$\qquad$ Hour: $\qquad$ Date: $\qquad$


Mrs. Gallas loves red Skittles, but the last time she got a fun size bag there were no red Skittles! The bag was manufactured at the Skittles factory where 10,000 Skittles are made each hour. $20 \%$ of the Skittles are red. To make a fun size bag, 10 Skittles are chosen for each bag. What are the chances of getting a fun size bag with no red Skittles?

1. Is this a binomial setting? Explain.
2. Find the probability of getting 0 red Skittles in a group of 10 from the factory if this is not a binomial setting. Show your work.
3. Find the probability of getting 0 red Skittles in a group of 10 from the factory if this were a binomial setting. Show your work.
4. How do your answers from \#2 and \#3 compare? Why do you think this is?

To ensure that she gets more red Skittles, Mrs. Gallas buys a jumbo bag of Skittles which contains 900 Skittles. Let $X=$ number of red Skittles in a bag of 900 Skittles. Use a binomial distribution to model the situation.
5. Find the mean and standard deviation of $X$.
6. What is the probability of getting at most 150 red Skittles?
7. If we were to make a histogram of $X$, what do you think the shape would be?
8. Redo problem \#6 above with a normal distribution and compare your answers.
$\qquad$ Hour: $\qquad$ Date: $\qquad$

# Lesson 6.3 Day 3- Normal Approximation to Binomial Distributions 

Important ideas:

## Check Your Understanding

In a survey of 500 U.S. teenagers aged 14 to 18 , subjects were asked a variety of questions about personal finance. One question asked whether teens had a debit card. Suppose that exactly $12 \%$ of teens aged 14 to 18 have debit cards. Let $X=$ the number of teens in a random sample of size 500 who have a debit card.

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 50 or fewer teens in the sample have debit cards.
3. Justify why $X$ can be approximated by a Normal distribution.
4. Use a Normal distribution to estimate the probability that 50 or fewer teens in the sample have debit cards.
