

Name: _____ Hour: _____ Date: _____

Do You Like Green Skittles?

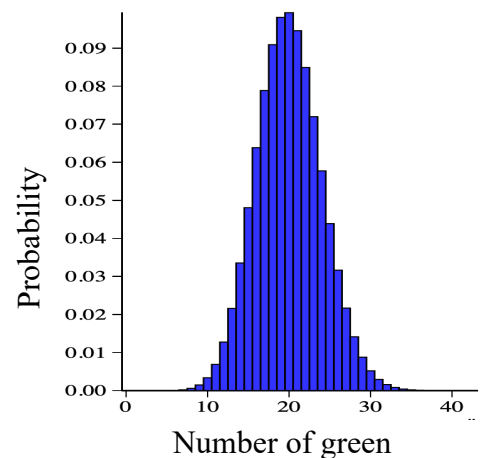


In 2013 Skittles changed the flavor of green from lime to sour apple (big mistake!!). Mr. Wilcox takes a small handful of 5 Skittles from a bin of 10,000 Skittles and gets ALL GREEN (terrible)! If 20% of the Skittles are green, what is the probability of this happening?

1. Is this a binomial setting? Explain
2. Find the probability of getting 5 green Skittles if this is **not a binomial setting**. Think $P(\text{1st green AND 2nd green AND 3rd green } \dots)$. Show your work.
3. Find the probability of getting 5 green Skittles if this were a **binomial setting**. Think binomial formula. Show your work.
4. How do your answers from #2 and #3 compare? Why do you think this is?

Mr. Wilcox now grabs a huge handful of 100 Skittles from the large bin of 10,000 Skittles. Let X = number of green Skittles in a handful of 100 Skittles. X can be considered a binomial random variable because the 10% condition is satisfied.

5. What is the probability of getting at most 11 green Skittles? Show work.
6. What is the approximate shape of the distribution?
7. Calculate the mean and standard deviation of X .
8. Re-do problem #5 using a Normal distribution.



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Normal Approximation to Binomial Distributions

Important ideas:

Check Your Understanding

Suppose that 65% of high school students eat breakfast before going to school. A random sample of 500 high school students were surveyed. Let X = the number of high school students in a random sample of size 500 who eat breakfast before going to school.

1. Explain why X can be modeled by a binomial distribution even though the sample was selected without replacement.
2. Use a binomial distribution to estimate the probability that 300 or fewer high school students in the sample eat breakfast before going to school.
3. Justify why X can be approximated by a Normal distribution.
4. Use a Normal distribution to estimate the probability that 300 or fewer high school students in the sample eat breakfast before going to school.