	4	2	403040402
	6	1	3	2	5	601030205
	7	2	3	3	1	702030301
	1	6	3	2	5	106030205
	3	4	1	6	3	304010603
	4	2	4	5	2	402040502
	5	3	1	2	5	503010205
	4	3	3	3	4	403030304
	6	4	2	2	2	604020202
	5	4	3	2	2	504030202
	4	5	2	2	4	405020204
	3	3	5	1	5	303050105
	3	7	2	2	4	307020204
	6	6	1	2	1	606010201
	2	6	2	3	4	206020304
	4	6	1	2	3	406010203
	3	2	5	4	3	302050403
	2	6	3	3	3	206030303
	3	2	6	5	1	302060501
	4	2	5	2	4	402050204
	2	5	2	3	5	205020305
	3	5	3	2	4	305030204
	4	1	6	3	3	401060303
	2	1	4	1	8	201040108
	2	2	2	5	6	202020506
	4	3	3	2	5	403030205
	2	2	2	5	7	202020507
	3	0	4.5	5.5	4	300045554
	3	4	2	4	3	304020403
	5	2	2	3	4	502020304
	2	2	2	8	3	202020803
	0	2	4	5	6	2040506
	4	3	2	5	3	403020503
	3	4	3	2	4	304030204
	3	3	2	2	6	303020206
	3	3	5	2	3	303050203

Total packets:	215	
23 matching packets (pre mathsjam 2024)		
Record:	10	
Number of 0s:	33	
Reds:	747	26.51757188
Oranges:	720	25.55910543
Yellows:	662	18.74026893
Greens:	688	24.42314519
Purples:	715.5	25.39936102



Sheet1 | Cleaned up

Last year…

Last year we decided that there were

$$\binom{20}{4} + \binom{21}{4} = 10830$$

possible packets of Skittles in total, and that we should open 123 packets to have a 50/50 chance to see a match.

Except – over the last year I've done "the Skittles talk" at a bunch of open days…

…and we've found a match every time…

…even with only 50 participants.

Is my maths wrong?!

Out of my 10830 possible packets of Skittles,

5 have exactly 17 Skittles of the same colour;

25 have exactly 16 Skittles of the same colour;

and 70 have exactly 15 Skittles of the same colour.

So the likelihood of getting a packet of Skittles that's overwhelmingly orange (or overwhelmingly red, or yellow,...) should be about…

1%.

How many packets would I need to open to start doubting my assumption that all packets are equally likely?

In other words, what's the smallest *n* such that

$$0.99^n < 0.05?$$

$$0.99^{298} = 0.05004$$

$$0.99^{299} = 0.04536$$

$$0.99^{300} = 0.04904$$

I’ve got data from (almost) 300 packets of Skittles, and nobody’s ever had 15 of the same colour.

In fact, nobody’s ever had more than 10, which means I could have reached the same conclusion after only 18 packets

But then I wouldn’t have this lovely dataset…

www.clarewallace.co.uk/skittles