

Application exercise 6.3: Candy Machine

Team name: _____

Write your responses in the spaces provided below. WRITE LEGIBLY and SHOW ALL WORK! Only one submission per team is required. Concise and coherent are best!

Assume you have a large candy machine and each time you dispense candies you get 6 candies. Assuming that you know that half of these candies are orange, you are interested in how many orange candies you get each time you dispense candies. To visualize this, go to <http://www.rossmanchance.com/applets/OneProp/OneProp.htm?candy=1>.

How to use the applet

- In the box next to **Number of candies**, type 6.
- Click **Draw samples**.
- To repeat this simulation 10 times, type 10 in the box next to **Number of samples**.
- A dot plot appears below with dots representing the number of orange candies in each simulation.
- To find the probability of at least 2 candies in your 11 simulations, type 2 in the box next to **As extreme as \geq** .
- To compare this result to the theoretical value from the Binomial distribution, click the box next to **Exact Binomial**.
- To find the probability of at most 2 candies in your 11 simulations, click on the box that says \geq to make it become \leq .
- To reset at any time, click **Reset** at the bottom.

Answer the following questions based on this applet. Be sure to show your work.

1. Is this a binomial experiment? Explain.
2. What is the mean number of orange candies in this experiment?
3. What is the variance of the number of orange candies in this experiment? What is the standard deviation?
4. What happens to your sample proportion of candies ≤ 2 compared with the theoretical proportion when you take 1000 more samples? Why does this happen?
5. Verify the probability of getting at most 2 orange candies by calculating it with the binomial distribution.